Space in Musical Semiosis
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An Abductive Theory of the Musical Composition Process

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“The same dream came to me sometimes in one form, and sometimes in another, but always saying the same or nearly the same words: Make and cultivate music, said the dream. And hitherto I had imagined that this was only intended to exhort and encourage me in the study of philosophy, which has always been the pursuit of my life, and is the noblest and best of music.”  
— Plato: Phaedo

“But a musician is one who has gained knowledge of making music by weighing with the reason, not through the servitude of work, but through the sovereignty of speculation.”  
— Boëthius: De institutione musica

“Although I shall discuss the uses and effects of music, I am concerned primarily with what music is, and not what it is used for. If we know what it is, we might be able to use and develop it in all kinds of ways that have not yet been imagined, but which may be inherent in it.”  
— John Blacking: How musical is man?

“It is not easy to determine the nature of music, or why anyone should have a knowledge of it.”  
— Aristotle: Politics

“To speak about the entire process of accumulating music knowledge is patently impossible, for it would involve an understanding of all the mechanisms of learning in all societies.”  
— Alan P. Merriam: The anthropology of music

“I seriously believe that a bit of fun helps thought and tends to keep it pragmatical.”  
— Charles S. Peirce: CP 5.71

“In order to be deep it is requisite to be dull.”  
— Charles S. Peirce: CP 5.17
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Introduction

About this inquiry

This study examines musical semiosis, the formation of musical meaning through cooperation of three elements: a sign, its object, and its interpretant. This is also a study of space and spatiality in musical processes, and particularly in the composing of music. These subject matters entail three interdependent threads of inquiry, which permeate this book. One of these threads is the question of what is understood by musical composition and how the latter operates as a process. Another thread deliberates on how we conceive space and spatiality, especially in the context of music. The last but not least thread addresses the problem of semiosis itself, and the capacities by which it incorporates space. In music, the first two threads are united in the third one, as the musical composition process is here approached from the viewpoints of spatiality and semiosis.

The principal aim is not to test an existing hypothesis, let alone to prove a theory right or wrong. Rather, the task is to construct a plausible hypothesis which would explain the facts and which would be subjected to testing in future phases of inquiry. In this respect, the project is abductive. In Charles S. Peirce’s words (CP 7.202; EP2, 94–95; MS 690; The Logic of Drawing History from Ancient Documents),¹

[a]ccepting the conclusion that an explanation is needed when facts contrary to what we should expect emerge, it follows that the explanation must be such a proposition as would lead to the prediction of the observed facts, either as necessary consequences or at least as very probable under the circumstances. A hypothesis, then, has to be adopted, which is likely in itself, and renders the facts likely. This step of adopting a hypothesis as being suggested by the facts, is what I call abduction.

In the following pages, I shall attempt to present the unexpected situation; that is, the lack of thorough understanding of musical semiosis and of the musical composition process, and the perplexity of spatial concepts in musical discourse. I shall also present the construction of a hypothesis, suggested by the “facts” presented

¹ ‘CP’ and subsequent digits refer to the eight volumes of Collected Papers of Charles Sanders Peirce and their paragraphs, edited by Charles Hartshorne and Paul Weiss (vols. I–VI), and by Arthur W. Burks (vols. VII–VIII). ‘EP’ and the volume number refer to the volumes of The Essential Peirce, edited by Houser and Kloesel, and The Peirce Edition Project. The manuscript number ‘MS’, when used, refers to Richard Robin’s catalog of Charles S. Peirce’s papers (Robin 1967; 1971). In some cases, the name of the article or other title is also given.
in a variety of utterances regarding semiosis, music, and the musical composition process.

According to Peirce, the justification for abduction is that “from its suggestion deduction can draw a prediction which can be tested by induction and that, if we are ever to learn anything or to understand phenomena at all, it must be by abduction that this is to be brought about” (CP 5.171; EP2, 216; MSS 314, 316; The Nature of Meaning; see also CP 2.270, 5.145, and 5.603; Paavola 2006). It is the task of future studies to continue this line of thought along the lines of deductive, inductive and abductive logic, should doing so become tempting, worthwhile or necessary.²

The attempt is to find an achronic view, rather than a synchronic or a diachronic one. Without a doubt, there is a great deal to be learned by studying historical developments and past traditions, as well as by comparative research of concurrent issues of musical spatiality and semiosis. Nor can issues of time be altogether neglected if the topic concerns space. Furthermore, since semiosis and music are both processes, some degree of temporality is inherent. Yet, the main concern is, first and foremost, to better understand the principles of signification, the composition process, and the spatiality involved. The concern is not to discover a status quo of any contemporary or past musical practice, but in chiseling out a more or less comprehensive, time-invariant rationale, which may be called a theory of the musical composition process. This kind of theorizing, however, does not demand the use of invariant musical universals, conceptions of knowledge as something absolute, eternal and immutable or the like.

Instead, the subject matter calls for the use of Peircean notions of doubt, belief and inquiry. In my work with music, “real and living doubt” has arisen from the apparent obscurity of the concept of musical spatiality and the seeming riddle of the composition process. This “irritation of doubt” has caused a struggle, which Peirce calls “inquiry”, striving to reach a “state of belief” (CP 5.374–376; EP1, 109–123; The Fixation of Belief and CP 5.394; EP1, 124–141; How to Make Our Ideas Clear). This

² Peirce depicted his conceptions of science on several occasions, such as in CP 1.43–125 (Lessons from the History of Science), CP 1.180–202 (An Outline Classification of the Sciences), CP 1.232–237 (The Essence of Science), CP 1.238–272 (The Divisions of Science), CP 5.358–387 (The Fixation of Belief), CP 7.49–138 (The Scientific Method), and, CP 7.162–255 (The Logic of Drawing History from Ancient Documents; EP2, 75–114, MS690). The last of these states: “That which is to be done with the hypothesis is to trace out its consequences by deduction, to compare them with results of experiment by induction, and to discard the hypothesis, and try another, as soon as the first has been refuted, as it presumably will be. How long it will be before we light upon the hypothesis which shall resist all tests we cannot tell; but we hope we shall do so, at last.” (CP 7.220; EP2, 107) Peirce’s vision holds that the progress of science (which he took as self-evident) is a result of combination of abductive, deductive and inductive logic, and that the goal of the investigation is eventually the truth, a mutually agreed explanation of reality, independent of us (CP 5.407–408; EP1, 138–139; How to Make Our Ideas Clear). Regarding Peirce’s conceptions of fallibilism, the idea of continuity, and evolution, see CP 1.141–175, or chapter 1.2.5.
state of belief, enduring for some time, and the means of achieving relief from the irritation of doubt, together constitute the subject matter of this book.

As has become apparent by now, Charles Sanders (or Santiago) Peirce’s philosophy forms, in a variety of ways, a framework within which the hypothesis is constructed. This is not a hermeneutical undertaking of finding out what Peirce truly said or intended to say in his time. Rather, the objective of the present reading of Peirce is merely to contribute to the construction of the hypothesis. I hope to convince the reader that instead of ad hoc eclecticism, the presented Peircean approach is at its core sound and logical, befitting the subject matter.

**About musical spatiality**

Musical spatiality has been understood in a variety of ways, both by laypersons and by professional musicians and musicologists. For instance, it has not always been clear what is meant by *musical spatiality* as opposed to *auditory, sound or sonic spatiality*. Sometimes the existence of musical spatiality has been denied altogether. Musical space has been envisioned in some cases as *music in space*, in other cases as *space in music*, or *space of music*. The former cases associate musical spatiality with actual, physical, concrete, material or external space, whereas the latter ones associate it with psychological, phenomenal, cognitive or conceptual spatiality. Furthermore, musical spatiality has sometimes been associated, quite exclusively, with particular musical *elements* or *parameters* in more or less symbolic or abstract manners.\(^3\)

Later chapters address the ideas attached to musical spatiality in closer detail. For now, as anticipatory examples, let us take two contrasting conceptions of musical spatiality, dating back to the 1950’s. In many regards, those days gave new impetus to discourse on musical spatiality, thanks to developments in such areas as electroacoustic music, musical serialism and reactions to it, and cognitive psychology. Both examples depicted here were originally presented in a hands-on context, without specific aims at deeper analysis of musical spatiality.

In his widely used book for introductory courses in music and music appreciation, Joseph Machlis attributed musical space to the combination of *melody* and *harmony*: “Tones [of a melody] move up and down, one being higher or lower than another in musical ‘space’” (Machlis 1955, 14). Since rhythm added the temporal aspect, together they formed a musical timespace—or spacetime, as you prefer: “From the interaction of the two dimensions—musical space and time—emerges

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\(^3\) Compared to ‘space’, the term ‘spatiality’ refers here to a broader concept, pertaining to and embracing all that is related to space and its nature, characteristics, qualities, and quantities.
the total unit which is melody” (idem). A few pages later, concerning harmony, Machlis wrote (ibid., 19):

We are accustomed to hearing melodies against a background of harmony. To the movement of the melody, harmony adds a third dimension—depth. It imparts richness and color to the melodic line, weight and body to the musical tissue. Harmony is to music what perspective is to painting. It introduces the impression of musical space.

This internally and unavoidably incoherent viewpoint is not original to Machlis, and throughout the second half of the twentieth century and since, conceptions of this kind have implied and promoted a narrow and somewhat ambiguous, perhaps even naïve, and somewhat abstract idea of musical spatiality to many readers. Suffice it to point out that this conception is suffused by associations with Western music, particularly with common practice notation, and gives no logical explanation for what produces “the impression of musical space”. Nevertheless, Machlis’s conception of musical space can be thought of as an instance of conceiving space in music. In this conception, music contains some form of spatiality by virtue of its characteristics.

For others, musical space has been a more concrete, perhaps even more mundane issue, which involves sound projection or performer placement in a listening space, site-specificity of musical works, incorporation of environmental soundscape(s) in musical works, or otherwise the qualities or characteristics of physical, perceived or experienced auditory space. All these imply a possibility of somehow referencing the music in terms of sound in a three-dimensional physical or psychophysical coordinate system. In other words, musical spatiality is conceived as music in space: by virtue of its characteristics, the space contains musical processes.

Henry Brant, for example, found this kind of “space factor” in music to be an essential aspect of musical composition, without which “it could almost be compared to a method of composing which made no specific provision for the control of time values or of pitches” (Brant 1967, 223). Since the early 1950’s his musical works have incorporated antiphony, placement, or movement of performers in relation to the audience and the surroundings as fundamental compositional parameters. Especially during the latter half of the twentieth century, many composers were in agreement with this idea, and incorporated the “space factor” in essential aspects of their works, some even before Brant and Stockhausen (see Harley 1993, 1994a).4

The idea of space in music, as presented by the Machlis example above, neglects the obvious fact that each instance of sound projection and perception takes place

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in our physical living environment, in physical space. Although often neglected in Western musical discourse, the “space factor” undeniably contributes to musical experience. However, if musical spatiality is understood merely as music in space, that is, as distribution or spatialization of sound, then music risks being equated with sound, which in turn raises severe objections and insurmountable questions.

The varied conceptions of musical spatiality reflect the more general concept of music and musicology of particular eras, styles, traditions, and artistic or practice-related standpoints. At the same time, extramusical conceptions of space and spatiality cannot be separated from the special case of musical spatiality. It is not the task of this research to set down normative truths on what musical spatiality in these terms is or should be. This would be not only a vain, but a silly task, since for instance the conceptions of music in space and space in music, exemplified above, are far from being mutually exclusive. Rather, the quest is to find a common, mediating ground between these and certain other understandings. This common ground, between spatial conceptions involved in music, serves later as a major factor in the analysis of musical semiosis and musical composition.

About the musical composition process

The apparent obscurity of the concept of musical spatiality can be compared to the apparent mysteries of the musical composition process. For composers themselves, accurate and comprehensive verbalization of the composition process has rarely been a task of ease or pleasure, although there are exceptions to this. Naturally, composers are the experts of composition processes. But the post factum reporting and analysis of composing usually requires speaking or writing about the process, which itself is essentially a non-verbal task. The reporting of the process is detached from the process itself. As far as the forms of inquiry are concerned, any concurrent probing or examining may well interfere with the process. This holds for both probing by outsiders and concurrent reflection by composers themselves.

This implies the important methodological question of to what degree verbal utterances by composers themselves are representative of the actual composition process, especially considering that at least some parts or aspects of the process are commonly regarded as subconscious, whatever that entails. According to Ericsson and Simon (1980, 247),

verbal reports, elicited with care and interpreted with full understanding of the circumstances under which they were obtained, are a valuable and thoroughly reliable source of information about cognitive processes. It is time to abandon the careless charge of ‘introspection’ as a means for disparaging such data.
Due to musical and scientific developments during the twentieth century, increased awareness of various compositional and musical aspects has yielded sophisticated analyses of music and composition process by a multitude of composers. Yet, the examination and analysis of such utterances in relation to the current theoretical framework is the task and responsibility of the interpreting researcher. Some aspects of cognitive processes may be reported one way or another. Other, essential aspects may well be beyond the reach of the subject, or reporting may be expressed in ways that require extensive interpretation.

For outsiders, that is, for those who do not compose music, the possibilities of examining the composition process have been limited either to purely theoretical considerations, to probing or observing the act of composing, or to examination of the products of the process, that is, sounds, sketches, notations, etc. Each of these three cases has its particular advantages and disadvantages, and as we do not exactly know how a composer’s mind functions in particular cases, we must be satisfied and do with the incomplete yet viable methods of inquiry. Any means of analysis of observed, reported, probed or discovered data is bound to be fragmentary, either due to flawed techniques of analysis, to incomplete data, or to both.

The present study seeks to avoid these problems by being a theoretical exploration into this subject matter. Neither the collection nor analysis of observational data has been performed specifically for these purposes. However, empirical endeavors do usually yield valuable information from specific aspects of the subject matter in question, and it serves no good to neglect those findings altogether. Therefore, this study attempts to construct a hypothesis, which is supported by certain items of empirical evidence, and which itself could then be subjected to tests in different ways.

It has been emblematic of discourse on musical composition, that the matter has generally been disclosed in two contrasting ways, whether by composers or by outside observers. First, reports have been given, in one extreme, as more or less meticulously detailed cerebrations of the chronological steps, phases and means, methods and procedures of putting a musical work together, that is, in terms of practical manuals for composition aimed either at amateurs or professionals or both. Simultaneously, a deeper explanation of the reasons, causes, motives or purposes of such activity are usually left aside. This clings closely to the traditions of musica practica and later, particularly, musica poetica (see e.g. Listenius 1927/1549, caput 1).

At the other extreme, the musical composition process has been described in very general and abstract, even ideal terms. This line is connected to the tradition of musica theorica or musica speculativa, and to traditional musical aesthetics. In the worst cases, these may have appeared as rationalized or pseudo-rationalized, as enigmatic writings of transcendental speculation, as ascriptions of both the workings and
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the outcome of the act of musical composition, as well as its impact on the listener, to cosmic harmony, divine mediation, absolute spirit, or what not. Composing has been described, for instance, as a matter of balance, integration or interaction of mind and heart, or of Apollonian and Dionysian oppositions.5

In some presentations these tendencies of musica poetica and musica speculativa coincide, but without a fruitful synthesis. And without a sensible synthesis, they are inadequate for reaching a thorough understanding of the subject matter. These expressions reflect their functional use, and their particular cultural and historical contexts, but from today’s perspective the conceptual apparatus for approaching composition process on those terms is by far insufficient.6

Promoting this dualism of musica poetica versus musica speculativa, Eduard Hanslick was pessimistic enough to point out (1986/1854, 30), that “[s]ince music has no prototype in nature and expresses no conceptual content, it can be talked about only in dry technical definitions, or with poetical fictions. Its realm is truly not of this world.” This study is an attempt to clear this misconception: it can be argued that music does have “prototype in nature.” The important question concerns what this “prototype” is, how it operates, and why. It is also a matter of what is understood by “nature”. I maintain that confinement to “poetical fictions” and “dry technical terms” is not necessary. This does not lead to any contradictions with considering musics as cultural practices, since here the evolution of cultural practices is considered a part and a result of the natural evolution.

Granted, musical composition process—as any process involving understanding and production of auditive, visual, gestural or other signs—is a complex issue. Complacency with mystification or the down-to-earth business of musical processes may appear understandable. But even if it were true that dissecting the process of musical

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5 See e.g. Nietzsche 1990/1895/1872. In Hako and Nieminen (1981, 115), Kaija Saariaho spoke of “heart-brain-coordination” as composer’s developing ability. Of course, descriptions of this kind might well be beneficial for the discourse in popularizing or clarifying the issue, or for didactic reasons. Usually, they are certainly not intended as in-depth analyses, but rather as practical conceptual tools of artistry.

6 For instance, Reginald Smith Brindle opens his Musical Composition (Smith Brindle 1986, viii et passim) with blatant mystification: “... through composition musicians can ... feel the mystery of our art as they could in no other way. To compose is one of the most wonderful experiences God has given us, and the journey into our imagination is something other mortals may never experience.” The main content of this Kompositionlehre serves as an example of studies of musica poetica, describing the practical task of composing music. As another example, in the late 1940s, John Cage envisioned composition “as an activity integrating the opposites, the rational and the irrational” (Cage 1973/1961, 18). For Cage, the rational referred to two concerns of the mind: “structure” or “the division of a whole into parts”, and “method” or “the note-to-note procedure”. The irrational referred to “method” and “material”, that is, “the sounds and silences of a composition”, both concerns of the heart (idem). Already this joins together the two lines of musica practica and musica speculativa; the rest of the article Changes describes in minute detail certain aspects of Cage’s composition process in various of his works.
creation might be detrimental to the process itself (since once revealed, it might stop working), researchers should not be satisfied with the practical applications and leave as a mystery what is outside the actual handicraft of composing. A true task of musicology is to reach a deeper understanding of the musical composition process. This, in turn, requires an analysis, and perhaps a rethinking, of the whole concept of music and of musical processes.7

Regardless of this dichotomy’s obscuring any lucid in-depth analysis of the composition process itself, a slow evolvement of theories of composition process has taken place in what seems a dialogue between the heirs of musica poetica and musica theorica, with significant impact from other fields of research. Namely, compositional theories have evolved from dealing exclusively with the musical work to the psychology of composition in terms of problem-solving, and further toward semiocognitive theories of composing music.8

This has been possible by increased collaboration with supporting fields of composition research, such as philosophy, psychology, cognitive sciences, and artificial life studies. Section 2.3 takes a closer look at the pros and cons of different approaches to the musical composition process and theories or models thereof. A logical consequence in the sequence of different approaches to the composition process, it seems, is the application of semiotics in order to peruse the kernel of that process: the formation of meaning. Hence the semiotic approach of this text.

About semiotics

The history and tradition of Western semiotic research is traceable from ancient times to our postmodern days, although the study of signs and signification has not always been labeled as a distinct discipline of semiotics. Although today’s semiotics is a broad and multifaceted field, most of the modern conceptions of semiotics are usually thought of as stemming from, or at least influenced by two quite distinct

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7 Igor Stravinsky’s reply to Robert Craft’s question—“You often say that to compose is to solve a problem. Is it no more than that?”—reveals the urge to adhere to the business of composing and the disinterest in the deeper analysis: “Seurat said: ‘Certain critics have done me the honour to see poetry in what I do, but I paint by my method with no other thought in mind.’” (Stravinsky and Craft 1980/1958, 20). Fittingly, Stravinsky named his book of six Harvard lessons Poetics of Music (Stravinsky 1947), rather than Practices of Music, portraying his emphasis on the role of homo faber.

8 It ought to be noted that distinguishing a theory of musical composition from those of musical listening or musical action is merely a question of emphasis, at least in the present perspective. For example, musical composition necessarily involves both listening and action. Part two delves deeper into the issues of outlining music and musical composition.
traditions, one originating from Ferdinand de Saussure’s sémiologie, and the other
from Charles S. Peirce’s semeiotic.\(^9\)

Saussure (1966/1916, 16) maintained, that semiology as “a science that studies the
life of signs within social life is conceivable; it would be a part of social psychology,
and consequently of general psychology.” Saussure stressed the role of linguistics
in this science, the part which was in his view to serve as a model for semiology
(ibid., 68).\(^10\)

Signs that are wholly arbitrary realize better than the others the ideal of the
semiological process; that is why language, the most complex and universal of
all systems of expression, is also the most characteristic; in this sense linguistics
can become the master-pattern for all branches of semiology although language
is only one particular semiological system.

Due to this, and due to the subsequent applications and developments of Saussure’s
ideas emphasizing formal and structural aspects of sign systems, the Saussurean
tradition of semiology has been deeply rooted in linguistics and structuralism.

The Saussurean tradition was further developed, particularly, by the schools of
Prague (e.g. Nikolay S. Trubetskoy and Roman Jakobson), Copenhagen glossematics
(Louis Hjelmslev), Paris (Algirdas Julien Greimas), and by Claude Lévi-Strauss’s
structural anthropology. In Greimas’s work, the Saussurean tradition was fused with
the structuralist tradition of Russia and Eastern Europe. This structuralist fusion
formed the basis for the breakthrough of semiology in Paris, and subsequently in
other parts of Europe in the 1960’s, resulting in more or less distinct subdisciplines
of, among others, literary semiotics (Roland Barthes), psychoanalytic semiotics

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\(^9\) See, e.g. Eco (1975); Eco (1979/1976, 14–16); Rey (1978, 98–110); Tarasti (1990, 10–11); Deely
(2000b, 1); Chandler (2002, 5). However, Tarasti (1990, 5–11) adds cultural semiotics as a fourth main
category to Thomas A. Sebeok’s tripartite classification of semiotics to empirical semiotics (such as the
study of medical symptoms), philosophical semiotics (represented by e.g. Charles S. Peirce’s semiotics
and by John Locke in his Essay concerning human understanding), and linguistic semiotics (Ferdinand
de Saussure, Roman Jakobson, Louis Hjelmslev, Algirdas Julius Greimas et alia). Cultural semiotics is
represented in particular by Yuri Lotman and the so-called Moscow-Tartu school (or Tartu-Moscow
school, as it is preferably called—see Kull & Lotman 1995). For handbooks and dictionaries of semiotics,
see Nöth 1985; Sebeok 1986; Bouissac 1998; Danesi 2000; and Bronwen & Ringham 2000. For general
introductions to semiotics, see e.g. Chandler 2002; Sebeok 2001; Johansen & Larsen 2002/1994; Danesi
1999, 1994; Deely 1990; and Tarasti 1990. For the semiotic conception of ‘modern’ and ‘postmodern’,
see Deely 2000a.

\(^10\) Saussure’s original statement is in French: “On peut donc concevoir une science qui étudie la vie des
signes au sein de la vie sociale; elle formerait une partie de la psychologie sociale, et par conséquent de la
psychologie générale...” (Saussure 1967/1916, 33); and: “On peut donc dire que les signes entièrement
arbitraires réalisent mieux que les autres l’idéal du procédé sémiologique; c’est pourquoi la langue, le
plus complex et les plus répandu des systèmes d’expression, est aussi le plus caractéristique de tous; en
sens la linguistique peut devenir le patron général de toute sémiologie, bien que la langue ne soit qu’un
système particulier” (Saussure 1967/1916, 101).
Space in Musical Semiosis

(Jacques Lacan), and musical semiotics (Wilson Coker, Nicolas Ruwet, Jean-Jacques Nattiez, Gino Stefani, Eero Tarasti, Vladimir Karbusicky, David Lidov, Robert Hatten, Raymond Monelle etc.).

Since its period of hegemony in semiotics in the 1960’s and 1970’s, the linguistic-structural tradition has been subjected to critique. The critique has mainly been aimed at the narrow conception of the domain of semiotics, particularly the anthropocentric conception of language as the superior sign system. Another objection has been the denial of the intentional, interacting subject in favor of the text or other object with form, structure or grammar. (Cf. Sebeok 1975, 86–87; Sebeok 1991, 49–82; Tarasti 1990, 8 and 38–39; Deely 1993, 253; Deely 2000b, 2.) The anthropocentrism of the Saussurean tradition led to the conception that culture is more or less ontologically and epistemologically separated from nature. Meanings and processes in this kind of post-structural semiology tend to be relative and ungrounded. In this perspective, the Saussurean tradition has portended the continental postmodernism and its relative, even rootless epistemology.

Contrary to Saussure, Charles S. Peirce defined semiotic as equal to logic (CP 2.227): 11

Logic, in its general sense, is, as I believe I have shown, only another name for semiotic (σημειωτικέ), the quasi-necessary, or formal, doctrine of signs. By describing the doctrine as ‘quasi-necessary,’ or formal, I mean that we observe the characters of such signs as we know, and from such an observation, by a process which I will not object to naming Abstraction, we are led to statements, eminently fallible, and therefore in one sense by no means necessary, as to what must be the characters of all signs used by a ‘scientific’ intelligence, that is to say, by an intelligence capable of learning by experience.

For the term ‘logic’, Peirce differentiated two uses (CP 1.444):

In its narrower sense, it is the science of the necessary conditions of the attainment of truth. In its broader sense, it is the science of the necessary laws of thought, or, still better (thought always taking place by means of signs), it is general semiotic, treating not merely of truth, but also of the general conditions of signs being signs (which Duns Scotus called grammatica speculativa), also of the laws of the evolution of thought, which since it coincides with the study of the necessary conditions of the transmission of meaning by signs from

11 John Locke had done the same: “The third branch [of science] may be called σημειωτική, or the doctrine of signs; the most usual whereof being words, it is aptly enough termed also λογική, logic: the business whereof is to consider the nature of signs the mind makes use of for the understanding of things, or conveying its knowledge to others” (Locke 1661/1690, vol. 2, 309). It is unclear, however, whether Peirce ever ended up using the spelling semiotics. He was occupied with the term, and hovered between, at least, semiotic, semiotic, semeiotic, and semeiotics (CP 2.227, CP 8.377, for instance). Through their correspondence, Peirce was also familiar with Victoria Lady Welby’s term and concept of significs, but considered it narrower (CP 8.378).
mind to mind, and from one state of mind to another, ought, for the sake of taking advantage of an old association of terms, be called *rhetorica speculativa*, but which I content myself with inaccurately calling *objective logic*, because that conveys the correct idea that it is like Hegel’s logic.

As opposed to the Saussurean conception of *semiology* as a subdiscipline of social psychology, Peirce drew a broader and a more comprehensive picture of *semeiotic* in his *Outline Classification of Sciences* (CP 1.180–202, see also CP 1.238–283). For Peirce, semeiotic was the philosophic—or *cenoscopic* science of signs, cenoscopy or coenoscopy referring to the study of the common, i.e. the common experience, the common sense (see CP 8.199, Kent 1987).

In Peirce’s conception and division of the sciences, each subdivision builds on the previous ones. Hence, semeiotic builds on mathematics, on phenomenology (or *phaneroscopy*) and on esthetics and ethics (or *practics*).\(^{12}\)

In turn, semeiotic serves as a foundation for metaphysics, and for idioscopy, that is, for all the special sciences, such as psychology, ethnology or history, as well as for the physical sciences. Thereby, in Peirce’s classification, semeiotic serves as a basis for musicological inquiry, as well.\(^{13}\)

Although Peirce never reached his goal of building a complete philosophical system, his conception of semeiotic as a scientific discipline is, in the end, rather well-organized within his incomplete system, and clearly broader than that of the linguistic-structural tradition of semiology. Musical semiotics—the science of musical signs—draws parallels not only from structural linguistics or linguistic semiotics, but also from the semiotic study of dance, mimics, plastic arts, every day life, society, psychology and biology, and others. Musical semiotics requires broad frames, yet something that can be a definitive and unambiguous conceptual framework.

The attempt to broaden the linguistic-structural concept of text to include that of non-verbal languages or non-symbolic sign systems is simply not enough. That does not alter the anthropocentric and language-oriented foundations which sub-

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\(^{12}\) “Phenomenology ascertains and studies the kinds of elements universally present in the phenomenon; meaning by the phenomenon, whatever is present at any time to the mind in any way. Normative science distinguishes what ought to be from what ought not to be, and makes many other divisions and arrangements subservient to its primary dualistic distinction. Metaphysics seeks to give an account of the universe of mind and matter. Normative science rests largely on phenomenology and on mathematics; metaphysics on phenomenology and on normative science.” (CP 1.186; EP2, 259; *An Outline Classification of the Sciences*.)

\(^{13}\) According to Peirce, the three sciences of discovery are mathematics, philosophy, and idioscopy (i.e. special sciences). “Mathematics studies what is and what is not logically possible, without making itself responsible for its actual existence. Philosophy is positive science, in the sense of discovering what really is true; but it limits itself to so much of truth as can be inferred from common experience. Idioscopy embraces all the special sciences, which are principally occupied with the accumulation of new facts.” (CP 1.184.)
stantially disregard the elementary core processes of semiosis in favor of the idea of semiosis primarily as symbol manipulation in cultural context. Although the Peircean cenoscop[y is admittedly plagued by constant revisions of both concepts and terminology, it does allow for a pragmatist (or pragmaticist) view of music as a simultaneously subjective and intersubjective (cultural, social) practice, closely tied to action and experience.\textsuperscript{14}

The Peircean approach also allows for a \textit{naturalist} conception of epistemology, and fruitful connections to other disciplines, such as cognitive sciences, or other traditions of semiotics, such as the biosemiotic tradition stemming from Jakob von Uexküll’s \textit{Bedeutungslehre} (von Uexküll 1982/1940).

Furthermore, because semeiotic is an integrated part of Peirce’s large system of philosophy of science, Peircean conceptions of truth, objectives of inquiry and scientific methodology are at our disposal, when necessary. It appears that opting for the Peircean trace of semiotics is not only a possibility, but a necessity.

\section*{About this book}

This book is divided into five parts, not counting this introduction. The first part outlines the philosophical starting points of the study, and clarifies some key concepts and terminology used. It presents the framework for the study, which is that of naturalist pragmatism.

The second part contemplates the very concept of music. It also reviews past theories of composition process, addresses the predicaments in them, and outlines the requirements of a contemporary theory of that process.

The third part delves into spatiality, semiosis, the formation of meaning, and explores some approaches to representation and signification that could be applicable in this pursuit. A Peircean synthetic view of mind as a semiotic system is presented. According to that view, spatiality plays a main role in semiosis.

The fourth part relates the synthetic view of mind to the idea of music being a mental process as expressed in part two. Different aspects of music and spatiality are examined. As an outcome we encounter the idea of musical semiosis operating by means of spatial embodiment and metaphors.

\textsuperscript{14} Peirce coined the word \textit{pragmaticism} in order to avoid further misinterpretations of his earlier term \textit{pragmatism}: “So then, the writer, finding his bantling ‘pragmatism’ so [ill] promoted, feels that it is time to kiss his child good-by and relinquish it to its higher destiny; while to serve the precise purpose of expressing the original definition, he begs to announce the birth of the word ‘pragmaticism’, which is ugly enough to be safe from kidnappers” (CP 6.414; EP2, 334–335; \textit{What Pragmatism Is}; cf. EP2, 516n3, 539n2–4).
The last part is a “coda”. It takes a look back at parts one through four, and projects avenues for future work. Hence, the book loosely follows a rondo form: following this introduction, parts one, three and five deal with the semio-philosophical framework and the process of inquiry, while parts two and four address the more musicologically oriented issues.

Although the ideas expressed in this book relate in various degrees to different musical genres, styles, cultures or features, the original point of interest for this study was the composition process of electroacoustic music. One might find traces of this throughout the book. Although “electroacoustic” does not denote any style or musical practice in particular, it does connote a close relation to what is commonly termed contemporary Western art music, and its avant garde. This leads largely to omission of contact points with many musical practices in which ‘space’ may play a significant role. At the same time, the subject matter of the composition process leads to the omission of substantial issues relating, for instance, to the performance or reception of music.

Furthermore, the emphasis is not on historical, stylistic, nor technical aspects of music or musical composition, even though these will unavoidably be touched upon. Nevertheless, it is my aspiration, that this book would offer some ideas for future undertakings in historical and analytical fields, for instance, and most of all, in compositional fields of music and musicology.

The non-ideal nature of the goals of this research project and the inherent possibility for fallacy notwithstanding, I would not claim having reached the goals. First of all, the practical possibilities of reaching a solid and transparent understanding of the difficult subject matter are limited. Second, reliance on any state of belief appears precariously volatile as current scientific understanding is accumulating and ever-changing, thanks to the effective undertakings of researchers and research communities. Nevertheless, in the following pages, I wish to present the results of my contemplations for the reader to comment, contest, and perchance to commend. As throughout this project, I believe that by exposing one’s thoughts for public commentary in the community of scholars and students, the goals of one’s study are brought closer and closer. In this respect, this book portrays a current understanding of the issue in question. It is one phase of understanding in what apparently is an unending path of inquiry, or an endless hermeneutic spiral. I look forward to the possible discussion raised by these propositions.
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I also wish to show my appreciation to the participants of other conferences I have had the privilege to attend. They have provided me with valuable feedback during this project. These conferences include the annual joint national symposia of the Finnish Musicological Society and the Finnish Ethnomusicological Society, and a variety of international conferences. I also want to show my gratitude to my past and present employers at the University of Oulu and at the Sibelius Academy for the allowances or travel grants allotted for conferences during this project.

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Introduction

The group collaboration of AWE has been fundamental in this pursuit. AWE, or Artist, Work of Art, and Experience is an interdisciplinary group of artists, musicians and researchers, formed around pragmatistic conceptions of arts and interest in pragmatistic philosophy and semiotics.

In particular, I want to most cordially thank the mentor of the AWE group, docent Pentti Määttänen, Ph.D., who has been my paragon of philosophic, semiotic and scientific pursuit. His indomitable inspiration for music and the arts combined with the professionalism of a keen and knowledgeable philosopher and his unfaltering humanism has been exemplary both of excellent academic and good man. Thank you.

Furthermore, I wish to recognize the unparalleled camaraderie and the inspiring philosophical, musicological and humane dialogue I have carried out for several years with Ph.D., Ed. Lic., M.A. Lauri Väkevä. In addition to the smaller formal research projects we have carried out as a team, I have enjoyed his companionship as a colleague and a friend.

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I would also like to thank my parents, who passed away during this project, for providing me with opportunities to study, especially for the years in Hungary and the United States. My dear wife Kirsi, and our wonderful children Aino, Ilona, and Onni, whose lives joined and fulfilled mine during this project, this book is dedicated to you with love.
Peircean naturalist pragmatism as foundation for inquiry

This study argues that music and musical composition process are spatially embodied. Briefly put, this means that music, which is here regarded as a semiotic process, is in a fundamental way logically connected to the spatial characteristics of the tangible world we live in. The character and constitution of this embodiment form the core of this book. Although presented as abductive, or hypothetical, this kind of argument should not and cannot be just a result of random operations, or a wild guess. The challenge is precisely the careful construction of the argument.

Charles S. Peirce listed six rules according to which hypotheses ought to be synthesized. Although introduced in the context of research of historical documents, they are potentially applicable in this context, as well. The rules are briefly summarized as follows (CP 7.225–230; EP2, 113–114):¹

1. The hypothesis “ought to explain all the related facts”.
2. The “first hypothesis should be that the principal testimonies are true; and this hypothesis should not be abandoned until it is conclusively refuted”.
3. Preference of one hypothesis over another should be based on great objective probabilities, although never absolutely conclusive consideration; “merely subjective likelihoods should be disregarded altogether”.
4. The hypothesis should be divided “into its items as much as possible, so as to test each one singly”.
5. Hypotheses that explain a larger field of facts should be given precedence.
6. Due to economic reasons, the hypothesis that will in any case be tested in full or in part should be given precedence, if all other aspects are equal.

A good hypothesis, Peirce also wrote, should be able to explain “the surprising facts we have before us which it is the whole motive of our inquiry to rationalize” (CP 7.220). In this case, these facts are reflected in our experience of the operation

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¹ Since Peirce’s days, the topics of abduction and hypothesis have been elaborated in several occasions (see for instance Hintikka 1998; Niiniluoto 1999; Paavola 2006). In this book, a pragmatist view of abductive methodology is employed. Similarly, several other issues in this book are treated first and foremost from a Peircean perspective exclusively. As Peirce’s pursuit for a complete philosophical structure serves the purposes of this book, I shall make no attempt to depart from Peirce’s thinking and origins of pragmatism unless decidedly necessary. Although unavoidably important, the in-depth analysis and detailed synthesis of Peircean ideas expressed here versus post-Peircean critique and commentary must be carried out elsewhere. While limiting the use of secondary literature in this context, this is mandated by the economical limitations of research (see CP 5.589, 7.220; Rescher 1976).
of the musical composition process, and of the spatiality involved in music. The hypothesis at hand attempts to approach these facts comprehensively.

The principal testimonies supporting the construction, that is, the utterances in the discourse about music and composition, are principally assumed to be representative of the operations of musical composition process, one way or another. This notwithstanding, the attempt is made to reach a degree of non-subjective probability and broad applicability of the hypothesis. The goal of non-subjectivity is also pursued by incorporating insight from recent developments, for instance in cognitive science and philosophy of mind, into the governing Peircean framework of the study.

Regarding the construction of hypotheses, with the exception of pure mathematics being a mere “science of hypotheses” (CP 4.233), Peirce called for experimental verification (CP 5.197):

Any hypothesis, therefore, may be admissible, in the absence of any special reasons to the contrary, provided it be capable of experimental verification, and only in so far as it is capable of such verification.

However, since the present argument is presented as a hypothesis, we need not be concerned with the actual testing at this point. It is enough that the hypothesis has the potential of being subjected to test, to experimental verification or nullification, preferably in many distinctive ways.²

The concern is now to construct a hypothesis “in the absence of any special reasons to the contrary” that is capable of extensively explaining “the surprising facts we have before us” regarding musical composition process. The last section (5.2) of this book returns to the issues of testing, and the future of this trail of inquiry in general.³

² Whether the argument stated here ought to be labeled as a hypothesis or as a theory, is perhaps a question worth asking. From Peirce’s standpoint, it is a question of support and inference. When capable of explaining the observed facts (or their approximate representations) including deviations within the facts, “an hypothesis of this importance is called a theory, while the term hypothesis is restricted to suggestions which have little evidence in their favor” (CP 2.638). On the other hand, hypothesis, or abduction or retroduction as Peirce called it, in this sense the terms being quite interchangeable, is one of the three stages of inquiry, or the three methods of inference. Of the three methods, neither deduction nor induction “can originate any idea whatsoever”, while abduction “consists in studying facts and devising a theory to explain them” (CP 5.145). In other words, the term hypothesis stresses the aspect of inference, and to a degree its provisional and processive aspects, while the term theory emphasizes the more or less lasting outcome of this abductive inference and the condition of being subjected to and possibly supported by subsequent deductive and inductive inference, with a possible result of sufficient proof. (See also CP 2.707; 5.171; 2.663 and 2.638.) I shall use the words hypothesis and theory interchangeably in this context, the slight difference being the aforementioned emphasis.

³ Reverting to the notion of belief: “The most that can be maintained is, that we seek for a belief that we shall think to be true. But we think each one of our beliefs to be true, and, indeed, it is mere tautology to say so.” (CP 5.375). As to what Peirce meant by verification, see e.g. CP 5.198–205; EP2, 235–239, especially the “fifth place".
Taking note of the fourth rule, the argument of this study can be presented in a nutshell in the general form of syllogism, in the mood of *Barbara* (see e.g. CP 2.461–; 2.552–; 2.619–):

I  Rule: Mental phenomena are spatially embodied.

II  Case: Music and musical composition process are mental phenomena.

III  Result: Hence, music and musical composition process are spatially embodied.

Since “Barbara, is, in fact, nothing but the application of a rule” (CP 2.620), we do not need to be concerned with the validity of the inference from the premises to the result. Instead, the logic of the syllogism depends on the constitution of the premises. The task seems clear. What needs to be established are the minor and major premises of the syllogism: how it is, that the musical composition process is a mental phenomenon; and how it is, that mental phenomena are spatially embodied.⁴

If these endeavors prove successful, the third, concluding part of the syllogism results, and the repercussions thereof can then be addressed. Hence, the fact that Barbara “particularly typifies deductive reasoning” does not contradict the abductive character of this study. The syllogism just happens to serve the current needs by being an appropriate form in which to represent this inference.⁵

Part three of this book develops the major premise, by taking a position in semiotics based on a naturalized conception of mind. From this viewpoint, the role of spatiality in semiosis is examined. The second part focuses on the minor premise of the undertaking, that is, on music and composition process, and on their character as mental phenomena. As such, neither premise is a novel idea, as has been shown in the domains of cognitive science and cognitive musicology, for instance. However, in this case, the approach is first and foremost Peircean. Despite the fact that Peirce did not specifically address music, this is an attempt to view music and composing from the perspective of Peircean phenomenology, pragmaticism, and semiotics.

I do not claim that the understanding of Peirce, on which the premises are built here, would be better or worse than any other understanding of Peirce’s writings, let alone that the following would be a musicological application of what Peirce

⁴  Peirce insisted on the spelling ‘premiss’, since the word derives from 13th century Latin usage of ‘praemissa’ rather than ‘premise’, which is applicable for inventories, buildings and legislation (CP 2.253 and 2.582; Thompson 1973/1953, 272).

⁵  Instead of an antiquated syllogism, there are, naturally, other ways of posing the argument, for instance as a formula in predicate calculus: \( \forall x[(M(x) \rightarrow F(x)) \land (F(x) \rightarrow S(x)) \rightarrow (M(x) \rightarrow S(x))] \). This, however, would appear anachronistic amidst a Peircean framework, and as mentioned, this text is deliberately confined to the Peircean framework as long as tenable.
intended in his efforts of constructing a philosophical system. This is but one way of seeing the issue, one feasible state of affairs, one possible reality.

With that in mind, this first part introduces the overall foundation of the endeavor. It sloughs through issues of a very basic nature, and addresses some grand scale questions. This has seemed necessary in order to avoid the all-too-often encountered problem of speaking past one another both in semiotics and in musicology, instead of conversing. The foundation is a construct of (mostly Peircean) naturalist pragmatism. It describes a possible world (and, indeed, a probable one), of which both the premisses and the conclusion speak in parts two, three, and four. It is not possible nor is it the task of this study to argue extensively on the validity of the description of the foundation, or to go into a detailed analysis of any of the big issues of the first part. Hence, the argumentation both for the presented framework and against the views opposing it is very limited, although the characteristics of the world are not by any means taken as self-evident. What follows is an outline of the core assumptions, upon which the logic of the inference from premisses to the conclusion is conditional. In other words, the claim is that the syllogism above is true in the world of naturalist pragmatism.

Let us begin with what is meant by naturalism in this context, and continue to a brief discussion of certain elements of naturalist pragmatism, before outlining the esthetic, the practical, and the semiotic.

1.1 Naturalism and musicological research

When one discusses concepts of music or the musical composition process from a naturalist viewpoint, alarm bells may be heard sounding. The creative process of music is sometimes thought of as something so deeply human and culturally conditioned, that naturalism may seem altogether inappropriate. Applying a naturalist philosophy to a genuinely human, humane and humanistic topic such as creative processes and meaning-formation in music and the arts may evoke objections or at least concerns of a) irrelevancy, b) category mistakes, and c) unnecessary and even misjudged reduction of music into cognitive psychology, neurobiology or even further into chemistry and physics. This calls for a three-part disclaimer concerning the general application of naturalism in musicology as an answer to these concerns, before further venture into outlining the current perspective of naturalist pragmatism.

First, naturalism is by no means irrelevant when we study music. I cannot claim that it would be the only or the best approach to take—there may well be other, even more suitable ones. However, this does not mean that we could not approach
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music in a musicologically relevant way from the viewpoint of naturalism. A naturalist approach simply takes the view that human culture is an outcome and a part of natural evolution. In this sense, humans are basically physical and biological beings inseparable from the natural world, regardless of the complexity of social and cultural endeavors active in the network of contemporary human life. In other words, instead of being opposed to each other, nature and culture are considered inseparable, as culture is immersed in nature. Nature embraces culture. This, in turn, implies no methodological decisions on the practical level of inquiry, nor commitment to either phenomenological nor physicalist language of description or explanation.

For some readers, the term naturalism may primarily bring to mind William Van Orman Quine and his naturalized epistemology (Quine 1969). While the naturalism of Quine and his followers may be said to stem from Dewey’s pragmatist naturalism, and thereby to be a descendant of Peirce’s pragmaticism, there are notable differences (Alanen 1996, 135; Short 2007, 320n2). Briefly put, Quine’s starting point seems absurd: taking (natural) science (and mathematics) as the epitome or even as the sole representative of the concerns of epistemology while neglecting the more general cases of practical knowledge is odd. Peirce’s critical common-sensism held, that scientific inquiry forms an exception to inquiry at large, in the sense that its aim is “the establishment of doctrines, and the provisional establishment of them, at that” (CP 5.60), and these “established truths” are not final, but “propositions into which the economy of endeavor prescribes that, for the time being, further inquiry shall cease” (CP 5.589). Practical inquiry, on the other hand, settles the beliefs we are willing “to risk a great deal upon” (CP 5.589). Once the science of epistemology has solved the more general and significant case of practical inquiry with its fuzziness and uncertainty, the epistemological question of science and its efficient and refined methods of fixing beliefs may be approached as exceptions. (Cf. Buchler 1939, 62–71.)

Quine’s naturalized epistemology may further be questioned at least for the following: for not giving room to the possibility of not reducing (it may be, that \textit{definire non est eliminare}); short-sighted reliance on the supremacy of sensory evidence alone (at the cost of both the character of the knower as an actual object, causally integrated in the world, and the imaginative ability of the knower to predict and hypothesize the operations of the world); and for the narrow, verbal-language-oriented conception of what constitutes an observational language. Do not music and the arts constitute observational languages? What are the grounds for denying the possibility that they are? Furthermore, the Quinean epistemology seems to lean on what could be called the classical conception of representation, i.e. the view that mind is “internal” to the subject and contains images or other counterparts of
the “external” world by means of which the “external” is presented to the mind. It seems unfathomable that this approach would succeed in building a conceptual bridge across mind and body. Instead, it quarries a moat between the two. Peirce’s semiotics stresses the continuity of semiosis, and in Peircean semiotics, it is the very concept of sign which provides the means of connecting the actual objects to habits of action, thus accounting for the representation of the actual objects. In short then, this book is not about naturalism of Quine’s sort. It is founded on the ideas closely tied to naturalism as expressed by the American pragmatists Peirce and Dewey some one hundred years ago.6

The second part of the disclaimer is that, if we take cultural evolution to be an outcome of the natural evolution, there is consequently no need for resorting to transcendental or immaterial entities that would be responsible for the human mind, for the formation of meaning, or for artistic creation. Also, it follows that as long as we deal with music as culture exclusively, there is no possibility for a category mistake, since music belongs to the same category with nature: culture comprises certain aspects of the natural living environment of humans as semiotic beings. Hence a naturalist explanation of musical processes is feasible, assuming that the theories concerning music be in harmony with, and explainable in terms of more basic, or rather, more extensive views of its theoretical superset of cultural and natural theories. Should we not accept this, we would have to resort to explanations that regard music, culture, or both as more or less unnatural. In brief, naturalism and culturalism are far from being mutually exclusive or contradictory (see Määttänen 1993a, 9).

This takes us to the third point: reduction in the present sense does not imply reduction of one phenomenon to another. That is, the goal is not to reduce music into neurobiology or physics, nor to reduce mind-states of a creative person to brain-states of connected neurons with varying activities. To quote Patricia Smith Churchland (1992, 278),

6 In Dewey’s words (LW 16: 137–138): “The sign-process characterizes perceptions all the way up the path of behavioral evolution; it serves directly for the expanded discussion of differentiated linguistic representation; it deals competently with the ‘properties’ and the ‘qualities’ that have for so long a time at once fascinated and annoyed philosophers and epistemologists; it can offer interpretation across all varieties of expressive utterance up to even their most subtle forms. All these phases of behavior it can hold together simply and directly.” To be precise, it does not make sense to talk about mental representations as being *internal* versus actual objects being *external*. Mental representations are tied to the actual characteristics of the world, since actual objects force themselves upon us as objects of the sign, and the meaning of the sign is in the habits of actions to which it is interpreted. In other words, actual objects belong to the functional organization of mind (Määttänen 1993a, 17 et passim). This idea will be encountered several times throughout this book.
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[i]n the sense of ‘reduction’ that is relevant here, reduction is first and foremost a relation between theories. Most simply, one theory, the reduced theory $T_R$, stands in a certain relation (specified below) to another more basic theory $T_B$. Statements that a phenomenon $P_R$ reduces to another phenomenon $P_B$ are derivative upon the more basic claim that the theory that characterizes the first reduces to the theory that characterizes the second.

Reduction in this understanding (fig. 1) is usually considered a good thing in science. Successful inter-theoretical reduction results in explanatory unification through synergy of theories and through ontological simplification of various phenomena. These were some of the goals of Peirce, among others, and the very field of semiotics is a prime example of this cross-disciplinary endeavor.

In the process of inter-theoretical reduction, there must first exist theories to be reduced one to another. Second, there tends to emerge needs for revision of either of the two, which may result in, third, coevolution of the theories, or at least evolution of either one. (Churchland 1992, 284.) The process of reduction may result in a complete abandonment of a theory, and the rise of a new one, and in this sense theoretical reduction is tied to paradigm changes of science (cf. Kuhn 1969/1962, viii, 10–).

For instance, phlogiston or ether theories are no longer needed to account for chemical reactions or for the transmission of light, respectively. As a dissimilar example, the classical paradigm of cognitive science, with its emphasis on language, symbol manipulation, rules, computer metaphor, and serial or linear computing, has not (yet) completely turned into the contemporary associationist (or connectionist) paradigm, fostered particularly in neurophysiology, natural and artificial neural network research, parallel computing, and naturalist modeling of cognition. The research within the two competing or complementary paradigms of cognitive science may benefit from each other. And even if a theory can be reduced to a more basic theory, it does not necessarily make it useless, but sometimes the opposite: the

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Figure 1. Reduction as reduction of one theory to a more basic theory, as opposed to reduction of one phenomenon to another. (Adapted from Churchland 1992.)
reduced theory may well serve as a good explanation for the phenomenon, while enjoying a synergy with the reducing theory, at best.

Nevertheless, the aim of the present undertaking is not to reduce phenomena of musical semiosis or theories of musical composition into cellular or molecular levels of explanation. The aim is to construct a spatially cognizant theory of the composition process, which would be concordant, wherever relevant, with both theories of a different character in terms of the naturalistic approach, such as the recent cognitive, neurophysiological, and physical paradigms, and with cultural and social theories of music.

One might be tempted to label the cultural and social explanations as “higher” levels of abstraction. Meanwhile, it is often assumed, that reduction to so-called “lower” physical, chemical or neurophysiological of explanation would make things least abstract and most concrete and tangible. But, as soon as we reach, say, chemical levels of explanation, we are faced with another direction of abstractness. Not one of us has actually seen, heard or touched an atom, let alone a quark. If we study things that have to do with our lives, such as music, it is the explanatory level of the human subject and organism in an environment about which we should be most enterprising, since that is the most tangible and least abstract (that is, least separated, least disengaged) degree of explanation, the level of actual pragmatic signification, and thereby the most crucial scope of operation. This ought to be clear to any musician. Science is commonly supposed to serve, benefit and contribute to that level, our life. Applying Peirce’s pragmatist maxim (e.g. CP 5.2) to science itself, there seems no other option. Hence, in this current task, the naturalistic approach is applicable, since music, the composition process included, is considered a useful activity of a cultural being in its natural environment. (Cf. Ojala 2000.)

1.2 Elements of the present view on naturalist pragmatism

Let us now sketch out some of the main elements of naturalist pragmatism for the benefit of laying down the foundation for the premisses. This foundation derives largely from Peircean phenomenology and pragmaticism, and can be described as naturalist, realist, materialist, and pragmatist. It employs the key concepts of object, organism, action, interaction, experience, mind, subject, and representation. It is also thoroughly semiotic, but this will perhaps become more evident at a later point. Other aspects of stances presented here shall also be examined in detail in part three. The present sketch serves as an introductory synopsis.
1.2.1 A realist assumption

To begin, we may safely take a realist position, according to which objects of the actual world (sometimes referred to as the substantial, physical, material or external world) exist, independent of our thinking of them (see e.g. Hookway 2004, 138; Short 2007, 41). Also, there are causal relations between the objects. Peirce divided objects (CP 8.12) into figments, dreams, etc., on the one hand, and realities on the other. The former are those which exist only inasmuch as you or I or some man imagines them; the latter are those which have an existence independent of your mind or mine or that of any number of persons. The real is that which is not whatever we happen to think it, but is unaffected by what we may think of it.

At this point, the existence of objects is assumed in the latter sense. These objects include ourselves as living organisms with certain motor and sensory abilities, and metabolism.

Although this research deals with human-made music and semiotic processes of the human, the conception presented here does not deny nor exclude the possibility of music or related processes by other animals, as well (see e.g. Mâche 1992; Wallin, Merker and Brown 2000, and Martinelli 2002, 2007). The human awareness or explicated conceptualization of music and the arts does not rule out the possibility that other species could pursue them. Furthermore, it does not render impossible that other animals could also be aware, on their own terms, of arts and music, or other corresponding processes. The term organism emphasizes the realist, naturalist, interactive and evolutionary aspects of the music-making animal. As will later become apparent, some advanced form of motor and sensory abilities are required of the organism for being able to engage in musical processes.

Causality yields the necessary support for organisms to be able to rely on predictability of action and perception, without which no habits of thinking or action are possible. In virtue of the motor abilities, the organism has the potential of acting upon other objects. Due to being an object in the actual world, the organism, with or without sensory abilities, has the potential of being effected by other objects of the environment, and their action, through causal relations. In short, the organism is engaged in interaction with other objects of the environment.

As an example of the causal relations, we can take the projection of sound, which is defined as propagation of pressure variations in elastic media, such as air, due to mechanical collisions of molecular objects. A closer analysis of causation is not the topic of this book. For the present purposes, it suffices to summarize those characteristics of the actual world, due to which one set of circumstances, states of affair
or events results in, produces, determines, or necessitates other circumstances, states of affair or events, with a certain degree of consistency, or probability.

To an ensuing scepticist objection to the realist assumption above one may promptly reply by putting the burden of proof on the sceptic. (See Määttänen 1993b.) As there are any definitive (common-sense, experiential, or logical) reasons not to assume its existence? It is the task of the sceptic to show that the actual world or its causality does not exist, or that there is conclusive evidence showing that we should not assume the existence of such. To this day, no such evidence has been presented despite many efforts. This point needs to be brought out, since some thinkers still are occupied by the scepticist argument. The sceptical attitude as a methodological tool in philosophy, on the other hand, is a *sine qua non.*

For now, it is enough to assume interaction between an organism and its environment, as a special case of causal interaction between any objects of the actual world. In interaction, one organism may directly or indirectly effect another organism via actual objects.

Peirce’s notion of interaction is a little different. He described interaction as taking place between an *inner world* and *outer world.* I shall return to this notion of two worlds, and the distinction between the real and the actual. But clearly, the connection between the inner and outer worlds, or mind and body, forms a crucial problem in any philosophy. Other naturalist and semiotically relevant conceptions of interaction have been expressed by, e.g. John Dewey (1980/1934, 1938, 1939 or LW 10, 12, 14:3–) and Jakob von Uexküll (1982/1940).

### 1.2.2 Moderate materialism

Having rejected Cartesian dualism, Peirce balanced between materialism and idealism, more to the favor of the latter. (CP 5,598, 6.329, 6.605p1.) This may seem

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7 Due to fallibility of all inquiry as we know it, the infinitesimally meager possibility of the non-existence of the actual world cannot be altogether ruled out. However, there is no need to bother with that unlikely possibility, due to the overwhelming practical evidence supporting its existence. More important than the discussion on the sceptic argument, are the issues relating to the qualities and characteristics of the actual world, what we come to know of them, and how.

8 As an answer to this predicament (CP 7,570), Peirce suggested *synechism:* the doctrine that all that exists is continuous (CP 6.163, 7.565). For synechism, see CP 6.163–184 and 7.565–578, and Murphey 1961, 379–407. The doctrine is somewhat undermined by Peirce’s “blundering treatment of Continuity” (CP 6.174, and 6.120–126; see also Murphey 1961, 336). Murphey (ibid., 407) tied the failure of Peirce’s grand philosophic design to Peirce’s inability “to find a way to utilize the continuum concept effectively”. Yet, despite its challenges, Peirce’s synechism as a doctrine of continuity might certainly contribute to the pragmatist exploration of spatiality. However, the scope of this book does not allow a closer look at Peirce’s synechism and the doctrine of continuity.
problematic in the current naturalist framework. Peirce criticized materialism for being (CP 6.24, see also CP 6.274 and 277)

quite as repugnant to scientific logic as to common sense; since it requires us to suppose that a certain kind of mechanism will feel, which would be a hypothesis absolutely irreducible to reason—an ultimate, inexplicable regularity; while the only possible justification of any theory is that it should make things clear and reasonable.

However, Peirce was wary of idealism, as well (CP 6.25; cf. Short 2007, 46–47):

The one intelligible theory of the universe is that of objective idealism, that matter is effete mind, inveterate habits becoming physical laws. But before this can be accepted it must show itself capable of explaining the tri-dimensionality of space, the laws of motion, and the general characteristics of the universe, with mathematical clearness and precision; for no less should be demanded of every philosophy.

It appears, that Peirce’s objections to materialism are mostly due to his conception of materialism as extreme materialism, according to which “the Whole is governed by mechanical forces that are determined by the state of things at the instant they act, without any reference to a purpose of bringing about any determinate state of things in the future”, and hence also “mental phenomena are exclusively controlled by blind mechanical law”. (CP 6.274.)

Although for Peirce, the dependence of mind upon body in terms of neurophysiology was a fact, with findings of only incipient contemporary psychology and neurophysiology at his disposal, opting for materialism must have seemed unappealing. In particular, the issue of temporality must have appeared incomprehensible, since in his opinion (idem):

the fact that our knowledge of the future is of so different a kind [from] our knowledge of the past seems to be hopelessly in conflict with materialism; since the laws of mechanics, as they are now understood, make the dynamical relation of the past to the future exactly the same as that of the future to the past.

In today’s perspective, Peirce’s main argumentation for the rejection of materialism is weak. A feeling mechanism does not seem to be “an ultimate, inexplicable regularity” in our days of artificial neural networks and up-to-date artificial intelligence, at least as long as feeling is understood as a purely perceptual quality of “outward sense”, and not as “secondary feeling”, akin to emotion, or as a subject’s conception of herself in relation to the world (cf. CP 1.306–311). Although Peirce’s concept of ‘feeling’ is far from lucid and straightforward, it can be approximated that what Peirce meant by feeling, was “nothing but sensation minus the attribution of it” to a subject of sensation—perception at its infancy (CP 1.332, see chapter 3.2.2). Nowadays, the mechanisms of feeling, in this sense, are quite well
understood. The “blindness” of “mechanical laws” does not equate to automated, mechanically accurate and absolute predetermination of mental phenomena by the actual world, which seems to be the gist of Peirce’s objection.

Peirce was concerned with individual, self-controlled habits, as opposed to absolute determination of feeling by mere material causation. As it is understood now, the fuzziness of the logic of cognition answers Peirce’s bewilderment of the seeming contradiction between materialism and fallibility. In our days, cognitive science is eager to answer Peirce’s question of how “blind mechanical laws” control “mental phenomena”, i.e., what is the relation between lower level and higher level cognitive processes. Although these issues are far from solved, they are not the mystery they used to be some one hundred years ago.

Nor is the issue of temporality and differences in knowledge about past and future, although far from resolved, the mystery it used to be, at least not in the so-called lower levels of explanation of natural or artificial neural networks and memory. In sections 3.3 and 3.4 these issues will be dealt with in closer detail.

That being said, it is equally important to note that Peirce’s objections to the idea of a feeling mechanism seem to have been partly justified. The identification of the feeling mechanism or thinking mechanism with the brain leads to a common mistake: instead of being localized in the brain, thinking is the semiotic connection between objects of perception and objects of action, as will be argued more in detail later (see also Skagestad 2004, 247–250).

Peirce admitted that materialism cannot be “absolutely refuted” (CP 6.274), and that simplicity is a distinguishing merit of materialism, even though “there are so many facts which have all the appearance of being opposed to it” (idem).

It can be assumed that it was partly the hegemonic, historical weight and philosophical Zeitgeist of the Hegelian-Kantian tradition in Peirce’s life, and partly the disbelief of atheism easily attached to materialism, that lured Peirce away from materialism towards idealism. Also, Peirce’s rejection of positivism (see CP 6.604, 2.511p1) with its adherence to the observable, excluding abduction as a stage of inquiry, might have had its effect on this question. Nevertheless, as Peirce stated in his plan for A Guess at the Riddle: “Faith requires us to be materialists without flinching” (CP 1.354).

Based not only on this re-reading of Peirce, but on an overwhelming load of scientific and practical evidence supporting materialism as opposed to idealism, let us assume the moderate materialist view, that only the objects of the actual world actually exist (hence the wordings ‘actual world’, ‘actual object’, etc.). If needed, the apparent existence of other entities can be explained in terms of the objects of the actual world. This does not need to result in physicalism in the sense that scientific
inquiry or other knowledge could or should be reduced to the language of physics. For humans, physics is not a first science. As pointed out in the introduction, the focus and starting point for inquiry is the human scope, and the whole function of scientific inquiry is to serve human life as we conceive it. Therefore, excessive theoretical reductionism does not serve a purpose. (Cf. Ojala 2000.)

Existing objects are entirely composed of matter as opposed to, for instance, mind having an existence apart from the body-object. The same materialism applies for other abstractions, such as creativity, truth, or culture, art, and music. These are concepts that have proved to be valuable by serving (or by having served) a purpose in thinking, reasoning and linguistic communication, but ultimately they do not actually exist. However, objects that carry the features or have the characteristics or functions ascribed to the abstract entities may actually exist. The qualities of such objects may contribute to the usefulness of abstract concepts, but this depends on the concept in question and is, finally, a matter of subjective judgment and understanding of the abstraction in each case. It is the challenging task of conceptual analysis to bring out the necessary critique regarding concepts of this kind, the unavoidable ontological pregnancy of explanatory language notwithstanding. Still, this materialist stance calls for applicable abstractions to be in concord with the actual characteristics of the world, as far as they have become known to us. But, in general, it does not necessarily diminish the applicability of abstract concepts.

1.2.3 Experience, mind, and subject

Apart from the exclusively materialist aspect, reality has another, subjective or perceptual aspect. In using its sensory and motor abilities, a living organism constructs a representation of a number of characteristics the environment in experience, in virtue of its interaction with the environment. Thereby, the organism develops mind—competence which guides the organism’s action in the actual world, based on the representation thereof (cf. Colapietro 1989, 110).

According to T. L. Short (2007, 87),

Peirce distinguished between reality and actuality, or existence. The existing is the reacting; reaction is instantaneous, here and now. Reality is enjoyed by laws that have no here-and-now existence and that are not reactants. At the same time, there would be no reality without existence. For we call no represented law real if it does not govern actual reactions.

Hence, the word ‘actual’ refers here to the physical, truly existing, regardless of any perceiver, and ‘perceptual’ to the representational, perceiver-dependent, whereas ‘real’ may either be ‘actual’ or perceived as existing by a perceiver. Therefore, the
more accurate wording for ‘external world’ seems to be ‘actual world’, and for ‘internal world’, ‘perceptual world’ or ‘phenomenal world’ would be preferable.

The view of mind as an ability opposes the idea of mind as a container of representations. To avoid severe misunderstandings, it must be stressed that representation does not here mean forming of any kind of more or less accurate image of the perceived in a way that the image would somehow be fed in and contained as an item in a representative system, from which it would then be collected when needed. Rather, representing something means forming a connection (or a collection of connections), one way or another, between that which is perceived and anticipatory motor action. Through the competence of mind, the organism eventually also forms a representation of the relation of itself and its environment. A key notion of this book is, that this connecting character of representation is wholly tantamount to Peirce’s concept of the Sign (and thought-sign in particular) as a relational semiotic entity between the Object and the Interpretant (see part three; Skagestad 2004, 250).\(^9\)

In Peirce’s terms, experience is the “cognitive resultant of our past lives” (CP 2.86, see also CP 5.611), due to the influence on the organism by the actual world, which with brute force modifies our ways of thinking (CP 1.321, see also CP 1.426). In this pragmatist sense, experience is the accumulation of representation of the actual world, including the representation of the organism itself in its surroundings. It takes place in virtue of interaction between the organism and its environment, through action and perception, and it is inclusive of the outcome of the transformation of the organism and its abilities, i.e., the changes in the organism’s behavior, including social and cultural interaction.\(^10\)

In the current conceptual apparatus, perception refers not only to the mere effect of actual objects on sensory organs (that is, sensation; see CP 7.543 and chapter 3.2.2), but also to the extensive and comprehensive process of organizing a representation of a particular state of affairs (that which is perceived), eventually terminating where action begins (hence the wordings ‘perceptual world’, etc.). In other words, action is a consequent of perception.\(^11\)

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9 For an example of a rudimentary representation of this kind, see the critter Roger in Churchland (1992, 420–425).

10 Peirce’s motto on perception and action reads (CP 5.212): “The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action; and whatever cannot show its passports at both those two gates is to be arrested as unauthorized by reason.”

11 From this it does not follow necessarily that an instance of perception would fully determine a respective instance of action (see chapter 3.2.2). For Peirce’s description of perception, percept and perceptual judgment, see, e.g. CP 7.615–636; Määttänen 1993a; and chapter 3.2.2.
The idea that experience refers to the accumulation of the representation of the actual world, resulting from perception, can be condensed as follows: perception accumulates into experience. See CP 4.172, 5.405, and 7.538.12

Since perception is close to being momentary, and experience cumulative over time, the former is in a sense particular, while the latter is more general although evolving. Similarly, action is also momentary and particular. In terms of evolving accumulation over time, the generality corresponding to the particularity of action, is habit (of action).13

The concept of habit will be discussed in detail later. For now, let us settle for Peirce’s definition of habit as “a general law of action, such that on a certain general kind of occasion a man will be more or less apt to act in a certain general way” (CP 2.148). Habit is a broad concept, not necessarily limited to humans, since (CP 5.538):

it denotes such a specialization, original or acquired, of the nature of a man, or an animal, or a vine, or a crystallizable chemical substance, or anything else, that he or it will behave, or always tend to behave, in a way describable in general terms upon every occasion (or upon a considerable proportion of the occasions) that may present itself of a generally describable character.

The term mind has a particularly vast history of multifarious use. Philosophy of mind is a keystone element in most philosophical systems, and what can be said here barely scratches the surface of the issue. As mentioned, here the term refers to the organism’s competence of directing interaction with the environment, based on (perceptual) representations of the (actual) world. Hence, mind is still considered the cognitive faculty, but the characterization of mind as a competence underlines that mind, per se, is not an actually existing entity, but a natural ability, developed in interaction of the organism and its environment. Furthermore, it approaches the mind-body problem by stressing the idea that the circumstances, or qualities of the actual world, pose or even force themselves upon the representative mechanisms of the perceiver to the point that the actual objects belong to the functional organization of the subject’s mind (see Määttänen 1993a, 17 et passim). On the other hand, the perceived gains its meaning finally in habits of action, that is, in its relation to the actual world. Hence, rather than speaking of external versus internal, it is better to speak of actual in conjunction with perceptual.

12 The process, in which the perceived is related to past experience, is often referred to as apperception. Here, however, the process of perception already takes place in relation to past experience; hence a separate concept of apperception seems unnecessary.

13 A fitting attribute for perception might be ‘quasi-momentary’. Based on neurophysiological measurements, it seems that perception occurs in a continuous temporal window of ca. 200 milliseconds (See Näätänen, Ojala and Ruismäki 1997). The evidence of this temporal window is in concord with the relation between Representamen and Interpretant as proposed in chapter 3.3.1.
Mind is based on experience, and vice versa, since mind directs each organism’s action and thereby exposes it to perceive and experience in a distinctive way. Yet, there is more to experience and mind than just the accumulation of perception and ability to guide action, as will become clear shortly. In any case, the competence of mind is greatly enhanced by the representations of characteristics of the organism itself, of the relation of the organism and its environment, other organisms included, and of the competencies of the organism. But awareness, in terms of the organism being reflectively knowledgeable of the existence of objects of the world or their qualities, let alone self-awareness, is not necessary. Mind originates in the most rudimentary interplay of action and perception, and develops phylogenetically, ontogenetically, and, eventually, also sociogenetically to possibly encompass even the most complex logic. However, the exact division of the roles of phylogenesis, ontogenesis and sociogenesis in the development of mind is not relevant for our purposes, and is disregarded here.

This conception opposes the conception of mind as a container of ideas, as a machine or machine-like mechanism manipulating symbols. It is not diametrically opposed to the view of mind as a dynamic structure or as a collection of representations, but, more than those, it insists on the processive nature of adaptation of the organism by means of interaction with the environment.

The character of representations utilized by mind should be understood in a non-symbolic sense. The spectrum of representations includes the low-level representations as illustrated by, e.g. P. S. Churchland (1992), but also extends to so-called high-level representations, which demand, e.g., linguistic capabilities (and in this sense, use of symbols, as well). Epistemologically, there is no gap between these extremities, as suggested by Määttänen (1993a). In representation, something somehow stands for the represented. In this sense, representation is essentially a semiotic issue. The means of semiotic representation will be further discussed in the third part of this study, but in this context, it ought to be stressed that representation, in the current sense, does not refer to any image-like portrayal contained in the mind, but rather, representation is seen as the dynamic plethora of interrelated logical connections between the perceivable qualities of the actual world and, as ramifications of the perception, the possibilities of acting upon actual objects.

Another term often encountered in this context is consciousness. Nowadays, the word consciousness carries such a burden of various denotations and connotations, that it is perhaps best to avoid the term entirely (see e.g. Revonsuo and Kampa-trinen 1994; LW 16:261; or CP 6.489). Peirce, however, frequently used both ‘mind’
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and ‘consciousness’, sometimes slipping to interchangeability of the two (e.g. CP 7.551–552), but usually making a distinction between them.\textsuperscript{14}

Peirce made a considerable effort to distinguish between the two terms in CP 7.362–688, while many of his other writings tend to be infested with the prominence of consciousness in the flavor of late nineteenth-century psychological disputes over conscious versus unconscious. Peirce acknowledged the ambiguity in the then young field of psychology (CP 7.364): “To begin with the psychologists have not yet made it clear what Mind is. ... Almost all the psychologists still tell us that mind is consciousness.” Let us elaborate this briefly.\textsuperscript{15}

In 1904, in a letter to William James (CP 8.290, see also 8.281–285), Peirce differentiated between the two concepts by quoting Alexander Bain’s note to \textit{Analysis of the Phenomena of the Human Mind} by James Mill (1878):

> Consciousness is the widest word in our vocabulary. By common consent it embraces everything that ‘mind’ embraces. ... We speak of the object-consciousness as our attitude in being cognisant of the extended universe; while our attitude under feeling and thought we call subject-consciousness or mind.

In his 1903 Lowell lectures on categories and pragmatism, Peirce regarded consciousness as having two sides, “namely, action, where our modification of other things is more prominent than their reaction on us, and perception, where their effect on us is overwhelmingly greater than our effect on them” (CP 1.324). As is fitting to his trichotomic phenomenology, Peirce had already earlier divided consciousness into three categories, which are (\textit{A Guess at the Riddle}, ca. 1890; CP 1.377),\textsuperscript{16}

> first, feeling, the consciousness which can be included with an instant of time, passive consciousness of quality, without recognition or analysis; second, consciousness of an interruption into the field of consciousness, sense of resistance, of an external fact, of another something; third, synthetic consciousness, binding time together, sense of learning, thought.

Contrasted to that, mind was something that contained ideas: one has ideas, images, or something else in one’s mind (e.g., CP 5.232, 5.300), something is present to the mind (CP 1.38). Whatever is in mind, may be of any category or level of consciousness (CP 1.310). Namely, corresponding to the three categories of con-

\textsuperscript{14} The markings EW, MW, and LW with numbers refer to the collected works of John Dewey: \textit{Early Works}, \textit{Middle Works}, and \textit{Later Works}, respectively, volume of the series, and page numbers.
\textsuperscript{15} For Peirce’s many definitions of consciousness, see CP 1.374–384, 7.524+, (particularly CP 7.542–552), 7.580, and 8.279–294.
\textsuperscript{16} Peirce’s phenomenological—or phaneroscopic—categories of Firstness, Secondness, and Thirdness are the topic of chapter 3.2.1. The three phenomenological categories form an axiomatic idea in Peirce’s philosophical structure, classification of the sciences, and the theory of signs, as well as other writings. Unavoidably, however, the categories are touched upon on here.
sciousness, “three whole states of mind” are “Feeling, Knowing, and Willing” (CP 7.342–343). The two sides of consciousness (perception and action) correspond to two sides of mind, since (CP 1.325):

In will, the events leading up to the act are internal, and we say that we are agents more than patients. In sense, the antecedent events are not within us; and besides, the object of which we form a perception (though not that which immediately acts upon the nerves) remains unaffected. Consequently, we say that we are patients, not agents.

This is enough to indicate, that, what seemed to distinguish mind from consciousness in those contexts, was that mind was a focal, attentive, container-like domain of feelings, reactions, and thoughts or ideas, like Bain’s subject-consciousness, whereas consciousness extended to cover, it seems, all representation of the world by the organism. Today, of course, this is more often considered a feature of mind, not of consciousness. But at that time, it was still a real issue, whether or not there is an unconscious mind. Thus, it is no wonder that mind was either identified with consciousness, or even taken to be a special case of consciousness by Peirce. Hence mind could be a narrower concept than consciousness, also for Peirce. Mind even had connotations to (Hegelian) Spirit, since in A Neglected Argument for the Reality of God, Peirce went so far as to identify pure mind with disembodied spirit (CP 6.490).

In Minute Logic, or Philosophy of Mind, as the heading reads in CP 7.362–688, the situation is a little different (see also Skagestad 2004, 247–253). Although it probably predates the quotes on consciousness above, it is more likely to be relied on for Peirce’s notions on mind versus consciousness, since here, the very topic is psychognosy, the psychical sciences, and the following specifically addresses the relations of consciousness and mind.17

Peirce tried to clarify the psychological nebula by claiming that “consciousness is really in itself nothing but feeling”, and “feeling is nothing but the inward aspect of things, while mind on the contrary is essentially an external phenomenon” (CP 7.364). This takes us back to the affair of the internal versus external, or perceptual versus actual. Consciousness as feeling, is “the immediate element of experience generalized to its utmost” (CP 7.365). We shall return to Peirce’s concept of feeling later. What is more important at the moment, is how Peirce characterized mind.

Peirce attacked the notion that mind would reside in the brain, or in a certain lobe. He compared the externality of mind to electricity and metallic wire: electricity does not reside in the wire, but the wire conducts electricity (CP 7.366). The analogy is appropriate, indeed. Although Peirce did not express it directly at that

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17 The passage of CP referred to here is the first chapter of volume VII, Book 3 (CP 7.362–387), which is edited mostly from the first section of Minute Logic of possibly 1902.
point, the statement about mind being “essentially an external phenomenon” implies that mind connects the qualities of actual (external) objects as they are perceived to the external objects as potentially acted upon. The three whole states of mind span from perception to action, and what is considered knowing, or reason, is the association between the two (CP 5.212):

The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action; and whatever cannot show its passports at both those two gates is to be arrested as unauthorized by reason.

The major flaw in the wire analogy is, of course, that mind is usually not straight-forward and hard-wired (which would undermine the process of interaction and adaptation), but “a very difficult thing to analyze” (CP 7.366). And the analysis boils down to the question of how is it possible that “ideas produce material effects” and “motions of matter affect ideas”, without resorting to the doctrine of “Parallelism” or superphenomenal metaphysics. Peirce suggested that there is no contradiction in that question, but unfortunately his hypothesis about it, founded on concepts of vortices, viscosity, and ether, has proved false in all its details, as he himself guessed (CP 7.370–371).

That notwithstanding, it seems that Peirce’s theory of signs can provide the means for resolving that question, as will be suggested in part three. The current conception of mind is close to Peirce’s conception of mind in the sense of being essentially external and connecting, as presented above. The role of consciousness is countered to a “special, and not a universal, accompaniment of mind” (CP 7.366), but due to Peirce’s ambiguous treatment of consciousness, and to contemporary usage of the word, the term is avoided, if possible. If needed, the concept Peirce (and Bain) referred to as mind, or subject-consciousness, is termed awareness, or focus of attention. Indeed, Peirce himself ended up concluding that the fact that consciousness does not actually exist, is “no novelty” (CP 6.489), as a comment on William James’s 1904 paper Does ‘Consciousness’ Exist?

The next key term to be synopsized here is subject. The ordinary meaning of the word in modern (and postmodern) philosophy has been the conscious or thinking subject, relating to and complementing the object by being the cognizing agent “to which all mental representations or operations are attributed; the thinking or cognizing agent” (OED, s.v. ‘subject’). Peirce, however, quite rarely used the term in this intent (see CP 5.607, 6.111, 7.355). More often he used the word “subject” in the sense of the emerging experimental psychology (subject as “victim of the experimentation”, see, e.g., CP 7.43), or in the sense of logic relating to the other fundamental instru-

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18 By the doctrine of Parallelism, Peirce referred to the idea that “that which when viewed from the outside appears as material, when viewed from the inside appears as mental” (CP 7.368), i.e. mind-body dualism.
ments of logic, namely predicate and proposition (see CP 2.315–361). Both usages carry on the Kantian tradition, according to which “[t]he thinking subject is the object of psychology” (KdrV, 323; A334, B391), and according to which both subject and predicate are such primary concepts, that their “logical functions … cannot be defined without perpetrating a circle, since the definition must itself be a judgment, and so must already contain these functions” (KdrV, 263; A245, B302).

Peirce simply does not seem to cherish the term subject, perhaps due to his strict usage of subject in propositional logic, perhaps due to Kant’s claimed indefinability of subject, perhaps in order to avoid confusion with the terminologies of propositional logic and psychology. Peirce’s phenomenology (or phaneroscopy) does not, however, contradict the use of the term in the sense of the basis of phenomenal or manifested existence of something which, unlike a thing, understands.¹⁹

As already stated, in virtue of interaction, the organism forms a representation of the actual world, including a representation of itself, and the relation between the organism and its environment. Based on this representation, the organism develops the ability – namely, mind – to guide its actions in the environment. This ability means ability to guide one’s behavior, to make judgments and decisions, to prefer one represented situation, circumstance or setting over another; that is, it includes what has been called will. Thus, the developing ability of mind gives way to emerging subject. Subject, in this context, refers to the combination of organism as an object and of mind, i.e., to organism with competence to guide its interaction with the actual world, one way or another, based especially, but not exclusively, on representations in experience. Again, no self-awareness is assumed nor required. Also, the concept of subject does not necessarily lead to solipsism, neither in terms of subject being a property of the brain, nor in terms of subject being a solitary entity without membership in a community of peers.

Finally, let us discuss some aspects of Peirce’s concepts of world for a moment. Peirce used a plethora of expressions referring to this and that world, and, again, sometimes in a confusing, or at least varying manner. It is not necessary to analyze these in detail here, but in a nutshell, Peirce was idealist, in the sense that the broadest of his worlds are “the ideal worlds”, “the world of ideas”, “the Platonic world”, or “the world of forms”, outside of which is only the “world of utter nonsense” (CP 5.553). By the ideal of that world, Peirce meant that “[a] description of thing which occurs in that world is possible, in the substantive logical sense.” (CP 3.527). The thing does not (necessarily) exist, it is only logically possible (cf. mathematics

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in the *Outline Classification of the Sciences*; CP 1.180–202). When it is created, it is not created absolutely. But it is also not (always) concerned with practical exigencies, with hard facts of the actual world. Actually, “[t]he idea in its purity is an eternal being of the Inner World” (CP 4.161). In other words, the existence of ideal worlds emerges from the imagined, deliberated logical possibilities discovered in virtue of the attraction of ideas “in our minds, and, in the course of our experience of the inner world” (CP 4.157). The worlds of ideas do not (necessarily) exist, but are logically possible. Therefore, the existence or non-existence of logical worlds in general is not relevant here.  

Of all the logically possible worlds, however, there is one that actually exists, and that is what Peirce referred to as the *real world*. To quote Peirce (CP 3.527), “[o]f those which occur in the ideal world some do and some do not occur in the real world; but all that occur in the real world occur also in the ideal world”. From that point of view, the existing universe may seem “an offshoot from, or an arbitrary determination of, a world of ideas” (CP 6.192).

In spite of that, let us emphasize the non-idealist aspects of Peirce’s thinking. According to Peirce, “we can only know facts by their acting upon us” (CP 1.432). Our experience is construed by virtue of the hard facts compelling their presences in our experience, by their brute force. And the “real world is the world of sensible experience” (CP 3.527). Therefore, the actuality of the real world (CP 1.368) is a prerequisite for all experience and thinking, and consequently also for the creation of ideas (see also CP 7.659). The ideal worlds are, in this perspective, hypothetical worlds which serve a purpose by providing possibilities for testing the organism’s potentialities for adaptation. In this sense, the notion of ideal worlds is closely connected to imagination.

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20 However, in 1904, in a letter to William James, Peirce limited the number of worlds to only three: “F. E. Abbot, one of the strongest thinkers I ever encountered, first showed me that there were just three; the outer, the inner, and the logical world. The others are not distinct worlds” (CP 8.299). This is the line followed here, although with different wordings as argued for earlier: instead of ‘outer’ or ‘external’, ‘actual’ is preferred, and instead of ‘inner’ or ‘internal’, ‘perceptual’ or ‘phenomenal’ is used.

21 Peirce used the plural of the ideal worlds, but the definite singular of the real world (e.g. CP 7.535). He took the existence of the real world as self-evident (CP 1.368, 5.549, although see CP 5.244), but what the characteristics of the real world are, what we come to know of them, and how, is another issue. Here, Peirce’s wording ‘the real world’ corresponds to the wording ‘the actual world’.

22 Rather than being idealist in the Hegelian sense (see CP 1.368, 5.91, 5.436, and 8.118), Peirce emphasized the thinking (and the cultural) capacities as essential features of man, and as the leading characteristic of human beings: “For, as the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign; so, that every thought is an external sign, proves that man is an external sign. That is to say, the man and the external sign are identical, in the same sense in which the words homo and man are identical. Thus my language is the sum total of myself; for the man is the thought” (CP 5.314; see also 5.539).
The real world, in turn, may be either external or internal (CP 2.144). In chapter 1.2.1 we already assumed the actual aspect of the “real world”, the actual world. We have also treated the perceptual aspect of reality and the emergence the perceptual world (or phenomenal world) in a preliminary manner. To repeat: a living organism with sensory and motor abilities and metabolism, constructs a conception of a number of environmental characteristics through experience, by virtue of the interaction with that environment. Thereby, the organism develops mind – competence which guides the organism’s action in the actual world, based on the representation thereof. This representation of the actual world, which is due to the compelling nature of experience, is (a part of) the phenomenal world (see later chapter 1.2.5, and Colapietro 1989).

Although a profoundly diverse matter, it is a useful condensation to say that we live in two worlds (see CP 1.321). For the subject, or rather, as a constituent of subject, the actual world is represented in an incomplete and fallible phenomenal world, although this may seem to imply unnecessary dualism. For the subject, this phenomenal world is the readily accessible world, the forum of life, decision-making, reasoning, and thought. From this perspective, the phenomenal world is as real as the subject herself, while actually, only the actual world and the organism exist. Indeed, from the viewpoint of the subject (CP 5.493), the interaction of these two worlds chiefly consisting of a direct action of the outer [or, in the vocabulary used here, actual] world upon the inner [or perceptual] and an indirect action of the inner world upon the outer through the operation of habits.

### 1.2.4 Denial of dualism

The above may seem akin to the phenomenological conception that “[t]he thing and the world exist only in so far as they are experienced by me or by subjects like me” (Merleau-Ponty 1998/1962, 333). Nevertheless, no Husserlian phenomenological bracketing out of the actual world and its natural interpretation is necessary here. Part three addresses more in detail both the construction of the representationally or phenomenally existing perceptual world and its interdependence and

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23 Returning to Peirce's three numbered worlds (CP 8.299), the logical world, or the world of ideas is there to be discovered by the thoughts of the phenomenal world, but this process is (partly) constrained by the causality of the actual world. But actually, from the naturalist standpoint, the world of ideas only exists as a part of the phenomenal world. Thus, two worlds actually remain. The rest is appearance, fancy, imagination. Furthermore, since the actual (or “external”) objects belong to the functional organization of mind, the “internal” world is not hermetically internal, but rather, logically connected to the “external world”, in a fundamental way.
logical connection with the actually existing world, due to which any dualist separation of the two is impossible.\textsuperscript{24}

Still, it may be useful to think in crude terms that we do live in two worlds: as organisms among other objects of the collective actual world, and as subjects in a more private, fallible phenomenal world. The organism has access only to the actual world, through causal relations, and only as an object within it, while the subject, in virtue of the abilities of the organism, has access to both, directly or indirectly. The privacy of the phenomenal world is far from hermetic, due to both brute presence of the actual world and its forcible resistance to organism’s interaction, and the substantial similarity of experience between similar organisms in similar circumstances. In the actual world, nevertheless, there is no privacy in this sense. The phenomenal world can be modified by the interventions of the brute force exerted by the causality of the actual world, in situations where the perceptual representation does not comply with the realities of the actual world. Reversely, based on the perceptual representation, the subject can engage in action which affects the actual world. Hence the bracketing is unnecessary, despite the inherent fallibility of representation.

The phenomenal world is not dependent only on sense perception. The causality effecting the organism has repercussions on the subject as well, in ways other than sense perception alone. The subject can infer as to the nature of the actual world. The subject does not live only in the phenomenal world, but also in the actual world, since the organism without which the subject would not ensue, is a part of the actual world, and exposed to its causal effects.\textsuperscript{25}

These causal effects are the basis for experience, as experience involves brute force (CP 2.84). In brief, “objects of the external world belong to the organization of the mind”, to quote Määttänen (1993a, 17 et passim). Määttänen (1993a; see chapter 3.2.4) analyzed the issue in detail, and it serves as a major source for the treatment of action and experience in the third part, although ‘actual’ has here replaced ‘external’ in nomenclature. The above also means that subject, or mind, cannot be reduced to mere brainstates, although the neural paradigm of the nervous system as a representative mechanism (in the sense that it connects perception with action) must be subscribed to.

\textsuperscript{24} For the pragmatists’ anti-dualism, see e.g. Alexander 2006.

\textsuperscript{25} An unabashed example of this is death by a falling safe: if a safe fell from above and hit an organism killing it, also the subject would cease to exist, regardless of whether the subject perceived the falling safe or not. But even if the injuries to the organism were not fatal, there would evidently be radical changes to the competence of the subject to guide the organism’s behavior.
Conditional idealism fits in the naturalist framework

Above, some references were made about Peirce being a descendant of the idealist tradition, although being a dissident one, his idealist straits differ from the Hegelian tradition. In Peirce’s own usage, the word naturalist referred largely to the natural scientist, and especially the biologist (see e.g. CP 2.646, 5.65, 6.293). In his lifetime, Darwin’s theory of evolution (as well as the Lamarckian one) raised heated discussion. The natural sciences played a prominent role both in Peirce’s personal life, and in the scientific life of the late 19th and early 20th century in general. Peirce made a few references to naturalism, but in contexts that convey meanings far from today’s meanings of naturalism (see CP 8.138). In short, Peirce did not treat naturalism as a philosophical notion in the contemporary sense. On the other hand, what philosophical naturalism is, is a manifold issue. How does Peirce actually fit in the naturalist framework? What is naturalism in terms of Peirce’s philosophy (cf. Hookway 1985, 2–3; EP1, xxviii–xxix)?

Naturalism was earlier (section 1.1) described fundamentally as the idea, that human culture is both an outcome and a part of the natural evolution. In this sense, humans are basically physical and biological beings inseparable from the natural world, regardless of the complexity of social and cultural endeavors active in the network of contemporary human life. Nature and culture are considered inseparable, because culture is immersed in nature (cf. EP2, xxxii–xxxiii). Since Peirce’s pragmatism (or pragmaticism) together with his semiotics (or semeiotic) is at the core this study, it is fitting to describe the current framework as subscribing to naturalist pragmatism. The recent revival of pragmatism has been particularly of this naturalist flavor, although it has frequently been referred to as pragmatic naturalism (see e.g. Shook 2003; cf. Väkevä 2006; Pihlström 1996, 1998, 2003). Differing from hard-line naturalism, naturalist pragmatism implies no methodological decisions in the practical level of inquiry, nor commitment to either phenomenological nor physicalist language of description or explanation.

Naturalist pragmatism maintains that even the most complex cultural, social, and scientific life and meaning is rooted in the natural operation of natural organisms. Hence also the emergence of idealism, for instance, can be thought of as stemming from a developed form of organism’s interaction with its environment, since hypothetical inquiries into logically possible worlds may be useful for the organism. The motor and sensory abilities of living organisms have been a matter of biological evolution and natural selection. The emerging biological mechanisms have served a purpose by being useful by supporting and improving the possibilities for survival. Similarly, the faculties of representation, the accumulation of experience and the
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construction of mind serve a purpose by being useful in the organism’s adapting to and interacting with the environment. The possibility to rely on the success of experience-based action allows the subject to make predictions of the future and act accordingly, and allows for esse in futuro.

This world of hypothetical future situations, inclusive of the subject herself in the potential situations, Peirce called the world of fancy as opposed to the world of fact (CP 1.321). In this context, I shall refer to the competence of this estimation of hypothetical future situations as imagination. This fully concords with Peirce’s description of imagination as (CP 2.148)

an affection of consciousness which can be directly compared with a percept in some special feature, and be pronounced to accord or disaccord with it. Suppose for example that I slip a cent into a slot, and expect on pulling a knob to see a little cake of chocolate appear. My expectation consists in, or at least involves, such a habit that when I think of pulling the knob, I imagine I see a chocolate coming into view. When the perceptual chocolate comes into view, my imagination of it is a feeling of such a nature that the percept can be compared with it as to size, shape, the nature of the wrapper, the color, taste, flavor, hardness and grain of what is within.

Imagination yields belief-habits. In case the imaginative, hypothetical prediction is erroneous, the error may be experienced and subsequently corrected. If the error remains undetected for some time, even the expiration of the unfortunate organism may result. In the long run, the correction of the error (either by individual or a group of organisms) provisionally leads asymptotically towards adaptation of the organism to the more or less changing circumstances of its environment, and the subject, in a sense, towards what could be called truth. (CP 2.650, 5.350, 5.582.)

This appears to be an instance of the correspondence theory of truth. In Basis of Pragmatism (CP 5.549–554), Peirce agreed with Kant, in saying “[t]hat truth is the correspondence of a representation with its object is ... merely the nominal definition of it”. Something is required of truth beyond the mere criterion of correspondence. Peirce’s conception of truth is closely tied to his ideas of pragmatism

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26 CP 5.487 matches the outer world with the world of percepts, and the inner world with the world of fancies. This is somewhat inconsistent with outer world being synonymous with the external, or actual world, and inner world with the phenomenal, internal world, perceptual world, or the world of representation (see above 1.2.4). But, according to Peirce, percepts have a dual nature in the sense that they are external by being partly determined by the external (or actual) objects and their qualities. Partly they are internal, since they are partly determined by the organism and its abilities. That is, percepts belong to both perceptual and actual world, should one wish to use this parlance. Fancies, on the other hand, are not (directly) determined by actual objects, and in that sense, they are purely perceptual. However, fancies, or fancied reiterations do have the effect of producing habits (CP 5.487). In brief, the world of fact is the actual world, and its (direct) effect on phenomenal world, while the world of fancy is not directly effected by the actual world (although logically connected to it).
The key concepts in Peirce’s theory of truth are those of the pragmatist inquiry, particularly doubt and belief. Consequently, a major source for Peirce’s theory of truth are his writings on pragmatism, in which truth is described by means of belief, as settlement of opinion by a satisfactory relief from the irritation of doubt (CP 5.416; What Pragmatism Is; see also CP 5.375, 5.555–564):

If your terms ‘truth’ and ‘falsity’ are taken in such senses as to be definable in terms of doubt and belief and the course of experience (as for example they would be, if you were to define the ‘truth’ as that to a belief in which belief would tend if it were to tend indefinitely toward absolute fixity), well and good: in that case, you are only talking about doubt and belief. But if by truth and falsity you mean something not definable in terms of doubt and belief in any way, then you are talking of entities of whose existence you can know nothing, and which Ockham’s razor would clean shave off. Your problems would be greatly simplified, if, instead of saying that you want to know the ‘Truth,’ you were simply to say that you want to attain a state of belief unassailable by doubt.

The evident problem is, that “we seek for a belief that we shall think to be true. But we think each one of our beliefs to be true, and, indeed, it is mere tautology to say so” (CP 5.375). How is it possible to avoid the inherent subjective fallibility, and to pursue objectiveness usually associated with truth—to arrive at understanding irrespective of what each of us might think? There is a dual answer to this: on the one hand, individual inquiry is continued due to the irritation of “the doubts that are forced upon our minds” (CP 2.84). The circumstances of the actual world do not remain unchanged. Even if the doubt is once settled by belief, and “[t]he force of habit will sometimes cause a man to hold on to old beliefs” (CP 5.387), even after there is no sound basis to them, new doubt is bound to rise, if we are to adapt to the new circumstances. On the other hand, we are not alone, and the inquirers form a community (or rather, communities), which together carry the responsibility of resolving the shared irritation of doubt. Particularly the field of science is “essen-

27 Dewey agreed with Peirce, as expressed in his quotes of Peirce in LW 12:3,43n6: “The best definition of truth from the logical standpoint which is known to me is that of Peirce: ‘The opinion which is fated to be ultimately agreed to by all who investigate is what we mean by the truth, and the object represented by this opinion is the real.’ Op. cit., Vol. V, p. 268. A more complete (and more suggestive) statement is the following: ‘Truth is that concordance of an abstract statement with the ideal limit towards which endless investigation would tend to bring scientific belief, which concordance the abstract statement may possess by virtue of the confession of its inaccuracy and one-sidedness, and this confession is an essential ingredient of truth.’ (Ibid., pp. 394-5.)” This is CP 5,565. William James’s promotion of a pragmatic theory of truth as something being true so long as to believe it is profitable endangers the genuine pragmatist intent by twisting the truth conception towards a myopic stereotype. To put it in Peirce’s semiotic terminology, “truth is the conformity of a representamen to its object” (CP 5.554).
truth is “something public” (CP 5.384). The objectivity of truth “really consists in the fact that, in the end, every sincere inquirer will be led to embrace it -- and if he be not sincere, the irresistible effect of inquiry in the light of experience will be to make him so.” CP 5.494). Peirce even went as far as defining truth via inquiry: “I suppose that by the True is meant that at which inquiry aims.” (CP 5.557). As long as inquiry continues, it is approached asymptotically. And truth would be the final settlement of opinion, and the sole end of inquiry (CP 5.375). In Peirce’s words (How to Make Our Ideas Clear; CP 5.407):

The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real. That is the way I would explain reality.

Thanks to the methodical pursuit of inquiry, said Peirce, “[o]f the things which seem to us clearly true, probably the majority are approximations to the truth” (CP 4.71), but continued: “We never can attain absolute certainty; but such clearness and evidence as a truth can acquire will consist in its appearing to form an integral unbroken part of the great body of truth” (ibid.). Hence the expression “asymptotically” above.

Peirce did talk about absolute truth, but with care (CP 5.494; see also CP 4.61, 5.419):

I hold that truth’s independence of individual opinions is due (so far as there is any ‘truth’) to its being the predestined result to which sufficient inquiry would ultimately lead. I only object that, as Mr. Schiller himself seems sometimes to say, there is not the smallest scintilla of logical justification for any assertion that a given sort of result will, as a matter of fact, either always or never come to pass; and consequently we cannot know that there is any truth concerning any given question; and this, I believe, agrees with the opinion of M. Henri Poincaré, except that he seems to insist upon the non-existence of any absolute truth for all questions, which is simply to fall into the very same error on the opposite side. But practically, we know that questions do generally get settled in time, when they come to be scientifically investigated; and that is practically and pragmatically enough.

This reliance on a potential, possibly reachable truth, to which inquiry eventually would lead, should inquiry be carried on indefinitely, and “so far as there is any ‘truth’” Peirce called his conditional idealism (CP 5.494). While admitting sympathy with Hegel, Peirce criticized Hegel’s absolute idealism for two reasons: for the disembodied concept of the Absolute Knowledge (CP 8.118), and in particular for overlooking the role of the brute force (CP 8.41, 8.45, 8.272), that is, the episte-
mological connection between the internal and the external world, which neglect still tends to persist in contemporary phenomenology (CP 5.436; but see also CP 8.125):

The truth is that pragmaticism is closely allied to the Hegelian absolute idealism, from which, however, it is sundered by its vigorous denial that the third category (which Hegel degrades to a mere stage of thinking) suffices to make the world, or is even so much as self-sufficient.

Briefly put, Peirce’s conditional idealism vouches for

1. a broad conception of the ideal, in which the ideal is either something that “recommends itself to immediate feeling”, or “a generalization of some familiar kind of good”, or else something “whose character cannot be known in advance, so that it can only be defined as the result, whatever it may be, of a process recognized as productive of good” (CP 8.136†3);  

2. a conception of truth, which is pragmatist, in the sense that truth is an outcome of inquiry, settlement of doubt by belief, and which is ideal in the sense that, in inquiry, belief would “tend indefinitely toward absolute fixity” (CP 5.416);  

3. the necessity of continuous inquiry in the pursuit of the ideal, due to the irritation of doubt raised by the hard facts of the external world, attained both by individuals and communities;  

4. fallibilism of inquiry and consequently the view that “[e]verything thus depends upon rational methods of inquiry” (CP 7.78), which science, in particular, uses and develops in the critical pursuit of the truth (which renders science a necessity); and  

5. uncertainty of “when the truth will be reached”, sometimes suspicion that absolute certainty cannot be attained (CP 4.71), but sometimes optimism that it will be reached (CP 7.78).

Of these five, not one contradicts the naturalist framework as described above. As far as obtaining truth is concerned, this abductive study deals with beliefs, and

28 “I am a Schellingian, of some stripe”, wrote Peirce in CP 6.605 in a reply to Dr. Carus (and other necessitarians) to clarify his position to idealism. It seems that Peirce wanted to, first and foremost, to denounce Hume (and nominalism) in favor of more moderate, or even synthetic, mediating views between idealism and materialism (see chapter 1.2.2), and perhaps to assert further affinity to Schelling’s view that the task for the (transcendental) philosophy is to understand how intellectual subjectivity relates to natural objectivity and to seek for knowledge achievable through the balance between and through the coalescence of the absolute, objective reality and the subjective perception of the nature. In other words, this commitment to Schelling’s tradition is just another way of phrasing his conditional idealism.

29 This description of the ideal refers to Peirce’s recursive triadic categories, which will be the topic of chapter 3.2.1.
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not (necessarily) with truths. The very task of this study is to dare to construct a hypothesis which *is likely to* explain, based on current beliefs, the semiotic process of musical composition in terms of semiosis in general, and the role of spatiality in it. The truthfulness of the hypothesis will be an issue only when inference, whether inductive, deductive or, again, abductive, is carried out after this study. In any case, this study constitutes one point in the continuum of the inquiry. Since the whole process of inquiry operates through strong logical connections with the external world and its brute force, and aims to find beliefs that quenches the irritation of doubt, the role of the actual world and the *embodiment* of the semiotic process may not be neglected. This study presents the logical construction of a hypothesis, based on current beliefs concerning Peirce’s naturalist pragmatism, music and spatiality. We might justifiably consider it highly plausible (and hopefully do), but in the final analysis it may or may not correspond to the actual situations, actual processes of musical composition, and the role of space in those processes.

1.2.6 Inquiry and pragmatism

Let us return to the concept of inquiry. As mentioned, from the naturalist perspective, the asymptotic process towards adaptation by the organism to the environment is what inquiry in a broad sense is about. For Peirce, the “whole end of inquiry is the settlement of belief; so that a man shall not war against himself, nor undo tomorrow that which he begins to do today” (CP 8.41). Although at core the processes are similar, Peirce distinguished *scientific inquiry* as a special case of inquiry, and differentiated between *scientific belief* (or the scientific method of fixing belief, CP 5.410) and *practical belief* (or living belief, CP 6.485).

Scientific inquiry requires methodological rigor, and differs from the temporal scope of ordinary life. Scientific beliefs (or established truths) do not necessarily need to be relied upon in practical action: “Speaking strictly, belief is out of place in pure theoretical science, which has nothing nearer to it than the establishment of doctrines, and only the provisional establishment of them, at that. Compared with living belief it is nothing but a ghost” (CP 5.60). Living belief is (CP 5.589)

the willingness to risk a great deal upon a proposition. But this belief is no concern of science, which has nothing at stake on any temporal venture but is in pursuit of eternal verities (not semblances to truth) and looks upon this pursuit, not as the work of one man’s life, but as that of generation after generation, indefinitely. Thus those retroductive inferences which at length acquire such high degrees of certainty, so far as they are so probable, are not pure retrodictions and do not belong to science, as such; while, so far as they are scientific and are pure retrodictions, have no true probability and are not matters for
belief. We call them in science established truths, that is, they are propositions into which the economy of endeavor prescribes that, for the time being, further inquiry shall cease.

Hence, scientific inquiry is partly a matter of economy, while practical inquiry by means of action and perception, is a matter of adaptation, and even survival. This applies to this study, as well. This case is an attempt to construct a spatially cognizant semiotic theory of musical composition process. A truthful understanding of the research topic in question involves a continuum of inquiry, but since we are in pursuit of an ideal, the true character of the research topic “cannot be known in advance, so that it can only be defined as the result, whatever it may be, of a process recognized as productive of good” (CP 8.136n3). However, the “economy of endeavor prescribes” that, at this point, inquiry is limited to formulating such a hypothesis that it does not fall into being an “established truth” in its self-evidency but has such a degree of probability that its propositions are not merely “matters of belief” (CP 5.589).

The topic here is concerned with the practical issues of musical signification and composition processes. Therefore the concept of practical inquiry (as opposed to scientific inquiry, which is the domain of Wissenschaftswissenschaft, the study of science itself) is at core of the subject matter. Practical inquiry is the process of action and perception, the process of experiencing by means of interaction with the environment by the organism, or by the subject.

While a biological organism without motor and sensory abilities is merely exposed to causal effects of the actual world in the same way as non-organic entities, only an experiencing organism—a subject—has the potential ability to make assumptions as to the future, to set goals, and to be effected by these assumptions, expectations, or belief-habits of future in present action. Indeed, (CP 2.148)

this is the most important point – a belief-habit formed in the imagination simply, as when I consider how I ought to act under imaginary circumstances, will equally affect my real action should those circumstances be realized.

This may well cause a problem, but also open new possibilities, due to the fallibility of the inquiry. Namely, as soon as the subject begins to operate without a constant, direct involvement of the hard facts of the actual world, and within the imaginary competence, the phenomenal world of the subject begins to live a life of its own, in

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30 In Peirce’s vocabulary, retroduction, abduction and hypothesis are, if not identical, at least close to being synonymous. See note †21 in CP 7.97. Calling the general case of inquiry “practical” poses some inconsistency as far as Peirce’s normative sciences are concerned. The expression “living inquiry”, on the other hand, may imply that science would somehow be lifeless, but see CP 1.116: science is referred to as living inquiry. Perhaps the suitable term might be ordinary inquiry.

31 Nevertheless, there seem to be noteworthy similarities between musical processes and the process of scientific inquiry.
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a sense. Usually, the resistance of the hard facts updates the expectations due to the connection of the subject’s phenomenal world with the organism’s actual world. But a belief formed in the subject’s imagination without this updated connection may well be erroneous, yet nevertheless effect the actual action of the organism.

In worst cases, this may result in potentially harmful habits of action and eventually in perilous instances of action. In best cases, this may result in beneficial possibilities of expanding the means of action, enhancing the ways of perceiving, and engaging in interaction with the environment in new ways. These new possibilities may create altogether new, unprecedented situations in the actual world to be experienced by the subject herself and by others. In other words, the fallibility of inquiry guarantees the possibility of creative action and the manifestation of the possible worlds of fancy relating to the practical exigencies of life.

Whether or not the reliance on imagination is beneficial or not, depends in the final analysis on the usefulness of the habits of action and their instances. In short, meaning is use (see EW 5:195, MW 9:19, and LW 8:231). In this sense, there is something in imagination that could be called virtual: the imaginative ability may overcome the hard facts of life and the sensory-based experience thereof. Imagination becomes a powerful tool for the subject, since by virtue of imagination the subject prepares “to act under imaginary circumstances” that may be realized. If they are realized, the subject’s habits of “real action” have already been prepared by imagination (see CP 2.148). Hence, imagination is a virtue.

Somewhat paradoxically, this potential of predicting the future, its fallibility notwithstanding, this ability of expectation, is at the core of pragmatism. Peirce’s pragmatic maxim (CP 5.2, 5.402, and 8.119; How to Make Our Ideas Clear; and CP 5.17 for the original in French) stated

Consider what effects that might conceivably have practical bearings we conceive the object of our conception to have: then, our conception of those effects is the whole of our conception of the object.

The maxim is a broad definition, and it seems to allow for the naïve conception, according to which the pragmatist attitude can be accused of a lack of social responsibility or of greed for instant gratification. However, as the aspect of practical bearings is considered, the pragmatic maxim includes not only the immediate practical

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32 "Now as I understand pragmatism it is of the very essence of it that belief is expectation of the future in all cases. Consequently it seems to me that the third kind of consciousness is also a ‘constituent principle of all’ our life, and a fortiori of all experience.” (CP 8.294) The “third kind of consciousness” refers to Peirce’s letter to William James, (CP 8.286–301), concerning consciousness as feeling, experience, and consciousness of future of expectation.
bearings but also the expectation of potential action, should circumstances for it arise, “no matter how improbable they may be” (CP 5.400).\footnote{For summaries on this American contribution to philosophy, see, for instance, Scheffler 1974, Menand 2001, or de Waal 2005. To clarify, the term pragmatism does not here refer to the neopragmatist works by, e.g. Richard Rorty or Richard Shusterman, but to the original New England pragmatists of the late 19\textsuperscript{th} and early 20\textsuperscript{th} century. Peirce’s own account of pragmatism, or pragmaticism, can be found in volume 5 of the CP, and particularly in the Harvard lectures on pragmatism (EP2, 133–241), and in the Monist series of 1905 (EP2, 331–397, see also 398–433), as well as in the early paper How to Make Our Ideas Clear (which does not yet mention the word pragmatism; EP1, 124–141; CP 5.388–410). For the difference between pragmatism and pragmaticism, see CP 6.414--; EP2, 334–395; What Pragmatism Is, or, for instance, Deely 2000b and Pihlström 2004.}

For Peirce, “[a]n expectation is a habit of imagining. A habit is ... a general law of action, such that on a certain general kind of occasion a man will be more or less apt to act in a certain general way.” (CP 2.148) This “would-be” (CP 2.664) expands the horizons of the pragmatic maxim temporally and also socially, as far as temporally evolving repercussions and awareness of others are conceivable by the subject. “This is why [the pragmaticist] locates the meaning in future time; for future conduct is the only conduct that is subject to self-control” (CP 5.427). In addition, since the imaginative ability of expectation and provisional action has itself proved to be useful, it has survived and flourished in biological and cultural evolution. Thus, the temporal perspective is inherent in the pragmatic maxim.

The subject, which is constructed in virtue of action and experience, and which more or less has the competence of imagination at her disposal, guides the organism’s action in the actual world. This subject’s being-in-the-world is constantly growing and updating itself as experience of the actual world is accumulated, including that about the organism itself. From this perspective, then, any part of the subject’s phenomenal world, such as music might be, is as real as the subject herself, or as real as the actual world as a whole appears to be.\footnote{A propos of being-in-the-world, the analysis of Heidegger’s conceptual collection of e.g. Dasein and In-der-Welt-Sein is well beyond the scope and aim of this book. See chapter 2.2.8 and section 5.2.} The phenomenal world is partly anchored in the experiential representation of the actual world, and partly due to the imaginative competence of the subject. These two, it is important to note, are by no means mutually exclusive, even if the imaginative competence is not necessarily directly anchored in the practical exigencies of life (CP 8.266). In common terms, this intertwined dualism is not news: we are accustomed to thinking that, on the one hand, we have what appears to be hard facts, and on the other, we have our own fantasy life. And they affect each other. But this is beside the point. The imaginative, abductive competence of the subject is much more than everyday fantasy or day-dream. Without imaginative competence we could not make even the most elementary predictions as to the operation of the
world: When I raise my teacup, I imagine, I expect, that the warm liquid will run into my mouth. When I press the doorhandle or turn the doorknob, I believe, I predict that I can go through the wall from the door opening. Each habit relied upon in the predictions is based on accumulated perception, i.e. experience: the tea usually flows unless the cup is empty, this door has always opened, etc.

Consequently, “every expectation is a matter of inference” (CP 2.148). The inferential process forms the habits and produces the beliefs and opinions in the process of inquiry. Largely we are unaware of the process, but (idem)

[a] man may become aware of any habit, and may describe to himself the general way in which it will act. For every habit has, or is, a general law. Whatever is truly general refers to the indefinite future; for the past contains only a certain collection of such cases that have occurred. The past is actual fact. But a general (fact) cannot be fully realized. It is a potentiality; and its mode of being is esse in futuro. The future is potential, not actual. What particularly distinguishes a general belief, or opinion, such as is an inferential conclusion, from other habits, is that it is active in the imagination.

What is worth pointing out here is that, first, the subject and her phenomenal world have solid epistemic connections to the actual world through the organism’s existence as an object among other objects of the actual world. Second, the competence of imagination is at the subject’s disposal in order to guide the organism’s action beyond mere reaction to the brute force of the actual world. This action, in turn, may affect the same organism or any other organism, and hence may result in further experiencing, regardless of whether the subject is aware of the experience or not. Third, since it is possible to become aware of any habit, it is also possible to become aware of other subjects as well and even their habits in more or less accurate ways. Consequently, by virtue of the competence to estimate various hypothetical situations of the future, the subject may guide the organism to instantiate action purposefully (to produce sound, for instance) in order to be perceived and consequently experienced by herself or by others. This in turn may subsequently result in further action (with or without sound) and in further perception, ad infi-

35 According to Peirce, “an inference, in the broadest sense, is a deliberate adoption, in any measure, of an assertion as true” (CP 7.187). This definition concerns scientific inference in particular. The word measure refers to the necessary, possible and contingent modes of acceptance. The concept of truth was discussed earlier. Peirce continued to point out that “the different sciences deal with different kinds of truth” and that “[w]e all hope that the different scientific inquiries in which we are severally engaged are going ultimately to lead to some definitely established conclusion, which conclusion we endeavor to anticipate in some measure” (idem).
Nitum. In a sense, this could be called a chain of interaction. Usually, however, we speak of communication (or autocommunication).16

1.3 Issues of esthetics and practics: towards semiotics

The word ‘communication’ refers in its original sense of communicare (OED, s.v. ‘communicate’) to making something common, to share. To be precise, what is common or shared in this respect, are only the states of the actual world, which may have been modified through an organism’s action. According to the naturalist stance, nothing else can be shared between subjects. What can be made common, to a degree, are the states of the phenomenal world, but only by means of the actual states. This includes the production of sound, or other modification of actual objects, even modification of other organisms, one way or another, directly or indirectly. Hence all interaction (or transaction) between subjects takes place in the natural, actual world and through its objects. All cultural, social, intersubjective, subjective, phenomenal forms of action, perception and experience are tied to actually existing objects of the world, i.e. to nature.37

The possibility to share objects of the actual world is what allows for social interaction and cultural phenomena. In this respect, the explanation needs not resort to metaphysical or transcendental entities. This is the core of the naturalist embodiment.

In all its simplicity, the naturalist stance toward communication has enormous ramifications. Consider, for instance, a scream that is projected in the actual world. Other organisms are potentially affected by it, and the scream is, possibly, experi-

16 The evolvement of this kind of chain of interaction also involves the notion of tool, and will be discussed more in detail in part three. Instead of the linear notion of a chain, a network of interaction would perhaps be a more accurate expression of real-life situations. At the same time, the process of interaction with the environment can be thought of as an interplay between the inferential processes of abduction (forming hypothetical belief as to the operations of the actual world), induction (conformation or nonconformation of the hypothesis to the actual world), and deduction (logical consequences of successful conformation). Cf. CP 7.220.

37 Transaction is John Dewey’s term, which emphasizes the totality of the “[f]unctional observation of full system, actively necessary to inquiry at some stages” (LW 10:71), in contrast to separation of components pertaining to the term ‘interaction’. Dewey went as far as entirely rejecting the interactional approach in his procedure for the general theory of knowing and knowns (LW 16:265), since in his opinion, the interactional approach “shatters the subject matter into fragments in advance of inquiry and thus destroys instead of furthering comprehensive observation for it” (LW 16:67). Unlike the interactional approach, the transactional approach, for Dewey, included all three techniques of inquiry: physical, physiological, and behavioral, and activity of both organisms and environments together (LW 16:70). See also LW 13:25; LW 16:100–104. Here, the term transaction becomes quite unnecessary, since interaction is considered to encompass aspects of all levels from physical interaction of objects to social interaction of subjects.
enced by other subjects. The meaning of the scream, the conception of that particular scream lies in the practical outcomes induced by the scream. The practical outcomes depend on the experience gathered by the subject, and the scream has its effect on the subject’s future action, whatever that may be—perhaps even the absence of (re)action. Conversely, in principle, any experience may result in the action that produces the scream, when a subject has gathered such experience, and hence cultivated such habits of action, that in due circumstances the habit of screaming is evoked and instantiated.

Action and perception were the two aspects of Peirce’s notion of consciousness, or rather, of mind, in this context. These two aspects are applicable in communication, too. However, in conjunction with the arts, the term esthetic is usually attached to issues of reception, perception, and experience, while practical, practice, praxis etc. are used to refer to artistic, musical, legal, medical, and other activities. Consequently, both practical and esthetic (or if nouns, praxis and esthesis), in variant spellings, have been historically loaded with denotations and connotations. This is an attempt to navigate through those dire straits.

Esthesis (αἰσθησίς) originally and commonly referred (and in modern Greek still refers) to the activity in which a subject perceives (and consequently experiences) actual objects or their qualities, without any specific criteria as to the nature or characteristics of the experience. Hence the adjective esthetic (αἰσθητικός), “of or for sense-perception, sensitive, perceptive”, or, “of things, perceptible” (LSJ, s.v. ‘aisthetikos’), and the word anesthetic as the antonym of esthetic. The verb stem αἰσθε- is the common denominator for words relating to feeling and apprehension by the senses.

Praxis (πρᾶξις, or in modern spelling, πρᾶξη), in turn, is the Greek for act, action, deed, practice, and the adjective practic (πρακτικός), correspondingly concerned with action, both deriving from the verb ‘to do’ (πράττειν, or in modern spelling, πράττω).

Indeed, Ockham’s razor should certainly be used, if distinction is not made between praxis and action on the one hand, and esthesis and perception on the other hand. What makes things more complicated, is of course the fact that both esthesis and praxis have gained a plethora of additional meanings in the tradition of arts, music, aesthetics, and philosophy, since there has been need of grasping the phenomena of those domains in terms of language. The problems of assessing the experiential natures of arts and music, in particular, have raised the need to distinguish artistic, musical, or esthetic action and perception from action and perception in general, or from action and perception of common, everyday life. Such traditions, then, tend to exhibit conceptions of arts and music as distinguishable, and even
secluded, from everyday life. Especially the Baumgartenian tradition of *Æsthetics* (Baumgarten 1988/1750–58) as the science of the Beautiful, philosophy of Taste or theory of Fine Arts has obscured the original conception of the esthetic.

While heading towards pragmatist conceptions of praxis and esthesis, artistic action and artistic perception, and the broad concepts of *art* and *semiosis*, let us first make a crude summary of their conception by Aristotle. Aristotle’s conceptual construct is not without conflicts, and clearly, a thorough review of Aristotle in this respect is beyond the scope of this book. However, some remarks can be made for the benefit of reviewing the conceptions of Charles Peirce and John Dewey, and synthesizing a group of conceptions based on all three.\(^{38}\)

### 1.3.1 Aristotle on esthetic and practic

It may seem far-fetched to jump to Aristotle amidst a pragmatist context. However, Aristotle’s impact on both theories of art and on the pragmatists already may warrant the detour. More than Aristotle’s notion of art or music as imitation of nature (*μίμεσις*, mimesis), some of his concepts of the intellectual virtues and corresponding activities have provided explicit or implicit bases for a number of theories of arts and music, often through Peircean or Deweyan pragmatism. Of the pragmatists themselves, Peirce, for instance, held Aristotle “of all possible authorities the highest” (CP 1.88). Therefore, Aristotle may provide some support in questions that are left obscure by the pragmatists. Thereby Aristotle may contribute to a pragmatist view of esthetic and practic (see chapter 1.3.4). Let us now approach the issues of praxis and esthesis from Aristotle’s perspective of knowledge, or intellectual virtues.\(^{39}\)

The sixth book of *Nicomachean Ethics* (NE VI. 3.–7., 1139b–1141b) lists five intellectual virtues or virtuous states, which are, in varying English translations (see also e.g. Ross 1995/1923, 221–227):

1. science, scientific knowledge, or understanding (*ἐπιστήμη*, episteme);
2. art (*τέχνη*, techne);
3. practical wisdom, practical knowledge, practical intelligence, or prudence (*φρόνησις*, phronesis);
4. intuitive reason, or intelligence (*νοῦς*, nous); and
5. wisdom, or theoretical wisdom, particularly philosophic wisdom (*σοφία*, sophia)

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\(^{38}\) For the inconsistencies in Aristotle’s thoughts of action, see Ackrill 1980 or Hintikka 1973.

\(^{39}\) For *mimesis*, see e.g. Woodruff 1992, Golden 1992 or Potolsky 2006 in addition to Aristotle’s *Poetics*. 

36
According to Aristotle, understanding or *episteme* is “a state of capacity to demonstrate” that “what we know is not even capable of being otherwise” (NE 1139b). Therefore the object of episteme is “of necessity” and eternal. Episteme has also “other limiting characteristics”, i.e. methodological requirements, which Aristotle specified in the Analytics. Episteme is expressed in demonstration or proof, apodeixis (ἀπόδειξις).

Aristotle’s intuitive reason or nous “grasps the first principles” (NE 1140b) of (scientific) knowing. It consists in the basic means of knowing and learning, which takes place either by syllogisms (demonstrations) or by induction. According to Aristotle, “demonstration [ἀπόδειξις] proceeds from universals and induction from particulars” (APo 81b), and “induction is the starting-point which knowledge even of the universal presupposes, while syllogism proceeds from universals.” (NE 1139b). Induction, in turn, is impossible if “we lack sense-perception” (APo 81b). Consequently, “it is sense-perception that apprehends particulars. It is impossible to gain scientific knowledge [ἐπιστεμεν] of them, since they cannot be apprehended from universals without induction, nor through induction apart from sense-perception.” (idem).  

This may seem to imply that intuitive reason would somehow be the same thing as sense-perception. Unfortunately, Aristotle’s own definition or description of nous in NE VI. 6 is more exclusive than inclusive, and in other places partly contradictory (see e.g. NE 1098a as contrasted to APo I.), leaving the concept somewhat unclear. Based on NE and APo, Ross (1995/1923, 223) maintained, that the grasping of the first principles (grasping “the ultimate premises from which science takes its start”) is to be understood “as the process whereby after experience of a certain number of particular instances the mind grasps a universal truth which then and afterwards is seen to be self-evident. Induction in this sense is the activity of ‘intuitive reason.’”

Hence, it can be bluntly argued, that *nous* as the faculty of intuitive reason pertains, not to sense-perception per se, nor to discrimination or perceptual judgment, but mainly to generalization of particulars into universals. The question of the role of the perceptual faculty (*aisthetikon*) and its relation to the faculty of reason (*noetikon*) in Aristotle remains unsettled, according to Modrak (1987, 8–9, and 117). However, it seems appropriate to assume such omnipresence to the perceptual faculty that all types of knowledge rely on it. It is difficult to envision that practical wisdom, art or scientific knowledge would be excluded from relying on perception.

According to Aristotle, *sophia* or wisdom had two main meanings, one being excellence in art, and the other wisdom in general, “not in some particular field or in any other limited respect” (NE 1141a). In this latter sense, sophia is the “most
finished of the forms of knowledge” (idem). Aristotle’s examples indicate that, sophia is wisdom regarding ulterior and fundamental problems, metaknowledge in the sense that it is partly knowledge about knowledge itself, as it “must also possess truth about the first principles” (idem). Consequently, it “must be intuitive reason combined with scientific knowledge ... of the highest objects” (idem). In other words, sophia consists in nous and episteme, and comprises knowledge of the necessary, theoretical wisdom (Ross 1995/1923, 223–224).

Art or techne, in turn, is concerned with “contriving and considering how something may come into being ... and whose origin is in the maker and not in the thing made” (NE 1140a). It is “knowledge of how to make things”, which do not come into being “by necessity” nor “in accordance with nature”, i.e. which “have their origin in themselves” (idem). According to Ross, “art is subordinate to practical wisdom”, in the sense, that the result, the work of art, the object of making “is itself the means to something further, viz. the using of it, and ultimately to some form of action” (Ross 1995/1923, 222). In NE, Aristotle implied this in his clear separation of the two, and expressed the difference between techne and phronesis in terms of means and ends: “while making has an end other than itself, action cannot; for good action itself is its end” (NE 1140b; cf. Ackrill 1980). I shall get back to the issue of means and ends in due time, but for now it suffices to stress that techne is the knowledge concerned only with making or manufacturing an object, without going further than that. Indeed, it is, in modern parlance, the technical knowledge of producing, without consideration of the ramifications or possible applications of the product.

Finally, phronesis or practical wisdom is “a reasoned and true state of capacity to act with regard to human goods.” (NE 1140b). It is possessed by those who “can see what is good for themselves and what is good for men in general”. Phronesis is “the same state of mind” as political wisdom, but its essence is not the same, since phronesis is also “identified especially with that form of it which is concerned with a man himself—with the individual, and this is known by the general name ‘practical wisdom’”, as opposed to household management, legislation, and politics (NE 1141b–1142a).

Ross (1995/1923, 224) summarized the complete scheme of Aristotle’s kinds of knowledge based on division between knowledge of the necessary (theoretical wisdom) and knowledge of the contingent (virtues that “deal with things that are variable”, NE 1140b). Parts pertinent here are illustrated in figure 2. Sophia (theoretical wisdom) is a combination of nous (intuitive reason) and episteme (science), knowledge of things that necessarily are, independent of our manipulation. Contrasted to that, by manipulating the contingent, “we may wish either to do something—to be active in a certain way, or to make something—to produce something
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distinct from the activity of producing it" (Ross 1995/1923, 222). The former refers to phronesis, the latter to techne.

![Figure 2. Main divisions of the Aristotelian concept of knowledge, adapted from Ross (1995/1923, 224).](image)

Each state, or intellectual capacity, is expressed by particular kind of activity as follows:

<table>
<thead>
<tr>
<th>Intellectual virtue (ἐντελέξια, entelechia)</th>
<th>Corresponding activity (ἐνεργεία, energeia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>wisdom (σοφία, sophia)</td>
<td>contemplation (θεωρία, theoria)</td>
</tr>
<tr>
<td>– intuitive reason (νοῦς, nous)</td>
<td>– induction, conception (active νοῦς)</td>
</tr>
<tr>
<td>– science (ἐπιστήμη, episteme)</td>
<td>– explanation, proof (ἀπόδειξις, apodeixis)</td>
</tr>
<tr>
<td>art (τέχνη, techne)</td>
<td>making (ποιήσις, poiesis)</td>
</tr>
<tr>
<td>practical wisdom (φρόνησις, phronesis)</td>
<td>doing (πρᾶξις, praxis)</td>
</tr>
</tbody>
</table>

If the knowledge of the necessary (sophia) is a combination of intuitive reason (nous) and science (episteme), there remain three main types of activities: theoria, praxis and poiesis. Theoria refers to the activity of speculation, beholding and viewing, not only concretely in terms of scientific exploration, but also in the manner of being detached from everyday life, contemplation valuable for its own sake. Theory is the active expression of the theoretical knowledge, sophia. As an example, the theory reported in this book is an expression of both intuitive reason and the science of musical semiotics. It is an utterance of interrelated concepts, the main topic of which happens to be making and doing, as well as semiosis of musical composition process.
Poiesis, in turn, refers to fabrication, manufacturing, or making of a product or an object. It requires certain skill, means or method of production, knowledge of making, techne. Hence we speak of poetics, for example, in the meaning of art of poetry, poems being the end products that require skills for characterization, creating plot-structure, verbal style, thought, spectacle, rhetoric, etc. Note, however, that poetics in this sense does not deal with the values or meanings in poetry (nor values or significance of poetry), or anything else but the technical, down-to-earth production of verse. From the viewpoint of the musical composition process, then, poiesis is the concrete process of actualizing composition, whether by jotting down the notation, improvising on an instrument, manipulating recorded sound, programming or otherwise operating the computer etc., in order to accomplish a piece of music, a fragment of sound or other actual object (or a set of objects) as the end result of the activity. How well the composer manages to relay musical ideas into the “object” of “art”, depends on how good a technique the composer has, irrespective of the goodness or badness of the musical ideas themselves.

In comparison, praxis, which originally tended to emphasize the economic, political or other public nature of the activity, is goal-oriented and voluntary action, which is good for something beyond manufacturing a product (cf. Regelski 1998a–b). Whereas poiesis ends when the product is completed, and the cogitation of theoria is timeless, praxis is continuously connected with the exigencies of life (hence idioms such as practice of law, medicine, or instrument). The success, goodness and morality of praxis is guided by phronesis, practical wisdom, thought, and judgment concerning the consequences of the purposeful or intended activity. Since phronesis is about “what is good for men in general” and praxis is the active, goal-oriented expression of phronesis, praxis is essentially an activity with a target of one or more persons, even all people. In terms of musical composition process, praxis is a complement of poiesis, meaning that praxis is that aspect of composing which is concerned with affecting the audience, the listeners. Praxis is the activity of musical expression as opposed to technique, should one wish to make that distinction.42

Ross noted that the concept of art in Aristotle’s usage “includes useful as well as fine art, and Aristotle is as a rule thinking of the former” (Ross 1995/1923, 222). The works of useful art are used as instruments of some other activity (other than the making of the object itself), and in the case of fine art “its use might be supposed to be aesthetic contemplation, but there is no clear evidence that Aristotle thought of this as an end in itself” (idem). Ross’s concern over the division of techne

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42 Note that the term audience here is not limited to concert audience but to any situation of musical processes: even a composer sitting alone in his studio is his own audience at the time of composing. In this sense, listening is always present in musical composition process, one way or another. See part two.
between useful and fine art reveals the widespread conception of aesthetics that in my opinion is unnecessary, since it is implied that fine art would not be useful, or that it would be pursued for its own sake. Both alternatives are contradictory to the pragmatic maxim.

Admittedly, fine art, if you like to use that expression, is about something that goes well beyond mere manufacturing of an object, but at that point fine art becomes, not only art (techne) but a matter of phronesis to which techne is, as mentioned, subordinated. If fine art is continuously connected with the practical exigencies of life, if it is about what is good for men in general, if it employs judgment concerning the consequences of the purposeful or intended activity, and if it is a reasoned and true state of capacity to act with regard to human goods, it fits the description of phronesis. The distinction between techne and phronesis is in concord with the artist’s frequent distinction between technique and expression. Naturally, it is difficult, perhaps even impossible to draw a line between what is technical and what is expressive in contemporary art, but nevertheless it seems both usual and useful to make the theoretical and pedagogical distinction between techne and phronesis as types of knowledge, between poiesis and praxis as kinds of activity, or between technique and expression as elements of artistic or musical processes.43

Let us move on to a very brief overview of Aristotle’s notion of perception. Earlier, it was suggested that perception plays a role in all five intellectual virtues. According to Modrak, Aristotle’s theory of perception is founded on five foundational principles, which she, despite the dangers of anachronism, justifiably dresses in the vocabulary of contemporary cognitive science, in order to emphasize that Aristotle’s theory of perception is contrasted to Platonic dualism, and quite comparable to twentieth-century materialism (Modrak 1987, 24):

1  Descriptive Principles
   a. Psychophysical Principle. Many states, if not all, that are ordinarily assigned to the soul are psychophysical states, namely, psychical states with physical realizations.
   b. Actuality Principle. A cognitive faculty is potentially what its object is actually.
   c. Sensory Representation Principle. If a cognitive activity has a sense object as its focal object, the psychic faculty involved is a perceptual faculty.

2  Prescriptive Principles

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43 This is not to say that musical expression would be the same as musical praxis. Musical expression certainly is one element of musical praxis, but not all of it.
a. Analytic Principle. A psychological explanation should begin with an account of the constituent parts of the phenomenon under consideration and then make this account the basis for extending the explanation to cover more complex phenomena of the same sort.

b. Normative Psychophysical Principle. Psychological explanation at its most complete will take the psychophysical character of psychological states into account.

(For a closer look at Aristotle's conception of sensory perception, five senses, and the common sense [κοινἠ αἴσθησις, koine aisthesis], see Modrak [1987] or Ross [1995/1923, 135–160].) Aristotle’s theory of perception also includes the concept of imagination or phantasia (φαντασία). As defined by Aristotle, phantasia is “that in virtue of which we say a phantasma arises in us” (DA 428a1–2; Modrak 1987, 82). Phantasmata, in turn, are mental representations, both of those that are realistic and those that are not. In this sense, phantasmata may be thought of as knowledge of the possible, compared to knowledge of the necessary or knowledge of the contingent. A phantasma is fallible, according to Modrak (1987, 82):

The object as presented in a phantasma fails to correspond precisely to any object actually in the subject’s perceptual field. ... a phantasma is a sensory presentation of an object that cannot simply be identified with an object in the subject’s immediate environment.

According to Ross (1995/1923, 148–149), the main functions of phantasia are, first, the formation of after-images; second, memory, which is impossible without images, and which is actualized by recollection; and, third, dreams, which are by-products of previous sensations. “In the absence of stimulus from without, the mind is more free to attend to images, and at the same time more liable to be deceived by them” (Ross 1995/1923, 149). The fourth function of imagination is connected to desire, which is the cause of movement, and which presupposes imagination. In other words, imagination is the basis for desire, which, in turn, leads to movement. Finally, the fifth function of phantasia relates to thought in general: although thoughts are not images, we cannot think without them, even when a universal is grasped. “An image is a particular mental occurrence, just as much as is a sensation; thought first occurs when the mind discerns a point of identity between two or more images” (Ross 1995/1923, 152; APo 100a, DA 427b–434a). It appears that the Peircean conceptions of perception and imagination presented earlier in chapters 1.2.3 and 1.2.5, correspondingly, are very Aristotelian at heart. Let us now move on to the New England pragmatists.44

44  DA refers to Aristotle’s De Anima (On the Soul).
1.3.2 Charles Peirce on esthetics and practics

Peirce’s conception of the esthetic is ambiguous and inarticulate. He attached the term esthetic primarily to feeling, quality, to judgment and enjoyment, each elements of perception (see CP 1.591, 5.111, and 5.113). Peirce acknowledged that he, like most logicians, was not well acquainted with esthetics (CP 2.197, 1.191, 5.111), but “lamentably ignorant of it” (CP 2.120). While declaring himself oblivious to the contents of the domain of esthetics itself, Peirce had an understanding of the position and nature of esthetics as a science. For him, esthetics as a scientific discipline was in close contact with logic and ethics, all three comprising the normative science in his classification of the sciences. Therefore, it is best to approach his conception of esthetic and esthesis in terms of research about them, i.e. by contemplating the character of the normative science.

In Peirce’s classification of the sciences, esthetics is the first branch of normative science, along with practics (which wording Peirce preferred over ethics) and semeiotic (or logic, synonymously). It is “the science of ideals, or of that which is objectively admirable without any ulterior reason” (CP 1.191). Logic, ethics, and esthetics are not “simply the arts of reasoning, of the conduct of life, and of fine art”, although each is closely related to the corresponding practical undertaking, respectively. Peirce classified them as normative, because “these sciences do study what ought to be, i.e., ideals” (CP 1.281).

Defining esthetics as a science of ideals may seem awkward, considering what has been said above about Peirce and the naturalist perspective. It is worthwhile to approach this issue by considering the roles of each of the three normative sciences, and to recall Peirce’s concept of ideal (see chapter 1.2.5).

In his description of the normative sciences, Peirce defined the third, logic, as the theory of deliberate thinking. By deliberate he meant that “it is controlled with a view to making it conform to a purpose or ideal.” (CP 1.573) Since thinking is a special case of action, he continued, the theory of deliberate thinking must be based on “the theory of the control of conduct, and of action in general, so as to conform to an ideal” (CP 1.573). This theory of action, or control of conduct, is the middlemost of the normative sciences, practics.

Now, what conforming to the ideal, or purpose means, is that action is (CP 1.574)
reviewed by the actor and that his judgment is passed upon it, as to whether he wishes his future conduct to be like that or not. His ideal is the kind of conduct which attracts him upon review. His self-criticism, followed by a more or less

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45 For an analysis of Peirce’s classification of sciences, see Kent (1987). For the classifications themselves, see CP 1.176–283 (both outline and detailed account); EP2, 258–262 (only the outline).
conscious resolution that in its turn excites a determination of his habit, will, with the aid of the sequelæ, modify a future action.

This revision of future action depends on how action and experience conform to the actual world, i.e. on the reliability (but not necessarily verisimilitude) of representation. This, in turn, depends on perception and action. For this perceptual aspect of revision, Peirce used the concept of habit of feeling, “which has grown up under the influence of a course of self-criticisms and of hetero-criticism; and the theory of the deliberate formation of such habits of feeling is what ought to be meant by esthetics” (CP 1.574).46

In other words, for Peirce, esthetics was the science which investigates how the habits of feeling the actual world are formed in the ongoing adaptive process of action and experience. These perceptual habits serve for habits of action, and for the important special case of them, namely habits of thinking. Since practics investigates deliberate action and logic deliberate thinking, the subject matter of esthetics is a necessary condition for the subject matters of the other two branches of normative science. Conversely, the discipline of logic relies on that of practics, which in turn relies on that of esthetics.47

Peirce pointed out that self-criticism, hetero-criticism, and subsequent resolution are “more or less conscious”, i.e., more or less involve the subject’s awareness and imaginative competence. This corresponds well to the concept of inquiry, but there is no need to exclude either conscious or non-conscious control of conforming to ideals, at least not for now. Also, I take it that Peirce’s word “hetero-criticism” refers to an undertaking potentially shared by many, as is the case in inquiry. In important special cases, however, the modification of future action, that is, adaptation to the actual environment, takes place by the same subject as the original action. This potential tendency towards solipsism is smoothly avoided in Peirce’s normative science: the question is addressed mostly, but not exclusively from the standpoint of a singular subject, without consideration of intersubjectivity, although intersubjectivity is by no means excluded.

46 By feeling, Peirce meant “nothing but sensation minus the attribution of it to any particular subject” (CP 1.332). In that sense, feeling is the very beginning of perception. For a more extensive definition of feeling by Peirce, see CP 1.306—. Note also, that from the contemporary perspective, the definition of consciousness as feeling, as quoted above in chapter 1.2.3, seems awkward if feeling indeed does not include the attribution of sensation to any particular object.

47 One may object to this by claiming that action is a necessary condition for perception, and not vice versa. Here, however, we are not dealing with action in general, but deliberate action in particular. In order for action to be deliberate in Peirce’s sense, the ability to perceive is indeed a necessary condition. It is clear that in a complex *semiotic* process, all three domains are closely intertwined. See sections 3.2 and 3.3. Note how the classification of the normative sciences adheres to the phenomenological categories of Firstness (into which esthetics belongs), Secondness (practics) and Thirdness (logic). See chapter 3.2.1.
In an extended scope, inquiry by a community of inquirers involves instances of action that cause a variety of changes in the actual world. In virtue of the world being shared with other organisms, these changes force their ways into the experience of all organisms sharing the environment, thus demanding a review of experience and modification of future action. The ideal or purpose in question is the very reality of the actual world, or conversely, what appears as the reality is the end result of the inquiry, as the world becomes real for the subject—or subjects—through the conformity of action and experience with the brute forces of the actual world. In Beverley Kent’s words, Peirce “shunned the route of defining the real as the cause of cognition, and instead took the opposite approach: the real is the final result of cognition (see chapter 1.2.3). He argued that the existence of objects is an hypothesis needed to explain the coherence of our experience. It is inferred by hypothetical reasoning; and if it is a hypothesis, then the real must be general.” (Kent 1987, 42.)

Let us return to the subject of mid-normative science. In the *Outline Classification of the Sciences* (CP 1.176–; EP2, 258–262; 1903) Peirce had used the term *ethics*. Pondering upon the name for the science in 1906, in which “the distinctive characters of normative science are most strongly marked”, Peirce ended up with the term *practics* (CP 1.573). He even suggested *antethics*, “that which is put in place of ethics”, since ethics seemed to “be forbidden by the received acceptance of that term” (CP 1.573; EP2, 377; 1906). Peirce, then, criticized the traditional conception of ethics—in respect to conforming to ideals (CP 1.573):

> Ethics is not practics; first, because ethics involves more than the theory of such conformity; namely, it involves the theory of the ideal itself, the nature of the summum bonum; and secondly, because, in so far as ethics studies the conformity of conduct to an ideal, it is limited to a particular ideal, which, whatever the professions of moralists may be, is in fact nothing but a sort of composite photograph of the conscience of the members of the community. In short, it is nothing but a traditional standard, accepted, very wisely, without radical criticism, but with a silly pretence of critical examination.

In other words, in Peirce’s opinion ethics as a science should be concerned simply with how ideals of action in general come about, and not be concerned with what these ideals are, let alone with stating one set of ideals as the norm. However, taken Peirce’s conception of inquiry and conditional idealism, it can be envisioned, that

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48 This enforces the phenomenal aspect of reality, including the social and cultural aspects of the phenomenal world. But if we shall take this as (the only) support for the existence of the actual world, we are in a circular situation. In the final analysis, we must leave the door open for the possibility that the actual world, after all, does not exist. But, as pointed out earlier (chapter 1.2.1), the burden of proof is with the sceptic. For all practical reasons, the evidence supports its existence, on the grounds of the apparent coherence of the experience with the brute force, in most cases. And as the conforming experience accumulates, the sceptic’s task becomes more difficult.
in due course, the ethic inquiry would approach the understanding of what the ethic, or practic ideals are.

Considering Aristotle’s concept of praxis, Peirce’s choice of words is quite suitable. Practics studies conditions in which action adjusts and conforms to ideals; it studies goal-oriented action. Since practics is based on esthetics, the ideals of action are “what is good for men in general”, the success of inquiry permitting. Similarly, Peirce’s conception of esthetics differs from the German traditions of the time, more in the favor of the Aristotelian notion of esthesis. In Peirce’s words (CP 1.574):

> It is true that the Germans, who invented the word [esthetics], and have done the most toward developing the science, limit it to taste, that is, to the action of the Spieltrieb from which deep and earnest emotion would seem to be excluded. But in the writer’s opinion the theory is the same, whether it be a question of forming a taste in bonnets or of a preference between electrocution and decapitation, or between supporting one’s family by agriculture or by highway robbery. The difference of earnestness is of vast practical moment; but it has nothing to do with heuretic science.

Hence, the domain of Peirce’s normative science becomes complete, in consideration of the phenomenal collection of perception, experience, imagination, action, and thought. Whereas logic is the theory of thought, and practics that of action, esthetics is the theory of feeling (CP 1.574). Peirce’s three normative sciences “may be regarded as being the sciences of the conditions of truth and falsity, of wise and foolish conduct, of attractive and repulsive ideas” (CP 5.551).

Peirce’s conception of esthetics, practics, and normative science as a whole, as outlined here, calls for two remarks. First, either the notion of esthetics as the theory of feeling is insufficient, or the notion of practics as the theory of “Useful and Pernicious” action (CP 5.551) ought to be understood very broadly. Since feeling is “nothing but a quality, and a quality is not conscious: it is a mere possibility” (CP 1.310), issues such as perceptual judgments, attribution of sensation to a particular situation etc. are excluded from esthetics. If they are excluded, they must fall either into the domain of practics, which would then contain these issues usually thought of as issues of esthesis, or into the domain of logic, that is, of semiotic.

From Peirce’s writings it remains unclear whether he thought that esthetics should study habits of feeling as far as they contribute to habits of action, or whether that is the domain of practics or of logic. It is difficult (and perhaps unnecessary) to draw an exact line between the branches of normative science. Based on Peirce’s phenomenological categories (chapter 3.2.1), however, it seems that the subject matter of esthetics ought to be only of potential, embryonic character (see for instance CP 1.302). Esthetics should study Firstness, “the Idea of that which is such as it is regardless of anything else” (The Categories Defended, CP 5.66; EP2, 160). Consequently,
practics ought to be understood in a broader sense, inclusive of the remaining perceptual issues, as far as practical exigencies of life are concerned. This is not contrary to Peirce’s thinking, since the self- and hetero-criticisms in the review of deliberate action are based on the habits of feeling.

Since thinking is a special case of action, logic (or semiotic) as the theory of deliberate thinking is an extension and augmentation of practics, the theory of deliberate action. The habits of thinking, when they exist, play a more or less significant role and effect the conforming to the ideals beyond the mere duality of the habits of feeling and habits of action. More or less, the domain of semiotic inserts a wedge between the esthetic and the practic, expanding the operation of mind beyond mere perception and (re)action. In any case, there cannot be a gap between the domains of esthetics and practics.

Second, Peirce connected the conduct of life to practics, and fine arts to esthetics (CP 1.281, 5.125), which is no surprise considering the tradition of æsthetics as a discipline pertaining to fine art. Consequently, if esthetics is, as apparent from above, to be understood in the narrow sense as a “theory of feeling”, as Peirce suggested, some major concepts of theorizing the (fine) arts are largely rendered anew, and theories of fine art would extend their domain beyond esthetics.

It is obvious, that fine arts are not only about feeling in Peirce’s meaning of the word, but involve to a great extent deliberate action (both in terms of Aristotle’s praxis and poiesis, the distinction which Peirce unhappily disregarded), as well as deliberate thinking. Therefore, any theory of fine art ought to rest, not only on esthetics, but also on practics, and semiotics, given Peirce’s conception of normative science. Beyond feeling, which is a topic of esthetics, practics is concerned both with perception and action in arts, while semiotics is concerned particularly with signification in arts, thus combining perception and action. Based on the pragmatist maxim, the meaning of arts is in the habits of action it engenders. This makes it even more obvious that no clear lines of demarcation exist between the branches of Peircean normative science. Fortunately, Peirce’s output on semiotics is abundant, and his thorough theory of semiosis encompasses both esthetic and practic issues.

1.3.3 John Dewey on esthetic and artistic

Beyond his classifications of the sciences, Peirce wrote practically nothing on esthetic, practic, nor on the arts or music. Instead, the pragmatist account on the esthetic and the artistic can be found first and foremost in John Dewey’s *Art as Experience* (Dewey 1980/1934; LW 10). More recently, Richard Shusterman (2000/1992), among others, has elaborated on pragmatist esthetics, and issues of
embodiment (or somaesthetics), for instance. But in order not to detach ourselves too much from the Peircean framework, the neopragmatist endeavors are disregarded here.49

Incorporating John Dewey’s writings into a Peircean framework does not constitute an anachronism or a breach, since Dewey was practically a contemporary of Peirce, and definitely well acquainted with Peirce’s work. Dewey was Peirce’s student at the Johns Hopkins University in the early 1880’s, kept track of Peirce’s thinking during Peirce’s lifetime, and gradually incorporated aspects of Peirce’s work in his own. From this perspective, Dewey’s conceptions of esthetic and artistic have strong connecting points with Peirce’s philosophy (cf. Zeman 1977). Unfortunately, it is impossible here to dig thoroughly into Dewey’s conceptual structures and to analyze exhaustively the differences in the two pragmatists’ thoughts. The main focus is on Dewey’s conceptions of esthetic and artistic.50

The account of naturalism presented earlier fits well in Dewey’s naturalism, which he actually stated clearer than Peirce, and in a vocabulary that is materialist without flinching (Art as Experience, LW 10:34–35, see also, e.g., LW 14:15):

The fact that civilization endures and culture continues—and sometimes advances—is evidence that human hopes and purposes find a basis and support in nature. As the developing growth of an individual from embryo to maturity is the result of interaction of organism with surroundings, so culture is the product not of efforts of men put forth in a void or just upon themselves, but of prolonged and cumulative interaction with environment.

Without major disagreements, Dewey underwrote the Peircean ideas of pragmatic doctrine (see, for instance, The Pragmatism of Peirce; MW 10: 71–78). The same holds for Peirce’s concept of inquiry, although Dewey defined inquiry, not in terms of doubt and belief, but in terms of indeterminacy and determinacy (Logic: The Theory of Inquiry; LW 12:108):51


50  This is not to say that the neopragmatists, such as Richard Shusterman, have ignored the roots of pragmatism. For Dewey’s article on Peirce’s pragmatism, see Dewey 1916; MW 10:71–78.

51  The insubstantial disagreements or misunderstandings between Peirce and Dewey (see e.g. CP 8.205–213 and 8.239–244) concerned mainly Dewey’s clear emphasis on the biological perspective as opposed to Peirce’s emphasis on logic. On the one hand, Peirce never managed to finish his great philosophical structure, and on the other hand, it took Dewey some time before reaching his comprehensive insight of Peirce’s thinking. Peirce’s famous detachment of pragmaticism from pragmatism (CP 6.414–) was primarily a reaction to William James’s conception of pragmatism differing from Peirce’s notion of it as “strictly a method for determining the meaning of concepts; it is not a theory of their
Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole. Together, the naturalist underpinning, pragmatic conception of meaning, and the process of inquiry comprise the key elements of Dewey’s conception of experience. In Dewey’s conception, too, experience accumulates in the course of interaction (MW 6:448–449):

Experience thus has a conservative, cumulative character, the phase of habit, of formation of the self and all its powers by what it goes through. And since subsequent experience depends in large measure upon the set and bent given the self, upon its past activities, this involves also a certain pre-formation, a limiting, of further experience. But experience has also a prospective, outreaching, projective aspect. The principle of habit does not exhaust experience; it marks only a limit of movement in one direction. Curiosity, variation, invention, discovery, are involved in the active, or “trying on” phase, of experience, just as much as fixation in habitual attitude is in its “undergoing” phase. Which of the two phases, the conservative or progressive, is dominant at a given period of history is a matter not so much of the biological or psychological structure of experience, as of its social standards and aims.

Dewey underlined that, in discussion on experience, the aspects of organism and environment are not independent or isolated (see LW 16:263). In his view, habits (of action) are reciprocal and complementary constituents of both organism and environment in the sense that “natural operations like breathing and digesting, acquired ones like speech and honesty, are functions of the surroundings as truly as of a person. They are things done by the environment by means of organic structures or acquired dispositions” (Human Nature and Conduct; LW 14:15). Experience is “the result, the sign, and the reward of that interaction of organism and environment which, when it is carried to the full, is a transformation of interaction into participation and communication” (LW 10:28).

From the continuous, general stream of experience, Dewey distinguished esthetic experience and ordinary experience. Although making this distinction, Dewey pursued a theory of (fine) art, in which Art is not “upon a remote pedestal” (LW 10:11), but in which art enjoys a living relation to other modes of experience. In Dewey’s words (LW 10:16–17):

truth nor of their relation to existence” (MW 7:327). Dewey found himself between the two friends of his (MW 4:98–115).

Scheffler (1974, 197) summarized these elements as “biological emphasis”, “experiment, as a deliberate alteration of the environment by inquirers” and “the Peircean doctrine of meaning”, but the intent is the same.
The understanding of art and of its role in civilization is not furthered by setting out with eulogies of it nor by occupying ourselves exclusively at the outset with great works of art recognized as such. The comprehension which theory essays will be arrived at by a detour; by going back to experience of the common or mill run of things to discover the esthetic quality such experience possesses. Theory can start with and from acknowledged works of art only when the esthetic is already compartmentalized, or only when works of art are set in a niche apart instead of being celebrations, recognized as such, of the things of ordinary experience. Even a crude experience, if authentically an experience, is more fit to give a clue to the intrinsic nature of esthetic experience than is an object already set apart from any other mode of experience. Following this clue we can discover how the work of art develops and accentuates what is characteristically valuable in things of everyday enjoyment. The art product will then be seen to issue from the latter, when the full meaning of ordinary experience is expressed, as dyes come out of coal tar products when they receive special treatment.

Since experience is “the fulfillment of an organism in its struggles and achievements in a world of things”, it is “art in germ” (LW 10:25). But what makes experience finally esthetic? For Dewey, in order for experience to be esthetic, as opposed to anesthetic, there has to be an experience. Due to the lack of words, Dewey used the indefinite article to denote the distinction possible in some other languages, like the German Erlebnis versus Erfahrung, or the Finnish elämys versus kokemus.

In an experience, there is a flow from something to something, with a satisfactory solution, closeness to a consummation as opposed to cessation, a sense of unity. Also, a vivid consciousness is a feature of an esthetic experience. The formal characteristics of an experience are continuity, cumulation, tension, conservation, anticipation, and fulfillment (LW 10:143, 149). An experience is demarcated from other experiences in the general stream of experience when “the material experienced runs its course to fulfillment” (LW 10:42). An experience does not end when the sound stops, for instance, but “only when the energies active in it have done their proper work” (LW 10:47), and prolongation of the experience is neither possible nor desirable (LW 10:150).

The formal characteristics only describe how an experience ensues. What delivers the contents to the satisfactory solution of the flow, the sense of unity, consummation, or fulfillment is the act of expression, which then may produce an expressive...
object. “There is no expression without excitement, without turmoil,” yet a mere spewing forth or discharge of inner agitation is not an expressive act in the esthetic sense, but self-exposure and dismissal (LW 10:67). Dewey took transformation of a baby’s cry as an example of an intrinsically expressive act, underlining the idea of the pragmatic maxim (LW 10:68):\(^{54}\)

At first a baby weeps, just as it turns its head to follow light; there is an inner urge but nothing to express. As the infant matures, he learns that particular acts effect different consequences, that, for example, he gets attention if he cries, and that smiling induces another definite response from those about him. He thus begins to be aware of the meaning of what he does. As he grasps the meaning of an act at first performed from sheer internal pressure, he becomes capable of acts of true expression. The transformation of sounds, babblings, lalling, and so forth, into language is a perfect illustration of the way in which acts of expression are brought into existence and also of the difference between them and mere acts of discharge.

This is art in its incipient stage. The act of expression may now be administered in reference to its consequences; it is performed purposefully, with intent. There is an audience to the act of expression; there is an imagined future state of affairs, which the actor of the expression fancies. The channel of outburst is transformed into a communicating medium. The materials of the expression are transformed, shaped into forms suitable for the purpose. The materials of the expression are the means for reaching the end of the activity, the imagined future state of affairs. There has been a transformation of action, without an end-in-view, into action, with an end-in-view. (LW 10:68–69; see LW 13:222).

According to Dewey, every deed of art is marked by this kind of transformation of natural, spontaneous, unintended activity to “a means to a consciously entertained consequence” (LW 10:68). However, there may or may not be “a split between what is overtly done and what is intended” (LW 10:69). The activity may be insincere, “a simulation of an act that intrinsically has another effect”; there may be an ulterior motive, an intent to gain favor (idem). In that case, the person or persons acted upon (the audience, for instance, or any recipient), and their consequent actions

\(^{54}\) Note how this corresponds to Wittgenstein's notion of language game. Despite the famed originality of Wittgenstein's thinking, he must have been at least familiar with pragmatism, as suggested at least by Jaime Nubiola (1997) and Albert Atkin (2006). It is also noteworthy that Wittgenstein's notion of 'language game' was introduced in his late work after 1929, after his contacts with Frank Plumpton Ramsey, who in 1927 wrote “Facts and Propositions” introducing quite a Peircean idea of pragmatism. “I must emphasise my indebtedness to Mr Wittgenstein, from whom my view of logic is derived. Everything that I have said is due to him, except the parts which have a pragmatist tendency, which seem to me to be needed in order to fill up a gap in his system," wrote Ramsey (1990/1927, 51). Dewey's *Democracy in Education*, in which Dewey extended his hat example of learning of meaning by using into language as well, was published already in 1916 (MW 9:19). See Määttänen 2005.
are a means for something. In art, the activity is sincere, “not subordinated to any external end” (EW 2:271), the act of expression produces an experience, nothing less, nothing more. On the one hand, in art, the act of expression manages to transform the materials of expression into forms suitable for producing an experience. On the other hand, the act of expression in art does not go beyond producing an experience in the sense that the act of expression does not have an ulterior motive of serving an end other than producing the experience. Or as Dewey put it: art constitutes an experience (LW 10:91). In this sense, artistic acts of expression are performed, and works of art are “made manifest for their own sake” (LW 10:63).

There is a seeming danger of confusion or contradiction here. If an artistic act of expression produces an experience, which is an end, as opposed to a means to something, the activity has ceased, and the experience would be valuable for its own sake. According to Dewey, the meaning of a hat is the use of it, and similarly the meaning of art would be the use of it. Hence it may seem that art has no meaning, since the experience produced is the end of the act of expression. But it is important to note that the production of an experience is the end or purpose of the act of expression from the perspective of the one performing the act, while from the perspective of the audience, recipient, or perceiver, an experience makes “human intercourse more rich and gracious – just as a painter converts pigment into means of expressing an imaginative experience” (LW 10:69). Hence, for the perceiver, the meaning of an experience is the use of it, and the significance of art is determined by the experiences and uses of it. 55

Let us conclude this condensation of Dewey’s theory of art with five remarks. First, Dewey emphasizes the concepts of esthetic and artistic, but his conception of esthetic is extended from the original Greek esthesis, and even from Peirce’s esthetics. The artistic, and art in particular, has a clear association to the Aristotelian techne, but it also expands to include what Peirce considered as the field of practics and Aristotle as praxis. Dewey’s use is sometimes confusing, since, according to Dewey (LW 10:53),

We have no word in the English language that unambiguously includes what is signified by the two words “artistic” and “esthetic.” Since “artistic” refers primarily to the act of production and “esthetic” to that of perception and enjoyment, the absence of a term designating the two processes taken together is unfortunate. Sometimes, the effect is to separate the two from each other, to regard art as something superimposed upon esthetic material, or, upon the other side, to an assumption that, since art is a process of creation, perception and enjoyment of

55 In other words, art is not simply imitation of nature, as in the Ancient doctrine of mimesis, if strictly understood, but rather “nature transformed by entering into new relationships where it evokes a new emotional response” (LW 10:86).
Peircean naturalist pragmatism

it have nothing in common with the creative act. In any case, there is a certain
verbal awkwardness in that we are compelled sometimes to use the term “esthetic”
to cover the entire field and sometimes to limit it to the receiving perceptual
aspect of the whole operation.

Besides perception and enjoyment, Dewey’s ‘esthetic’ refers to “experience as
appreciative, perceiving, and enjoying. It denotes the consumer’s rather than the
producer’s standpoint” (LW 10:53–54). Although Dewey’s ‘esthetic’ tends, some-
times, “to cover the entire field”, ‘artistic’, too, is not without its perceptual elements
(LW 10:55):

The doing or making is artistic when the perceived result is of such a nature
that its qualities as perceived have controlled the question of production. The
act of producing that is directed by intent to produce something that is enjoyed
in the immediate experience of perceiving has qualities that a spontaneous or
uncontrolled activity does not have. The artist embodies in himself the attitude
of the perceiver while he works.

This takes us to the second remark. Because the artist also perceives while he or
she works, the working process of the artist (the musical composition process, for
instance) always includes the process of reception, as well. Even if nobody else
hears, the composer is her own audience. Dewey referred to this experience as
the artistic-esthetic experience (LW 10:56). In an artist’s work, then, there are two
operations of transformation performed, one on the physical materials that (pos-
sibly) comprise the work of art, and in addition to that (LW 10:81),

a similar transformation takes place on the side of ‘inner’ materials, images,
observations, memories and emotions. They are also progressively re-formed;
they, too, must be administered. This modification is the building up of a truly
expressive act. The impulsion that seethes as a commotion demanding utterance
must undergo as much and as careful management in order to receive eloquent
manifestation as marble or pigment, as colors and sounds.

In fact, Dewey continued, there are not two separate operations, but “[t]he work is
artistic in the degree in which the two functions of transformation are effected by
a single operation” (LW 10:81).

Third, Dewey did not violently segregate fine art from useful art. In his 1887
Psychology, he wrote (EW 2:271–272):

There is no separation of use and beauty, of useful and fine art, but there is a
distinction. Both kinds of art are ways of expressing an idea and thus have a
common principle. But in the merely useful this process of expression is simply
a means to some product beyond. It has no free value, but only as leading up to
the article produced. There is a divorce of the process from its product.
In *Art as Experience* (first published in 1934), Dewey suggested that the “customary distinction [between fine art and useful or technological art] is based simply on acceptance of certain existing social conditions” (LW 10:33) and “the history of that industrial development through which so much of production has become a form of postponed living and so much of consumption a superimposed enjoyment of the fruits of the labor of other” (LW 10:34). Dewey was advancing the idea, that it is necessary to distinguish between useful and fine art only based on the “completeness of living in the experience of making and of perceiving” of art, and based on the ultimate degree of usefulness, “that of contributing directly and liberally to an expanding and enriched life” (LW 10:33–34), of being “fully alive” (LW 10:24). This makes esthetic experience a very subjective matter. However, the subject or individual is socially aware, even socially conditioned, being a member of a community of inquirers (LW 12:26–27, see also MW 5:389, 14:217).

Fourth, there is always a possibility that the end-in-view in the act of expression is different from the actual end or outcome of the action (LW 13.216). This opens the way for misunderstanding and even accidental production of an experience. In other words, something may be experienced as esthetic regardless of whether it was intended to produce an esthetic experience or not. By the same token, there is the possibility that only the artist herself experiences the act of expression as intended. This highlights the semiotic character of the esthetic experience.

The last remarks concern issues to be omitted here. Due to the scope of the book and the purpose of citing Dewey, interesting questions of ethics are not discussed here, just as they were not discussed in conjunction with Peirce. The ethical questions relating to esthetics include, for instance, the estheticity of experiences that have esthetic qualities but are, by and large, undesirable and “harmful to the world” (LW 10:46). Also, Dewey’s conception of semiotic is omitted here, but not because it would be irrelevant. Dewey defended in his writings, and, in his later years, also seems to have otherwise followed Peirce’s conception of semiotic to the degree that synopsizing him in this respect seems unnecessary here (see *A Confused ‘Semiotic’*, a review of *Signs, Language, and Behavior* by Charles Morris in LW 16:210–241).

In addition, the notion of beauty (and goodness, and truth) is passed over here, since, according to Dewey, beauty “is simply a short term for certain valued qualities” (LW 10:255–256), and despite being the traditional topic of æsthetics, is quite irrelevant here (cf. LW 10:203). Still another subtopic absent here is the work of art, or the art object, regardless of it being an important concept in Dewey’s theory of art (cf. section 5.2). The work of art, particularly the musical work, is contrasted with the processive nature of music in part two.
1.3.4  A synthetic view of esthetic and practic

Although on many fundamental questions Dewey and Peirce agreed, there are also issues to reconcile. In certain respects, Aristotle appears useful in this operation. Based on the preceding chapters, this subchapter attempts a reconciliation and sketches an outline of a pragmatist conception of esthetic and practic, and to a degree, of semiotic as well. Note that this treatment is used only as a conceptual tool, for the benefit of referring to different aspects of esthetic, practic and semiotic later. Let us proceed step by step, in twelve steps.

Step 1: Compatibilities.

To begin, although the wordings may differ, the topics largely agreed on by Peirce and Dewey include the following:

1. the overall pragmatist disposition;
2. the concept of inquiry, and the notion that subject’s being in the world is interaction with the environment;
3. the idea that experience accumulates in interaction;
4. the view that past experience is used for the benefits of adjustment with the surroundings and anticipation of future in the process of inquiry; and
5. the conception that in art something imaginative, fictive, or virtual is presented in order to be experienced, or as Peirce (sic!) put it in CP 1.383: “The artist introduces a fiction; but it is not an arbitrary one; it exhibits affinities to which the mind accords a certain approval in pronouncing them beautiful, which if it is not exactly the same as saying that the synthesis is true, is something of the same general kind.”

Dewey made a definitive separation from idealism and clearly emphasized the biological basis, or “the organic substratum” (LW 10:31) of human experience. This was not foreign to Peirce either, considering the role of the actual world in his concept of inquiry, although his thought was still fed by idealism, conditions of Newtonian mechanics, and his religious-metaphysical aspirations.

Step 2: Incompatibilities.

The incompatibilities between Peirce and Dewey are apparent in the issues of esthetic, practic, and artistic. This will also bring up the question of the role of semiotics, to which Dewey did not pay too much attention. Reversely, Peirce’s small output concerning the arts emphasizes Dewey’s pragmatist theory of art. While being a crude simplification, figure 3a may be helpful in illuminating the issue.
It may seem that comparing the domain of Peirce’s normative science with that of Dewey’s theory of art is a category mistake. But this is not the case. While Peirce’s branches of normative science deal with experiencing within and without art, Dewey’s theory of art represents a special case of experiencing, a special case which consists in all three aspects of perception, action, as well as thinking, but which is separated from the general stream of experience by the criteria of an experience. Dewey’s esthetic experience, “absorbs into itself memories of the past and anticipations of the future”, and the being is “wholly united with his environment and therefore fully alive” (LW 10:24). In the artistic act of expression the materials are transformed into forms suitable for the intended purpose, both for the audience, and for the imagined state of affairs. The materials of the expression are the means for reaching the end of the activity, the imagined future state of affairs. There has been a transformation of action without an end-in-view into action with an end-in-view.

Figure 3a. A simplified and cursory graph of the domains of Peirce’s normative science and of Dewey’s esthetic theory of art. According to Peirce, logic or semiotic is the theory of thought, practics that of action, and esthetics the theory of feeling. Dewey described the artistic process by means of artistic act of expression, on the one hand, and by means of esthetic experience, on the other. Esthetic experience and artistic acts are distinguished from the general stream of experience by the criteria of an experience. The arrow in the background illustrates the direction of determination, causation, or temporal evolvement. This illustration depicts the starting point for the reconciliation of the conceptions of esthetic, practic and artistic.

Although Dewey’s theory emphasizes perception and action, thinking is, by far, not excluded from an experience, since “[t]he word ‘esthetic’... is Gusto, taste” (LW 10:53), and “[e]xpertness of taste is at once the result and the reward of constant exercise of thinking” (LW 4:112). On the other hand, (LW 4:134) knowing is itself a kind of action, the only one which progressively and securely clothes natural existence with realized meanings. For the outcome of experienced objects which are begot by operations which define thinking, take into themselves, as part of their own funded and incorporated meaning, the relation to other things disclosed by thinking.
In other words, Dewey’s concept of experience, and thereby esthetic experience, too, consists in the intertwining aspects of perception, action, and thinking. To reiterate, for Peirce, esthetics is the theory of feeling (which is perception in its infancy), practics the theory of action, and semiotics the theory of thinking.

Reciprocally, Peirce defined experience as “forcible modification of our ways of thinking, the influence of the world of fact” (The Basis of Pragmaticism in Phaneroscopy; CP 1.321), a definition which already includes the esthetic, practic, and semiotic, in the sense of Peirce’s normative science.

Dewey’s double use of ‘esthetic’, as pertaining sometimes only to esthetic experience and sometimes inclusive of the artistic or productive, is perplexing but understandable, considering the tradition of aesthetics, and the need to analyze also the production of work of art. Furthermore, there is probably no need, or even possibility for hard divisions between experiencing and producing, or between artistic and non-artistic. Nevertheless, conceptually, perception may be delineated from action, and artistic may be separated from esthetic, and from non-artistic. And here, at the construction site of a theory of the musical composition process, it is useful to do so, for the sake of distinguishing between artistic action and action at large, and between artistic perception and perception in general.

Step 3: Esthetic and practic.
Let us use the Peircean flavor of the Aristotelian notion of esthesis as strictly perceptual, only relating to Peirce’s concept of feeling, sensation without the attribution of it to anything, perception in its infancy without recognition or analysis. This intensively narrows down what the process of esthesis is. In modern terms, it also presents an atypically limited view of the domain of esthetics, yet broadens it to cover all incipient perception, not only that pertaining to the arts. However, this conception is in concord with the Peircean framework presented earlier, as well as with Peirce’s phaneroscopic categories and his theory of Sign, from which the semiotic theory of composition process is later derived. As the esthetic is trimmed anew, more attention is paid to the aspects of practic and semiotic, which seems appropriate.

This, however, demands slight elaboration of Peirce’s somewhat incomplete formulation of normative science. If esthetics were the theory of habits of feeling, and nothing beyond that, then the remaining issues of perception would seem to fall, first and foremost, into practics, the theory of action, as noted earlier. This would lead to a situation in which the role of thinking is unsettled. Either the habits of thinking would not be logically connected with those of feeling and action, or else they would not exist at all. In the former case, the habits of thinking would not be
a matter of the natural world, but rather, some transcendental operations detached from the practical exigencies of life. Obviously, this does not fit the naturalist framework applied here. In the latter case, experiencing would only be a matter of feeling (or sensing) and acting (or reacting). Action would be solely based on sensation, and each instance of action would be determined by an instance of feeling. To put it in terms of system science, the input to the system would be mapped to the output system in a straightforward manner. This is the case in simple reflexes, or in organisms without mind (in the sense depicted earlier), that is, in biological (or cybernetic) organisms without any ability to guide their operation and interaction with the environment, without ability for semiosis, what ever that term might entail.\footnote{The straightforward mapping of the input to the output corresponds to the s-model introduced by Määttänen (1993a) and to the notion of “direct coupling” between perception and action in Gärdenfors (2000) See chapter 3.1.2. This is the sort of determinism, for which naturalist approaches have sometimes been criticized. The criticism may be justified if and only if the habits of thinking were omitted in the naturalist theory, in favor of the habits of feeling and habits of action alone. This alternative is not pursued here.}

**Step 4: The semiotic wedge.**

It can be suggested that as soon as the ability to represent emerges, there emerges a semiotic rupture, so to say, between the esthetic (in Peirce’s strict perceptual meaning of the word) and the practic—a rupture which is fixed by the semiotic, the Sign. This evidently takes place due to the biological organism’s needs to adapt to the environment. The relationships (or the mappings) between feeling and action become more and more complex, and the instances of action are no longer determined by the instances of feeling alone.\footnote{This corresponds to the transition from s-model to p-model in Määttänen 1993. In real life, no hard boundaries exist between esthetic and semiotic, or between semiotic and practic. The distinction made is only conceptual and terminological.}

The sign combines the object of perception to its interpretant, the habits of perception to the habits of action. Thinking, in this perspective, is an extension of action, and of perception. “All genuine thoughts ... anticipate and endeavor to regulate some future experience, i.e. they are plans of action”, as Dewey put it (*How We Think, MW* 6:395) The habits of thinking contribute to conforming to ideals (as described in chapter 1.3.2) and overcome the mere determinist duality of habits of feeling and habits of action. Consequently, the theories of action and perception become a theory of thinking, a semiotic theory, in which esthetic and practic theories are contributing ingredients. Indeed, in this development, the domain of semiotic inserts a *wedge* between the esthetic and practic, giving birth to the operation of
mind, beyond mere perception and (re)action. The illustration of Peirce’s normative science in figure 3a may now be reformulated as figure 3b.58

Figure 3b. The domains of Peirce’s normative science, as the role of the semiotic is exposed and empowered when a rupture emerges between the reflexive or non-mental connections linking the esthetic and the practic. The semiotic connects the esthetic to practic; habits of thinking connect habits of feeling with habits of action; or in semiotic vocabulary: the sign welds the object of sign to its interpretant.

Step 5: Making and doing as kinds of action.

But this is not enough. For one, Peirce altogether neglected the concepts of art and artistic, and the concept of music by the same token, rare examples notwithstanding. In his writings, the perceptual ability of artists is commended, but in some other occasions artists are portrayed even with pejorative connotations (CP 1.18, 1.48, 5.112 for instance). At the same time, Peirce also neglected the distinction between making and doing, let alone between technique and expression. Happily, Dewey’s concept of an experience as an artistic experience becomes handy in this respect. Let us next deal with making and doing on a general level, and return to the special case of artistic action and perception shortly.

In his educational philosophy and in *The Quest for Certainty*, Dewey frequently referred to making and doing. Clearly the background for that pair of concepts is in Aristotle (see, for instance MW 2.258–259 and LW 11.404–405). Dewey’s distinction between making and doing followed the Aristotelian concepts of praxis and poiesis (see e.g. *The Quest for Certainty*, LW 4:4–20).

In chapter 1.3.1, the activities corresponding to the Aristotelian intellectual virtues were condensed into the three main types of theoria, praxis and poiesis.

58 With the unraveling of the determinist duality of the habits of feeling and habits of action due to the semiotic wedge emerges the issue of whether the “internal representation” is accurate or not, right or wrong, correct or incorrect. To put it in Umberto Eco’s fashion (1979/1976, 7): the semiotic begins when the sign is able to lie. Overcoming determinism, or causality, is the beginning of the semiotic.
Although the Stagyrite considered theoria an activity of the highest kind, Dewey criticized Aristotle’s hierarchical valuation of the speculative virtues of intellect as higher than the practical virtues of intellect. According to Dewey, “[t]heory separated from concrete doing and making is empty and futile” (LW 4:100), as is befitting, considering the pragmatic maxim. It ought to be recalled, however, that the pragmatic maxim does not call for instant gratification, but considers practical bearings within a potentially infinite temporal continuum.

Since theoria as an activity does not involve actual objects (other than the mechanism embodying the activity, such as the nervous system in connection to sensory and motor systems), from the perspective of naturalist pragmatism, only two kinds of action need to be considered as far as interaction with the actual world is concerned. Note that this view does by no means renders theoria an unnecessary activity, nor does it void sophia as an intellectual virtue; quite the opposite. The distinction is made between action and activity: doing and making as two kinds of action manipulate actual objects, and as soon as theoria is somehow manifested, which can only take place through praxis or poiesis, the manipulation of actual objects also takes place, but only in virtue of praxis or poiesis. Hence, from the naturalist viewpoint, the activity of theoria can be excluded as a kind of action. See figure 3c.  

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Figure 3c. The domains of normative science: On the left, the Deweyan division of the practic into doing and making exposed. On the right, the same with the application of Aristotelian terminology, and with the activity of theoria still shown, in addition to the two kinds of action. From the viewpoint of naturalist pragmatism, praxis and poiesis constitute the kinds of action, since the activity of theoria becomes manifested only through the action of praxis and poiesis as text or formulae jotted on paper, speech uttered, or the like.

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More precisely, theoria can be thought of as a special case of praxis in the sense that a) the target of the action “with regard to human good” (NE 1140b) are the habits of thinking of the subject herself; and b) therefore it does not involve manipulation of actual objects as praxis or poiesis. If it does, it is praxis.
Step 6: Semiosis and the three kinds of knowledge.

Next, let us incorporate the Aristotelian intellectual virtues underlying the activities of theoria, praxis and poiesis, and contemplate what ramifications that incorporation has on semiotics. The right side of figure 3d illustrates the conceptions of esthetic, practic, and semiotic synthesized from Aristotle, Peirce, and Dewey, as seen in figure 3c. The esthetic consists in initial, conceptually unreachable sensory perception without perceptual judgments or attributions of the sensations, or feelings, to objects. The practic consists in two kinds of action: praxis (itself) and poiesis (subordinated to praxis), which are distinguished from each other by means of their objectives and scope of operation. The semiotic consists in the three kinds of knowledge: sophia, phronesis, and techne, which underlie the activities of theoria, praxis, and poiesis, respectively.

![Figure 3d. The incorporation of the Aristotelian intellectual virtues into figure 3c yields a synthesis of the conceptions of esthetic, practic, and semiotic, based on Aristotle, Peirce, and Dewey. On the left, the previous step from the right hand side of figure 3c (with theoria now omitted); on the right, the final synthetic view.](image)

Here, the speculative virtues of intellect are shown as combined so that sophia consists in episteme and nous, making the total of intellectual virtues or kinds of knowledge three: sophia, phronesis, and techne. Theoria, the activity corresponding to sophia consists in apodeixis and the active nous, but is omitted in the graph of the synthetic view, since, as mentioned, theoria constitutes only activity. It is a special case of activity in the sense that, being contemplative, pure thought, it does not involve making or doing as such. It does not involve objects of the actual world (other than the apparatus of thinking itself). From the standpoint of the actual world, the only activities, the practical bearings of which can be potentially experienced by the community of inquirers, are praxis and poiesis. Hence phronesis and techne as the practical virtues of intellect. The two kinds of action are mandated by the framework of naturalist pragmatism: poiesis is action affecting the state of
the objects of the actual world, while praxis is action affecting states of the phe-
nomenal worlds of other semiotic organisms, which subsequently are also poten-
tially capable of sharing their (possibly altered) states. This sharing of phenomenal 
worlds necessarily involves actual objects, since only those can actually be shared. 
Therefore, praxis as action necessarily involves poiesis.  

Also esthesis—the veridical sensory aspect of perception—is marked in figure 3d. 
Note that esthesis does not by far constitute all aspects of perception. For instance, 
phronesis is considered perception, too, since perception is essentially apprehen-
sion of individual facts, and phronesis “of the direct, unreasoned type is a kind of 
perception” (Ross 1995/1923, 225). 

Hence, there are three kinds of knowledge involved in the semiotic, two kinds of 
action in the practic, and only one kind of esthetic. This is in concord with Peirce’s 
phaneroscopic categories. The practic relies on the esthetic, and the semiotic both 
on the practic, and on esthetic. Thereby, the semiotic logically connects the esthetic 
with the practic. In other words, the semiotic process connects esthesis of actual 
objects with praxis and poiesis on actual objects.  

What has remained untouched, is that in terms of Peirce’s division of the norma-
tive science, esthetics is the theory of habits of feeling, practics is the theory of habits 
of action, and semiotic (or logic) the theory of habits of thinking. This synthetic 
view with its conceptual divisions and subdivisions serves as basis for assessment 
of past theories, and projection of requirements of a new, semiocognitive theory of 
musical composition process in part two. But before that, some remarks remain to 
be made, concerning imagination, the artistic, and communication in the arts. 

Step 7: Remarks on imagination and phantasia. 

Let us back up a little, and contemplate the role of imagination. An organism is 
engaged in interaction with the actual objects of its environment. Interaction takes 
place by means of perception and action. (Chapter 1.2.1.) Experience is the total 
accumulation of perception. Experience and perception are regarded as the accu-
mulative and particular aspects of the semiotic process from esthetic to the point 
of action, and the means of interaction of the organism with the environment. 
(Chapter 1.2.3.) Esthesis provides the basis for representation of actual objects in 
phronesis and techne, which determine praxis and poiesis; these last, in turn, pro-

60 This corresponds to the dual character of communication: on the one hand, the actual objects 
are made common (poiesis), and on the other hand, through these objects, something is delivered to 
other subjects (praxis). See chapter 1.2.6. 

61 In terms of Peirce’s categories, esthesis is a First of Firstness, poiesis a First of Secondness, praxis 
a Second of Secondness. Techne is a First of Thirdness, phronesis a Second of Thirdness, and finally, 
sophia a Third of Thirdness. See chapter 3.2.1.
vide the active aspect of perception, the action directed by the hypothesizing about the operations of the actual world, which beliefs are then verified or discarded based on accumulating experience.

As opposed to phronesis and techne being types of knowledge of the contingent (the contingent being the actual world), sophia is knowledge of the necessary, and not similarly connected to the practical exigencies of life or hard facts of the actual world. According to Ross (1995/1923, 223), while the subjects of sophia include “heavenly bodies”, it also “probably includes all the three divisions of ‘wisdom’ recognised in the Metaphysics—metaphysics, mathematics, natural science.” It is wisdom regarding ulterior and fundamental problems, and it appears to be all of the organism’s knowledge of the non-contingent.

Regarding the role of imagination (or phantasia, in Aristotle’s terms), let us recall that imagination was earlier described as the competence of estimating hypothetical future situations (chapter 1.2.6). Peirce described imagination as “an affection of consciousness which can be directly compared with a percept in some special feature, and be pronounced to accord or disaccord with it” (CP 2.148). Aristotle’s concept of phantasia is complex. Ross’s summary of it (1995/1923, 148–149) was already introduced in chapter 1.3.1. According to Modrak (1987, 81), “[p]hantasia is invoked in explanations of sensory illusion, memory, dreaming, action and even discursive reasoning. The cognitions grouped together under phantasia are all functions of the perceptual system.” A phantasma has sensible features, but “fails to correspond precisely to any object actually in subject’s perceptual field” (ibid., 82).

Modrak suggested that phantasia occurs “under conditions that are not conducive to veridical perception” (ibid., 82), which would rule it out of esthesis. This distinction may be put to question, however, on the basis that the subject may or may not know whether perception is veridical or not. More accurately, it may be argued that, since esthesis never creates a perfect representation, some extrapolation or hypothesizing always occurs, even in esthesis. Support for this may be found in Modrak’s conclusion, that “[p]hantasia requires the physical substratum of the perceptual system as a whole” (ibid., 115).

What is common in these three characterizations above, is that imagination is regarded as accounting for generalizing, extrapolating and hypothesizing possible states of affairs, events and situations, which serve the subject or organism by enhancing conformation to ideals, or adaptation into environment. The question may be raised whether, without imagination, there may be knowledge of the necessary (or possible) versus knowledge of the contingent, since only contingency may be what determines knowledge of the necessary drawn from all the innumerable, possible alternatives. At least, this is the case in the framework of naturalist pragmatism.
Also, the three characterizations do not place imagination into any particular kind of activity or any phase in the semiotic process. Rather, imagination appears to be an omnipresent ability throughout semiosis, in that respect. In each stage of the semiotic process, representation may be enhanced by imagination, the projective and anticipating beliefs in representation, more or less, depending on how useful the extrapolation or hypothesizing is, in consideration of the practical bearings.

In brief, then, it seems that imagination is the ability to extend the phenomenal world by expanding, extrapolating, estimating and hypothesizing possible situations of the actual world for the sake of adaptation, enhanced interaction with the environment, and successful action in future situations. It appears that, without imagination, the transition from a reflexive organism, with only a poietic type of knowledge, into a sophisticated semiotic subject is impossible.

**Step 8: Remarks on arts, artistic, and experience.**

This brings us to the question of art, the arts, and the artistic. Dewey’s notion of experience describes and thereby sets criteria for the artistic. In order to avoid confusion, the double use of ‘esthetic’ is avoided here by resorting to the distinct notions of artistic action and artistic perception. Unfortunately Dewey’s notion of an experience and the vocabulary chosen here are, terminologically, slightly inconsistent. ‘An experience’ and ‘artistic perception’ are considered synonymous here, for the benefit of clarity. Should the expression ‘artistic experience’ be needed, it would here refer only to the accumulation of the artistic perception in experience, and would thus include both experiences of artistic reception and artistic production, or artistic act of expression, in Dewey’s terms. However, it seems questionable how artistic experience in that sense could be distinguished from experience at large.

For now, it suffices to say that ‘artistic’ refers to experiencing which fulfills the conditions of Dewey’s description of an experience: an experienced flow from something to something, with a satisfactory solution, a sense of unity, a vivid consciousness, all in virtue of an act of expression which is perceived as somehow meaningful, not as a means for an ulterior end but as making the “human intercourse more rich and gracious” (LW 10:69; chapter 1.3.3).

Consequently, artistic action is action which produces an experience. To be successful in that endeavor, it involves phronesis to guide the activity of praxis, and techne which guides poiesis as subordinated to praxis. Clearly, all accumulated experience may have an effect on a subject’s artistic action. The act of expression is determined by the habits of feeling, habits of thinking, and habits of action, which are reciprocally and constantly updated in the course of interaction.
Artistic perception, in turn, is perception in which one reaches an experience, and concurrent accumulation of it in experience. It involves esthesis, as well as the updating and reevaluation of habits of feeling, habits of thinking, and habits of action. The meaning of an experience is the use of it, the conceivable practical bearings of the experience, as the pragmatic maxim suggests. Perceiving an experience yields more or less changes in habits of thinking and habits of action.

Hence, in a typical case of reception of art, the subject feels (in esthesis), perceives and experiences (in semiosis) an experience, which yields to some kind of revision of habits of feeling (esthesis), habits of thinking (semiosis) and, eventually, habits of action (praxis). In other words, it is not only typical, but follows by definition, that art has meaning by changing the recipient’s habits of feeling, thinking and acting. In most cases, the revision of habits pertains to regular everyday life, but as a special case of the revision of habits, artistic action may take place. In this sense, art resembles play, and the current theory of art can be described as a play theory of art.

In artistic action, the subject takes on a dual role of both acting and perceiving. In artistic action, the end-in-view is the producing of an experience, and the activity is guided by habits of feeling, habits of thinking, and, last but not least, habits of action. These are constantly revised, on the grounds that the artist is always her own audience. Note that not all artistic action becomes manifested in terms of manipulation of actual objects, but may remain in the phenomenal realm of the subject, that is, as speculative or imaginative. However, it may be argued that the elements, characteristics or patterns of such action must at least once become actually manifested and perceived before they can be manipulated strictly phenomenally.

Step 9: Interplay of art and non-art.

As artistic perception is a special case of perception at large, and artistic action a special case of action; the four constitute an interplay in which the arts and the artistic subject are regarded as being in close contact with everyday life.

Art life may begin, and sometimes has begun, to live a life of its own, irrespective of usual life. However, the pragmatist conception of art emphasizes that the meaning of usual arts is in the applicability, in the conceivable practical bearings, and the use of it.

While possibly pedestrian and at the same time possibly leading to a conceptual quagmire, figure 4 (inspired by Greimas’s semiotic square) makes an attempt to illustrate this straightforward interplay in which both artists and non-artists are engaged. It ought also to be noted that the artistic and the non-artistic tend to be so tightly intertwined that the actual separation of the two seems difficult if not impossible.

Hence the conception of *ars gratia artis* seems simply incomprehensible, or merely a chance occurrence in the pragmatist framework.
possible. The numbered arrows portray how different kinds of action or perception may induce different kinds of perception or action, respectively. Let us begin by listing how action yields perception by means of manipulating objects for perception.

Artistic action is either successful in producing artistic perception (arrow 1 in figure 4), or fails to do so (arrow 2), in which case the effort of the artist is vain, the object manipulated is just another object of everyday life, and the artistic end-in-view is lost. The artist either succeeds or fails in her attempts to create artistic experience.

A new composition is either understood (and experienced as artistic) or not understood. However, one way or another, artistic action is always more or less successful, as long as the artist is honest in her studio work of manipulating the material so that artistic experience really takes place in her perception. In other words, there is always an understanding, perceiving audience for the artist. If nobody else, at least the artist herself is her own audience.

Yet, artistic perception may take place even if the action is not intended to be artistic (arrow 3). In other words, ramifications of regular everyday action may be perceived as an experience—incidentally. For instance, a cast-iron staircase may be regarded as art regardless of the original intents of its maker (who perchance could not care less how the cast-iron work is perceived as long as it provides safety). In that case, manipulated objects intended for something else end up being artistic. Hence, bird song, for instance, might be considered art, if it yields an experience. The fourth case is the non-artistic case of everyday life (arrow 4): non-artistic action yields non-artistic perception, as an “ordinary” part of life in an everyday world.63

Figure 4. Mutual interplay of artistic action, artistic perception, non-artistic perception, and non-artistic action. The numbering of arrows refers to the text.

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63 However, John Dewey, for one, emphasized that it is the act of expression that produces a work of art. The dilemma of accidental versus intentional esthetic experience can be resolved by employing the concept of inquiry. In contrast to practical inquiry, its special case of scientific inquiry provides an enhanced means of inquiry, in virtue of its methods, rigor, and scope. Similarly, the arts are enhanced means of producing artistic experiences.
Peircean naturalist pragmatism

Next, let us do the opposite by listing how perception may yield action (or at least changes in habits of action) in virtue of the semiotic. Artistic action does not appear by chance or as given by some metaphysical entities. Rather, it is a result of both artistic perception (such as perceptions of the various aspects of artistic traditions, techniques, cultures—sources of poiesis, arrow 5) and non-artistic perception (arrow 6), the perception of everyday life, which may serve as sources of praxis for the artist. Here we are dealing with so-called inspiration, expression, or artistic content, whether programmatic or not. Also, the artist may or may not be aware of the inspiration and its source. In other words, the artist does art (and also makes art) based on her perceptions and experiences of everyday life, life in general, and uses the means accumulated in artistic perception to guide the artistic action. Yet, this does not (necessarily) mean that art would be about the artist’s personal life.

Arrow 7 depicts the regular case outside the “art world”, the situation in which non-artistic perception yields non-artistic action. Last but not least (arrow 8), the perennial significance of art as a cultural and social phenomenon lies in the fact that artistic perception leads to more or less extensive changes in habits of action in general, thus making “human intercourse more rich and gracious” (LW 10:69).

All these aspects of interaction take place by means of actual objects, which serve as media of communication, artistic or not. The objects are shared by the utterers and the recipients. In the traditional setup of communication or information theory, the above is usually presented as a linear exchange of information from person to person. Naturally, this is possible. But in terms of music and the arts, a plethora of situations ought to be considered, such as a networked arts community of subjects interacting with each other through their utterances and receptions, or the (theoretical) degenerate case of one single subject uttering and perceiving her own actions, artistic or not. Also, temporality should be taken into account: the same subject may perceive a particular object, situation or event as artistic at one point in time and as non-artistic at another moment. More accurately, in that case one should rather talk about an organism rather than subject, since it is questionable whether the subject remains the same throughout time.

Step 10: A remark on awareness.

The idea of vivid consciousness, in esthetic and other descriptions by Dewey, suggests that an esthetic experience, in his opinion, needs to be an aware experience. This notion, if it stands, has some consequences. Understandably, the awareness of the experience enhances the perception of the circumstances and situations related

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64 It seems that, from the pragmatist viewpoint, here lie the grounds for general music education and general arts education, and for defending the position of arts in our contemporary society.
to the experience, thereby promoting future possibilities for similar experiences, and enriching the understanding of experiencing in broader terms.

But there is a potential downside here, which Dewey himself suggested inadvertently: the idea of awareness in an esthetic experience leads to the idea of art as a conscious idea, as “the greatest intellectual achievement in the history of humanity” (LW 10:31), which in turn has resulted in the conception of “man as the being that uses art” (idem). This, again, may lead to subsequent separation of the human from the natural, and to the problem of compartmentalization, a critique of which is one of the starting points of Dewey’s thought concerning the esthetic. Also, Dewey’s distinction of an experience from the flow of experience, makes it feasible to mark out entities that may normatively or even authoritatively be valued as good or bad, as acceptable or inadmissible.

It seems that we can well do without the further necessary requirement of awareness of artistic perception (or an experience), although the enhancement provided by awareness is not to be denied. Most of the constant flow of experience never reaches the threshold of awareness. However, this kind of experiencing also remains a part of the accumulative experience, and may altogether guide and change the organism’s action (and habits of action) much more than the experience one has been aware of. Unawareness of perception or action, or the inability to attend to or to recall the perception or action, does not mean that action could not be meaningful and aimed at particular ends-in-view, or that the perceived would not affect subject’s habits of thinking or habits of action.

Step 11: A remark on the virtuality of art.

The pragmatist conception of art as presented above joins together Peircean semiotics, Dewey’s conception of artistic experience and the biological substratum (see LW 10:233), as well as the Aristotelian distinctions between the intellectual virtues and their corresponding activities. Based on the above, as an object of scientific study, art seems to belong to the domain of semiotics. Art is a process of perceiving, acting, and thinking, a process of formation of meaning, a type of semiosis. It is also inquiry. It is a process of experiencing by means of interaction with the environment by the organism, or by the subject, for the purpose of adapting and evolving.65

Dewey expressed the crux of the matter in an example of an act of expression, the context of which has already been quoted (LW 10:69):

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65 Note, how the denotations of art and artistic have been separated from its original point of reference, techne. This, however, fits with contemporary usage of the words.
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Acts that were primitively spontaneous are converted into means that make human intercourse more rich and gracious—just as a painter converts pigment into means of expressing an imaginative experience.

An artistic experience is an imaginative experience. Mere mimetic representing is possible in art, should it be perceived as artistic, but the real power of art lies in its ability to become virtual (see chapter 1.2.6). It may be necessary to recall (see chapter 1.2.6) that virtuality here means the possibility to produce experiences which go beyond (or above) the experiences of everyday life, or life without the enhanced imaginative ability that the arts provide: the imaginative ability has virtue by its overcoming of evidence delivered by the hard facts of life and the sensory-based experience thereof. Art provides a domain for imaginative hypothesizing, and amplifies the virtuosity of perceiving. In Dewey’s words (LW 10:91): “The poetic as distinct from the prosaic, esthetic art as distinct from scientific, expression as distinct from statement, does something different from leading to an experience. It constitutes one.” Instead of merely re-presenting the actual reality, art presents virtual realities. (See also CP 1.383.)

Step 12: Values in arts.

The virtual realities presented are different from each other. Evidently, some are good for you, some are not. Good praxis, whether artistic or not, is governed by phronesis, the practical wisdom of good and bad. It, too, is formed in natural and cultural situations. This entails values regarding what is good and/or bad be involved in praxis. In perceiving we are dealing with modification of experience, and in praxis with mind-altering action. How do we find out what is good and what is bad? Phronesis is governed by sophia, knowledge concerning perennial questions, which grows in and from the subject’s phenomenal world and especially from the subject’s fallible imaginative ability to make predictions, to hypothesize in advance what future may unfold, based on experience. And this imaginative ability cannot exist without perception and action, and not without the natural world of actual objects.

Hence, there are in a sense two continua involved: a continuum of values, and a continuum of understanding. Each perception is, in the final analysis, a perception by an individual organism, although more or less fused with and conditioned by one’s membership in one’s communities. Consequently, it is a subjective matter, what is valuable in an experience, and which experiences are valuable. Also, from the perspective of an individual subject, understanding and misunderstanding may be

66 Although surpassing the sensory experience to a certain degree, questions related to transcendence in this sense are still a matter of future work in logic, or semiotics.
equally valuable. An experience may be valuable regardless of how the perceived situation came about, whether intentionally as caused by someone, or incidentally.

But from the perspective of a community, it is always important that the members can communicate or share their experiences as well as possible, i.e. with as little misunderstanding as possible. Understanding by means of modifying and perceiving actual objects (such as sound) is made possible by the fact that the members of the community tend, for all practical reasons, to have similar ways of perceiving, acting, and also thinking (being usually organisms that more or less resemble each other, and residing in like habitats). The more similar the members are, the less danger of misunderstanding there is, and vice versa. Also, for a community, certain kinds of experiences may prove to be more valuable than others, and, for the sake of the community’s well-being, the valuable experiences should be encouraged and cultivated. In other words, the value of an artistic experience is both an individual and a community matter, and the more communitarian it is, the more important avoidance of misunderstanding becomes, while the individuality of experiencing gives leeway to more extensive variance in imagination. Even in the pragmatist perspective, there are bases of value to be found for art education and music education, as well as for the avant-garde and for music critique. However, these issues will not be developed any further in this context.

Conclusion.

Considering the current conception of esthetic, practic, and semiotic, Peirce’s classification of the normative sciences seems quite well placed. In the synthetic view presented, esthetics is still the theory of perception, although essentially that of feeling. Practics is still the study of action, particularly that which is guided by phronesis, that is, praxis. Technē is subordinated to phronesis, just as poiesis is subordinated to praxis. Logic, or semiotic, is indeed the theory of thought, of the representations of the lived world, forum of prediction, make-believe, and imagination. Practics builds on and includes esthetics, and logic builds on and includes practics. Logic and semiotics are synonymous, although the term logic tends to emphasize the conformity of experience with brute force, while the term semiotics tends to emphasize the processive character of the subject’s being in the world, the inquiry based on Signs and their objects, and their interpretations. All three—esthetics, practics, and semiotics—rely on phenomenology, the study of “whatever is present at any time to the mind in any way” (CP 1.186) and serve as a basis for both metaphysics and for special sciences, such as research in the arts and music.

Let me reiterate in Peirce’s words, that while, “[a]ccording to this view, esthetics, practics, and logic form one distinctly marked whole, ... [t]he question where
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precisely the lines of separation between them are to be drawn is quite secondary” (CP 1.574). Conceptually, however, it is useful to distinguish between the three for the benefit of constructing theories of musical semiosis and the musical composition process, since the latter involves aspects of all three. Esthesis is not (only) the process of artistic reception, but the key to revision of action for “shaping and reshaping” (LW 10:56 and MW 6:136). Esthetics is not merely the study of the beautiful, or pleasant, but the study of esthesis as a functional part of the experiencing the organism’s interaction in the natural environment (which, as mentioned, includes the cultural environment). On the topic of musical composition process, practics is not only the study of action of e.g. *musica poética*, but of the unfolding of phronesis, knowledge guiding the practice of musical composition. And finally, semiotics is not only the study of representation and its meaning but also of imagination and its use, of inquiry as the complete semiotic process, the logic of the organism’s conforming to the environment, and how the process of semiotic relies on practic and esthetic

1.4 The place of the current framework in philosophy

The framework of Peircean naturalist pragmatism presented above is a reading of pragmatism, and one with an end-in-view. As mentioned, it is not a hermeneutic undertaking of truly understanding what Peirce or Dewey intended. Nor is it the task here to engage in argumentation for or against this framework, but rather to take it as it has been perceived and synthesized, in order to pursue the objective of constructing an abductive theory of the musical composition process. For the benefit of further orientation to and about naturalist pragmatism, this chapter briefly relates the current framework with a small number of other ideas or trends in philosophy and science.

The current framework, presented above, is a version of naturalist pragmatism—a variety of pragmatism, which maintains that cultural evolution is a result and part of biological evolution. Naturalist pragmatism emphasizes the biological origin of humans and of human culture; it is a naturalized epistemology of phenomenology and semiosis, which emphasizes that, in the final analysis, all questions are empirical. Again, in Peirce’s terms: “every truth must come to us by the way of experience” (CP 1.417).

Peircean naturalist pragmatism is supported by a great deal of recent and, to some degree, by earlier research in cognitive sciences, among others. For instance, Jean Piaget’s widened conception of experience is very similar to Peirce’s, and the importance of action in addition to sense perception is crucial in his concept of
sensorimotor intelligence, even if he used a different terminology. Piaget defined intelligence as adaptation (Piaget 1970/1953, 4):

Intelligence is an adaptation. In order to grasp its relation to life in general it is therefore necessary to state precisely the relations that exist between the organism and the environment. Life is a continuous creation of increasingly complex forms and a progressive balancing of these forms with the environment. To say that intelligence is a particular instance of biological adaptation is thus to suppose that it is essentially an organization and that its function is to structure the universe just as the organism structures its immediate environment. ... The organism adapts itself by materially constructing new forms to fit them into those of the universe, whereas intelligence extends this creation by constructing mentally structures which can be applied to those of the environment.

There are further parallels between Piaget and Peirce, as Määttänen (1993a) has noted (cf. section 5.2). While Peirce exhibited no exclusive differentiation as to the level of organization, Piaget and particularly the representatives of the neurally inspired cognitive paradigm have presented a bottom-up explanation, according to which complex (or so-called higher) cognitive faculties are based on simpler (so-called lower) ones. This ties social phenomena and their development (sociogenesis) to the biological development of the individual (ontogenesis) and the species (phylogenesis). Hence, what is called cultural evolution is a direct consequence, continuation, and part of natural evolution, and it holds that the human being is at core a biological, animal organism.

Peirce stressed the complex end of the continuum, the cultural: “Now the organism is only an instrument of thought. But the identity of a man consists in the consistency of what he does and thinks, and consistency is the intellectual character of a thing; that is, is its expressing something.” (CP 5.315). In this sense, humanism is not opposed to naturalist pragmatism.

Of the pragmatists of the original Metaphysical Club, Peirce was the one who “had come upon the threshing-floor of philosophy through the doorway of Kant, and even [his] ideas were acquiring the English accent” (CP 5.12; see also Menand 2001). Both Kant and Hegel exerted a strong influence on Peirce (Murphey 1961, Brent 1998/1993), and the spirit of their idealisms is present in his philosophy, although crucial differences exist. Peirce was an idealist in the sense that he stressed the complex end, or top-level of representing. For him reality was primarily a subject’s reality and fundamentally mental, which is shown in cogitations such as the following (CP 5.314):

the word or sign which man uses is the man himself. For, as the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign; so, that every thought is an external sign, proves that
man is an external sign. That is to say, the man and the external sign are identical, in the same sense in which the words homo and man are identical. Thus my language is the sum total of myself; for the man is the thought.

However, one way in which Peirce’s idealism opposes those of Kant and Hegel is by being conditional, as was explained in chapter 1.2.5. It is twofold in the manner that the hard facts of the actual reality resist the organism, and the subject is oriented in the perceptual reality, while there is no epistemic gap between the two, in virtue of inquiry. In other words, Peirce’s idealism is pragmatist and naturalist. (Cf. Savan 1995.)

Consequently, Peircean naturalist pragmatism opposes any extreme or physicalist versions of materialism, in the sense that, while actually the objects of the actual world exist, no resort to a physicalist level of explanation is necessary or adequate. From the viewpoint of the subject, the phenomenal world is the world of living. If there is a first science, it uses the level of subject in explanation, while keeping close contact with other levels of explanation, such as the sociological or neural levels. For Peirce the polymath, this meant an endeavor of “a theory so comprehensive that, for a long time to come, the entire work of human reason ... shall appear as the filling up of its details” (CP 1.1).

In the current perspective, any Cartesian separation of mind and body, or Husserlian bracketing out of epoché is not only unnecessary, but also harmful, since the compartmentalization of mind and body obscures the analysis of experience. Inquiry is based on interaction carrying across the illusory but non-existing gap between mind and body, and “if the Cartesian dualism be admitted, no divine assistance can enable things to affect the mind or the mind things, but divine power must do the whole work” (CP 8.30).

In other words, Cartesian dualism is in fundamental contradiction with Peircean naturalist pragmatism. Mind and subject (or consciousness) are actually non-existent, but exist significantly as features of the functioning system of representation and interaction, thereby involving actually existing entities, such as nerve tissue, sensory organs, motor units, and other actual objects. Mind is but a potentially useful abstraction, a concept that allows analysis. However, it is the body (and its nervous, sensory and motor systems) that interacts with environment, represents it, and thereby allows for the phenomenal world in its entirety. There is a solid and reliable, although fallible, epistemological connection between the actual and the phenomenal world.

The remaining remarks are either anachronistic to Peirce, or deviate from Peirce’s stances, due to being extensions of Peirce’s thinking to Dewey and beyond.
In light of the indented quote above (CP 5.314), it seems that Peirce can justly be criticized for anthropocentrism and anthropomorphicism. Although the presentation of Peirce here emphasizes logic, human thought, and language, the foci of his inquiry were of course not limited to human species. There is indeed an intriguing amount of friction in Peirce as a theoretician and a practical man of sciences. His broad endeavors of pragmatism and semiotics have proven to be applicable far beyond what he ended up mostly being engaged in: normative accounts of objective, scientific inquiry, stemming from the needs of a chemist, physicist and geologist.67

Any thorough analysis of experience and semiosis must take into account the development of the mental abilities, not only socially or ontogenetically, but also phylogenetically. This is fitting for the naturalist character of the current framework. Peirce acknowledged the underpinning naturalism in, e.g. CP 2.753–754 (see also CP 5.46–47):

Nature is a far vaster and less clearly arranged repertory of facts than a census report; and if men had not come to it with special aptitudes for guessing right, it may well be doubted whether in the ten or twenty thousand years that they may have existed their greatest mind would have attained the amount of knowledge which is actually possessed by the lowest idiot. But, in point of fact, not man merely, but all animals derive by inheritance (presumably by natural selection) two classes of ideas which adapt them to their environment. In the first place, they all have from birth some notions, however crude and concrete, of force, matter, space, and time; and, in the next place, they have some notion of what sort of objects their fellow-beings are, and of how they will act on given occasions. ... Man has thus far not attained to any knowledge that is not in a wide sense either mechanical or anthropological in its nature, and it may be reasonably presumed that he never will.

Side by side, then, with the well established proposition that all knowledge is based on experience, and that science is only advanced by the experimental verifications of theories, we have to place this other equally important truth, that all human knowledge, up to the highest flights of science, is but the development of our inborn animal instincts.

Hence, Dewey’s reliance on the organic substratum of interaction is well in place. Consequently, in the pursuit of a theory of the musical composition process, two consequences should be pointed out. First, in the conception of what music and musical semiosis are, the zoomusicological perspective ought not be excluded (see Mâche 1992; Wallin & Merker & Brown 2000; and Martinelli 2002, 2007). The same applies for arts in general. That is, given the description of art and experience

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67 I am grateful to Prof. Vincent Colapietro for drawing my attention to this. See Colapietro 1987.
above, theories of musical processes cannot begin with the assumption that music or the arts are exclusively practiced by the human species. Any limitation of arts to humans alone, or to some particular human cultures, needs to be carefully argued for, if at all possible. The possibility of such argumentation, of course, depends on how we conceive music and the arts.

The second point relates to language. In Peirce’s opinion, “all thought whatsoever is ... mostly of the nature of language” (CP 5.421). To what degree thinking is “of the nature of language” is beside the point; the point is that verbal language does not constitute thinking, and should by no means be identified with it. Rather, linguistic semiosis should be taken as an exception, as a special case of thinking. The starting point for semiotic theories of music and the musical composition process cannot be language. The current framework is opposed to linguisticism, i.e. to linguistic hegemony in philosophy, semiotics, cognitive science, studies in artificial life and artificial intelligence. Although a complex communication system requiring complex perceptual, cognitive and motor abilities, verbal language is not a primary means of thought, communication, representation or semiosis. Top-down approaches of linguistic flavor tend not only to serve as a model for climbing the tree from the top down, but also to mislead research orientation, since terms and concepts cannot be transported directly from a special case to a general theory, at least not in this case. Also, views that semiosis could be studied as texts exclusively are inadequate, if the views downplay the roles of an experiencing subject, interaction of organism and environment, and the reality of the actual world as the perennial basis for semiosis.

Considering the above, there are many incompatibilities between the current framework and many European, or so-called ‘continental’ philosophies, both of Peirce’s time and after, while some empathy can be found in some aspects of North American philosophy, and naturally in semiotics. Despite the passion for the importance of the process of interpretation of signs, and in some respects, the issue of embodiment as well, a contrasting example in many ways is the post-structuralist movement and postmodern deconstructionism (Derrida, Foucault, Lyotard, and Rorty), and its disembodied relativity. The stance taken here is that even the most contemporary flux of most contemporary texts (linguistic and particularly non-linguistic ones) have their interpretation anchored in the (habit of) action, however mutating that fixation of habit may be. It is simply important not to ignore this, and to escape addressing meaningful questions, resolutions of which might bear significantly on practice.

Regardless of opposition to many recent ideologies of European philosophy, there are 20th century thinkers outside the pragmatist and semiotic traditions with
affinities to Peircean naturalist pragmatism, such as Jean Piaget, as already mentioned, but also to a degree, Merlin Donald, Ernst Cassirer, Hilary Putnam after refuting functionalism, and Martin Heidegger, to name a few (see section 5.2). However, the history of pragmaticist ideas versus European philosophical traditions of the 20th century must be written at some other place and time. Here it is time to make a move to the actual topic of this book: music.

1.5 Summary of the framework of inquiry

This part has outlined a conception of Peircean naturalist pragmatism, which serves as a framework for the inquiry presented in the next three parts. It also made an effort to combine the Aristotelian intellectual capacities with the pragmatist views on normative science and art. The next three parts constitute the core of this research, in the form of a syllogism:

I Rule: Mental phenomena are spatially embodied.

II Case: Music and the musical composition process are mental phenomena.

III Result: Hence, music and the musical composition process are spatially embodied.

The viewpoint of naturalist pragmatism set off first with the assumptions, that only the objects of the actual world actually exist, and that an organism (which is a particular kind of actual object) is engaged in interaction with the actual objects of its environment by means of perception and action. Experience and perception are regarded as the accumulative and particular aspects of the semiotic process from esthetic to the point of action, and the organism’s means of interaction with the environment.

Following Peirce, a conceptual distinction was restated between the normative sciences of esthetics as the theory of feeling, practics as the theory of action, and semiotics (or logic) as the theory of thought. Aristotle’s notions of intellectual virtues and corresponding activities were employed in order to distinguish further between the domains of the normative sciences. In the synthesis of Peirce, Dewey and Aristotle, esthesis was described as strictly perceptual, only relating to Peirce’s concept of feeling, sensation without the attribution of it to anything, perception in its infancy without recognition or analysis. Two kinds of action were distinguished: poiesis as the manufacturing or manipulation of actual objects without further agenda, and praxis as operation on objects with a particular goal of affecting subjects by means of objects. Whether caused by poiesis or praxis, or not, the changes in the organization of actual objects may, in turn, be objects of feeling, objects of perception. The
logical connection of action, actual objects and perception is one side of the process by virtue of which the sensorimotor organism exists in the world.

The domain of semiotics as the theory of thinking was divided into three: techne and phronesis, the practical virtues of intellect, which determine poiesis and praxis, correspondingly. The third, sophia, is wisdom regarding perennial questions, and appears to be all organism’s knowledge of the necessary versus contingent. This theoretical knowledge does not directly concern the practical exigencies of life. It is and develops only by virtue of action and perception. On the other hand, it governs phronesis and techne, and thereby, to a degree, the organization of actual objects, and the potential perceptions of them. Thereby sophia, phronesis, and techne constitute the organism’s ability to guide its being in the actual world. This competence was termed mind. The logical connection of perception—thought-action is the other side of the process of interaction that is the organism’s—or now, the subject’s—being in the world.

In the process of interaction, each situation and object of perception is conceived to have practical bearings, i.e. the process is a process of meaning-making, semiosis. The semiotic process evolves through evolution of the subject’s habits of thinking which logically connect habits of feeling to habits of action, and through the subject’s fallible imaginative ability to make predictions, to hypothesize in advance, based on experience, what the future may unfold. Imagination, on the other hand, cannot exist without perception and action, and not without the natural world of actual objects, because it is the competence of estimating hypothetical future situations of the actual world. No other worlds actually exist, according to the naturalist standpoint. The actual objects belong to the functional organization of mind.

The semiotic process is an adaptive process of inquiry. Practical inquiry relieves the irritation of doubt and settles beliefs we are willing to risk a great deal upon, while scientific inquiry aims at rigorous but provisional establishment of beliefs, considering the economy of the endeavor.

The artist introduces and communicates a non-arbitrary fiction (see CP 1.383), an imagined state of affairs, by manipulating materials into forms suitable for the intended purpose of hypothesizing about the possible operations of the actual world, which are then verified or discarded based on accumulating experience. Artistic perception is perception of an experience. It involves esthesis, and updating and reevaluation of the habits of feeling, of thinking, and of action. The meaning of an experience is the use of it, the conceivable practical bearings of the experience, as the pragmatic maxim suggests. Perceiving an experience yields more or less changes in the habits of thinking and habits of action.
Art necessarily requires imagination. Imagination is the ability of extending the phenomenal world by expanding, extrapolating, estimating and hypothesizing possible situations of the actual world for the sake of adaptation, enhanced interaction with the environment, and successful action in future situations. It appears that without imagination, the transition from a reflexive organism, with only techne and phronesis as types of knowledge, into a sophisticated semiotic subject is impossible. Art in this respect is a process of inquiry. It is a subject’s process of experiencing by means of interaction with the environment, for the purposes of adapting and evolving. If the artistic action is governed by sophia, wisdom concerning perennial questions, and by phronesis, the practical wisdom of good and bad, the praxis may be good and successful, in the sense that the artistic perception yields changes in the habits of thinking and habits of action that are good for the individual, the community, or both.
2 Music and the musical composition process are mental processes

This second part focuses on the minor premiss of the syllogism that constitutes this book. The focus is on how music and musical composition are mental processes. This entails analysis of the concept of music, as well as rethinking of theories of the musical composition process.¹

The first section of the second part (2.1) contemplates the very concept of music. Section 2.2 investigates its character as a process. The process character of music is sketched with a particularly semiotic point of view. The semiotic viewpoint is based on the framework of naturalist pragmatism presented in the first part.

Section 2.3 draws together a synoptic view of different theories or models of musical composition, in order to construct an understanding of what is required of a contemporary theory of the musical composition process. Certain past models and theories of musical composition process are measured against the conceptions of esthetic, practic, and semiotic as presented in part one, as well as the conception of music presented in section 2.2.

2.1 The concept of music

2.1.1 Of concepts

Peirce on concepts.

In constructing a theory, the key concepts involved need to be analyzed (see CP 5.207, 5.413). According to Peirce’s formulation (CP 8.191), “[a] concept is something having the mode of being of a general type which is, or may be made, the rational part of the purport of a word”. Here the aim is to analyze that mode of being of the general type, which is the purport of the word or term ‘music’.

Peirce’s pragmatic maxim states: “Consider what effects that might conceivably have practical bearings you conceive the objects of your conception to have. Then, your conception of those effects is the whole of your conception of the object” (CP 5.438, italics original; see chapter 1.2.6.). The pragmatic maxim provides a method

¹ The analysis of music as a mental process entails that music is also a semiotic process, since in the Peircean framework, the mental ability is a part of semiosis. The opposite does not necessarily hold: there seem to be semiotic processes that are not mental, e.g. phytosemiotic and physiosemiotic ones.
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for conceptual analysis. “The method prescribed in the maxim is to trace out in the imagination the conceivable practical consequences, -- that is, the consequences for deliberate, self-controlled conduct” (ibid.). In this sense, the analysis of concepts, such as the one carried out here, is an application of the pragmatic maxim, and an instance or a phase of the ongoing process of pragmatist inquiry.

Direct application of the pragmatic maxim eventually yields a conception of music as being all the effects with conceivable practical bearings that music has. In other words, what can be understood as the meaning of the word ‘music’ is the conceivable use of the word ‘music’. Once all the practical bearings for use are considered, we end up with the purport of the word. Similarly, the meaning of music is the use of music (see, again, EW 5:195, MW 9:19, and LW 8:231). All this should be quite clear, on the supposition that we know to what the term ‘music’ refers. But we do not, not exactly. Or at minimum, we should not take our acquaintance with the reference for granted. If we do not know what the objects of our conception are, how could we know what effects may or may not have practical bearings on those objects? As a result, what the word ‘music’ does and does not refer to, needs to be elaborated. But does not music in its plurality and impalpability evade conceptual analysis altogether?

The pragmatic maxim is the third grade of clarity, according to Peirce (CP 5.402), the first and second being “familiarity with a notion” and “the defining of it” (CP 5.392; How to Make Our Ideas Clear). The first grade, that of familiarity “hardly seems to deserve the name of clearness of apprehension, since after all it only amounts to a subjective feeling of mastery which may be entirely mistaken” (CP 5.389). As far as the first grade of clarity is concerned, in our societies, almost everyone is—in his or her own way—familiar with music, the musics he or she hears and listens to, and has possibly “lost all hesitancy in recognizing it in ordinary cases” (idem). Think, for example, of the sounds which engulf us in shops and supermarkets, public transportation, or commercial radio and television. Of course, one might be actively involved in musical poiesis and praxis by playing, recording, arranging, composing and so on, but that does not necessarily clarify the subjective experience of familiarity. However, it is unnecessary to go through that familiarity with music here, since the study and reporting of the kinds of phenomenology relating to people’s familiarity with musics have long been pursued, at least by socially oriented musicologists, ethnomusicologists and music anthropologists.

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2 Peirce’s treatment combines the concept with the term, proposition or argument that labels the concept. Chapter 3.1.2 provides a more contemporary account of concepts and properties by Peter Gärdenfors (2000), that makes a clear distinction between the linguistic labels and the concept. Here, the Peircean account serves as a tool for delineating the concept of music.
Music is a mental process

Therefore it is perhaps no wonder that in our days the utterances of the second grade of clarity, that is, those defining the concept of music in depth, are primarily found—when found—in works of culturally and ethnologically oriented musicologists, based on their experiences of the different phenomenologies of different musics. Of course, one major factor luring ethnomusicologists to come out with their definitions during the past 50 years or so, has been the quest not only to define, but to redefine the concept of music and to steer thinking away from the concept of music (i.e., Western art music) toward the plurality of conceptions of musics, including those of Western art music. Although Peirce boldly maintained, that “[n]othing new can ever be learned by analyzing definitions”, he also admitted that “our existing beliefs can be set in order by this process” (CP 5.392). Therefore, “the books are right in making familiarity with a notion the first step toward clearness of apprehension and the defining of it the second” (idem). Yet, the pragmatic maxim needs to be followed, since the distinct apprehensions portrayed even by most satisfactory precise definitions fail in making the idea “perfectly clear”, as Peirce’s example of the concept of ‘reality’ shows (CP 5.405–406).

Peirce insisted that (CP 8.191; see CP 5 ed. note, page v) all concepts are relational and definable, while only sensation, or the simple qualities of feeling are indefinable. This is contrary to “the ordinary doctrine” (CP 5.294) of the Kantian tradition, according to which the concrete can be explained by more and more abstract, finally unanalyzable ideas (CP 5.177). Even the most nebulous and impalpable concepts, such as music might be, ought to be definable in terms of concrete conditions by tracing out their practical bearings. It is obvious, that whatever music is, it goes beyond mere sensation or a quality of feeling. For example, any instance of action or activity involved in music, whether aware or not, is enough to render music something beyond a quality of feeling. And going much beyond the initial familiarity with the concept, the definitions and descriptions by musicologists (and other experts) provide the second grade of clarity, in the process of making the idea “perfectly clear”.

That process, however, appears infinite (befitting the infinity of inquiry). According to T. L. Short (2007, 58, see also 285–288),

One supposed problem with this maxim is that the effects we conceive an object to have depend on the contexts in which we imagine the object to be placed and on our beliefs about the things forming those contexts; as our stock of germane beliefs grows, so does the list of conceivable effects. There is no end to

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3 According to Peirce (CP 5.491), “the most perfect account of a concept that words can convey will consist in a description of the habit which that concept is calculated to produce. But how otherwise can a habit be described than by a description of the kind of action to which it gives rise, with the specification of the conditions and of the motive?”
the effects that we might conceive injustice, say, or electromagnetism to have. But this consequence is not a problem at all, if Peirce’s intent was to show that conception is a function of knowledge, that meaning is inexhaustible, and that its explication is never complete...

In addition to the inherent incompleteness of the analysis of the concept, the plurality of music juxtaposes the concept of music with conceptions of music. Being central to logic, the core concepts of concepts, terms, propositions and the methods of defining are also closely tied to the theories of sign, mind, and inquiry. In CP 7.467, the concept of concept is correlated to that of conception:

In general, what the mind pronounces is that the feeling or idea of yesterday and that of today belong to one system, of which it forms a conception. A concept is not a mere jumble of particulars, -- that is only its crudest species. A concept is the living influence upon us of a diagram, or icon, with whose several parts are connected in thought an equal number of feelings or ideas. The law of mind is that feelings and ideas attach themselves in thought so as to form systems. But the icon is not always clearly apprehended. We may not know at all what it is; or we may have learned it by the observation of nature.

This implies that, in contrast to conception, every concept is a sign (CP 8.305, 8.332) of a general kind. We may or may not be aware of the sign—the system comprising of the icon and the feelings or ideas attached to it. In addition, Peirce pointed out that we may or may not be aware of the icon influencing us. Consequently, conceptual analysis of ‘music’ should examine both the “several parts” that are connected in the icon, as well as the systems that are formed from feelings, ideas, or other concepts.4

These two aspects correlate with the traditional facets of conceptual analysis, namely those ordinarily referred to as extension and intension.5 Along this tradition, Peirce gave this bipolar description of concept in the Dictionary of Philosophy and Psychology (CP 2.364):

Concepts, or terms, are, in logic, conceived to have subjective parts, being the narrower terms into which they are divisible, and definitive parts, which are the higher terms of which their definitions or descriptions are composed.

Having studied the historical developments and nuances of the nomenclatures of the two quantities (extension and intension, or comprehension; see CP 2.393–406), Peirce ended up using vocabulary set forth by sir William Hamilton, namely

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4 We shall return to the concept of icon and Peirce’s theory of signs and signification in closer detail in part three.

5 Extension usually refers to the class of objects pointed to by the term or to which the concept is applied. For instance, ‘human’ refers to all the human beings. Intension usually refers to the characteristics, conditions or principles that delineate the term or concept. For example, ‘human’ is ‘the rational animal,’ ‘the featherless biped,’ and ‘the ecologically myopic mammal’.
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*breadth* (or width) and *depth*, which are quite synonymous to the terms extension and intension, correspondingly, as generally understood. He also introduced a third quantity, named *information*. An elaboration of these three into a doctrine of logical quantity can be found in CP 2.407–430 and in commentaries such as Murphey (1961), but perhaps the sufficing brief definitions of informed breadth and depth are:

1. “By the informed breadth of a term, I shall mean all the real things of which it is predicable, with logical truth on the whole in a supposed state of information” (CP 2.407); and
2. “By the informed depth of a term, I mean all the real characters (in contradistinction to mere names) which can be predicated of it (with logical truth, on the whole) in a supposed state of information, no character being counted twice over knowingly in the supposed state of information” (CP 2.408, emphasis added).

Peirce’s concept of *information* refers to “the sum of synthetical propositions in which the symbol is subject or predicate, or the information concerning the symbol” (CP 2.418). It may be expressed, according to Peirce, as the product of breadth and depth (CP 2.419). Peirce subsequently pointed out that the Kantian inverse proportionality of breadth and depth, or extension and intension, does not hold under all circumstances (see CP 2.400–426; Murphey 1961, 93).

**Ramifications for the analysis of the concept of music.**

In conceptual analysis, then, all three aspects should be taken into consideration, namely extension (or breadth), intension (or depth), and information. The analysis of the concept of music should account for various extensions of the concept of music, that is, the different instances of the world’s music cultures—at least those of which we know. The definition or analysis of the term ‘music’ should be wide enough.

At the same time, the definitions or analyses must not rely solely on readily apprehensible extensions of the concept, let alone on enumeration of world musics. It is paramount that the definition or analysis be analytically devised primarily by intension of the concept of music, so that the characteristics, criteria, or principles that delineate the term ‘music’ are accurate enough to include all musics and nothing but music. Namely, accurate intension of the concept yields accurate extension, but not the other way around.

Last but not least, the definition or description of the concept of music should take into consideration all pertinent information concerning the concept: the conditions under which the statements regarding the concept of music hold or fail. Here,
the main directions for the information concerning the concept of music arise, on the one hand, from utterances about music by musicologists, myself included, and the framework of naturalist pragmatism as described in part one, on the other. The subjective experiences of musicologists are familiarity, the first grade of clarity. The definitions, descriptions and other utterances constitute the second grade of clarity. What follows is an attempt to work towards the third grade of clarity.

According to Peirce, “[p]hilosophy is positive science, in the sense of discovering what really is true; but it limits itself to so much of truth as can be inferred from common experience” (CP 1.184). In that sense, we now leave the pragmatist philosophy and enter idioscopy, namely the special science of musicology.

2.1.2 On the concept of music

The key terms relevant to the theory of musical composition process may be understood in a variety of ways. Therefore the current conception of them needs to be uncovered in light of the underlying framework. Let us now explore the concept of music to set a ground for the coming chapters. Music being a notoriously non-verbal phenomenon, the importance of being wary in putting ideas of inquiry into words or concepts into terms is additionally highlighted.

Clearly, the conceptions of what music is all about have varied in the course of history and from culture to culture. The objective here is not to present a full-scale summary of musical conceptions presented in the past, nor to attempt at an all-around roundup of analyses of the concept of music across cultures. A plethora of works have been written on the topic, often under the headings of musical aesthetics. It is impossible to derive an accurate account of what constitutes music by reaching all the individual, original sources of the actual music cultures of the world. That inquiry, in turn, relating to the breadth or extension of the concept of music, is a major undertaking of ethnomusicology, anthropology of music, or sociology of music, and not an immediate concern here.6

The notion that there has been music in all past and present cultures of the world in some form or other is largely agreed upon by musicologists (see for instance Nettl 1964, 3). But disagreements arise concerning what the criteria for music are, and whose criteria should be followed in which situation.

6 For historical reviews of Western conceptions of music, see e.g. Benestad 1978, Fubini 1991, Lippman 1992, Portnoy 1980/1954, Schäfke 1982/1934 and Zoltai 1970. For compilations of source readings on the topic, see e.g. Katz and Dahlhaus 1987 or Lippman 1986, 1988 and 1990. The New Grove Dictionary of Music and Musicians reads (Grove’s, s.v. ‘Musicology’, §II, 8): “Music aesthetics seeks to answer the questions: what is music? how does it carry meaning?” Considering the present framework (see part one), those questions are essential to the field of musical semiotics.
The criteria or constitution of the concept of music may become discernible not only in the action of the musical context, that is, through participating in and observing real life situations involving music and its practical bearings. It may also be discerned through reference, i.e. as somehow coded in a verbal language or other sign-system defining or describing music.

For all practical reasons, only referential utterances are considered here. As noted in the previous chapter, they constitute the second grade of clarity in the apprehension of the concept. Real life situations were not observed for the purpose of this study, although as more genuine, they should be considered more accurate and true. In other words, the study does not directly include musicological empiria. Instead, using the expertise of musicologists it works on a metalevel, in terms of music. The simple reason is the division of labor. Admittedly, every step of translation to another sign system or coding and decoding risks distorting the original content. But if the task is to scientifically examine and communicate the concept of music as a whole, in any case, translation to a verbal system of communication becomes both quite unavoidable and worthwhile, for all practical purposes—for the benefit of the economy of inquiry.

Referential utterances may either be definitions more or less following the form “x” = df “y”, or more or less intelligible explications. In our days, explicit definitions of music are scarce, except for the general encyclopedia definitions and musical aphorisms found in dictionaries of musical quotations or such. This seems to have resulted from realization of the complexity of musical cultures and from conceiving music as a multicultural cluster concept (see Putnam 1984/1975, 52). As the conceptions of music have become culturally more sensitive, music and its “mode of being of a general type” (CP 8.191) tend to be regarded as such a multifaceted issue that it escapes definition due to any definition being too narrow or too broad—even both at the same time—to cover all conceptions of music present in the world’s cultures.

Yet, a working definition needs not consolidate all individual conceptions. As noted, a concept is of a general kind, and we may or may not be aware of it. For comparison, in order to define thunder within a particular framework, it is not necessary to consider how all the different people might think of thunder as the wrath of gods, as clouds bumping into each other, as Grandpa’s tractor, or whatnot, unless the research topic happens to be the variance of individual conceptions of thunder or such.

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7 Being a musician myself, I cannot altogether exclude the real life situations of music, nor is there reason to do so. A researcher cannot step outside himself or herself, but carries his or her own background of experiences and traditions, regardless of whether he or she tries to exclude the subjective past. Hence this study does combine features of idioscopy and coenoscopy—musicology and philosophy.
Therefore I maintain, as Peirce implied (CP 8.191), that it is both possible and desirable to search for a fertile and accurate definition or description—whatever one prefers to call it—of the concept of music that would comfortably host a variety of musics and their practical bearings, and provide a healthy basis for a theory of musical meaning and the musical composition process. This may be considered a naïve or vain attempt, but giving up without making a bold effort takes us nowhere. While a definition alone is not enough, the effort made and the dialogues, distinctions and deliberations en route may well work toward making the idea of music clear.

Based on how the definition or characterization is chosen, and what purpose it is intended to serve, the task may even be quite simple. In reality, though, any serious analysis of the concept of music needs to be revised and reworked as the knowledge about musical processes matures (cf. Short 2007, 58; chapter 2.1.1). Therefore shaping of a good definition of ‘music’ is a complicated task indeed. The challenge concerns the breadth (extension), depth (intension), and information of the concept. An apotheotic definition would embrace most, if not all musics of the world while being narrow enough not to cover anything but the musical semiosis, associated actual objects, esthesis, and praxis included. It would be deep enough to encompass all pertinent aspects of the musics. Furthermore, it ought be informative of those conditions under which it holds or fails to hold. And once defined, the conditions or boundaries of the definition ought to be acknowledged when the definition is being used.

While short of clear-cut definitions that are authoritative, applicable and contemporary, explications of the concept of music are abundant. Some of them aim particularly at analyzing the concept of music, in one way or another. Others explicate the characteristics thereof, without any particular goal of conceptual analysis. Explicating musical concepts is not only a philosopher’s privilege, but rather, for any professional musicologist, musician, or non-musician to attend to. And just like the observation of or participation in real-life situations of music, all the explications thereof may serve in developing understanding, analyzing and defining the concept of music.

That notwithstanding, articulating the concept of music is a particular duty of the musicologist. It is musicologists who first benefit from the analysis of the concept of music. As noted, in Peirce’s definition, philosophy “limits itself to so much of truth as can be inferred from common experience” (CP 1.184). As such, philosophers’ insight into music would not usually go beyond that of laypersons, unless the philosopher is somehow especially versed in music-related issues. Laypersons’ utterances, while being genuine, may lack extensive experience on the topic. Expressing
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only more or less initial familiarity with the topic, they may also be inarticulate to the point that their understanding would require intensive interpretation.

Consequently, when considering the concept of music and the nature of composing as a musical process from purely musical horizons, Charles S. Peirce’s ideas would hardly be a commendable option. While the polymath nature of his work in mathematics, physics, chemistry and geodecy are clearly visible in his writings, substantial contributions to music and arts are few. He addressed issues pertaining to music mainly from the historical perspective as a branch of the liberal arts or mathematics, or drew music-related examples from his own personal perspective illustrating issues of e.g. logic, cognition and phenomenology. At the same time, he reflected his own rudimentary experience in music and, frankly, an immature conception thereof. Nevertheless, Peirce’s conception of music is not an issue here, and by no means impedes the application of his philosophy and semiotics in music research.8

For those kinds of reasons, the explications uttered by musical laypersons, philosophers included, are largely omitted here, and only in some cases are the practical versus musicological utterances by musicians taken into account. In short, for the sake of economy of research (CP 5.589), it is best here to look for support, when needed, in musicological accounts on the concept of music, either as explicit definitions, or as more or less intentional explications.9

Verbal definitions and explicit explications of music tend to place themselves somewhere along the bipolarity between the absolute and the relative. In the absolute extreme, the explication may appear as an inclusive and exclusive canon, set by some for global use concerning all cases of what is and is not music. In the relative extreme, the conception leaves it up to each individual, group, or culture to decide what is music, and how to refer to it.10

Old-time musicology was criticized for its absolute extremity: for founding itself in a value-laden way on a short-sighted concept of music stemming solely from the

8 Peirce was aware of his inexperience in this respect. The following quotes ought to serve as illustration of his disposition: “Thought is a thread of melody running through the succession of our sensations.” (CP 5.393); “… the exercise of intricate ratiocination requires great energy and prolonged effort, while musical practice is nearly unmixed pleasure, I suppose, for those who do it well.” (CP 1.657); and “I know very well that my dog’s musical feelings are quite similar to mine though they agitate him more than they do me.” (CP 1.314).).
9 In our Western culture, there is a conspicuous distinction between professional musicians and laypersons, between those who make music and those who do not, and those that are considered musical and those that are not. As several ethnomusicologists have pointed out, this does not hold globally. See e.g. Blacking (1977/1973, 32–).
10 Compare exalted exclamation such as “Yes, there is music! Beethoven!” with the paradoxical definition by Luciano Berio: “music is everything that one listens to with the intention of listening to music” (Berio 1985, 19; cf. Padilla 1995a, 1998).
then tradition of Western classical art music and from Kantian-Romantic autonomous aesthetics. Any such chauvinism, zeal, or even bigotry, whether encountered in the discourse on Western classical art music (as in the past), or in the discourse on other musical cultures or subcultures (as might be the case today), poses either foreseen or inadvertent limitations to the breadth of the concept of music.

The relative extremity, in turn, has the danger of leading to a situation where anything goes, and the depth of the concept is consequently not articulated. This in turn may easily lead to inflation of the term, as the latter may become applicable to practically anything.

In scientific inquiry, the subject matter itself is the main factor, based on which research problems are set, methods selected, and research pursued. Some leeway is certainly welcome and even necessary in research in the arts and humanities, but if too kaleidoscopic a diversity is allowed for the subject matter, the domain of the discipline faces the threat of dissolving into obscurity, which obviously is detrimental in the long run. Luckily, in present day musicology these tar pits are by and large averted.

While it is not relevant to go too deeply into issues of mind and language or verbal ability, it is nevertheless beneficial to remark the differences between actual processes of music, conceptions or concepts of music, and the use of the term ‘music’. This, as it happens, is not too obvious in Peirce’s treatment of the term concept, and it seems that too often these are considered inseparable.

First, the pragmatic maxim speaks of the conceivable practical bearings of the effects of object as the conception of the object. For instance, we may have a conception of honesty that has everything to do with things such as adapting to agreed norms, doing the right thing, telling how things truly are, being kind to others and ourselves, not faking it etc. Regardless of that conception, we then may, even knowingly, act differently from those ideas—not necessarily purposefully violating our beliefs, but in ways that are mismatched with our conception. Action may run short of the conception. In that respect, a conception is at least partly an ideal, although consisting of habits of action, beliefs.

Similarly, we may have individual conceptions, or potentially even a more or less jointly established concept, that would stand for the activities pertaining to music. But as far as meaning is considered in terms of habits of action, meaning needs not necessarily be actualized, since not all habits are necessarily turned into action. A true conception includes all the conceivable practical bearings of the object, both actual and potential. Based on that, our conception of music would include things it may be, in addition to things it actually is. Consequently, there may well be differences between how a person actually participates in musical processes and what that per-
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son’s conception of music is. Hence, it can be assumed that the conception of music is, in this sense, a larger issue than becomes apparent from the actual musicking.

Second, we may have a term as an inaccurate label for grasping the conception and communicating it to others. For instance, the term ‘liberty’ is a handy tool for participating in the language game, in that it attempts to grasp the actual processes relating to things such as freedom, opportunity, responsibility, choice, restriction, power etc. But as a word, it unavoidably fails to include the whole concept that it is supposed to refer to. A single word cannot include in itself a concept, it may only point at conceptions by individuals. As text it is nothing but consecutive characters; as spoken word, it is only a sequence of phonemes. Yet it may act as a powerful sign. The fact that grasping the concept by means of a term is practical, should not lead to identification of the term with an individual conception, let alone a particular term with a general concept. There may be huge differences between the conceptions of, say, a British human rights and civil liberties defender versus an armed U.S. constitution amendment aficionado, when they use the word ‘liberty’. Those differences are not carried in the word, but dependent on the user, her experience, and the conception to which she has attached the word ‘liberty’. The sign needs to be interpreted.

Correspondingly, music as concept or conception and ‘music’ as an actually used term in the context of verbal language are two very different things. The English word ‘music’ is not necessarily accurate in reflecting what music is about for all individual speakers of English, let alone for non-speakers of English. Furthermore, many cultures and languages do not have or use a word directly corresponding to the modern English word ‘music’, while they may have other words that grasp aspects of the conceptions of music shared or not shared across cultures. Especially, they are very likely to have forms of what will be discussed here as musical semiosis in their culture, in their individual and more or less socially shared interaction with the environment, regardless of the terms of spoken language available or in use.11

Consequently, there seem to be two major options for the reference of a word: the actual objects of the world that are jointly agreed to be the references (through language game), or conceptions by people that use the word in the language game. In my opinion, the reference is always to the conception as opposed to actual object, although it is always inaccurate by not being able to communicate the conception in its entirety. A word makes an imperfect attempt to externalize, to communicate the conception, but a pure reference to an actual object is impossible. For instance,

11 For instance, Moisala (1991, 164–165) reported, that the interviewed Gurung people used the Nepali words instead of Gurung words in describing music. “In many cases, the Gurung word either did not exist or was not known.” (ibid., 165). According to Moisala (1998, 6), the Himalayan village people do not have a word that would directly translate to the word ‘music’.
‘an apple’ may be thought to refer to the fruit of the table apple tree (*malus domestica*). But even such simple reference is based on conceptions of the apple fruit. The word does not point to the apple fruit as an actual object but to our conception of it. The word for ‘an apple’ exists due to what it affords to us, its role in our lives, our experiences of it (as food, as symbol of this or that etc.), our conception of it. And the same seems to apply for each and every word.

In the case of ‘an apple’, the affordance to us is quite uniform across the world: there is a clearly delineated and identifiable fruit-object referred to as the apple, which affords eating to us, more than anything (as opposed to the common apple worm, codling moth, *cydia pomonella*, to which it affords also a home in its larval stage). This may make it seem as if the reference would be only to the actual object. But, as the pragmatic maxim maintains, the conceivable practical bearings of the effects of the apple are “the whole purport of the word, the entire concept” (CP 8.191). The pragmatic maxim remains valid, regardless of the fallibility of the term to communicate the conception, and regardless of Peirce’s seeming emphasis on terms, propositions and arguments as tools of thinking.

But is there a clearly delineated and identifiable object referred to as music? Can the affordability or the purport of music be stated in one or more sentences? Hardly. But still we may well engage ourselves in efforts that attempt to communicate individual conceptions of music, through terms, despite the risk that words fail to point at both the conceptions and the actual processes of music.

Hence, it may appear that what kind of term is selected to grasp the concept usually referred to as music, may eventually be totally irrelevant. But evidently, it may be most practical to settle for the established term ‘music’, obviously, and to try to communicate its extension and intension, for the benefit of it becoming understood.

Consequently, yet another remark to be made concerns the dichotomy sometimes labeled in ethnomusicology as emic versus etic, referring to conceptions of music relished within a culture versus conceptions carried across cultures. It has been suggested that each music culture should be approached on its own specific terms. While the sensitive methods of musical anthropology and ethnology avoid the perils of posing preexisting patterns on the phenomenon, they may also settle for cultural relativism, instead of naturalist holism.\(^\text{12}\)

\(^\text{12}\) See, for instance, Moisala (1991) or Merriam (1980/1964, 63), according to whom “what is considered to be music or non-music sound determines the nature of music in any given society.” Certainly, the conceptions of music by people and the actual forms of their music-making affect each other. But here the topic is not the various conceptions of music by these or those people, but rather, the actual musical processes, which are viewed from the perspective of a conception of music, namely the one based on the naturalist pragmatism being outlined.
Yet, despite all the cultural sensitivity employed, I do not see why it should be problematic for me to give a status of music to something I would consider music, even if the members of the culture originating the music would not speak of it by using the term ‘music’ or corresponding counterpart of it in another language. Admittedly, concepts about music, or rather, conceptions of music are paramount, not only to the ethnomusicologist, but to the musicologist without the “ethno” prefix, as well, “who searches for knowledge about a music system, for they underlie the music behavior of all peoples” (Merriam 1980/1964, 84). But Merriam’s viewpoint is deliberately anthropological: the focus is on varying conceptions of a music system at a time, musics by different people and different peoples rather than the concept of music as something that is found in all known cultures. Merriam stressed plurality as opposed to universality.

Returning to the analogy of thunder: as a natural phenomenon, a thunderstorm is what it is, regardless of how those being exposed to it report it. Of course, thunderbolts and thunderclaps may seem horrifying, dangerous, powerful, and they may be attributed mysterious and myth-like characteristics, that again have an effect on how people experience them. And if those conceptions result in certain practical consequences, those consequences constitute one aspect of thunderstorm, but not more than that. Meanwhile, the actual characteristics of thunderstorm and the process of its development remain what they are. Even if people’s experiences of thunderstorm may vary according to how its function is conceived, it still remains a thunderstorm and ought to be examined primarily as such, if that is the objective of inquiry.

As already pointed out, a working definition of music need not necessarily take into consideration the conceptions, nor, consequently, the utterances concerning music by laypersons or by musicians. What should be taken into consideration are the musical processes themselves. And what constitutes a musical process is finally a matter of defining it as we see fit, based on observations and experiences of different musics, and the chosen theoretical framework—all things considered.

To exemplify this further, let us consider another example outside music, namely food. The Swedes, among many others, do not usually consider insects food. Reciprocally, the traditional Swedish surströmming—putrefied Baltic herring—would probably not be regarded as food by most people outside Scandinavia. In Mexico however, jumiles or stink bugs (euchistus taxcoensis) are sometimes eaten, even alive, and hence constitute comida in the local culture. In order to carry out a gastronomic study covering both countries or more, neither the Scandinavian nor the Mexican traditional, local, intracultural or “emic” practice of what is used as food and what is not is enough. Let alone, what the layperson (or the gastronomic informant) regards as or calls food, or the fact that she might not even have a word corresponding to
the English ‘food’, is irrelevant in terms of the gastronomic study, unless the topic happens to be precisely how the local nominate or what they consider food. It may even be that the informants have never, on a conscious, reportable level, paid any attention to what the members of their society eat.

In contrast to the gastronomic language game, what matters more is what is consumed as food and how (esthesis), how food is prepared (praxis), and how these processes are experienced as systems of perception, thinking and action (semiosis). A solid base for both comparative and comprehensive study would be founded on concepts, which, instead of only listing the nomenclatures or analyzing the reports of conceptions of local informants, would search for more universal criteria for food applicable to varying conditions and contexts globally, such as regarding food as substance consumed for nutrition, taking into account other esthetic, or better, semiotic values of food as well. Inquiry tends to lead towards the discovery of patterns of esthesis, praxis and semiosis, out of which the concept is formed. But reciprocally, successful conceptual analysis in turn assists in making decisions concerning research agendas, methods, and topics. In brief, when the task at hand is like the current task, one is geared towards pursuing the gastronomic or, in our case, musical universals, despite the threat of despair.13

Yet, I do not believe any musicologist, or any other person for that matter, could step outside his or her own self, leaving his or her own culture and unlearning past experience in order to understand fully a music culture outside his or her own, let alone the complete spectrum of different music cultures. We can, however, take other musical cultures or cultural processes into account the best way we can, even acculturate ourselves to them through experiencing and learning. We may be able to study particular cultures, or to pursue the ideal goals of understanding cultures outside our own, understanding world's musics and their makers. This is a musicological corollary of Peirce’s notion of scientific inquiry.

This section, in anatomizing the concept of music, looks for support in accounts of music explicated by musicologists, rather than conceptions of music uttered by laypersons or musicians themselves (which may or may not be discernible from

13 Clearly, dialogue takes place between cultural, local and individual conceptions of music, and the concept of music that reigns over each phase of musicological discourse, although there need not be unanimous agreement on them. Yet, each attempt of scrutinizing music needs to be aware and to express its ruling conception of music, one way or another. If this is not done, the inquiry seems to be musicological only by chance. For musical universals, see e.g. the special issues of Ethnomusicology (vol 15 no 3) and Worlds of Music (vol 19 no 1/2); Nettl 1964, 1983; Harwood 1976; and Miereanu and Hascher 1998.
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laypersons), either explicitly or implicitly. In this sense, this section is concerned with meta-analysis of the concept of music.¹⁴

Musicologists have approached the concept of music from different perspectives. The task here is to express a conception of music that accords with the many-sided concept of music, which currently serves as the basis for much of musicological inquiry. In particular, the conception of music advanced below links to the current inquiry residing within the framework of naturalist pragmatism, and is geared towards devising a semiotic, cognitively oriented theory of musical composition process.

The explications of music rely on the paradigm case argument: if the explications successfully address the central aspects of the phenomenon, the sceptic unavoidably needs to resort to distortion of the concept. Therefore, the next two sections are scaffolded by explications of music uttered by expert musicologists in various research traditions of musicology over the recent years.

The first of the two upcoming sections applies some aspects of esthesis, praxis and semiosis from the first part of this book to music. The latter section goes more into detail in explicating what a theory of the musical composition process might entail within the framework of naturalist pragmatism.

Obviously, the excerpts or ideas selected for supporting the forthcoming explications exhibit only some aspects of some traits of thinking by individual researchers, and are by no means historically encompassing nor synchronically across-the-board. The support extracted is not necessarily representative of either their own complete or current views, nor views of their associated research traditions at large. The scope in which it is possible to convey the conceptions is narrow enough to give only a very quick, and by no means thorough glance at each utterer’s view of the whole concept. Nevertheless, I would dare maintain that the support is relatively representative of certain, mutually complementary research traditions of music in our times. And as will be seen, despite their sometimes conflicting points of departure, the excerpts quoted and ideas uttered usually seem to be in astonishingly good harmony both with each other and with the underlying framework of naturalist pragmatism, exceptions notwithstanding.

¹⁴ According to Seeger (1977, 105), “nonmusical specialists can ... talk learnedly about some aspects of music in ways often as incomprehensible to musicians and to other specialists as to non-musicians who are not specialists of any kind. But they may still talk of music as a whole in terms of common sense. The musicologist must try to comprehend as much as possible of all these ways of talking and to integrate them in such a way as to reconcile the diverse viewpoints, orientations, methods, and aims involved.” Here, the point of departure is the reconciliation already performed by musicologists.
2.2 Semiosis and the process nature of music

Let us now move on to contemplate how the concept of music might be understood within the framework of naturalist pragmatism as presented in the first part. Extracted from and scaffolded by utterances of expert musicologists (and based on my own familiarity with music), there are six aspects that highlight the naturalist-pragmatist approach to music: real, communicative, representative, useful, embodied, and non-arbitrary characteristics of musical processes. Each of these takes a stance regarding other conceptions of music and is more or less rooted in the framework of naturalist pragmatism. Each of the six aspects contributes to understanding of what musical meaning is, and how it comes about. Let us call the conception of music here a pragmatist conception of music.

Naturally, what I am maintaining here is more than anything a conception of mine, although I construe it by keeping the framework of naturalist pragmatism and the utterances by musicologists as the starting point. The reception of these ideas in future time and place will show to what degree this depiction of music comes close to “something having the mode of being of a general type which is, or may be made, the rational part of the purport” of music as musicologists conceive it, to borrow again Peirce’s definition of concept (CP 8.191). Apparently, the usability of the concept of music, such as portrayed here, will determine its reception.

2.2.1 Music is real

As noted in chapter 1.2.2, according to the moderate materialist view, only the actual objects of the actual world actually exist. The question of reality as it pertains to music is problematic in the sense, that there is no actual object in the actual world we could justifiably call music. It is problematic to maintain that a printed score of Beethoven’s Fifth Symphony would be music, if it is merely ink dots on sheets of paper. On similar grounds, a recording of Here Comes the Sun by the Beatles would not be music, neither as a groove in a vinyl record, nor even when the cone of a speaker element thrusts air molecules into a series of atmospheric disturbances. Sound, even music-related sound does not equal music, and neither does any representation of the sound. Music, in this sense of actuality of actual objects, does not exist. Still, it can be maintained that music is real. 15

15 This is according to the present framework. For the distinction between ‘real’ and ‘actual’, see chapters 1.2.1–1.2.3. Admittedly, the meaning of a word is in its use. For instance, some English speakers tend to refer to notation of a composition as ‘music’: “Where is my music?”. But this inquiry is not a survey of colloquial use of English words, but rather a construction of a theory, which demands conceptual analysis and perhaps adjustment.
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Music falls into the category of terms that have proved to be valuable by serving (or by having served) a purpose in thinking, reasoning and communication, but which ultimately do not actually reside as objects in the actual world. However, objects that carry features or convey characteristics that are attached to those terms or concepts may actually exist. The term ‘music’ has been found useful in describing certain complex situations of the actual world. There are situations which we refer to as being music, musical, or somehow music-related. These situations typically involve both sound and people, people acting upon sound, sound affecting people, or both.  

The realness of music stems first and foremost from the fact that it is fundamentally rooted in subject’s interaction with the actual world and constitutes a particular kind of interactive process. As discussed in part one (chapters 1.2.3–1.2.6), the subject’s being in the world establishes and constantly updates itself when experience of the actual world accumulates, including that about the organism itself. The subject manifests itself, not because of some underlying substantial reason (such as certain physical or physiological characteristics of the organism, although those may be necessary conditions for particular implementations of subject), but in virtue of the constant dynamic interaction between the organism and its environment. The subject’s operation consists in a ceaseless sequence of events, a perpetual series of changes. It is a process.

Reaching an adequate explanation is a matter of the kind of logic and experience from which the explanation is derived. Here, the framework of naturalist pragmatism has been selected as the logic employed. With that in mind, we need not resort to any metaphysical explanations of music, on the one hand. The framework of naturalism selected here simply rules out the possibility that music would be a metaphysical entity, of metaphysical origin, or something caused or endowed by such. On the other hand, the notion that music would equal to musical work is clearly insufficient, as far as musical work is conceived as an actual object and that alone, even if resulting from certain complex situations of the actual world. Instead, in this perspective, music is conceived as a process, as a part of the subject’s continuous operation as understood in the pragmatist framework. Musical semiosis is a subset of semiosis at large.

Consequently, music involves both aspects of realism described in chapters 1.2.1–1.2.3: the material and the phenomenal. First, in the obvious materialist sense, music as process involves sound and organisms with sensory and motor abilities. Music incorporates actual objects in causal relations: living organisms produce sound in

16 According to Peirce, realities “are those which have an existence independent of your mind or mine or that of any number of persons” (CP 8.12). As far as music does not exist regardless of our minds, it is not a reality in Peirce’s sense.
action, and living organisms are effected by the sound in perception. Living organisms are actual objects. The molecules of air or another substance transmitting the disturbances we call sound are also actual objects. These have causal relations with each other. They both constitute hard facts of the actual world.\(^{17}\)

There are hardly any objections to the condition that, as far as there is music, it involves perception of and action on sound by people (see, for instance, Blacking 1977/1973, x). Sound as actual object constitutes the “surface structure of music”. Sound functions as a \textit{vehicle} in the interaction of the organism and the environment. Sound is the means, in virtue of which there is a logical connection from \textit{action} to \textit{perception} in the processes referred to as music. This connection between the organism and sound is epistemologically well-established in virtue of causation: sound is a result of motor action by organism, and the perception of sound is a result of the effects of the propagation of pressure variations on the organism.\(^{18}\)

Second, music is real in the phenomenal sense. As John Blacking (1977/1973) eloquently put it, music is “soundly organised humanity” in addition to being “humanly organised sound”. Music is a process that necessarily involves one or more subjects, as opposed to organisms.

As soon as the merely reactive connection of sensation and action is ruptured into the continuum of sensation, \textit{sign}, and action, the organism’s interactive processes become processes of thought or semiosis (see chapter 1.3.4). Habits of thinking contribute to action, musical action included. Habits of thinking also contribute to perception, including musical perception. At that point then, it has become possible that a) action on sound and perception of sound become something beyond merely reacting, and that b) the subject even acknowledges and is able to report the semiotic processes, music included.

It might seem impossible for anyone to participate in musical processes without being aware of doing so. But whether we prefer it or not, there are examples that show that there is no need to demand that the subject’s awareness or acknowledgment of participation in the process ought to be a necessary condition for music. Let us,

\(^{17}\) The sternness with which sound causes effects on us may well be equated with Peirce’s example of the man walking down Wall Street and getting knocked down (CP 1.431). Sound is compelling. It forces itself upon us. Whether we wish or not, we come to know sound as hard fact, possibly without being able to recall, report or recognize it. We are constantly exposed to the brute force of sound. Yet, what kind of consequences the exposure to sounds has, is a different issue. However, the fact that we may react to sound even when asleep, possibly even in a temporary state of coma (see Kane et al 1993), illustrates the importance of sound to the subject’s being in the world.

\(^{18}\) This view, which appears to assent to methodological solipsism, does not by any means rule out intersubjective or social aspects of music. Just as the actual objects belong to the functional organization of mind, so belong other organisms and thereby subjects, too. But there is no direct connection from subject to subject other than by means of actual objects.
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for instance, consider muzak in department stores and such, or casual humming of familiar tunes that might evoke memories of this or that. We are not necessarily able to recall these situations. We are not necessarily always aware of our participation in musical processes. What does and does not constitute music can be determined in ways other than by the subject’s awareness or unawareness of the musical process. Neither perception nor action in music requires acknowledgment of the process.

However, the effect of the process on the subject’s phenomenal reality does appear to be a necessary condition for music. It is assumed, that music is something more than directly responding to a stimulus by an innate or acquired reflex. Music is not determined by external factors in the sense that any action involved in music would be a simple, mechanical reaction to sensation, or that perception in musical processes would follow distinguishable patterns that are reciprocated by detectable patterns of behavior. Also, music is clearly not a result of random events and their effects on us or by us.

Rather, music is partly anchored in the experiential representation of the actual world (Peirce’s world of fact), and partly due to the imaginative competence of the subject (Peirce’s world of fancy), which in turn is a consequence of the organism’s ability to experience and to form patterns of expectation. The claim is that music is a part of the subject’s being in the world, in the way that in music, too, the subject estimates and designs hypothetical future situations, experiences them, and acts accordingly. The experiential and imaginative situations are real in the phenomenal sense, because the subject’s existence relies on experience and imagination (as discussed in chapters 1.2.6 and 1.3.4). These situations may become real in the materialist sense through action, be experienced by subjects sharing the environment, and potentially have their brute effect on the future action of the subjects.¹⁹

Espousal of these kinds of contemplations on the reality of music can be found, for example, in utterances by cognitive musicologists. Mary Louise Serafine’s influential definition of music as cognition maintained, “that music is a form of thought and that it develops over the life span much as other forms of thought develop, principally those such as language, mathematical reasoning, and idea about the physical world” (Serafine 1988, 5). The assumption that “a musical composition is a fixed object residing in the external environment” (ibid., 64) is substituted by the view that “artwork is not a fixed, external object, but an abstract and fluid one that rests on human cognitive construction in all phases of its existence—composing, performing, and listening.” (ibid., 67) Consequently, “the artwork must be defined

¹⁹ For the role of the worlds of fancy and fact, or imagination and experience, see chapters 1.2.3–1.2.5. One might raise the question of which is antecedent and which consequent, music or the ability to operate with hypothetical situations. Evidently, music exists in virtue of the ability, and, at the same time, is one way of developing that ability further.
in terms of the human processes that give rise to it, from both the productive and receptive points of view” (idem).

According to Serafine (1988, 24–25), there are two major difficulties in defining music as sound:

One is that the definition of music as sound radically underspecifies the object in question; the vast majority of sounds are not music. The other is that music can and frequently does occur in the absence of sound; it may be entirely internal or imaginary, as it probably is during much of composition, the recollection of familiar pieces, and so on.

Of course, sets of more strict criteria or conditional prescriptions of sound could be established in order to distinguish musical sound from non-musical sound, but that evidently leads to cumbersome complexities, and probably to a dead end (see e.g. Serafine 1988, 64–67). For instance, the criteria that musical sound would be heard only in concert halls (or other performance spaces) or in certain social contexts, fail, because they end up insufficiently enumerating or describing the possible situations. Finally, they fail in situations where there is music, but no sound.

Serafine’s (1988) line of thought is realistic and materialistic—and while her conceptual apparatus differs from the current pragmatist one, her logic essentially agrees with it (although see chapter 2.2.2 for what is disturbing in Serafine’s line of thought):

1. The world consists of mind and outside world.
2. Music exists in the world.
3. Music does not (only) exist in the world outside of the mind.
4. Therefore, music exists in the mind.

According to Serafine, “[t]his conception of music not as a fixed object but as a cognitive construction is consistent with what is probably the common popular or folk view of music.” (Serafine 1988, 67). It is probably the common contemporary musicological view, too. Some musicologists state their position in this regard; many do not express their stance yet silently accept this view. Today only a few, if any, appear to disagree explicitly.

Correspondingly, musicologists today seem generally to agree with the refutation of metaphysical explanations of music either by explicitly accepting psycho-physical parallelism, that is, the monist view of “the mental world as an epiphenomenon of the physical world” (Leman 1993, 155) or by adhering to theoretical frameworks that either comply to non-metaphysical stances or avoid treating the issue altogether.20

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20 Both the older symbolic and the newer nonsymbolic or subsymbolic paradigm of cognitive musicology consider music as a cognitive process. The difference between the paradigms lies in beliefs regarding what kind of representative system music is. The division corresponds to the more general division between symbolic and subsymbolic paradigms in cognitive sciences and artificial intelligence research.
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According to Mauri Kaipainen (1994, 15), the fundamental assumption that “music is regarded as a process of the human mind” implies that “there is no manifestation of music without cognitive involvement” by cognizing organisms engaged in the process. Being a process, music does not exist as static objects, although objects are involved in the process. Since music “unfolds in time”, and the process is driven “from mental states to others”, the nature of the musical process is inherently dynamic (ibid., 20). The dynamics of the musical process may or may not involve others, but, in any case, music “can always be characterized as knowledge interaction between an individual and her/his sonorous environment” (ibid., 23).

Interaction between organism and environment is a complex process, and “the subsymbolic account sees perception and cognition as the result of dynamic interaction of very complicated and connected mechanisms. ... Percepts and concepts are conceived as attractor points, that is, stable points of the system state, the meaning of which should be understood in terms of interaction with the environment” (Leman 1993, 156). According to Leman (ibid., 157), the interaction between the organism and the environment is the starting point for all knowledge at higher levels. “The model of a cognitive process is therefore in fact also a model of the environment in which this cognitive process operates.” (idem).

As a rough generalization, it may said, that ethnomusicologists (or anthropologists of music or music ethnologists), too, tend to share the view of music as a real and dynamic process, although the starting points for research are to be found in the cultural and social aspects of music. Nevertheless, the cultural emphasis needs not be in contradiction with the naturalist view of how music is real.

According to Alan P. Merriam (1980/1964, 21),

[t]he central concern of cultural anthropology is with what is called ‘culture.’ Man moves in time; that is, he has a sense of the past, the present, and the future and he is intellectually aware of himself as existing in time. From man’s standpoint, so do all other animals, though it is doubtful that we can attribute an intellectual time sense to them. Man also moves in space, and this he quite obviously shares with all other living organisms capable of movement. Man moves, too, in society; he identifies himself with his fellows and cooperates with them

For representatives of the symbolic paradigm of cognitive science, see e.g. Chomsky 1957; Newell and Simon 1972; Fodor 1975, 1981; Fodor and Pylyshyn 1988. For representatives of the subsymbolic or nonsymbolic paradigm, see e.g. P. S. Churchland 1992; Searle 1990, 1992; Smolensky 1988, 1991; see also Loewer & Rey 1991.

21 Mauri Kaipainen, among others, emphasizes the temporal aspect of music and deemphasizes the spatial, so to say, or objectual aspect. However, he describes process as a “continuous flow of activity within a set of constraints” (Kaipainen 1994, 20). A key argument of this book is that the constraints of the activity can be approached in terms of spatiality. In a sense, then, we are looking for a balance between the temporal and spatial emphases, perhaps even reconciliation of the seeming discrepancy between temporality and spatiality in music.
in maintaining his group and assuring its continuity. But man is not unique in this respect either, for other organisms such as ants, bees, and the higher primates also arrange themselves into societies.

Even the unique (or perhaps not so unique) human culture, or “man’s cumulative learned behavior” (ibid., 21), may be seen as folding back to “the basic needs of the human biosocial organism” (ibid., 23).

According to Merriam, musical sound is “the end result of a dynamic process” (Merriam 1980/1964, 145), in which “music sound feeds back upon the concepts held about music, which in turn alters or reinforces behavior and eventually changes or strengthens music practice” (idem). Accordingly, wrote Merriam (ibid., 27), “music cannot be defined as a phenomenon of sound alone, for it involves the behavior of individuals and groups of individuals”.

Hence Serafine, Merriam and Kaipainen, among many others, share the view of music as a real, dynamic process. Indeed, the idea of music as a process of interaction, instead of merely an (actual) object, is largely accepted in contemporary musicology. While there are differences as to how much emphasis is given to considerations of realism, few seem directly to oppose the stance that music is a process that is a subset of our cognitive or semiotic processes.

2.2.2 Music is communicative

Since “music cannot be transmitted or have meaning without associations between people, music is a process of communication”, as John Blacking (1977/1973, x) put it. Besides subjects as transmitters and receivers (or whatever terminology of communication theories you choose for participating subjects), communication also requires a medium that is accessible to the participants. Let us consider the mutual roles of the two factors of communication in the musical process: sound and subject-organism.22

As far as music is regarded as communication, what is actually shared or transmitted is not music, nor its meaning or content, nor a subject’s emotions, expressions, or thinking. Instead, sound and sound alone is the thing operated upon and acces-

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22 Naturally, musical communication can be modeled as consisting in many more than just two components. The emitter or enunciator, the recipient, the codes of the two, the channel in addition to medium, social and cultural milieux, noise or disturbances on the message etc. Yet, the core of the communication can also be simplified to two components, as implied by the framework presented in the first part of this study. Of the many alternative theories or models of communication (for which in general see e.g. Mortensen 1972, 2007), one could in this context head toward Peircean semiotic theories or models (see e.g. Bergman 2000, 2004; Colapietro 1989; or Brier 2006), but for now the focus is not generally on communication and semiosis but only on communication as one feature of musical semiosis.
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Music is a mental process sible to the organisms and thereby to subjects participating in musical processes. Of course, the organism may also have access to any actual object that resides in the subject’s environment. And clearly, the visual, haptic, and other modalities of communication have their effect on the perceiving subject, but this is where the line is now drawn as far as we are dealing with the process of music: operations that involve interaction with sound.

How sound is perceived and experienced, what the vehicle of communication might convey, or with what expectations of interpretation sound may be loaded, are strictly speaking another issue. These matters of encoding and decoding form the crux of musical semiotics. True, music-related communication involves oftentimes verbal instructions, notation or other representation, but in each case the use of the representation (e.g. haptic gestures, reading a score or playing back a recording) requires deciphering the representation or elements of it into actual sound, at least once, in order to be communicative as a musical process. For the sake of clearness, brevity, and method, therefore, let us approach the issue in terms of production, perception and experience of sound alone, and address the other representations of musical sound, such as teacher’s or conductor’s gestures, notation, or software instructions on another occasion. Furthermore, it should be noted that the word ‘sound’ does not here refer only to a single sound, a tone or a sign, but rather, to any conglomeration of more or less complex sounds of various durations.

According to Mary Louise Serafine, “sound appears to be neither necessary nor sufficient for the occurrence of music”, but instead, music’s defining characteristic is that “it involves a particular set of thought processes. Moreover, these processes operate in part on the domain of time, not sound, and in part in a more abstract, even formal, domain. Music sound, however, arises more as a consequence or by-product of musical thought than as the stimulus of it or the raw material on which it works” (Serafine 1988, 25).

What is disturbing in Serafine’s line of thought, is that it emphasizes the distinction between mind and the actual world, thus reinvigorating the traditional mind-body problem of philosophy. Thought processes certainly are, in the final analysis, defining characteristics of music. But I would not go that far in dismissing the role of sound: it may be that in some particular instances sound is “neither necessary nor sufficient for the occurrence of music”, but the ability to interact by means of sound (by perceiving, possibly by acting upon it, too) certainly is a necessary condition for music. The habits of action for the production of sound are necessary, but the instantiations of those habits need not always take place. This condition can only be reached if sound is actually operational in the process, to the degree that habits can emerge. Musical thought processes cannot exist without interaction with sound.
For example, a skilled score reader may hear the sound of the performing forces in her imagination, *in her head*, as it may be referred to. But this skill has required practicing, learning, imagining, and trying out *with actual sound* before it has become possible. The musician needs to be experienced enough to be able to imagine the action of sound production and perception of sound. And the necessary experience accumulates only through the actual interplay of action and perception, during the whole development of the organism-subject.

As far as the alleged dichotomy between thought and actuality is concerned, semiotically speaking the category of thought “does not by itself constitute reality, since this category ... can have no concrete being without action, as a separate object on which to work its government, just as action cannot exist without the immediate being of feeling on which to act” (CP 5.436).²³

Sound forces itself on the organism’s perceptual apparatus. Perception of sound results in an effect on the subject’s future action, which in turn may or may not produce sound. Conversely, any experience, whether originating in sound or not, may result in the action of producing sound (see fig. 4 in chapter 1.3.4). Parallel to action and perception in semiosis at large, then, there are two aspects of musical semiosis to be considered: *musical action*, in which sound (or an externalized representation or set of instructions thereof) is produced, and *musical perception*, in which sound is perceived. Both of these are subsets of corresponding aspects of semiosis at large, of action and perception, correspondingly.

This needs clarification, since obviously not all perception of sound is musical, and not all production of sound is musical. What distinguishes musical interaction from non-musical interaction between organism and sound? Evidently musical sound needs to have certain features or characteristics that distinguish it from non-music. As especially the ethnomusicologists have repeatedly pointed out, the question cannot be solved by analysis of the acoustic criteria of musical sound alone. According to John Blacking (1977/1973, 30–31), the surface structure of music “cannot be explained adequately as part of a closed system without reference to the structures of the sociocultural system of which the musical system is a part, and to the biological system to which all music makers belong”.

This is where the synthetic view of esthetic and practic, based on Peircean semiotic and Dewey’s conception of art, may come in handy (see chapter 1.3.4). John Dewey’s notion of *an experience* was utilized in chapter 1.3.4 to outline a pragmatist conception of art. To recapitulate, according to Dewey, in an experience, there is

²³  This, according to Peirce, is what sunders pragmaticism from Hegelian absolute idealism (see chapter 1.2.5; CP 5.436). Pragmaticism vigorously denies that the category of thought suffices to make the world. At the same time, naturalist pragmatism works towards dismissing the mind-body problem by emphasizing the logical connection between the actual world and the phenomenal world.
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a flow from something to something, with a satisfactory solution, closeness to a consummation as opposed to cessation, a sense of unity. An experience is formally characterized by continuity, cumulation, tension, conservation, anticipation and fulfillment (LW 10:143, 149). An experience is demarcated from other experiences in the general stream of experience when “the material experienced runs its course to fulfillment” (LW 10:42). An experience does not end when the sound stops, but “only when the energies active in it have done their proper work” (LW 10:47). Consequently, in the pragmatist framework, as far as perceived sound is music and music is art, the perception of sound results in an experience as described by Dewey. At least for the sake of argument, let us for now assume that music is art, in Dewey’s meaning of the word.

Dewey described only the formal characteristics or narrative development of an experience. He did not go about analyzing the process of artistic experience in detail in terms of semiotic theory. This calls for elaboration at some point. But for now it suffices to notice that musical perception is a special case of perception of sound, in which there is an experience in Dewey’s sense, a certain kind of consummatory experience of transition from tension to fulfillment.

According to Dewey, again, what delivers the contents to the satisfactory solution of the flow, consummation, or fulfillment is the act of expression (LW 10:67). As noted earlier (in chapter 1.3.3), something may be experienced as esthetic—as an experience—regardless of whether it was intended to produce an esthetic experience or not. There is always a possibility that the end-in-view in the act of expression is different from the actual end or outcome of the action (LW 13.216). In other words, the experience of the sound produced by a musician or by someone else may be more or less different from the intended. A chance birdsong may perhaps be experienced as music, or accidental railroad noise, too, for that matter. The birdsong experienced as music may have been intended as a courtship or recognition signal. The railroad noise may have been altogether unintended. Misunderstanding may take place in any interspecific or intraspecific situation. While the tail movement of a dog denotes friendship, in a cat it denotes hostility, and in the case of a horse merely the presence of flies (Sebeok 1972, 131).

However, those are inadvertent situations. As far as communication is concerned, it may well be assumed that the more accuracy, the better. It appears contrary to the naturalist starting point to assume that the failure of intended communication would in the long run be somehow beneficial for the participants, and only exceptionally might one expect some benefit from it. Communication tends to suffer when it becomes distorted. Any communication process that constantly fails to convey the intention will not, in all likelihood, last long in the competition of natural evolution.
In short, while accidental esthetic experiences cannot be ruled out (and there is no need to do so), an intended, purposeful and designed act of expression is more likely to be efficient in producing an experience.²⁴

Hence while defining music as organized sound is insufficient, it is certainly on the right tracks. In music, sound is organized in particular ways in order to affect the listeners. There may be happy coincidences, but usually the effort of organizing produces information. But it does not follow that the information would be in any way useful in itself (cf. e.g. Wiener 1965/1948, 11). Based on the pragmatic maxim, conceiving the practical bearings of the organized sound transforms that information into experience (or knowledge). Regardless of the simplicity or complexity of the organization, the sound needs to be perceived in suitable ways in order for an experience to be brought forth.

The possibility of creating a musical experience increases and the chance of misunderstanding diminishes if the musician, who produces the sound, manages to imagine, how the action of expression might be perceived and experienced by others. Action becomes musical action if and only if that action yields an experience by means of sound as the vehicle of interaction. Therefore, and as accuracy in musical communication indeed seems to be a factor, musical action cannot be limited to musical poiesis alone, that is, to considerations of the habits of action underlying the production of sound alone, with no regard to how the sound may be experienced or what kind of conceivable effects the sound may have. Defining music as organized sound is insufficient.²⁵

Contrasted to musical poiesis, musical praxis is goal-oriented and voluntary action, which is good for something beyond producing sound. While musical poiesis is concerned only with the production of sound and not beyond, musical praxis is continuously connected with the practical exigencies of life: what conceivable practical bearings the sound has when experienced. Musical praxis is guided by phronesis, practical wisdom, thought, and judgment concerning the consequences of the purposeful or intended activity. (See chapter 1.3.1.)

Since phronesis is about “what is good for men in general” and musical praxis is the goal-oriented act of expression, musical praxis has a target of one or more

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²⁴ The “accuracy” of communication does not here refer to the question of whether or not references in music are accurate (as in words, especially in proper names). Here, the concern is to what degree particular sounds (or settings of sounds) are experienced similarly among different subjects.

²⁵ Despite the wording here, it is hardly the task of a lone musician to single-handedly develop the necessary abilities or habits of action. It is more likely that larger and smaller groups of people (thus forming musical cultures and subcultures) develop into having their specific ways of understanding—or interpreting—the particular sounds and situations related to music. Still, each of us, living in the actual world and our own local (sociocultural and natural) circumstances of it, more or less possesses the ability to anticipate the ramifications of our actions.
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subjects, potentially even all the subjects of the community. In terms of musical processes, then, praxis is the active aspect of composition or performance process which is concerned with how the sound effects the audience, the listener. In other words, musical praxis is the action involved with musical expression as opposed to action involved with musical technique. This is fitting, since in the Aristotelian setting techne is the knowledge that underlies poiesis. Yet, musical praxis necessarily involves musical poiesis, production of sound, directly or indirectly. And correspondingly, musical phronesis requires musical techne, since there needs to be the ability or knowledge to actualize the sound. 26

Let us illustrate this with a fictive example, and assume subject A, who produces sound, which can be perceived and experienced by subject B. If A produces the sound with no regard to how it might be perceived (as in poiesis without praxis), there is evidently little chance that the sound would develop into an experience in B’s perception. A good praxis would be to imagine how the sound is perceived, or rather, to produce the sound in such a manner, that it would with all likelihood result in a wanted experience. Hence praxis requires the ability, the intellectual virtue of estimating, imagining, and simulating patterns of perception and action of others. And most probably, the only way to develop that kind of ability is that A first develops such patterns of perception, that the sound develops into an experience in her own perception. Only then may A well begin to hypothesize how others may experience the sound. In short, musical praxis requires musical competence (see Stefani 1985).

The abductive production of sound by A may take place in such a manner that it potentially produces same kind of experience in B as in A herself. Conversely, even if A does not hypothesize about B’s habits of perception, but only relies on her own, B may in turn learn how A might experience the sound. In either case, one subject has learned something of the other’s ways of being in the world. But clearly, learning other’s habits of perception can only take place by means of interaction, and if mutual it requires feedback. In other words, there needs to be action involved, too, whether musical or not. This potential to share ways of experiencing by means of sound apparently forms the basis for the celebrated social aspects of music, especially for the power that is often found in making music together. Having become familiar with each other’s ways of experiencing, subjects may create and recreate situations that will be experienced in wanted manners thus creating or enforcing common identity between participants in the process. If the essence of a subject (as opposed

26 Note that the term audience here is not limited to concert audience but to any situation of musical processes: even a composer sitting alone in his studio is his own audience at the time of composing. In this sense, the listening process is always present in the musical composition process, in one way or another.
to organism) is in the ways the subject perceives, thinks and acts, knowing how others perceive and experience is paramount for knowing others, and consequently for adapting to the community, and for becoming a subject with social processes of interaction. In other words, know my music, and you know me.27

Two remarks follow. First, since the ways of perceiving and experiencing are as complex as they are with humans, regardless of the effort made, it is most likely impossible for anyone to accurately learn other’s ways of experiencing. Music is not a universal language (see e.g. Merriam 1963, 209; Merriam 1980/1964, 10), and it even makes sense to cultivate the concept of musical idiolects (Nettl 1983, 46). But if music is communicative, it does provide a means of sharing aspects of each other’s phenomenal reality. Any subjects living in similar circumstances, including not only physical surroundings but organisms’ and subjects’ circumstances as well, are likely to have similar ways of experiencing. In that sense, there is no reason to rule out the possibilities for rudimentary forms of musical universals, if that is taken to mean similar ways of perceiving and experiencing certain aspects of sound. From that core of natural similarity, our biosocial continuum spans to cultural diversity. (See also Nettl 1983, 15–51.)

Second, musical communication need not be intersubjective. That is, subject A and subject B may well be the same organism, and music hence may be autocommunicative. The subject may, for instance, recreate or modify an earlier experience, knowingly or unknowingly, for the benefit of experiencing it anew. As suggested by e.g. Mauri Kaipainen (1994, 24), the whole process of music can be thought of as autocommunication, since “even interindividual communication can be reduced to knowledge dynamics [of] the individual and the world”. This methodological solipsism does not need to lead to underestimating the cultural, social or intersubjective aspects of musical processes. There simply is no direct epistemic or causal connection from one subject to another. The others are, in any case, presented to us by means of actual objects in the actual world, either as traces of action by others, or as organisms of the others. To assume this is not the case means resorting to metaphysical explanations.

In practical terms, it may be taken for granted that a composer needs to perceive the sound herself in order to be able to estimate how others might perceive it. An alternative compositional strategy might consist in forgetting about the perceptual features and to focus only on poiesis, in which case the probability of reaching an experience appears quite random or accidental. This alternative strategy would evidently be disastrous in natural and cultural evolution.

27 In Merriam’s words: “music is a means of understanding peoples and behavior and as such is a valuable tool in the analysis of culture and society” (Merriam 1980/1964, 13).
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Figure 5. The aspects of general and musical semiosis as far as the subject’s operation is concerned, as depicted based on the synthetic view of esthetic, practic and semiotic (ch. 1.3.4).

In terms of the synthetic view of esthetic, practic and semiotic in chapter 1.3.4, the aspects of the subject’s operation in a complete musical process are about to be put together.

It appears, that on the subject’s behalf music involves 1) esthesis, or the habits of feeling; 2a) poiesis, or the habits of manufacturing, making or producing sound; and 2b) praxis, or the habits of doing, the practice of goal-oriented activity, which is good for something beyond manufacturing a product, namely, concern with affecting the audience (see figure 5).\(^{28}\)

The activities of poiesis and praxis cannot take place without the corresponding or underlying practical virtues of intellect. Hence a complete musical process also involves, as underlying capacities attached to poiesis and praxis, correspondingly, 3a) techne, or the knowledge concerning making of the sound; and 3b) phronesis, or the ability of expression. These abilities develop in the process of interaction, in the process of shaping and reshaping, in which esthesis is the key to the revision of action. Thus it is appropriate that phronesis and techne are, according to Aristotle, knowledge of the contingent, intellectual virtues that “deal with things that are variable” (NE 1140b).

The picture is not complete without consideration of the remaining, speculative virtue of intellect. It may be debatable whether or not complete musical processes necessarily involve 3c) sophia, which in the case of music would briefly put mean wisdom regarding ulterior and fundamental problems of music, metaknowledge about the musical process itself. It seems that, if sophia is not a necessary condition for operational process of music (depending, of course, on the conception of

\(^{28}\) The wording ‘complete musical process’ refers to a musical process in which the subject participates in all aspects of the process, namely action, perception and thought. That includes musical composition, improvisation, performance, conducting; but excludes e.g. both musical reception or listening without musical action, and any action on sound with no regard to the perception of sound produced.
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music), its role nevertheless may well be of the utmost importance, depending on the character of the musical process and on how the subject participates in it, and especially in mediating the musical skills, knowledge or wisdom to others, whether to contemporaries or to the youth of a society.

Namely, as pointed out in chapter 1.3.4, values regarding what is good and bad are involved in praxis, and in phronesis as its underlying knowledge. In answering questions of good and bad, phronesis is governed by sophia, knowledge concerning perennial questions. If the dividing line between musical and non-musical phronesis is thin, it is even thinner between sophia in general and musical sophia in particular. Sophia, as outlined earlier, grows from the subject’s experience, and especially from the fallible imaginative ability. From that perspective, it is easy to regard sophia, when applied to music, as knowledge concerning perennial questions of not only music, but of life in general, e.g. akin to personality, world view, message, creativity, or that which Nettl (1983, 30–32) calls added versus given. The given, then, would comprise phronetic and technic knowledge. Fittingly, to Aristotle sophia also meant excellence in art. This may well lead to identifying the artistic in music or in other arts as a successful combination of sophia, phronesis, and techne.

Theoria, the activity corresponding to the intellectual virtue of sophia, can only be actually manifested through praxis or poiesis, through the manipulation of actual objects. In summary, then, and parallel to semiosis in general, musical semiosis may be thought to involve three kinds of knowledge (sophia, phronesis and techne), two kinds of action (praxis and poiesis), and one kind of perception (esthesis). This is again in concord with Peirce’s phaneroscopic categories. The practic relies on the esthetic, and the semiotic both on the practic, and on the esthetic. The semiotic process in general connects esthesis of actual objects with action on actual objects. And in music, the actual object interacted with is sound, the vehicle of musical communication.29

2.2.3 Music is representational

According to John Blacking (1977/1973, x), “the sound object in music is about something, it represents. It needs someone to produce it, and someone to experience it.” This holds regardless of the impossibility of accurate estimation of

29 In terms of Peircian phaneroscopy, musical esthesis is a First of Firstness, musical poiesis a First of Secondness, and musical praxis a Second of Secondness. Similarly, musical techne is a First of Thirdness, phronesis a Second of Thirdness, and finally sophia a Third of Thirdness. See chapter 3.2.1. The musical processes are not distinctly or hermetically separated from semiosis in general. Rather, they are only characterized by these specific features. The distinction here is primarily conceptual, in the sense that it is intended to assist in the inquiry on actual musical processes, particularly that of composition.
reception and the constant possibility of misunderstanding. Sound is the vehicle of communication in musical processes. It conveys something, it stands for something, for someone. As already noted, it is beneficial, or even necessary, that the composer, performer, or other musician acting upon or producing sound can estimate how the sound would be experienced, what kind of consequences this or that action yields.

But in actuality, no composer can estimate all the different ways the produced sound is experienced. Yet conversely, there is always an audience whose habits of perception the composer is extremely familiar with: the composer herself, if nobody else. If the composer has something to share with other people (that is, possibly some personal wisdom concerning perennial questions i.e. sophia, or Nettl's added; or possibly the more or less conventional habits of musical action, or Nettl's given), similar experience of sound becomes desirable, and misunderstanding undesirable. Consequently, then, good musical praxis on the composer's behalf becomes essential, and the practical wisdom of phronesis as “a reasoned and true state of capacity to act with regard to human goods” (NE 1140b) becomes a necessity.

Whether sound acts “with regard to human goods” or not is shown in the feedback, in the action instantiated by the listeners, including the acting musician herself. This of course may take place directly or indirectly, in different ways, at different times and places. Nevertheless, consequent adjustment does take place, more or less, as a result of the practical bearings the sound has had at that point. Alan P. Merriam noted (1980/1964, 33):

The product [of sound], however, has an effect upon the listener, who judges both the competence of the performer and the correctness of his performance in terms of conceptual values. Thus if both the listener and the performer judge the product to be successful in terms of the cultural criteria for music, the concepts about music are reinforced, reapplied to behavior, and emerge as sound. If the judgment is negative, however, concepts must be changed in order to alter the behavior and produce different sound which the performer hopes will accord more closely with judgments of what is considered proper to music in the culture. Thus there is a constant feedback from the product to the concepts about music, and this is what accounts both for change and stability in a music system.

Although Merriam spoke of the performer, the same applies for the composer of music. Merriam also puts greater emphasis on the activity and adjustment of a conceptual system by the musician rather than the listener. Does the musician need to adjust to the criteria of the listener? Does not the listener also adjust her behavior, concepts and ways of experiencing? How are the criteria of the musician and the listener different? Are not the criteria assimilated, more or less, every time we experience music? It may indeed be a continual learning process for both, although
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perhaps not often in equal ways. And what is learned in the process, tells us something about something.³⁰

Phronesis, the practical wisdom that enables us to estimate and imagine situations, does not consist in sets of guidelines for expression, stylistic dogmata or other compositional or expressive techniques as explicit rules. Such formulations may be extracted from practical wisdom, and are often done so for educational or other purposes. However, as such, these extractions give an incomplete picture of phronesis. In Wayne Bowman’s words: “Phronesis is not just knowing-how, then, but also knowing-when, knowing-whether, knowing-to-whom, knowing-how-much, and knowing-in-just-that-way. It is situationally-specific and situationally-relative, such that the agent must decide each course of action on its own merits – without resort to the kind of generalized knowledge that legitimately prevails in technical and theoretical fields” (Bowman 2000, 100–101). As musical praxis is revised and reshaped (as described in the quote of Merriam earlier), phronesis can be understood as the subject’s control of revision in the (more or less) exhaustive period of “shaping and reshaping” (LW 10:56 and MW 6:136; see chapter 1.3.4). It is an ongoing process, “experience- and character-driven, a function of who one is” (Bowman 2000, 101).

Since the process of shaping and reshaping is guided towards desired ends, it is always autocommunicative, although not necessarily only that. The composer-musician is constantly present in the process as a perceiving and acting subject. As a sequence of instances of action and perception, the process may be only autocommunicative, if the modification of the environment is not shared with other subjects at that point. But ordinarily, the modification of the environment by producing sound is always more or less shared with other subjects, directly or indirectly, since the other subjects are essential for the subject’s being in the world. The other subjects that inhabit the environment as organisms, constitute an important part of the environment with which the subject interacts. They have access both to the modifications of the environment directly, and to the practical bearings the modifications have on their subjects. Reciprocally, the actions by other subjects modify the actual world

³⁰ Although the word ‘composer’ is strongly attached to the tradition of Western art music, here the term refers to anyone initiating musical semiosis by producing musical sound or by uttering instructions for doing so. The composer therefore may be an improviser and even a performer, as far as the performer’s own contribution to the process, as opposed to a hermeneutic attempt to recover or discover the ways of experiencing intended by someone, is concerned. Consequently, ‘composer’ could also be labeled in a more cumbersome way ‘composer-musician’. This leads to a deconstructionist topic of analyzing who really is the composer. The beginning of section 2.3 returns to the issue of composer versus performer.
³¹ The period of “shaping and reshaping” does not refer only to the situation of a composer simmering down an idea before acting it out, but to the development of musical competence in general, i.e. the particular situations of composing, singing, playing or other musical action.
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accessible to the subject. In addition to being organisms and objects of the actual world, other subjects belong to the functional organization of subject. Intersubjectivity is unavoidable, while methodological solipsism still remains valid.

Phronetic control is at the subject’s disposal by virtue of accumulated experience and competence of imagination, and due to the possibility of relying on the success of experience-based action, which allows the subject to make predictions about the future and to act accordingly. The control, as already suggested, takes place either directly between the sound and the subject herself (autocommunication), or indirectly by means of sound (or representation of sound) and other subjects, or both. In music, the phronetic process of adjusting “shapes and reshapes” musical praxis. In reshaped praxis, the subject’s action then modifies the actual world so that the resulting sound, when perceived and experienced, more and more corresponds to the situation imagined by the composer-musician.32

The shaping and reshaping take place in many scopes, from particular instances of action (say, pitch level of sustained tone or narrative continuum of a performance) to general habits (stylistic treats of specific cultures or subcultures, eras or periods of time). They may also be thought to take place in three major temporal perspectives: it is partly the story of the acting organism’s and subject’s development, and partly the story of the development of particular events of action and perception. The former take the form of habits; the latter are instantiations of habits. The third possible perspective is the intersubjective, socio-cultural development, operating by means of signs and shared experiences, shared meanings. Again, the last one can be thought of as folding back to individual semiosis and interaction with the environment inhabited by other subjects, as long as methodological solipsism is accepted.

By virtue of shaping and reshaping, the actual reality is modified towards a virtual reality: the sound in the actual world is modified so that it could be perceived as a particular intended situation. Sound in music is virtual, in the sense that it is purposefully instantiated for the benefit of producing a wanted experience, and the perceived situation would not otherwise occur. It is as it is owing to the subject’s process of producing it. (Cf. chapter 1.2.6.)33

32 Actually, once the subject has formed habits of this process, it is possible to pursue this phronetic control without the modification of the actual world. For instance, a composer might have the habit of “composing in the head”, i.e. reviewing the action without actually producing sound. However, this habit is possible only if the habit is originally formed, one way or another, by the controlling of actual sound production.

33 Since the term ‘virtual reality’ has become inflated, it is necessary to point out that the virtual reality of music is often thought of as not being true virtual reality since it lacks immersiveness. In truly immersive VR, the subject is perceptually deprived of the actual reality, ideally in all sensory modalities. This would open an avenue for lengthy discussions on technical imperfections of immersive VR techniques, reports on oceanic and other immersive experiences within music, and issues such as synesthesia.
As the experience of sound corresponds to the imagined situation, the virtual reality of music gravitates towards becoming real for the subject. The conceived changes in the hard facts of the sound environment eventually do not contradict the conceivable changes in the representation of the actual world. If the sound being perceived is too complex, too simple, or otherwise incompatible with the perceiver’s habits of feeling, thinking and acting, the experience cannot become an experience, it cannot become real for the perceiver. In that case, the sound is not experienced as music. Generally speaking, the logic of the virtual reality in music seems compatible with the conceived logic of the actual world. And by virtue of this compatibility, it is possible for music really to stand for something.\footnote{It is assumed, that the virtual reality in music (that is, the sound as perceived) is more or less coherent in terms of its events being logically related to each other. This may be the essence of the concept of style. Whether there may be some kind of unified core of musical logic, what the core of the particular logics of musical styles might generally be, and whether or not the logics of the virtual events somehow correspond to the logics of the actual world, are main questions of this book. We may agree to use the term ‘virtual’ or not, but John Blacking chose that term to elucidate an important, if not the main function (in Merriam’s terms) or use (in pragmatist terms) of music: “We may say that ordinary daily experience takes place in the world of actual time. The essential quality of music is its power to create another world of virtual time.” (Blacking 1977/1973, 27; see also idem, 50–51) This does not need to be an escape from reality, since, for instance, even the music of the Venda “is an adventure into reality, the reality of the world of the spirit” (ibid., 28).}

In musical semiotics there is no need to embark on a detour into doubly articulated representation as might be necessary in linguistic semiotics. I believe that the kernel of the representative character of music (and possibly of many other arts, as well) may be found through the concept of virtuality, and that in music, the logic of that virtual reality is founded on musical spatiality, the concept of which we shall return to later.

This does not mean, however, that the perceivable characteristics of music and those of the actual world would correspond to each other in a straightforward manner, as suggested by the simple understanding of the doctrine of musical mimesis. Admittedly, sometimes we may find characteristics that are describable as one-to-one mappings between musical sound and the actual world or nature (the so-called iconic signs in music, such as cuckoo or other bird song idioms), but more often the virtuality is manifested by means of more abstracted, complex, heterogeneous and multifaceted metaphor, analogy, similarity, or isomorphy.\footnote{The metaphor theory by George Lakoff and Mark Johnson (Lakoff and Johnson 1980; 1999) and the concept of metaphor play an important role in this book. That role is taken up in chapter 3.1.2.}
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with notions of amodal perception, conesthetic organization, and archaic processes of signification. In the early stages of ontogenic maturation, our sensory systems are undifferentiated, which allows for transition or fusion of experiential references and representations across and regardless of different sensory modalities. Stern (1985, 51–57) refers to this as amodal perception, and Spitz’s notion of conesthetic organization essentially refers to the representation or experience that is based on amodal or conesthetic perception (Spitz 1965, 44–).

Following the psychoanalytic theories of Freud and his successors, the term ‘archaic’ in this context refers to “the preverbal modes of dealing with the world, with modes of experiences and perception that pre-exist language and capacity for verbal, rational, and logical thinking.” (Välimäki 2003a, 251). Once the secondary process is established, the two processes exist simultaneously, although in many cases the verbal or rational secondary process may inhibit or suppress the primary process.

According to Spitz, the Western world emphasizes the diacritic organization, that is, the secondary process of signification. “Our deeper sensations do not reach our awareness, do not become meaningful to us, we ignore and repress their messages. Indeed, we are fearful of them and we betray this fear in many ways.” (Spitz 1965, 136). Those that have retained the capacity to make use of conesthetic perception and communication (or primary process), “belong to the specially gifted. They are composers, musicians, dancers, acrobats, fliers, painters and poets, and many others, and we often think of them as ‘highstrung’ or labile personalities” (idem).

Psychoanalytic musicologists tend to locate the core of musical signification in the primary process, the conesthetic organization, the symmetrical mode of being, or the semiotic chora. Perhaps more accurately, the core might be found in the dialogue between the primary and the secondary processes, enabled in musical semiosis. The primary process predates the conscious secondary process with the verbal, propositional, rational, and the syntactical. It also continues to underlie and complement

36 This refers to the possibility of synesthesia, or conesthesia, as Spitz put it. For the emerging subject, the sensory modalities are by no means differentiated until later phases of childhood development. At the fetal stage, the sensory system is more or less functional already prior to and during physical maturation. The differentiation between the sensory organs, and the phenomenological differentiation of the perceived takes place even later. The ability to overcome or to avoid the boundaries between sensory modalities seems to be of great importance in musical processes.

37 The juxtaposition of the two modes of signification is central to psychoanalysis, and they are referred to, somewhat synonymously, as primary process versus secondary process (Freud 1900, S.E. 4–5), conesthetic versus diacritic organization (Spitz 1965), symmetrical versus asymmetrical modes of being (Matte Blanco 1975), or semiotic and symbolic modality or dimension (Kristeva 1984/1974). As the Finnish musicologist Susanna Välimäki has noted, in applying Eero Tarasti’s notions of (1998a) post-colonialist semiotics, it can be stated that the rational system colonizes the archaic system. (Välimäki 1998, 374.)
the secondary process during the hegemony of the latter. Reciprocally, the secondary process cooperates with the primary process in musical situations, for example, by providing the circumstances in which conesthetic perception is allowed or may take place (such as concerts, ceremonies, rituals, etc.). There cannot be one process without the other, in general, neither for a socially operational human psyche, nor for those participating in musical processes of human societies. However, an important question, particularly in psychoanalytic musicology, concerns the balance between and the role of both processes in music, and particularly, how music operates within the primary process, assuming that it is essential for musical signification.

That assumption relies on the characteristics of conesthetic organization. By virtue of the underlying amodality of perception, perceptions and habits or schemata of perceptions can be transferred from one perceptual modality to another. In that way, perceived sound can stand for perceptions in other modalities, and consequently, the subject may relate theoretically any experience with the experience of sound, both in esthesis and in praxis.

As a representative of cognitive musicology, Mauri Kaipainen (1994, 21), too, subscribes to “musical holism”. While his notion of representation as “our internal states” is in conflict with the current pragmatist view (attempting to overcome the mind-body dilemma), he agrees, that musical representation must be based primarily on the input of the auditory modality, but also vision, somatosensory and motor information, representational states generated by the brain, and possibly other internal states (e.g. hormonal) – altogether forming a holistic configuration of features that defines the coordinates of the music-cognizer in the virtual experiential space, present in parallel at any given moment.

Corresponding with the notions of shaping and reshaping imagined and perceived situations, Kaipainen calls these holistic configurations “musical situations” (1994, 21; see chapters 2.1.6 and 2.1.8).

Consequently, “music may function as a microcosm of life” (Välimäki 2003a, 254). In music, sound is created in such a way that when it is perceived, the perception is somehow isomorphic or analogous with perceptions of other significant situations. In this manner, according to the predominant paradigm of psychoanalytic musicology, “music presents and represents functional structures of psychic processes” (idem; see also Rechardt 1987; 1984).

Usually in the interaction between subject and environment, it is the subject’s representation that needs to be adjusted, compelled by the hard facts of the actual world. But what is special about the musical situation, is that in shaping and reshaping sound in musical praxis, and in experiencing the sound, both the hard facts of the sound and the representation are adjusted towards the wanted situation, until
the experienced situation is “true” to the imagined situation. We can make—or I
dare say, create—such situations, that are experienced as wanted, assuming we have
the technique, the techne needed for that poiesis. This is, of course, not true for the
actual world: we cannot force the actual world to behave exactly as we wish.\textsuperscript{38}

In music, the actual reality (in terms of sound) is modified as desired, and the
modified situation attempts to re-present the intended, the imagined situation, as
through revision the experience (hopefully) begins to comply with the intended.
For the composer herself, at least, the compliance ought to be feasible. The sound
in the actual world then stands for the imagined situation. Thus music is represen-
tational.\textsuperscript{39}

Once the modified situation (of sound in particular) is shared with others, the
imagined situation may be experienced by others, as well. Whether other subjects
experience the situation similarly, is, as noted, a tremendously complex issue. There
have been claims both for and against the existence of musical universals, and both
for and against the notion that musical communication is strictly socially condi-
tioned. In terms of musical \textit{universals}, the current conception is a synthesis: the strict
conception of invariant musical universals is rejected (see Introduction: About this
inquiry and chapter 2.1.2), but as far as universals do exist, they exist as our abstrac-
tions and conceptualizations of the particulars and their common features.

May musical praxis result in such modifications of the environment, that a partic-
ular sound may be experienced in a way common enough for the imagined situation
to be shared by several subjects? If the answer to this is negative, the only possible
state of affairs would be a plethora of musical \textit{idiolects}. Evidently, there is a degree of
both similarity and difference between subjects in each experience, as far as human
subjects are concerned. Consequently, then, the different modifications stand for
the different imagined situations for different subjects in varying degrees.

If music is a process of creating virtual situations and experiencing them, what
kind of situations are created, and why? As far as the surface structure is concerned,
the variety of situations is present in the musics of the world. From the pragmatist
viewpoint, the common denominator for the musics can be found, based on the
pragmatic maxim, in the usefulness of musical praxis. The situations presented or
re-presented in music are \textit{useful}.

\textsuperscript{38} It is too harsh to claim that only the hard facts, i.e. sounds, are adjusted in the process of shaping
and reshaping in music, since the imagined situation hardly remains constant during the process.
\textsuperscript{39} For what is here meant by representation, see chapter 1.2.3. Rather than asking “What does music
represent?” we should ask “What is represented \textit{in} music, and \textit{how}?” If music is a process of action and
experience, more than representing something, it just is, it takes place. Something, though, is represented
\textit{in} that process. And that leads to the question ‘Why?’ (See Benestad 1978, 73.)
2.2.4 Music is useful

Musical semiosis is a subset of semiosis at large. Semiosis, the process of signification in which experience is accumulated and mind constructed, serves a purpose by being useful in the organism’s adapting to and further interacting with the environment (see chapters 1.2.4 and 1.2.6). In the struggle for survival, this process of adaptation has needed all the help it can get. Based merely on the evidence, that music has (so far) survived and flourished in the cultural (and thereby in the natural) evolution, it appears unavoidably useful. The fact, that music is representational, at least in the autocommunicative sense, implies that the usefulness of music is tied to the process of adaptation of organism with its environment.

In this sense, music as a process of action and experience is not an end in itself; rather, it has its raison d’être, as do children’s games or scientific inquiry. John Blacking (1977/1973, 28) described the music of the Venda as “an experience of becoming, in which individual consciousness is nurtured within the collective consciousness of the community and hence becomes the source of richer cultural forms”. From a Peircean perspective, this is reminiscent of the notion of inquiry. Not surprisingly, then, Blacking shared the view that music as a process is not only useful, but “essential for the very survival of man’s humanity” (ibid., 54).

There is a difference between music as a process or biological-cultural phenomenon being a means for an end, and musical action or perception not being a means for an end within the musical process. Musical action and perception clearly become useful through the fact that the whole musical process is useful. When speaking of music or arts being or not being a means for an end, the distinction is pursued between, on the one hand, the instantly gratifying, instrumentalist approach to exploiting musical phenomena in order to gain economic, social, or other advantage regardless of what and how music represents, and, on the other hand, the approach to using music as a means of inquiry on its own terms. In the latter, the reward, which may or may not be instantaneous, is based only on the signifying characteristics of music.

On the other hand, Blacking remarked, concerning the Venda, that only some of the music “is regarded as what John Dewey has called ‘an instrument indispensable to the transformation of man and his world.’” (Blacking 1977/1973, 49). The same may hold in other cultures. Much non-verbal communication by sound is merely signals of social events, and “no less utilitarian than commercial jingles, radio station identifications, some incidental music, and the hymns or songs that are essentially the ‘badges’ of different social groups. Many songs of initiation are more important as markers of stages in ritual or as reinforcements or mnemonics of lessons than as
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musical experiences” (ibid., 50). Blacking distinguished between occasional music that is “simply for having” on the one hand, and on the other, music which is art, music which does not merely exhibit good craftsmanship, but which “enhances human consciousness”, “music that is for being” (idem). This connects with Merriam and the issue of the extramusicality of certain functions listed by him (see below). Whether the utilitarian signals of social events are really music, depends on the definition of music.

Also in this context, the ecological perspective as nurtured in cognitive musicology is in concord with the framework of naturalist pragmatism. The ecological perspective “in general attempts to explain knowing and knowledge in the environmental context of the cognizer” (Kaipainen 1994, 56). As a special case, musical ecologism boldly maintains that “whatever we know about music must ultimately arise causally from the physical environment around us”, and that “there must be some use or function for our musical knowledge in the environment” (idem). According to Kaipainen (idem), music-cognizer is more than “a passive recorder of the sonorous world”, since knowledge representation is used in the construction of perception, and also “to actively cause the world to sound” in musical action.

As a matter of fact, the current theory may be conceived as a kind of play theory of music. Music does not exist for the sake of itself. Rather, the meaning of music is in its use. With no conflict to that, it would probably be more apt to pragmatistically speak of music as inquiry, rather than play, or as process of creating virtual reality.\(^40\)

On the one hand, this rules out the possibility of music as ars gratia artis—art for art’s sake, and nothing more. On the other hand, the idea that the meaning of music is in its use, does not imply a short-sighted, superficial or end-driven view, which might see musical processes valuable primarily in financial or political or even emotional terms, in search of high quarterly return on investment, immediate ideological goal, or other instant gratification (see EW 2:271). Again: the pragmatic maxim includes not (only) the immediate practical bearings but rather the expectation of potential action, all things considered. The pragmaticist “locates the meaning in future time; for future conduct is the only conduct that is subject to self-control” (CP 5.427).

The simple proposition is threefold. The three factors are not to be taken as consecutive phases, but as contemporaneous aspects, various scopes of an integrated

\(^{40}\) It is hardly a coincidence, that in many languages, verbs corresponding to to play are used both for music and for games. These kinds of synonyms can be found at least in French (jouer), German (spielen), Dutch (spelen), Danish and Norwegian (spille), Swedish (spela), Hungarian (játszik), Greek (παίζω), and Russian (играть). Many languages, of course, including Finnish, Italian, Spanish, and Irish (Gaelic) seem to differ in this respect, although the Finnish leikki (for playing games or with toys), for example, appears to share the root with the Norwegian leik (play, game, song, melody). For play theories of music, see for instance Kurkela 1994. For virtuality, see chapters 1.2.6 and 2.2.3.
Space in Musical Semiosis

process. First, in musical praxis, sound is produced (and thereby the actual world modified) in such a manner that the sound stands for imagined situations. Whether those situations stand for situations that subject has actually experienced, situations that subject may actually encounter, or situations that are only hypothetical, does not matter, for now.

Second, in musical esthesis, the brute force of sound compels the subject to experience the sonic changes in the actual world, which more or less results in modified habits of action. Note that esthesis goes on already during the shaping and reshaping of musical praxis, not only in finalized performance, if the two are at all temporally disjunct.

Third, since the modification of the environment takes place by means of sound, it is a relatively safe process, and not likely to be actually harmful. Situations in music can be experienced as if they were situations of actual life. But more than actual, they are virtual, and that makes them meaningful. There is no need to duplicate the actual reality. In music, the sounding reality is modified to somehow stand for such actual situations, which subjects might encounter in life. If the modification is a result of praxis, guided by phronesis (as opposed to poiesis, mere making, manufacturing without consideration of the consequences for experiencing subjects), this process serves as a safe testing ground for real-life and virtual (possible and perhaps even impossible) situations and is therefore useful, i.e. meaningful. One might say that music functions, in a sense, as a research laboratory of actual life.

Research has its methods. Mauri Kaipainen (1994, 22) has indicated, that through its transmuting situations, “music involves the expectation and anticipation of world situations on the one hand, and confirmation or disconfirmation of these on the other”. This view is not only “intuitively acceptable and straightforward” (idem), but also supported by a number of theories applicable to musical cognition and empirical findings concerning musical knowledge. The process of producing musical situations and experiencing them consists in producing and experiencing a changing, more or less complex set of interrelated parameters, that suggest and build expectations concerning the subsequent situations.

The idea of music as inquiry—practical or scientific—seems to be closely related to the origin or development of musical styles. For satisfactory treatment, this topic would deserve a discussion of its own, but re-reading the following quote from CP 7.317 with the idea of music as inquiry might serve as fuel for contemplations on style, culture and subculture, art, ideology, education, business ethics, propaganda, taste, vanguard and tradition as they pertain to music, should music be considered inquiry:
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There is an important difference between the settlement of opinion which results from investigation and every other such settlement. It is that investigation will not fix one answer to a question as well as another, but on the contrary it tends to unsettle opinions at first, to change them and to confirm a certain opinion which depends only on the nature of investigation itself. The method of producing fixity of belief by adhering obstinately to one’s belief, tends only to fix such opinions as each man already holds. The method of persecution tends only to spread the opinions which happen to be approved by rulers; and except so far as rulers are likely to adopt views of a certain cast does not determine at all what opinions shall become settled. The method of public opinion tends to develop a particular body of doctrine in every community. Some more widely spread and deeply rooted conviction will gradually drive out the opposing opinions, becoming itself in the strife somewhat modified by these. But different communities, removed from mutual influence, will develop very different bodies of doctrine, and in the same community there will be a constant tendency to sporting which may at any time carry the whole public.

If *music is inquiry* in Peirce’s meaning of the word, it needs to agree with the other characteristics of inquiry, as well (see chapters 1.2.5–1.2.6). There needs to be some kind of “irritation of doubt that causes a struggle to attain a state of belief” (CP 5.374). Inquiry ceases when a satisfactory state of belief is attained. Although Peirce criticized his own view (see CP 6.485), he identified the settlement of belief, and thereby the state of satisfaction that “is attained with the settlement of belief” (CP 5.564), with truth.

Peirce’s self-criticism points at the difference between the Truth, on the one hand, as “the satisfaction which would ultimately be found if the inquiry were pushed to its ultimate and indefeasible issue” (CP 6.485) and true opinion, on the other, as based on firm belief (CP 5.375): “The most that can be maintained is, that we seek for a belief that we shall think to be true. But we think each one of our beliefs to be true, and, indeed, it is mere tautology to say so.”

The former calls for truth as intended in Peirce’s conditional idealism (see chapter 1.2.5), while in the latter case, truth is more temporary and subjective. Whether by coincidence or not, Peirce’s elaboration on belief, corresponding to the latter case, draws parallels to music (CP 5.397):

*It [belief] is the demi-cadence which closes a musical phrase in the symphony of our intellectual life. We have seen that it has just three properties: First, it is something that we are aware of; second, it appeases the irritation of doubt; and, third, it involves the establishment in our nature of a rule of action, or, say for short, a habit. As it appeases the irritation of doubt, which is the motive for thinking, thought relaxes, and comes to rest for a moment when belief is reached. But, since belief is a rule for action, the application of which involves further*
doubt and further thought, at the same time that it is a stopping-place, it is also a new starting-place for thought. That is why I have permitted myself to call it thought at rest, although thought is essentially an action. The final upshot of thinking is the exercise of volition, and of this thought no longer forms a part; but belief is only a stadium of mental action, an effect upon our nature due to thought, which will influence future thinking.

An objection to this, concerning the parallels to music, might concern the issue of awareness. In the contemporary context, there seems to be no reason to assume that we should necessarily be aware of participating in musical processes (as noted before). At the same time, there seems to be no reason to assume, as Peirce seems to have done, that we should necessarily be aware of our beliefs or our processes of inquiry, either. This holds as long as ‘awareness’ is understood as the capacity to hold something in the focus of attention, or as the ability to report the object of attention.

But Peirce’s conception of ‘awareness’ seems to have been much broader, even universal (see EP2, 472; *An Essay toward Improving Our Reasoning...; MS 682*). For Peirce, ‘awareness’ embraced the whole operation of mind: directly inaccessible feeling, polar volition operating within the duality of effort and resistance, and encompassing, synthetical cognition (see CP 1.375–384). These three Peirce mentioned as “three quite disparate modes of awareness” (CP 1.332) and as “three general states of mind” (CP 7.541). In other words, the criterion of awareness seems only to mean that beliefs are matters of the operation of mind. And that, as we have noticed, holds for music, as well.

What do we seek when we participate in musical processes, a true opinion or the Truth? There seems to be two answers to that question, based on which kind of settlement of opinion we pursue: subjectively satisfying or conditionally objective, true opinion or logical truth. On the one hand, Peirce maintained that, in inquiry, we do not necessarily seek a true opinion, since “as soon as a firm belief is reached we are entirely satisfied, whether the belief be true or false”, and “the settlement of opinion is the sole end of inquiry” (CP 5.375). On the other hand, according to Peirce’s definition of logical truth (CP 5.565, see also Dewey LW 12:343n6), “[t]ruth is that concordance of an abstract statement with the ideal limit towards which endless investigation would tend to bring scientific belief, which concordance the abstract statement may possess by virtue of the confession of its inaccuracy and one-sidedness, and this confession is an essential ingredient of truth.”

Peirce’s critical common-sensism held that scientific inquiry is an exceptional form of inquiry, in the sense that its aim is “the establishment of doctrines, and the provisional establishment of them, at that” (CP 5.60), and these “established truths” are not final, but “propositions into which the economy of endeavour prescribes
Music is a mental process that, for the time being, further inquiry shall cease” (CP 5.589). Scientific inquiry is connected to the organized learning of scientific communities and their means of operation (traditions, methods, channels and means of communication, etc.).

Practical inquiry, on the other hand, settles the beliefs we are willing “to risk a great deal upon” (CP 5.589). It is connected with the more private, everyday life of subject, with practical exigencies and with subjective experience. While practical inquiry may settle for a firm belief that is satisfactory, scientific inquiry aims at eventually ideal objectives.

If music is inquiry, is it practical or scientific inquiry? One is tempted to draw the conclusion that, parallel to the practical and scientific kinds of inquiry, we could distinguish two extremes in music as processes of inquiry: one that operates on an individual level, connecting and delimited to the private life of the subject (whatever that entails), and the other which is more institutionally, culturally or socially organized, having a sense of both tradition and progression that is elevated in the sense of surpassing individual momentary subjectivity, thus capable of internal commentaries, reactions, and counteractions. In either case, in music, we “want to attain a state of belief unassailable by doubt” (CP 5.416).

Based on the above, the idea of music as inquiry (whether practical or scientific) comes very close to Dewey’s notion of an experience, with its idea of satisfaction, resulting from settlement of opinion or belief, resolution of tension or irritation, consummation (see chapter 1.3.3).

In everyday life, we are exposed to brute force. On practical beliefs we are ready to risk a great deal. Practical inquiry is a matter of survival. But in music, there is no actual, direct danger involved with the brute force, other than by means of sound. Yet, music as practical inquiry aims at a firm belief, with which “we are entirely satisfied, whether the belief be true or false”, in other words, at subjectively satisfactory relief from irritation of doubt. The significance of music is tied to the individual conception of meaningfulness. This opens the way for a discussion of psychodynamics and therapeutic effects of music.

Music as scientific inquiry, in turn, would aim at ideals in the sense that music, in that perspective, relies on knowledge of traditions and, from that basis, aims at progression (as does science, according to Peirce, see e.g. CP 5.589), towards establishment of provisional doctrines (CP 5.60), and ultimately towards concordance “with the ideal limit towards which endless investigation would tend to bring” music (see CP 5.565).

41 The case might be similar in other arts as well. Think for instance of naïvists with their enhanced personal touch and focus on local topics versus more institutionally organized art that uses complex internal references and mutual commentaries in the visual arts (such as Arcimboldo; see Weckman 2001), or common autobiographers versus writers such as Umberto Eco or Marcel Proust.
The framework of naturalist pragmatism rules out the possibility that these ideals of music would be some kind of metaphysical entities, without substance. Rather, what kind of inquiry takes place in the laboratory that is music, ought to be found in the actual, practical life of those participating in music. At the same time, as far as music can be conceived as scientific inquiry, it does incorporate an institutional aspect of methods, techniques, rigor, and scope of operation, all of which aims at efficiency of learning, just as science as an institution of enhanced learning does.42

The notion of music as a form of inquiry, and in that sense comparable to science, emphasizes the importance of musical processes. From the viewpoint of naturalist pragmatism, there lurks a minor problem of whether the states of belief that are satisfactorily attained in music are about immediate matters of survival, or whether they are more about adapting to the cultural environment or social setting. While many appear to think less of the former alternative, the latter receives more support, as suggested by Alan P. Merriam (1980/1964, 15): “Music is interrelated with the rest of culture: it can and does shape, strengthen, and channel social, political, economic, linguistic, religious, and other kinds of behavior.” Others go even further by announcing, e.g., that music is “profoundly necessary for human survival” (Blacking 1977/1973, 116).

In this context, it would be difficult to ignore the conceptual distinction between uses and functions of music made by Merriam (1980/1964, 209–210):

In observing uses of music, the student attempts to increase his factual knowledge directly; in assessing functions he attempts to increase his factual knowledge indirectly though the deeper comprehension of the significance of the phenomenon he studies. Thus music may be used in a given society in a certain way, and this may be expressed directly as part of folk evaluation. The function, however, may be something quite different as assessed through analytical evaluation stemming from the folk evaluation. ... Functions, in particular, may not be expressed or even understood from the standpoint of folk evaluation—such evaluations we would group under the heading of ‘concepts’. ... Music is used in certain situations and becomes a part of them, but it may or may not also have a deeper function. ... ‘Use’ then, refers to the situation in which music is employed in human action; ‘function’ concerns the reasons for its employment and particularly the broader purpose which it serves.

Merriam proposed ten major and over-all functions of music (idem, 219–227 et passim), in “no special order of significance” (ibid., 219):

42 Consequently, the dilemma of accidental versus intentional esthetic experience (see chapter 2.2.2) can be resolved by employing the concept of inquiry. In contrast to practical inquiry, its special case of scientific inquiry provides an enhanced means of inquiry. Similarly, arts are an enhanced means of producing artistic experiences. While it is possible to obtain an artistic experience accidentally, it is more likely to be produced by a purposeful act of expression.
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1. The function of emotional expression.
2. The function of aesthetic enjoyment.
3. The function of entertainment.
4. The function of communication.
5. The function of symbolic representation.
6. The function of physical response.
7. The function of enforcing conformity to social norms.
8. The function of validation of social institutions and religious rituals.
9. The function of contribution to the continuity and stability of culture.
10. The function of contribution to the integration of society.

From the viewpoint of naturalist pragmatism, it is highly unlikely that anything that has survived natural and cultural evolution would be without a function in Merriam’s sense, or without a use in the pragmatist sense. Evidently music, too, has a function or certain functions. Music serves a purpose. It is not an end in itself. How does the pragmatist conception of music as inquiry, whether practical or scientific, meet the functions of music as suggested by Merriam?43

The last four of the ten functions have to do only with social or cultural aspects of music, as opposed to purely subjective or possibly autocommunicative aspects. That suggests further analysis as to the social versus subjective characteristics of musical processes. In chapter 2.2.3 we noted that other subjects, which inhabit the environment as organisms, constitute an important part of the environment with which the subject interacts. They have access both to the modifications of the environment directly, and to the practical bearings the modifications have on their subjects. Reciprocally, the actions by the other subjects modify the actual world accessible to the subject. In addition to being organisms and objects of the actual world, other subjects belong to the functional organization of a subject. Yet, as noted in 2.2.2, there simply is no direct epistemic or causal connection from one subject to another. The others are, in any case, presented to us only by means of actual objects in the actual world, either as traces of action by others, as organisms of the others, or as other actual objects. Assuming this is not the case means resorting to metaphysical explanations.

Consequently, social behavior in general can be approached in terms of collective operation of individuals, and so are social aspects of musical processes also

43 The fact that Merriam’s distinguishes functional from useful as involving “deeper comprehension” or “broader purposes” might suggest that it is better to describe music as ‘functional’ rather than ‘useful’. However, here the nomenclature follows the (Deweyan) pragmatist tradition of theory of arts in which the term ‘useful’ denotes and connotes a close connection of music with the experiencing subject. This is also to avoid confusion with Merriam’s notion of function (see below in this chapter).
reachable via more basic functions of individual’s habits of perception, action, and thinking.  

Let us consider the seventh and eighth function proposed by Merriam, the functions of enforcing conformity to social norms and validation of social institutions and religious rituals. These seem to raise the objection that, if musical processes are used as a means for such ends, it appears we are not speaking of music as art, according to the pragmatist conception of music and art, but of exploitation of sound and the subject’s habits of interaction with sound as tools for social goals.

Aristotle expressed the difference between *techne* and *phronesis* in terms of means and ends: “while making has an end other than itself, action cannot; for good action itself is its end” (NE 1140b). According to Dewey, in art the activity is sincere, and “not subordinated to any external end” (EW 2:271). The act of expression produces an experience, nothing less, nothing more. On the one hand, in art, the act of expression manages to transform the materials of expression into forms suitable for producing an experience. On the other hand, in art, the act of expression does not go beyond producing an experience, in the sense that the act of expression does not have an ulterior motive of serving an end other than producing the experience, or as Dewey put it: art constitutes an experience (LW 10:91). In this sense, artistic acts of expression are performed, and works of art are “made manifest for their own sake” (LW 10:63; cf. chapter 1.3.3).

Consequently, the pragmatist conception of music, as expressed so far, would appear to deny the possibility that music (as far as it is art) could have the functions or purposes of enforcing conformity to social norms and validation of social institutions and religious rituals. Namely, ‘music’ in those cases could be substituted for practically anything: flying kite has the function of validating certain social institutions (of kite flyers); participation and correct behavior in weddings or funerals enforces collective conformity to social norms of families and friends. And as for the ninth and tenth proposed function, jokes and debates, for instance, contribute to the continuity and stability of culture and society; wearing, say, facial make-up or badges with the colors of a soccer team contributes to the integration of the society of soccer fans, etc.

Hence, from the pragmatist viewpoint, the last four functions listed by Merriam would not be musical, but extramusical phenomena, not integral to the concept of

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44 Conversely, one might foster the idea of approaching individual habits through the collective, social, communal organization. From the naturalist point of view, however, that would be treading a difficult path, since the initial assumptions are concerned with node-like organisms, that eventually organize themselves in interaction with the environment, rather than social networks, that consist in subjects and their relations. But neither approach rules out the other.
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Music (as considered here), albeit they might be noteworthy to anthropologists or sociologists interested in music-related questions.

However, if we recall some of the points made earlier (in this part and in part one), the story takes another twist. According to Peirce, as noted, “the sole object of inquiry is the settlement of opinion” (CP 5.375). The beliefs attained are habits: habits of feeling, action, and thinking. At the same time, the habits of feeling, action, and thinking are formed in virtue of the process of interaction with the environment, in which the organism is engaged. According to the pragmatic maxim, each situation in the interaction, each object of perception is more or less conceived to have practical bearings, i.e. the process is a meaning-making process, semiosis. This holds at least if the organism has developed any ability to guide its being in the actual world, that is, mind. The process of inquiry is fundamentally an adaptive semiotic process.

Furthermore, the actual objects of the environment (the organism itself included) belong to the functional organization of mind. Other subjects as organisms inhabit that environment. Consequently, other subjects also belong to the functional organization of the subject’s mind. Yet, the others are, either as organisms or as subjects, in any case, presented to us only by means of actual objects in the actual world.

Now, let us return to the idea of music as inquiry, and the last four of Merriam’s functions of music. As far as music is inquiry, it may be thought of as a form of adaptive interaction between organism and environment, to which other subjects belong. This suggests that the last four functions suggested by Merriam may be considered special cases of a more general function, that of adapting to the environment.

From this perspective, the subject matter of musical inquiry, so to say, may be located in the need to coexist with other subjects, the need to adjust to the physical environment, the need to unify or mend subject’s own means of existence, or other needs that contribute to the accumulation of experience in subject’s mind, and thereby to the existence of the subject and the survival or the organism. At least there is no apparent reason to limit the topic to social interplay or cultural alone, albeit those aspects apparently make a marked contribution to human life.

Compared to the general function of adapting, the first six functions of music on Merriam’s list may be considered anew. Namely, the question may be raised, whether or not, instead of being functions in Merriam’s own meaning of the word, they illustrate the means by which it is possible for music to have a function of inquiry. The remaining six functions, perhaps with the exception of the third one, are intertwined in the operation of the core function of music. The fourth function suggests that music is communication, but how? By means of symbolic representation: musical sound somehow stands for something—symbolically, Merriam noted.
But what is understood by the notion of symbolic representation? Merriam (ibid., 229–) referred to Cassirer, Langer, Leslie White, Charles Morris and Charles L. Stevenson, but perhaps Peirce will give a more original insight on the issue.45

It seems likely, at this point, that also the functions of physical response, emotional expression, aesthetic enjoyment and the possible function of entertainment are closely connected to communication by symbolic representation, whatever that means. A successful communication by symbolic representation may apparently evoke emotional experience, and hence the representation may be said to convey an expression, whether as originally intended or somehow misinterpreted. And when an expression is conveyed in a consummatory way (or, depending on the esthetic theory applied, perchance some other criteria must be met), the domain of aesthetic enjoyment is entered. As far as physical response is concerned, it is always present in musical perception, as well as action, due to the embodiment in music (see chapter 2.2.5).

Merriam was cautious enough to leave out the concept of art in conjunction with the functions of music. Yet, the functions he proposed do not seem to markedly contradict the notion of music as inquiry. How does the pragmatist conception of art, then, match the notion of music as inquiry?

In the current pragmatist perspective, the word ‘artistic’ refers to experiencing which fulfills the conditions of Dewey’s description of an experience: experienced flow from something to something, with a satisfactory solution, a sense of unity, a vivid consciousness, all in virtue of an act of expression which is perceived as somehow meaningful. Dewey continued with an important criterion: the artistic experience is meaningful as it makes the “human intercourse more rich and gracious” (LW 10:69). In other words, Dewey added a progressive requirement for music—or anything—to be art. Since both inquiry and art often entail an aspect of progression, does the conception of music as inquiry imply that music is art? Not necessarily. Based on the above, if music does have intersubjective, communal and progressive aspects, it may well be considered art. If not, that is, if it is regressive (as opposed to being progressive) and unrewarding for the community, as judged by ultimately endless investigation, it is clearly not art. And somewhere in-between is the grey area, in which music may be conceived as individually therapeutic, perchance regressive, perchance progressive.

Concerning the question of whether the benefits of music need to be communitarian in order for music to be considered art, I would rather opt for a more inclusive than exclusive delineation of the notion of music as art. Namely, it is very difficult

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45 The function of entertainment may be thought of as being included in other functions (especially functions 1, 2 and 4 through 6), but a closer analysis of entertainment and music is beyond the current scope. Peirce and symbolic representation are dealt with in sections 3.2 and 3.3.
to draw a line between what is beneficial only from an individual perspective versus what is beneficial also from a communal perspective. For instance, music that may seem regressive to many, may well be therapeutic to an individual, and hence progressive first in an individual scope, and, as judged by ultimately endless investigation, may prove to be invaluable for the community, as well. Think of the abundance of garage bands, or the reclusive, idiosyncratic composers of experimental music, for instance. You never know what the future holds. In brief, judgments concerning what is art and what not, cannot be determined short-sightedly, as the history of musical appreciation has shown. Indeed, the pragmaticist “locates the meaning in future time” (CP 5.427). This, however, does not imply, that anything goes for musical art. If we hold on to the views that art needs to be socially progressive, and that music may be art, musicians, music critics, music educators, and even members of audience need to consider their values and aim their musical activities accordingly. In other words, again, there needs to be good phronesis, and if perennial questions are concerned, sophia as well as the basis for musical praxis.

Art or not, in music, the end of both action and perception is the construction of experience. Action and perception that is incidental, random or aimless, or calculated or instrumental for possible secondary consequences, i.e., as a means for something else, is excluded. Consequently, musical praxis, which always involves revision of habits of action, based on perception and experience, needs to be guided so that the end result moves towards the construction of (a wanted) experience. And that experience makes music useful.46

2.2.5 Music is embodied

Section 1.1 characterized the foundation of this inquiry as naturalist. According to the naturalist view, cultural evolution is a direct consequence, continuation and a part of the natural evolution. The human being is basically a biological, animal organism. Employing the denial of any need for metaphysical origins or foundations to music leads to a corresponding naturalist view of music. There are different ways of expressing this view. For the sake of clarity, let us look into some aspects, each with a slightly different emphasis on musical embodiment. This characteristic of music has also been referred to as musical holism (see 2.2.3), which embraces the

46 This does not mean that esthesis would be utterly passive reception, while praxis is the active one. It is a matter of balance: in praxis the organism affects the environment more than it affects the organism, in esthesis the other way around. In esthesis, too, constant revision takes place. As far as randomness is concerned, musical situations such as Cage’s chance music, Xenakis’ stochastic music, or the aleatory counterpoint by Lutoslawski are not excluded by this definition, since the same end of action is present: the whole context of music still has the purpose of constructing experience, by means of controlled chaos.
corporeality of the musical processes as subsets of semiotic or cognitive processes, since it maintains, that there is “no other way to represent musical significance except physically via the body” (Kaipainen 1994, 21).

One aspect of musical embodiment concentrates on the very stance that denies metaphysical origins or foundations for music and its existence. Since cultural evolution cannot be separated from natural evolution, neither can music, as a cultural or biological process, be separated from its origin in natural evolution. As described in the previous chapter, music is useful because it may cultivate or enhance an organism’s ways of interacting with and adapting to the environment, and thereby it may contribute to the survival of the organism or species by means of inquiry. It is no different from other processes of mind in that perspective. There are no grounds to assume that music, of all the processes of mind, would be a useless evolutionary process, which despite its uselessness for some unearthly reason would have survived for eons in all known human cultures.47

It might be difficult to show in what ways music directly or instantly contributes to the survival of the species. But the same holds, at least partly, for science and many other forms of inquiry, as well. In this sense, music is one of the many processes that constitute mind. Music is a part of the subject’s natural being in the world. Music is embodied in the sense that it is a process of mind, and not some metaphysical entity, phenomenon, or anything caused or endowed by such. Indeed a key notion in the framework of naturalist pragmatism, as discussed in part one, is the idea that the mind is embodied, in the sense that it is a result of and a developing ability governing the interaction of the organism and its environment.48

As one example supporting this view, Marc Leman (1993, 157), representing the subsymbolic paradigm of cognitive musicology, agreed that “there are not other entities, objects or events than those given by nature ... (and those that can be accessed by scientific methods)”. There is no epistemological gap between the mind and the body, since “the connection between a mental representation and the real world [here: the actual world] can be provided by a model of the sensoric and low-level

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47 For an introduction to evolutionary musicology, see Wallin, Merker and Brown 2000, and for an introduction to zoomusicology (or zoömusicology), Martinelli 2002.

48 John Blacking (1977/1973, 107) was pessimistic enough to maintain that “[m]usic cannot change societies, as can changes in technology and political organization. It cannot make people act unless they are already socially and culturally disposed to act. It cannot instill brotherhood, as Tolstoy hoped, or any other state or social value.” I believe it is a matter of temporal (and spatial) perspective, whether or not music can be perceived to change societies, or to resist the changes in societies. Music apparently cannot directly or immediately produce or resist such changes, but it is, now by definition, meaningful in the way that it prepares the minds of the participants in musical processes to deal with such issues, and by its virtual reality, it may also provide the tools of projecting different possible worlds—perhaps even “an experience of the best of all possible worlds” (ibid., 51) just like the tsikona for the Venda can.
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perceptual mechanisms of the auditory system” (idem). In other words, according to the subsymbolic paradigm of cognitive musicology, the functioning models of the perceptual mechanisms give reason to believe, that the mind-body problem needs not encumber epistemological ponderings in the future.

Mauri Kaipainen (1994, 50) capitalized on the logic that, if music is taken to be a special case of more general cognitive processes, “anything that can be said about cognition can also be said about music”. Consequently, the concept of music converges on the concept of (knowledge) representation (idem): 49

Knowledge representation of the world of sounds is what corresponds to an individual’s accumulated experience of music and thereby her/his personal music history. Knowledge representation is, at least in this framework, more or less synonymous with memory, and it correlates, more or less, with what is often called musical competence.

The examples by the representatives of the subsymbolic (or asymbolic) paradigm of cognitive musicology subscribe to the naturalist foundation for music. *Music is embodied naturally, in the ontological sense*, without need to resort to metaphysical explications. While the ontological discussion as to the naturalist versus metaphysical explications of music has not been the main concern of, say, ethnomusicology; similar stances have been implied by John Blacking, among others. According to him, the surface structure of music “cannot be explained adequately as part of a closed system without reference to the structures of the sociocultural system of which the musical system is a part, and to the biological system to which all music makers belong” (Blacking 1977/1973, 30–31; see also Merriam 1980/1964, 14). This is not applicable to the study of music alone, but to participating in and contributing to the musical process itself, since “the nature from which man has selected his musical styles is not only external to him; it includes his own nature — his psychophysical capacities and the ways in which these have been structured by his experiences of interaction with people and things, which are part of the adaptive process of maturation in culture” (ibid., 25). This suggests consensus with the pragmatist framework and the notion of ontological embodiment of music.

In his comparison of symbolic and subsymbolic descriptions of music, Marc Leman (1993, 157) gave a tripartite breakdown of the factors contributing to development of musical knowledge by learning, according to the subsymbolic paradigm: “the environment (comprising the distribution of the information), the physical properties (of the information and the brain), and the dynamic properties (of information processing in the brain and of the action of the system in the environment).” Although the question of implementation of the representative system and the physi-

49 This, however, also raises the question of what delineates the subset of music from its superset of general cognitive processes.
cal properties of that system were excluded, in part one it was discussed, how these factors constitute the dynamic system of interaction between the organism and the environment in the actual world, yielding, among other forms of signifying processes, music.

Current research in cognitive musicology focuses on the dynamics of the system in which, or in virtue of which the musical representation is manifested. The manifestation is natural or simulated, actual or virtual, a natural neural network or an artificial neural network attempting to simulate the natural neural network. If cognitive processes are implemented in neural networks or possibly in other representative systems, and if music is a cognitive process, it follows that music is embodied in the sense of implementation.

In the framework of naturalist pragmatism, however, the embodiment of music does not refer only to the embodiment of the cognitive mechanisms in the nervous system, nor to the denial of metaphysical ontology alone. Music, being a subset of cognition or mind, is embodied as a process of interaction between organism and other actual objects of the environment. Consequently, music is corporeal in the way that there needs to be an interactive body of organism with motor and sensory abilities (operated by means of natural neural network, or possibly by some other means) to produce sound. The action of producing sound requires effort to overcome resistance of the actual objects, or exposure to characteristics of actual objects (air or other pressure, friction, gravity, etc.). Similarly, the perception of sound involves actual corporeality, sensory and motor abilities.

According to the framework of naturalist pragmatism, both the ontological and the implemental aspect of embodiment hold for any action and perception, not only action and perception of sound, let alone music. Instead, what may be considered distinctive of musical processes, in addition to the features described earlier, is the corporeal embodiment of the musical sign, content, message, expression, structure or form. This entails that the gist of the musical processes be that the features of musical sound, of the process of producing the sound, or perceptions thereof, are akin to the characteristics of the interaction between the organism and the environment, whether it be by analogy, isomorphy, metaphor or other means. It is in this sense that music is corporeally embodied.

To summarize this chapter: music is regarded as naturally embodied in the sense that, in musical semiosis as in semiosis in general, first, semiosis can be explained naturally as opposed to metaphysically; and, second, the implementation of the semiotic system is natural (and only so, at least until it is successfully implemented virtually). Musical semiosis is also corporeally embodied. The topic of the corporeal embodiment or non-arbitrariness of music will be continued in the next chapter.
Semiosis is tied to the modification of the actual environment and the experience of the modifications. As long as the subject lives in a natural environment (as opposed to an artificial one), the formation of meaning is tied to the characteristics of the natural environment. This implies, that musical habits or abilities, whether concerned with action or perception, cannot be forced. Musical habits can only be fostered and nurtured as a part of subject’s being in the world. The subject can be exposed and acculturated to act and perceive situations in music, but the process of adaptation needs to be evoked in the subject herself.

2.2.6 Music is non-arbitrary

When the framework of naturalist pragmatism was introduced in the first part, the discussion did not extend to the formation of meaning in detail. The analysis of semiosis in terms of the theory of signs is the topic of sections 3.2 and 3.3. But at this point, it is worthwhile to add to the list of characterizations of music yet another feature relating to signification, namely the character of musical semiosis as a type of non-arbitrary semiosis.

As far as the reception of music is concerned, non-arbitrariness entails that the experiences of various characteristics of sound (esthesis) are somehow analogous or isomorphic to other experiences. Musical action, in turn, is praxis involving revision through esthesis. The non-arbitrariness also entails that musical praxis is guided (by phronesis) towards producing sound that is experienced as analogous to some other experience. The musical habits of action aim at production of non-arbitrary experiences. More than that, it appears that isomorphy, analogy or metaphor pervades semiosis in general, in that the habits of thinking that connect the habits of feeling with habits of action maintain, at least in some respects, the isomorphic relations of experience, musical or non-musical. In brief, *semiosis and musical semiosis* as its subset *are spatially embodied*. This argument is central to this book, and is therefore elaborated more in depth throughout parts two, three, and four.\(^50\)

The claim for non-arbitrariness of semiosis seems contrary to Peirce’s idea (CP 3.360) that signs “are, for the most part, conventional or arbitrary.” If musical semiosis is non-arbitrary, is it somehow exceptional? How could Peirce’s conception of conventional or arbitrary signs be consolidated with the idea of non-arbitraryness of semiosis in general?

The notion of arbitrariness of semiosis portrays not only Peirce’s conception of thinking, but more generally the ruling idea of modern times, which emphasizes (or emphasized) the role of language in thought. Peirce continued (idem, see also CP 50 The spatial concepts such as space, topological and metric space, or metaphor, central to this study will be discussed in section 3.1., and their roles in the semiotic theory in sections 3.2 and 3.3.

5.421): “They [that is, signs] include all general words, the main body of speech, and any mode of conveying a judgment.” Clearly, the use of verbal language and linguistic research have had a tremendous impact on both semiotics and philosophy, not only after the so-called linguistic turn, but ever since the days of Descartes and Kant, clear through the modern and postmodern eras. Language has also been a convenient starting point for examining semiosis, since research reportage takes place mostly in written or spoken verbal language.

Nevertheless, no convincing evidence has been presented to show that thought processes would somehow be fundamentally linguistic. Rather, since Peirce’s days, more evidence has accumulated to support the idea of what is now being called the morphological turn (Petitot 1990; see chapter 3.1.2), i.e. that thought processes are fundamentally non-arbitrary, and that the formation of meaning by means of verbal language and like abilities is the exceptional kind.51

Certainly it appears, as exemplified later in this chapter, that musical processes are first and foremost non-arbitrary. Non-arbitrariness of music means that the ways by which the representation in music takes place (whether in praxis or in esthesis) are fundamentally not a matter of arbitrary agreement between participants. This does not mean that there would not be cultural or subcultural musical conventions. The plethora of musical styles around the world and across social groups portrays a kaleidoscopic view of different musical styles, means of expression, and manners of musical semiosis. Yet, the idea is that all musical processes do share some degree of similarity in the operative ways of signifying. Should one wish to call those similar features or principles musical universals, so be it. In any case, the deep core of musical semiosis (as opposed to the surface structures of musics) relies, not on acquired conventions or arbitrary agreements, but, on the one hand, on the available variety of the characteristics of sound as the vehicle for music, and, on the other hand, the relations of those characteristics with the characteristics of all experiences of the subjects involved in the musical processes.

This does not altogether rule out the possibility, that musical processes might also involve arbitrary, negotiated semiosis. There are situations in which arbitrary representation does occur in music. Examples can be found, as known, in “horn” motifs or other like signals (e.g. Caprice no 9 “The Hunt” by Niccolò Paganini or the opening of Sonata op 81a “Les Adieux” by Ludwig van Beethoven). But even

51 In cognitive science and philosophy of mind, there has been an extensive debate between the classical, language-oriented stances based on e.g. Jerry Fodor’s (1975) language of thought hypothesis and the newer connectionist or associationist views that build on subsymbolic modes of representation. See e.g. Ramsey, Stich and Rumelhart 1991; Loewer and Rey 1991, Macdonald and Macdonald 1995, McCauley 1996, and Stainton 2006 for compilations. Here, an alternative stance is taken, based on Peircean semiotics, that the morphological accounts and conceptual forms of representation mediate between the symbolist and associationist modes of representation, as suggested by Peter Gärdenfors (2000).
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these exceptional cases are fundamentally based on a more essential means of representation, of which they have later become arbitrary. The habitual horn motifs, for instance, are in our days rarely met in their original signaling situations (of postal service, hunt, war, or bucolic scenes). The textual references of second and higher order have made familiarity with the original situation quite unnecessary, and the detachment or distancing of the representation from the original has turned the non-arbitrary representation into a matter of convention or agreement. Yet, in most situations, the changes in sound stand for changes in situations in subject’s internal world in virtue of being somehow non-arbitrary. In other words, it seems that the theory of arbitrary signs in music can be reduced to the theory of non-arbitrary ones.

The idea of corporeal embodiment of music, discussed in the previous chapter, may entail that it is the very action of producing the musical sound that marks the sound one way as opposed to another, meaning that the features of sound tend to be determined by the action needed to produce the sound. Still, at least in principle, the signifying features of sound may correspond to any variety of patterns of action and perception that could possibly be present in the general process of interaction between organism and environment.52

Semiotics evidently may provide tools for analytic treatment of the process of non-arbitrary semiosis, such as music. Since the non-arbitrary character of musical representation can be approached in terms of spatiality, the main task of this inquiry is, finally, to examine the role of spatiality in semiosis, and particularly in musical semiosis. We shall get to that in parts three and four, respectively.

What follows is a brief look at writings by musicologists of different traditions: ethnomusicology, cognitive musicology, and psychoanalytic musicology, each giving their support to the idea that musical semiosis is primarily non-arbitrary as described above.

John Blacking and Charles Seeger on the non-arbitrariness of music.

The idea of the non-arbitrariness of music is shared by representatives of various musicological traditions. Others might disagree. Many do not express their positions explicitly. John Blacking was very explicit in stating that (Blacking 1977/1973, 100) “[t]he rules of musical behaviour are not arbitrary cultural conventions”. Blacking maintained, that (ibid., x–xi)

Music is too deeply concerned with human feelings and experiences in society, and its patterns are too often generated by surprising outbursts of unconscious cerebration, for it to subject to arbitrary rules, like the rules of games. Many, if

52 For ‘markedness’ in this context, see Hatten 1994.
not all, of music’s essential processes may be found in the constitution of the human body and in patterns of interaction of human bodies in society. Therefore musicologists, too, “shall learn more about music and human musicality if we look for basic rules of musical behavior which are biologically, as well as culturally, conditioned and species-specific. It seems to me that what is ultimately of most importance in music cannot be learned like other cultural skills: it is there in the body, waiting to be brought out and developed” (ibid., 100). These statements by Blacking are well in concord with the naturalist notion of non-arbitrariness of musical semiosis, stemming from the naturalist idea that human culture is an outcome and a part of the natural evolution.

While Charles Seeger was critical of the linguocentric predicaments, his own approach remained in alliance with or in shadow of the ideas of the linguistic turn. The impetus of the linguistic turn may have been a necessary, or at least an unavoidable phase in musicology, semiotics, cognitive science and artificial intelligence, but today it may prove to be more of a burden than a helpful tool. While language cannot be ignored as long as musicological inquiry is being reported verbally, it ought to be possible to construct theories involved in music research independent of considerations of language. Yet some of Seeger’s notions are helpful in finding a way “through the thicket of ambiguity surrounding the familiar term music” (Seeger 1977, 32).

Seeger defined communication broadly as “transmission of energy in a form” (Seeger 1977, 19; see also Seeger 1994, 335–). Communication is a “biologically given” capacity (Seeger 1977, 23), and the semiotic systems of communication “are variably direct (asymbolic) and indirect (symbolic): speech and the visual systems, more indirect and symbolic; music and the tactile systems, more direct and asymbolic” (ibid., 23).

According to Seeger, in a direct and asymbolic communication like music, “the transmission of energy transmitted in the forms of the system will parallel or run a course paradromic to the act of its production by its producer” (ibid., 23). If the receiver and producer participate “in the same sets of physical, biological, and cultural contexts” communication may elicit in a receiver a similar act” (ibid., 23).

In contrast, being symbolic and indirect, (verbal) language needs to be converted (ibid., 24). The symbols of speech constitute an arbitrary form of communication as compared to the acts of producing and receiving, which are somehow analogous, parallel, similar, or paradromic. In short, both speech and music communicate whatever the world view of each of us is: “speech, by symbolizing it; music, by embodying it” (Seeger 1977, 43).

53 Seeger included gustation and olfaction in the tactile communication (1977, 20; 1994, 348).
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Seeger wanted to make a distinction within music that would be parallel to the distinction between the semiological notions of langage, langue and parole (Seeger 1977, 25). Hence a brief definition of music by Seeger reads (1977, 25):

speech = the concept music, as the universal cultural system of predominantly asymbolic auditory communication;

language = the percept music, as the particular sung and played subsystem that is one of the many musics of man;

the speaking of a language by individual speakers = the singing and playing of a music by individual musicians.

Whereas Seeger’s idea of percept music seems to correspond to the surface structures of different musics, the deep core of musical semiosis may be found in what Seeger calls concept music, regardless of the various subsystems or particular instances of musicking. Yet, it is clear that even if “there may be a few general bio-acoustic universals of musical expression” (Tagg 2002, 3)—or perhaps more than a few—mere compartmentalizing the issue into categories from universal or general core systems to individual or particular instantiations of surface systems does not take the effort of deciphering musical semiosis far, unless the bridging principles between the core and the surface are understood. In that, the concept of space may become handy.

Subsymbolic cognitive paradigm and non-arbitrariness of music.

In the subsymbolic paradigm of cognitive musicology, music is understood as a cognitive process involving particularly the auditory subsymbolic representations, and direct, constantly ongoing interaction with the environment by the cognizant organism. Subsymbolic representations are, if not isomorphic, at least paradigmic, analogous, responsive, causally related to the represented. The relation needs not be simple one-to-one relation, but may (well) be a “second-order relation” (Shepard & Chipman 1970, quoted in Leman 1993, 136). The interaction with the environment provides the causal justification for the existence of representation: “A stimulus gets its meaning in virtue of the response with respect to the environment. The memory is a resonator” (Leman 1993, 134).

The quoted article by Marc Leman is a divider between two paradigms of cognitive musicology: the older symbolic, and the newer subsymbolic paradigm. Both paradigms consider music as cognition (Serafine 1988). The difference between the paradigms lies in how the cognitive system processes music—how music is represented. The juxtaposition between the paradigms of cognitive musicology runs parallel to the corresponding contrasting paradigms in cognitive science and philosophy of mind.
In the symbolic paradigm, music is regarded as language-like symbol-manipulation that uses place memory to recall data. That is, knowledge is situated atomistically in a certain location. Larger chunks of knowledge consist of complex (hierarchical) sets of these elementary data. Symbolic representation is arbitrary (or conventional), in the sense that labels represent without (immediate or direct) causal justification for the representation (in the represented). (Leman 1993, 126–132, 154–158.)

Leman continued by coming down on naturalist pragmatism to a great extent: “In such a system the signals encountered get meaning because they are relevant for the action. The meanings, or knowledge structures, are determined partly by the architecture and system dynamics, partly by the pressure of the environment” (Leman 1993, 135).

Leman made the diplomatic and (even politically) correct observations that all three levels of representation (symbolic, subsymbolic and acoustic) are needed, and that in “musical activities both forms of knowledge are combined” (Leman 1993, 159). Regardless of that, he left little hidden of his stance: “The symbolic paradigm ... seems to impose constraints on the research in musical imagination. This paradigm is in disagreement with the most important empirical foundations in this field, to wit: psychoacoustics” (ibid., 158). Contrary to that, the subsymbolic paradigm seems to provide “a valuable alternative to the atomistic accounts of imagination and mental representation” (ibid., 159).

Even more contrary to the symbolic approaches to cognition (such as argued by Fodor and Pylyshyn 1988), Mauri Kaipainen’s approach assumed nonsymbolism, meaning that “cognition does not necessarily involve symbols on any level, and if such are used, their use does not involve the core of cognition” (Kaipainen 1994, 44). This strong declaration implies further need for the analysis of the concept of symbol. Kaipainen pointed out the distinction between two (extreme) senses in which the term ‘symbol’ is used. In one, philosophically more traditional sense, symbol is distinct and atomic, arbitrary in relation to its semantic content, combinatorial and recursively syntactical. In this sense symbol is used in, among others, Fregean logic, Chomskian linguistics and Fodor’s language of thought. (ibid., 44–46.) In the second, semiotic or social, but philosophically less traditional sense, symbol is the Saussurean conventional assignment of a sign, or a representational vehicle, to arbitrarily stand for its content (signifiant for the signifiée; ibid., 46–48). The latter

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54 Leman distinguished three kinds of representation in music: acoustical (or sonological), which is “closest to the physical properties of sound”, symbolic, and subsymbolic representation (Leman 1993, 126). The first corresponds belong to the class of actual objects, while the last two are contrasting (although not necessarily mutually exclusive) means of mental representation. The subsymbolic representation could initially be defined as “the level between the acoustical and the symbolic representation” (Leman 1993, 132). Cf. Gärdenfors and his notion of conceptual representations (Gärdenfors 2000; chapter 3.1.2).
sense also reroutes us back to Peirce, which connection is made by Kaipainen, too. (Cf. sections 3.2 and 3.3.)

According to Kaipainen, the two imports of ‘symbol’ are similar enough to be both included in the discussion of musical symbolism, since rather than being contradictory to each other, what is common to both the formal and the social sense of ‘symbol’, is that “the semantic relationship between the symbol and the content is arbitrarily assigned or postulated” (ibid., 48). The distinction between the two comes from whether the relation of the sign and its content is assigned formally or socioculturally. In either case, Kaipainen maintained, symbolism cannot be accepted as a foundation for cognition, since “there seems to be no explanation for how symbols are established, or for how the necessary agreements are reached” (ibid., 48). For the time being, let us leave the analysis of the concept of symbol at that.

Application of this nonsymbolism to music yields a conception of music which “does not regard music as communication based on arbitrary (social or formal) agreements of semantic signification, but as active participation in the knowledge dynamics, with and within the world of sounds” (Kaipainen 1994, 53). This does not lead to conceptual elimination of symbols from musical processes altogether, but clarifies that symbols are needed in describing musical processes “apart from the musical expression itself” (idem). Symbols are “quite justifiable for most purposes of musical praxis, but cannot explain the nature of the musical expression itself” (ibid., 53).

The subsymbolic or nonsymbolic notion of music consequently relies on musical ecologism, which holds that “whatever we know about music must ultimately arise causally from the physical environment around us. On the other hand, it is emphasized that musical ecologism requires that there must be some use or function for our musical knowledge in the environment” (ibid., 56; see above, chapter 2.2.4). This implies that the uses or functions of the cognitive process of music arise from the cognizer’s relation and interaction with the physical environment. Music involves the “expectation and anticipation of world situations on the one hand, and confirmation or disconfirmation of these on the other” (ibid., 21). Warded here in the vernacular of cognitive musicology, all this nevertheless supports the pragmatist view, that music as a primarily subsymbolic or non-arbitrary cognitive process serves a purpose (or use or function), of being beneficial for the cognizing individual’s existence in the environment by means of creating holistic “musical situations” (idem), which stand for the situations in the world by defining “the coordinates of the music-cognizer in the virtual experiential space, present in parallel at any given moment” (idem).
Space in Musical Semiosis

Psychoanalytic theories and non-arbitrariness of music.

The psychoanalytic approach to music emphasizes the dual characteristics of musical processes and the prominence of the primary process or the conesthetic organization (see chapter 2.2.3). Spitz’s list of the categories involved in the conesthetic organization comes very close to many properties often attributed to musical processes (Spitz 1965, 135): “equilibrium, tension (muscular or otherwise), posture, temperature, vibration, skin and body contact, rhythm, tempo, duration, pitch, tone, resonance,clang, and probably a number of others of which the adult is hardly aware and which he certainly cannot verbalize.”

The multifarious conesthetic realm of experiencing is corporeal or bodily. The semiosis both in music and in the whole conesthetic realm seems to be based on action and experience in the non-mediated, direct ways in which the subject as organism is actually being (or, should one say existing) in the actual world. Consequently, the process may be difficult to report verbally, or, if reflected, described much in the same terms.

While several others should not be ignored, a particularly intriguing psychoanalytical theory, in terms of inquiry into musical semiosis, was presented by Ignacio Matte Blanco (1975, 1988). His choice of conventional predicate calculus for the basis of formalization seems to not have been necessary however, but nevertheless his theory of bi-logic offers valuable psychoanalytical insight into the role of non-arbitrariness in musical semiosis.55

Matte Blanco continued Freud’s and (perhaps even more so) Jung’s work on the two modes of thinking, the conscious and the unconscious. Correspondingly, Matte Blanco distinguished two modes of being: the dividing, discriminating mode of consciousness that incorporates mostly asymmetrical relations as a basis of its bivalent logic, and the indivisible mode of the unconscious, the bilogic of which is based on relational symmetry in addition to the asymmetry.

The discriminating consciousness poses on the perceived the three-dimensional spatial construction and the linear organization of time, with which we naively (or perhaps not so naively) believe the actuality itself to agree, but which we need for the sake of coherence of the mind, if not for other reasons. The relations of elements in consciousness are mostly asymmetrical, that is, the relation cannot be inverted (compare the nuances in propositions “The music critic is a member of the audience.” and “The audience is a member of the music critic.”). The distinctions in asymmetrical

relations are responsible for forming hierarchies of categories, nested structures, in which the focus of attention may move in a linear fashion, thus allowing for more or less detailed differentiation.

The unconscious, in contrast, has no principle of contradiction, no negation in the traditional sense of the word. The relations are, exceptions allowed, symmetrical. Perhaps the most significant feature of the symmetrical logic is the principle of generalization. In symmetrical logic, a part may be equated with the whole, or a member of a set with the complete set. Ramifications of this are tremendous. In comparison to asymmetrical logic, which tends to create linear chains of relations along the hierarchical system of nested categories, symmetrical logic easily spawns an infinite network of relations between elements, in a way that we might be most familiar with from dreams.

For instance, a feather in symmetrical logic may correspond for instance to a pillow or to a bird, as opposed to being merely associated with them as a part. Reversely, the pillow or the bird may be equated with the feather. The bird, to continue, may correspond to any other animal, flight, height, lightness, freedom, skies, flocks of birds, wings, eyes, beaks, claws; or the pillow to bed, sleep and tranquility, gag and suffocation, arousal and sexuality, etc. Any element or part or feature of any element may have any number of correspondences, thus creating an infinite network of relations, in which transitions from magnitude to another, or from a sensory modality to another are uninhibited by the conscious discrimination, yet guided by the accumulated experience of the subject.

The two logics are not hermetically separated, but rather they operate together thus construing a continuum, facets of which are in dialogue of analysis and synthesis, in constant dynamic interplay (assuming the situation is not pathological). At one end, there is the pure bivalent logic, void of symmetrical elements, categorized, and hence controllable. At the other end, there is the most unified, unfragmented symmetry without interference of categories, paradoxically simultaneously whole and filled with the multitude of particulars or features thereof, and in close, vivid contact with the actual environment.

Matte Blanco, like Freud and Jung, assumed the unconscious to be the basis of the operation of mind. Everything in consciousness stems from the unconscious, but not necessarily the other way around. “The unconscious is the true psychical reality.” (Freud 1900, The Interpretation of Dreams, SE 5:613.) Yet, for what is considered a healthy operation of the mind, a dynamic balance between the two is needed. The category boundaries may well be more unifying than bisecting, and the ability to
make detailed distinctions, that is, analysis, may enable us to make prescissions and abstractions (CP 2.428, 4.235).\textsuperscript{56}

Why or how are symmetrical logic and the interplay of bi-logic pertinent in music? This takes us back to the question of music representation raised in chapter 2.2.3: How does music operate within the primary process? The assumption was, that in the conesthetic organization of perceiving amodally, perceptions and habits or schemata of perceptions can be transferred from one perceptual modality to another. Thereby perceived sound can stand for perceptions in other modalities, and consequently, the subject may relate any experience with experience of sound, both in esthesis and in praxis.\textsuperscript{57}

In symmetrical logic, the transitions across perceptual modalities are unproblematic, since any part is equated with the whole, and vice versa. There are two conceivable ways this can take place: either by relative simultaneity or by analogy (or both). In the former, the various characteristics become more or less fused, and to a degree interchangeable, as they happen to be (repeatedly) associated together in certain (reoccurring) situations. In the latter, the characteristics become interchangeable in virtue of their similarity: a round shape is round whether in visual, tactile, kinesthetic, proprioceptic, vestibular, apparently even in auditory modality. In Peircean terms, we are dealing with indexicality and iconicity, respectively.\textsuperscript{58}

Regarding whether this constitutes non-arbitrariness, the situation is clear in the case of iconicity. But regarding indexicality, the problem seems more complex. Namely, the relative simultaneity may be a result of weak, incidental associations, even random coincidences, on the one hand. In that case, the situation seems arbitrary. On the other hand, the association may be strong due to a common cause among different features in different modalities, in which case the situation is non-arbitrary. As an example of that, consider the habitats of the fetus and the neonatal, and their multimodal ramifications in various situations, noticeable throughout the life within and without music and arts. (Cf. Guerra Lisi and Stefani 2003; Stefani and Guerra Lisi 2006.) As we notice, there is no clear-cut separation between arbitrariness and non-arbitrariness. Rather, there is a grey area, in which arbitrariness is a matter of degree.

While symmetrical logic may account for music’s ability to represent matters of experience regardless of modalities, a major problem rises. If several aspects of perception in different sensory modalities are fused into one auditory modality, how is it possible to convey the plurality of perceptions in one modality, such as the

\begin{footnotesize}
56 For Peirce’s choice of spelling of prescission, see CP 5.449.
57 Cf. the notion of conflation in chapter 3.1.2.
58 However, see section 3.2. There is a difference in applying the terms indexicality and iconicity to developing thought-signs versus the use of complete signs and their relations.
\end{footnotesize}
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auditive one? To begin with, is it possible to encode the multisensory perceptual complexity in musical sound?

The answers to these questions may lie in those characteristics of music that operate in symmetrical logic. Let us take an example and assume two phrases, in which the melody (assuming there is such) is repeated. We could label this as usual: \( a \mid a \). At the same time the harmony (assuming there is such) might be founded on one tonality in the first phrase (say, a major key in Western tonality), and another one in the second phrase (say, the parallel minor key or harmony resulting from chromatic clusters). In other words, the repeated melody is reharmonized. In terms of harmony or tonality, then, the second phrase constitutes a variant or contrast \( a \mid \neg a \) or \( a \mid b \). Now, unless we consciously dissect and categorize the separate elements of the music, we hear the melody together with the harmony, the result of which is contradictory when considered in terms of asymmetrical logic: the latter phrase simultaneously is and is not alike the first phrase; it is \( a \), and it is \( \neg a \) or \( b \). But the apparent contradiction is not a problem in symmetrical logic.\(^{59}\)

Symmetrical logic may be thought of as being a superset of asymmetrical logic, just as anything conscious has its basis in the unconscious. We may choose to consciously analyze the separate elements of music. In that case, we may successfully operate in terms of asymmetric logic, while the principal means of representation (or presentation) in music are non-arbitrary, as the different aspects, parameters, elements of musical sound are analogous to what they stand for.

It seems that, by being primarily non-arbitrary, music can access both ends of the continuum of the symmetrical and asymmetrical logics. Music may represent (or present) different aspects of perceivable features by virtue of the plurality of its features. As already noted in chapter 2.2.4, these features may be experienced as if they were features of situations of actual or imagined life, features of situations that the subject might encounter, might want to encounter, or might not want to encounter in life. Since the whole process is relatively safe, without actual danger of perishing, music serves as a safe testing ground or playground for life, either for personal use, or for communicational use of a society.

In psychoanalytical terms, music may function as a useful good or bad object, and as a transitional or self-object (e.g. Välimäki 2005, 96–97; Kurkela 1994, 459–467; 59

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\(^{59}\) Clearly, there ways of circumventing the contradiction of this utterly simple example within the traditional bivalent logic by assuming divisibility of phrases into parametric elements or by means of other detours. It may also be thought, that the shortcomings of the bivalent logic evident here might be overcome by other logics such as fuzzy logic (Zadeh 1965). But the fuzzy logic, for instance, only converts the bivalent logic into a matter of degree, to summarize it crudely. In remaining merely quantitative, bivalent or fuzzy, it remains unclear about how the asymmetrical logics could holistically incorporate the qualitative paradoxes, such as this, inherent in symmetrical logic.
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Lehtonen 1986, 103–110; Rechardt 1984, 86–87), and that may include also the intersubjective or collective application of music.

The example above pictured only two crude elements (melody and harmony) in a particular scope of operation (a phrase). In real life situations, the number of musical features is likely to be much greater, possibly functioning simultaneously in different temporal scopes (such as hierarchical forms) and other magnitudes (such as registers versus scale degrees in pitch organization). In speaking of different aspects, parameters or elements of musical sound, we could also talk about dimensions of music, instead. This might be more appropriate, since the spatial characteristic of the core of musical semiosis is about to become more apparent. But let us leave that aside for now, and return to the spatial embodiment of music in part four.

2.2.7 Padilla and Tagg on the concept of music

It is impossible to draw together all the various conceptions of music. However, it seems that the dialectics between the stances of ethnomusicology, cognitive musicology, psychoanalytic musicology and semiotics already takes us quite far in the quest for delineating a concept of music that would fit in the framework of naturalist pragmatism. Yet it seems necessary to sample some of the rare recent writings that have explicitly addressed the problem of the concept of music, in order to cover more bases concerning the pragmatist conception of music. The selected writings in this chapter present the conceptions of music as expressed by two musicologists: Philip Tagg, a cosmopolitan scholar of popular music who is also semiotically inclined; and the Chilean-born musicologist Alfonso Padilla of the University of Helsinki. The two have shared a common interest in a broad spectrum of research topics in musicology.

In a short, provisional course text, Philip Tagg (2002) put forth a concise working definition of music, using eight of what he calls axioms as the basis for the definition (Tagg 2002, 3):

\[ \text{Music is that form of interhuman communication in which humanly organised, non-verbal sound is perceived as vehiculating primarily affective (emotional) and/or gestural (corporeal) patterns of cognition.} \]

Another recent, thorough attempt on defining music (and definition of music as art) has been articulated by Alfonso Padilla (1995a; 1995b; see also Padilla 1998).

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60 Some fifteen years earlier Tagg (1987) expressed six general tenets concerning music in order to clarify the issues relating to the semiotics of popular music, and to broaden the scope of musical semiotics (and musicology). The six tenets constitute another definition of music, substantially quite similar to Tagg (2002), although the text is not explicitly labeled as such.
Starting primarily from ethnomusicological grounds and Marxist dialectics, Padilla condensed his view of the problem as follows (Padilla 1995a, 320–321):

1 Concerning its general social nature, music
   a. exists in all cultures as an acoustic phenomenon (although not necessarily as a conceptual phenomenon);
   b. is meant to be listened to rather than read;
   c. is fundamentally both biological (innate and hereditary) and cultural (learned conventions);
   d. appears also as vocal music in all known cultures;
   e. utilizes a complex functional network;
   f. is in a constant process of change.

2 Concerning its acoustic properties, and concerning it as a language system in all known music cultures music
   g. consists in basic acoustic properties: pitch, duration, intensity and timbre;
   h. follows certain explicit and implicit norms and conventions, which deal with the musical structure, grammar and syntax, without being universally applicable.

3 Concerning its most general structural principles, music
   i. is based on a dialectic interaction of contrasting elements and organizes its discourse in a more or less stable developmental form of thesis–antithesis–synthesis;
   j. is based on the opposition of the principles of repetition and recapitulation;
   k. is based on the principles of tension and relaxation;
   l. operates in all known cultures on the four functional principles (and their combinations): introductory, expository, developmental and concluding.

4 On the level of specific (surface) structure of all existing musical works music does not know absolutely universal elements.

It seems that Tagg’s and Padilla’s definitions correspond quite well with each other, and with the pragmatist conception of music presented in chapters 2.2.1 through 2.2.6. Yet a few remarks might be in place here, as far as the mutual consolidation of Tagg’s and Padilla’s definitions and the conception of music in the framework of naturalist pragmatism is concerned.

First, sensitive to cultural differences, both Tagg and Padilla (item 1a) are explicit about the point that a culture not having a term for music does not mean that the culture has no music (nor a concept corresponding or similar to music): “Having no exact verbal equivalent to our ‘music’ clearly does not mean that the culture in question is without music in any more than the English language’s lack of verbal equivalent to the Hindi notion of rasa or the German notion of Weltanschauung
means that we cannot conceive of different types of feeling/mood/state-of-mind” (Tagg 2002, 1).

When Padilla indicates that there is no need for music “as a conceptual phenomenon” (1a) in order for there to be music in a culture, the wording seems to point to the existence of music as a distinguishable entity, of which there is an intersubjectively shared concept, uttered in verbal language, as opposed to subjects having their own, unuttered, perhaps even unconscious conceptions of music. In the pragmatist perspective, habits of action and perception, which are involved in participation in musical processes, necessarily tie the existence of music as an acoustic phenomenon to the existence of it in experience. Consequently, there is always a conception of the musical processes by the subject (see chapter 2.1.1 and 2.1.2), as a definition of conception by Peirce reads: “a conception is not an idea at all, but a habit.” (CP 7.498, see also CP 5.412). The subject, however, need not be informed of it, nor uttered or share it with others.

What has been described here as music, may be an easily recognizable part of a culture, as it often is for Westerners in Western countries; or it may be fused with another cultural phenomenon, such as dance, theatre, religious rituals or other ceremonies. A culture may have music in the sense described here regardless of a) whether or not the word ‘music’ or a corresponding one is used in the culture to grasp things like what we generally tend to understand by ‘music’; b) whether or not members of the culture use the word ‘music’ for the sounds or experiences of sounds of Western musics as opposed to different words used for a culture’s indigenous musics; and c) whether or not the culture even has any word to describe what is here called ‘music’. Tagg’s point above supports the viability of defining or describing music in a framework such as the current one, and of putting that theory to the service of research on various musics, regardless of whether they have been labeled or conceptualized one way or another in the cultures studied.

Second, Tagg’s delineation of music as interhuman communication is surely feasible and in everyday usage a reasonable alternative, given our knowledge of musics in the world up until today. Padilla acknowledges that there might be some consensus concerning the interhuman character of musical communication, but at the same time notes that some view birdsong as music, and even art (Padilla 1995a, 324–325).

However, whether or not music is only a matter of communication between individuals of homo sapiens, may pose a too narrow definition. Music, as otherwise defined by Tagg, and as outlined here, may or may not have existed in other human species or subspecies in the past (Falk 2000; Frayer & Nicolay 2000); it might exists in communication by other animals (Mâche 1992; Geissman 2000; Marler 2000;
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Slater 2000; Martinelli 2002; 2007); and, at least in the future, it is feasible that music might come to originate in an artificial intelligence. Then we would encounter at least one more problem, which is that of defining ‘subject’: at what point might an artificial mind become ‘someone’, instead of ‘a product of someone’? By using the concept of subject (whether human or possibly proto-human, animal, or artificial) as a participant of the communication, we avoid the problem of anthropocentrism (see Martinelli 2002, 6 et passim; section 1.4). In any case, Tagg and Padilla both clearly agree with the communicatory characteristic of music as presented here.

Third, the attribution of music as a humanly organised form of communication that carries affective or gestural patterns of cognition (Tagg 2002, 3; see above) corresponds to several aspects of musical praxis, poiesis and esthesis as presented here. Namely, if something is organized by someone, there are implicit or explicit goals towards which the organization is steered. In order for something to vehiculate “patterns of cognitions”, the sound must be organized so that it evokes those patterns. This requires both knowledge of what kind of sound it takes to evoke the patterns, and knowledge of how to produce the necessary kind of sound.

In chapter 1.3.4 we came to a formulation that “poiesis is action effecting the state of the objects of the actual world, while praxis is action effecting the states of the phenomenal worlds of other semiotic organisms, which subsequently are also capable of sharing their possibly altered states. This sharing of phenomenal worlds necessarily involves actual objects, since only those can actually be shared. Therefore, praxis as action necessarily involves poiesis.” On those terms, then, a consequent of Tagg’s definition is that music requires praxis and poiesis. Correspondingly, the evocation of the patterns of cognition becomes possible only through esthesis. If the sound is produced so that it creates certain experiences, the sound may represent (or present) the situations that are experienced as such.

Padilla makes closer distinctions between the issues relating to praxis and poiesis, on the axis of universality versus particularity (although not in that order). The surface structures of known musics do not contain universally common elements (that is, there is no common collection of acoustic features that would be shared by all musical sounds; Padilla’s item 4). Nevertheless, sounds of musics, for the simple reason of being sounds and being perceived by humans (as far as human music is concerned), do share the same collection of possible basic properties, which may then be used (or not used at all) in different ways in different musics (items 2a and b). Evidently, poiesis on these acoustic properties is what provides the possibilities for conveying the practical effects in music. Yet, the acoustic properties are only the actual objects in the process, and how the acoustic properties are perceived, is of course another, complex issue. We shall return to this later in parts three and four.
Fourth, Padilla points out the omnipresence of vocal music (item 1d; see Lomax 1968). Tagg, in turn, makes clear the non-arbitrariness of music by stating that the sound produced in musical praxis is not verbal (which would be arbitrary). These do not have to be contradictory. As a matter of fact, Tagg (2002, 3) resolves this succinctly:

Like speech, music is mediated as sound but, unlike speech, music’s sounds do not need to include words, even though one of the most common forms of musical expression around the world entails the singing, chanting or reciting of words. Another way of understanding the distinction is to remember that while the prosodic, or ‘musical’ aspects of speech—tonal, durational and metric elements such as inflexion, intonation, accentuation, intonation, rhythm, periodicity—are important to the communication of the spoken word, a wordless utterance consisting only of prosodic elements ceases by definition to be speech (it has no words) and is more likely to be understood as ‘music’.

Tagg’s wording that musical perception (patterns of cognition) is “affective (emotional) and/or gestural (corporeal)”, also strongly implies non-arbitrariness, although that alone would leave it uncertain. Corporeal gestures may be arbitrary. Think, for instance, of the sign “I love you” in American Sign Language, familiar from various contexts. The extended thumb, first and fourth fingers stand for letters ‘I’, ‘L’ and ‘Y’. The ASL is partially arbitrary, as often the sign of the initial letter of the word in written English is a part of the sign. Affectiveness, in any case, points to non-arbitrariness, since emotions involve asymmetrical logic.

Evidently, Tagg does not disagree that both the action of producing sound (musical praxis) and the perception of sound (musical esthesis) are primarily non-arbitrary, since, according to him, music is “close to preverbal modes of sensory perception and, consequently, to the mediation of somatic (corporeal) and affective (emotional) aspects of human cognition” (Tagg 2002, 3).

Fifth, while Tagg’s definition harmonizes well with the conception of music presented in 2.2.1 through 2.2.6, it omits one essential feature, which I find necessary concerning music as a phenomenon that permeates cultures worldwide, namely, the usefulness of music. This feature is inherent in the pragmatist account.

Padilla does include the feature of usefulness, implicitly. According to him, music “utilizes a complex functional network” (item 1e), referring to Merriam’s conception of uses and functions of music (Merriam 1980/1964, 209–210). In chapter 2.2.4, an attempt was made to show that the last four functions suggested by Merriam may be considered special cases of a more general, extramusical function, that of adapting to the environment; and that the first six functions are intertwined in the musical semiosis in a way that adheres to the idea of music as inquiry. Padilla seems to support rather than to oppose this conclusion. Padilla rejected several dictionary (and...
other) definitions, and finally concluded that music is not only an artefact, an object; it is also and above all a process. In the naturalist framework, musical processes are treated as both biological or natural and cultural, since the culture is man-made nature, so to say (item 1c). And, musical processes are also in constant flux, as far as interaction between subjects and environment is in constant flux (item 1f).

There is no need to go deeply into the reasons why Tagg in that context intentionally or unintentionally omitted the feature of usefulness. It may or may not have to do with the load of aesthetic tradition of Western art music in musicology. In any case, the pendulum swings and has again reached the other end: there is no need to counter what discourse in philosophy of music education has labeled the aesthetic and praxial traditions of ‘musicking’ (cf. chapter 5.2).

There should be no need for attempts to justify all musics as equal, nor elevate one or more musics to an absolutely superior status by default. The usefulness of the musics evidently depends on two things: the subject experiencing it, and the impact that has on the society of which the subject is a member. An ear-blasting head-bangers’ bash may be therapeutic or otherwise beneficial to the participating person in a certain context and temporal scope. But whether or not it is beneficial for the participants in the long run, or in the scope of the whole society, is another question. (One is tempted to hand out pamphlets calling for healthy discussions about these matters.) There needs to be serious research done, in order for musicians to be able to defend and improve the status of music in our contemporary, competitive culture; and, for instance, music education ought to have clearly set yet evolving goals, erasing any traces of *laissez faire* mentality. Societies need to comprehend the actual impact of music on its own grounds, instead of its contribution to the GNP via the ‘music business’.

Finally, sixth, Padilla’s items 3a–d concern a crucial feature of music that was only implied in chapters 2.2.1 through 2.2.6, namely, the temporal organization of music, or musical narrativity. The fact that the content of this book focuses on musical spatiality rather than temporality does not diminish the relevance of how musical sound is organized in time, nor the diachronic continuum of perception and action in musical processes. Generally speaking, temporality is here treated together with, and as a special case of, spatiality. We shall return to the issue of temporality in music in chapter 4.1.5, and in conjunction with the concepts of situation and narrativity (in the next chapter). For now, it suffices to note that Padilla’s items 3a–d do not seem at odds with the conception of music outlined here, but rather go into greater detail in delineating musical praxis.
2.2.8  Eero Tarasti, existential semiotics, and music

Conceptions of music within the subsymbolic paradigm of cognitive musicology seem to be quite coherent between different scholars. However, these conceptions may greatly differ from those present in the old symbolic paradigm of cognitive musicology, which regarded music as rule-based symbol manipulation, rather than a non-arbitrary process of interaction. Within psychoanalytic musicology, the different emphases in the conceptions of music between contemporary scholars are connected to their positions regarding the psychoanalytic paradigms (see e.g. Välimäki 2005, 38–52, 80–97).

Since the current framework is a semiotic one, it is appropriate to take a brief look at the developments in musical semiotics. In terms of paradigms in semiotics, several have been presented over the past century, namely:

1. empirical semiotics, such as the study of medical symptoms;
2. linguistic semiotics, such as Saussure, Jakobson, Hjelmslev and Greimas;
3. philosophical semiotics, such as John Locke and Charles Peirce; and
4. cultural semiotics, such as the Tartu-Moscow school (see Tarasti 1990, 5-11; Foreword: About semiotics).

The different paradigms or research traditions have constituted the domain of “classical semiotics”. At times, the juxtaposition between the traditions of classical semiotics has been contradictory and detrimental, at other times, complementary and rewarding.

Professor Eero Tarasti (2000, 3–4; 1998b, 39–44) has pointed out that there is a shift taking place both in musical and in general semiotics from the “classical semiotics” to less traditional and more novel, original, and perhaps more flexible currents of research. According to Tarasti (1998b, 39), classical musical semiotics attempted “to reduce a musical sign to a normative, constraining set of rules, whether it be a generative grammar, style norms, or various classes of signs as defined by general semiotics”. More recently, “one need not try to reduce the object to a code system, but may conceive of it in a more phenomenological and hermeneutic way so as to understand its originality” (ibid., 40).

One alternative in the new musical semiotics is “to scrutinize the whole situation of communication, taking into account the fact that every sign is an act committed by some subject” (Tarasti 1998b, 41). While Tarasti (idem) expected that “this concrete physiological and bodily perspective” might open up one avenue for analysis, “which connects music to the prevailing epistemes of a culture, to its dominant canons, to the stylistic constraints of musical discourse”, he also expressed his concerns regarding the approaches in which “[m]usic is viewed merely as a transaction
Music is a mental process according to the traditional model of communication” or in which the musical sign is contextualized “as a way of living in a sociological context” or “as a transmission in modern media society” (ibid., 43). Consequently, in search for an approach that balances both the communicational and the significational, he has embarked towards existential semiotics (see Tarasti 1996a, 2000, 2004).

A comparison of Tarasti’s existential semiotics with the framework of naturalist pragmatism is well beyond the scope of this book, and not necessarily without disputes. Nevertheless, let us draw attention to some parts of Professor Tarasti’s work that indicate pertinent aspects of the conception of music present in his recent writings, and especially those aspects that relate to musical conceptions as depicted above.

Interestingly, the shift in semiotics “away from universality, and toward more particularity” (Tarasti 1998b, 40) is in a specific way reminiscent of the paradigm shifts both in cognitive sciences and artificial intelligence. Namely, it coincides with the shift away from the exclusively top-down, rule-based, constraint-oriented and grammar-seeking, symbolist view of classical cognitive science and the “good old-fashioned artificial intelligence” (GOFAI), towards inclusion and even preference for the subsymbolic and neurally inspired paradigm.

Illustrative of this, Tarasti (idem) refers to Raymond Monelle’s deconstructionist analyses (Monelle 1992), in which “textual ‘ruptures’ are identified, which momentarily reveal the universe of unarticulated semiotic, the pre-symbolic world of gestures and desires”. In cognitive science, this shift expanded the target of study from a hermetic mind, black-boxed brain or operationally more or less static symbol-manipulating machine into a (more or less) genuinely existing, sensomotoric organism that dynamically interacts with the objects of its environment. In musical semiotics, this corresponding shift has reciprocally expanded the target of study from a static musical object, equipped with a code and thereby significant in itself in virtue of its internal relations, into a dynamic musical process involving both musical objects and musical subjects, and the relations thereof, implying referential or contextual analysis in addition to analysis of the inner relations of a musical object or work of art.

In a way, there has occurred in both fields a reaction to the earlier linguistic turn (Rorty 1992/1967), a re-turn away from the language-oriented view of signification as a symbol-manipulating, rule-based system (cf. chapter 2.2.6). As Tarasti (1998b, 41) puts it: “One alternative is to shift from mere observation of a musical utterance (text), in order to scrutinize the whole situation of communication, taking into account the fact that every sign is an act committed by some subject. In general, one realizes that communication involves a dialogue between subject and
utterance. Efforts in this direction have been made in psychoanalytic and feminist-oriented analysis, where scholars have theorized how the human body is projected into music”.

The differences between the old and the new are radical. And when compared to the pragmatist conception of music, the new in musical semiotics as described by Tarasti seems to get to the heart of it: in contemporary musical semiosis, music is understood as a holistic and dynamic process of communication or dialogue involving subject and subject’s action (and experience). Instead of static structures and musical works, for instance, we are dealing with a subject engaged in dynamic processes of interaction. In Tarasti’s existential perspective, “music is portrayed as a rich interaction between all participants in the communication and the meaning involved in the music itself”. Essentially, this disrupts “the unidirectional, linear-chain model, since in real communication our exchanges go back and forth and not in just one direction. In such an analysis, music already appears as a certain situation rather than as a fixed object” (1998b, 43). Here we reencounter something that we came across in chapter 2.2.3 in conjunction with Mauri Kaipainen and the cognitive approach to musicology. How do the two key notions of situation relate to each other?

Tarasti’s existential semiotic concept of situation “first of all refers always to a certain particularity” (1998b, 44), in the sense that typologization of situations “presumes that the situational phenomenon has first been investigated as its own entity. Situation cannot be explained as a series of detached causal chains, but rather as a continuous intermingling of events representing various modes of being in the real contexts in which they occur” (ibid., 45). More precisely, “[s]ituation is that part of the world with which one enters into a relationship. One is in a relationship to the world via his/her situation. Situation is the whole of all those phenomena, objects, and states of affairs under which and by which a person’s organic and conscious existence is realized. Situation always consists of a space of play—a Spielraum—of various factors” (ibid., 45).

I read this as a manifesto against a serial, linear, rule-based, absolutely determined view of signification, in which one thing unavoidably would lead to another and that again to another. The notion of situation is central in cognitive, semiotic, as well as pragmatic approaches to signification: it is not only an interface or contact surface between subject and the rest, but rather, situations are the interactions between the subject-organism and the actual world, the actual context. Situation is what joins action

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61 The dialogue of subject and utterance corresponds to Dewey’s idea of shaping and reshaping.
62 From the viewpoint of the holistic, dynamic contemporary musical semiotics, some polemic openings for discussion, such as Small (1999) seem unnecessary today, or seem to fall short of their goals in some degree.
Music is a mental process and experience, subject and the actual world. It is through situations that we exist in the actual world as organisms, and in our phenomenal worlds as subjects.

The existential approach insists on taking the uniqueness of situations into consideration as opposed to generalizing categorization, and therefore the analysis of situation ought to be scalable to different scopes, depending on the needs of scrutiny. Here, the needs are not focused on the surface structures, but the main interest is rather in the whole, both as semiosis in general and musical semiosis in particular are concerned, uniqueness of particular situations notwithstanding.

As far as music is concerned, musical communication and musical signification merge in the concept of situation (Tarasti 1998b, 46; 1996b, 431). A typical model of communication (see, for instance Eco 1979/1976; Jakobson 1960; Shannon & Weaver 1969/1949) consists in a coded message being transmitted through a channel from sender (emitter, etc.) to recipient, both with their codes and contexts. This traditional, simple, one-directional model can be replaced by a model that recursively embeds the agent/patient relations such as composer/audience or narrator/listener into concentric levels, for the benefit of examining musical narrativity (fig. 6):

Figure 6. The communicational and significalional structure of narrative music. Adapted from Tarasti (1998b, 47; 1996b, 434).

In figure 6,
C = the physical composer, that is, the creature “subject to historical and organic processes” (1998b, 47)
iC = the implied composer, that is, “someone with a certain competence, who provides his musical message with signs” (ibid., 48)
N = narrator, who “organizes musical events according to a certain kind of logic, while taking into account a possible audience” (ibid., 46)
iN = implied narrator (or theme-actors as agents) “which functions in a purely musical sense in such a way that it influences another theme-actor” (idem)
L = physical listener
iL = implied listener, that is, the one who can “presumably receive and decode correctly” the signs provided by the implied composer (ibid., 48)
A = audience, that is, the patient for whom the musical events are organized by the narrator in each work
iA = implied audience, or theme-actors as patients, that is, theme-actor, which behaves as a recipient” of the purely musical action (ibid., 46)
In brief, “the whole world of text is situated” (idem) in the actual (physical) world inhabited by the actual composer and the actual listener. Matters related to performer, interpreter, etc., are omitted here, but could be incorporated by extending the model. As Tarasti (ibid., 49) noted, a logical consequent of the view of situations as acts or events is that they can be described in terms of the logic of act and action, such as G. H. von Wright’s (1963) elaboration. Within the world of text (marked by the rectangle in the figure), the actual relationship of agent and patient is reiterated in embedded levels of narration. Consequently, while situation may refer to situation of the actual world, within music—or any other narrative—situations within the world of text represent: “elements of outer reality are internalized so as to form factors that wield influence inside the musical discourse” (ibid., 48).

Musical situations, regardless of the level of presentation or representation, are amalgamations of interaction of the agent and patient. “In music, situation always implies an actor; no situation can exist without an actor somehow pertaining to it. Therefore, what is crucial for a musical work is the way it draws listeners into this situation and forces them to participate in it. Situation is thus an act (i.e. an active situation) or an event (i.e. a passive situation) of a musical subject” (ibid., 49).

Bluntly compared, both Kaipainen’s cognitive notion of situation and Tarasti’s existential notion of situation refer to particular instances or states of continuous, complex, holistic configurations that, by virtue of subject’s interaction, represent—stand for something—in their contexts. The configurations may represent via their internal relations and via their relations to other configurations of the world, which is also inhabited by the subjects involved in the situation. The configurations of objects in situations are not meaningful by themselves. They become meaningful only, and always, in their contexts, which are established during the process of semiosis—in cognition. And that process of semiosis or cognition is the process of the subject’s interaction with the actual world.

Besides the evident differences in methodology and detailed topics of research, the two notions of situation differ mainly in that the cognitive notion relies on methodological solipsism, such that possible intersubjective issues are avoided by examining the interaction only as an interaction of the organism and its environment. The existential notion embarks from the intersubjective end—top-down, rather than bottom-up—and seems to disregard detailed analysis of the mind-body problem.

For cognitive scientists, the mind-body problem is a central question, which is answered, briefly put, by folding any of the complex virtual experiential states or higher levels of representation back to the knowledge dynamics of the representative system, which features distributedness, parallelism, nonsymbolism, and connection-
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ism. In other words, the starting point of cognitive notion (in the subsymbolic paradigm) is from the bottom-up, and situation pertains first and foremost to low-level representation (with some kind of insurance usually taken out against problems of implementation), regardless of the simplicity or complexity of the holistic situation. Namely, mostly for methodological reasons, it has been customary in cognitive science to simplify the examination and simulation of cognitive tasks into rudimentary, even isolated aspects of an otherwise holistic system of experiencing. This has lead to critique. At the same time, connectionist methodology has proven to be a rewarding choice as it has in a relative short period of time provided noteworthy results in attempts at understanding particularly the so-called low cognitive faculties before taking up bigger challenges.

The existential notion of situation, in turn, differentiates a continuum of recursive levels of agent/patient, and while each level is tied to or manifested in the narrativity of the signifying process, it is not (necessarily) concerned with implementation, that is, with the actual operation of the representative system but only the functional operation. Furthermore, the existential notion of situation is, through its broader context of existential semiotics, in a strictly critical stance on connectionism and the attempt to explain the so-called higher cognitive faculties based on descriptions of neural networks (see for instance Tarasti referring to G. H. von Wright’s argument of a brain surgeon in Tarasti 2000, 4–5).

Hence, fundamental differences between the cognitive and existential notions of situation are to be found in how much attention is paid, first, to the epistemic conditions of how the subject’s being-in-the-world is tied to, based on, or constrained by the actual world inhabited by the subject’s organism; and, second, to the complexity of the situations, as illustrated by the recursive agent/patient-levels. More so, fundamental differences can be found in their relations to naturalism.

Consequently, major issues stand in the way of a convergence of the threads of cognitive and semiotic musicology. It seems that, in the framework of naturalist pragmatism, an alternative may open to reconcile some of the main incompatibilities between cognitive and existential semiotics: the unheeded grounding of socially significant interaction in actual reality in existential semiotics, and the seeming solipsism and situational simplicity in cognitive semiotics. The key seems to be found in the explanation for the emergence of the competence underlying the communicative act, that is, the epistemology of signification.

Whether these differences can or need to be reconciled is now beside the point. What is attempted here, is the reconciliation of certain salient features of these notions of situation and conceptions of music with the framework of naturalist
pragmatism, and the discovery of a conception of music that is sufficiently stable to serve as part of the theory of musical composition.

Based on the above, the reconciliation of the conceptions of music does not seem impossible. As noted, the paradigm of cognitive musicology seems to accord well with the pragmatist conception of music as advanced here. And, surprisingly or not, nor does the existential notion of music, as expressed by Tarasti, seem to have any major disagreements with the pragmatist conception of music. The basic notion of musical semiosis as a process of communicative interaction involving the subject came up earlier. While the existential notion of music seems to be less keen on the non-arbitrariness and embodiment of music, it puts more emphasis on techniques of representation in the semiotic process, particularly in terms of temporal organization, and on the complexity of meanings.

Therefore, let us continue with the existential semiotic notion of situation for a moment. This takes us back to the pragmatist aspect of usefulness of music, present also in the existential notion. Situations provide “an occasion for an event or an act to occur or to be accomplished” (Tarasti 1998b, 51, following von Wright 1963).

In narrative processes, occurring events create sequences in which one situation may or may not be followed by another one; that is, event $p$ may result in event $q$ or event $\neg q$, and so “there emerges a network of alternative chains of events”, a network (Tarasti 1998b, 51).

A musical style takes shape as alternatives are observed in the chains. There are possible choices for each branch in the network of events, and a chain of those that actually occur. “How we conceive the range of possibilities”, that is, musical style, “is a consequence of what we observe on the surface of the reality”, that is, the actually occurring events (Tarasti 1998b, 51). We learn the possible choices by observing the occurring choices. And vice versa, we choose the events based on the possible choices. Tarasti connects this idea with Heidegger: “Da-sein represents the whole situation with all its possibilities. Da-sein, however, refers only to the being-there of the surface reality” (ibid., 51–52).63

![Diagram](image.png)

**Figure 7.** Network of alternative chains of events (dashed line) and the actual chain of events (solid line). Adapted from Tarasti 1998b, 51; 1996b, 438.

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63 The idea of learning-situated possibilities relates to the ideas of acculturation and adaptation.
The narrativity that is created through dialogue between the continuation of the expected or possible, and the actually occurring continuation of the situations provides a possibility to create a virtual world with its own logic, habits, time and space. “When a primitive man, while listening to or telling a myth, sinks into a fabled and extrahistoric time, for us the need to escape mentally into ‘a strange universe and time’ is fulfilled when hearing music” (Tarasti 1978, 33, quoting Mircea Eliade’s *Aspects du mythe*, 1963; Tarasti 1994a). Thereby music, just as myth, may be effective in resolving conflicts of actual life by transferring them to a virtual reality of its own, in which the alternatives may be tested safely (idem).

“Situation might be easily identified with a space”, Tarasti points out (1998b, 49), and hence, the continuum of actually occurring situations versus situations that are possible at any given moment could also be approached in terms of the actual space and virtual (or phenomenal) spaces, and musical narrativity as changes in actual and virtual space.

While Tarasti connects situation and situatedness as existential concepts with Heidegger’s concept of *in-der-Welt-sein*, and does not underwrite the naturalist groundings of the representative process, similarities of the existential framework with the framework of pragmatism and the current key concepts of object, organism, action, interaction, experience, mind, subject, habit and representation (see section 1.2) are striking, and the same holds for the conceptions of music. Music is meaningful, not in virtue of the sound itself regardless of the subjects, but through the relations of the musical sounds within themselves, and together with the experiential aggregate of the subject interacting with her environment. The experiential aggregate is accumulated in order for the subject to be in the world. And the significance of musical processes can be found in their ability to provide means of working out virtual situations, that is, situations that stand for actual situations of the world, in order for the subject’s mind to guide the actions of the organism in the actual world.

Therefore music has uses or functions for the individual (and society, and culture), through the subject’s relation to and interaction with the world—hence the term existential is very fitting in this context. Music operates by means of situations and events, and their expectations and confirmation or disconfirmation, and these situations somehow stand for—are signs of—situations that may actually or possibly be encountered in the world.

To summarize, it can be noted, that the existential conception of music does not seem to disagree with the pragmatistic notion of music as inquiry. At the same time, there remains much necessary groundwork to be done, within both semiotics in general and musical semiotics in particular, in order to construe a logically
solid understanding of musical signification that would incorporate the differing stances or mutually compatible conceptions in various traditions of musicological research.  

Next, a glance will be taken at various theories and models of musical composition in the past, and their relation to the naturalist conception of music. The next section also outlines some necessary requirements for a contemporary theory of the musical composition process.

2.3 Theories and models of composition

The naturalist conception of music was discussed in detail in the previous section. This section takes us to composition. The *Oxford English Dictionary* divides the usage of the English term ‘composition’, be it musical, written or other, into three main meanings (OED, s.v. ‘composition’), with examples of usage from different contexts:

1. As an action, as the action of putting together or combining, combination of things as parts or elements of a whole;
2. As the mode with the resulting condition or state, as the manner in which a thing is composed, compounded, or made up; condition or state as resulting from, or constituted by combination; constitution, make, with reference to ingredients; and
3. As the product. A condition consisting in the combination or union (material, practical, or ideal) of several things; a combination, aggregate, mixture; an intellectual production

Corresponding to the three general usages of the term, the OED also gives brief explanations of ‘composition’ specific to music (idem):

9. The action or art of composing music.
17. Artistic manner, style.
21e. A musical production, a piece of music.

The usage reflects the role of composition in various aspects of musical semiosis: sophia, phronesis and techne (the art, skill, or the habits of composing; the artistic manner, styles in music cultures, subcultures, and individuals). It also reflects

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64 This is aptly marked by Tarasti, as well: “An entirely different semiotic program takes shape on this basis, which is not very far from Peirce’s triadic sign categories. If representamen refers to organic process, to something physical, the object, in turn, to facticity, to that sign content which stems from outside, from ‘reality’, then the interpretant would imply the consciousness, as a concept which in our minds unites sign with the object. This new program takes a negative attitude towards linear causality and dissolves it into three dimensions of an existential sign: its facticity (being in Dasein), its physical aspect as an organic process, and its role in the consciousness.” (Tarasti 1998b, 45–46.)
the aspects of praxis and poiesis (the action of composing music), and the actual object of sound as the vehicle of musical communication (in the sense used earlier, namely, including the representative notation or other instruction for producing the sound). Hence, the pragmatist conception of music and its notion of shaping and reshaping sound towards a wanted experience by the same or by other subjects seems to be in concord with the OED description of the usage of ‘composition’.

As may be obvious by now, the word ‘process’ refers here to continuous and somehow systematic (i.e. not random) sequences of actions by a subject or by several subjects, aimed at a goal, and leading to accomplishment of a result. This is in harmony with what OED gives as the chief current sense of the term (see OED, s.v. ‘process’, 8.). As one meaning of ‘process’ OED also lists “[t]he continuing interaction of human groups and institutions”, which is again fitting, considering the role of interaction in the framework of naturalist pragmatism, and in the conception of music as depicted in section 2.2.

Consequently, it can be assumed that when we speak of the composition process, there is a subject or subjects active in the series of actions, as well as in defining the goals. That is, the subjects, endowed with habits of feeling, thinking and action, are active participants in the process. The quest for understanding musical processes hence leads to the need of examining the processes from ‘within’ the subject as opposed to applying a ‘black-box’ metaphor, where the emphasis is only on the relation between the input and the output of the process.

In the process of musical composition, then, a continuous sequence of actions is geared towards the production of an entity of sound, which may be delivered as a code of some kind (notation, recording) or as an actually sounding phenomenon, in order to be experienced by the composer herself or by others.

Despite the evident importance of understanding the compositional process, relatively few holistic studies on it have been published until recently (although see Introduction: About musical composition process). As late as 1985, John A. Sloboda was compelled to warn his readers about how little composition is studied and understood (Sloboda 1985, 103). Some attempts were made earlier (e.g. Bahle 1936; 1939; or the short section on creative work in Révész 1946), but since the mid-1980’s the topic has been addressed more and more frequently.

The existing literature pertaining to the musical composition process varies extensively, both in terms of approach, and in terms of substance. At least the following categories or fields of research can be distinguished as contributors to knowledge about the musical composition process:

1. Composers’ descriptions and interviews. These are usually more or less casual contemplations or conversations, simply aimed at getting across various poietic
issues of composing, such as how a particular work of music was accomplished, what
the composer paid attention to in the poiesis of the work, etc. Although first-hand
verbal sources, they can often be criticized for their lack of internal logic or scientific
qualities. In some cases, composers’ utterances have provided articulate in-depth
analyses, but rarely, if ever, embedded in any feasible theoretical framework or into
pertinent discourses in musicology. If embedded in a theoretical context, they can
be a valuable asset, but usually to integrate them into one or another theoretical
system would require extensive interpretation, during which the first-handedness
is easily lost.

2. Psychology of music and psychology of creativity. Various problem-solving and
decision-making theories have been postulated (e.g. Weisberg 2006, Davidson and
Sternberg 2003), but the question remains as to what degree general psychological
theories of creativity or composition can be applied to musical activities. Gardner
(1985/1983) suggested that musical intelligence is a separate form of intelligence,
which would therefore lead to conclusions that musical praxis and poiesis have a
‘different set of rules’ from other forms of intelligence. If that is the case, how would
the ‘rules’ of musical signification be different? General problem-solving theories
tend to fail in explaining musical composition simply because the key question of
musical signification is left untouched. But then, why should and could there be a
totally different, disjunct set of rules for musical signification versus signification in
general? Still, the psychology of music may provide valuable insight into the musical
composition process, as summarized in chapter 2.3.2.

3. Cognitive musicology (and the related research of artificial intelligence in music).
The study of knowledge and learning of music is apparently fundamental to under-
standing the compositional process. Composition, in turn, is the complete form
of musical activities and musical cognition. Hence, Laske (1991, 237), for instance,
suggested that composition, and not listening, is the paradigmatic way for modeling
music. With that in mind, it is strange that the standard textbooks on music cogni-
tion deal very little, if at all, with the process of composition. The inattention to
composition may serve as evidence of the long-lasting, empty prejudice that the act
of musical composition—or, as it is sometimes labeled: musical creativity—would
somehow be beyond human understanding, or even taboo as a research topic.
Within cognitive musicology, one answer to this may be musical ecology (Kaipainen
1994; see also Louhivuori 1997; Maróthy 2000). Although still delimiting itself to a
ggrass-roots level of operation, that kind of cognitive approach nevertheless attempts
to account for the cognitive system as a whole.

4. Musical semiotics. Composition can be seen as a communicative activity,
which in its discourse uses various signs with variable meanings attached to them
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by participants in the process. Semiotics attempts to help us understand how the composer deals with signs and their meanings, and it is therefore important that at least some aspects of semiotics are included in discussion on compositional processes. Here, Peircean semiotics plays an important role, not only because of the underlying pragmatist framework, but because Peircean semiotics attempts a holistic account of signification. However, the task of applying the Peircean semiotics specifically to music remains (although see Martinez 1997; Cumming 2000; cf. section 5.2).

5. Ethnomusicology. The goals of ethnomusicology tend to be closer to examining notions, values and processes of music as parts of culture (as culture, in culture), rather than examining the compositional processes within a culture from the perspective of the individual (the subject). While compositional processes may not be in focus, the ethnomusicological approach nevertheless tends to encompass not only subjects as listeners or recipients but as more or less active, perceiving and cognizant members of music-making communities. Consequently, ethnomusicology (or anthropology of music or music ethnonomy) has contributed towards understanding the composition process even within contemporary Western music culture, by becoming knowledgeable of methods for examination and by correlating processes of music and music production in Western and other music cultures.

6. Historical musicology and case studies on composition. The historical methods and case studies on musical composition have furnished sources on a variety of past problems that may be juxtaposed with today’s compositional problems. Especially in the historical case studies, a variety of approaches has been used to investigate specific works, specific aspects of composition and the outputs of specific composers. Nevertheless, a solid and comprehensive theory of musical composition applicable broadly to different contexts still remains to be formulated.

The objective of theoretical explanation is in the regularities, or the anomalies in relation to the regularities, that are present in a phenomenon or set of phenomena. That is, theories explain and often predict regularities of phenomena and hence go beyond mere description. These regularities may be structural, temporal, operational, functional, instrumental, etc. In other words, the regularities may be present in any aspect of the phenomenon. A good theory therefore is expected to explain several aspects, and to do it well—possibly truthfully, whatever that entails. The completeness of the theory remains to be evaluated in the scientific discourse and its application to practice. In this sense, a theory is an internally and externally coherent group of propositions which explain a type of phenomenon; i.e. it is coherent within itself and with corresponding theories based on the same epistemological stances.

Many utterances that deal with musical composition process are, rather than theories, models of musical composition: they describe the actions involved in com-
position, but abstain from explaining the process underlying the action. A theory of the composition process would attempt to explain, in a coherent way, the workings of that process, and delve deep into the operation of musical semiosis, into the formation of meaning of musical signs, and the cognitive mechanisms involved. A model of the composition process is a representation of the process, which shows the construction, organization or operation of the system in an identical, analogous or symbolic way. A model may be an exact replica of the system, have some parts or aspects similar to the system, or represent a part or the whole in symbols, such as words or graphs. Consequently, a model may imply or epitomize a theory, and a theory may be illustrated or otherwise complemented by a model.

A functional theory of the musical composition process can be expected to consist of conceptions or beliefs which provide an adequate and useful explanation of the phenomena and questions involved in composing music. Throughout the centuries, a variety of conceptions of musical composition have been expressed in literature, either implicitly or explicitly. But despite such efforts, no comprehensive theory of musical composition has established a paradigm-like status. More than seventy years ago Julius Bahle (1936, i) remarked, that he great guesswork surrounding the activity of artistic creation has so far, with few exceptions, led rather to obscuring the problems rather than to clarifying them. Already the fact, that almost in every case the subject matter of investigation was the ‘strange’ in the creative process, led to the calamity of seeing only single parts instead of the whole. Thus especially the isolated phenomena of the ‘Idea’ and the ‘Inspiration’ essentially comprised the contents of the circle of problems surrounding artistic creation. This much too narrow definition of the problem backfired, however, when each empirical-psychological research attempt at explanation failed and therefore left the gates open for only more metaphysical speculations.

The problems encountered in constructing theories of musical composition partly stem from the concept of composition itself. All three main aspects of the term ‘composition’, given by OED, necessarily fall into the domain of theory of musical composition: first, the aspect of the actual object, the so-called musical work, the more or less well-defined or well-formed entity, that is being produced, commu-

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65 Bahle’s original reads: “Das große Rätselraten um den Vorgang des künstlerischen Schaffens hat bisher mit wenigen Ausnahmen eher dazu geführt, die Probleme zu verdunkeln als aufzuhellen. Schon die Tatsache, daß beinahe immer nur das ‘Merkwürdige’ am Schaffenprozeß Gegenstand der Untersuchung war, führte zu dem Verhängnis, nur einzelne Teile an Stelle des ganzen zu sehen. So bildeten namentlich die isolierten Phänomene des ‘Einfalls’ und der ‘Inspiration’ im wesentlichen den Inhalt des Problemkreises um das künstlerische Schaffen. Diese viel zu enge Problembestellung rächte sich jedoch dadurch, daß der Forschung jeder empirisch-psychologische Erklärungsversuch mißglücken mußte und ihr daher nurmehr die Tore zu metaphysischen Spekulationen offen bleiben.”
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cated and experienced, and the composite of music as an act of communication and the object. The second aspect is the aspect of music conceived (or sound perceived) as a composite of features, elements, ideas, motifs, patterns, modes, conventions or like, that is, as sensation, perception and experience; and third, the aspect of someone as a subject instantiating the habits of composing, and performing the act of making (up) music, that is, musical poiesis and musical praxis. The product, as noted, is not just an object made or manufactured, but produced in such a way that it possesses such wanted characteristics that are (believed to be) necessary for it to produce certain kinds of experience by its user, recipient, or in this case, listener. Such an ability involves habits of feeling, action, and thinking. Not one part of it can be neglected if one wants to grasp the process comprehensively.

Musical semiosis, the elements of which were just presented above, is cyclic. If we forget the relation between music and other semiotic processes for a moment, and consider simply the musical process alone, it is cyclic in the sense that musical action (praxis) yields sound, which results in feeling (esthesis), perception and experience, which in turn ends in habits of action. Habits of action, when instantiated, begin the cycle anew. The process may be shortcut or emphasized in various ways, but at core, each phase of the cycle needs to be examined as an equally important factor in musical semiosis, in order to construe a well-balanced understanding of the whole process.

The same holds when the relation of musical processes and other semiotic processes are taken into account. Semiosis in general is cyclic in the similar manner, involving action, objects of the actual world, perception and experience, habits of action and, again, instantiated action and so forth. Combining musical semiosis as a subset of semiosis in general, then, results in an interplay of music and non-music, which is similar to the interplay between art and non-art as discussed in chapter 1.3.4 (see fig. 4).

Section 1.3 dealt with esthesis, praxis and semiosis, as well as with the artistic. Now it seems, that the naturalist conception of music might, based on the above, be substituted for the conception of artistic in chapter 1.3.4 in the framework of naturalist pragmatism, in order to fathom how musical semiosis is connected with semiosis in general: how is it, that musical semiosis is a subset of semiosis at large. To paraphrase chapter 1.3.4, then, like art, 67

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66 A more accurate expression might be ‘spiral’ or ‘helical’ since any arbitrarily chosen end point of the full cycle differs from the corresponding start point. The conceptual similarities with the notion of hermeneutic circle or spiral are evident. But for now, let us leave the connection to continental philosophy at that (see section 5.2).

67 Clearly, there are also features that differentiate between music and other arts, the primary difference being that in the musical process, the objects involved as objects of action and objects of perception are non-arbitrary (non-verbal) sounds. See 2.2.6 and 2.2.7.
music is a process of perceiving, acting, and thinking, a process of formation of meaning, a type of semiosis. It is also inquiry. It is a process of experiencing by means of interaction with the sounds of the environment by the organism, or by the subject, for the purpose of adapting and evolving.

And to paraphrase section 1.5, just like the artist,

the musician introduces and communicates a non-arbitrary fiction, an imagined state of affairs, by manipulating sound materials, in the musician’s case, into forms suitable for the intended purpose of hypothesizing about the possible operations of the actual world, which are then verified or discarded based on accumulating experience.68

This unavoidably takes us back to the question of whether or not music is art. In the pragmatist framework, a feasible criterion is the Deweyan one: Musical perception is perception of an experience, if and only if music is art. In that case, to paraphrase chapter 1.3.4 again,

music involves esthesis, and updating and reevaluation of the habits of feeling, habits of thinking, and habits of action. The meaning of an experience is the use of the music, the conceivable practical bearings of the experience as the pragmatic maxim suggests. Perceiving an experience yields more or less changes in the habits of thinking and habits of action.

That assumed, we may then continue, that

music necessarily requires imagination. Imagination is the ability of extending the phenomenal world by expanding, extrapolating, estimating and hypothesizing possible situations of the actual world for the sake of adaptation, enhanced interaction with the environment, and successful action in future situations. It appears that, without imagination, the transition from a reflexive organism, with only a poietic type of knowledge, into a sophisticated semiotic subject is impossible.

And additionally,

If the musical action is governed by sophia, wisdom concerning perennial questions, and by phronesis, the practical wisdom of good and bad, the praxis may be good and successful, in the sense that the musical perception yields changes in the habits of thinking and habits of action, that are good for the individual, the community, or both.

68 Here, as in chapter 1.3.4, arbitrariness or non-arbitrary refers to CP 1.383: “The artist introduces a fiction; but it is not an arbitrary one; it exhibits affinities to which the mind accords a certain approval in pronouncing them beautiful, which if it is not exactly the same as saying that the synthesis is true, is something of the same general kind.” Despite the danger of unwanted confusion, the choice of the word ‘non-arbitrary’ is deliberate here, since non-arbitrariness refers at the same time to the artist’s or musician’s conception of the possible state-of-affairs (This is how things might be!), as well as to corporeal musical embodiment as discussed in chapter 2.2.6. Perhaps the difference between the two is not as great as one might first believe.
This cyclic character of musical semiosis has an important ramification concerning research topics in musical semiosis and theories of musical processes. In the past, the focus of descriptions or prescriptions of musical composition has often been on the musical sound, its composite nature, and its poiesis. In other words, attention has been on the object and its manufacture, rather than the process *in toto*. This is due to the evident fact that musical sound, especially as represented in notation, is something more readily comprehensible (within suitable frameworks of theories of musical works, or music theory) than the inherently complex act of composing, which involves not only observable action of producing sounds or writing down notation but, first and foremost, the cognitive processes of musical design and formation of musical meaning which underlie the particular utterances of musical expression.

But clearly, to limit research to the musical sound (or notation or other instructions for the production of sound) alone as the topic of musical semiotics is not sufficient, if the aim is understand the musical process in its entirety. That would simply leave out essential parts of the process, particularly the subjects that produce and experience the sound.

Consequently, research has sometimes focused on musical perception, or reception, of musical sounds, styles or musical subcultures, if you like. The study of reception, in this sense, corresponds to study of perception, experience and transformation of habits of action in general. But in the current perspective, this also is too limited, since musical action, both poiesis and praxis, are neglected.

In other cases, the focus has been on the production of the sound (or notation, or other instruction) that serves as the object in musical processes, that is, on musical poiesis.

As one example of the focus on poiesis, in 1739 Johann Mattheson described musical creation as a procession of various phases:
1. *inventio* in which thematic material, tempo, and key are found;
2. *dispositio* in which the material is structured;
3. *elaboratio* in which the theme and structure are carefully worked upon;
4. *decoratio* in which the melodic material is sensuously decorated; and finally
5. *executio* in which music is performed.

Mattheson’s description is a working although rudimentary outline of one aspect of the composition process, namely the temporal sequence of actions taken in poiesis. It describes the phases of the making of the sound from the initiating idea to
the production of sound. It can be considered illustrative of the musical thinking of Mattheson’s time and place, although it only depicts a narrow aspect thereof.69

In principle, any uttering concerning the process of musical composition (whether pedagogical, reflective, analytical or historical) may express in part or in full either an explicit theory of the musical composition process, an implicit description of it, or a (possibly tacit) model of how some aspects of the process come to exist. Each model or description portrays some kind of understanding of the phenomenon of musical composition, whether one broadly applicable to a variety of musical practices over temporal or cultural distances, or conversely, perhaps an altogether obsolete one, the utterer’s own idiosyncracies notwithstanding.

In contemporary and culturally acknowledgeable perspectives, however, naturalist pragmatism included, Mattheson’s description is clearly insufficient, if the goal is to depict the process of musical composition. Yet it would be unfair to make Mattheson the sole target of critique: similar examples of limited theories of musical composition process are numerous, and many of them are not intended to encompass the complete process in the first place, but to illuminate perhaps only one or two aspects of it. Yet another issue is, of course, how well the theory, be it implicit or explicit, succeeds in explaining the observed facts. In Mattheson’s case, the description would depict quite accurately the poiesis of writing musical works in late 17th, early 18th century Northern Germany and, depending on the case, possibly to some other musics.

The musical composition process involves all the key ingredients of musical semiosis, not only sound (as musical object), production of the sound (musical poiesis), or reception of the sound (musical esthesis and its continuation in semiosis). Composers participate in musical action by producing sound (or representations of sound), not only in terms of poiesis, but in terms of praxis, as well. They also listen to musical sound and experience music, in ways that are fundamentally similar to anybody else’s. Composers are also human beings that experience and act upon non-musical aspects of life, as well. The musical composition process involves the totality of the cycle of musical semiosis: action, sound, perception and experience as well as habits of action. It also involves both artistic and non-artistic aspects of action and perception. In brief, the process of composition contains the logical continuum of the cyclic musical semiosis. Composition, thus, may be thought of as an epitome of musical semiosis.

69 A great many utterances that illustrate the focus on poiesis are manuals of composition, or Kompositionslehren, which focus in detail on what kind of materials are relevant in a style, how the material may be elaborated and put together, etc. In other words, these utterances focus on the techne of poiesis, quite irrespective of the temporal sequence of actions in poiesis.
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Musical performance, in turn, constitutes a more complex process, in which the elements of composition may have been transferred to a secondary level or even tertiary level, in which the performer does not act on her own, but bases her actions on someone else’s more or less explicit instructions of producing or not producing the sound.\(^{70}\)

Musical performance may involve multiple phases of action, sound (or its representations, instructions for its production, etc.), perception, experience, and habits of action, all of which are fundamentally present already in the process of composition. It ought to be remembered that composition, in this context, does not refer only to jotting down notes on manuscript paper, but includes, in particular, improvisation, as well as all other situations where action, directly or indirectly, through tools or instructions, produces musical sound. Historically, it seems obvious that the distinct process of musical performance has emerged from the practical needs of specializing in musical poiesis, the action of producing the actual sound object, finally becoming, in certain music cultures, a discipline separate from composing.

All this implies that study of the composition process is central to musical semiotics. Also, the explanation of music as a process is obviously necessary. For that, the main elements of the naturalist conception of music have now been laid out, first by an outline of the framework of naturalist pragmatism in part one, followed by an analysis of the pragmatist conception of music above. The musical composition process is a semiotic process. Semiosis embraces action, perception, and experience. Musical semiosis involves musical praxis, poiesis, and esthesis. The reason for employing the Aristotelian vocabulary is that, among other things, it allows for distinction between mere production of object, and action that specifically attempts to produce experience (or an experience) by means of actual objects. Esthesis covers the revisionary aspect of praxis. Praxis is guided by phronesis, which originates in subject’s phenomenological world and, especially, in subject’s imaginative ability to hypothesize in advance. Imagination, in turn, is based on experience, the interaction of the organism with the environment, and the ability to rely on the accumulated experience.

\(^{70}\) Evidently, this leads to postmodern issues of who actually is the composer of a musical text, since no composer can free herself from her relations to the musical and other cultural traditions. This also leads to the question of the performer’s role and possible creativity attributed to it, whatever that may be. Here, the distinction between composing and performing differs from that of Christopher Small (1999) who quite convincingly argues for the central role of performing and listening in “musicking”. While Small rightly advocates the role of musical action as opposed to musical work, in my opinion he overestimates the role of the performer; and while the notion of the work of musical art was being shot off its pedestal, an innocent bystander became a casualty, as the role of composer was reduced to “providing material for performance”. Although about a decade has passed, Small’s sharp and fiery lecture still deserves a detailed rejoinder, which has to be done elsewhere, however. (See also chapter 2.2.8.)
In addition to the musical sound, apparently the aspects of poiesis, praxis, and esthesis need to be considered, in constructing a theory of the musical composition process in a framework such as naturalist pragmatism. But since theories of musical composition are designed to encompass more and more of the kaleidoscope of different ways of musicking through times and places, there begins to lurk the danger that, the more universal the theory, the less accurately it is able to explain the particular facets of different musical processes. There is a tradeoff between universality and particularity. Nevertheless, the interest here is neither in the detailed manuals of composition or poiesis of this or that style, nor in the reception, perception or esthesis of any particular style. This is an attempt to give an account of an understanding of the totality of the musical semiosis, as far as it is needed for constructing a theory of the composition process that would be in concord with both relevant theories of a more basic character in terms of the naturalistic approach (such as recent cognitive, neurophysiological, and physical paradigms), and with relevant cultural and social theories of music.

What still seems to be missing, is an explication of the very core of the process of musical meaning-making. How does music actually mean? How do the situations really become meaningful in musical narrativity? How are the various characteristics of musical sound logically connected to the habits of action, and vice versa? In order to answer that question, we must understand how semiosis in general operates. Only then can we attempt to construct a semiotic theory of the musical composition process. These issues are approached in parts three and four. Before them, however, let us briefly summarize earlier theories of the musical composition process, and take a closer look at some of them.

### 2.3.1 A synoptic view of past theories and models of musical composition

The phenomenon of musical composition process has been approached in various ways in past literature. As mentioned, some of it consists in descriptions or models that deal only with musical objects; other writings deal to some extent with the musical mind behind the sound. Some are temporally concerned; some are not. The example of Mattheson’s phases of musical composition portrays a temporal continuum of the formation of musical sound from its inception to its delivery. It describes how the work evolves, but does not explain why. Where does the composer get the material? Where does the structure come from? Based on what does he or she elaborate it? What is the foundation for decoration or other elaboration and why? These are difficult questions, and it is understandable that the answers
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have been avoided, either by meticulous explanations of the technical details of composition, or by speculation on aesthetics, but with little if any consideration as to the relations of the speculations and the actual reality of musicking.\(^{71}\)

In the historical perspective, there are hints of a general tendency to expand from descriptions of musical works as objects towards more semiotically and cognitively committed theories of musical interaction, or—as applicable here—of the musical composition process. Whether useful or not, I have distinguished four crude categories of relevant composition theories, as follows (table 2).\(^{72}\)

In the first category, that of *traditional theories of composition*, music is approached in terms of a finalized, existing entity of musical work and that alone, without regard to the role of the subject, whose actions produce the musical sound.

Theories of the second category, that is, *process theories of composition*, take into account the temporal evolvement of the finalized musical work from preliminary ideas and sketches of sound, the development from *inventio* to *executio*, but exclude the psychological or cognitive operations performed by the composer.

**TABLE 2. Four categories of theories of musical composition.**

<table>
<thead>
<tr>
<th>Category of composition theory</th>
<th>Object and terms of explanation</th>
<th>Principal method of explanation</th>
<th>Direction of reduction and inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional (synchronic) theories</td>
<td>musical work as object, elements of analysis and music theory</td>
<td>combining musical work from elements</td>
<td>musical work</td>
</tr>
<tr>
<td>(Diachronic) process theories</td>
<td>musical work as manufactured object, sketches, elements, styles</td>
<td>cultivating musical work from motifs, structures, forms, genres, styles</td>
<td>design process</td>
</tr>
<tr>
<td>Psychological theories</td>
<td>musical mind, task and problem solving</td>
<td>developing music from ideas, constraints</td>
<td>subject’s behavior</td>
</tr>
<tr>
<td>Semiocognitive theories</td>
<td>musical mind, meaning and semiosis</td>
<td>emergence of music from action and experience</td>
<td>semiosis</td>
</tr>
</tbody>
</table>

\(^{71}\) These two ways of evading the problems may be encountered in the old traditions of *musica practica* and *musica speculativa*, respectively. See Introduction: About musical composition process.

\(^{72}\) Compared to Alan Tormey’s (1988) distinction of types of music theory, the first category includes formalist theories, and “the psychologizing of musical perception” (Tormey 1988, 254) would apparently correspond closest to the third category. Traditional referential theories (Tormey 1988) might best be considered as proto-semiocognitive theories.
Perhaps the most essential thought underlying the third category, *psychological theories of composition*, has been the idea of musical composition as an interactive process between subject(s) and sound as actual object, deeply rooted in the subject’s being in the world. As far as this means the viewpoint of subject’s behavior, the affording language of explanation is the psychological one.

The humanistic line of thought is continued in the remaining category of *semiocognitive theories of composition*. The psychological models and theories of musical composition may be considered precursors to the semiocognitive theories. While psychological theories focus on the process in terms of behavior, thought, memory, etc. and typically utilize the psychological methodology, semiocognitive theories approach the composition process from the viewpoint of formation of meaning.

In addition to the four categories presented below, one might add a fifth one, that of generative models and theories of music and musical composition. The last decades of the 20th century witnessed the emergence of early experiments in computer-generated music (see e.g. Hiller 1970, Loy 1991/1988), mathematical explorations of musical formalisms (Xenakis 1992/1971), generative grammars and rule systems (Lerdahl and Jackendoff 1983), learning systems based on artificial neural networks (Todd and Loy 1991) and evolutionary methods of artificial intelligence (Miranda & Biles 2007). Consequently, digital composition systems, generative methods, and algorithmic music models have mushroomed.73

**Traditional theories of composition.**

Throughout the many traditions of music, several descriptions of the art of composition have survived. Depending on the culture and the era, the role of music in the society, and the governing musical style, various theoretical aspects of music have been in the foreground.

*Traditional theories of composition*, as expressed in the Western context mostly in textbooks of music theory and music analysis, in addition to manuals of composition, contain implicit or explicit conceptions of a finalized musical work. These utterances constitute theories that tend to consider the musical work as an object, as sound, or even as written-down representation of sound or instructions for its production, i.e. notation. They hold the conceived and produced musical work as their essential subject matter. Most of these traditional or *synchronic* composition studies

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(for instance traités de composition or Kompositionslehren in the Western tradition) present norms of composition of a (stylistically correct) work of music.

While the same is not necessarily true in other music cultures, in Western music, the development of common-practice notation moved the focus of traditional composition theories towards notated music rather than the perception, thinking and production of sound. The notated entity of the instructions, originally only a tool for the production of the musical sound, reached a strong status, to the point of equaling the conception of musical work. As in written language, continuously existing notation has made it possible to overcome the temporal volatility of sound, and hence its supremacy. This has been a factor which has resulted in the strong (but difficult) concept of musical work, although it appears that at least until the era of recordings, calling musical works final would often be an overstatement.

Capitalizing on common-practice notation, Western music analysis and music theory have produced a cornucopia of utterances of stylistic norms that attempt to, and often do, describe accurately the correct assembly of textures in different musical genres. In comparison, less attention has been given to the question of how the final situations in the sound objects (or as usual in the Western tradition, the instructions of their production) evolve from elements or initial germs. The question of how music comes to exist is too easily either left unanswered or dealt with either in a general level, by appeals to philosophy, ethics, or aesthetics of music, in an ungrounded way. Unfortunately, analyzing the outcome, the finished musical works or performances of music, does not necessarily shed any light on what transpired during the act of composition. And if music theory is based only on observed structural regularities with no regard to the subjects responsible for production and reception, one can only ask, what are the actual bases for the theory? What guarantees the correspondence of the theory with the actual musical process? Alan Tormey’s comment is descriptive of this (Tormey 1988, 253):

As a musician, I must admit that music theory in its most common forms has contributed relatively little to my understanding of music. As a philosopher, it has heightened my awareness of an uneasy, fragmented, often disruptive relationship between the interests of those involved in composing, performing and attending to musical events, and those whose business it is to extract from or impose theoretical structures upon those primary musical activities.

The concern with the musical work, as opposed to the process of producing one, has thus given rise to a legion of practical ‘cookbook’ approaches that permeate the literature of Tonsatzlehre, analysis, harmony and counterpoint. In many cases these

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theories of musical composition are very close to musical analysis, which is fine as such: the principle of analysis and resynthesis is welcome. However, one tends to be left with a set of rules or normative guidelines of how things should be in a finalized composition, with little or no clue as to how one gets there. Furthermore, the analysis of musical works (conceived as sound object or instruction of its production) may involve the presumption that the finalized work should follow the foot-steps of earlier works, in other words, more or less repeat the existing. While this can, by definition, hardly be called creative, it is nevertheless an inseparable part of the valuable communication of the knowledge of the traditions of compositional procedures and techniques, or music-making in general, that are commonly taught to students of music, and to students of composition in particular. And this is what these theories mostly are: “technical descriptions of musical structure, or pre-compositional formulae” that “give us, at best, the anatomy of a work” (Tormey 1988, 254). Yet, they describe the phenomenon of musical composition in their own, often detailed ways.

Sketch analyses and other process theories of composition.

*Process theories of composition*, based most often on analyses of composers’ sketches, also contain similar implicit or explicit conceptions of musical work, but emphasize its temporal evolution. The process theories also tend to consider the musical work as an object, and hold the conceived musical work as their essential subject matter. However, in contrast to traditional synchronic theories, the process theories or *diachronic theories of musical composition* pay detailed attention to the temporal development, from germ to sketches, testing and editing, on to the finalized work. This is typically done *post factum*, and the roles of the maker and the listener may remain nothing more than speculative, if not altogether ignored, at the expense of the musical work.

Most valuable sources of insight for musicologists studying the composition processes of past masters have been the sketches and notes left by the composers. With careful analysis of the sketches and by comparing the sketches with finalized works and other known facts, not unlike in a detective story, researchers have been quite successful in recreating the order of steps, through which the musical work has become to exist. This has made it possible to formulate theories of the processual development of musical works from the initial jottings to the finalized work.75

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75 See e.g. studies on Beethoven by Nottebohm (1970/1872; 1970/1887) and Cooper (1990); Tyson’s (1987) studies on Mozart; von Westernhagen’s (1973; 1956) on Wagner; Marshall’s (1989; 1972) on J. S. Bach, or the studies on Sibelius by Kilpeläinen 1992; Virtanen 2005; and Huttunen, Kilpeläinen and Murtomäki 2003. See also Kerman 1982.
Sketches can provide help in confirming the sequence of various stages in the process, assuming sketches are available and datable. However, in contemporary computer-assisted composition, for instance, this is often not the case. Whereas Beethoven left behind his sketch-books, composers working with computers may well have frequently destroyed the intermediary documents in order to save disc space during and after the project. From oral traditions and old musics few if any sketches may be available. Furthermore, sketches tend to be shorthand notes for the intended reader, that is, for the composer herself, and may later be overly cryptic even to the composer herself, not to mention to outsiders. (See Sloboda 1985, 104–115.)

Sketch analyses and other studies connecting to the process theories of musical composition attempt to describe sometimes very personal working habits of particular composers, and the degree to which these views can be generalized remains unclear, as these theories do not (extensively) deal with the action and experience of the subject putting forth the musical work, but only with the phases of the work itself. However, they emphasize the importance of the temporal continuum in the composition process, and that the working process itself consists of, not just putting elements of musical sound together into musical structures according to pre-compositional formulas, but of successive stages of varying representations of something—situations—on which a subject is working. They may also be successfully connected to known events in the composer’s life and thus lead to better understanding of the composer as a person, as a subject.

Sketch analyses are one, but only one tool, together with biographical, sociocultural and historical evidences that are available or traceable for studying the development of particular musical works. One could consider this category to include all those explanations and descriptions of musical composition process that involve the temporal continuum from idea to musical work, but excluding the in-depth analysis of the role of the acting subject, the composer, as well as that of the recipient, the listener.

Thus, what is common to the first two traits is that of the cyclic process of musical semiosis, they only embrace the actual object, that of sound, and even more so, usually mainly the notation or other instructions for the production of the sound. While the aspect of poiesis necessarily accompanies these theories of composition of musical object, the aspects of esthesis and praxis are less attended to, and the explanation of the cyclic process is broken.76

76 In terms of the Nattiez–Molino (Nattiez 1990) tripartition, the two types of theories embrace the neutral level, and pay little if any attention to the poietic and the esthesic levels. However, the Nattiez–Molino tripartition itself seems inadequate for describing the complete cycle of musical (or other) semiosis, since it makes no clear distinction between poiesis and praxis, nor does it thoroughly
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Psychological theories of composition.

As an example of criticism aimed at traditional and process theories, John A. Sloboda has criticized the “vast body of literature on musical compositions” which is “concerned more with the musical relationships evident in the finished product than with the moment-to-moment psychological history of the genesis of a theme or a passage” (Sloboda 1985, 102).

Answering to his critique and to the then meager amount of relevant psychological literature on the topic, Sloboda (ibid., 118–) introduced a model of the composition process, which operates on terms such as conscious and unconscious, memory, judgment, knowledge, constraints and problems. Sloboda’s study is a landmark in applications of psychology to complex sociocultural behaviors, music in particularly. It has given a notable contribution to clarify the mystified notions of composition process, due to the rise of the Romantic genius cult accredited to e.g. Kant, Goethe, and Beethoven.

Some related studies appeared both before Sloboda 1985 (e.g. Vernon 1930, Graf 1969/1947, Bennett 1976) and after (e.g. Sloboda 1988, Emmerson 1989, Roozendaal 1993, Collins 2005). More and more these theories have succeeded in applying the theories of general and cognitive psychology and problem-solving in a cross-disciplinary manner to the study of musical composition process, and to incorporate the findings of the psychology of music with the research of musical composition (see e.g. Roozendaal 1993 and its relation to Bereiter and Scardamalia 1987 and Smith and Lansman 1989). At the same time, the developing tradition of psychological theories of composition has also been distracted by the joint rise of contemporary neurophysiology, connectionist cognitive paradigm, and the contemporary paradigm of artificial intelligence and their applications in cognitive musicology.

Sloboda’s theory and other psychological composition theories (see chapter 2.3.2) tend to contain the aspects of both esthesis and poiesis, in addition to the aspect of sound. These theories examine the composition process as a series of a cognitive tasks, in which the musical work is formed via different phases of the subject’s actions. Psychological nomenclature is used. These theories hence do consider the subject, as well as the interplay between the subject and the musical work as object.

The interplay involves musical poiesis and musical esthesis, but the psychological theories of composition theories tend to overlook how and why the structures and criteria of problem-solving are formed. These theories do not convincingly take into account the central issue of how musical meaning emerges and what significance music possesses as a phenomenon tied to the mental functions. In other words, the

analyze the relations between esthesis, poiesis and praxis and their role in the cyclic semiotic process. Unfortunately a more detailed critique of the tripartitive model is beyond the scope of this book.
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complete cycle of semiosis, and the roles of phronesis and sophia in semiosis, are not considered in depth. It can be stated, that the psychological theories of composition lack in strength of epistemological foundation, at least as far as semiosis and musical knowledge is concerned. The key question is the age-old one: Whence music?

Semiocognitive theories of composition.

The naturalistic view of the organization of mind and the pragmatistic conception of semiosis provide us with an alternative for resolving the problem in psychological composition theories mentioned above. As expressed earlier in section 1.1, naturalism in this context refers to the idea, that “human cognition and culture must be explained by assuming that natural evolution has produced a biological species capable of originating the historical evolution of society and culture” (Määttänen 1993a, 9; see also Määttänen 2006a). The formulation of naturalist pragmatism used in this context was given in part one.

Based on naturalist pragmatism, the semiocognitive theories of composition process underwrite conceptions of music such as presented in section 2.2, and hold, that musical composition is a multifaceted, central aspect of musical semiosis, and consequently as a special case of general cognitive and semiotic processes. In this respect, semiocognitive composition theories are in not in conflict with, e.g. contemporary (associationist or connectionist) paradigm of cognitive science and its ideas of cognitive dynamics or cognitive ecology, i.e. with views that cognition is founded on the interplay of knowledge-acquisition and knowledge-use, the idea which is translatable into the semiotic interaction of the organism with its environment.77

The sounding objects, that are considered musical works in the vernacular musical discourse, are considered products of the musical process, actual objects that are set forth for perception, experience, and interpretation, and consequently logically strongly connected with both musical action and experience. The musical process is cyclic in the sense described earlier, and all the aspects of the cycle of semiosis are paid attention to: object, its perception and experience—or to put them jointly in more semiotic terms: habits of feeling, habits of thinking, and habits of action—as well as the instances of action, both in the sense of poiesis, and praxis. Also, the relationship between musical semiosis and semiosis in general is taken into account.78

Research in many fields has sparked a plethora of new, intriguing music-related studies over the past decades. One of the disciplines bustling with innovations are the cognitive sciences. The research dialogues of and between subsymbolic and

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77 This entails an affinity of semiosis and cognition, which is analyzed more in detail in part three.
78 Again, notation or other instructions for the production of the sound are considered secondary issues, transliterations or codings of sound. Like sound, they are also traces of the process.
symbolic representation together with complex system dynamics of cognition have yielded many applications to cognitive musicology.

The neurally inspired cognitive theories of different aspects of music seem to work well, and to correspond to empirical observations, at least in the grass-root level of explanation. However, the time has not yet come, and perhaps never will, when a complete explanation of musical processes, including the composition process and musical signification, could be presented in these terms. While today’s neurally-inspired music research builds primarily on its bottom-up principle, the aim of the semiocognitive composition theories, such as the one presented here, is not to impose predefined, top-down thinking, or to push forth any efforts of competing bottom-up approaches, but to form an interpretation of the big picture, so that the theory of the composition process, as situated in musicological discourse, would be in concord with advances in both cognitive musicology and musical semiotics.

Semiotics, as opposed to or together with cognitive sciences, may prove to be indispensable in this holistic task, since as the science of signs and meanings, it offers several ways of dealing with the key issue of musical composition process, namely the formation of musical meaning. Semiotics also offers a broadly applicable theoretical framework, relevant both in musicology and the cognitive aspects of the musical processes, but also in other forms of signification as well.

Some theories of musical composition may be considered as a kinds of preliminary prototypes of semiocognitive theories of musical composition process, such as theories of affects and figures. These connect characteristics of musical objects with their perception and experience, and more or less take into account the aspects of praxis and poiesis. Clearly, however, they have also been problematic, not the least since they view the composition process static rather than dynamic, are applicable to only one or few musical styles, and are notably weak in their epistemological bases. A fixed vocabulary of musical semantics does not serve well in explaining the ever evolving plethora of musical habits of feeling, action, and thinking.

Until today, semiocognitive theories of music, that incorporate insight from cognitive musicology into semiotic framework, or vice versa, have been relatively few. Examples can be found in the variety of such recent works as Tiits 2002; Windsor 2004; Clarke 2005; Reybrouck 2005; 2006; and López Cano 2004; 2006.

Their main focus, however, is not on the composition process of music per se. Hence, the need for a cognitively aware semiotic theory of musical composition process. And since, to my knowledge, there seems to be no direct precursor of theory of musical composition process in the framework of naturalist pragmatism, the category of psychological theories of musical composition deserves a closer look.
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2.3.2 Examples of psychological models or theories of musical composition

The following models date from no earlier than 1985, when Sloboda’s aforementioned study was published. This does not mean, that no such models or theories existed earlier, but does insinuate that the development of a comprehensive compositional theory has only been taking its first steps during the past decades.

John A. Sloboda’s model.

Sloboda’s (1985) model is based on evidence from sketch studies, composers’ writings, and reports of live observations of both composition and improvisation. The ground rules in his model are the following:79

1. composition is considered a process rather than a work of art (Sloboda 1985, 102);
2. the composer is guided by superordinate structures or plans (ibid., 103); and
3. these plans can be rather provisional, i.e. change over the course of the process (idem).

Sloboda gave a diagram of typical compositional resources and processes (fig. 8), and distinguished two major phases in the process: emanation of an initial idea or inspiration, “where a skeletal idea or theme appears in consciousness” (ibid., 116), and detailed working-out of it (execution). During the emanation phase, superordinate constraints (G in figure 8) direct the formation of an initial idea (A), which is manifested as a theme (B) based on general tonal and stylistic knowledge (F). The second phase, execution, consists of elaboration (extension, transformation and development) of the theme (B) toward a goal set by superordinate constraints (G). Each intermediate form is judged against the goal, and either the intermediate form is further elaborated, or the goal is altered, or both, until the intermediate form is accepted by the superordinate constraints, thus giving out the final form (D). Throughout the elaboration, a repertoire of compositional devices (E) is exploited in pursuit of the goal.

Since the initial idea (A) emanates from the superordinate constraints (G), and the role of the superordinate constraints is essential in the phase of working-out the idea into the final form, the focus here is in the latter major phase of the process. It

79 Although Sloboda’s model is here set under the heading of model and theories of musical composition process, Sloboda emphasized that the model presented “is not a ‘theory’ or an ‘explanation’ of the compositional process, but simply an economical way of describing some of the elements present in composers’ accounts of their activities” (Sloboda 1985, 119). Of a theory, Sloboda would have required more thorough specification of the elements of the model.
appears that the initial idea is manifested as an instantiation of the superordinate constraints in particular circumstances.

Sloboda specified the elements which reside in consciousness (A through E) and unconsciousness (F and G), and pointed out that the line between conscious and unconscious varies from composer to composer. Furthermore, referring to Nisbett and Wilson (1977) and Ericsson and Simon (1980), Sloboda rightly pointed out, that it is not even necessary to talk about unconscious and conscious operation, in this context. More important would be to examine, what is it a person can recollect, let alone report, according to Sloboda (1985, 121–122). This does not downplay the role of the unconscious, or if you prefer, the primary process, conesthetic organization or symmetrical logic in music (see section 2.2); rather, and hopefully, it clarifies the issue. It can be assumed that the domain of the symmetrical logic is more difficult to utter verbally than is the case with asymmetrical logic, which is more readily available for verbal and analytic communication. Therefore the events that follow symmetrical logic are more difficult to reflect or recollect in the dominant, consciousness-related sense of words. Instead of verbal utterances or analytic reflections, symmetrical logic and conesthetic organization may become noticeable through non-verbal processes, of which music is but one part.

The sequence of phases A–B–C–D (fig. 8) illustrates the producing of the “final form” from the initial idea, with the possibility of recursion to goal alteration and judgment. This sequence from an idea to a theme, to intermediate forms, and eventually to the final form seems to correspond well to composition processes closely attached to the common practice Western tonality, or using its genres. Assuming that the notion of theme in Sloboda’s model refers to the motivic-thematic notion of the Western tonality (see Sloboda 1985, 118), however, in regards to the many facets of the contemporary Western music, or musics in other cultures, there is no guarantee that the scope of operation would grow from motifs or themes to larger elements, as a kind of bottom-up evolution of the whole from details. The initial idea may be holistic in the sense that it may be applicable to many aspects, scopes or characteristics of the sound (or musical work, if you prefer). The initial idea may even be an idea of the overall form, in which case the final form would evolve from the whole into details, as a top-down process.

In any case, there is a phase of transformation and development of the initial ideas before the final form is reached. During the working-out phase, the composer works on the object of sound to give it intermediate forms, makes judgements whether the intermediate forms are perceivable as intended, and pending on that, adjusts action. She may also alter the goals of the process.80

80 Of course, one may ask to what degree forms in music are final. Many composers even in the tonal Western tradition, where the concept of musical work is relatively solid, have retouched, revised or
If the composition does not take place at the same instance it is performed, in other words, if the question is not about improvised music (if that serves for an implicit interim interpretation of ‘improvisation’), the working-out phase may obviously take much time. The difference between that and improvisation needs not be greater than the fact, that in improvised music, the decisions made are irreversible; hence, preparation for judgements and setting of goals must be clearly conceived and adjustments made rapidly to accommodate any changes.

The critique presented above notwithstanding, Sloboda’s account of the phase of transformation and development is translatable into the theoretical framework of naturalist pragmatism. Paraphrasing, again, chapter 1.3.4 and the condensation of the Deweyan notion of artistic act of expression, now in the context of musical rewritten works that have been already “finished” in the sense of having had their first performances.
composition: “In the composer’s act of expression the sound materials are transformed into forms suitable for the intended purpose, both for the audience, and for the imagined state of affairs. The materials of the expression are the means for reaching the end of the activity, the imagined future state of affairs.” And paraphrasing Dewey directly (LW 10:56, italics altered):

Until the composer is satisfied in perception with what he is doing, he continues shaping and reshaping. The making comes to an end when its result is experienced as good—and that experience comes not but mere intellectual and outside judgment but in direct perception. A composer, in comparison with his fellows, is one who is not only especially gifted in powers of execution but in unusual sensitivity to the qualities of things. This sensitivity also directs his doings and makings.\(^8\)

The elements of Sloboda’s model consider until this point (A through D) have been instantaneous, volatile, or particular, occurring as objects and actions upon objects at particular moments in time. In psychological terms, the representation of these objects and actions upon these objects employ the short-time memory (if the very crude division is valid between the short-time and long-time memories). In contrast to that, the elements of Sloboda’s model that occupy the long-term memory, are elements E (repertoire of compositional techniques), F (general tonal and stylistic knowledge), and G (superordinate constraints on form and direction). It seems that, in semiotic terms, these elements, similarly, would correspond quite well to the two subsets of habits of action, namely habits of poiesis, or techne (E and F) and habits of praxis, or phronesis (G). The elements occupying short-time memory (A through D), may, in turn, be thought of as particular instantiations of these habits.\(^8\)

Think, for instance, of larger scale formal structures used in 12-bar blues or in Classical Viennese rondi, or on a smaller scale, the common ‘licks’ or standard ornamentations in the same styles. All these were, in their historical contexts, rel-

\(^8\) Regardless of whether composers are or are not “especially gifted” for one reason or another, Dewey’s descriptions of artists’ direct perception, sensitivity to the qualities of things, directing doings and makings, all point at a close connection between esthesis and praxis, and close contact with actuality. This is, in turn, comparable to the ideas presented about music’s relation with the symmetric logic (as proposed by Matte Blanco; see chapter 2.2.6) and its connection to actuality. The difference is, that in music, the composer controls and even plays with the chaos, instead of being vulnerably exposed to its hard facts.

\(^8\) The element F, general tonal and stylistic knowledge, could be thought to incorporate also practic aspects, knowledge of how the inspired thematic material would be experienced, and knowledge of how it would be expressed in a particular style, respectively. Here, however, it is thought that F is only concerned with the poietic, should the distinction be made somehow. But since poiesis is governed by phronesis, there needs to be, in any case, strong connections between the elements G, and both F and E, which are governed by G.
Music is a mental process
tively stable, but they were also evolving stylistic idioms that were used in par-
cular situations. Regardless of style or scope of the idiom, they can be regarded as
habits (long-term representations, subjective and intersubjective norms) and their
instantiations (short-term representations, the actually used applications of the
norms). Both lower level (of particular sound object) and higher level (formal, or
rather, complex levels) require notions that are able to accommodate the aspects of
accumulating and updatable repertoire, as well as the active use of such repertoire.
The framework of naturalist pragmatism has the concept at hand: habits of action
and actions as their particular instantiations.

The mutual relation of E and F is somewhat problematic. The repertoire of
compositional devices (E) is, according to Sloboda, situated in consciousness. Yet
on several occasions, composers, whose works have been analyzed by others, have
commented that they cannot necessarily recall having made such and such decisions
of using this or that ways of making, in other words this or that technique. In my
opinion, just like a performing musician, a composing musician, too, has more or
less had to become proficient in his technique, in such ways that there is no neces-
sity to keep it constantly under the searchlight of consciousness, so to say. At the
same time, the composer may well be aware of the general stylistic issues he or she
chooses to use or not to use in the working-out of the intermediate and final forms.
Consequently, the difference between E and F is not the fact, that the other is con-
scious and the other not. The only essential difference I see between the repertoire of
compositional devices (E) and general stylistic knowledge (F), is that the repertoire
of compositional devices refers more to the actual habits of poiesis, knowledge con-
cerning the making of the sound, in other words, the action upon the object (with
no regard as to its consequences). The general stylistic knowledge appears to refer
more to the knowledge concerning the Deweyan idea of shaping and reshaping, or
to esthesis and its interpretation. In other words, the general stylistic knowledge is
concerned with the relation between esthesis and poiesis, with the feedback, and
the criteria of testing and controlling the characteristics of the intermediate form
as they are experienced and compared to the set goal. Consequently, E and F in
Sloboda’s model, when combined, could be said to constitute the knowledge that
logically connects esthesis to poiesis, that is, techne.83

What remains unclear in Sloboda’s model is the ontology of the superordinate
constraints. Sloboda did not go into detailed contemplations of how the superordi-
nate constraints (G), or the repertoire of compositional devices (E) and the general
stylistic knowledge (F) are formed, and how exactly they control idea formation and

83  In Sloboda’s model, esthesis, necessary for shaping and reshaping, takes place only through ele-
ment G. In actuality, the process of perception evidently passes through many stages before reaching
the practic knowledge.
form judgement as they do. Rather, as it stands, the elements E, F, and particularly G seem to be a mysterious black box.

A simple answer, of course, would be that the compositional devices and the stylistic knowledge arise from acculturation of the composer-to-be into the musical culture she ends up being a member of. And the superordinate constraints may be a result of the general cultural growth of the individual as a member of her community.84

I do not find that sufficient. From where do the stylistic norms and general cultural norms of the community come? If the answer is: “From the individual members of the community”, we are in a vicious circle. Obviously, we cannot, and there is no need to try to, analyze the reasons and origins of general social behavior in detail here. But the fact that the framework of naturalist pragmatism, so far, seems to have been able to embrace the model of musical composition suggested by Sloboda, as well as fostering a naturalist conception of music, gives rise to the thought, that it might be feasible to conceive the emergence of the stylistic norms and superordinate constraints as being somehow connected to the idea of music as inquiry, as well as to the characteristic of music as being embodied.

Hence, the element so far missing from the model could be related to sophia, the wisdom regarding ulterior and fundamental problems (cf. chapter 1.3.4). Sophia governs phronesis and thereby poiesis, as well. It is what connects the musical processes with the general semiosis, the everyday life in its entirety. As noted in chapter 2.2.2, sophia grows from the subject’s experience, and especially from the fallible imaginative ability. From that perspective, it would easy to regard sophia, when applied to music, as the knowledge concerning perennial questions of life in general, and how those questions are related to music.

Simon Emmerson’s model.

Simon Emmerson (1989) presented his model in an article advocating experimental analysis and other renovations in composition pedagogy. Improvements in that field would definitely be most beneficial applications of a successful composition theory. Emmerson’s viewpoint is that of a composer, as opposed to that of a psychologist. Yet, the model presents the musical composition process in terms closely connected to the domain of psychology.

Getting acquainted with Emmerson’s model (figure 9) begins with the element of testing: “It doesn’t matter why I combined these sounds: Do they sound right together?” (Emmerson 1989, 136). Essentially, actions are tested through the acceptance of the objects produced. Objects that pass the test are stored, and actions,

84 Note, that the term ‘composer’ need not mean a professional composer, but refers here simply to anyone active in the process of musical composition.
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that have produced the successful objects are reinforced and collected into action repertoire. In contrast, actions that produce failing objects are either modified and tried again, or rejected altogether in favor of new actions.

While action is situated “firmly in the area of the composer’s poiesis” (idem), the testing in musical composition process, according to Emmerson, is not carried out by the composer alone, although she “brings to bear previous experiences” (idem). Instead, “[r]efERENCE to other members of the community (composers, performers and listeners) is essential” (ibid., 142).

Emmerson’s claim, that action is located in the composer’s poiesis, raises an issue of the role of praxis. Emmerson’s apparent stance would lead to the conception that the goal of the composer’s actions is only the making of the object, with no considerations of the perception of those actions. The actions of composition would be quite random. Yet, one of generalizations, on which Emmerson’s model is based, is “that communication between composer and audience rests to some extent on a common code or at least common expectations and assumptions” (Emmerson 1989, 135). Emmerson also assumed, that “the composer’s code is a necessary condition for the esthesic perception” by the audience, although the audience may fail “to unravel the composer’s code in all its detail” (idem). This suggests that Emmerson simply did not make the distinction between praxis and poiesis, referring to the composer’s actions of producing the sound simply as poiesis.

![Diagram](image-url)

Figure 9. Simon Emmerson’s elaborated model of composition. (Adapted from Emmerson 1989, 138.)
In addition to the need for a closer look at poiesis and praxis in Emmerson’s model, two questions emerge. First, what is the origin of new actions? Emmerson replied: “It doesn’t matter! We can free ourselves from justifying this input on at least one rotation of our model, then perhaps it may join a corpus of the repertoire open for further corroboration or rejection. The parallel with the Darwinian view of evolution is unavoidable; random mutations are quite acceptable, even to be encouraged, providing they are subsequently tested!” (ibid., 138; italics original). This may seem like an unwisely indifferent attitude towards the dilemma of innovation. But it also gives support to the role of abductive logic and imagination in semiosis as described in part one. Maybe random mutations of action cannot be ruled out, but it seems more likely, that the innovative variation contributing to the growth of the action repertoire may be due to the fallibility of inquiry. Misunderstanding may, in its various ways, be the guarantee of creative action. And, let us recall, imagination was the term for the competence of estimation of hypothetical future situations (see chapter 1.2.5).

Second, where do the criteria for testing come from? Why does some combination sound right and another one does not? According to Emmerson (ibid., 137), “the TEST procedure is neither absolute nor stable. The model is embedded within the social psychology of its real time.” Consequently, “[i]t is the business of the psychologist of music to examine the TEST procedures and to establish a hypothesis concerning the preference rules embodied therein. The composer needs not be conscious of these rules to use them or to participate in their development. And they are rules which change in time and context” (ibid., 138; capitals original).

While it needs not be the composer’s task, it is unclear whether psychology alone is the discipline of choice for that. Namely, going beyond the discovery of superficial preference rules, the key to understanding the process is more likely to be in the systematic analysis of how those preferences are formed. And that is a matter of formation of meaning, and consequently possibly a business for the music semiotician to examine.

Emmerson’s model has much in common with the Sloboda’s model. Both focus on the working-out of a preliminary object through intermediary stages into a final stage (Sloboda), or into a stage worth storing for good or possibly until reworked (Emmerson). The development of the object is subjected to critique, and successful actions are accumulated into a repository of stylistically acceptable actions.

Compared to Sloboda, Emmerson paid less attention to the analysis of the “preference rules” of the testing procedure. Apparently this is due to the fact, that Emmerson’s approach was that of a composer composing for an audience, rather than that of a psychologist of music, or a semiotician. Emmerson knowingly excluded
from his model those issues attached to the relation between musical and general semiosis.

At the same time, Emmerson emphasized the cyclic and dynamic characteristic of the process more than Sloboda did. While Sloboda’s model implies dynamic evolution of the stylistic knowledge, repertoire of compositional devices and, in particular, the superordinate constraints, Emmerson’s model is inherently dynamic, due to the element of feedback after testing. Sloboda’s almost linear continuum from an idea to a final form (action level) is replaced by the modification and reinforcement cycle, and the work-oriented notion of ‘form’ is replaced by a more process-oriented notion of ‘action’. This is also in concord with the naturalist conception of music.85

The reinforcement of successful action, and modification of unsuccessful action or search of new action corresponds to the notions of accumulation of experience and the development of habits, as well as Dewey’s notion of shaping and reshaping in the artistic process.

Emmerson avoided the problem of the affinity for tonal music, which was encountered in Sloboda’s model. The roots of Emmerson’s model are in close contact with electroacoustic music, but “it is intended to draw inferences for all genres of contemporary music.” (Emmerson 1989, 136). Theoretical efficiency in Emmerson’s model is gained by the possibility to apply the model on different levels or temporal scopes of operation from short samples of sounds to larger scale forms (although that brings the new notion of CYCLE TIME into the model, see Emmerson 1989, 141).

Emmerson also stressed the contact of the composer with other members of the community. At the cost of the social emphasis, the possibility of autocommunicative music was not heeded, but the basic linear model from composer to listener was expanded to intersubjective communication. In contrast, Sloboda’s model emphasizes self-criticism. Simultaneously, Emmerson was overly quiet about the role of the object versus the composing subject and the audience and their actions. As an example of this, it becomes only implicitly clear, that the testing procedure directly tests sounding objects, rather than actions. The role of the actual objects as necessary elements in the chain of communication should not be overseen. Namely, what is it that keeps the cycle running? Admittedly, that is not necessarily a duty of composers or even musicologists to answer, but the framework of naturalist pragmatism and the conception of music as inquiry may be applicable to this, as well.

The substance of the test procedures are left open by Emmerson, as well. Emmerson left that to psychologists: “It may be that psychologists of music wish to analyse just what it is that makes a particular strategy sound ‘right’” (Emmerson 1989, 143).

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85 Cf. the footnote on Small 1989 at the beginning of this section.
Yet he gave a clue as to the key role of experience in the joint venture of testing: “Crudely a mere ‘exchange of ideas’ must be replaced by more sophisticated notions of ‘experience management.’” (Emmerson 1989, 142.) Although Simon Emmerson is primarily a composer and a musicologist as opposed to psychologist, his model of composition nevertheless employs a psychological approach to composition in that the focus is primarily on the composing subject and the subject’s behavior.

Ron Roozendaal’s psychological analysis of musical composition process.

Roozendaal’s psychological analysis of musical composition process (Roozendaal 1993) is the third example of psychological theories and models of musical composition. It combines aspects of Sloboda’s model of musical composition process (Sloboda 1985), other studies on music (Lerdahl 1988; Serafine 1988), research on architectural and industrial design (Eastman 1970; Teyken 1988), and theories of the processes of written composition of verbal texts, particularly the studies by Carl Bereiter and Marlene Scardamalia (Bereiter and Scardamalia 1987), and by John B. Smith and Marcy Lansman (Smith and Lansman 1989).

Many concepts in Roozendaal’s model were already present in Sloboda’s model, such as cognitive processes, intermediate products, goals, and constraints. From the model by Smith and Lansman (1989) Roozendaal made use of e.g. the key notion of cognitive modes. A cognitive mode is “a particular way of thinking that writers [or composers] adopt in order to accomplish some part of the overall writing [or composing] task” (Roozendaal 1993, 315). During a musical composition process the different modes are used, not (necessarily) sequentially, but in any order. For each mode (exploration, situational analysis, organization, writing, and three levels of editing), their processes, products, goals and constraints are given. Also, three levels of organization are used: global, coherence relations, and expressions. (See table 3 below.)

The process is not assumed to be sequential, proceeding from one phase to another one, although a linearly sequential process is possible. Instead, it is assumed, that there is “an increase in the number of structured ideas as opposed to unstructured ideas during the compositional process” (Roozendaal 1993, 319). During the structuring process, “a set of ideas, themes and intermediate parts (cf. Sloboda’s model) develop into final composition using different types of knowledge” (idem).

The model was tested by Roozendaal through live observation of eight composers, who were asked to 1) write two modulating melodies and 2) finish two incomplete melodies, one of which modulated. First results have been in accordance with the model, but the final results of the experiments based on the model are not published in Roozendaal 1993, nor later, to my knowledge.
Roozendaal’s model could be said to be a descriptive model, as opposed to a prescriptive or explanatory model. It covers various aspects of compositional process, but not the dynamics inherent in cognition in general, nor in the process of composition. As a fusion of various compositional models, Roozendaal has extracted a collection of processes and products, for which his model accounts. The detailed spectrum of the psychological concepts resulting from Roozendaal’s analysis and from the application of the model by Smith and Lansman (1989) illustrates how multifarious compositional processes may exist.

The cognitive modes can be likened to the aspects of action and perception, or praxis, poiesis and esthesis in the framework of naturalist pragmatism. The three modes highest in the table clearly are matters of praxis: first, the assignment or the initial idea is the gist of the act of expression; second, the exploration, or the preparatory elaborations of the initial idea in order to gain general sense of the possibilities and objective of expression; and third, the situational analysis, which, as typical of praxis, consists in analyzing the objectives in relation to the audience. All these are concerns of what needs to be done in order to produce an experience.

The fifth mode, that of writing—or better: musical encoding—is typically a matter of poiesis, the actual making of the sounding object. The fourth mode, organization, as it is labeled by Roozendaal, seems to be the borderline where praxis and poiesis meet. Namely, the transformation of “network of concepts into coherent hierarchy” seems to relate, on the actual level of operation, to issues such as choosing the right or suitable genre, formal structure, or other means of expression provided by the musical tradition or subculture for the act of expression that has been developing.

All these modes, when in operation, probably also involve esthesis, but in Roozendaal’s model, based on Smith and Lansman 1989, esthesis, or shaping and reshaping for which esthesis is a necessary condition, have been given specific categories, according to the level of scope of editing. This may seem to suggest that, unlike Emmerson’s model, the process would be envisioned somehow sequential after all, so that the modes of editing would come into use only after the initial assignments, explorations, situational analyses and organizations have already been in progress. Yet, the first modes may well be the modes of editing. For instance, the composer may begin by arranging previously composed music, or the assignment or the initial idea may rise from or be inspired by a book, a painting, an event in actual life, etc. The composer is always a member of her cultural and musical traditions, and in that sense, we encounter here the postmodern paradox of the non-existence of an initial writer (or composer) of the text. Everything the composer does, may be thought of being somehow related to past experience, musical and non-musical, and in that
sense, all composition may also be thought of as editing. Consequently, the specific modes for editing, seem omnipresent and hence unnecessary as categories comparable to others. However, the distinction of the three levels of operation seem to be beneficial, and seem to be applicable to the rest of the five cognitive modes.

**TABLE 3. A hypothetical model of musical composition by Roozendaal (adapted from Roozendaal 1993, 320).**

<table>
<thead>
<tr>
<th>Cognitive modes</th>
<th>Processes</th>
<th>Products</th>
<th>Goals</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>Representing</td>
<td>Representation Plan</td>
<td>To form a mental representation</td>
<td>Flexible</td>
</tr>
<tr>
<td></td>
<td>Planning</td>
<td></td>
<td>To form a plan</td>
<td></td>
</tr>
<tr>
<td>Exploration</td>
<td>Knowledge-telling</td>
<td>Individual, clustered</td>
<td>To externalize ideas</td>
<td>Flexible</td>
</tr>
<tr>
<td></td>
<td>Representing</td>
<td>and networked musical or non-musical</td>
<td>To cluster related concepts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clustering</td>
<td>concepts</td>
<td>To gain general sense of available</td>
<td>Informal</td>
</tr>
<tr>
<td></td>
<td>Associating</td>
<td></td>
<td>concepts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noting relations</td>
<td></td>
<td>To consider various possible relations</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situational</td>
<td>Analyzing objectives</td>
<td>High level summary statement</td>
<td>To identify and rank potential public</td>
<td>Flexible</td>
</tr>
<tr>
<td>analysis</td>
<td>Selecting</td>
<td>Audience description</td>
<td>To identify major actions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prioritizing</td>
<td>List of major actions desired</td>
<td>[To c]onsolidate realization</td>
<td>Extrinsic</td>
</tr>
<tr>
<td></td>
<td>Analyzing audiences</td>
<td></td>
<td>To set high-level strategy for piece</td>
<td>perspective</td>
</tr>
<tr>
<td>Organization</td>
<td>Analyzing</td>
<td>Hierarchy of concepts</td>
<td>To transform network of concepts into</td>
<td>Rigorous</td>
</tr>
<tr>
<td></td>
<td>Synthesizing</td>
<td>Crafted labels</td>
<td>coherent hierarchy</td>
<td>Consistent</td>
</tr>
<tr>
<td></td>
<td>Building abstract structure</td>
<td></td>
<td></td>
<td>Hierarchical</td>
</tr>
<tr>
<td></td>
<td>Refining structure</td>
<td></td>
<td></td>
<td>Not sustained</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>prose</td>
</tr>
<tr>
<td>Writing</td>
<td>Musical encoding through</td>
<td>Coherent music</td>
<td>To transform abstract</td>
<td>Not</td>
</tr>
<tr>
<td></td>
<td>knowledge-transformation</td>
<td></td>
<td>representation of concepts and relations</td>
<td>necessarily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>into music</td>
<td>refined</td>
</tr>
</tbody>
</table>
### Cognitive modes

<table>
<thead>
<tr>
<th>Processes</th>
<th>Products</th>
<th>Goals</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editing: global organization</td>
<td>Noting large scale relations</td>
<td>To verify and revise coherence relations within intermediate[ly] sized components</td>
<td>Focus on large-scale features and components</td>
</tr>
<tr>
<td>Noting and correction [of] inconsistencies</td>
<td>Refined composition structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manipulating large scale structural components</td>
<td>Consistent structural cues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing: coherence relations</td>
<td>Noting coherence between parts and constituents</td>
<td>To verify and revise coherence relations within intermediate[ly] sized components</td>
<td>Focus on structural relations among parts and constituents</td>
</tr>
<tr>
<td>Restructuring to make relations coherent</td>
<td>Refined parts and constituents</td>
<td></td>
<td>Rigorous logical and structural thinking</td>
</tr>
<tr>
<td>Arranging</td>
<td>Coherent logical relations between parts and constituents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing: transforming, extending, developing and modifying [ing] musical unit</td>
<td>Reading, imagining, playing and listening</td>
<td>To verify and revise musical units</td>
<td>Focus on musical unit</td>
</tr>
<tr>
<td>Musical analysis and judgement on basis of constraints</td>
<td>Refined musical unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>on form and direction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musical transformation (via compositional devices)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musical encoding Instrumentation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sloboda’s model intrinsically assumed transition from the smaller scopes of thematic material towards the larger scopes of complete forms during the process. Emmerson’s model, in turn, was applicable to different scopes (or cycle times) regardless of the sequential order, but the formation of relations between the different scopes remained unclear. The three levels of organization and especially the
notion of coherence relation in Roozendaal’s model may account for the combination of the different magnitudes of the object being produced, that is, how the motivic materials operating in the temporal scale of seconds or fractions of a second (if there are motivic materials) are logical constituents of the larger units of the sounding object, that may last minutes or hours.

In comparison to the refinement of the psychological concepts in Roozendaal’s model, the more classic concepts of the naturalist pragmatism, such as esthesis, poiesis and praxis, may seem crude. This is an example of the tradeoff mentioned earlier between universality and particularity in theories. The traditional, synchronic theories of composition observe the objects, but not the subjects in the process, and consequently largely ignore the process character of composition. In the transition from those theories to the more dynamically oriented psychological models and theories of composition, the detailed conceptual collection of music theories, say, theory of the Baroque counterpoint or the theory of ūṭaḷa in Carnatic music, is replaced by the conceptual framework of psychology.

Similarly, if we are to move from psychological theories of composition process towards semiocognitive theories, the psychological collection of concepts will be replaced by semiotic (or cognitive) concepts, which are more suitable for that specific task. This need not mean that the semiocognitive theory of musical composition would necessarily somehow be more distant from the actual object of sound or from the active subject. An attempt needs to be made to establish a theory that would, to a reasonable degree, be able to subsume both the actual poiesis, which the traditional composition theories are capable of doing in detail, as well as the subjective praxis, for which the psychological models are prepared.

The necessity for a transition towards semiocognitive theories derives from the fact that psychological theories are centered on what goes on during the subject’s processes, but are not deeply concerned with the motives, reasons, purposes or causes of the behavior. In the psychological models this is noticeable in that Sloboda, Emmerson and Roozendaal all assume that the initial idea or impetus for the compositional cycle or process simply comes from somewhere. Also, criteria of ‘rightness’ (Sloboda 1985, 119), based on which the judgements or testing takes place during the development of ideas and intermediate parts into an allegedly final composition, are not accounted for. Yet, the transition away from the psychological models does not render them useless, just as the tonal *Tonsatzlehre* or other traditional theories of musics are not useless due to the psychological models of composition. The question is about finding the suitable means of explanation in different circumstances or perspectives of the composition process.
2.3.3 Requirements for a contemporary theory of the musical composition process

The psychological theories of musical composition may thoroughly describe the behavior of the composer during that process. In the descriptions, psychological theories take into account and make use of traditional synchronic theories as well as diachronic process theories of musical composition. The description is given within the conceptual framework of the discipline, including its terminology, and relying on the underlying set of mutually interrelated concepts that deal with the premisses, axioms, or other principles of the inquiry.

As noted, what remain unaccounted for in the psychological theories of musical composition, are criteria of ‘rightness’ in the judgment of both initial ideas and the criteria for working-out of those ideas by modifying actions, initiating new actions or by altering goals. Whether the judgment is carried out by the composer alone, or jointly by a “community of interest”, as Emmerson (1989, 142) justifiably suggested, the shaping and reshaping in any case requires the composer or the community to engage in a phase of the compositional process, that involves perceiving the intermediate objects and relating them to accumulated experience, which results in modification of habits of action. In other words, each token of the phase of shaping and reshaping in itself constitutes a semiotic process. Consequently, a semiocognitive theory of musical composition process may give a try at the problem of “Why does it sound right?”, possibly even open up answering to “Whence music?”, the key question of musical signification.

Corresponding to psychological theories, semiocognitive theories of musical composition process ought to take into account and make use of the other theories of musical composition, while explicating the process based on a pertinent conceptual framework.

In this case, the chosen conceptual framework for the semiocognitive theory is naturalist pragmatism. The conception of music as anatomized in section 2.2 is in concord with the framework. The naturalist conception music views music as inquiry, which in turn is a process, by definition. Composition is first and foremost regarded as the process consisting in the continuous sequence of actions taken by composing subject geared towards the production of entities of sound, which may be delivered as a code of some kind (notation, recording) or as actually sounding objects. Since the process involves shaping and reshaping of the intermediate objects, the relation between the composing subject and the sounding object is interactive in the sense of naturalist pragmatism.
The semiocognitive theories ought to make use of the other theories, particularly the psychological theories of musical composition process, as long as they have been successfully subjected to critique. The pertinent conceptions of music should also be taken into account. Therefore, some further remarks are fitting. Some of the issues are accounted for in the psychological theories. Others have become discernible due to the omissions or incompatibilities of the psychological theories with the conceptions of music or naturalist pragmatism. Yet others are issues that are noteworthy due to the complexity of the concept of music.

As a basis, let us recall the synthetic view of esthetic, practic, and semiotic (see fig. 10), based on Aristotle, Peirce, and Dewey, and presented earlier in chapters 1.3.4 (fig. 3d, right side) and 2.2.2 (fig. 5). The synthetic view accommodates aspects of action, perception, and experience, and subject’s interaction with the environment. The synthetic view seems also suitable for grasping some key concepts pertaining to the conceptions of music in section 2.2, and to the psychological theories of composition process as outlined in chapter 2.3.2.

First, it seems that the aspects of action and perception, and particularly the factors producing the sound and the shaping and reshaping of it, as presented in the psychological models, can well be treated in terms of praxis, poiesis and esthesis. From Roozendaal’s analysis, the five cognitive modes that remained were folded to the notions of praxis (first three), poiesis (the fifth), or both (the fourth). Sloboda’s elements of E (repertoire of compositional techniques) and F (general tonal and stylistic knowledge) were considered habits of poiesis, and G (superordinate constraints on form and direction) habits of praxis.

As praxis and poiesis necessarily involve esthesis, the role of esthesis, too, is readily employable for the notions of judgement, goal alteration (Sloboda’s model); testing, reinforcement, rejection and modification (Emmerson); as well as editing (Roozendaal). This, however, requires acknowledgment of the cyclic character of the process, both as involving critique by the composer herself, or adjustment of the actions by the “community of interest” (Emmerson). Here, Peirce’s notions of self-criticism and hetero-criticism, respectively, seem to come in handy (CP 1.574; see chapter 1.3.2).

Second, Sloboda’s model implied growth from small elements through intermediate forms into the complete final form. Emmerson’s model, in turn, was applicable in different temporal scopes of the object being worked upon from short samples of sounds to larger scale forms. For those purposes, Emmerson introduced the notion of cycle time. Roozendaal’s analysis contained three different levels of organization: level of expressions, global level, and the unifying level of coherence relations.
It seems that the factor of coherence versus incoherence should somehow be accounted for in a semiocognitive theory. Or at least there may be no discrepancies between the composition theories regarding the coordination of the macrolevel to the microlevel, and vice versa. This study takes the stance, that the coherence versus incoherence of both musical experience and experience in general are due to how musical experience, experience in general and the actually existing objects relate to each other: “the existence of objects is an hypothesis needed to explaining the coherence of our experience” as Kent (1987, 42) described Peirce’s approach to cognition and the real (chapter 1.3.2).

Third, both Sloboda and Emmerson brought up the issue of short-term memory (STM) versus long-term memory (LTM). Perhaps Roozendaal had foresight to omit the problematic concept of memory from his analysis, although the psychological analysis would eventually need to relate the compositional activity with the mnemonic ability. While in closer psychological analysis the division between STM and LTM may be far from sufficient, the dual division of memory seems to be such an important cognitive factor, that it should be taken into account when devising a cognitively aware theory of musical composition. In a comment to Sloboda’s model, it was suggested, that habits and their instantiations might serve as the pragmatist concepts compatible with the elements of cognitive operation in long-term and short-term memories, respectively.

Fourth, as already mentioned, the emergence of initial ideas as well as the criteria of ‘rightness’ during the judgment or testing need to be accounted for. Since the psychological theories have not sufficiently addressed the issue, this requirement for the semiocognitive theory is of paramount importance. The notions of music as inquiry, imagination, fallibility, and abduction (among other modes of inference) were suggested in a comment to Emmerson’s model as starting points for that treatment.
Fifth, and closely connected to the previous, the relation between the process of music and other, non-musical processes of the psyche, cognition, or semiosis, ought to be addressed to the extent that the quest for meaning in music would reach an adequate depth and breadth of explanation. This is indeed the key question in musical semiosis: Whence music? The notion of music as inquiry, and the characteristics of music as delineated in section 2.2 give directions to this long and winding road.

Sixth, the semiocognitive theory of composition must be in harmony with the list of characteristics of music as outlined in section 2.2, that is, with the pragmatist conception of music. To remind, the characteristics were labeled real, communicative, representative, useful, embodied, and non-arbitrary. In addition, there ought to be no unresolvable disagreements between the relevant explicit definitions of music by musicologists (such as Tagg’s and Padilla’s in chapter 2.2.7). Furthermore, there should be room for the temporal organization and possible hierarchic dynamic designs of music (such as Tarasti’s account of narrativity in music as presented in chapter 2.2.8). It seems, that at least the conceptions of music as expressed here by quotes from Tagg and Padilla do not pose insurmountable obstacles. There seems to be some issues of epistemic conditions between the naturalist and the existential approaches to music that need to be addressed at another point. However, both the existential concept of narrativity, and the cognitive and existential notions of situation seem rewarding, rather than problematic.

Seventh, a good theory of musical composition process might also be able to account for the juxtapositions of conscious versus unconscious, composition versus improvisation, and artistic versus non-artistic in musical composition.

To conclude, the eighth remark: the three examples of the psychological theories of musical composition are not the only studies in the category, nor is the explanatory spectrum of those theories limited to those summarized here. Some answers to the issues listed above may be found among theories, that are best described as psychological theories of musical composition process (see for instance the account for composition process and for new ideas by the Finnish musicologist Yrjö Heinonen in Heinonen 1995, 15–36). Other theories of musical composition, such as the rule-based theories (see e.g. Laske 1991), may also provide some insight. However, the fourth and fifth remark in particular indicate, that the key problems to understanding musical composition are, at core, semiotic. Therefore, it is time to take a closer look at semiotics and the formation of meaning from the perspective of naturalist pragmatism, before returning to the problems of musical meaning.
The second part focused on the minor premiss of this book: *music and musical composition are mental processes*. The concept of music and theories of musical composition process were analyzed in the framework of naturalist pragmatism presented in the first part. Here is a summary of the second part.

Although Peirce held that all concepts are relational and definable, the plurality of music juxtaposes the concept of music with various conceptions of music. No interpretations of observations of actual musical processes were made. Rather, some explicit definitions and a selection of implicit explanations of music by expert musicologists scaffolded the outlining of the concept of music. These musicologists represent different research traditions, and consequently different approaches to the concept of music.

Six characteristics highlighted a pragmatist conception of music. According to the review of the concept, music is real, communicative, representative, useful, embodied, and non-arbitrary. Music is real in the sense, that it is a process of interaction involving subjects as organisms and sound as actual object. As such, musical semiosis is a subset of semiosis at large. There is a well-established epistemic connection between organism’s action, sound, and organism’s perception. Also, music is a part of subject’s existence, as in music, subject estimates and designs hypothetical future situations, experiences them, and acts accordingly. Music is also real in the sense that, for the subject, the phenomenal world is as real as the subject herself, and music is fundamentally rooted in the subject’s interaction with the actual world and constitutes a particular kind of interactive process.

Music is communicative in that musical action consists in both poiesis and praxis. Musical poiesis is the making of the sound, subordinate to musical praxis. Musical praxis, guided by the phrontic wisdom of “what is good” and possibly by the sophic knowledge of perennial questions, is action that affects the subject’s or others’ experience by possibly causing an experience. Whether an experience or not, experience is compelled by the hard facts of sound. The effect of action may be different in each subject, and different from the intended. But by shaping and reshaping, the sound, the ways of producing it, and the ways of experiencing it are adjusted towards wanted situations. Music is representative, in the sense that the sound may be perceived as somehow standing for actual or possible situations.

Consequently, music is useful. Situations in music can be experienced as if they were situations of actual life. Music provides a relatively safe testing ground for real-
life and virtual situations. Experiencing possible situations enhances the possibilities of adaptation to actual, challenging situations.

Besides the role of sound as the means of producing experience, it is specific to music, that it is embodied and non-arbitrary. Of three different notions of embodiment in music discussed so far, corporeal embodiment is central in terms of musical semiotics: musical representation operates fundamentally in virtue of isomorphisms or analogies, as opposed to being arbitrarily negotiated, as is the case with verbal language. The isomorphic character of musical representation suggests that spatiality is an essential concept for the analysis of musical semiosis, thus suggesting spatial embodiment of musical semiosis, which is discussed in part four.

That notwithstanding, the temporal organization of musical sound and the aspects of musical narrativity need to be taken into account. There may be a way to consolidate the roles of temporality and spatiality in musical semiosis, pending on the conceptions of time and space. A key concept to the consolidation may be that of situation.

The third section gave a synoptic view of different theories or models of musical composition. These were divided into four categories of relevant theories or models. The traditional synchronic and the diachronic process theories focus only on the sound object or its poiesis, excluding the cyclic process of semiosis, and the role of the communicative subject. Psychological theories and models investigate the behavior of the composing subject, and more or less take into account the cyclicity.

John Sloboda’s diagram of typical compositional resources and processes (Sloboda 1985), Simon Emmerson’s elaborated model of composition (Emmerson 1989) and Ron Roozendaal’s hypothetical model of musical composition (Roozendaal 1993) were compared against the conceptions of aesthetic, practic, and semiotic as presented in part one, as well as the conception of music presented in the second section of this second part.

Based on the comparison, many aspects of the psychological models or theories can be grasped in the framework of naturalist pragmatism. The aspects of action, perception and sound as object in the psychological theories or models can be treated in terms of praxis, poiesis, and esthesis. The cyclicity of the process of composition corresponds to the cyclic characteristic of interaction between subject and the environment, which is also capable of taking into account the aspects of intersubjective communication and autocommunication. The elements of testing, critique or judgement relate well to the Deweyan notion of shaping and reshaping, and Peirce’s notions of self- and hetero-criticism.

Habits and their instantiations might serve as the pragmatist concepts compatible with the elements of cognitive operation residing in long-term and short-term
Music is a mental process

memories, respectively. The treatment of different levels of organization in the production of sound suggest, that the factor of coherence versus incoherence between microlevels and macrolevels of organization should be accounted for in a semiocognitive theory of musical composition. A semiocognitive theory may attempt to accommodate the concept pairs of conscious versus unconscious, composition versus improvisation, and artistic versus non-artistic.

The psychological theories or models summarized do not explicate the criteria of ‘rightness’ in the judgment of either initial ideas or in the working-out of those ideas by modifying actions, initiating new actions or by altering goals. These issues are deeply entangled with the formation of meaning in music. While other theories with psychological or other orientation may also be successful, the need to explicate the formation of meaning suggests a semiotic approach. The framework of naturalist pragmatism, the pragmatist conception of music, and the psychological theories of musical composition seem to provide a healthy basis for the construction of a cognitively aware semiotic theory of musical composition process.

In chapter 1.2.3, the term ‘mind’ was described as the competence guiding organism’s action in the actual world, based on the representation thereof. In the pragmatist account, representation is about forming a connection (or a collection of connections) between perception and action, one way or another. This connecting character of representation is closely related to Peirce’s concept of the Sign as a relational semiotic entity between the Object and the Interpretant. This is a central topic of part three.

In short, as presented in the second part, music is a mental process, and consequently also a semiotic process. It involves poiesis and praxis as aspects of musical action, that produces sound (as object in the actual world), that is intended to be experienced. Musical action is guided by the subject’s habits of thinking (techne, phronesis and sophia), which connect the habits of feeling with habits of action. Musical semiosis is a subset of general semiosis, in that music and musical composition employ and develop competence that guides organism’s action in the actual world, based on the representation thereof. Music and musical composition are mental processes.
3 Mental processes are spatially embodied

Part one presented the principal features of naturalist pragmatism as the founding framework of this study. In the second part, the framework was subsequently applied to the concept of music. Now, the same foundation serves as the basis for the treatment of the concept of space, the operation of mind as a subset of semiosis, and the spatiality in mental processes.

The first section of this third part samples the concept of space from a variety of perspectives, examines certain spatially aware theories of cognition, and suggests a pragmatist conception of space. The second section delves into Peirce’s ideas of phaneroscopic categories, signs, and cognition. It also gives a summary of a naturalistic approach to semiosis as modeled by Pentti Määttänen. Deriving from the first two sections, the third one presents a view of the mind as a semiotic system, in which the concept of spatiality plays a central role.

The “established facts” of scientific inquiry on space have undergone major revisions in the past centuries. Today, there is a range of possible approaches in the analysis of the spatial concepts, from those of physical cosmology to those of cognitive psychology or phenomenology. It is not the purpose of this book to present a thorough historical view of spatial thinking. These can be found, for instance, in the seminal views of the historical developments of thought of space by J. J. C. Smart (1973/1964), Max Jammer (1970/1954), and Alexander Gosztonyi (1976).

Similarly, there is an abundance of studies on Peirce’s views of categories, semiosis and cognition. The task is not to attempt an all-embracing presentation of Peirce’s theories. Rather, the first two sections relate to each other in such a way, that the literature concerning space is sampled with the particular goal of being able to coordinate the conception of spatiality with a reading of Peirce’s theories, so that together, they would contribute to an understanding of mental processes and their spatial embodiment, the topic of the third section.

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1 The examination of models and theories of the composition process in section 2.3 revealed the need to examine the composition process in terms of signification and semiosis. The analysis of the concept of music in section 2.2 confirmed that music is a mental process, the mental being a subset of semiosis in Peircean semiotics. In terms of the framework, we took off from the very “surface level” of actual objects and organisms (chapter 1.2.1) and moved in part one to the pragmatist view of subject and subjects being in the world. In this part we continue to the “deep level” of signification as necessitated by the requirements for a contemporary theory of the musical composition process.

3.1 The concept of space

Space and spatiality have been present in a huge variety of topics in a vast amount of research in several disciplines, semiotics and musicology included. The concept of space has been under focus especially in mathematics, physics, psychology, cognitive sciences, as well as philosophy, but it is by no means a stranger in the humanities either. A multitude of dichotomies or differences of opinion tends to persist between the various research traditions and their respective conceptions of space, impeding a holistic view. A holistic view would, of course, be desirable when the topic of research touches a broad band of issues, and particularly when spanning between the actual world and the phenomenal worlds, as is the case in semiosis, or in music and other forms of communication.

Clearly, any thorough analysis of the concept of space, even from one perspective, cannot be performed here, however. Instead, what follows is an attempt for a transition from the multitude of dichotomies into a continuum, i.e. to briefly present such an abductive conception of space that could encompass spatiality from the materially physical space to abstracted phenomenal spatiality, for the benefit of developing an understanding of semiosis in general, and musical semiosis in particular.

In English, the term ‘space’ has had two major usages: denoting time or duration and denoting area or extension. In the former sense, the word has referred to short and long lapses of time between two definite events, to amounts of time contained in specified periods, to amounts of time somehow determined, or to any period or interval of time. In the latter sense, the term has generally denoted linear distance or interval between two or more points or objects, superficial extent or area, area sufficient for some purpose, extension from point in all directions, room available for something, and, finally, “continuous, unbounded, or unlimited extension in every direction, regarded as void of matter, or without reference to this” as well as “the immeasurable expanse in which the solar and stellar systems, nebulae, etc., are situated; the stellar depths”, that is, the universe. (OED, s.v., ‘space’.)

The dual character of the term is present already in the etymological roots of the term. For instance, in Latin, the word *spatium*, too, had both references to both time and area (LS, s.v. ‘spatium’). The stem of the word, *spa-*, seems to be quite widely Indo-European, and is traceable across West European languages from e.g. the old Icelandic *spönn* or the Middle Low German *spamm*, homologous with the modern English noun *span* (between fingers, in particular), to the Latin *spatior*, for taking a walk (cf. German *spazieren*) or even to *spadion*, the Dorian word for race-course (cf. *stadion*) etc. (Zoëga, s.v. ‘spönn’; OED, s.v. ‘space’; LS, s.v. ‘spatior’; LSJ, s.v. ‘spadion’.)
Mental processes are spatially embodied

How the additions to *the Oxford English Dictionary* have accumulated over the past one hundred years seem to indicate that the temporal reference has become less common, while the new references to the latter main sense of the OED listing have clearly increased. Hence, in our days, ‘space’ points usually either to the spacetime manifold as the structure of the universe, space in the cosmological sense, or in the workaday sense, to available room, expanse, area, and capacity.

What seems to be common to the various usages, appears to be that they all deal with a totality of mutual relations of two or more points, whatever those points may be. The relation may involve issues such as similarity, dissimilarity, membership, adjacency. These, in turn, easily translate to continuity, connectedness, dimension, homeomorphism, all of which are key notions of (point-set) topology, the branch of mathematics that studies topological spaces, i.e. properties of forms that remain invariant when stretched, bent or otherwise transformed. The issues may also include that of (perceivable, measurable or defined) distance, area, volume or other size, in which case the space becomes metric in mathematical terms.

Regarding the role of mathematics, Peirce put it in a special position among the sciences (CP 1.184):

> Mathematics studies what is and what is not logically possible, without making itself responsible for its actual existence. Philosophy is *positive science*, in the sense of discovering what really is true; but it limits itself to so much of truth as can be inferred from common experience. Idioscopy embraces all the special sciences, which are principally occupied with the accumulation of new facts.

Topology as a branch of mathematics studies the logical possibilities of the characteristics of spaces, without a need to take into account their real existence. But in the context of semiosis, ‘space’ is indeed tied to the real existence of the participants of semiosis, both in terms of actual reality and phenomenal reality. Therefore, topology cannot (alone) provide the answers to the current problems concerning spatiality.

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3 Point-set topology examines these properties by studying the limits and properties of sets of points. Hence it is also called set-theoretic topology. Let us take the old mathematical joke to clarify: A topologist is a mathematician who cannot tell the difference between a coffee cup and a doughnut. Namely, the cup and the doughnut are topologically equivalent, since both are simple, single-holed tori. Topologically, the cup can be transformed into the doughnut, or vice versa, so that for each point, there is a matching point. (Such a transformation may become more intelligible if you imagine infinite pliability of the objects, and forget about the materials and distances present in the actual life.) In comparison, a pretzel’s topology is more complex, since a regular pretzel is a three-holed torus, while doughnuts usually have just one whole. If you try to transform a pretzel into a doughnut, what do you do with the two extra holes? The points of the pretzel do not match those of the doughnut, and hence the pretzel and the doughnut are not homeomorphic. See, e.g. Kelley 1975/1955, Gaal 1964, Willard 1968, Arkhangel’skii & Ponomarev 1983 and Munkres 2000.
While the mathematical approach to space should not be altogether forgotten, the main reason for taking the short scenic route across the historical semantics and etymology of the term was to shed some light on the complexity of the concept and to glance at how the concept is anchored in everyday life and being in the actual world, both in action and in experience.

Think of spatior, or walking, for instance. In walking, the organism, an actual object of the actual world, performs a sophisticated sequence of small actions, taking care of the balance by constant feedback and adjustment of movements, posture etc. from one location to another, circumventing any possible obstacles, during a period of time. At the same time, the subject, if there is one, directs the organism’s action towards a selected goal—the destination of walking—and constantly perceives changes in the environment in order to guide the action. The subject may also have developed an understanding of herself as a walking subject and organism in the environment, and of the constantly changing mutual relations between herself and the environment. In short, the seemingly simple actions like walking, for instance, are immersed in various aspects of spatiality from very physical or actual to very subjective or phenomenal, even conceptual (see e.g. Vaughan 2003).

As discussed in the context of the concept of music (chapter 2.1.2), the analysis of a concept needs not be based on how people in everyday life use a word. In the case of music, that approach was considered potentially detrimental for the analysis. Instead, utterances of expert musicologists were considered more beneficial.4

The situation is not much different with the concept of space. Compared to folk theories or laypersons’ conceptions of space, utterances by experts may be considered more rewarding for analysis of the concept of space. The primary goal is not to examine what people in general think of space or spatiality, or how they report the conceptions they may have of space. The laypersons’ utterances concerning space may be superficially grounded (“The Earth is flat because it looks like it. The sun revolves around the earth because I think it does.”), mutually contradictorily, and even in contradiction with their own actions. Actions, in turn, according to pragmatist principles, reflect some aspects of the true beliefs as beliefs are habits of action.5

Although empirical studies of spatiality and habits of actions (instantiated and non-instantiated) certainly would do good, there is unfortunately no possibility for that here. Consequently, we shall rely on certain specialists’ views, which are more or less based on empirical studies, and more or less outcome of philosophical

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4 The lay conceptions of spatiality reflect the first grade of clarity, our common “familiarity with a notion”. The dictionary definitions, in turn, exhibit the second grade. The analysis of the concept here works towards the third grade of clarity. (See CP 5.392; chapter 2.1.1.)

5 According to Peirce, “genuine belief, or opinion, is something on which a man is prepared to act, and is therefore, in a general sense, a habit.” (CP 2.148; see also CP 2.435, 3.160–161, 5.394–398.)
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contemplation. Yet, laypersons’ conceptions, as shown in the dictionary definitions above, may not in the long run be too far from the conception of spatiality extracted here.

3.1.1 Absolute and relative conceptions of actual space

Recall that part one introduced the idea of realism with two aspects, the one of the actual environment, inhabited by organisms and other actual objects that are actually real for the organism, and the other of the subject’s phenomenal world, which is real to the subject. Parallel to that, a pair of contrasting aspects of space are here referred to as the *actual space*, which is space as far as it involves (only) the objects of the actual world, pertaining to the organism and other actual objects, seemingly external to the subject, independent of subject’s thinking; and *phenomenal space*, which is present in the representations and experience that constitute the subject. The former could perhaps otherwise be termed natural space, but according to the naturalist foundation, the phenomenal is not opposed to being natural, rather the opposite. Also, the term ‘external space’ would not be befitting, since, as noted in part one, the actual objects belong to the functional organization of the subject’s mind (Määttänen 1993a).

There may appear to be a categorical difference between actual and phenomenal spatiality, relating to the classic mind–body problem: what is the relation between the actual space involving objects of the actual world and a phenomenal space that is a part (and a result) of the subject and her mind. In semiosis, does the actual space at some point turn into a phenomenal space, and vice versa? From the viewpoint of naturalist pragmatism, it can be maintained that the same strong epistemic connection that bonds subject and organism together, or the actual and phenomenal worlds together, also holds for actual and phenomenal spatiality. Let us now outline the development of the concept of the actual space for the benefit of delineating the contemporary conception of phenomenal spatiality (in the next two chapters). Namely, from the viewpoint of naturalist pragmatism, there is a solid logical connection between the actual and phenomenal spatiality, and traditional understandings or folk theories of the actual space may be misleading en route to the pragmatist conception of space.⁶

Historically, the thinking of actual space has had two opposing major traditions, those of *(a) relative space* and *(b) absolute space*. These are also referred to as relationalist versus substantivist conceptions of space, respectively. The possible third alternative, the scepticist one, that the actual space would not (necessarily) exist,

⁶ The treatment of the concept of the actual space in this chapter is largely based on Max Jammer’s history of theories of space in physics (Jammer 1970/1954).
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was already rejected earlier in section 1.1. According to Albert Einstein, “[t]hese two concepts of space may be contrasted as follows: (a) space as positional quality of the world of material objects; (b) space as container of all material objects. In case (a), space without a material object is inconceivable. In case (b), a material object can only be conceived as existing in space; space then appears as a reality which in a certain sense is superior to the material world” (Einstein’s foreword to Jammer 1970/1954, xiii).

Aristotle and the Classical conceptions of space.

In Western thinking, the standard understanding of the absolute actual space was at first developed by the geometers, astronomers and philosophers of the Ancient Greece, based on earlier Mesopotamian, Sumerian and Egyptian ideas. The Greek geometers attempted to formulate an axiomatic account of the actual space, but were mostly confined to two dimensions, that is, to plane geometry. The apparent reason for this was that there were unresolvable inconsistencies between the rigorous two-dimensional Euclidean geometry and the Greek conceptions of the three-dimensional firmament, the world and the cosmos. Consequently, neither the kinetics of actual objects (issues such as velocity or acceleration), nor the structure of the universe, that is, space in mechanics or in astronomy, were axiomatically geometrized by the Greek. As Max Jammer put it, “how could Euclidean space, with its homogeneous and infinite lines and planes, possibly fit into the finite and anisotropic Aristotelian universe?” (Jammer 1970/1954, 26).

Aristotle rarely used the Greek term for space (χώρα, chora), and did not offer an explicit theory of space (Ross 1995/1923, 88). Instead, he did write about place (τόπος, topos), which is sometimes translated as space (see e.g. the Loeb edition), and about the heavens (ουρανός, ouranos) and the World, the Universe (κόσμος, kosmos). In Categories (VI.5a), place (topos) is described as a continuous quantity, occupied by parts of solids, that “have a limit in common”. Hence place (or space in this sense of the word) is a finite container of objects. (See Jammer 1970/1954, 22; for topos see also Rhetoric and Topics).7

According to the Aristotelian view of the cosmos (in De Caelo, i.e. in Περί ουρανοῦ), the universe is similarly finite, composed of matter as opposed to there being a void. According to Aristotle, there are more than 50 concentric spheres

7 There were, of course, other conceptions of space in the antique Greece, such as the Pythagorean, Democritian or Platonic ones (see e.g. Jammer 1970/1954, 7–26). Yet, the basis for further developments in the history of the concept of actual space seems to have been the Aristotelian conception, and the emancipation from it (ibid., 27–94). From the current perspective, the fact that Julia Kristeva chose the same term chora for the pre-linguistic (or non-linguistic) domain of semiosis, seems a conflicting choice, as will become clear later (see Kristeva 1984/1974; Välimäki 2005, 178 et passim).
Mental processes are spatially embodied

(Metaphysics 12.1073b–1074a). The eternal, perfect and unchanging superlunary bodies of the outer spheres rotate around the sublunary sphere of the imperfect earth, which is at rest at the center of the universe. (See Ross 1995/1923, 96–99.)

This cosmology, when combined with the Aristotelian conception of topos, may have formed the core of the classic idea of the absolute space. However, the ideas could not really be combined until much later. Without going to the details, there is “a serious inconsistency between his [Aristotle’s] own space theory on the one hand and his cosmology and theology on the other”, as Jammer (1970/1954, 21) pointed out.

These inconsistencies were criticized as early as by Simplicius in the 6th century C.E. But in its completeness, the Aristotelian construct was strong enough to survive. Logically, space did become the finite, immovable, material, three-dimensional container of everything. In the Western world, the Aristotelian (or the later Ptoleman) cosmology took finally over from the Platonic cosmology, and was held on until the Copernican revolution began in the 16th century. The rigorous Euclidean geometry had become the basis for scientific and practical measurements. Together, Greek cosmology and geometry provided a solid, although mutually incompatible setting for theories involving spatiality for centuries. With only some exceptions, mostly on metaphysical grounds (Jammer 1970/1954, 23), the Aristotelian cosmology and the Euclidean geometry remained unquestioned until the dawn of modern natural sciences.

Despite the historical developments towards absolute conceptions of space, Aristotle might also be conducive to a more relativist interpretation, if the flaws and inconsistencies could had been resolved. Namely, while the Aristotelian treatment of spatiality has its inherent flaws, his theory of place (topos), according to Max Jammer (1970/1954, 17), was “the most decisive stage for the further development of space theories”. And due to the mutual relation of space and place (idem), the theory of place indirectly also constitutes another theory of space.

Jammer also suggested, that Aristotle’s theory of place anticipated the idea of relativity of space, although the argumentation is based on the notion of the classical elements, their assumed natural tendencies, and the geocentric view of the universe. Namely, already in Aristotle, “space is likened (using a modern expression) to a field of force” (Jammer 1970/1954, 19). Space, in that perspective, might not be completely independent of matter, but, rather, relative to the distribution of matter. This is perhaps the most important determining factor of the relative versus absolute conception of space.

According to Jammer (1970/1954, 16), Aristotle’s Physics superseded Plato’s Timaeus only in the twelfth century. While Plato might also have served as an example of the Greek cosmologies, Aristotle is more closely related to the Peircean framework, after all.
However, in Aristotle’s conception heavy bodies move towards the center of the earth due to the influence of space on the matter, rather than space being subordinate to the distribution of matter (see Jammer 1970/1954, 19). According to Aristotle, “[i]t so happens, that the earth and the Universe have the same centre, for the heavy bodies do move also towards the center of the earth, yet only incidentally, because it has its centre at the centre of the Universe” (DC 296b).

Interestingly, Aristotle’s student Theophrastus, critical of Aristotle, spoke of “the incomprehensibility of the universe as not being in space, and comes to the conclusion that space is no entity in itself but only an ordering relation that holds between bodies and determines their relative positions” Consequently, Theophrastus viewed “space as a system of interconnected relations” (Jammer 1970/1954, 23.) Yet, the idea of relativity of space was not totally strange to Aristotle either, since for him, place (topos), like solid, plane, and line, was a continuous quantity, consisting of parts “which have position in reference one to another or else they have no such position.” (Categories VI, 5a15). Yet, the absolute conception of space fit in the Aristotelian construction to the degree, that it remained the governing authority for centuries. Meanwhile, the relativist conception of space remained marginal.

Newton’s absolute space.

Quite similarly to its Classical predecessor, Isaac Newton’s view of absolute space ruled Western thinking for a long period of time, regardless of its flaws and deserved critique. Newton (Principia 1962/1729/1686, 6–12) is traditionally considered as the originator of the concept of absolute space in the modern Western sense. While it holds on to the main notion of space as an absolute container of everything, Newton’s concept of absolute space differs in many aspects from the Aristotelian conception.

Newton’s conception of absolute space was a result of his first law of motion: “Every body continues in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed upon it.” (Principia, 13; see Jammer 1970/1954, 101). According to Newton, “real, absolute rest, is the continuance of the body in the same part of that immovable space, in which [a ship or other container] and all that it contains, is moved.” (Principia, 7; see Jammer 1970/1954, 102), and determining whether or not something is truly at rest or not requires an absolute system of reference. Hence absolute space became both logical and ontological necessity for determining rest and rectilinear motion.

Although in Newton’s lifetime (1718) Edmund Halley confirmed Giordano Bruno’s idea that the so-called fixed stars were not fixed, Newton held on to the hypothesis, that “the center of the system of the world is immovable. This is acknowl-
Mental processes are spatially embodied

edged by all, while some contend that earth, others that the sun, is fixed in that centre.” (Principia, 419). Newton opted to choose, among all possible inertial frames, the center of gravity of our own solar system as the center of the world, and boldly assumed, that this center is at rest. He did not take into account the masses of the other stars, nor their movement. (Jammer 1970/1954, 103.)

Newton’s mechanics was able to show that the acceleration of a mass depended on the effecting force. This explained not only the kinematics of motion (change of location, speed) but also its dynamics (relation to force etc.). At the same time, Newton’s assumption of the necessity of an absolute point of reference led to the denial of the relativity of motion and to the necessity of the concept of absolute space. (See Reichenbach 1958/1927, 214.)

Newton believed, that “space (as an inertial system) acts on all material objects, while these do not in turn exert any reaction on space.” (Einstein in Jammer 1970/1954, xiv). Consequently, according to Newton (Principia, 6), “[a]bsolute space, in its own nature, without relation to anything external, remains always similar and immovable.” Consequently, in the Newtonian absolute view, too, space is the eternal container of all objects, but also explicitly independent of matter, and infinite. According to Jammer, this view was partly due to Newton’s conception of God as omnipresent, constituting “duration and space” (Principia, 545), as opposed to e.g. Berkeley’s conception of God being the only eternal, infinite, indivisible and immutable, wherefore space should be relative, and inconceivable “without body and motion”. (Jammer 1970/1954, 112–113; Principia, 544–546; Berkeley 1982/1710, §§110–117). The theological ramifications of various conceptions of space evidently had an effect on their acceptance, although at least Newton attempted “to draw a clear line of demarcation between science on the one hand and metaphysics on the other” (Jammer 1970/1954, 98).

In brief, the features of the Newtonian conception of absolute actual space can be summarized as follows:

1. Geometry is considered a special branch of mechanics, and its axioms are “facts of immediate experience” (Jammer 1970/1954, 96–97). Mathematics is subordinate to physics. The absolute space is absolute both mathematically and physically.

2. Time, space, place, and motion need not be defined, “as being well known to all” (Principia, 6).

3. Space acts on all material objects, but objects do not exert any reaction on space. (Einstein in Jammer 1970/1954, xiv)

4. “[B]ecause the parts of space cannot be seen, or distinguished from one another by our senses, therefore in their stead we use sensible measures of
them. For from the positions and distances of things from any body considered as immovable, we define all places; and then with respect to such places, we estimate all motions, considering bodies as transferred from some of those places into others. And so, instead of absolute places and motions, we use relative ones; and that without any inconvenience in common affairs.” (Principia, 8.)

5 Relative space is a (moving) coordinate system included in, and a part of the absolute space. Coordinate systems are not just useful tools. Relative spaces measure the absolute space.

6 “Absolute space in its own nature, without relation to anything external, remains always similar and immovable. Relative space is some movable dimension or measure of the absolute spaces; which our senses determine by its position to bodies; and which is commonly taken for immovable space; such is the dimension of a subterranean, an aerial, or celestial space, determined by its position in respect to the earth.” (Principia, 6.)

7 Absolute space is the substratum for all physical events, spatiotemporal relations and processes. Through measurements, absolute simultaneity, duration and location, absolute separation of locations and events in absolute space are definable.

8 Matter is abstracted to the Newtonian concept of “mass-point” as opposed to Cartesian concept of spatial extension. Kinetics and dynamics of actual objects are examined in terms of mass-points.

Newton’s view continued to be accepted until the beginning of the 20th century, despite the fact that the practical aspects of science could actually quite well have done without it (Jammer 1970/1954, 139–140). Even Newton himself “recognized the difficulties involved in speaking of such an unreal structure whose ‘parts cannot be sensually perceived’” (Reichenbach 1958/1927, 211; quoting Principia). What Newton failed to see, was that an absolute reference system is not required for explaining the relative movements of external objects. (Jammer 1970/1954, 110). Even Newton’s contemporaries Leibniz and Huygens tried to find explications for the dynamics of motion without the absolute conception of space, but the issue could not be solved until the early twentieth century. Despite all this, for many the Newtonian conception of the absolute space still remains the dominant theory.

9 Newton continued by admitting that “it may be that there is no body really at rest, to which the places and motions of others may be referred”, thus himself putting the concept of absolute space under doubt.
Mental processes are spatially embodied of actual space in everyday situations of the practical life, whether implicitly or explicitly.\(^{10}\)

**Transition to the contemporary relative conception of space.**

Already in Newton’s time, Gottfried Wilhelm Leibniz had come to the conclusion, that “there exists only a motion of bodies relative to other bodies, and it is impossible to distinguish one of these bodies as being at rest, because rest means nothing but rest relative to another body, i.e., rest is itself a relative concept.” This theory of the relativity of motion, called kinematic relativity by Reichenbach, was later a major point of departure for the contemporary theory of relativity. (Reichenbach 1958/1927, 210.)

Towards the end of the 19\(^{th}\) century, it had become clear that the absolute space was neither theoretically necessary, nor could it be experimentally corroborated. The concept of absolute space, although perhaps still possible from the philosophical standpoint, was considered “metaphysical” and its elimination was demanded (Jammer 1970/1954, 143). This was put in a nutshell by Henri Poincaré (1914/1897, 93; see Jammer 1970/1954, 143–144):\(^{11}\)

> Whoever speaks of absolute space uses a word devoid of meaning. This is a truth that has been long proclaimed by all who have reflected on the question, but one which we are too often inclined to forget.

The relative conception of the actual space finally became the dominating paradigm after Albert Einstein published his special theory of relativity (STR) in 1905 and the general theory of relativity (GTR) in 1916. Without diminishing Einstein’s contribution, it should be noted, that the developments towards the idea of relativity of actual space included, e.g. Galileo’s conception of the relativity of motion, Mach’s rejection of Newton’s pail experiment, the Michelson–Morley experiment and the dismissal of the luminiferous ether, the discovery of non-Euclidean geometry and Bernhard Riemann’s notion of space as n-dimensional manifold and its later extensions, the distinction between mathematical or theoretical and physical or actual space, and the developments in research of the psychological (origin of) space (see Jammer 1970/1954; Reichenbach 1958/1927). The evidence gathered

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\(^{10}\) G. W. Leibniz and Christiaan Huygens had been in correspondence regarding this matter. In 1920, D. J. Korteweg found Huygens’ posthumous papers providing a solution to this, concluding that “[i]t is therefore impossible to state that a body is at rest in infinite space, or that it moves therein; rest and motion are therefore only relative.” (D.J. Korteweg and J.A. Schouten. 1920. *Huygens*, *Jahresbericht der deutschen Mathematiker-Vereinigung* 29, 126; quoted in Jammer 1970/1954, 125; the Latin original translated by Max Jammer 1970/1954, 124; see also Reichenbach 1958/1927, 210–213).

\(^{11}\) Ernst Mach (1882/1883, x; earlier edition quoted in Jammer 1970/1954, 143), in turn, described the absolute space as “conceptual monstrosity” (“das Begriffsungetüm des absoluten Raumes”).
during the 20th century has not disproved Einstein’s theories nor has it been contradictory with the relative conception of space.

Let us now pick out some characteristics of the relative conception of the actual space that might prove to be relevant for the current study.

First, space, as it pertains to the actual world, is a matter *a posteriori*. There are no mathematical or other a priori methods for deciding the characteristics of the spatiality of the actual world. As all problems, this, too, can only be settled based on *experience*. (*Cf. Jammer 1970/1954, 146*).

Fallibility of inquiry therefore applies to the established facts about the spatiality of the actual world, as well. While mathematics describes and predicts possible spaces, the actual world inhabited by us is what it is.13

Second, instead of the actual space being an existing entity independent of what we may think, both absolute and relative space are “free creations of the human imagination, means devised for easier comprehension of our sense experience.” (Albert Einstein’s foreword to Jammer 1970/1954, xiii). Contrary to the absolute conception, space (or time) has no causal properties in itself, according to the relative conception. In short, our conception of the actual space is a phenomenal space.

In the relative conception, what is real about the space, is the system of *mutual relations of actual objects or their characteristics*. Thus space is not, as it was according to the absolute conception, a pre-existing substratum containing all the physical events, a theatre for spatiotemporal relations and processes, that would act on all material objects, but would in return be unaffected by the objects. Rather, space obtains its existence from the characteristics of actual objects, and from the ways they are perceived. Putting the concepts of space and object in this order, of course, makes no changes to the actual world, but merely to the way it is understood.

Third, accordingly, space and other space-related ideas, such as time, place and motion should not be considered simply given, “well known to all”. They are *concepts in need of recurring reassessment*. One factor which exhibits the *a posteriori* character of space is the dimensionality of the actual world. The believed three-dimensionality of the actual space (or the four-dimensionality of the actual spacetime) is not a self-

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12 This is in direct opposition with the transcendental and ideal notion of space by Kant, who maintained, that “[s]pace is not an empirical concept which has been derived from outer experiences” but “an a priori representation which necessarily underlies outer appearances” (*KdRV* 68, A23 and 24, B38 and 39).

13 In this respect, mathematics (including geometry and topology) is not subordinate to physics, but a different scientific endeavour. As Reichenbach, for whom geometry was “a theory of relations”, put it (1958/1927, 92): “The geometrical axioms are not asserted to be true within mathematics, and mathematical geometry deals exclusively with implications; it is a pure deductive system.” Similarly, the Peircean classification of sciences holds that principle, as far as the division of labor between mathematics and idioscopies, such as cosmology and astronomy, are concerned.
Mental processes are spatially embodied
evident fact, but rather, an assumption made because it simply seems most conven-
tient, or the best solution for most situations based on our conception of the world
so far. However, this does not rule out the possibility to rely on the evolutionary
principle of Peirce’s conditional idealism, that persistent inquiry (especially the
scientific, communicated inquiry) eventually leads towards a better adaptation to
the actual world, and in this case, to more accurate representations of the actual
space, if necessary.

Fourth, the geometry of the actual space is thought to depend on matter. At
first, this may seem to contradict the previous Einstein’s notion, that absolute and
relative spaces are “free creations of the human imagination”. But if space is indeed
understood as a means “devised for easier comprehension of our sense experience”, as
opposed to an actually existing entity, as was the case with the absolute conception
of space, there is no contradiction: the actual space is a living theoretical construct,
a conceptual tool, with which we attempt to grasp the actual reality—the relations
of the actual objects.

The fact, that this turns spatial concepts pertaining to the actual world into a
matter of agreement, does not imply relativism in the sense that any conception
of actual spatiality would be equally viable. Instead, again, spatiality of the actual
world is a matter a posteriori. What kind of geometry gets created is a matter of
convenience, a convention, born in connection with experience. “We select that
system of geometry which enables us to formulate the laws of nature in the simplest
way” (Jammer 1954/1970, 165). (See Poincaré 1914/1897.)

And as the formulation of the laws of nature stand presently, according to the
relativist conception, the geometry of the actual space is a function of the mass-
energy distribution (of visible and dark matter and energy) in accord with the Ein-
stein’s field equations (e.g. Jammer 1954/1970, 22). Hence the distribution of actual
objects is the causa efficiens of the actual space. We can measure characteristics of
actual objects, but not the actual space itself (see Jammer 1970/1954, 162–165).14

By 1876 Bernhard Riemann’s translator, William Kingdon Clifford wrote: “I hold in fact
(1) That small portions of space are in fact of a nature analogous to little hills on a surface which is
on the average flat; namely, that the ordinary laws of geometry are not valid in them.
(2) That this property of being curved or distorted is continually being passed on from one portion
of space to another after the manner of a wave.
(3) That this variation of the curvature of space is what really happens in that phenomenon which we
call the motion of matter, whether ponderable or ethereal.
(4) That in the physical world nothing else takes place but this variation, subject (possibly) to the law
Philosophical Society; quoted in Jammer 1954/1970, 163) In the field theories, the view is reversed,
so to speak: the “hilliness” or flatness of space is dependent on the distribution of the matter.
Here, the usual physical terms ‘matter’ and ‘energy’ are substituted for ‘object’ due to the strive for
consistent and simple nomenclature. Connected to this, a situation is the distribution of objects,
From this perspective, experience can tell us nothing about the actual space itself, but it can tell us something about material objects and their relations, since we as organisms are ourselves objects and exposed to the causal effects.15

Fifth, in the process of “formulating the laws of nature”, there may be several explications or theories, different from each other, that may be simultaneously valid for explaining the geometry of the actual world, pending on the scope or context. For instance, in our local human scale, for all practical, down to earth matters, the actual space may be approximated as a geometrically flat three-dimensional Euclidean space, since in our everyday lives we are far from the magnitudes of the speed of light or astronomical masses or other circumstances that render the Euclidean conception inadequate. In those circumstances, time may seem independent of the spatial dimensions.16

On the galactic scale, the characteristics of the objects (their velocities and masses in particular) reach another magnitude, introducing situations or effects (such as redshifting of electromagnetic radiation, light bending, time dilation and black holes) that are better explained in terms of Einstein-Minkowski spacetime and Einstein’s GTR. In that approach, the actual space is described more accurately as a four-dimensional spacetime, which is no longer homogeneously flat, but locally curved based on local circumstances. Finally, in the cosmological scale, yet other phenomena are encountered (such as the cosmological redshift and cosmological background radiation), that may need extensions to the four-dimensional Einstein-Minkowski space, such as the complex dimensionality hinted by Stephen Hawking (1988; Hawking & Penrose 1996).

Sixth, in each scope of the actual space, we may choose the coordinate system, its origin and other characteristics of space as we see fit. In everyday life, we orient our actions based on spatial reference points such as ourselves, our homes, perhaps the landmark mountain in the middle of an island, the center of the earth due to the gravitation, the sun as the heart of our planetary system, or the center of the Milky Way around which our sun revolves. Concerning the actual space, there is no fixed point, no origin of axes, no absolute point or entity of reference. Instead, the point of departure may be selected as is seen fit or useful.

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15 In words of J. Clerk Maxwell (1952/1877, 12): “We cannot describe the time of an event except by reference to some other event, or the place of a body except by reference to some other body. All our knowledge, both of time and space, is essentially relative.”

16 Whiteman (1967, 196–197) described this locality of space as follows: “By saying that the space is strictly local, we are presuming that physical circumstances are in fact such that Euclidean geometry can be implemented in a natural representation by the use of standard [measuring] rods.”
Seventh, yet another concept that is relative is distance. Many of the primary characteristics of space, in terms of everyday usage of the word, translate to the key notions of topology. From the topological perspective, many of the key notions, such as continuity, connectedness, dimension, and homeomorphism, do not involve the concept of distance.

Distance is usually taken to be the length of a line between two points. While this may hold in different cases, there are differences as to what constitutes the line between the points. Depending on that, different definitions of distance (different metrics) are applicable. Let us take a practical example. In a city with a grid plan, that is, with streets perpendicular to each other, there are at least two different ways of assessing the distance: either as the Euclidean distance—"as the crow flies", or as the “city-block” distance—as the distance that needs to be covered to get from place A to place B when unable to cut through the city blocks (see figure 11). To get to the opposite corner of a city block of 100 meters by 100 meters, it takes a minimum of 141 meters for a crow, but 200 meters for a taxi. Mathematically speaking, when a distance function is defined, a topological space becomes a metric space. While the topological space is the same (the blocks and streets are connected similarly etc.), the metric space for a taxi driver is different from that of a crow, since the distance functions are defined differently.

\[
d(A, B) = \sqrt{\Delta x^2 + \Delta y^2}
\]

\[
d(A, B) = \Delta x + \Delta y
\]

Figure 11. Two distance functions. On the left: the Euclidean distance is the common distance function, based on Pythagoras’s theorem. On the right: the city-block distance function is applicable to grid-like situations, and defines distance simply as the sum of coordinate differences. In mathematics, these are considered two-norm and one-norm distances, respectively.

The path that is taken obviously makes a difference. Similar problems are raised when the geometry is not flat, but curved: the shortest way to the other side of the globe would be a straight tunnel through the Earth, but we do not usually consider that as a feasible distance. This also leads to the distinction between covered distance and displacement. While two points may be adjacent to each other (small displacement), there may be factors that necessitate a longer, more complex route between the two points. In addition, the route from B to A may need to be differ-
ent from the route from A to B. More generally, distance may also be regarded as a vector as opposed to scalar, i.e. including direction in addition to magnitude.

The dispute in natural science between the absolute and relativist conceptions of the actual space, carried out at least since the days of Aristotle and Theophrastus, ended in the victory of the relativist conception and the dismissal of the absolute one. The Newtonian absolute conception of the actual space faced theoretical cul-de-sac, and was later found incompatible with empirical measurements. The effects predicted by the relativity theory and pertinent to the relativist conception of space, as opposed to the absolute one, only appear in extreme conditions, where velocities are close to the speed of light, masses are of astronomical magnitudes, etc. However, the massive paradigm shift in vanguard physics did not have much effect on the basic theories of mechanics, for example, as long as the circumstances remain reasonably close to scope of everyday human life. Therefore the principles of object manipulation, kinetics and dynamics can still be well approximated by Newtonian mechanics for most practical purposes in everyday life. As a result, the absolute conception of space still seems to persist in our everyday lives.

In short, the relative conception opposes the view that space would be some kind of pre-existing substratum, where objects are located and in which events take place. In the relative conception, the actual space and the transforming distribution of matter are intricately tied to each other. The conception of the actual space is based on the conception of objects and their (changing) relations, and in that perspective, the way we understand the actual space is determined by the understanding of objects and events. In that sense, the actual space is a conceptual tool for easier comprehension of our experience. Consequently, from time to time there needs to be reassessment of the concepts of dimensionality, curvature, distance, coordinate system, and other concepts that relate to the geometry, topology or metrics of space.

3.1.2 Geometry of thought and spatial metaphor in cognition

The previous chapter presented a synopsis of the relative (also known as relationalist) and absolute (a.k.a. substantivist) concepts of the actual space. While useful for grasping the characteristics of the actual world, spatial conceptions are fallible. The spatial concepts evolve in the adjustment of the operation of the mind, during the interaction with the environment. The history of the concept of the actual space demonstrates this.

There appear to be no major disagreements between the contemporary relativist conception of the actual space and the framework of naturalist pragmatism as
described in part one. Before continuing towards a pragmatist conception of space in the next chapter, let us take a glance at some other contemporary ideas, that seem to fit in the framework, namely certain ideas relating to phenomenal spatiality. These ideas approach the semiotic problems of signification: what are phenomenal spaces and how do they come about?

As mentioned at the onset of chapter 3.1.1, there may seem to be a categorical difference between actual and phenomenal spatiality, relating to the classic mind-body problem. But, as pointed then out, the same strong epistemic connection, that bonds subject and organism together or the actual and phenomenal worlds together, holds for actual and phenomenal spatiality, as well, from the viewpoint of naturalist pragmatism. In particular, there exists no actual entity of actual space, independent of our thinking, that would need to be perceived and represented phenomenally.

The ideas by George Lakoff and Mark Johnson and by Peter Gärdenfors synopsized below enter the core of the naturalist embodiment of mind. They maintain, that the operation of mind is spatially embodied. They deal with phenomenal space in terms of morphodynamic or morphological models, and as theories of semiosis they would consequently exemplify what Jean Petiot (1990) called “a morphological turn” (see also Almeida e Costa 2006; chapter 2.2.6). However, they do not enter the field of semiotics. Instead, their field is the study of conceptual mappings, which “has produced great insights over the last several decades, not only for the study of language, but also for the study of such subjects as scientific discovery, design, mathematical thinking, and computer interfaces” (Fauconnier and Turner 2008, 1). 17

A key notion in the framework of naturalist pragmatism, as discussed in part one, is the idea that the mind is embodied in the sense that it is a result of and a developing ability governing the interaction of the organism and its environment. Now, the interest is in how the relations of the characteristics of the actual objects constitute the basis for the operation of the mind, and how complex thinking becomes possible by virtue of simpler ways of representing.

Metaphors we live by.

In Metaphors We Live By, linguist George Lakoff and philosopher Mark Johnson (1980) maintained that metaphors structure our thinking and action. In Philosophy in the Flesh (Lakoff and Johnson 1999), the ideas were matured and developed

17 As Fauconnier and Turner suggested, the study of conceptual mappings, conceptual blending and cognitive metaphors has been very active during the past years. Recent studies of importance in this morphological respect include Ziemke, Zlatev and Roslyn 2007; Turner 2006; Coulson 2006; Gärdenfors 2005; Hampe and Grady 2005; Brandt 2004; Mandler 2004; Fauconnier and Turner 2003; Gentner, Holyoak and Kokinov 2001; Gärdenfors 2000; Lakoff and Núñez 2000; Lakoff and Johnson 1999; Rohrer 1999; Fauconnier and Sweetser 1996; Gibbs 1994; and Ortony 1993/1979. See also Gibbs 2008.
further. Instead of being merely linguistic structures giving nuances to written or spoken language, Lakoff and Johnson maintained that metaphors are central for the development of thinking, as soon as we are dealing with something beyond the actual objects of the world and their properties.\footnote{See Aristotle’s \textit{Rhetoric} and \textit{Poetics} for a classic (and Classical) description of linguistic metaphor. According to Aristotle (\textit{Poetics}, 21): “[m]etaphor is the transference of a term from one thing to another: whether from genus to species, species to genus, species to species, or by analogy. … Metaphor ‘by analogy’ is a case where the relation of \( b \) to \( a \) is the same as that of \( d \) to \( c \): the poet will use \( d \) instead of \( b \), or the reverse.” See also Lakoff and Johnson (1999, 69–70) for justification of the use of the term ‘metaphor’ in this context.}

The ubiquity of metaphors in language merely reflects the fact that metaphors are pervasive in every aspect of our thinking, communication and reasoning, whether conscious or not. According to Lakoff and Johnson (1999, 47),

\begin{quote}
We acquire a large system of primary metaphors automatically and unconsciously simply by functioning in the most ordinary ways in the everyday world from our earliest years. We have no choice in this.
\end{quote}

Lakoff and Johnson also maintained that the mind is embodied. There is no autonomous faculty of reason, independent of bodily capacities, as suggested by “the Western philosophical tradition” (ibid., 16–17, 21–22). The embodiment of mind comes from the fact, that concepts are “crucially shaped by our bodies and brains, especially our sensorimotor system” (ibid., 22). Lakoff and Johnson (1999, 23–36) argued for this through three kinds of rudimentary concepts, rooted in sensorimotor experience: color concepts, basic-level categories, and spatial-relations concepts.\footnote{While the notion of color concepts readily relates to common everyday experience of colors, the term “sensory” concepts could be more appropriate, since some of the primary metaphors given as examples involve other senses, as well. Furthermore, in explaining the color concepts, Lakoff and Johnson use spatial concepts such as center and periphery (1999, 24) indicating that the color concepts—and perhaps all sensory concepts—could be analyzed in terms of spatial relations. See Gärdenfors 2000, or below.}

The basic-level categories are cognitive structures that have evolved to “optimally fit our bodily experiences of entities and certain extremely important differences in the natural environment” (Lakoff and Johnson 1999, 27). For instance, in the category hierarchies of \textit{furniture} – \textit{chair} – \textit{rocking chair} or \textit{vehicle} – \textit{car} – \textit{sports car}, the basic-level categories of \textit{chair} and \textit{car} have a cognitive priority, because they are \footnote{1 “the highest level at which a single mental image can be represented” \footnote{2 “the highest level at which category members have similarly perceived overall shapes”}} (ibid., 27–28)
Mental processes are spatially embodied

“the highest level at which a person uses similar motor actions for interacting with category members”; and

“the level at which most of our knowledge is organized”.

Embodied in the common characteristics of actual objects and in the means available for sensorimotor interaction, the basic-level categories consist in collections of the basic objects of interaction. The available means for interaction depend on the internal and mutual relations of the objects and the interacting subject-organism.

Lakoff and Johnson used the term ‘spatial-relations concept’ for the structures of thinking that operate on the relations between objects. “Spatial-relations concepts are at the heart of our conceptual system”, yet “they do not exist in the external [here: actual] world” (ibid., 30). It is the objects themselves, and their properties, that exist in the actual world.

Lakoff and Johnson (1999) held, that the elementary spatial relations consists of an image schema, a profile (that highlights the operational structure of the schema), and a trajector-landmark structure (that produces the operation into the schema). For instance, in the source-path-goal schema, there is a trajector that moves on a path from source to goal (the schema). The trajector has a position, path taken, direction, and path projected. A to profile would highlight the goal, while a from profile would highlight the source as the landmark. (Ibid., 30–34.)

The image schemata are cross-modal, that is, imposable on different sensory domains as well as motor action. The image schemata are also topological, that is, they can be stretched, bent or otherwise transformed. They need not have a metric, but they may (cf. chapter 3.1.1). They are used to refer to many kinds of relations such as being inside or outside (the container schema), moving from, through, along and to (the source-path-goal schema), being in front or in back (bodily projections). (Ibid., 30–36.)

Lakoff and Johnson (1999, 35) list a collection of primitive image schemas that in different languages reflect the cognitive constructs of spatial relations: “part-whole, center-periphery, link, cycle, iteration, contact, adjacency, forced motion (e.g., pushing, pulling, propelling), support, balance, straight-curved, and near-far. Orientations also used in the spatial-relations systems of the world’s languages include vertical orientation, horizontal orientation, and front-back orientation.”

Although there are good reasons to refute the hegemony of verbal language in semiosis, admittedly verbal expressions may reflect the embodiment of cognition.

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20 This train of thought could be rerouted to the discussion tradition on James J. Gibson’s notion of affordance (see e.g. Gibson 1986/1979, Gibson 1966; Norman 1999; Jones 2003, Scarantino 2003), which in turn is a very pragmatist idea: “The meaning or value of a thing consists of what it affords” (Gibson 1982, 407).
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Apparently, linguistic structures such as ‘a close encounter’, ‘a distant relative’, ‘a big problem’, ‘a short period of time’, indeed display the spatial embodiment of the so-called higher concepts or logic. For Lakoff and Johnson (1999, 30–36), this kind of expressions reflect the logic of the higher levels of thinking, that is based on metaphors of the embodied spatial-relations concepts.

According to Lakoff and Johnson, complex thought processes are based on simpler, spatially embodied interaction by means of primary metaphors, or complex metaphors, which are constructed of the primary metaphors. Primary metaphors consist in combinations of the structures of sensorimotor experience with subjective experience.\(^\text{21}\)

Lakoff and Johnson (1999) omit a detailed analysis of what constitutes “subjective experience”. Presumably it refers, in that context, to one’s experiences of oneself both as an organism and as subject, relating to various aspects of survival, as shown in its rudimentary forms of pleasure versus discomfort, and described in its more refined forms as examples such as “feeling warm”, “foul smell”, “discomfort”, “relief”, or “force”. It also seems to refer to experiencing properties of actual objects by sensorimotor means as related to oneself. However, these are all ways of perceiving, which could be broken down to properties and concepts. Consequently, it would be possible to find the corresponding quality dimensions, which would show how the notion of “subjective experience” is reduced to conceptual spaces as suggested by the theory of conceptual spaces discussed below (see Gärdenfors 2000).

An integrated theory of primary metaphor was presented by Lakoff and Johnson (1999, 46–59 et passim) in four parts:

1. According to (Christopher) Johnson’s theory of conflation, young children’s subjective (nonsensorimotor) and sensorimotor experiences are indistinguishably undifferentiated in experience. Later, the domains are separable, but the cross-domain associations (metaphors) remain. (Cf. chapter 2.2.3.)\(^\text{22}\)

2. Grady’s theory of primary metaphor maintains that all complex metaphors consist of primary metaphors, which arise naturally by means of conflation. The stage of conflation, in which “connections between coactive domains are

\(^{21}\) Why the emphasis on space instead of time, for instance? Do not time and space form the timespace together? One can make a claim that space is primary, because conceptions of time are also spatially embodied. We do not usually think in terms of fast or slow distance, but rather in terms of short time and long time. Time is more often discussed in terms of spatiality, than the other way around. Now, it can be argued, that this is not only a linguistic metaphor, but that expressions of this kind are due to the spatial embodiment of time (Lakoff and Johnson 1999, 139 et passim; see also Gärdenfors 2000, 177–178; chapter 4.1.5).

\(^{22}\) A spatial example: a parent affectionately holds an infant close to the body. In conflation closeness and warmth (sensorimotor experience) is associated with security and affection (subjective experience). This could be contrasted with the possibility closeness being associated with anguish, for instance.
Mental processes are spatially embodied

established and the domains are not experienced as separate”, precedes the stage of differentiation, in which the domains are “differentiated into metaphorical sources and targets” (Lakoff and Johnson 1999, 49).

3 Narayanan’s neural theory of metaphor suggests that the conflating associations are realized in simultaneous neural activations resulting in permanent connections. Metaphorical entailment A–B–C is possible in which A activates neuronal cluster C by activating B which belongs to it.

4 Fauconnier and Turner’s theory of conceptual blending argues that by simultaneous activation, connections between distinct conceptual domains may be formed, which may lead to more complex metaphors (see Fauconnier & Turner 2002).

Lakoff and Johnson (1999, 50–54) gave a listing of 24 typical primary metaphors. These include metaphors in which subjective judgment is matched with mainly sensory experience (table 4a). In others (idem) the motor aspect of the sensorimotor experience is emphasized (table 4b).

TABLE 4a. Examples of primary metaphors and corresponding conflations emphasizing sensory experience (selected from Lakoff and Johnson 1999, 50–54).

<table>
<thead>
<tr>
<th>Primary metaphor</th>
<th>Primary experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affection Is Warmth</td>
<td>Feeling warm while being held affectionately</td>
</tr>
<tr>
<td>Bad Is Stinky</td>
<td>Being repelled by foul-smelling objects</td>
</tr>
</tbody>
</table>

The majority of primary metaphors are based on conflation of subjective experience and such sensorimotor experience, in which relations between objects or relations between characteristics of objects are predominant (table 4c).

Out of these kinds of primary metaphors, more and more complex metaphors are built. Conversely, an abstract domain is understood by means of a more concrete domain. The primary and the complex metaphors constitute most of our conceptual system, and affect how we think, whether we are awake or asleep (Lakoff and Johnson 1999, 60). Both primary and complex are mostly unconscious, so we have no direct access to them (ibid., 73). Yet, Lakoff and Johnson did not rule the possibility
of nonmetaphorical concepts, since both the sensorimotor concepts (as used in ‘I grasp the cup.’) and plain perceptual judgments (as used in ‘Those two cups are of different color.’) are literal (ibid., 58).

TABLE 4c. Examples of primary metaphors and corresponding conflations emphasizing spatial experience (selected from Lakoff and Johnson 1999, 50–54). Only some examples are chosen, and the list could be continued.

<table>
<thead>
<tr>
<th>Primary metaphor</th>
<th>Primary experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Important Is Big</td>
<td>As a child, finding that big things, e.g., parents, are important and can exert major forces on you and dominate your (...) experience</td>
</tr>
<tr>
<td>More Is Up</td>
<td>Observing rise and fall of levels of piles and fluids as more is added or subtracted</td>
</tr>
<tr>
<td>Categories Are Containers</td>
<td>Observing that things that go together tend to be in the same bounded region</td>
</tr>
<tr>
<td>Linear Scales Are Paths</td>
<td>Observing the amount of progress made by an object in motion</td>
</tr>
<tr>
<td>Purposes Are Destinations</td>
<td>Reaching destinations throughout everyday life and thereby achieving purposes (e.g., if you want to drink, you have to go to the water cooler)</td>
</tr>
<tr>
<td>Purposes Are Desired Objects</td>
<td>Grasping a desired object (correlation between satisfaction and holding a desired physical object)</td>
</tr>
<tr>
<td>Understanding is Grasping</td>
<td>Getting information about an object by grasping and manipulating it</td>
</tr>
</tbody>
</table>

The more abstract thinking is, the more layers of metaphors are necessary. As an example of how a series of complex metaphors may be grounded on a set of primary submetaphors, Lakoff and Johnson (ibid., 60–69) gave a complex mapping of the cultural belief that people are supposed to have a purpose in life and pursue the goals set forth. Briefly, it goes as follows:

1. The complex metaphor is: “People are supposed to have destinations in life, and they are supposed to move so as to reach those destinations.”
2. This is combined with: “A long trip to a series of destinations is a journey.”
3. The complex metaphorical mapping in virtue of which the complex metaphor is grounded (embodied) due to grounding (embodiment) of the more basic metaphors (in this case source-path-goal schema):
   A Purposeful Life Is A Journey
   A Person Living A Life Is A Traveler

---

23 In contrast, ‘I take it that the colors of the cups are close.’ would exhibit two different metaphors.
Life Goals Are Destinations
A Life Plan Is An Itinerary

On this complex metaphor, further metaphors may be based, for instance to ideas such as “Look how far we’ve come” or “This relationship is going nowhere” (Love Is A Journey Metaphor); “We’re driving in the fast lane on the freeway of love” etc.

In this manner, complex situations in the world of fancy are dealt with based on the logic embedded in the embodiment of primary metaphors. Primary metaphors “provide subjective experience with extremely rich inferential structure, imagery, and qualitative ‘feel’, when the networks for subjective experience and the sensorimotor networks neurally connected to them are coactivated” (ibid., 59). The complex metaphors exemplify three aspects of mind central to Lakoff and Johnson, namely metaphorical thought, the embodiment of mind, and the cognitive unconscious (ibid., 73).

Lakoff and Johnson (1999, 6) maintained, that

[t]he mind is not merely embodied, but embodied in such a way that our conceptual systems draw largely upon the commonalities of our bodies and of the environments we live in. The result is that much of a person’s conceptual system is either universal or widespread across languages and cultures. Our conceptual systems are not totally relative and not merely a matter of historical contingency, even though a degree of conceptual relativity does exist and even though historical contingency does matter a great deal. The grounding of our conceptual systems in shared embodiment and bodily experience creates a largely centered self, but not a monolithic self.

If Lakoff’s and Johnson’s theory holds, spatial relations form the fundamental basis for cognition and semiosis. In fact, it seems that Lakoff and Johnson were overly careful when stating, that “the spatial logics of these body-based image schemas are among the sources of the forms of logic used in abstract reason.” (ibid., 36). Spatiality is of great import in their theory, but it seems that the role of spatiality could be considered even more crucial. It can namely well be argued that spatiality, as it pertains to semiosis, is not only about the relations between objects, but, also, about the relations within each object, and between qualities of objects.24

In the dispute between the absolute and relativist stances to the actual space, the conception of space as an absolute container of objects failed to stand against the more flexible and more comprehensive relativist account of actual space. The table got turned around. Space was no longer superior to material objects. Instead, the structure of the actual space was seen to be determined by the properties of objects,

24 To be exact, the expression “spatial relations” comes close to being tautological. See chapter 3.1.3.
and thus space itself emerged from the properties and relations of elements apparently residing “in the space”. Space without material objects became inconceivable (Einstein in Jammer 1970/1954, xiii).

The same holds for phenomenal spatiality, in a way. There is nothing that arbitrarily limits the use of space as a conceptual tool to relations between objects. The view of phenomenal space as a container of objects seems to fail as insufficient and superficial. Space is used as a tool to categorize, identify, differentiate, and grasp both objects as well as properties of objects prior to, in addition to, and regardless of the object formation and the access to relations between objects.

Consequently, the division in Lakoff and Johnson (1999) to color concepts, basic-level categories and spatial-relations concepts should be taken only heuristically, as supporting the goals of the metaphor theory. Namely, color concepts and basic-level categories, as well as trajector and landmark structures can be regarded as structures of conceptual spaces. Conceptual spaces (and thereby the notion of spatiality as relations between and within objects as well) will be discussed in conjunction with Peter Gärdenfors’s theory of conceptual spaces below.

Nevertheless, it seems that all the basic-level categories result from the relative similarity of the possibilities of perceiving and manipulating objects. It appears feasible, that our knowledge is indeed organized to a great extent at basic-level categories, just because the basic-level categories are the highest level for single mental images, whatever that pertains. That, in turn, is due to the similarities of possible motor actions and perceived overall shapes of objects, or more generally, the perceived characteristics of objects. And the similarities, in turn, are judged based on how the characteristics both between and within the objects of the basic-level categories are repeatedly perceived and what kinds of habits of action they afford.

Lakoff and Johnson acknowledge their debt to earlier philosophers of the embodied mind, in particular to John Dewey and Maurice Merleau-Ponty (ibid., xi). They also briefly summarize (ibid., 551–568) their ontological and epistemological stances. These seem to match quite well the framework of naturalist pragmatism, at least as far as the notions of embodied person, embodied reason and embodied concepts are concerned. However, the scope of this book does not allow a more detailed analysis of the correlations between Philosophy in the Flesh and naturalist pragmatism.

The geometry of thought.

Lakoff and Johnson (1999) emphasized the role of metaphor in the spatial embodiment of cognition. They maintained that complex cognitive structures emerge by means of metaphors from the corporeally and environmentally embodied sensorimotor experience and its conflation with what they referred to as subjective expe-
Mental processes are spatially embodied

experience. Yet, they did not go into detail in explaining how experience emerges and how the concepts and properties of the cognitive structures take place by virtue of the spatial embodiment. In contrast, that was a major theme in Peter Gärdenfors’s *Conceptual spaces* (Gärdenfors 2000).

Gärdenfors’s theory of conceptual spaces is “an investigation into the geometry of cognitive representations”, although it may seem “more a research program than a well-developed theory” (ibid., 259). In either case, it is well compatible with the framework of naturalist pragmatism, regardless of differences in nomenclature.²⁵

Gärdenfors’s notion that “[t]he fundamental cognitive role of concepts is to serve as a bridge between perceptions and actions” (2000, 122) supports the notion of the semiotic wedge and the idea of the semiotic interaction, in which organism is engaged, and puts concepts into a vital role in it (see chapter 1.3.4). According to Gärdenfors (idem),

In the simplest case, where there is a direct coupling between perception and action, a concept can be seen as a decision procedure where the perception is categorized and the chosen category then determines a choice of action. This is the role of concepts in lower animals (and the only role behaviorists would accept). In humans and many of the higher animals, cognition is dominated by other more indirect modes that are not triggered by perceptions alone. In these cognitive processes, concepts have function in reasoning and in acting that is independent of perception.

The only way the decision procedures can be created, is “with the aid of the experience of the agent.” (ibid., 122). Gärdenfors (idem) even emphasized the very pragmatist principles in stating, that “[t]o be useful, the procedures should not only be applicable to known cases, but should generalize to new situations as well,” which points to the law-like, or belief-like characteristic of the habit of action. As far as inquiry as the driving force necessary for the survival of the organism is concerned, Gärdenfors asserted that “[i]f the agent realizes that it has made a mistake, it will adjust the application rules for the concepts that led to the error” (ibid., 123). To put the matter in slightly more pragmatist terms: the adjustment of perceptions, categorizations and thereby the habits of action makes it possible for the agent to learn, in virtue of the semiotic interaction.²⁶

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²⁵ As a theory of concepts, Gärdenfors (2000) also gives a more thorough and empirically more up-to-date account of the concept of concept than the brief Peircean account given in chapter 2.1.1. In contrast, the Peircean account is perhaps more readily applicable to both the framework naturalism as well as the view of the mind as a semiotic system theorized later in this part due to the Peircean vocabulary.

²⁶ Although Gärdenfors addressed the issues of how concepts are learned, conceptual spaces “only describe the structure of representations” (ibid., 31) without taking the dynamics of the representative processes too much into account. The symbolist and associationist approaches correspond to the
There is a known mismatch between the symbolist and associationist (connectionist, or subconceptual, as Gärdenfors called it) approaches to cognition. There are also known inherent difficulties in both approaches, such as the symbol grounding problem, and the problems relating to similarity and learning processes (ibid., 33–43, 123). Neither the symbolist nor the associationist approach excels in explaining concept acquisition (ibid., 1). To mediate, Gärdnors advocated a conceptual form of representation, based on geometrical structures, and operative between the subconceptual and symbolic levels. Briefly put (ibid., 257): the conceptual level can be seen as a bridge between the two other levels. In biological systems, the dimensions of a conceptual space often emerge from self-organizing neural systems. This generally involves a reduction of dimensionality from that of the subconceptual level. When going from the conceptual to symbolic level, the symbolic structures can be seen as emerging from the structure of the conceptual spaces.

According to Gärdenfors, conceptual representation is independent of the symbolic level of representing, and more fundamental, since animals, humans included, can represent qualities of objects “without presuming an internal language or another symbolic system” (ibid., 43). The conceptual representation has its origin in the subconceptual and the physical, in terms that the actual world largely constrains the representations in the perceptual domains (ibid., 44). In humans, at least, all three levels cooperate in one system.

Gärdenfors defined conceptual space as “a set of quality dimensions with a geometrical structure” (ibid., 24). According to Gärdenfors (ibid., 6), qualities of objects are represented in quality dimensions, each “endowed with certain geometrical structures (in some cases they are topological or ordering structures).” Quality dimensions are the framework in which properties are assigned to objects and relations between objects are specified (idem).

For integral quality dimensions, a value cannot be assigned in one dimension without giving a value on the other. Other sets of dimensions, that is, dimensions that can be assigned values irrespective of each other, are separable (ibid., 24).

symbolic and subsymbolic paradigms of cognitive sciences and cognitive musicology (see 2.2.5 and 2.2.6).

Gärdenfors thus divided the levels of representation into three. Compared to Smolensky (1988 and 1991), Gärdnors’s subconceptual level corresponds closely to Smolensky’s subsymbolic level, but while Smolensky synonymized the conceptual and symbolic levels, Gärdenfors made a clear distinction between the two. See Gärdenfors 2000, 247–249.

In endnote 57 (ibid., 267), Gärdenfors marked, that conceptual level of representation is "topologically and geometrically formal, but not logically formal". Conceptual representation certainly does not fit in the common conception of formal logic, or rather, propositional logic. However, if we consider Peirce’s notion of logic as the theory of thinking and synonymous to semiotic, conceptual representation appears not only logically formal, but fundamentally so. (See chapter 1.3.4.)
Mental processes are spatially embodied

Figure 12. A quasi-three-dimensional illustration of the color spindle, that is, the integral conceptual space of color representation. The letter B stands for blue, G for green, Y for yellow, R for red, W for white, and S for black. The degree of similarity between two colors corresponds to the distance between two points in the conceptual space. Some basic principles apply. For instance, if two points occupy the same position in the space, the colors are identical (identity). If point ‘b’ is located between two points ‘a’ and ‘c’, the color ‘b’ is also between the colors ‘a’ and ‘c’ (betweenness). Note that the hue dimension is cyclical, not linear. (After Gärdenfors 2000, 11; see Sivik and Taft 1994, 148.)

As an example of a conceptual space consisting of integral quality dimensions, Gärdenfors gave the color space (ibid., 9–13; see figure 12): hue with a cyclical geometrical structure, chromaticness (or saturation) with a minimum of zero for grey and a maximum for high saturation, and brightness spanning between white and black extremities. Each color can be described and identified by its position as a point in the color space, i.e. by means of azimuth, radius, and elevation. In contrast, the size of an object and its hue are separable, since they can be assigned values irrespective of each other.29

Since the color space consists of integral dimensions, and color is separable from other qualities, it constitutes a domain. A conceptual space consists in one or more domains (Gärdenfors 2000, 26). Note that “not all domains in conceptual spaces

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29 As far as the actual space and scientific theories are concerned, Gärdenfors pointed out that in Newton’s mechanics, time and space were separable, but in the current relativist conception time and space constitute one integral set with a Minkowski metric (Gärdenfors 2000, 25–26, cf. chapter 3.1.1).
are assumed to be metric. Sometimes a domain is just an ordering or a graph with no distance defined” (idem).

The degree of similarity between two colors in the color space—or more generally, similarity between any two points in a (metric) conceptual space—corresponds to the distance between the points in the conceptual space. The distance in space depends on the metric of the space (that is, on how distance is defined for the space, see chapter 3.1.1). Also, there are alternatives for the correspondence function between similarity and distance. Gärdenfors relied on the common assumption, that “similarity is an exponentially decaying function of distance” (ibid., 20), without taking a strict stance on what exponent the decay function should be used. Not all domains need to be assumed metric, that is, with a defined distance function that would correlate to similarity.

Gärdenfors used the distinction between integral and separable dimensions to distinguish between properties and concepts: “A property is defined with the aid of a single dimension or a small number of integral dimensions forming a domain”, while “a concept may be based on several separable subspaces.” (ibid., 60). This way the theory of conceptual spaces avoids the problems of defining properties faced by both classical extensional semantics and intensional semantics. Property is neither defined as a set of objects with the property, nor is it something that would relate objects to possible worlds. (Ibid., 63–66.) The rough idea is that a particular property is describable as a region of a conceptual space. As mentioned, conceptual spaces consist in a number of quality dimensions. A point in the space is represented by a vector with an index for each dimension. A property, as a region of a conceptual space, is consequently represented by a collection of points, that are somehow connected. It is noteworthy, that this kind of definition of property assumes neither actual existence of objects nor of possible worlds (ibid., 67; cf. chapter 2.1.1).

Evidently, some kinds of mechanism are needed that connect the points to each other and divide the space into regions. For example, ‘now’ divides the one-dimensional space of time into regions of ‘past’ and ‘future’. Positions of points in space can be described as more or less central or peripheral to a particular region. Prototypical members of categories would be located at the center of the regions. Correspondingly, the membership of the peripheral points of the region may be more ambiguous. However, defining properties as regions does not necessitate the existence of a particular prototype at the center of the region. Also, each new example bringing

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30 Gärdenfors suggested, that domains need not necessarily be totally independent. For example, the domains of “ripeness and color of fruits covary” (ibid., 26). The domains of the example, however, are of different complexity: the ripeness of fruits is judged partly in terms of the color. The case could be made, that ‘ripeness’ is a concept that consists of such more sensory-based domains as color, taste, smell, and texture, each with a set of quality dimensions. See the example of ‘apple’ below.
Mental processes are spatially embodied

a new point into the region of the space and a new member into the category, may affect the balance of the region, alter the category boundaries, and move the center of gravity of the region, that is, update the prototype (ibid., 122–126).

The shapes of the regions of space depend on the means of dividing. The partitioning may be arbitrary, or it can be based on some naturally arising methods, e.g. the distances between the points of space from the centers of the regions. In the latter case, the partitioning further depends on what kind of distance function is used (see chapter 3.1.1 and Gärdenfors 2000, 66–100).

Figures 13a and 13b. a) On the left: a prototype Voronoi tessellation of two-dimensional space with six prototype points divides space into six convex regions, if Euclidean metric is used. The bisectors between the regions and the prototypes at the center of each region are shown. Each point is connected to the region, the prototype of which is the closest in terms of unweighted Euclidean distance. b) On the right: a prototype Voronoi tessellation of space with the same six prototypes, now based on unweighted city-block metric. The regions are star-shaped, but not convex. In every region there are at least two points, between which there are points of other regions. See Gärdenfors 2000, 87–92, 136–141; Okabe, Boots and Sugihara 1992. These natural principles of dividing are extendable into any positive number of dimensions.

If the Euclidean distance function is used, the space becomes divided into convex regions, i.e. regions in which there are no points of other regions between any two points of the region. This is illustrated in the Voronoi tessellation of two-dimensional space in figure 13a. If the city-block metric is used, the regions become star-shaped, i.e. there are no points of other regions between a point of the region and the prototype of the region (figure 13b). If arbitrary means of dividing are used, the regions may be diversely connected or even disconnected (figure 13c). The condition of being convex is stricter than the condition of being star-shaped, which in turn is stricter the condition of being connected. In any case, a natural property “is defined in terms of well-behaved regions of conceptual spaces—a definition that cardinally involves the geometrical structure of the various domains” (ibid., 255).  

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31 There are alternatives to the prototype Voronoi categorization by means of standard Voronoi tessellations demonstrated in figure 13a, such as the generalized Voronoi categorization, nearest neighbor
Space in Musical Semiosis

According to Gärdenfors, the question of which metric should be used for which conceptual space is partly an empirical one. Integral dimensions often warrant the Euclidean metric, while separable dimensions seem to rather call for the city-block metric. In case there is no prototype structure in the conceptual space, and no natural metric, “a criterion of natural properties based on connected regions is perhaps the strongest that will be justified.” (ibid., 91–92). Nevertheless, tessellations of space and other divisions of space into categorical regions is an efficient means of discretizing the otherwise continuous (or pseudo-continuous) dimensions of the conceptual space. Evidently, the process of discretization into finite sets of categories eases the cognitive load and speeds up learning. Also, classes can be given labels, i.e. the categories can be named by linguistic and other terms. (ibid., 89)

A central thesis in Gärdenfors’s book is, that “most properties expressed by simple words in natural languages can be analyzed as natural properties” (Gärdenfors 2000, 75–76). The criterion for the naturalness of a property is (ibid., 71):

Criterion P  A natural property is a convex region of a domain in a conceptual space.

This seems to be supported empirically for instance by Taft and Sivik’s studies on color terms (vs. Goodman’s ‘grue’ and ‘bleen’ as unnatural properties—see Goodman 1979/1955).

The distance functions may be weighted in various ways, pending on the context, thus emphasizing the quality dimensions differently from each other. In other words, the salience of different quality dimensions may vary, pending on the context.

categorization and average distance categorization (see Gärdenfors 2000, 136–141). The alternatives “often result in very similar categorizations” (ibid., 141). The Voronoi tessellation is also known as Dirichlet tessellation. See Okabe, Boots and Sugihara 1992.
Mental processes are spatially embodied

While a property is a region of one domain, a concept may be based on several domains, that is, several separable subspaces (ibid., 60, 101). Just as the salience of different quality dimensions of a property may expand or contract pending on the context, the different domains of a concept are weighted against each other, depending on the salience of each domain in varying contexts. As an example of a concept, Gärdenfors gave the domains and regions in the representation of 'apple' (table 5; ibid., 102–).

<table>
<thead>
<tr>
<th>Domain</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Red–yellow–green</td>
</tr>
<tr>
<td>Shape</td>
<td>Roundish (cycloid)</td>
</tr>
<tr>
<td>Texture</td>
<td>Smooth</td>
</tr>
<tr>
<td>Taste</td>
<td>Regions of the sweet and sour dimensions</td>
</tr>
<tr>
<td>Fruit</td>
<td>Specification of seed structure, flesh and peel type, etc. according to principles of pomology</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Values of sugar content, vitamins, fibers, etc.</td>
</tr>
</tbody>
</table>

The first four domains are usually learned first, as we gain everyday experience of apples (as actual objects) and perceive their features. Each of the four domains is connected with a specific sensory modality, and the region in each domain is a subspace of a larger region of the general domain. For instance, of all possible shapes, apples are roundish, and of the complete color space, the colors of apples are confined to red, yellow and green, pending on gathered experiences. At least in natural situations, we do not expect apples to be blue, cubic, coarse, or salty. Eventually, the red–yellow–green subspace of the color domain, for instance, may be expanded by brown regions, if we encounter a rotten apple. In short, each perceived instance either reinforces the prototype partitioning in each domain, or “shapes and reshapes” it. Each domain in the conceptual space is partitioned so that prototypical and less prototypical yet apple-like qualities are located in the domain's region. Each domain is also endowed with a geometrical structure, which may be relatively straight-forward, as is the case with the color spindle or the four- or five-dimensional taste space. The structure may also be complex, as is the case with texture, which, as Gärdenfors (ibid., 103) suggested, could perhaps be modeled using fractal theory.

Learning about apples as fruits with properties similar to other fruits will add a new domain. Other new domains (and possibly new dimensions to existing domains) are added to ‘apple’ when we learn about the nutritional values of apples, or about apples as commodities, about the symbolic (or semiotic) load of apples.
as signs of knowledge, sin, wisdom, beauty, love, sexuality, youth, health, etc. Such domains are different from the domains of color, taste or texture, in that they do not directly consist of specific perceivable quality dimensions. Rather, they are “higher level properties” (ibid., 92) or, perhaps more accurately, concepts themselves. While shape space is applicable for seed structure, and texture space for flesh and peel types etc., Gärdenfors could also have approached the fruit space of ‘apple’ either as being another concept of ‘fruit according to pomology’ applicable to the concept of ‘apple’. Furthermore, “the shape space is supervenient on the spatial and angular dimensions” (ibid., 95). In other words, some of the conceptual spaces are nested or recursive in the sense that they may contain domains that could be thought of as being themselves concepts. The properties shared between apples and oranges, for instance, opens way for the hierarchically higher representation of fruits when the domains of ‘apple’ and ‘orange’ become nested in the (possibly only emerging) conceptual space of ‘fruit’. Just as the categorization of domains into regions, also the hierarchical constructs with higher and lower levels serve the economy of representation.

According to Gärdenfors, “[t]he addition of new domains is often connected with new forms of actions that require attention to previously unnoticed aspects of concepts” (ibid., 103). The addition of domains such as nutrition, commodity, or sign exhibit the potential ‘apple’ has for (healthy) eating, trading, or communicating. To be more precise, the addition of new domains in this sense is connected with the new habits of action thus joining the new domain with new meaning. Actually, the same applies for those domains that are more directly sensory-based: the taste space becomes, of course, salient only if the apple is to be eaten, or the shape space as soon as one grasps the apple in order to eat it or to play ball with it. As noted, the conceptual representations connect perception with action. In the simpler domains, however, the connection between perception and action is more straightforward, to the point that it may possibly go unnoticed altogether.

Nevertheless, the main points of the relationship between the conceptual spaces and semantics is about to be revealed. Gärdenfors's fundamental semantic theses are (ibid., 167):

L: Basic lexical expressions in a language are represented semantically as natural concepts.

LA: Basic adjectives are represented semantically as natural properties.

LV: Basic verbs are represented semantically as dynamic natural concepts.

LN: Basic nouns are represented semantically as multidomain, nondynamic natural concepts.
Examples of what constitutes natural in this context, drawn from empiria, include (ibid., 168–170):

**LA:** Color terms. Words for colors in natural languages delineate convex regions of color space. There seems to be no color name that would consist in two disjoint regions in color space (e.g. green and orange regions).

**LV:** Image schemata such as ‘leave’, in which the *trajector* follows a *path* from the inside to the outside of the *landmark* (see Lakoff and Johnson 1999 and above).

**LN:** Any name of an object (such as ‘apple’), but also any more abstract noun that is a label, which is a cluster in the conceptual space. i.e. which “denotes a phenomenon that shows a number of *correlations* in a number of domains” (ibid., 170).

In the perspective of this book, the relationship between conceptual spaces and linguistic expressions is necessary mainly in the treatment of symbols (see section 3.3), and in bringing out the role of the conceptual level of representation, which Gärdenfors condensed in his description of cognitive semantics (ibid., 154; see also chapter 2.1.2):

A semantics is described as a mapping from the expressions to a conceptual structure. This mapping can be seen as a set of *associations* between words and meanings—associations that have been established when the individual learned the language. According to this view, language represents a conceptual structure, but it does not directly represent the world.

In contrast to the semantic theories that claim that language would point to the world, or to sets of possible worlds, meaning is here separated from linguistic truth conditions. “The meaning of an expression is a conceptual structure (with its own ontology) that must be determined before the correspondence with the world, that is, truth conditions, can be discussed” (ibid., 158–159.) In short, “[c]ognitive models are primarily *image-schematic* (not propositional). Image-schemas are transformed by *metaphoric* and *metonymic* operations” (ibid., 161).

This guides us to consider the relation between the metaphor theory and the theory of conceptual spaces. Gärdenfors proposed that “what constitutes an image schema can be given with the aid of the theory of conceptual spaces. The image schemas are often just *topological* structures.” (ibid., 163; cf. Lakoff and Johnson 1999, 30–36) The core hypothesis in Gärdenfors’s spatial analysis of metaphor, is that “a metaphor expresses an identity in topological or geometrical structure between different domains” (ibid., 176). Gärdenfors agreed with Lakoff’s *invariance principle* (Lakoff 1993, 215; also cf. Matte Blanco 1975; 1988 and chapter 2.2.6), according to which “[m]etaphorical mappings preserve the cognitive topology (that is, the
image-schema structure) of the source domain, in a way consistent with the inherent structure of the target domain.” As a result, “a metaphor can transfer information about one conceptual domain to another” (Gärdenfors 2000, 177). This also suggests, that one conceptual domain or a part of such may stand for another conceptual domain or a part of such. The topological invariance of cognitive spaces and metaphoric transitions between the spaces makes it possible, that aliquid stat pro aliquo, to put it in the traditional semiotic catchphrase.

Consequently, “[a] word that represents a particular structure in one domain can be used as a metaphor to express the same structure in another domain” (ibid., 176). From this perspective, it seems evident, that “symbolic representations would be rather exceptional and parasitic upon the geometrical ones,” while the “geometrical mode of representation is also used for higher forms of mental processes” (ibid., 52).

It also seems that there is an inherent need, justified by evolution, for structuring representations by means of quality dimensions, since “without an initial structure, the world would be just a ‘blooming, buzzing confusion’” as Gärdenfors quoted William James (ibid., 27). Gärdenfors’s theory of conceptual spaces agrees with the theories by Harnad (1987) and Mandler (1992) in the sense, that the topographic mappings (such as tonotopies, retinotopies etc.) and other perceptual low level representations are selectively parsed into image-schemata or categories of the middle level of representing. The continuous stream of sensory information is filtered and reduced to discrete phenomena. The third level, then, introduces the symbols, in terms of labeling the concepts by words or other terms of languages. (Cf. Määttänen 1993a). The parts of Gärdenfors’s theory that focus on the process of categorization, that is, on how properties are assigned and concepts formed, are important, because the origin of the invariance in perception and thinking seems to be a necessary condition for the creation of complex habits and beliefs, and thereby crucial for the whole process of semiosis. These issues are returned to in sections 3.2 and 3.3.

Gärdenfors maintained, that the physical properties of light may not be relevant for describing the color space. The same holds for relations between objects and their representations more generally (ibid., 12): “Isomorphism should not be sought in the first-order relation between an object and its (internal) representation, but in second-order relation between the relations among alternative external objects and the relations between the corresponding internal representations.”

However, as Gärdenfors agreed, there may still be “interesting connections between phenomenal and physical dimensions, even if they are not perfectly matched” (idem). Gärdenfors goes as far as suggesting that it is “reasonable to assume that the psychological conceptual spaces of humans are, at least in their fundamental dimensions, close to identical” (ibid., 81). This is a result of the natural selection,
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which “has made us all develop a conceptual space that results in inductions that are valid most of the time and thus promote survival” (ibid., 82).

It may seem, that the principles of natural selection are not necessarily applicable when the conceptual spaces are culturally learned, at least not directly. Some quality dimensions are generated directly by virtue of sensory input, others seem to be further from that. However, regardless of the complexity, the semiotic or cognitive processes are embodied in geometrically structured quality dimensions and conceptual spaces. While representations responsible for fundamental cognitive activities may have “evolutionary justification” for their tonotopic, somatotopic or other topographic mappings, or whatever accounts for the basic geometrical structures of representing, it seems feasible, that also the more complex ways of representing would be organized in a similar manner, so that “[t]he structuring principles of these mappings are basically innate, even if the fine tuning is established during the development of the human or animal” (ibid., 27). If the ideas of Lakoff and Johnson are combined with this, it would also seem feasible that the role of metaphor as the *motus operandi* of thinking would be due to the spatial compatibility between the source and target domains.

There would have been several other ways to approach phenomenal spatiality, such as Merleau-Ponty’s phenomenology, or the Husserl’s and Kant’s traditions. The writings chosen here seem to fit in the framework of naturalist pragmatism. And while a more thorough reading of Lakoff and Johnson, and Gärdenfors, and the inclusion of the vast amount of more recent studies in the field would give rise to a more refined understanding, they also appear to provide a sufficient answer to the questions of, first, what can be understood by phenomenal spaces, and second, how the concept of phenomenal space is used to grasp the *mutual relati* onal*ity of objects and their characteristics* as they are perceived, as they are represented in semiosis, that is, as they are present in the experience that constitutes subject. Now that some of the actual and phenomenal aspects of spatiality have been sketched out, it is time to draw together a pragmatist account of spatiality.

3.1.3 A pragmatist conception of space

This chapter presents a pragmatist conception of space that embraces relevant points of the conceptions of actual and phenomenal spatiality outlined above. The pragmatist conception of space is fitted in the vocabulary and conceptual structures of the framework of naturalist pragmatism, and serves to develop a spatially aware understanding of both general and musical semiosis.
Although the term ‘conceptual space’, as used by Gärdenfors in particular, is an apt one, I prefer the wording ‘phenomenal space’ here. The primary reason for this is that ‘phenomenal space’ is a broader term, referring to conceptual and subconceptual space alike, and also to symbolic space, if needed. Also, in the Peircean context, ‘conceptual’ emphasizes “the mode of being of a general type” (CP 8.191), or the relative stability of concepts, while ‘phenomenal’ brings out the dynamic interplay between particular instances of perception and the more sustaining accumulating experience (cf. instances of neural activation and synaptic weights).

Charles Peirce on spatiality.

Since the philosophy of Charles S. Peirce largely provides the framework for this study, the ideas of spatiality expressed above ought to be compared with his ideas of spatiality. There is no possibility for a thoroughgoing analysis of Peirce’s thoughts on space here. Instead, the following is a collection of topics addressed by Peirce, intended to merely give an inkling of Peirce’s conceptions of spatiality, as a heuristic for a current pragmatist account of spatiality.

During Peirce’s lifetime, major changes were taking place in scientific Western concepts of space (see chapter 3.1.1). In mathematics, Lobachewsky and Riemann, among others, developed the non-Euclidean geometry replacing the centuries old tradition. In physics, the debate between absolute and relativist theories of actual space became reheated, and Peirce took part in the discussion. The advent of psychology—or psychics as Peirce termed it—paved way to notions of phenomenal space. For Peirce, the conceptions of space or spatiality did not play a crucial role in philosophical structuring. Yet, his work in semiotics and philosophy, too, may show way to reevaluation of spatially related notions. As far as space, too, is concerned, he was “the Last of the Moderns” and “First of the Postmoderns”, as suggested by John Deely (2000a).

Peirce was well aware of the developments of spatially oriented research in his time, not the least because he was employed for over thirty years by the United States Coast and Geodetic Survey to study astronomy and geodetics (see e.g. CP 6.28–29, 8.92–93). Peirce witnessed the major changes in the latter half of the 19th century, but as he died in 1914, he did not see the break through or ramifications of the theories of relativity, nor the later rise of phenomenal approach to spatiality. Consequently, his conception of space is an alloy of the old solid paradigm and the harbingers of a new one. Peirce leaned to Kant and Newton, but was well up-to-date, particularly as far as mathematics and physics are concerned.32

32 See, for instance, CP 1.2.49, 3.557 (showing Peirce’s familiarity with non-Euclidean geometry), CP 3.13.41 (with considerations of Lobachevsky and apriority of space as well as Riemannian curvature constant), CP 6.29 (parallax measurements for determining the curvature of non-Euclidean space).
In Peirce’s classification of sciences, the study of space falls into scientific metaphysics, the third category of philosophy, and forms its third category, physical metaphysics, “which discusses the real nature of time, space, laws of nature, matter, etc.” (CP 1.192; see also CP 6.6; cf. Thompson 1973/1953, 286–287n6). On the one hand, metaphysics “welds itself” into physical and psychical special sciences (CP 6.6). On the other hand, philosophy and the special sciences may be “calling in the aid of mathematics” (CP 3.557), which studies logical possibilities “without making itself responsible for its actual existence” (CP 1.184; EP2, 259; see also CP 3.428), i.e. hypotheses, with no relation to actual time or space. Hence the Peircean classification of sciences well allows a naturalist conception of space applicable to both actual and phenomenal worlds. While many of Peirce’s writings on space are geared either towards actual spatiality or towards mathematics, some of them also address issues that are common to both physics and psychics, thereby relating to the more holistic metaphysical inquiry of space.

Peirce’s writings on mathematical space show strive for systematization and axiomatization of topology (or topics) and geometry. For describing the properties of spaces and objects, Peirce used a system of his own (see CP 6.211†3, Christiansen 2003), without gaining sustaining success in topology.

Peirce was familiar with the works of Lobachewsky, Riemann, Bolyai, and other mathematicians involved with the developing of non-Euclidean geometry (see e.g. CP 3.133–134, 8.91–96). However, Peirce seems to have been somewhat unsatisfied with the fact, that the new non-Euclidean geometry neither rejected nor confirmed the three-dimensionality of the actual space, which consequently has to be determined a posteriori (although see footnotes to CP 3.134).

This makes dimensionality and consequently the whole actual space a topic of the special science of physics: “there is a real science of space and a real science of time, and that these sciences are positive and experiential -- branches of physics, and so not mathematical except in the sense in which thermotics and electricity are mathematical; that is, as calling in the aid of mathematics” (CP 3.557).

Regarding the actual space, Peirce took it and only it as real: “The sole reality is the distribution of qualities of matter in space and time.” (CP 6.61; see also CP 6.68). This is the naturalist heart of the naturalist pragmatism, if ‘sole reality’ is taken to mean those and only those things that actually, objectively exist. Yet, he underwrote to fallibilism. In his uncertainty about the three-dimensionality of the actual space, he mostly relied on Newton’s conception that space is absolute, pre-existing container. He believed the Newtonian conception of space was “the true one” (CP 5.530), or “an excellent hypothesis”, based on the observations of the time (CP 7.486).33

33 Compare the following: “Thus, space, as far as we can see, has three dimensions; but are we quite sure that the corpuscles into which atoms are now minced have not room enough to wiggle a little in a
In other contexts Peirce was bolder (CP 5.496):

When we go on to the nature of Space, I boldly declare that Newton’s view that it is a real entity is alone logically tenable; and that leaves such further questions as, Why should Space have three dimensions? quite unanswerable for the present. This, however, is a purely speculative question without much human interest. (It would, of course, be absurd to say that tridimensionality is without practical consequences.)

When Mach and others suggested replacement of the Newtonian theory of the absolute space by a relational one, Peirce reacted by defending Newton and attacking Mach (see CP 5.496, 7.485–490; chapter 3.1.1). Randall Dipert (1973, 79) suggested, that “Peirce came to believe in the existence of absolute space as a result of his examination of Mach’s proposals”. This may well be true, since Mach (or anyone else) had no whole, solid, substantial theory available at the time, but only a program for a theory. Consequently, it must have seemed that there is no reason to abandon the ruling absolute hypothesis. Pending on more thorough investigation, another reason why Peirce opted for the absolute rather than the relationalist account, may have been that he wanted to cling on to the belief of space as an actually existing entity, an objective continuum of the actual world, inhabited by its objects, hosting the hard facts, to which inquiry would allow us to adapt asymptotically (CP 7.486–489). In extreme interpretation, the relativist accounts, such as those by Mach or Leibniz, may have seemed to jeopardize all that.

In Leibniz’s relativist account on space (rejected by Peirce in e.g. CP 5.530), space was a system of relations, without metaphysical or ontological existence, yet definitely concerned with actual objects (Ariew 2000, 45–46; Jammer 1954/1970, 117):

I will here show, how men come to form the notion of space to themselves. They consider that many things exist at once, and they observe in them a certain order of coexistence, according to which the relation of one thing to another is more or less simple. This order is their situation or distance. When it happens that one of those coexistent things changes its relation to a multitude of others which do not change their relation among themselves, and that another thing, newly come, acquires the same relation to the others, as the former had, we then say it is come into the place of the former; and this change we call motion in that body, in which is the immediate cause of the change. And though many, or even all, the coexistent things should change according to certain known rules of direction and speed, yet one may always determine the relation of situation which every coexistent acquires with respect to every other coexistent, and even

|fourth| (1.249) and “We can perfectly well suppose that atoms or their corpuscles move freely in four or more dimensions.” (CP 1.273; see also CP 2.732, 5.496, 5.586, 6.11, 6.82, 6.575, 7.197, 7.488, 7.568). Also, see chapter 1.2.3 for the reasons of wording ‘actual’ instead of ‘real’.

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that relation which any other coexistent would have to this, or which this would have to any other, if it had not changed or if it had changed any other way. And supposing or feigning that among those coexistents there is a sufficient number of them which have undergone no change, then we may say that those which have such a relation to those fixed existents as others had to them before, have now the same place which those others had. And that which comprehends all those places is called space.

Besides the recurring themes of dimensionality (e.g. CP 2.732, 6.575, 7.568) and continuity (e.g. CP 1.166, 2.85, 6.84, 6.134, 6.164, 6.168), Peirce worked on questions of shape, finiteness and measurements of the actual space (see e.g. CP 6.28–, 6.419–421). Back in 1891 Peirce assumed, that “within another century our grandchildren will surely know whether the three angles of a triangle [in the actual space] are greater or less than 180°” (CP 6.29). Amidst these issues, up-to-date still today, the stray references to ether in CP 7.15, for instance, seem strangely anachronistic. And had Peirce witnessed the developments after the Special and General Theories of Relativity, maybe his reliance on Newton and on the achievements of future inquiry would not have been so unwavering.

For the current purposes perhaps more interesting aspects of Peirce’s thoughts on spatiality are to be found in the metaphysical considerations and in the emerging psychological inquiry. These comprise a collection of more or less interconnected thoughts, rather than a clearly demarcated theory of metaphysical or psychological space. Putting aside Peirce’s attachment to the Newtonian absolute space as the best hypothesis available at the time, many aspects of Peirce’s notions of space simultaneously support the relativist notions of space as described above, and fit better in the framework of naturalist pragmatism, as described in this book.

For instance, the remark, that “[t]he sole reality is the distribution of qualities of matter in space and time” (CP 6.61) seems to tie together the notions of actual reality with its causality and phenomenal reality with its beliefs (cf. chapters 1.2.1–1.2.3). While it holds on to the idea of space as a container, it also hits the naturalist target, that subjects are ultimately seen as organisms in natural environment. This does not need to lead to predeterminism or necessitarianism, so abhorred by Peirce (CP 1.323, 6.35–65), and unfitting to the framework of naturalist pragmatism.

Peirce emphasized the continuum of dynamic relations between actual objects and mind (or, as worded in CP 8.78, “soul”). Objects in space are in dynamic reaction with each other (CP 8.77), and “[t]he soul reacts dynamically with the future, cognitively with the past. Both are mediate.” (CP 8.78) While this is another way to describe the semiotic process of interaction, presented in part one, it leaves unclear the representative side of the interaction, and refers only to objects in the actual space.
The connection in Peirce’s writings between the actual space and phenomenal space may be searched, on the one hand, in qualities and feelings, and, on the other hand, in habits of action. In *The Law of Mind* Peirce noted, that “feeling has a subjective, or substantial, spatial extension” (CP 6.133, see also 6.277). ‘Feeling’, in turn, was described in *A Guess at the Riddle* as “passive consciousness of quality, without recognition or analysis” (CP 1.377, see also chapter 1.2.3). This seems to come close to Gärdenfors’s description of subconceptual quality dimension. Unfortunately, the notion of ‘spatial extension of feeling’ points to the spreading of nervous excitation in the actual organism, rather than phenomenal (subconceptual, conceptual, or symbolic) spatiality.

However, just before the quotation above, Peirce accredited feelings with continuity (CP 6.132; see chapter 1.2.2 for a note on Peirce’s doctrine of continuity):

> Time, as the universal form of change, cannot exist unless there is something to undergo change and to undergo a change continuous in time there must be a continuity of changeable qualities. Of the continuity of intrinsic qualities of feeling we can now form but a feeble conception. The development of the human mind has practically extinguished all feelings, except a few sporadic kinds, sound, colors, smells, warmth, etc., which now appear to be disconnected and disparate. In the case of colors, there is a tridimensional spread of feelings. Originally, all feelings may have been connected in the same way, and the presumption is that the number of dimensions was endless. For development essentially involves a limitation of possibilities. But given a number of dimensions of feeling, all possible varieties are obtainable by varying the intensities of the different elements. Accordingly, time logically supposes a continuous range of intensity in feeling. It follows, then, from the definition of continuity, that when any particular kind of feeling is present, an infinitesimal continuum of all feelings differing infinitesimally from that is present.

This deserves a few short remarks. First, this is not totally unlike the attempt of defining continuity of mathematical space through change of position suggested by Peirce in CP 6.164. Second, the fact that feelings are unreachable, in terms of not being analyzable without changing the character of the feeling, is in concord with the idea that subconceptual representation is unreachable for reporting, i.e. it is unconscious. Third, the claim, that time cannot exist unless there are some changeable qualities changing, turns the table, so to say, since it implies, that time is not an entity in which events take place, but rather, is created by the fact that something changes. The analogue with relative spatiality as opposed to absolute is clear. Tendency towards relative space and time in this sense is implied also in CP 1.433 (see also CP 4.172): “There are different kinds of existence. There is the existence of physical actions, there is the existence of psychical volitions, ..., and, for aught we know, there may be another creation with a space and time of its own.
in which things may exist. Each kind of existence consists in having a place among
the total collection of such a universe. It consists in being a second to any object in
such universe taken as first. It is not time and space which produce this character.
It is rather this character which for its realization calls for something like time and
space.” Fourth, note that Peirce used the same three-dimensional example as Gärden-
fors, the color space, for dimensions of representations or feelings of qualities.

This suggests a further reading of Peircean approach to phenomenal spatiality.
In CP 1.317 Peirce made an interesting comparison between feelings as parts of
consciousness and points as parts of space (Pragmatism, fragment 2): “The whole
content of consciousness is made up of qualities of feeling, as truly as the whole
of space is made up of points or the whole of time of instants.” CP 1.319 reinforces
and clarifies this:

I said that the phaneron is made up entirely of qualities of feeling as truly as
space is entirely made up of points. There is a certain protoidal aspect – I coin
the word for the need – under which space is truly made up of nothing but
points. Yet it is certain that no collection of points – using the word collection
to mean merely a plural, without the idea of the objects being brought together
– no collection of points, no matter how innumerable its multitude, can in itself
constitute space. . . .

If the intensive continuity of feelings of qualities implies that feelings can be
thought of as perceived quality dimensions, the same idea of spatiality seems to
apply to all representation. However, instead of being merely a collection of points,
or plurality of feelings, the elements that constitute the space need to be organized
somehow. According to the theory of conceptual spaces, this is done through
categorization, and other means of constructing conceptual representations, as
described above. And from that perspective, the concluding summary of A Guess
at the Riddle (CP 1.410–416) and the notions of spatial extension (of “flashes” of
perception) and formation of habits begins to look like a description of phenom-
enal space as well.

As to the opposite, linguistic “end” of representation, Peirce believed, that not
much more is needed than spatial terminology and metaphors for a logical language
(CP 2.290p1):

34 “[B]y the phaneron I mean the collective total of all that is in any way or in any sense present to
the mind, quite regardless of whether it corresponds to any real thing or not.” (CP 1.284.)
35 A case can be made, that the temporal relations can be reduced to spatial relations, or that, the
temporal relations are metaphors of spatial relations (see chapter 4.1.5 for temporality and spatiality in
music). Linguistic evidence supporting this can be found in a variety of languages. Not only do words
like space in English or διάστημα in modern Greek refer to temporal distance and extension in addition
to the spatial ones, but often temporal relations are described in terms of spatial relations. In addition
to the example of the Semitic languages pointed out by Ignaz Goldhizer (1877; quoted in Jammer
If a logician had to construct a language de novo – which he actually has almost to do – he would naturally say, I shall need prepositions to express the temporal relations of before, after, and at the same time with, I shall need prepositions to express the spatial relations of adjoining, containing, touching, of in range with, of near to, far from, of to the right of, to the left of, above, below, before, behind, and I shall need prepositions to express motions into and out of these situations. For the rest, I can manage with metaphors. Only if my language is intended for use by people having some great geographical feature related the same way to all of them, as a mountain range, the sea, a great river, it will be desirable to have prepositions signifying situations relatively to that, as across, seaward, etc. But when we examine actual languages, it would seem as though they had supplied the place of many of these distinctions by gestures.

What is left between the two opposites, is evidently the conceptual level of representation, as Gärdengors named it. In that context, and in the context of Peirce, Existential Graphs, Peirce’s chef d’œuvre (CP 4.347–), cannot be passed unnoticed. Although the writings on graphs seem to focus on the variety of syllogistic diagrams and refining the diagrammatic systems by Euler and Venn, what is interesting here, are the few comments on the purpose of the graphs. Namely, Peirce stated, that he agrees with Friedrich Albert Lange’s opinion “that all reasoning proceeds by the observation of imaginary Euler’s diagrams or of something closely similar … so far as to admit that an imaginary observation is the most essential part of reasoning.” (CP 4.355). Peirce’s description of diagrammatic reasoning, “the only really fertile reasoning” (CP 4.571), suggests that spatiality, whether visualized or not, plays a major role in reasoning (CP 2.778):

We form in the imagination some sort of diagrammatic, that is, iconic, representation of the facts, as skeletonized as possible. The impression of the present writer is that with ordinary persons this is always a visual image, or mixed visual and muscular; but this is an opinion not founded on any systematic examination. If visual, it will either be geometrical, that is, such that familiar spatial relations stand for the relations asserted in the premisses, or it will be algebraical, where the relations are expressed by objects which are imagined to be subject to certain rules, whether conventional or experiential. This diagram, which has been constructed to represent intuitively or semi-intuitively the same relations which are abstractly expressed in the premisses, is then observed, and a hypothesis suggests itself that there is a certain relation between some of its parts – or

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1970/1954, 4), examples of how the relation before (temporal) is expressed via the spatial relation of in front of (or be-foran), can be found in Germanic languages (vor and vor in German; för and för in Swedish, both pairs standing for before and in front of, respectively), Slavic languages (перед and перед in Russian), Finno-Ugrian languages (енне and ees in Estonian, ovdal and ovdas in Northern Sámi), Japanese (前 [mae] and 前に [mae ni]) and Polynesian languages (mua and mua in Māori). It can be assumed that there are many more examples.
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perhaps this hypothesis had already been suggested. In order to test this, various experiments are made upon the diagram, which is changed in various ways. This is a proceeding extremely similar to induction, from which, however, it differs widely, in that it does not deal with a course of experience, but with whether or not a certain state of things can be imagined. Now, since it is part of the hypothesis that only a very limited kind of condition can affect the result, the necessary experimentation can be very quickly completed; and it is seen that the conclusion is compelled to be true by the conditions of the construction of the diagram. This is called ‘diagrammatic, or schematic, reasoning’.

Consequently, Peirce maintained (CP 4.368) that the beauty, or the merits of the system of graphs “which are fairly considerable, spring from its being veridically iconic, naturally analogous to the thing represented, and not a creation of conventions. It represents logic because it is governed by the same law.” Since logic is the theory of thought, and “in its general sense ... only another name for semiotic” (CP 2.227), it might be inferred that, from the viewpoint of the pragmaticist, semiosis as the process of thought operates largely (if not altogether) by means of spatial relations. Graphs are analogous to the spatial relations operative in thinking, and are used as a tool of externalizing the thought process to an object of the actual world.

In Peirce’s time, and in his own life, the influence of Kant was still strong. Peirce made some remarks on the differences and similarities between his conception of space and Kant’s conception of space, or how Kant’s theory of space had been interpreted at the time. The key issue is the a priori versus a posteriori character of space.

According to Peirce (CP 5.382p1, see also footnote on Kant and space in chapter 3.1.1), “Kant proceeds to reason as follows: Geometrical propositions are held to be universally true. Hence, they are not given by experience. Consequently, it must be owing to an inward necessity of man’s nature that he sees everything in space.” In contrast, Peirce regarded early on the laws of space (and time) as a posteriori, to the point of being habituated through experience (CP 6.416, see also 4.172): “But there are certain of our inductions which present an approach to universality so extraordinary that, even if we are to suppose that they are not strictly universal truths, we cannot possibly think that they have been reached merely by accident. The most remarkable laws of this kind are those of time and space.”

Later Peirce extended this moderate position on universality to Kant as well (CP 5.525):

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36 This also gives a fine description of ‘moderate’ or ‘relative universality’ as opposed to ‘extreme’ or ‘absolute universality’. Cf. chapter 2.1.2.
Kant (whom I more than admire) is nothing but a somewhat confused pragmatist. ... Kant regards Space, Time, and his Categories just as everybody else does, and never doubts or has doubted their objectivity. His limitation of them to possible experience is pragmatism in the general sense; and the pragmaticist, as fully as Kant, recognizes the mental ingredient in these concepts. Only (trained by Kant to define), he defines more definitely, and somewhat otherwise, than Kant did, just how much of this ingredient comes from the mind of the individual in whose experience the cognition occurs. The kind of Common-sensism which thus criticizes the Critical Philosophy and recognizes its own affiliation to Kant has surely a certain claim to call itself Critical Common-sensism.

In a footnote (CP 5.223p2), Peirce mitigated the conflict between his critical common-sensism and Kant:

The above theory of space and time does not conflict with that of Kant so much as it appears to do. They are in fact the solutions of different questions. Kant, it is true, makes space and time intuitions, or rather forms of intuition, but it is not essential to his theory that intuition should mean more than “individual representation.” The apprehension of space and time results, according to him, from a mental process -- the “Synthesis der Apprehension in der Anschauung.” (See Critik d. reinen Vernunft. Ed. 1781, pp. 98 et seq.) My theory is merely an account of this synthesis.

In brief, based on this reading, Peirce’s conception of spatiality approaches a relativist one, regardless of his Kantian heritage and his acceptance of the Newtonian theory of absolute space as the best hypothesis of actual space due to the lack of better competitors (CP 6.82–84). Knowledge of the actual space is a posteriori.

Furthermore, through perception and action, the semiotic process ties the relations of objects of the actual world (the actual space) to the representative process of the mind, and vice versa. From feeling (akin to subconceptual spaces) to natural languages, the elements of thinking imply that spatial relations and metaphors have a central role in semiosis. Graphs display, in an externalized, analogous way, the schemata of reasoning, which implies kinship with Gärdenfors’s idea of conceptual spaces. Indeed, space is a conceptual tool, and a system of interconnected relations. Consequently, the idea of a point in space in Peirce’s answer to his own question “what is man?” (CP 7.580), seems to refer to subject in a phenomenal space, in addition to the organism in the actual space.

A pragmatist account of spatiality.

It is time to sum up what a contemporary pragmatist conception of space and spatiality would entail. Since many of the pertinent aspects have been discussed above in the context of actual space, phenomenal space, and Peirce’s thoughts on space, a short outline may suffice. The key points of a pragmatist conception of space are:
Space is a conceptual tool, an a posteriori system of interconnected relations.
Spatiality is about the relations of things perceived and experienced.
Phenomenal spaces connect perception with action, complementing the actual space.
Space is used to grasp instances and categories of objects, of characteristics of objects, and of sets of objects.
There are no dedicated construction mechanisms for complex representations.

Point one: Space is a conceptual tool, an a posteriori system of interconnected relations. As quoted earlier, Einstein remarked that absolute and relative concepts of actual space are “free creations of the human imagination, means devised for easier comprehension of our sense experience” (Albert Einstein’s foreword to Jammer 1970/1954, xiii). Based on the above, the remark seems very applicable both to actual and phenomenal spatiality. The concept of space and other spatial concepts are tools, useful for and used for grasping aspects of both actual and phenomenal world, including the thought processes or representations themselves. From that perspective, various views of phenomenal space, and both the absolute and the relativist conception of the actual space may appear to be well-founded, pending on their usefulness in various contexts. Consequently, issues of space and spatiality may constantly need revision or reassessment.

However, all things considered, as the pragmatic maxim also calls for, the absolute conception of the actual space as a pre-existing substratum of events or as a given container of objects is more limited than the relativist conception of actual space. In a sense, the theory of the former is explainable by the theory of the latter.37

The elements of the actual world are not affected by our thinking. But as a conceptual tool, space is a posteriori, as far as the actual world is concerned (as opposed to mathematical study of possible spaces, in particular). In the naturalist perspective, the actual world also includes the subject-organisms, and consequently also their phenomenal worlds. This leads to the situation, that all the problems relating to spatiality can only be settled based on experience, and the principles of useful correspondence with the hard facts of the actual world. Also, the possibility of fallibility of inquiry applies.

The fact that the space as a container seems a valid schema, extended from the powerful schema of object as a container, should not lead to the superficial, if not detrimental assumptions of space as an entity, let alone as an absolute, immovable, immutable, eternal entity, unaffected by objects, but capable of exerting force on

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37 The analysis of the concept of space in natural sciences has long ago surpassed the vernacular usage of ‘space’ (see chapter 3.1.1). There is no reason expect less from the discourse in the arts and humanities.
objects. Instead, the starting point for a pragmatist conception of space is the view of space “as a system of interconnected relations”, as Jammer (1970/1954, 23) described Theophrastus's conception.

Point two: Spatiality is about the relations of things perceived and experienced. Since all problems relating to spatiality can only be settled based on experience, and space is a system of interconnected relations, any conception of space is evidently based on perceived and experienced relations of things.

As far as it makes sense to talk about existence of space, space obtains its existence from its elements. As opposed to being a true entity, the apparent properties of space, such as containment, dimensionality, metric, etc., fold back to how the properties of points or other elements constituting the space are perceived. It is noteworthy, that space as a system of interconnected relations is not only about the particular relations such as momentary perceptions of instantaneous situations. Space involves also an accumulative or potential aspect. Namely, each particular relation or a set of relations manifests a possibility, and consequently, a collection or accumulation of particular relations sets up an expanse of potentialities. The expanse may be discrete or it can be assumed continuous or seemingly continuous. In short: elements of space set up a structure or a frame in which each point may or may not become occupied. In virtue of its elements in the past, a space is a host of future possibilities.38

This idea corresponds both to the prototype theory of perception, and to the connection between the momentary or particular character of perception and the relatively slowly evolving accumulation of perceptions into experience. It is also in concord with the idea of imagination as the competence of estimating hypothetical future situations.

Point three: Phenomenal spaces connect perception with action, complementing the actual space. The fact that space is a conceptual tool, neither dismisses the spatiality of the actual world nor tears a gap between the actual and the phenomenal. Also, the phenomenal space needs not be explained away in terms of the actual world. The interaction between the subject-organism and the environment can be thought of as an interplay between the dynamic actual space and the variously complex phenomenal spaces of the subject. We perceive matters of the actual world, and construct representations of the matters. In the naturalist perspective, this includes also ourselves and other subjects as inhabitants of the actual world, and the ways we construct the representations.

The representations allow for the subject's capability to guide the organism’s action, dependent on organism’s sensory and motor abilities and accumulated experience. Space is about the perceived states of affairs. It is a tool of adapting to and

[38] In this respect, Aristotle’s definition of space could be fine-tuned to “the total sum of all places potentially occupied by bodies”.
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existing in the world. In all probability, aspects of space (such as adjacency, similarity, continuity, connectedness, membership, or dimension) describe the relations between and within the actual objects, ourselves included. As subjects are organisms with sensorimotor capabilities inhabiting the actual world, it is not a surprise if the phenomenal spaces as conceptual tools involve similar spatial aspects. At the same time, the habits of action, that allow us to act upon objects of the actual world, involve spatiality in terms of the potential to causally effect the objects. In other words, phenomenal spaces connect perception with action, complementing the actual space.39

In semiosis, the interactive meaning-making process between organism and environment, aspects of the actual space are transformed into phenomenal spaces, and eventually, the phenomenal spaces are attempted to transform or map back to the actual space. Hence, the embodiment of the mind may well be described as spatial.

The imperfect but useful mappings between actual and phenomenal spatiality account for the solidity of the epistemic connection between the actual and phenomenal reality. This does not mean, that the connections between the actual and phenomenal spatiality (or vice versa) would be simple and straightforward, or that the “coupling between perception and action” would be so “direct” that the categorized perception would mechanistically determine the choice of action. The process of inquiry helps us adjust both perception and action towards adaptation to the environment, as described in part one. Inquiry may lead to complex phenomenal spaces.

Consequently, we can talk about embodiment of mind in at least four different ways. First, there is the idea of ontological embodiment, according to which there is no autonomous faculty of reason, or superphenomenally metaphysical mind (or like) as independent entities. This is the starting point of naturalism. Second, the idea of implemental embodiment maintains that there is a nervous system (or some other representative system), which forms the connection between perception of the actual world and action upon the objects of the actual world. Third, the idea of corporeal embodiment is that the characteristics of the bodies, that host the representative systems, and their relations to their environments evolve and change (evidently phylogenetically, ontogenetically as well as sociogenetically). Consequently, the representative system and its representations also evolve and change. And, fourth,

39 Incidentally, in the Finnish language, the word ‘tila’ stands for both ‘space’ (in the relativist sense akin to ‘room’, but not in the cosmological sense, as in ‘the Universe’) and for ‘state of affairs’, ‘status’, or ‘conditions’ (as well as for ‘estate’ or ‘farm’). Consequently, the derivatives of the word include a variety of words such as ‘tilata’ (to place an order), ‘tilanne’ (situation), ‘tilasto’ (statistics), ‘tilaisuus’ (opportunity), ‘tilavuus’ (volume), ‘tilat’ (premises), and ‘tilapäinen’ (temporary).
the *spatial embodiment* means that the representations operate on spatial terms, as described above.\(^{40}\)

**Point four: Space is used to grasp particulars and generalizations of objects, of characteristics of objects, and of sets of objects.** The elements that give rise to space in the interactive process with the world, that is, the points that constitute the space as conceptual tool, need not be single and complete actual objects. They may be particular instances of actual objects, instances of characteristics of objects, or instances of sets of objects.\(^{41}\)

Of three levels of representation, the conceptual level, as advocated by Gärdenfors, operates between the subconceptual and the symbolic levels. All three levels of representation may be comprehended in terms of spatial structures. Consequently, it seems logical to use the corresponding distinctions between the terms subconceptual space, conceptual space and symbolic space as three kinds of phenomenal spaces, although the levels seem to form a continuum rather than distinct kinds. The more primitive subconceptual spaces lack in categorization or combinatory structures of the conceptual spaces. The symbolic spaces, in turn, are characterized by habituated associations—arbitrary or non-arbitrary. In terms of topology, these may be further combinations of joint or disjoint regions or subspaces.\(^{42}\)

On the one hand, there seem to be natural needs and mechanisms of categorization, which filter and extract regions of conceptual spaces from the quality dimensions of the subconceptual spaces. The particular instances in subconceptual spaces are relative to the more general topologies of the specific sensory systems and thereby correlate in intricate ways to the topologies of the characteristics of objects of the actual world, in virtue of the causality of the sensory systems. As such, they represent various characteristics of perceivable instances, characteristics of the objects of the actual world. In the process of categorization, the “blooming, buzzing confusion” of the (relatively) continuous subconceptual representations are filtered and discretized into (more) finite sets of categories. These categories constitute the dynamic properties and concepts.

The subconceptual spaces are perhaps not as continuous as Gärdenfors suggests. There is a known dilemma of how continuous perception can be induced by the discrete elements of the sensory systems. This was noted, among others, by Peirce (CP 5.223): “if we were to see immediately an extended surface, our retinas must be

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40  Chapter 2.2.5 discussed the embodiment of music as a semiotic process on terms of the first three ways of embodiment. Part four deals with the spatial embodiment in music.

41  Instead of speaking with the loaded term ‘universal’, the more flexible ‘generalization’ is used.

42  There seem to be many cases, in which the organism and its environment are simple enough for the organism to cope with subconceptual representations alone—with very direct couplings between perception and action (see chapter 1.3.4). One could think of species such as the Californian sea hare (*aplysia californica*; see Churchland 1992).
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spread out in an extended surface. Instead of that, the retina consists of innumerable needles pointing towards the light, and whose distances from one another are decidedly greater than the minimum visible. Suppose each of those nerve-points conveys the sensation of a little colored surface. Still, what we immediately see must even then be, not a continuous surface, but a collection of spots.” A solution to this seems to be the inherent methods of averaging or interpolating, due to the variety of instances and the process of categorization. Adding to that answer, further solution might be found in the continuity of the actual objects and the fact that the actual objects are logically connected to perception and cognition.43

Gärdenfors (2000, 135) noted, that “there is no principal ontological difference between concepts and objects – objects are just very narrow concepts”, since in the representation of an instance of an object, all (known) regions of the domains are reduced to point (idem). I believe it is not always quite that simple, if object is taken as a particular. Let us recall Peirce’s suggestion (CP 7.467), that

A concept is not a mere jumble of particulars, -- that is only its crudest species. A concept is the living influence upon us of a diagram, or icon, with whose several parts are connected in thought an equal number of feelings or ideas. The law of mind is that feelings and ideas attach themselves in thought so as to form systems.

As noted (see chapter 2.1.1), this implies, that every concept is a sign of a general kind (CP 8.305, 8.332). While there seems to be no objections to the idea, that as a representation, an object would be a point in a conceptual space, a representation of a particular object is still a particular, an instance, as opposed to a generalization. Only a collection of repeated or different instances (especially if “not a mere jumble of particulars”, but somehow organized) may constitute a generalization—and the more instances represented, the more there are points in space, and consequently, the more extensive, stable, and reliable the space and its categorization may be. Hence the distinction between the particular objects or other instances (exemplars in conceptual spaces) and categories (static or dynamic concepts or properties as sets of domains of conceptual spaces) more or less corresponds to the distinction between the more particular perception and the more general experience, into which perception accumulates, made earlier in the first part.44

On the other hand, the categories can be associated with arbitrary labels, i.e. be named by (negotiated) linguistic and other terms, if useful, thus giving rise to natural or other languages. But, “the symbolic level depends on the conceptual” (Gärdenfors

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43 Again, see opening of chapter 1.2.2 for a note on Peirce’s doctrine of continuity.
44 In terms of implementation in natural or artificial neural networks, these distinctions can also be compared with the particular instantaneous activations and the more sustaining synaptic weights of neural networks.
Although the ability to label concepts and properties by terms of natural languages is proven efficient (albeit often problematic) in the language game and interpersonal communication, it does not change the fact, that the label is no more or no less than a label. The conceptual structures themselves, to which the labels point, are not communicated in words.45

More generally, the conceptual spaces may be associated with each other, or contained in each other, thus creating complexes of representation. This opens avenue not only for metaphors, but also to conceptual blending, in which, to put it in a nutshell, “structure from two input mental spaces is projected to a new space, the blend” (Fauconnier and Turner 2002, 47). Despite the usefulness of arbitrary labels that natural languages give to concepts and properties, and despite their position in past research in philosophy, cognitive sciences and semiotics, it may be, that the linguistic labels are just the tip of the iceberg, compared to the other symbolic or otherwise complex spaces that may turn out to be even more relevant for the inquiry of semiosis.

The evolutionary justification of the conceptual and other phenomenal spaces apparently comes from the fact, that they are useful for the organism’s (and the society’s) well-being and survival in the world. In the interaction with the environment, the phenomenal spaces are constantly adjusted so that the actions taken may serve purposes beneficial for the subject-organism (see part one). By virtue of the constant feedback through inquiry, the phenomenal spaces evolve in their ways of connecting perception with action. The subconceptual level is insufficient for complex representations, and the symbolic appears, in Gärdenfors’s words, “exceptional and parasitic” compared to the subconceptual and the conceptual. It is no wonder that Gärdenfors located meaning essentially in the conceptual level of representation, which put conceptual spaces into the core of cognition and semiosis.46

However, Gärdenfors connected the symbolic only with the linguistic. Should not the locus of meaning—from each subjective perspective—be in all the phenomenal spaces that constitute the ways in which each of us as organism connects

45 This refers to the symbol grounding problem. From the morphological perspective, the main oversight of the symbolic approach to cognition has probably been the lack of the distinction between symbols as labels of conceptual structures and the signifying conceptual structures themselves, that is, the conceptual spaces. The gist, as Gärdenfors quoted Jean Petitot, is that “the conceptual contents of mental states and their semantic correlates are no longer identified with labels for symbolic ordering. Their meaning is embodied in the cognitive processing itself. More precisely, it is identified with the topology of the complex attractors of the underlying neural dynamics” (Petitot 1995, 234; quoted in Gärdenfors 2000, 257).

46 It may seem illogical to discuss the locus of meaning, due to the cyclical or helical character of semiosis involving objects, perception, representation that joins perception with action, and instantiated action upon objects. There is no middle point to that.
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perception with action and the ways in which we as subjects meet the world? If the symbolic representation is understood more broadly as to include any arbitrary, associated, negotiated, or otherwise conventional collection of natural concepts and properties, there seems to be no reason to position meaning anywhere else, but on all three levels of representation, each carrying their own duties (see sections 3.2 and 3.3).

Point five: There are no dedicated construction mechanisms for complex representations. In compliance with the abductive disposition of this book, an assumption can be made that there is no inherent natural reason why complex representations would need an operation mechanism different from that of the simpler ones. Instead, it can be assumed that the construction mechanisms of complex conceptual spaces extend the construction mechanisms of the more simple ones. Reversely, abstracts domains are understood by means of more concrete domains, “down” to the literal concepts (compare ‘I got it!’ as ‘I understood what you meant’ with ‘I got it!’ as ‘I caught the ball!’), and thereby eventually to the spatiality of the actual world. From this, it does not follow, however, that the so-called high cognitive functions would be (solely) determined by the perceived circumstances of the actual world at a particular moment. The representative system appears so unfathomably complex that it seems that there might be what is considered free will, after all.

Categorizations, combinations, associations and metaphors seem to be important construction mechanisms of complex representations and learning. In addition, there seem to be mechanisms that simply filter out less pertinent features or representations. The process of discretization of the continuous quality dimensions into adjustable categories diminishes cognitive load and speeds up learning thus improving effectiveness of representing. Conceptual and symbolic spaces are constantly adjusted in inquiry. New exemplars add new points in the space, which may change the balance between the regions of the space and shift prototypes of the regions, and regulate the salience between the regions or subspaces. New quality dimensions and domains may be added as new experiences accumulate.47

Topological structures of phenomenal spaces exist on different levels, different contexts, from sensory domains to motor action. Topological correspondences between different domains allow for the metaphorical mappings, in virtue of which something may stand for something else in some respect.

There is yet a remark to be made concerning the distinction between space as being present in all aspects of semiosis (both as the actual space and as the phenomenal spaces), and the use of words referring to the spatial concepts in the sophic observation of semiosis. Namely, the semiotic process operates regardless of whether

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47 Parallels to this could perhaps be found in hypertrophy and proliferation in cellular growth.
we use the spatial concepts to describe them or not. The operation of the semi-
otic process, regardless of the level of the complexity, involves issues describable
in terms of differences, distributions, and distances between the characteristics or
their abstractions, i.e. in terms of spatiality. Yet, there is no entity of space that in
itself would take part in the semiotic processes. Only objects and their characteris-
tics either as actual or as phenomenal do. Instead, we use words referring to spatial
concepts because, in addition to the concepts themselves, they are useful tools when
we want to grasp, describe or explicate the operation of the semiotic process.

3.2 A semiotic approach to mind

The previous section focused on the concept of space. It outlined a pragmatist con-
ception of space, in which the role of phenomenal spaces complements that of the
actual space in semiosis. This section delves into the domain of semiotics and espe-
cially into the semiotic theories of phenomena and cognition by Charles S. Peirce
and Pentti Määttänen, in order to present an spatially aware account of mind as a
semiotic system in the next section.

3.2.1 Peirce’s theory of phaneroscopic categories

The theory of phaneroscopic categories constitutes the core of Charles Peirce’s phi-
losophy. It forms the basis for Peirce’s philosophical structuring and a key to his
theory of signs. Consequently, references to the three categories in publications
on Peirce are ubiquitous. Outlines and interpretations of Peirce’s categories are
Wennnerberg 1962, Thompson 1973/1953, to name but a few. Therefore, and since
they are usually well known within semiotics, there is no need to discuss the cat-
egories in detail here. Instead, a brief outline ought to be sufficient.

As noted in chapter 3.1.3, Peirce used the term phaneron for (CP 1.284):

the collective total of all that is in any way or in any sense present to the mind,
quite regardless of whether it corresponds to any real thing or not. If you ask
present when, and to whose mind, I reply that I leave these questions unan-
swered, never having entertained a doubt that those features of the phaneron
that I have found in my mind are present at all times and to all minds. So far as
I have developed this science of phaneroscopy, it is occupied with the formal
elements of the phaneron.

Akin to phenomenology, phaneroscopy is a study which, according to Peirce, “sup-
ported by the direct observation of phanerons and generalizing its observations”,

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includes indicating the broad classes of phanerons, describing the classes and their mutual relations, and demonstrating the adequacy of the classes (CP 1.286, 5.43; Short 2007, 60–66; Bergman 2004, 156). Routinely, the classes are referred to as categories. 

Based on Peirce’s classification of sciences (see CP 1.238–; Kent 1987), phenomenology might theoretically resort to mathematics for aid. Still, it contents itself, as all philosophy “with observations such as come within the range of every man’s normal experience” (CP 1.241). An implication of this is that the phaneroscopic categories, as far as they pertain to the actual world, are also a posteriori. 

According to Peirce (CP 5.43; EP2, 148; cf. Wennerberg 1962, 33), “the word Category bears substantially the same meaning with all philosophers. For Aristotle, for Kant, and for Hegel, a category is an element of phenomena of the first rank of generality. It naturally follows that the categories are few in number”. In Peirce’s phaneroscopy, the irreducible categories are only three, and they are abstract to the point that they seem applicable to practically any aspect of phenomena. Consequently, the doctrine of the three categories may face the danger being too general and too abstruse.

Indeed a definitive character of Peirce’s categories and philosophy in general is his fondness of tripartitions or trichotomies. “This categorical approach is so dominating that the reader may well wonder if Peirce is not simply forcing his subject matters into too rigid a structure, without paying due attention to the varying facts of the cases”, as Mats Bergman noted (2004, 133). Spinks (1991) gave a thorough account of Peirce’s triadomany. In addition to the strict trichotomy and breadth of the categories, problems may arise from the fact, that Peirce revised his theory of categories in several occasions (see e.g. Bergman 2004, 133–226; Short 2007, 61–71).

Without further ado, let us take a look at Peirce’s description of the categories in his third Harvard lecture of 1903 (The Categories Defended, MS 308, CP 5.66, EP 2, 160; see also CP 7.524–538, 1.356, 8.328–332): 

48 Although Peirce called the categories primarily “cenopythagorean categories” (e.g., CP 1.351–352, 2.116, 8.328–329) or “Kainopythagorean categories” (CP 7.524–538), “phaneroscopic categories” also seems justifiable, since the categories pertain to phenomena, or phanerons in Peirce’s terms.

49 Note that the phaneroscopic categories and the categories of the conceptual spaces are two different things. In the context of the morphodynamic theories of cognition (such as Lakoff and Johnson 1999 or Gärdenfors 2000), categories are about the organization of the subconceptual representations into more readily functional discrete units. Also, categories in that sense are limited to the conceptual level of representation and the to symbolic level combining or labeling the conceptual representations. Peirce’s categories are theoretical, aimed at grasping the modes of thought, whereas the morphodynamic categories are in themselves forms of thinking.

50 For the names of the categories, Peirce recommended, that “for scientific terms, Firstness, Secondness, and Thirdness, are to be preferred as being entirely new words without any false associations whatever. How the conceptions are named makes, however, little difference” (CP 4.3; see Short 2007,
Category the First is the Idea of that which is such as it is regardless of anything else. That is to say, it is a Quality of Feeling.

Category the Second is the Idea of that which is such as it is as being Second to some First, regardless of anything else and in particular regardless of any Law, although it may conform to a law. That is to say, it is Reaction as an element of the Phenomenon.

Category the Third is the Idea of that which is such as it is as being a Third, or Medium, between a Second and a First. That is to say, it is Representation as an element of the Phenomenon.

The concise definitions by Peirce tend to require elaboration or examples, since the categories “are excessively general ideas, so very uncommonly general that it is far from easy to get any but a vague apprehension of their meaning” (CP 4.3). Therefore, let us make use of some of Peirce’s original expatiations (see CP 1.284–353, 5.41–65), although we face a dilemma, which Mats Bergman (2004, 196) accurately described:

Furthermore, it is notoriously difficult to express adequately the content of the categories. The predicament is obvious; although the first two categories are, in a sense, more primitive than thirdness, the third category is the proper domain of representation. When we attempt to explicate firstness and secondness, we do so by employing means properly belonging to thirdness. …; although the first and second category are, in a certain respect, directly observed apart from representation, there is no way to depict these as conceptions without violating their integrity.

The category of Firstness.

In addition to the inherent unreachability by description, the category of Firstness (or category the First) is characterized by possibility, potentiality, lack of reaction, lack of analysis, immediacy, presentness, and feeling. Peirce also described it as fresh and new “for if old it is second to its former state” (CP 1.357). It is also “initiative, original, spontaneous, and free; otherwise it is second to a determining cause” (idem). Therefore a First cannot be reached as it is, but only as a degenerate First. Firstness “comprises the qualities of phenomena, such as red, bitter, tedious, hard, heartrending, noble; and there are doubtless manifold varieties utterly unknown to us” (CP 1.418).

74). However, Peirce also used more descriptive names, that slightly changed over the years, e.g., Quality, Relation and Representation (1867, CP 1.551–555), Quality, Reaction and Mediation (1898, CP 4.3), or Quality, Reaction and Representation (1903, CP 5.771p1).
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Peirce’s description of Firstness in the third Lowell lecture (1903, CP 1.25), emphasized the character of possibility and immediacy as opposed existence and reaction (see also CP 1.422, 1.531):

Firstness is the mode of being which consists in its subject’s being positively such as it is regardless of aught else. That can only be a possibility. For as long as things do not act upon one another there is no sense or meaning in saying that they have any being, unless it be that they are such in themselves that they may perhaps come into relation with others. The mode of being a redness, before anything in the universe was yet red, was nevertheless a positive qualitative possibility. And redness in itself, even if it be embodied, is something positive and sui generis. That I call Firstness.

In a letter to Lady Welby in 1904, Peirce described qualities of feeling as typical Firsts (CP 8.329, cf. 5.66):

The typical ideas of firstness are qualities of feeling, or mere appearances. The scarlet of your royal livers, the quality itself, independently of its being perceived or remembered, is an example, by which I do not mean that you are to imagine that you do not perceive or remember it, but that you are to drop out of account that which may be attached to it in perceiving or in remembering, but which does not belong to the quality. ... The quality of red is not thought of as belonging to you, or as attached to livers. It is simply a peculiar positive possibility regardless of anything else. If you ask a mineralogist what hardness is, he will say that it is what one predicates of a body that one cannot scratch with a knife. But a simple person will think of hardness as a simple positive possibility the realization of which causes a body to be like a flint. That idea of hardness is an idea of Firstness. The unanalyzed total impression made by any manifold not thought of as actual fact, but simply as a quality, as simple positive possibility of appearance, is an idea of Firstness. Notice the naïveté of Firstness. ... The idea of the present instant, which, whether it exists or not, is naturally thought as a point of time in which no thought can take place or any detail be separated, is an idea of Firstness.

The fact, that Peirce at one point identified the category of Firstness with qualities of feeling, and at another point considered qualities of feeling only typical ideas of Firstness, exemplifies the process of developing the phaneroscopic terminology. It also implies, that while qualities of feeling definitely belong to the category the First, Peirce seems to have fostered an idea, that the categories could also be applicable to other things than classification of phanerons. Indeed, the fact, that the purpose of the three categories is to be able to understand experience better, does not rule out their applicability for other phenomena. However, this study needs
not be concerned with those possibilities, since the categories are used only for the benefit of developing a Peircean view of mind as a semiotic system.\footnote{Mats Bergman agreed with Vincent Colapietro (2001) in that “the categories are primarily heuristic aid”, as “the purpose of the Peircean categories cannot merely be to codify existing knowledge; their ultimate aim, as elaborated conceptions, is to serve as guides for research or openers of new perspectives.” (Bergman 2004, 169.)}

The category of Secondness.

The category of Secondness is characterized by duality, struggle, effort, perception, action, reaction, particularity and individuality, otherness and opposition, existence, brute force and fact. Chapter 1.2.3 described Peirce’s notion of consciousness (or mind or cognition, rather, in today’s language) as having two sides, action and perception. The description of the dual character is actually a description of Secondness. This is the quotation from chapter 1.2.3 in a larger context (CP 1.324):

We are continually bumping up against hard fact. We expected one thing, or passively took it for granted, and had the image of it in our minds, but experience forces that idea into the background, and compels us to think quite differently. You get this kind of consciousness in some approach to purity when you put your shoulder against a door and try to force it open. You have a sense of resistance and at the same time a sense of effort. There can be no resistance without effort; there can be no effort without resistance. They are only two ways of describing the same experience. It is a double consciousness. We become aware of ourself in becoming aware of the not-self. The waking state is a consciousness of reaction; and as the consciousness itself is two-sided, so it has also two varieties; namely, action, where our modification of other things is more prominent than their reaction on us, and perception, where their effect on us is overwhelmingly greater than our effect on them. And this notion, of being such as other things make us, is such a prominent part of our life that we conceive other things also to exist by virtue of their reactions against each other. The idea of other, of not, becomes a very pivot of thought. To this element I give the name of Secondness.

For Peirce, “existence means reaction with the environment, and so is a dynamic character” (CP 5,503, see also 6,336, 6,495). Consequently, existence as that which actually transpires in the actual world, and in the dynamic interaction between organism and environment, belongs to the category of Secondness. The causal relations of objects (and organisms as objects) involving brute force, events and situation perceived as well as action upon objects are all particular, to the degree that “different Secondnesses, strictly speaking, have in themselves no quality in common”, since “Secondness, strictly speaking, is just when and where it takes places, and has no other being” (CP 1,532, see also Wennerberg 1962, 35; Short 2007, 75–78).
In comparison to a First, which is “so tender that you cannot touch it without spoiling it”, a Second “is eminently hard and tangible. It is very familiar, too; it is forced upon us daily; it is the main lesson of life. In youth, the world is fresh and we seem free; but limitation, conflict, constraint, and secondness generally, make up the teaching of experience.” (CP 1.358) In short, Secondness is the category of actuality and existence.

As to the presence of the struggle in all Secondness, I understand it in two ways, mutually connected, but in different scopes. On the one hand, there is the practical struggle in terms of interaction between the causal objects of the environment, exerting their forces on each other, on us as organisms, and by us as organisms. On the other hand, in a larger perspective, there is struggle in terms of the continuous process of inquiry, involving irritation of doubt and settlement doubt by belief, as a means of adapting to and living in the world, perhaps (and likely) asymptotically learning more and more about how things are, irrespective of our thinking of them (cf. CP 5.45–51).

The category of Thirdness.

Whereas Firstness is pervasive in what Peirce termed feeling, and Secondness in the practical exigencies of life, Thirdness is pervasive in thinking (see e.g. Wennerberg 1962, 37; Short 2007, 84–86). Other principal attributes of the category of Thirdness are mediation, representation, connection, continuity, law, habit, generality, consistency, and prediction.

The brief description of Thirdness given in the Harvard lecture (see above, CP 5.66, see also CP 1.328, 1.530, 2.86, 3.423), held Thirdness synonymous to medium, and considered Thirdness “Representation as an element of the Phenomenon”. Also, according to CP 5.105, Thirdness “is only a synonym for Representation”. In contrast, the letter to Lady Welby mentioned earlier contains a more abstract and more general definition: “Thirdness is the mode of being of that which is such as it is, in bringing a second and third into relation to each other.” (CP 8.328). The synonymy of Thirdness with both medium and representation is in harmony with the idea, that somehow representation brings perception and action into relation with each other, combines them as a medium between (see chapter 1.2.3). Thirdness in this respect will be ubiquitous in the topics of the next two chapters (3.2.2 and 3.2.3), dealing with Peirce’s theory of signs and cognition.

Starting with the characteristic of mediation or connection, Peirce gave a lengthy list of examples in a fragment published in CP 1.337:

By the third, I mean the medium or connecting bond between the absolute first and last. The beginning is first, the end second, the middle third. The end is second, the means third. The thread of life is a third; the fate that snips it,
its second. A fork in a road is a third, it supposes three ways; a straight road, considered merely as a connection between two places is second, but so far as it implies passing through intermediate places it is third. Position is first, velocity or the relation of two successive positions second, acceleration or the relation of three successive positions third. But velocity in so far as it is continuous also involves a third. Continuity represents Thirdness almost to perfection. Every process comes under that head. Moderation is a kind of Thirdness. The positive degree of an adjective is first, the superlative second, the comparative third. All exaggerated language, “supreme,” “utter,” “matchless,” “root and branch,” is the furniture of minds which think of seconds and forget thirds. Action is second, but conduct is third. Law as an active force is second, but order and legislation are third. Sympathy, flesh and blood, that by which I feel my neighbor’s feelings, is third.

Note the distinction between law as an active force and law as order. Most times, Peirce clearly affiliates law with Thirdness, and in the context of Thirdness, Peirce’s references to law should indeed be taken as referring to order, rule, regulation, principle, convention, even belief and habit, since “[a] law never can be embodied in its character as a law except by determining a habit” (CP 1.536).

Also the aspects of generality and prediction are inherent in law as a Third, as Peirce deliberated in CP 1.26 (see also CP 5.102–103):

Five minutes of our waking life will hardly pass without our making some kind of prediction; and in the majority of cases these predictions are fulfilled in the event. Yet a prediction is essentially of a general nature, and cannot ever be completely fulfilled. To say that a prediction has a decided tendency to be fulfilled, is to say that the future events are in a measure really governed by a law. ... If the prediction has a tendency to be fulfilled, it must be that future events have a tendency to conform to a general rule. ... This mode of being which consists, mind my word if you please, the mode of being which consists in the fact that future facts of Secondness will take on a determinate general character, I call a Thirdness.

Interdependency of categories, and genuine versus degenerate categories.

The three phaneroscopic categories are categories of experience (CP 2.84). Firstness is the category of quality and possibility, Secondness that of actuality and existence, Thirdness the category of law and representation. An essential feature of Peirce’s theory of categories is that the categories are mutually interconnected.

Secondness and Thirdness are categories of complexity (CP 1.526). Secondness is dyadic, and if “there is one of the two which there is good reason for calling the first, while the other remains the second, it is that the Secondness is more accidental to the former than to the latter” (CP 1.527). Hence, there are two orders of Secondness:
“those whose very being, or Firstness, it is to be seconds, and those whose Secondness is only an accretion. .... One is the second whose very Firstness is Secondness. The other is a second whose Secondness is second to a Firstness.” (CP 1.528.)

Peirce’s example of this is the relation of quality and matter (CP 1.527). Quality, as a First, is only a possibility. When it comes to a relation with matter, it “imparts existence”, and thus becomes second to its Firstness. Consequently, its Firstness is no longer genuine, but degenerate, as Peirce coined the terms. Matter, in turn, “has no being at all except the being a subject of qualities”, i.e. it exists by having qualities. Without qualities, matter “would be nothing at all”. The very being of matter is to be second (cf. CP 1.528).

The example can be carried further, at least from the naturalistic perspective, as follows. Corresponding to the above, the very being of thought is to be third. In the naturalist perspective, thinking cannot take place without matter. Hence thinking involves both matter and quality. From the perspective of matter, as it comes into relation with thought, it becomes second to its Secondness. The Secondness of matter in relation with thinking is no longer genuine, but degenerate. Similarly, the degenerate Secondness of quality in relation with matter becomes third to its original Firstness. Its Thirdness in thinking is degenerate (see fig. 14).

Figure 14. The dependency of the complex phaneroscopic categories on the simple categories. The degeneration of Firstness and Secondness as they come into relation with Secondness and Thirdness, respectively. Secondness necessarily involves Firstness, and Thirdness necessarily involves Secondness. Consequently, there is only one order of Firstness (the genuine), two orders of Secondness (genuine and degenerate), and three orders of Thirdness (one genuine and two degenerate).

More generally, Secondness necessarily involves Firstness. Similarly, Thirdness necessarily involves both Secondness and Firstness. Firstness in Secondness and Thirdness is degenerate Firstness. Secondness in Thirdness is degenerate Secondness.

Despite the mutual dependency, the categories can be distinguished from each other, as clarified in CP 1.420:

No collection of facts can constitute a law; for the law goes beyond any accomplished facts and determines how facts that may be, but all of which never can have happened, shall be characterized. There is no objection to saying that a law is a general fact, provided it be understood that the general has an admixture of
potentiality in it, so that no congeries of actions here and now can ever make
a general fact. As general, the law, or general fact, concerns the potential world
of quality, while as fact, it concerns the actual world of actuality. Just as action
requires a peculiar kind of subject, matter, which is foreign to mere quality, so
law requires a peculiar kind of subject, the thought, or, as the phrase in this
connection is, the mind, as a peculiar kind of subject foreign to mere individual
action. Law, then, is something as remote from both quality and action as these
are remote from one another.

However, as far as the categories are categories of experience, all three categories
are omnipresent in phenomena, since “[n]ot only does Thirdness suppose and
involve the ideas of Secondness and Firstness, but never will it be possible to find
any Secondness or Firstness in the phenomenon that is not accompanied by Third-
ness” (CP 5.90).

**Adequacy of the three categories.**

So far, this chapter has outlined the broad categories of phanerons, described the
categories and their mutual relations. There is no need to attempt to prove or dis-
prove the adequacy of the categories or their irreducibility here. It is enough to
draw attention to a brief explication by Peirce. By the same token, it should be
noted, that for the purposes of the theory being developed in this book, the three
categories do seem to suffice. The framework of naturalist pragmatism, as described
in the first part, does not need other categories, and the three categories, as summa-
ized here, seem to amply serve the current purposes of theoretical construction.
From that perspective, the categories have indeed been stated “problematically, as
a surmise to be verified by observation”, eventually (CP 5.469, see Bergman 2004,

According to Peirce, the three categories are “irreducible and only constituents
of thought” (*The Categories Defended*, EP2, 165; see CP 5.82–92). His arguments are
based on possible and necessary conditions for relations. Perhaps the most succinct
explication for the dismissal of tetradic and higher relations, as well as irreducibil-
ity of the triadic and dyadic relations can be found in CP 6.323 (see also CP 1.363,
1.345–34; or Short 2007, 74 posing the burden of proof “on those who think the
categories incomplete”):

A tetradic, pentadic, etc. relationship is of no higher nature than a triadic rela-
tionship; in the sense that it consists of triadic relationships and is constituted
of them. But a triadic relationship is of an essentially higher nature than a dyadic
relationship, in the sense that while it involves three dyadic relationships, it is
not constituted by them. If A gives B to C, he, A, acts upon B, and acts upon C;
and B acts upon C. Perhaps, for example, he lays down B, whereupon C takes
B up, and is benefited by A. But these three acts might take place without that

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especially intellectual operation of transferring the legal right of possession, which axiomatically cannot be brought about by any pure dyadic relationships whatsoever. Just as much, but no more, is a dyadic relation – or the sort of fact expressed by a two-subject predicate – of a higher nature than any fact expressed by a one-subject predicate, such as ‘is blue.’ For the two-subject fact involves two one-subject facts, but is not constituted by them. If A acts upon B in any way, something analogous to a strain, or stress, takes place within A, and something of the same sort in B; but these two happenings might take place irrespectively of one another, without any action of A on B. In that sense the action is a higher sort of fact than the one-subject stress. A man cannot conceive of a one-subject fact otherwise than as more or less vaguely analogous to a feeling of his own. He cannot conceive of a two-subject fact otherwise than as analogous to an action of his own. A three-subject fact is comprehensible and is analogous to an utterance, a speech, a thought.

3.2.2 Peirce’s theory of perception

The theory of phaneroscopic categories provides tools for classifying phanerons, that is, those “collective totals” that are “in any way or in any sense present to the mind” (CP 1.284). In Peirce’s classification of sciences, phenomenology (or phaneroscopy) is the first of the three branches of philosophy (or cenoscopy), the second and third being normative science (with its own three branches of esthetics, prac-tics, and semiotics) and metaphysics. The theory of categories is “supported by the direct observation of phanerons” and generalizing the observations (CP 1.286), and, like all philosophy, “it limits itself to so much of truth as can be inferred from common experience” (CP 1.184). Just as mathematics can be called in aid for philosophy or the special sciences, phenomenology can be called in aid for the second and third branches of philosophy, or for the special sciences, such as psychology or musicology. Similarly, the theory of phaneroscopic categories is applicable to the needs of psychological, semiotic and musicological theories, such as theories of perception, theories of signification, or theories of musical composition.

The contemporary disciplines of psychology and cognitive sciences were taking only their first steps in Peirce’s days. The psychological, psychiatric, cognitive and neurological research from sociopsychology to neurophysiology has advanced tremen-dously during the past some one hundred years. Consequently, Peirce’s theory of perception may appear outdated in the light of today’s special sciences, and analyses of the theory may seem to be mostly of historical interest.

The reason for bringing up Peirce’s theory of perception in this context is, that understanding the pros and cons of Peirce’s thoughts on perception may help to understand his semiotics. Nevertheless, the theories of perception and semiotics
are two different theories, with different terminologies, different objectives, and different implications for methodologies, the former theories belonging to special sciences and the latter ones to philosophy.

Therefore, this chapter is concerned with some of the central notions in Peirce’s theory of perception. A particular interest is in their relation with the three phaneroscopic categories and their connection to the framework of naturalist pragmatism (see also Rosenthal 2004). The upcoming chapters will then relate essential points of Peirce’s theories of categories and perception to the theory of the Sign.

Part one of this book introduced the framework of this inquiry, based on an understanding of Peircean naturalist pragmatism. In chapter 1.2.3, perception was described as not only “the mere effect of actual objects on sensory organs (i.e. sensation), but as “the extensive and comprehensive process of organizing a representation of a particular state of affairs (that which is perceived), eventually terminating where action begins”. From that perspective, action is a consequent of perception, and perception accumulates into experience, as the motto was voiced. Perception and action were then described as momentary or quasi-momentary and particular, as opposed to experience being cumulative, more general, and evolving. The particularity of action is contrasted by and complementary to the generality of habit of action. Regarding habit, in turn, chapter 1.2.3 quoted Peirce’s brief definition of it as “a general law of action, such that on a certain general kind of occasion a man will be more or less apt to act in a certain general way” (CP 2.148).

How are action and perception, “the two sides of consciousness” connected to each other? What happens between “the gate of perception” and “the gate of purposive action” (CP 5.212)? In action, “our modification of other things is more prominent than their reaction on us”, and in perception “their effect on us is overwhelmingly greater than our effect on them” (CP 1.324), but the role of the objects of the actual world—the other things—is now a concern only as far as they have an effect on perception and as they are affected by action. The greater concern is the phenomenal and perceptual side of the inquiry-driven semiotic process of interaction, which part one described in lengths.

The description of the cycle (or spiral, or helix) of interaction in part one ended in chapter 1.3.4 with a model, which incorporated Aristotle’s, Dewey’s and Peirce’s ideas of the esthetic, practic and semiotic. The model seems consistent with the phaneroscopic categories, to the point that it involves one kind of esthetic (esthesis), two kinds of action (poiesis and praxis), and three kinds of knowledge (techne, phronesis and sophia). However, that model does not reveal how the process evolves from the esthetic to the practic, connected by the semiotic, nor is it intended to.52

52 The model in chapter 1.3.4 is intended to be taken heuristically, with a prospect of proving or not proving to be useful for analysis of interaction with “the other things”, which may be artistic or other
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As might be expected, as categories of experience or consciousness, all three phaneroscopic categories play an important role in Peirce’s theory of perception, since “[i]t is more particularly to changes and contrasts of perception that we apply the word ‘experience.” (CP 1.336).

On quality and feeling.

A reasonable starting point is Peirce’s agreement with the psychologists’ argument, that “the first impressions made ... must have been feelings of sense qualities” (CP 7.624). These are “disconnected from one another, and not appearing to stand over against a self as objects” (idem).

A short review of the notions of feeling and quality may be in place here. Peirce defined quality (CP 1.422–426, cf. also chapters 1.3.2 and 3.2.1) as a mere abstract potentiality, independent of thought and of the fact that it is possessed by a material thing. Qualities exist even while they are not actually perceived. The universe of phenomena appears to be made up of “nothing but sensible qualities”, and “we attend to each part as it appears in itself, in its own suchness, while we disregard the connections”, at first. The idea of quality is that it is considered a “monad”, a singular contributing element of a phenomenon or partial phenomenon, without reference to other elements or components and without reference to anything else.

In order for a quality to contribute to semiosis, it needs to be felt. Peirce’s expression quality of feeling refers to a quality that is no longer a mere potentiality but is actually felt. By a feeling, Peirce meant “an instance of that kind of consciousness which involves no analysis, comparison or any process whatsoever, ... an instance of that sort of element of consciousness which is all that it is positively, in itself, regardless of anything else” (CP 1.306).

Peirce seems to have been careful in his wordings. In the previous chapter, ‘quality of feeling’ was, if not equated with, at least considered an epitome of the category of Firstness. In CP 7.624 Peirce wrote about “feelings of sense qualities”. What is the difference between a quality of feeling and a feeling of sense quality? As mentioned in chapter 1.2.2, what Peirce meant by feeling, was “nothing but sensation minus the attribution of it to any particular subject” (CP 1.332). Peirce seems to contradict himself in saying at the same time, that sensation is “the initiation of a state of feeling” (idem). Yet his example clarifies, that a state of feeling is what persists between moments of sensation (idem):

In my use of words, when an ear-splitting, soul-bursting locomotive whistle starts, there is a sensation, which ceases when the screech has been going on for any considerable fraction of a minute; and at the instant it stops there is a second sensation. Between them there is a state of feeling.

objects to be acted upon, objects to be perceived, or other subjects to be communicated with.
Still, according to CP 7.543, “an element of feeling is one part of it”, that is, sensation. It seems, that Peirce wanted to release feeling from practical duties, so to say, to exclude the actual operation of the sense-organs from feeling, and to delineate feeling as something that is an immediate result of the sensation. Sensation, being tied to the operation of the sense-organs, would fade over time and be replaced by other sensations, while feeling would be carried forward in the nervous system (see CP 1.386).

Peirce was aware of the physiology of the nervous system as the implementation of sensations and feelings (see e.g. CP 1.393, 1.386). Excitation of the nerve-cells is what produces feeling (CP 1.388–390, 5.223, 6.133, 7.396). According to CP 6.22, feeling may be supposed to exist wherever a nerve-cell is in an excited condition. The disturbance of feeling, or sense of reaction, accompanies the transmission of disturbance between nerve-cells, or from a nerve-cell to a muscle-cell, or the external stimulation of a nerve-cell. General conceptions arise upon the formation of habits in the nerve-matter, which are molecular changes consequent upon its activity and probably connected with its nutrition.

Assumedly, then, as far as our practical and scientific inquiry has provided us with beliefs that correspond to the actual world, the causality of the actual world is what causes the differences in excitations of the nerve-cells hosting different sensations (hence sense-qualities, CP 1.418, 7.496–498, 7.624), and, when the sensations are felt, different ‘qualities of feeling’.

In terms of perception, then, ‘quality of feeling’ indirectly relates to the characteristics or features of the changes in the actual world, but is not necessarily concerned directly with sensations of the actual objects. According to Peirce, “[w]e experience vicissitudes, especially. We cannot experience the vicissitude without experiencing the perception which undergoes the change.” (CP 1.336). But what these vicissitudes or changes in the actual world are and how they are conveyed to us, is an issue of utmost complexity. A particular feeling may be produced by different causes. In any case, being thus released of the practicalities of sensation, ‘quality of feeling’ may also be a result of imagination, dream or hallucination: “A quality of feeling can be imagined to be without any [actual] occurrence, as it seems to me. Its mere may-being gets along without any realization at all.” (CP 1.304).

Due to the ubiquitous role of qualities of feeling in perception, Peirce may appear to alternately use the term ‘feeling’ and ‘quality of feeling’ and to equate the two (see e.g. CP 1.310). There can hardly be feeling without quality, but there is a difference between quality and quality of feeling, however. According to Peirce, both

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53 There lurks an inconsistency, that being a result of sensation would render feeling a second. However, from the viewpoint of the subject experiencing the phenomenon (or phaneron), feeling is still characterized by possibility, immediacy, lack of analysis and reaction, all attributes of Firstness.
quality and feeling are mere possibilities, not conscious (CP 1.310), unanalyzable in themselves, uncomplicated and simple in that they have no parts nor are they in relation with anything second (e.g. CP 1.378, 1.531, 5.284, 7.538). From that perspective, both certainly belong to the category of Firstness. But, quality in itself, is “eternal, independent of time and of any realization” (CP 1.420), and consequently also “general”, “somewhat vague” and “potential” (1.419). The potentiality of quality could perhaps be best described as ontological. It seems to wait for its manifestation, as in reality, “we only know the potential through the actual, and only infer qualities by generalization from what we perceive in matter” (CP 1.419). In contrast, the potentiality of feeling comes from the fact, that it has the potential of contributing to representation. Its contribution is its quality. It has no generality, but a vivid realization in experience (CP 7.530), “within an instant of time” (CP 8.41). Feeling provides quality with a manifestation, it embodies quality. “A feeling, therefore, as a feeling, is merely the material quality of a mental sign.” (CP 5.291)

What happened to the naturalist stance? The characterization above seems to imply that qualities are entities residing in some sort of transcendental metaphysical world of ideas. This is not the case. A passage in Peirce’s review of Karl Pearson’s The Grammar of Science hits the nail on the head (CP 8.144):

When we first wake up to the fact that we are thinking beings and can exercise some control over our reasonings, we have to set out upon our intellectual travels from the home where we already find ourselves. Now, this home is the parish of percepts. It is not inside our skulls, either, but out in the open. It is the external world that we directly observe. What passes within we only know as it is mirrored in external objects. In a certain sense, there is such a thing as introspection; but it consists in an interpretation of phenomena presenting themselves as external percepts. We first see blue and red things. It is quite a discovery when we find the eye has anything to do with them, and a discovery still more recondite when we learn that there is an ego behind the eye, to which these qualities properly belong.

The subject-matters of qualities, feelings and sensation are the elements of the solid logical connection between the perceptual borderlines of the actual world and the phenomenal world. Qualities are generalizations, “free creations of the human imagination”, based on our constant flow of perceptions. Matter is “a permanent possibility of sensation”, as Peirce quoted Stuart Mill in CP 1.487. Sensation initiates feelings, which manifest the qualities. There is a logical although not simple transition from the actual world of matter and cause to the phenomenal world that beings with qualities of feeling.

At the same time, there is a transition from the unassailable Firstness of Qualities (CP 7.530) to Firstness of feelings, and towards Secondness, and its actuality.
On percept.

*Percept* is a central notion in Peirce’s theory of perception. As Peirce explained in CP 7.619, a percept “embodies no intensions” and “does not stand for anything”. It is insistent and compelling, in that “[n]ot only does it appear, but it disturbs me, more or less”, and “I can only get rid of it by an exertion of physical force” (CP 7.620). This is because the object of percept “is the result of the action of the universe on the perceiver” (CP 4.539fn2). In that action, “the consciousness of an active object and of a subject acted on are as indivisible as, in making a muscular effort, the sense of exertion is one with and inseparable from the sense of resistance” (CP 5.607; cf. the notion that “the actual objects belong to the functional organization of the subject’s mind” in chapter 1.2.3 and in Määttänen 1993a, 17 et passim). In its insistence, “it contributes something positive”, something that can be known or learned (CP 7.622), i.e. it contributes to representation, and eventually, to belief.

Based on that description, percept seems closely connected to the process of inquiry, both to the evoking of irritation of doubt, and to settlement of the doubt by contribution to belief. Also, percept falls nicely to the category of Secondness. It involves brute force, and “appears under a physical guise” (CP 1.253). According to Peirce (CP 7.625),

> two utterly different kinds of elements go to compose any percept. In the first place, there are the qualities of feeling or sensation, each of which is something positive and *sui generis*, being such as it is quite regardless of how or what anything else is. On account of this self-sufficiency, it is convenient to call these the elements of “Firstness.” In the percept, these elements of Firstness are perceived to be connected in definite ways. . . . These connectives are directly perceived, and the perception of each of them is a perception at once of two opposed objects, – a double awareness. In respect to each of these connections, one part of the percept appears as it does relatively to a second part. Hence, it is convenient to call them elements of “Secondness.” The vividness with which a percept stands out is an element of secondness; because the percept is vivid in proportion to the intensity of its effect upon the perceiver. These elements of secondness bring with them the peculiar singleness of the percept.

In Peirce’s account, percept is also given a somewhat paradoxical attribution of being simultaneously “whole and undivided” while it also “has parts, in the sense that in thought it can be separated” (CP 7.625). The unity from plurality comes from that the qualities of feeling that are parts of the percept, are put into relation with each other, so that the qualities of feeling, the elements of Firstness in it, “are perceived to be connected in definite ways” (CP 7.625). The parts of a percept are compared and contrasted, differentiated and integrated, consolidated. In brief,
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the elements of the percept are organized and bound together to make the “whole and undivided” percept, “so that ordinary thought cannot proceed from whole to parts, but an operation more or less subconscious is supposed to manufacture the whole out of the parts” (CP 6.378).

All these characteristics imply, that percept can be attributed with yet another characteristic of Secondness, namely existence, as opposed to the possibility of Firstness. Yet, percept does not represent, in Peirce’s full meaning of the word. It only contributes to representation. A percept performs “the function of conveying knowledge of something else. That is to say, they have to be combined and generalized to become useful knowledge; so that they may be said to represent their own generalizations” (CP 5.607). In terms of phaneroscopic categories, then, there needs to be transition from Secondness to Thirdness.

On perceptual judgment.

A percept “exhibits itself in full”. It “contains no blank gaps”. (CP 7.625.) The parts of percept are combined in definite ways, and the unified percept is itself “perfectly explicit” (CP 7.633). In its singularity, a percept of a yellow chair “is so scrupulously specific that it makes this chair different from every other in the world; or rather, it would do so if it indulged in any comparisons” (idem). In contrast (CP 7.632),

the perceptual judgment ‘This chair appears yellow’ has vaguely in mind a whole lot of yellow things, of which some have been seen, and no end of others may be or might be seen; and what it means to say is, ‘Take any yellow thing you like, and you will find, on comparing it with this chair, that they agree pretty well in color.’ It thus directly invites the exercise of a freedom of choice on the part of the interpreter (any one yellow thing answering as well as any other) which freedom the percept sternly and stupidly precludes.

In other words, in perceptual judgment, percept is put into perspective and generalized, as described in CP 7.633: “The perceptual judgment carelessly pronounces the chair yellow. What the particular shade, hue, and purity of the yellow may be it does not consider.” This strongly implies, that in perceptual judgment the perceived qualities have already been categorized in the sense described by Gärdenfors (2000) and earlier in chapter 3.1.2, as well as combined and attached to object structure.

The generalization of percept in perceptual judgment is meaningful, since in virtue of it, “the mind professes to tell the mind’s future self what the character of the present percept is” (CP 7.630).\footnote{Due to the intimate relation between percept and perceptual judgment, Peirce proposed in CP 7.629 the term \textit{percipuum} “to include both percept and perceptual judgment.” However, there also seem to be reasons to make a distinction between the two.}
In CP 5.54 Peirce maintained, that perceptual judgment asserts “in propositional form what a character of a percept directly present to the mind is”. With this Peirce hardly meant, that the perceptual judgments would need to be uttered verbally or otherwise put in linguistic mold (see CP 7.635). The propositional form seems to simply refer to the idea, that perceptual judgment, such as ‘This chair appears yellow’ structurally and functionally “separates the color from the chair, making one predicate and the other subject. The percept, on the other hand, presents the chair in its entirety and makes no analysis whatever.” (CP 7.631, see CP 4.539fn1)

At the same time, it could be argued, that the judgment “This chair is yellow.” is comprised of more rudimentary judgments that are then combined, as in: ‘That is a chair.’ – ‘That is yellow.’ – ‘That is a yellow chair’.

Hence, perceptual judgment represents something, and does so, “whether truly or falsely” (CP 7.630). Representation is a characteristic of Thirdness, the category of thinking, mediation, law and habit. As stated by Peirce, “all our knowledge rests upon perceptual judgments” (CP 5.142) and “every object of thought is either a percept or a generalization, that is, an inference from percepts” (CP 8.153). Yet, perceptual judgment is involuntary, “utterly beyond control” (CP 5.115). There is more to representing, than perceptual judgment alone, and in terms of representation, perceptual judgment seems like an intermediate, although factual state.

As true or false representations, perceptual judgments may be revised, which means that there is a way of testing and checking upon their reliability (CP 7.636). This, of course, refers to the process of inquiry, and the adaptive feature of the semiotic process. Strangely, in CP 7.636, Peirce did not seem to regard the examination of the adjustment of perceptual judgments as anything important. If perceptual judgments are generalizations and representations, they need to have a close relation, if not joint identity with habits of action, at least if representing indeed “means forming a connection (or a collection of connections), one way or another, between the perceived and anticipatory motor action” as maintained in chapter 1.2.3.

On habits, beliefs, and inference.

According to CP 5.400, “the whole function of thought is to produce habits of action”. Defined by Peirce, “[a] judgment is an act of consciousness in which we recognize a belief, and a belief is an intelligent habit upon which we shall act when

55 These judgments seem to constitute what Peirce called perceptual facts, “the first judgments which we make concerning percepts. ... . Each such fact covers only certain features of the percept. I look at an object and think that it seems white. That is my judgment of the object perceived, or my judgment concerning the percept, but not the percept itself; and it is idle to attempt to criticize by any logic that part of the performance of the intellect which draws that judgment from the percept, for the excellent reason that it is involuntary and cannot be prevented or corrected.” (CP 7.198, see also 5.54, 5.568.)
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occasion presents itself” (CP 2.435). Are perceptual judgments enough to bring forth beliefs and habits, and to cover all thought or mental representation (CP 2.315)? After all, perceptual judgments can be evoked by real percepts, or by imagination (since quality of feeling may be a result of imagination), or even by hallucination (CP 2.142, 7.644). What the perceptual judgment represents, may be true or false, and, pending on inquiry, the judgment is adjustable. If indeed “all our knowledge rests upon perceptual judgments” (CP 5.142), what else could be needed for the logical connection from perception to action?

Perceptual judgments alone may seem to be enough for the logical connection, but at least for complex processes of semiosis, recognizing only the perceptual facts is insufficient. What perceptual judgments do is that they assert “what a character of a percept directly present to the mind is” (CP 5.54, emphasis added). Perceptual judgments tell us what we perceive in that particular situation, as compared to the past perceptions. Now, accepting that perception accumulates into experience (see chapter 1.2.3) leads to the situation, in which perceptual judgments are based on putting the percept “present to the mind” in relation with and perspective of the past experience. And that allows for the meaningful future predictions.

A habit may get established if the act removes the source of irritation of doubt. Each successful repetition may strengthen the habit (CP 1.390). The formation or change of habit does not necessarily take many iterations (CP 5.477), and, according to (CP 4.55)

\[
\text{if a belief is produced for the first time directly after a judgment or colligation of judgments and is suggested by them, then that belief must be considered as the result of and as following from those judgments. The idea which is the matter of the belief is suggested by the idea in those judgments according to some habit of association, and the peculiar character of believing the idea really is so, is derived from the same element in the judgments.}
\]

However, perceptual judgment is not the only kind of judgment. Only in very simple case perceptual judgments might be the only judgments and thereby the only means of forming of habits of action. At least for humans, “cognition is dominated by other more indirect modes that are not triggered by perceptions alone” (idem). Peirce apparently would have agreed with that, not the least due to his concern for individual, self-controlled habits, as opposed to determination of feeling by material causation (see chapter 1.2.2).

According to Peirce, perceptual judgments only tell us what we perceive in that particular situation, what is “directly present to the mind” (CP 5.54, emphasis now

56 For Peirce’s description of the formation of habit on the level of the nervous system, see e.g. CP 1.390, 3.157, or 6.281. For the distinction between doubt and feeling, and the affiliation of it with belief-habit, see CP 5.510.
added). Being tied to percepts, perceptual judgment is tied to operate with momentary instances, with particulars. At the same time, there needs to be a persisting element in perceptual judgment, based on which the judgment is performed. The content of the perceptual judgment cannot be controlled (CP 5.115, CP 5.212), except perhaps by modifying the actual world. Perceptual judgment is “the first judgment of a person as to what is before his senses” (CP 5.115).

According to the three “cotary propositions”, introduced in the last of the seven 1903 lectures on pragmatism (CP 5.181; see also CP 2.444).

1 perceptual judgment is “the starting point or first premiss of all critical and controlled thinking”, and, paraphrasing Aristotle’s catchphrase, nothing is in representation, which has not been in perceptual judgment before;

2 universal propositions may be logically inferred from perceptual judgments and their general elements; and

3 perceptual judgment is an extreme case of abductive inference, and differs from abductive inference only by being “absolutely beyond criticism”

What Peirce meant by inference, was “the self-controlled formation of new belief on the basis of Knowledge already possessed” (CP 7.276, see also CP 2.442). He also distinguished three chief steps in the process (CP 2.442): colligation, observation (or experimentation, in CP 7.276), and judgment (or generalization). In colligation, propositions believed to be true are brought together (CP 2.442), as suggested by “the law of association” (CP 4.55). It seems feasible that in colligation the perceptual judgment may be brought together with any proposition based on present or past experience. The second step, observation (and experimentation–CP 7.276), is the contemplation of the colligated complex, “the fixation of the attention upon a certain feature of it, and the obliteration of the rest of it” (CP 2.443). The last step generalizes the results of experimentation, recognizes its general conditions and forms “a habit of thought under the influence of it” (CP 7.276). Each conclusion of an inference is again the starting point of another one (CP 4.55). In short, inference, in its many forms, is the last bridge from perception to habit of action.

The inferential process, based on percepts, perceptual judgments, and past experience produces a belief, “on which a man is prepared to act” (CP 2.148). The process of the development of belief-habit is thought (CP 3.160). Also, every thought is a sign (CP 1.538). Due to the connection between logic and semiotic, the logical laws of inference are closely related to the laws of sign (e.g. CP 2.444p1). Therefore, semiotics, the doctrine of Signs, may complement the theory of perception.
3.2.3 Peirce’s theory of the Sign

The theorizing on perception in the previous chapter lead to the craft of logic, a.k.a. semiotics, the doctrine of signs (see also chapter 1.3.2). This chapter gives a reading of Peirce’s theory of signs, but attempts to focus on simply laying out the mature phase of Peirce’s theory, without going too much into details of the current discourse in semiotics or Peircean exegesis. The theory is then interpreted, elaborated and extended in section 3.3.

There is an abundance of writings on *semeiotic*, Peirce’s theory of signs, both by Peirce himself and by commentators. In different stages, Peirce gave numerous definitions and descriptions of Sign, its operation and its correlates, and the commentaries exhibit quite a variety of interpretations of the theory. For recent explorations, see e.g. Short 2004; 2007 and Bergman 2004. As Mats Bergman (2004, 231) pointed out, Peirce aimed at finding a general conception of sign, useful for both logic and for inquiry in general (cf. section 1.4 and Colapietro 1987).

It is not necessarily a simple task to consolidate all the different threads of thought that contribute to Peirce’s semiotics, such as the theory of the phanerosopic categories and the infatuation with triadic classification, the issues of perception and action and the larger-scale idea of inquiry, as well as pragmatism, the notion of critical common-sensism (e.g. CP 5.494, 5.497–501) and the common-sense conception of signs. A priori classificatory hypothesizing does not necessarily agree with the a posteriori judgments (CP 2.233, see also Bergman 2004, 230–232). Therefore, the reading of Peirce’s theory of signs presented below is, perhaps, more inclined to an adaptive understanding, rather than an analysis of what Peirce really intended in different phases of the development of the theory. Hopefully opportunist perils are avoided.

**Sign and semiotics.**

Peirce defined semiotics (σημειωτική) as the doctrine of signs, cenoscopic science of signs and as equal to logic, in its general sense (CP 2.227, 8.343). Analyses and descriptions of Sign tend to begin with the tripartition of Representamen, Object and Interpretant, such as given in CP 2.274.57

A *Sign*, or *Representamen*, is a First which stands in such a genuine triadic relation to a Second, called its *Object*, as to be capable of determining a Third, called its *Interpretant*, to assume the same triadic relation to its Object in which it stands itself to the same Object. The triadic relation is *genuine*, that is its three mem-

---

57 Instead of *semitic*, *semiotic* or other alternatives unquestionably used by Peirce, here, the established spelling ‘semiotics’ is used for the discipline (see preface). For the sake of clarity and tradition, some of the key terms in the theory of Sign are capitalized.
bers are bound together by it in a way that does not consist in any complexus of dyadic relations.

Evidently the terms Representamen and Sign were first used by Peirce without a clear distinction there between (e.g. CP 2.228), until he later made the distinction, that “[a] Sign is a Representamen with a mental Interpretant. Possibly there may be Representamens that are not Signs” (CP 2.274). Peirce continued with description of sunflower, turning towards the sun, as a Representamen without a mental Interpretant, but concluded, that “thought is the chief, if not the only, mode of representation” (idem). Finally, Peirce seems to have explicitly abandoned the term Representamen altogether (see Deledalle 1992; Bergman 2004, 236–241; Short 2007, 55n18). Here, the word Representamen is used, if needed, to refer to a mediating and enabling constituent of the Sign between Object and Interpretant, and the term Sign, in turn, to refer to the whole constituency of the triadic relation from Object to Interpretant (cf. Benedict 1985, 265–266). However, it remains to be seen how strong demarcations there are to be distinguished or delineated between Object, Representamen, and Interpretant, and how much the characteristics of the Representamen are those consisting in pure potential or possibility of mediation in the Sign. After all, for Peirce, Representamen was a First, at least from 1895 on (Deledalle 1992, 293). Hence, the reader will find a reinterpretation of the relation of Representamen and Sign below.

In any case, what is required of a Sign, is the mediation between Object and Interpretant. The mediation needs to be such that it goes beyond a mere dyadic relation between Object and Interpretant. The tripartite relations of the Sign have been illustrated in various forms, such as the historic Ogden–Richards triangle (Ogden and Richards 1936/1923, 11), the ‘Y’-shaped “fertility emblem” of the tripod or triple fork (CP 4.310; e.g. Merrell 1997, 13), and other triangular diagrams (see fig. 15). Despite the claims that the tripod diagram would correspond to the dynamic characteristic of semiosis better than triangular diagrams, the latter ones are used here (cf. Ketner 1988; Merrell 1997; Martinez 1997). This is because the triangular diagrams of the tripartition of the sign do bring out, when completed into the form of semiotic triangle (figure 16), not merely a set of dyads O–R, R–I and I–O but the endless or near-to-endless cyclicity of semiosis (CP 5.284). In the cycle of semiosis, sensory elements of perception evaluate to nothing without interpretation and development of habits of action, which again are useless without any actual action and manipulation of Objects, which in turn account to nothing without perception, from a semiotic subject’s point of view. Similarly, Sign gains its existence only in virtue of both Object and Interpretant. Hence, the semiotic triangle seems to suit the purpose fine, especially when the emphasis is on dynamic thought-signs.
Another definition by Peirce (in a draft letter to Lady Welby in 1908) brings out the direction of determination, and the internal divisions of the Sign, Object and Interpretant corresponding to the phaneroscopic categories and their interdependency as described in chapter 3.2.1 (CP 8.343):

I define a *Sign* as anything which on the one hand is so determined by an Object and on the other hand so determines an idea in a person's mind, that this latter determination, which I term the *Interpretant* of the sign, is thereby mediately determined by that Object. A sign, therefore, has a triadic relation to its Object and to its Interpretant. But it is necessary to distinguish the *Immediate Object*, or the Object as the Sign represents it, from the *Dynamical Object*, or really efficient but not immediately present Object. It is likewise requisite to distinguish the *Immediate Interpretant*, i.e. the Interpretant represented or signified in the Sign, from the *Dynamic Interpretant*, or effect actually produced on the mind by the Sign; and both of these from the *Normal Interpretant*, or effect that would be produced on the mind by the Sign after sufficient development of thought.
The nomenclature and the descriptions of the Interpretants, Objects and Sign varied somewhat over the years as the theory evolved. Although the discussion still goes on (see e.g. Bergman 2004, 370–386; Short 2007, 260–262), it seems accurate enough to take the position, that the term Normal Interpretant refers essentially to the same thing as logical interpretant (e.g. CP 5.476–491, 494; ca. 1906), Final Interpretant (CP 4.536 from 1906, 4.572 from 1902, 8.184–185 from 1903, 8.314 from 1909), Ultimate Interpretant (the same CP 8.314 from 1909), or, better, that the other third interpretants are special cases of Final Interpretant (see chapter 3.3.1). Likewise, the notion of Immediate Interpretant comes close to that of emotional interpretant (CP 5.475, 5.486), and the Dynamical Interpretant to energetic interpretant (CP 5.475–491, 494; cf. logical interpretant). In any case, there are two kinds of Objects and three kinds of Interpretants (CP 4.536 from 1906, 8.182 from 1903, and 8.333 from 1904), as described in CP 8.343 (and elsewhere by Peirce, see the quote above).\(^{58}\)

This is in concord with the idea, that Object belongs to the category of Secondness, the category of duality, action and reaction, struggle and effort, brute force and fact; and Interpretant to Thirdness, the category of thinking, law, habit and generality (cf. CP 2.242). If Representamen belongs to Firstness, being a mere possibility of a Sign in its character (cf. CP 2.275), Sign becomes a Sign, if and only if the Representamen actually has Object as well as “some Interpretant”, which “is a cognition of a mind” (CP 2.242). (See Bergman 2004, 370–.)

\textbf{Thought-signs.}

Two issues emerge. First, the example of the sunflower suggested that “there may be Representamens that are not Signs” (CP 2.274), and just above it was demanded that Sign have an Interpretant that “is a cognition”. Does this mean, that there cannot be Signs except those that are interpreted in thought? Among others, many of today’s biosemioticians, phytosemioticians in particular might disagree, depending on what we mean by thought and mind. With no intention of splitting hairs, it could be argued, that in order to be a Sign, any Interpretant somehow cognizing would be enough, at any stage of the theoretically endless series of interpretation. But that argument comes close to the wisecrack conundrum “Does the falling tree make a sound if there is no one to hear it?” More likely, the logical

\(^{58}\) Cf. Short (2007, 178–180), who argues that the different divisions of the Interpretant are “made on entirely different grounds” and by attending “to the uses Peirce made of those divisions”, we may dispel the “mistaken argument”, that “immediate and emotional interpreters are the same, as are logical and final interpreters, every energetic interpretant being dynamic, and conversely” (Short 2007, 179). According to Short, Peirce needed both the teleologically and the phaneroscopically derived trichotomies of Interpretant. Here, when dealing with Interpretants in the current context of thought-signs, one trichotomy seems to suffice, namely that of immediate, dynamic, and final Interpretant.
starting point for Peirce's semiotics was such, that (in CP 2.242) he simply focused on thought-signs (cf. CP 5.283–293) as special cases of signs (cf. Spinks 1991, 52–53; Short 2007, 32–36). Thought-signs were described by Peirce as follows (CP 5.283, see also 5.286):

Whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign. But it follows from our own existence (which is proved by the occurrence of ignorance and error) that everything which is present to us is a phenomenal manifestation of ourselves. This does not prevent its being a phenomenon of something without us, just as a rainbow is at once a manifestation both of the sun and of the rain. When we think, then, we ourselves, as we are at that moment, appear as a sign. Now a sign has, as such, three references: first, it is a sign to some thought which interprets it; second, it is a sign for some object to which in that thought it is equivalent; third, it is a sign, in some respect or quality, which brings it into connection with its object.

While attention is paid to thought-signs, the isolated conjectures to other signs appear as interpolations of the ideas on thought-signs. After all, synonymous to logic, semiotic is “the theory of self-controlled, or deliberate, thought” (CP 1.191). However, Peirce does not exclusively rule out the existence of signs other than thought-signs. Simply, “thought is the chief, if not the only, mode of representation” (CP 2.274), and in Peirce’s days representamens with “a cognition of a mind” as some Interpretant, were “the only representamens that have been much studied” (CP 2.242).

Consequently, Peirce could maintain, that (CP 2.308, but see CP 8.332):

Of course, nothing is a sign unless it is interpreted as a sign; but the character which causes it to be interpreted as referring to its object may be one which might belong to it irrespective of its object and though that object had never existed, or it may be in a relation to its object which it would have just the same whether it were interpreted as a sign or not.

In this study, the emphasis is on thought-signs and their formation, and consequently, this question is finally of minor importance in this context.59

Second, if the theory of Signs pertains first and foremost to thought-signs, how can the following three relations, implied in Peirce’s description of thought-signs above, be taken into account?

59 As a cenoscopic, that is, philosophical science of signs, semiotics “contents itself with observations such as come within the range of every man’s normal experience” (CP 1.2.41). While this cenoscopic constraint from Peirce’s classification of sciences pertains to the methods of (pure) semiotics and introduces an inherent element of interpretation of observations of “normal experience” into the science of signs, it as such does not necessarily restrict the subject matter, that is, the signs to only (human) thought-signs.
The relation between consecutive thoughts or thoughts of the endless series, in which each thought is somehow determined by the previous one, or more precisely: each representamen is an interpretant of the previous, and each object is the representamen of the previous thought-sign, until “all thought comes to an abrupt and final end in death” (CP 5.284, see also 1.339, 5.138, 8.225fn10). This is of importance particularly, because (CP 7.357):

beliefs at least are dependent upon the capability of the endless translation of sign into sign. An inference translates itself directly into a belief. A thought which is not capable of affecting belief in any way, obviously has no signification or intellectual value at all. If it does affect belief it is then translated from one sign to another as the belief itself is interpreted.

The relation between the aspects of “without” and “within” of the Sign, or the roles of Dynamical Objects and Dynamical Interpretants as opposed to Immediate Objects and Immediate Interpretants as elements of the Sign.

The relation between ourselves as subjects and the sign that we think, “[f]or, as the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign” (CP 5.314).

The distinction between applied versus theoretical semiotics.

Adding to the previous, a suggestion for distinction is in place. Namely, there are, in my view, two contrasting aspects in semiotics, or two radically different ways of discussing Signs. One aspect is that of theoretical construction and the constitution of the Sign: What makes a Sign a Sign? How does it operate? That is, how does the semiotic wedge of the Sign seal the rupture between esthetic and practic (see chapter 1.3.2), as soon as representation emerges? How does the dyadic “direct coupling” from perception to action, in which instances of action are determined by the instances of feeling alone, become transformed into the triadic relation of perception–thought–action, in which subject, as opposed to organism, can be distinguished? This aspect operates on the general level of constructing a semiotic theory, and is less concerned with individual applications of the theory to phenomena of the actual world. In this context, the purpose of descriptions, typologies and classifications of signs is construction of the semiotic theory, explication of the process of semiosis, and description of how the cycle of semiosis logically connects perception with action.

The other aspect is quite the opposite, namely, the theory applied to particular cases, individual situations, events, actions, and Signs of the actual world. What kind of actual (or external) Signs are manifested and used in semiosis and communication in this or that case? How are different elements of the Sign present and in balance
with each other in these or those processes of communication, or other interaction? In this context, the purpose of descriptions and classifications is the practice of the process of semiosis and the use of the semiotic theories in order to explicate various cases of signs and signification. A splendid, albeit morbid example of this latter approach to semiotics was given by the late Thomas A. Sebeok in a lecture at *Imatra Summer School of Semiotics*, in June of 1996. Paraphrased here, it brings out three ordinary types of Sign, namely the tripartition of icon, index, and symbol, as they are used in imagined circumstances of the actual world.

Imagine a fast road going over a hill. Behind the hill, there is a school on one side of the road, and houses on the other. Children have the habit of crossing the road just under the top of the hill. This is dangerous, because car drivers cannot easily notice them when driving up the hill from the other side. Therefore, a traffic sign is set at the foot of the hill warning the drivers. Consider three options:

1. The sign is a picture of children walking right to left, hand in hand (as is customary in many European countries), with the commonly agreed-on framing and colors for warning. The desired effect is, of course, that the sign warns about the children and, hopefully, triggers the action (as an interpretation of the Sign) of the driver slowing the car down. It works for all those drivers who make the connection from the (not-so-illustrative) picture of children in a triangle (which form is arbitrarily chosen) to the predicted risk of hitting the children crossing the road. The drivers need to have the habit of action of slowing down and paying attention to children when perceiving the sign. In this case, the road sign is a Sign as an Icon, emphasizing the iconic aspect of the Sign and the category of Firstness.

2. The sign—be warned, this is the morbid part—is not a road sign, as regulated by traffic legislation. Instead, brake marks, wrecks of smashed cars and victims of the accidents are left by the road side to indicate the risk, pointing at the importance of watching out for children. In this case, the sign is a Sign as an Index, emphasizing the indexical aspect of the Sign and the category of Secondness.

3. In the third option, the sign says: “Look out! Children at play!” For those who understand written English, it warns about the children, and hopefully, again, prompts the action of slowing the car down. Those who cannot read or do not understand English probably keep speeding. The road sign in this case is a Sign as a Symbol, i.e. in it, the symbolic aspect of the Sign and the category of Thirdness are emphasized.

Despite the fact that each option emphasizes a particular aspect of the Sign, to the point that the Sign in each option may well be called Icon, Index, and Symbol,
Space in Musical Semiosis

respectively, each of them also contains other aspects of the Sign, up to their capacities. Namely, the Symbol (of the category of Thirdness) includes aspects of Secondness (it has an actual existence as a sign, and assumed causal effects on other objects, etc.), and Firstness (it manifests qualities, such as the colors of the letters versus background, etc.). The Index (Secondness) includes aspects of Firstness (qualities of the marks, wrecks, and bodies), and also Thirdness (the representation of danger, the intended mediation between actual accidents of the past and prediction of the risk of future accident, etc.). Likewise, the Icon (Firstness) includes aspects of Secondness (actual existence as a sign, as above), and Thirdness (the negotiated representation of danger and the connection between past and predicted future, as above).

Here the mutual involvement of the categories differs from the interdependence of categories, and from notions of genuine and degenerate categories. Because the Signs are interpreted (in mental cognition), all three options are full Signs, with all aspects present, though some of them may be negligible, as far as understanding the (right) meaning of the Sign is concerned. The study of these kinds of fully developed Signs could perhaps best be termed “applied semiotics” (see e.g. CP 5.594).

In contrast, it can be said, that “theoretical semiotics” studies the development and constitution of complete Signs and their operation. A central question then is, What constitutes a Sign? That is to say, What are the elements of a fully developed Sign? This brings us to the tripartitions of the Sign and the derivation of the tenfold classification of the Sign. For a moment we must enter into some deep waters of Peircean semiotic theory.

Triadic relations and tripartitions of the Sign.

In the 1903 Syllabus (CP 2.233–272; EP2, 289–299), Peirce divided triadic relations into those of Comparison, Performance, and Thought, i.e. to those “of the nature of logical possibilities”, “of the nature of actual facts”, and to those “of the nature of laws” (CP 2.234). The phaneroscopic categories as the point of departure is evident.

In each division of triadic relations, there are three Correlates to be distinguished: First, Second, and Third (CP 2.235). According to Peirce, the distinctions are made based on complexity, the First being the simplest, the Third the most complex, and the Second being “of middling complexity” (CP 2.235–237). More accurately, between the three, the First, if any, is a possibility, and the First is a law only if all three are of the nature of law. Correspondingly, if one of the three is a law, it is the Third, while Third is a possibility only if all three are. As a consequent of the way Peirce specified the Second Correlate as being of middling complexity, the Second
Mental processes are spatially embodied

adjusts to the situation, so to say. Namely, “if any two are of the same nature, as to being either mere possibilities, actual existences, or laws, then the Second Correlate is of that same nature, while if the three are all of different natures, the Second Correlate is an actual existence” (CP 2.237). Let us recapitulate this in the form of two tables. The first one (table 6a) exhibits the alternative combinations for the dyadic relation between the First and the Third Correlate of a triadic relation:

TABLE 6a. Alternative combinations of the dyadic relation between the First and the Third Correlate of a triadic relation. The Second Correlate, that of middling complexity is added later.

<table>
<thead>
<tr>
<th>First Correlate</th>
<th>Third Correlate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>law</td>
</tr>
<tr>
<td>2</td>
<td>existence</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
</tr>
<tr>
<td>2</td>
<td>existence</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
</tr>
</tbody>
</table>

First never exceeding the complexity of Third, table 6a lists all the six alternatives possible for the dyadic relation between them, as opposed to there being $3^2 = 9$ alternatives, as one might first assume. Just as the complex phaneroscopic categories depend on the simple categories (cf. figure 14 above), if the Third Correlate is a law, the First Correlate may be either law, existence, or possibility. If the Third Correlate is an existence, the First may be either existence, or a possibility, and if the Third is a possibility, the First is necessarily also a possibility. The same could be expressed in terms of the determination of the Third Correlate by the First one.

TABLE 6b. Possible combinations between the First, Second, and Third Correlate of a triadic relation.

<table>
<thead>
<tr>
<th>First Correlate</th>
<th>Second Correlate</th>
<th>Third Correlate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>law</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>existence</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>existence</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>existence</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>possibility</td>
<td>1</td>
</tr>
</tbody>
</table>
Once the different options for the Second are added, so that the Second agrees to the description above, the table expands to the total of ten classes of triadic relations, as opposed to there being a total of \(3^3 = 27\) classes. Hence we get table 6b.

Having defined Sign as “a representamen of which some interpretant is a cognition of a mind” in CP 2.242, Peirce subsequently (CP 2.243–264) laid out the ten classes of Signs, based on three trichotomies, as summarized in table 7. The table reveals a known issue that seems to be an incongruity in the derivation of the classes of the Signs, as far as compliance to the phaneroscopic categories is concerned: The First and Third Correlates seem to have changed places with each other, if they are compared to the order in which Peirce explained them (CP 2.243–264): first the trichotomy of the Sign in itself, and last the trichotomy of the relation of the Sign to its Interpretant. In table 7, following the logic displayed in tables 6a and 6b, the order of the trichotomies is reversed. Let us return to that later, and outline briefly how Peirce described the various classes, and the three trichotomies underlying the ten classes. Each trichotomy displays, in its own way, a trifurcation into categories of possibility, existence, and law, and thereby complies with the phaneroscopic categories of Firstness, Secondness, and Thirdness.

TABLE 7. The ten classes of Signs as yielded by the triply trichotomous classification (CP 2.243–264). Note the reversed order of the First and Third Correlate. The justification for this will be discussed in chapters 3.3.1 and 3.3.2.

<table>
<thead>
<tr>
<th>First Correlate:</th>
<th>Second Correlate:</th>
<th>Third Correlate:</th>
<th>Full name of the class</th>
<th>Number of class</th>
</tr>
</thead>
<tbody>
<tr>
<td>The relation of the Sign to its Interpretant</td>
<td>The relation of the Sign to its Object</td>
<td>The Sign in itself</td>
<td>Argument (Symbolic Legisign)</td>
<td>X</td>
</tr>
<tr>
<td>3 Argument</td>
<td>3 Symbolic</td>
<td>3 Legisign</td>
<td>Argument (Symbolic Legisign)</td>
<td>X</td>
</tr>
<tr>
<td>2 Dicent</td>
<td>3 Symbolic</td>
<td>3 Legisign</td>
<td>Dicent Symbolic Legisign</td>
<td>IX</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>3 Symbolic</td>
<td>3 Legisign</td>
<td>Rhematic Symbolic Legisign</td>
<td>VIII</td>
</tr>
<tr>
<td>2 Dicent</td>
<td>2 Indexical</td>
<td>3 Legisign</td>
<td>Dicent Indexical Legisign</td>
<td>VII</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>2 Indexical</td>
<td>3 Legisign</td>
<td>Rhematic Indexical Legisign</td>
<td>VI</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>1 Iconic</td>
<td>3 Legisign</td>
<td>Rhematic Iconic Legisign</td>
<td>V</td>
</tr>
<tr>
<td>2 Dicent</td>
<td>2 Indexical</td>
<td>2 Sinsign</td>
<td>Dicent Indexical Sinsign</td>
<td>IV</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>2 Indexical</td>
<td>2 Sinsign</td>
<td>Rhematic Indexical Sinsign</td>
<td>III</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>1 Iconic</td>
<td>2 Sinsign</td>
<td>Rhematic Iconic Sinsign</td>
<td>II</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>1 Iconic</td>
<td>1 Qualisign</td>
<td>Rhematic Iconic Qualisign</td>
<td>I</td>
</tr>
</tbody>
</table>
The first trichotomy: Qualisign, Sinsign and Legisign.

The first trichotomy distinguishes between Qualisign, Sinsign, and Legisign, “according as the sign in itself is a mere quality, is an actual existent, or is a general law” (CP 2.243).

Earlier, quality was quoted to be “eternal, independent of time and of any realization” (CP 1.420, chapter 3.2.2). A Qualisign, in contrast to that, is “a quality which is a Sign” (CP 2.244), i.e. a quality that is embodied so that it can actually act as a sign. Consequently in respect to other two trichotomies, a Qualisign is “necessarily an Icon” (CP 2.254; cf. 2.248, 8.335), and, “since a quality is a mere logical possibility, it can only be interpreted as a sign of essence, that is, as a Rheme” (CP 2.254). Thus, there is only one kind of Qualisign, Rhematic Iconic Qualisign. Peirce’s typical example of a Qualisign is “a feeling of ‘red’” (CP 2.254), which he frequently gave as an example of quality of feeling, as well.

A Sinsign embodies a Qualisign (or several qualisigns), and reversely, a Sinsign can only exist “through its qualities” (CP 2.245). It is a single, “actual existent thing or event which is a sign” (idem). There are three different kinds of Sinsigns, a Rhematic Iconic Sinsign (a.k.a. Iconic Sinsign), a Rhematic Indexical Sinsign, and a Dicent Indexical Sinsign.

A Legisign, in turn, “is a law that is a Sign” (CP 2.246), law being understood in the sense of the category of Thirdness (chapter 3.2.1). A Legisign is a general type, and therefore, in order to signify, it requires an instance, an actually existing Sinsign, which Peirce called a Replica. Reversely, the Replica would not “be significant if it were not for the law which renders it so” (CP 2.246). The altogether six different kinds of Legisign are discussed more below.

The second trichotomy: Icon, Index and Symbol.

The example of children and the traffic sign above already demonstrated the second trichotomy of signs, that of Icon, Index, and Symbol. In the second trichotomy, the tripartition is made “according as the relation of the sign to its objects consists in the sign’s having some character in itself, or in some existential relation to that object, or in its relation to an interpretant” (CP 2.243).

An Icon denotes its Object “merely by virtue of characters of its own”, regardless of “whether any such Object actually exists or not” (CP 2.247). There are three different kinds of Icons, all Rhemes (CP 2.255, 258): Rhematic Iconic Qualisign (or just Qualisign, for short), Rhematic Iconic Sinsign, and Rhematic Iconic Legisign. Hence, the distinctions between different kinds of Icons can be made based on the first trichotomy.
An Index “denotes by virtue of being really affected” by its Object, which makes it impossible for an Index to be a Qualisign (or vice versa). Since the Index is affected by the Object, that is, the Index is produced an effect or a change upon by the Object, there need to be some qualities in common between the Object and the Index. Therefore, an Index necessarily involves an Icon. (CP 2.248) The four kinds of Indices are either Sinsigns, or Legisigns, and either Rhemes or Dicents.

A Symbol denotes its Object “by virtue of a law, usually an association of general ideas”, and is therefore “itself a general type or law, that is, is a Legisign” (CP 2.249). Consequently, “it acts through a Replica” (idem). Since “that which is general has its being in the instances which it will determine”, a Symbol requires (somehow) existent instances, and is “through the association or other law ... affected by those instances” (idem). A Symbol thus involves an Index. There are three different kinds of Symbols: Rhematic Symbolic Legisign (a.k.a. Rhematic Symbol or Symbolic Rheme), Dicent Symbolic Legisign (or Dicent Symbol), and, finally, Argument, the distinction being based on the third trichotomy.

The third trichotomy: Rheme, Dicent and Argument.

In the third trichotomy, the Sign “may be termed a Rheme, a Dicisign or Dicent Sign ..., or an Argument” (CP 2.250), depending on whether the Interpretant represents the Sign “as a sign of possibility or as a sign of fact or a sign of reason” (CP 2.243). In other words, “a Rheme is a sign which is understood to represent its object in its characters merely; ... a Dicisign is a sign which is understood to represent its object in respect to actual existence; and ... an Argument is a Sign which is understood to represent its Object in its character as Sign.” (CP 2.252).

The principle, that the third trichotomy is based on how the Sign is represented in the Interpretant of the Sign, reflects the continuum of Signs, in which each Sign determines an Interpretant, which in turn becomes the Representamen of a new Sign. In that perspective, a Rheme “is a Sign of qualitative Possibility” for its Interpretant: it “will afford some information; but it is not interpreted as doing so” (CP 2.250).

Parallel to an Index requiring an Icon, and a Symbol requiring an Index, a Dicent necessarily involves a Rheme, and an Argument always involves a Dicent Sign (CP 2.251–253). There are six kinds of Rhemata, three different Dicents, and one kind of Argument.

The ten classes of Signs.

Examples of the ten classes of Signs given by Peirce in the 1903 Syllabus are listed in table 8 (CP 2.254–261, 271, 253, 266–270). Perhaps with the exception of Quali-
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sign, they can all be considered examples of fully developed Signs, best suitable for what can be called applied semiotics, in the sense discussed earlier.

In my opinion, the examples as such are not typical ones of the different stages of developing thought-signs, again with the exception of the Qualisign example. Most of them serve well as examples of the Sign in the context of “applied semiotics”, but as far as the development of the Sign as the logical connection from Object of the Sign to the habit of action as the Interpretant of the Sign is concerned, the examples may even be misleading. An interpretation of how the different classes of Sign are present in the development of a full Sign is given in chapter 3.3.2.

The ten classes of Signs was illustrated by Peirce, perhaps not surprisingly, in triangles as shown in figures 17a and 17b (CP 8.376). Unfortunately, any illustration of a three-dimensional model, such as the three-way trichotomous classes of Sign, suffers if presented in ways limited to only two dimensions. It would be more suitable if the ten classes were elucidated in a three-dimensional model. Sample projections of a three-dimensional model into two dimensions are given in figures 18–21.

TABLE 8. Peirce’s examples of the ten classes of Signs.

<table>
<thead>
<tr>
<th>No.</th>
<th>Class (Rhematic Iconic) Qualisign</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>(Rhematic) Iconic Sinsign</td>
<td>a feeling of red</td>
</tr>
<tr>
<td>II</td>
<td>(Rhematic) Iconic Sinsign</td>
<td>an individual diagram</td>
</tr>
<tr>
<td>III</td>
<td>Rhematic Indexical Sinsign</td>
<td>a spontaneous cry</td>
</tr>
<tr>
<td>IV</td>
<td>Dicent (Indexical) Sinsign</td>
<td>a weathercock</td>
</tr>
<tr>
<td>V</td>
<td>(Rhematic) Iconic Legisign</td>
<td>a diagram, apart from its factuality</td>
</tr>
<tr>
<td>VI</td>
<td>Rhematic Indexical Legisign</td>
<td>a demonstrative pronoun</td>
</tr>
<tr>
<td>VII</td>
<td>Dicent Indexical Legisign</td>
<td>a street cry</td>
</tr>
<tr>
<td>VIII</td>
<td>Rhematic Symbol(ic Legisign)</td>
<td>a common noun</td>
</tr>
<tr>
<td>IX</td>
<td>Dicent Symbol(ic Legisign)</td>
<td>a proposition</td>
</tr>
<tr>
<td>X</td>
<td>Argument (Symbolic Legisign)</td>
<td>an argument</td>
</tr>
</tbody>
</table>
Figure 17a. Above. An illustration of Signs divided into ten classes by Peirce. After the “scrap” from CP 8.376 (a draft letter to Lady Welby, 1908). Numbers stand for the three trichotomies.

Figure 17b. Top of next page. The table with sign names and numbering after CP 2.264 (from the 1903 Syllabus). The Qualisign, icons, and rhemes are Firsts; sinsigns, indices, and dicents are Seconds; and legisigns, symbols, and the Argument are Thirds. NB: the illustrations are vertical mirror images of and compatible with each other, if number ones (for Firsts) are replaced by threes (for Thirds) and vice versa.

Figure 18. Next page, bottom. A two-dimensional projection of a three-dimensional model of ten classes of signs. The Qualisign (I) at the bottom front and left, the Argument (X) furthest at the top, right.
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<table>
<thead>
<tr>
<th>(I)</th>
<th>(V)</th>
<th>(VIII)</th>
<th>(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhematic</td>
<td>Rhematic</td>
<td>Rhematic</td>
<td>Argument</td>
</tr>
<tr>
<td>Iconic</td>
<td>Iconic</td>
<td>Symbol</td>
<td>Symbolic</td>
</tr>
<tr>
<td>Qualisign</td>
<td>Legisign</td>
<td>Legisign</td>
<td>Legisign</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(II)</th>
<th>(VI)</th>
<th>(IX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhematic</td>
<td>Rhematic</td>
<td>Dicent</td>
</tr>
<tr>
<td>Iconic</td>
<td>Indexical</td>
<td>Symbol</td>
</tr>
<tr>
<td>Sinsign</td>
<td>Legisign</td>
<td>Legisign</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(III)</th>
<th>(VII)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhematic</td>
<td>Dicent</td>
</tr>
<tr>
<td>Indexical</td>
<td>Indexical</td>
</tr>
<tr>
<td>Sinsign</td>
<td>Legisign</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicent</td>
</tr>
<tr>
<td>Indexical</td>
</tr>
<tr>
<td>Sinsign</td>
</tr>
</tbody>
</table>

Diagram:

- **Rhematic Symbolic Legisign**
- **Dicent Symbolic Legisign**
- **Argument (Symbolic Legisign)**
- **Dicent Indexical Legisign**
- **Rhematic Indexical Legisign**
- **Rhematic Indexical Sinsign**
- **Rhematic Iconic Qualisign**
- **Rhematic Iconic Sinsign**
- **Rhematic Iconic Sinsign**
Figure 19. The same projection (same point of observation, same position of model), with the three planes of the first trichotomy pictured. The planes from left: first, the only Qualisign (black); second, the three Sinsigns (grey); and third, the six Legisigns (white).

Figure 20. Similarly, a projection showing the horizontal planes of the second trichotomy: the three classes of Icons (bottom, black), the four classes of Indices (middle, grey), and the three classes of Symbols (top, white).
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Figure 21. To conclude, a projection of the model of the ten classes of signs, now highlighting the third trichotomy: the six classes of Rhemes (front left, white), the three classes of Dicents (middle, grey), and the last class, that of Argument (back, black).

Peirce’s theory of Signs will be elaborated further in the next section. Before that, there is one more ingredient of the current theory to be introduced, namely, the three models in Pentti Määttänen’s naturalistic approach to cognition.

3.2.4 Määttänen’s semiotic models of cognition

The last element to the theory being developed has been presented by Pentti Määttänen (1993a) in Action and Experience: A Naturalistic Approach to Cognition. It is a study of “the relation between action and cognition in traditional epistemology and modern cognitive science” (Määttänen 1993a, 9), and presents a naturalistic view of mind and language. It addresses human cognition and its relation with the actual world in a general level, and is not specific to music or musicology. Määttänen’s three-part model of cognition is based on analysis of Charles Sanders Peirce’s semiotics, Peirce’s ideas of facts, percepts, and experience, and on Jean Piaget’s (and
Lev Vygostky’s) views on action and cognition. The following presents a brief outline of Määttänen’s models of action and cognition.60

Pentti Määttänen’s naturalistic view on action and cognition.

Määttänen (1993a) interpreted Peirce in order to construct a logically sound naturalistic view of mind and cognition (ibid., 30; see also Määttänen 2006a–b, 2007a–b). In this context, it will be enough to focus on those aspects that are central to semiosis in general and particularly to those aspects that may eventually contribute to the semiocognitive theory of music and musical composition process. Sociocultural and intersubjective questions are not the immediate concern, nor the analysis of linguistic abilities of man, nor the possible phylogenetic, ontogenetic or sociogenetic origins of cognitive skills.

Määttänen set up a causal notion of motor action and constructed thereupon “a naturalistic view of mind, language and their relation to the reality” (1993a, 9; see also Määttänen 2006a). As such, the view is not specific to music. The premises for the bottom-up analysis consist in assuming the existence of “three-dimensional solid bodies and causal effects between them” (ibid., 63). Määttänen presented three models which comprise the operations of human mind: 1) causal and subcognitive, preperceptual s-model of motor action, 2) semiotic and cognitive, perceptual p-model in which perceptual qualities are attached to the preperceptual s-model, and 3) linguistic, serial, and cognitive l-model, which is based on s-model and p-model, instrumental action and language game. It seems that the l-model as a model of linguistic thought is not of great importance here. Instead, instrumental action and the p-model, on which the l-model is based, may appear rewarding.

The s-model and the causal connection between organism and environment.

Määttänen (1993a, 64–69) developed Johnson-Laird’s Craikian automaton (1983, 403–404) further into a model of control of the organism’s motor action, lacking conceptual competence and sensory capacities. In both models, the model is connected to the modeled environment through causal feedback loops (see also Määttänen 2007a). “From the point of view that the model is a model of the spatial arrangement of the objects on the table, we can say that the model is a spatial model, or s-model, for short” (Määttänen 1993a, 65).

The difference between Määttänen’s s-model and the Craikian automaton is that, according to Määttänen, the model need not resemble or be a picture of the environment. The properties that can be imprinted in the motor system depend on the object structure of the environment, properties of the organism (size, ability to

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60 This chapter is partly based on a previously published article (Ojala 2003), which has been adapted for current purposes with minor adjustments.
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move etc.), as well as on the properties of the system controlling the motor action (ibid., 66–67).

Through the causal relation, the real world exerts brute force upon the organism, resisting the latter’s “will”. This relation, the fact that the s-model is in a causal dyadic relation, is part of an explanandum for Peirce’s idea that we can only indicate the actual world: the s-model is a model of the spatial structure of the actual world, but we cannot access it as such, because there is no perceiving subject—only the causal connections. Hence the s-model is subcognitive and preperceptual, a possible index if there would be an Interpretant. But for now, we are not really dealing with a true Sign, since there is no consciousness, no subject to interpret the Sign, just a causal dyadic relation, or a degenerate sign relation between the organism and the environment. Furthermore, due to the causality, the s-model cannot lie. (Ibid., 81–82.)

The p-model: perception, experience, and the semiotic triangle.

When genuine sensory mechanisms are added to the s-model, the situation becomes radically different. Here, Määttänen capitalizes on Peirce’s theory of perception. The actual world of facts resists our will, and with brute force affects us. This influence of the world of facts was called experience by Peirce (CP 1.321). According to Peirce, facts make up the actual world, independent of us. Percepts, in turn, consist of qualities and relations of qualities. In terms of Object, facts are dynamic Objects, whereas percepts are immediate Objects. Percepts are external in the sense that the qualities and their relations are determined by the facts (such as a ball reflecting electromagnetic radiation of certain wavelengths due to its material properties), and internal in the sense that they are determined by the conditions of the subject (that is, by the sensory abilities, such as the ability of the retinas to react on certain wavelengths of electromagnetic radiation, on light). Qualities, as opposed to matter, do not resist our will. Hence, qualities are not elements of facts, but only of percepts. Both facts and percepts have a compelling nature, since they are both (at least partly) determined by the real world, independent of us. (Määttänen 1993a, 34–39.)

If sense perception is the only way of obtaining knowledge and if the phenomenal qualities are internal, the compelling hidden causes of perceptions cannot be reached. In order to solve this empirical dilemma, it now becomes rewarding to have the causal connections of the s-model at hand. In Määttänen’s analysis, the perceived qualities are connected with the model of motor action, the s-model. The result is a semiotic entity, which Määttänen (1993a) called the p-model. Parallel to Piaget’s sensorimotor scheme, the s-model gives the object structure of the actual world, onto which perceived qualities can be attached. In other words, the object structure
of experience is not a product of theory-laden perceptions, verbal or non-verbal concepts or immaterial categories but is logically given to us by some properties of the actual world via the causal s-model.

When the p-model is constructed, perceptual qualities are attached to the model of the object structure of the world, i.e. percepts are connected with the hard facts of the s-model. Hence in the p-model, the perceptual abilities are there for the organism, or emerging subject, to use. In Piaget’s terms, this would correlate to the shift from the sensorimotor level to the perceptual level. As the p-model gains independence, it begins to guide the motor action more and more, which reverses the direction of determination. Now the percepts become mainly in charge of the determination of perception (as opposed to the causal s-model, which settles for a secondary role), which in turn guides the action. “The p-model is updated on the ground of sensory information, and the role of motor action is really put to test in situations where the sense err, and the compelling character of motor experience becomes evident (we can’t walk through the wall)” (Määttänen 1993a, 73).

The p-model can now be considered a genuine Sign, a true semiotic entity. A p-model state is a Sign, the Object of which is the object in the actual world (remember that the s-model was determined causally by some properties of the actual world). The s-model already provides the object structure of the actual world. In the p-model, this is extended with the perceptual qualities, which together with the object structure presented by the s-model forms a phenomenal world, standing for the actual world. As p-model begins to guide the action, the objects of the phenomenal world stand for possible objects of action in the actual world. Due to the causal connection between the s-model (which controls the motor action) and the actual world, the instances of action determined by the p-model have a causal effect on the actual world. In other words, the p-model as a Sign has its Interpretant as the potential action on the objects of the world. Peirce’s pragmatic maxim, in turn, ties us to the pragmatistic conception of meaning: the meaning in the p-model is in the “practical bearings” of its Interpretant, in the possibly instantiating habit of action.61

In other words, the Interpretant is the total proper effect of the sign (CP 5.473), and the logical interpretant is of the nature of habit of action (CP 5.491). “The whole function of thought is to produce habits of action” (CP 5.400). Habits are beliefs.62

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61 For the pragmatic maxim, see e.g. CP 5.2, 5.17, 5.402, 5.438, 8.119, and chapters 1.2.6, 2.1.1.
62 For habits as beliefs, see e.g. CP 1.107, 2.148, 2.435, 2.643, 3.160–161, 4.53–55, 5.377, 5.397–398, 5.417, 5.510, 5.538, 7.354–359 and 8.270. See also Määttänen 2006b; 2007a–c; Ojala 2003 and chapter 1.2.5.
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Hence, thought, cognition and meaning have emerged. In terms suggested in chapter 1.3.4, there is now a semiotic wedge which bridges the semiotic rupture between perception with action.

In Peirce’s semiotic, Object (as events of the life-world) is perceived as Sign. The Sign is interpreted, and the final Interpretant is a habit of action. Määttänen emphasized the conclusion of Peirce’s semiotic triad into the *semiotic triangle*: action as instantiated habit of action determines Object (modifies facts through causal s-model), which in turn determines Sign (facts into percepts and perception) again. (See e.g. CP 1.324 and CP 4.531; Määttänen 1993a, 40–42; 2006b; 2007b–c; Väkevä and Ojala 1999, 313; and above, figure 16.)

Let me add two remarks concerning the p-model. First, the final Interpretant as a habit of action refers essentially to future, potential, and “would-be” action. Also, concerning the definition of sign by Eco, a p-model state can be false, caused by false perceptual qualities being attached to the causal s-model (which cannot lie). This opens way to the idea of play, in which make-believe phenomenal situations are instantiated. In this, there may be the core of not only children’s play, but also the seed of artistic and musical endeavors, as suggested earlier (chapters 1.3.4, 2.2.4).

Second, since the percepts include percepts of the subject itself as an object in the environment, the subject becomes aware of itself, thus potentially forming self-awareness. Since objects of the actual world are now potential objects for action by the emerging subject, they stand for something for *someone*, which appears to conclude the necessary requirements for the p-model to be a semiotic entity.

**Instrumental action, external signs and the l-model.**

In the p-model, instantiated action has actual, causal effects on the actual world. When these effects are perceived, there opens a possibility to create a habit of action where the original object (target) of action is used as a mediating stage in order to cause the effect. In other words, the original target of action is used as a tool to cause instrumental effect on the actual world. Originally, the reference relation between the tool and the instrumental effect (the object of the tool) is causal, it is an objective reference relation as it exists regardless of the subject, based on the tool’s physical properties which determine its potential effects. What the subject can reach, is only the immediate phenomenal object, not the physical dynamic object, and the reference relation between the immediate and dynamic object remains hidden, by definition. Still, due to the causal connection between the physical objects, the reference relation between the tool and its object (the effect) can be conceived, since both are perceived as phenomenal object. The reference relation between the tool and its object is no longer hidden, the tool becomes
a Sign of its Object. This conception is different from Eco (1979/1976), to whom the tool is a sign of another tool suitable for the same action (as a type-token reference), while for Määttänen the tool is a sign of the object of action.

If the reference relation is objective, the tool as a Sign becomes a medium of communication. Fire heats all human beings alike, and burns them just as easily (although the perceptual aspect involved, such as the feeling of pain or heat obviously varies from subject to subject). Fire is a public sign. (Määttänen 1993a, 123.)

With tools that are physically linked to their objects of action, the objectivity is tied to these physical, causal properties. With signs independent of material, the objectivity of the physical reference relation is moved to the usage of the sign, and thereby to other subjects, the society, the culture. How is this? Määttänen found parallels in Heidegger’s Sein und Zeit: “Only he who already understands, can listen.” (Heidegger 1986/1927, 164, see Määttänen 1993a, 124.) Määttänen suggested, that when the subject uses or presents tools, she produces external signs which then stand for the object of the tool (the action that would be done with the tool) to the subject or other subjects. All the subjects that have learned the use of the tool (revealed the hermeneutic reference relation between tool and its object) already share the same understanding of the tool as a Sign. In addition, they all have the possibility to learn the non-materially determined reference relation.

To quote Määttänen (1993a, 127):

This means that external physical entities (tools and signs) belong to the functional organization of mind in thinking. External signs build up new connections between different parts of the brain, and the organization of the mind is qualitatively changed. A genuinely human mode of thinking begins to emerge. The higher psychological functions are, according to Vygotsky, internalized social functions which are expressed in instrumental operations.

This way, the action which originated in the p-model, resulted in the development of tool use into use of external Signs. The meaning of these Signs is in their use: inherent use in case of simple practical tools, and social usage if the tools as Signs are conventional or arbitrary, that is, somehow mutually agreed upon. In either case, the external tools function as public signs, available for other subjects to perceive and interpret. This way Signs can be used as tools which have a special kind of object, one’s own brain (see Vygotsky 1986, 56) or someone else’s (Määttänen 1993a, 127). 63

63 Pragmatism is inherent in this: Once the tool is conceived to have effects with practical bearings, it becomes meaningful as a means of interacting, not only with the objects of the world, but with other subjects as well, assuming that the action taken by others due to the tool use is rewarding. Prime examples could be found in the early communication between a child and her parent (see e.g. Winnicott 1982/1971, Spitz 1965).
3.3 A Peircean view of mind embracing spatiality

This section ties together elements presented so far in the first and third parts, in order to sketch out a semiotic conception of mind that incorporates the pragmatist conception of spatiality. The sketch stems from the framework of naturalist pragmatism, as outlined in part one, as well as Peirce’s cenoscopy, phaneroscopy, and semeiotic, as outlined earlier in this part.

Obviously, in comparison with all the explications in the traditions and literature of mind sciences and philosophy of mind, this sketch can only be a rough wire-frame model, a clumsy cluster of considerations that seem possible from the viewpoint of naturalist pragmatism. While an attempt is made to avoid major conflicts with current findings in neurosciences, psychology and psychoanalytics, cognitive sciences and philosophy of mind, the relations to the mind sciences are not worked out in detail. This is because of the scope of this study: for all practical purposes, the focus needs to be on the Peircean pragmatist and semiotic framework. At the same time, the sketch is inspired and influenced by many of the established stances in those disciplines, in addition to those presented earlier in this section.64

In part one, it was denied that mind would be an entity internal to the subject, containing images or other counterparts as representations of the objects of the actual world. Instead, mind was described as the competence to guide action, based on subject-organism’s representations of the actual world and in virtue of the process of interaction with the environment. It was also noted, that the construction of mind serves a natural purpose by being useful in organism’s adapting to and interacting with the environment. Representing, in turn, was characterized as forming a connection or a collection of connections between what is perceived and the anticipation of what is acted upon and how. Consequently, the key questions in sketching a semiotic conception of mind—or any conception of mind—are, first, How do representations come about? and second, What is the relation between representations and the actual world?

These are huge questions, indeed, and one can only scratch the surface in addressing them in this context. The plethora of research reports in various branches of the mind sciences give detailed insight into these issues, each from its own particular perspective, based on the methods and research dispositions of the discipline. Yet, there perhaps lies the benefit of taking the semiotic approach: it may be, that semiot-
ics is not so attached to the detailed dilemmas, and therefore may contribute to the common scientific inquiry in its attempts to form an overview, the big picture. Fortunately, in our days, the representatives of different disciplines seem better aware of the advances in other, related disciplines. Hence criticisms such as the one projected by Peirce to William James in CP 8.289 are perhaps no longer relevant:

These people are all sensationalists. They analyze psychic phenomena into their smallest portions, just as a physicist does physical phenomena, -- and just as the latter, if you ask him what composes the physical universe, will say “matter and motion,” so these sensationalists find nothing present to the mind but feelings. If you say to the physicist “What! Nothing but matter and motion? Are there no signs?” he will reply, “Undoubtedly, but they are psychical phenomena.” Just so if you say to a sensationalist “What! Nothing but feeling? Are there no signs?” he will say, “Undoubtedly, but they are cerebral connections, – purely physical phenomena.”

3.3.1 The semiotic triangle revisited

Objects and Interpretants as elements of the semiotic triangle.

Part one finished the outline of naturalist pragmatism with the suggested notion of the semiotic wedge, describing how the mediation from perception to action changed from a more or less mechanistically determined direct coupling to a more complex conglomeration of cognitive structures, in virtue of the ability to represent (see chapters 1.3.2, 1.3.4, 3.1.2). Cognitive representation, in turn, is synonymous to sign, or to thought-sign to be precise (CP 1.339, cf. also CP 1.540, CP 1.564). A Sign connects the Object of perception with its Interpretant, and the habits of perception to the habits of action. By virtue of representations, the simple and determined reactive process of the organism turns into the complex semiotic process of the subject.65

The functioning of any semiotic process, whether natural or artificial minds in natural or artificial environments, culminates in the production of habits, driven by the semiotic organism’s adaptation to the environment. In Peirce’s words, again: “The whole function of thought is to produce habits of action.” (CP 5.400). In contrast to a habit of action, all instantiated action factually modifies the environment, and may produce “some sensible result” (CP 5.400). Hence we have two aspects of a semiotic system: “action, where our modification of other things is more prominent than their reaction on us, and perception, where their effect on us is overwhelmingly greater than our effect on them” (CP 1.32.4). The success of experiential habits allows

65 This chapter expands thoughts on the semiotic triangle previously published in Ojala 2006.
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the organism to predict the future and to act accordingly (CP 2.148). In this sense, semiosis allows for habits of thinking, imagination, and “esse in futuro”.

Let us return to the semiotic triangle as an illustration of semiosis (fig. 16 in chapter 3.2.3) and elaborate it (figure 22 below), based on distinctions made by Peirce between dynamical and immediate Objects, on the one hand, and between immediate, dynamic, and final Interpretants, on the other (see chapter 3.2.3). In perception, dynamical Object (dO) is represented in the Sign (S) as immediate Object (iO). The immediate Object is the Object as the Sign represents it, while the dynamical Object is the efficient but not immediately present Object (CP 8.343). As an Object with possible interpretation, the immediate Object belongs to the category of Firstness. The dynamical Object in its actuality belongs to the category of Secondness.

There are two other approaches to the same relation, exercised by Peirce. In terms of inquiry (see chapter 1.2.5), the dynamical Object corresponds to the actual cause that forces of the irritation of doubt upon our minds (CP 2.84, see also CP 4.536), while the immediate Object is the immediate cause, the factor based on which the subject may either “hold on to old beliefs” (CP 5.387), or, in case of doubt, feel need for adjusting the beliefs.

Figure 22. Semiotic triangle elaborated from figure 16. In perception, dynamical Object (dO) is represented in the Sign (S) as immediate Object (iO) through interpretation. The immediate Interpretant (iI) consists in the revealed impression of understanding the sign. The dynamical Interpretant (dI) is the actual dyadic effect of the Sign. Final Interpretant (fI), in turn, is the total understanding of the real and living conclusion, assumed that interpretation is carried to an ultimate opinion. Interpretation is made possible by collateral experience (CE), and leads to habit of action, which may instantiate into action, modifying the hard facts of the world. (Cf. Määttänen 1993, 40–).
In terms of perception (see chapter 3.2.2), the relation between the dynamical Object and the immediate Object corresponds to the relation between the actual characteristics of the causally related objects and the characteristics perceivable by virtue of qualities of feeling. Hence, our perception is based on what we possibly come to know of the object (iO), as opposed to the actual object itself (dO).

The large number of different kinds of Interpretants in Peircean semiotics shows the ambiguity and complexity of the notion of Interpretant. I will here follow the stance taken by Mats Bergman (2004, 370–386), which differs from those of Fitzgerald (1966), Zeman (1977) and Short (1996), for instance. (See also chapter 3.2.3 and the footnote on Short 2007, 178–180.) According to Bergman (2004, 385)

the various trichotomies of interpretant can be understood as results of the varying perspectives of inquiry involved. The immediate-dynamical-final division is the broadest substantial notion of the interpretant; it applies primarily to a structural and normative level of semiosis. ... In contrast, the emotional-energetic-logical division concerns the effect of signs on a human being ... [and] the intentional-effectual-communicational trichotomy may be viewed as the application of the triadic conception of the interpretant to the communicative field of signification.

Consequently, as far as semiosis is examined as an interactive process of an individual subject-organism in her environment, as is the case here, the division to emotional, energetic and logical Interpretants is applicable (see CP 5.475–491; Bergman 2004, 385–386, or chapter 3.2.3), together with the main division to immediate, dynamical and final Interpretants.

Starting with the Interpretants in the category of Thirdness, the notion of the final Interpretant, as expressed by Peirce in 1903 and 1909, is linked to his conditional idealism (see chapter 1.2.5). The finality of the final Interpretant assumes, that interpretation is carried so far that an ultimate opinion is reached (CP 8.184), not only by a particular subject, but by every subject (CP 8.315). The final Interpretant is therefore ideal in the sense, that “[n]o event that occurs to any mind, no action of any mind can constitute the truth of that conditional proposition” (idem). In the naturalist perspective, then, the final Interpretant could then be thought of as an ideal of the perfect equilibrium of adaptation to the actual world, not actually possessed by anyone, nor by any collective or society.

However, from the perspective of the semiosis of an individual subject-organism, the Interpretant of category, the Third, the logical Interpretant, is a habit (EP2, 431; EP2, 412; CP 5.491). It is also a concept (EP2, 412; Pragmatism, Variant 1; MS 318). As such, the logical Interpretant is “in a relatively future tense” (EP2, 410), and “the species of future tense of the logical interpretant is that of the conditional mood, the ‘would-be.’” (CP 5.482). Although it is subjective, it is nevertheless law-like and
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(relatively) general. As inquiry continues, the logical Interpretant asymptotically approaches the final Interpretant (cf. chapter 1.2.5).

In becoming or striving towards finality, the logical Interpretant changes—or as Peirce put it: “it must itself have a logical interpretant” (5.476). Since the logical Interpretant is a habit, the changes in the logical Interpretant are habit-changes, “meaning by a habit-change a modification of a person’s tendencies toward action, resulting from previous experiences or from previous exertions of his will or acts, or from a complexus of both kinds of cause” (ibid.).

According to CP 5.486, “the logical interpretant is an effect of the energetic interpretant”. In other words, the changes in subject’s habits are due to energetic Interpretants, the Interpretant in the category of Secondness within the division to emotional, energetic and logical Interpretants.

Similarly, among the tripartition of immediate, dynamical and final Interpretants, Peirce described the dynamical Interpretant as the actual dyadic effect of the Sign, “the effect actually produced on the mind” (CP 8.343, CP 8.315, CP 4.536). This connects well with the idea of mind as the competence that guides the action of the subject-organism (chapter 1.2.3), as well as with Peirce’s statement that “intellect consists in a plasticity of habit” (CP 6.86). This also ties the dynamical (and energetic) Interpretant to the changes in beliefs, where belief is “that upon which a man is prepared to act” (CP 5.12, CP 2.148; see also chapter 1.2.5; Määttänen 2006b, 2007a; Colapietro 1989, 110).

The dynamical (or energetic) Interpretant is involved with particularity and actuality. According to Peirce, the energetic Interpretant is a real fact or thing, comparable with real (or actual) object (EP2, 410). Based on Peirce’s definition of the energetic Interpretant, the actual effect produced always involves an effort, which may be muscular but more often a mental effort (CP 5.475).66

In the naturalist perspective, there seems to be no reason to make a major distinction between muscular and mental effort, since muscular efforts are mentally instantiated motor actions. In any case, what the effort—and thereby the energetic (and dynamical) Interpretant—seems to be about is more than just preparedness, disposition, potentiality or anticipation to act in a certain way in a particular situation. At the same time, the effort does not go quite as far as being actual manipulation or motor action of actual objects, but is a single mental act (CP 5.475), the particular state of activations and inhibitions of the (nervous or possibly other)

66 As Thirds, neither the final nor the logical Interpretant are particulars, and consequently neither of them pertains to immediacy or actuality, nor do they correspond to the immediate or dynamical Object (cf. EP2, 410).
system guiding the actual operation of motor system. Each state of that system results from the interpretation of the Sign.\textsuperscript{67}

This is clarified by Peirce in his example (CP 8.315):

When the captain of infantry gives the word “Ground arms!” the dynamic Interpretant is in the thump of the muskets on the ground, or rather it is the Act of their Minds.

It does not follow, however, that the resulting action would necessarily be successful, as intended. The effort simply makes an attempt to rearrange (or to restrain from rearranging) the actual world, and to update the habits. Thereby it gives impetus to another phase in the cycle of semiosis. But regardless of whether the action is successful or not, it affects the actual objects of the world in its scope and magnitude. Hence, the cycle of semiosis is completed as the dynamical Interpretant (more or less) determines the dynamical Object.

Parallel to the way dynamical Interpretant corresponds to the dynamical Object, immediate Interpretant (or emotional Interpretant) corresponds to the immediate Object. The important difference in their relation is, however, that while the immediate Object is determined by the dynamical Object, the dynamical Interpretant is determined by the immediate Interpretant.\textsuperscript{68}

All in all, since emotional and immediate Interpretants are Firsts among Interpretants, there is always an emotional (or immediate) Interpretant, if there is interpretation of any kind. And just as there are no dynamical Interpretants without immediate Interpretants, there are no final Interpretants without dynamical Interpretants, corresponding to the mutual relations of the phaneroscopic categories (see chapter 3.2.1).

The emotional Interpretant was described by Peirce as a feeling produced by the sign (CP 5.475). According to CP 8.343, the immediate Interpretant is “the Interpretant represented or signified in the Sign”, and according to CP 4.536, “the interpretant as it is revealed in the right understanding of the Sign itself, and is ordinarily called the meaning of the sign.” It is similar to immediate Object in that “both

\textsuperscript{67} Consequently, references to action in the context of energetic or dynamical Interpretant, such as in CP 5.491 (“[t]he habit conjoined with the motive and the conditions has the action for its energetic interpretant”, also from ca. 1907), should be taken as referring to mental action, guiding the organisms operation in the environment, and only thereby affecting the objects of the actual world. In other words, “the activity takes the form of experimentation in the inner world; and the conclusion (if it comes to a definite conclusion), is that under given conditions, the interpreter will have formed the habit of acting in a given way” (CP 5.491).

\textsuperscript{68} Meanwhile, “we find that the logical interpretant does not correspond with any kind of object” (EP2, 410). This is not a surprise: logical Interpretant, belonging to the category of Thirdness, requires the actuality of Secondness and the dynamical Interpretant, but in being law-like, there hardly can be a corresponding particular object.
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being apprehensions, or are ‘subjective’; both, too, appertain to all signs without exception.” (EP2, 410). Finally, in Peirce’s example of interpreting the reply “It is a stormy day.” (CP 8.314), the immediate Interpretant is described as “the schema in her [the interpreter’s] imagination, i.e. the vague Image or what there is in common to the different Images of a stormy day.”

This suggests that the immediate (emotional) Interpretant differs from feeling, as the perceptual notion of “nothing but sensation minus the attribution of it to any particular subject” (CP 1.332; chapter 3.2.2) in that it goes much beyond the sensory aspects of feeling, and even beyond percept. The immediate Interpretant seems to be more related to perceptual judgment in the sense, that both are first stages of representing. Perceptual judgment, as recalled, is “the first judgment of a person as to what is before his senses” (CP 5.115), and asserts “what a character of a percept directly present to the mind is” (CP 5.54; chapter 3.2.2).

There are differences, however, besides their origin in different theories. The perceptual judgment represents, but “truly or falsely” (CP 7.630), and is beyond subject’s control (CP 5.115). In contrast, the immediate Interpretant is “the interpretant as it is revealed in the right understanding of the Sign itself” (CP 4.536, emphasis added). Perceptual judgment is “an extreme case of abductive inference”, but does not involve elements of judgment such as colligation and observation (see chapter 3.2.2, or CP 2.442). Perceptual judgment is concerned simply with what is sensed (as in ‘This chair appears yellow’), without involving subjectivity in the sense of subjective experience as described in chapter 3.1.2. Yet, perceptual judgment may possibly be enough for recognizing a belief, i.e. it might lead to action. But only in very simple cases perceptual judgments might be the only means of forming of habits of action, as mentioned in 3.2.2.

In contrast, the immediate Interpretant seems to involve at least some inferential elements, primarily those of colligation, being still far from accomplishing “the conscious and controlled adoption of a belief as a consequence of other knowledge” (CP 2.442). It namely incorporates associations from interpreter’s present and past

69 In the same context of CP 5.475, Peirce gave a music-related example: “Thus, the performance of a piece of concerted music is a sign. It conveys, and is intended to convey, the composer’s musical ideas; but these usually consist merely in a series of feelings. If a sign produces any further proper significate effect, it will do so through the mediation of the emotional interpretant, and such further effect will always involve an effort.” (CP 5.475) Although the intention is to outline the distinction between emotional and energetic Interpretant (the latter involving effort), from the musicological perspective the example portrays, not the essence Interpretants as much as meager understanding of music. Namely, the idea that the proper “significate effect” of music would be limited “merely in a series of feelings” without further interpretation, that is, without the interpretation reaching dynamical and final Interpretants, is untenable to the point of not deserving a reply. The fact that we are not necessarily able to verbally express the habit-changes evoked by music or other “non-verbal varieties of art forms” does not mean that they would not be significant in Peirce’s full meaning of the word. Cf. Spinks (1991, 178).
experience, thus expanding the scope of the interpretant from merely sensory perception to cover “the schema in her imagination, i.e. the vague Image or what there is in common to the different Images” (CP 8.314). Thereby, it involves the interpreter’s subjectivity—the subjective experience (see Lakoff and Johnson 1999; chapter 3.1.2)—and from the subject’s perspective, it is always true, a right understanding. Just as “we think each one of our beliefs to be true” (CP 5.375), the same goes for immediate Interpretants: only as inquiry continues we may come to notice how the immediate interpretation was flawed. But at that point it is no longer the immediate Interpretant, because the interpretation has continued and matured.

Peirce’s idea of collateral experience (and collateral observation) may seem to connect well with the idea of maturing interpretation. Unfortunately, it is not too clear what Peirce exactly meant by collateral experience or collateral observation. CP 8.314 (1909, a letter to William James) indicates, that collateral experience is the means by which the dynamical Object is found out, based on the indications of the Sign. As stated in CP 8.179 (1903, review of Lady Welby’s book), collateral observation is “previous acquaintance with what the sign denotes,” but with that Peirce did not refer to the later distinction between denotation versus connotation. Rather, Peirce’s example points to all gathered experience pertaining to the interpretation (CP 8.179):

Thus if the Sign be the sentence “Hamlet was mad,” to understand what this means one must know that men are sometimes in that strange state; one must have seen madmen or read about them; and it will be all the better if one specifically knows (and need not be driven to presume) what Shakespeare’s notion of insanity was.

At the same time, Peirce began the passage (CP 8.179) by stating, that “all that part of the understanding of the Sign which the Interpreting Mind has needed collateral observation for is outside the Interpretant.” One way of getting this to make sense, is that Peirce was referring to what would be the immediate (or emotional) Interpretant, after which the collateral observation takes place. Another alternative would be reference to the final (or logical) Interpretant, before which all the collateral experience is taken into account. More likely, however, is that collateral experience is something different from the Interpretants of the Sign, but something that persists during interpretation. In any case, some kind of collateral experience seems requisite for interpretation, as there evidently need to be some kind of standards or landmarks for the interpretation of the Object.

It is difficult to draw a well thought-out distinction between immediate and dynamical Interpretants (or between emotional and energetic Interpretants) except in terms of the “categorical” difference of being affiliated respectively with (subjective) feeling without actuality versus actuality, determined by the feeling (cf. CP
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8.315). Also, drawing a line of demarcation between energetic and logical Interpretant seems somewhat problematic, since there is a constant interplay between the two, thus giving rise to the “plasticity of habit”. These difficulties come as no surprise, considering Peirce’s synechism, the doctrine of continuity (see e.g. 6.169–173; but also the opening of chapter 1.2.2). Hence, just as belief in inquiry tends “indefinitely toward absolute fixity” (CP 5.416), “the Dynamical Interpretant indefinitely approaches the character of the Final/Immediate Interpretant” (CP 8.315), as the habits of action are developed.

Object and Interpretant, two of the three elements of Sign, are in close contact with the two aspects of the semiotic system, perception and action. They embrace the epistemic connections between an interactive organism and its environment. But the core of the issue, the nature of the Sign itself, and its relation to experience, requires analysis.

What is a Representamen?

Chapter 3.2.3 expressed a concern relating to how strong demarcations there are to be distinguished between Object, Representamen, and Interpretant, and how much of the characteristics of Representamen consist in pure potential or possibility of mediation in the Sign. Particularly, the concern is the clarity of the concepts of Sign versus Representamen. As noted, Peirce ended up abandoning the term Representamen. In this book, the word is used, if needed, to refer to a mediating constituent of the Sign between Object and Interpretant. The term Sign, in turn, is used to refer to the whole constituency of the triadic relation from Object to Interpretant. This distinction is elaborated below.

As Mats Bergman (2004, 236–241) pointed out, Peirce’s notion of Representamen can be understood in many ways. On the one hand, the early notion (ca. 1899) held Representamen as “the thing” having the character “by virtue of which, for the production of a certain mental effect, it may stand in place of another thing” (CP 1.564). On the other hand, in 1903, Peirce defined Sign as “a Representamen with a mental Interpretant” (CP 2.273) and as “a Representamen of which some Interpretant is a cognition of a mind”. It is not clear, whether the Representamen and the Sign are synonymous (cf. CP 8.191), whether the Sign is a special case of Representamen, or whether reversely the Representamen is a special case of Sign (cf. CP 2.273, 2.303–304).

At the same time, there is the problem that in the derivation of the ten classes of signs, the First and Third Correlates seem to change places with each other (see chapter 3.2.3 and table 7). In other words, the problem is that Sign appears to be simultaneously or bivalently a First (as Representamen in the triad of Representa-
A possible solution to these problems may be found if Representamen is regarded as representation that provides the possibility of interpretation in the Sign relation, and the Sign as the relation between Object and Interpretant, that is as the (relatively) established mediation, thereby being a Third. The suggestion is as follows.

There are three kinds of elements in thought-signs: First, those of possibilities or potentialities; Second, those of particular, momentary actualities; and Third, those of relatively consistent but evolving, accumulative laws. These, of course, correspond to Peirce’s phaneroscopic categories. All these actually exist, somehow, since there are no other alternatives in the naturalist perspective.

There are two paths of determination: On the one hand, the Object determines the Sign, which determines the Interpretant, which (as a dynamical Interpretant) in turn determines the Object. This is illustrated by the semiotic triangle (and its elaborated versions, see figures 16 and 22 presented earlier). This also corresponds to the cyclicity of semiosis.

![Figure 23. A semiotic helix illustrating the endless character of semiosis with series of Objects, Interpretants and habits evolving in the course of inquiry.](image-url)
On the other hand, each Interpretant determines another Interpretant, thus forming an endless (or quasi-endless) “series of successive interpretants” (CP 2.303). The endless series of Interpretants is in concord with the idea of habits and habit-changes, since habit is “the essence of the logical interpretant” (CP 5.486). It can be well assumed, that the Object also exists as an endless series of consecutive situations or events of the actual world, i.e. as a series of successive Objects. In other words, there is a continuous process of change both with the situations of the actual world and its objects and with the subject’s phenomenal world. Inquiry strives for the correspondence between the subject’s habits and the objects of the actual world.

By combining the semiotic triangle (or the idea of cyclicity of semiosis) and the idea of the endless series in semiosis, we get a helix-like model of quasi-endless semiosis (figure 23). In it, Object \(_n\) is a particular situation of the actual world, which becomes represented in the Sign \(_n\). Object \(_n\) is determined both by the previous Object \(_{n-1}\) and by the action taken as determined by the Interpretant \(_{n-1}\). Each Interpretant \(_n\) is determined partly by the Object \(_n\) and partly by the previous Interpretant \(_{n-1}\). Changes in (logical) Interpretants correspond to habit-changes, and changes in (dynamical) Objects to the changes in the actual world.

The concept of Sign may need some reassessment when we take into account the roles of the two kinds of Objects, and the three kinds of Interpretants (see figure 24). As noted, “the essence of the logical interpretant” (or final Interpretant) is the habit (CP 5.486, cf. CP 5.494). The energetic Interpretant (or dynamical Interpretant) is the actual effect of the Sign, involving an effort of action, which in turn has more or less of an effect on the dynamical Object.

The immediate Object and the emotional (or immediate) Interpretant seem to be more problematic. The immediate Object and the emotional Interpretant are alike in that both are the immediate, instantaneous and unreachable elements of Firstness that contribute to representation. The main difference seems to be, that in the former, the origin of the Sign in the dynamical Object is emphasized, while the latter brings forth the role of interpretation in what and how Sign represents. This will be elaborated further below.

The Sign is not an entity or a thing, not a black-box which the Object enters, and out comes the Interpretant. The Sign is a Third, as it is connects the Object with its Interpretant and thereby joins the actual objects with habits of action. In comparison, the Object in its actuality is a Second. But what then constitutes the Firstness in this context? The immediacy of the immediate Object and emotional (or immediate) Interpretant come across as good candidates, but their role may lead to further ambiguity or bivalency of the Sign: If the immediate Object is “the
Object as the Sign itself represents it” (CP 4.536, cf. CP 8.314) and the immediate Interpretant, in turn, “the Interpretant represented or signified in the Sign”, there lurks a question of whether the Sign is indeed both a First and a Third—or is there more to the Sign, than the immediate Object and the immediate Interpretant?

![Diagram of the semiotic helix](image)

Figure 24. A closer look at the semiotic helix. Note that the habits contain the collateral experience needed for interpretation.

In CP 8.177–183 Peirce maintained, that the Sign cannot be understood without collateral experience, which functions as a standard of comparison for the interpretation. Therefore collateral experience needs to be something different from Interpretants, but something that persists during interpretation. Peirce’s treatment of collateral experience or collateral observation did remain somewhat unclear (see Short 2007, 193n11). In fact, it seems, that Occam’s razor could be in place here, since it seems to me that collateral experience can be regarded as all the accumulated experience that pertains to the interpretation of the Sign, i.e. as the habits that are relevant for the interpretation of the Sign. In short, the Sign consists in the relations of the Object and the habits that serve as the basis for each aspect of interpretation of the Object in representation.
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The three Interpretants now seem to find their places. The emotional Interpretant fuses with the immediate Object (in ways discussed more below). It is the feeling of “the Quasi-mind that is the Interpreter” (CP 4.536), as determined in the Sign partly by the Object. Based on emotional Interpretant, the energetic Interpretant is the effort of action upon the dynamical Object, committed by the interpreting subject as a result of the Sign. The logical Interpretant consists in the “modification of consciousness” (CP 5.485) or, in current terms, of mind, due to the Sign. But the Interpretants of the Sign are not determined solely by the Object. Instead, what Peirce called habits of thinking would seem to partly account for the logical Interpretant of the Sign, habits of action for the dynamical (or energetic) Interpretant, and habits of feeling for the immediate (or emotional) Interpretant. Hence, for each Interpretant, there is an element of Thirdness, persisting during interpretation, and providing the basis and reference for the interpretation, yet being themselves modifiable by the Sign. The habits and the Sign depend on each other: there would be no habits without the constant maintenance of them by the Sign, and there would be no Sign without the basis for interpretation provided by habits.

It is evident, that interpretation takes place throughout the connection between perception and action. That is, as soon as the Object is first being represented in the immediate Object, interpretation of the Sign begins, without any delays or intermediate steps, and continues until it is consumed by the dynamical Interpretant and submerged into the logical Interpretant. Consequently, what there seems to be, is a complex of continuous connections: the mediation between the perceived and the (potentially) acted upon, in which the dynamical Object is represented and interpreted through the mutually fused immediate Object and immediate Interpretant; second, the continuous conglomeration of dynamical Objects; and third, the continuous flux of subject’s habits. Peirce described the continuity of mind in CP 5.289:

At no one instant in my state of mind is there cognition or representation, but in the relation of my states of mind at different instants there is. In short, the Immediate (and therefore in itself insusceptible of mediation – the Unanalyzable, the Inexplicable, the Unintellectual) runs in a continuous stream through our lives; it is the sum total of consciousness, whose mediation, which is the continuity of it, is brought about by a real effective force behind consciousness.

Now, although thoroughly intertwined, it seems worthwhile to make a distinction between how the phaneroscopic categories of Firstness, Secondness and Thirdness are present, on the one hand, in the Sign as the complex set of relations between the Object and the habits that serve as basis for interpretation, and, on the other hand, in the habits as the persisting, underlying system that serves as the channel
upon which the Sign becomes interpreted and thereby represents. This distinction may help to solve the dilemma of Sign-as-First versus Sign-as-Third.

Namely, I take that the phaneroscopic categories are present in the semiosis in different ways, depending on the perspective. These may easily become confused with each other. In terms of a single Sign\textsubscript{n} (as the complex set of relations between a particular Object\textsubscript{n} and the habits pertaining to its interpretation), the category of Firstness comprises the immediate elements of Object and Interpretant (iO and emI in figure 25). The category of Secondness additionally includes the actuality of the dynamical Object (dO) and energetic (or dynamical) Interpretant. The category of Thirdness includes also the totality of representation, i.e. additionally the relation of the Object with the habits pertaining to the interpretation of the Sign (figure 25, brackets at the top).

![Phaneroscopic categories in the semiotic helix.](image)

Figure 25. Phaneroscopic categories in the semiotic helix.
For the semiotic subject-organism, the phaneroscopic categories appear differently. Still, let us ponder the essence of Representamen.

The existence of the actual objects, the subject-organism herself included, clearly belongs to the category of Secondness (figure 25, leftmost column). A clue to resolving the dilemma of changing First and Third Correlates may be the following. For each Object, the interpretation of the Sign becomes possible by virtue of the habits, the experience accumulated so far and pertaining to the Object. From that perspective, habits provide the possibility and potentiality for interpretation. Also, habits are characterized by other attributes of Firstness, such as immediacy, lack of reaction, lack of analysis and presentness, since any analysis, contact or effect upon them renders them anew, more or less unlike they were. And that is exactly what takes place in interpretation. Not only does the Object become interpreted in comparison to the habits, but the interpretation always, more or less, leads to renewal of the habits. Subsequently, the renewed habits are in fact habits that is, they are again the potential Firstness in respect to the Sign that interprets Object.

As for the Representamen, should one wish to use the term, there are several statements by Peirce consistent with the idea, that Representamen could be understood as the representative capability and potential provided by the habits applicable to the formation of the Interpretants, but yet to be updated by the Sign. In other words, Representamen could be taken as the experience accumulated hitherto and pertaining to the interpretation of the Sign. CP 1.541 reads (emphases original):

My definition of a representamen is as follows: A REPRESENTAMENT is a subject of a triadic relation TO a second, called its OBJECT, FOR a third, called its INTERPRETANT, this triadic relation being such that the REPRESENTAMENT determines its interpretant to stand in the same triadic relation to the same object for some interpretant.

In CP 2.275 Peirce noted, that

while no Representamen actually functions as such until it actually determines an Interpretant, yet it becomes a Representamen as soon as it is fully capable of doing this; and its Representative Quality is not necessarily dependent upon its ever actually determining an Interpretant, nor even upon its actually having an Object.

In other words, Representamen has the potential of determining Interpretant, irrespective of the existence of Object, and in that respect seems to correspond to those habits that contribute to the interpretation of the Sign. However, in order for there to be a Sign, the Representamen has to actually determine the Interpretant, i.e. it needs to carry through the interpretation of the Object. Should one then wish to use the term Representamen, it might be fitting to use it for the...
thought-habits, the represented, that is ready for the update, the next causation of semiosis by the Object.

In terms of the phaneroscopic categories, Representamen (being understood this way) indeed belongs to the category of Firstness, and Interpretant to the category of Thirdness, although the next Object and the next thought-sign changes the role of the Interpretant to Representamen, which then together with Object determines the new Interpretant. This way, in the semiotic continuum, the element of Thirdness constantly becomes an element of Firstness, due to the new element of Secondness (see figure 25, the rightmost column; see CP 1.339). And as soon as the new element of Secondness is being interpreted, the possibility of Firstness becomes a new, updated law of Thirdness.

It is possible that a simple mishap ends up being the best explanation for the changing of the Correlates in Peirce’s derivation of the ten classes. Still, I suggest, that this alternation of Thirdness and Firstness in the semiotic process, this constant changing from Representamen to Interpretant and Interpretant to Representamen may provide an alternative solution to the problem of the First and Third Correlates (chapter 3.2.3). It is obvious, that Peirce may have skipped a few bars, so to say, and assumed the conception of the Sign as the basis for the rest of the derivation. If the Sign is indeed understood as consisting in the complex relations between the Object and the habits that serve as the basis for each aspect of interpretation of the Object in representation, i.e. everything that pertains to the representation of the Object (which evidently would make sense), the three trichotomies given in CP 2.243–253 are simply in a logical order, but in an order different from the order in which Peirce presented the phanerosopic categories. The trichotomy given first by Peirce (CP 2.243–246), “according as the sign in itself is a mere quality, is an actual existent, or is a general law” (CP 2.243) involves the totality of the representation, the complete Sign, and is therefore the Third Correlate. The trichotomy given last by Peirce, that of Rheme, Dicent and Argument (CP 2.250–253) applies to the construction of the interpretation, the beginning of which is in the Representamen in the sense just discussed above. The trichotomy is made according to whether the “Interpretant represents it as a sign of possibility or as a sign of fact or a sign of reason” (CP 2.243). In case it is a possibility, we only have the un-updated Representamen (or Interpretant). In case it is a sign of reason, the pertaining habits that constitute the Representamen have been renewed into Representamen (or Interpretant) as the Sign has completed the connection between perception and action and thus tied the phenomenal to the facts of actual world. Finally, in case it is a sign of actuality, we are dealing with the moment we call now, the phase of changing our habits and accumulating our experience.
Mental processes are spatially embodied

Perhaps this manages to explain the derivation of the ten classes, as well as to consolidate the first two issues remarked in chapter 3.2.3. Also, one might entertain the idea of how much of this seems to be in concord with what is known of possible neural implementations. In that avenue of thought, the habits in general might correspond to the synaptic weights of the neural networks, and the Representamen to the collection of weights that is involved in the treatment of the particular situation. The immediate Object and the immediate Interpretant—fused together—might correspond to the neural activation on its many levels from level zero to associative levels, the former emphasizing the representation of the Object, the latter its Interpretation by the subject. The dynamical (or energetic) Object might correspond to the actual activation of the (afferent) motor system. Last but not least, the final (or logical) Interpretant might correspond to the affected synaptic weights involved, and might thus account for the changing of the operation of the neural net. In other words, the changes from Representamen to logical Interpretant (or from logI_n to logI_{n+1}) might correspond to learning.

Figure 26. The semiotic triangle elaborated further. The immediate Object and the immediate Interpretant overlap as they are fused together. Accumulated habits of feeling, action, and thinking serve as the basis for the formation of immediate, dynamical and final Interpretants, respectively. Habits as they pertain to interpretation can be thought of as a Representamen, which makes a separate notion of collateral experience unnecessary. Habits are constantly updated by Interpretants. The dynamical Interpretant affects the dynamical Object in action.
In connectionist models of cognition, the “weights are usually regarded as encoding the system’s knowledge” (Smolensky 1988, 1). Peirce’s notion of habits seems to correspond to that idea in the complete scope of different Signs. In the scope of particular Signs, the corresponding Peircean notion is the Representamen or the logical Interpretant, depending on whether the impact of the Sign on the Representamen is taken into account or not. This, in turn, is concord with Peirce’s critique of situating meaning in the dynamical Interpretant (CP 5.494), or worse, to the emotional Interpretant, although the latter might be “ordinarily called the meaning of the sign” (CP 4.536). The pragmatic maxim is valid.

Should one wish to illustrate this by elaborating the semiotic triangle further, one should keep in mind, that the traditional semiotic triangle only shows a “slice” of the semiotic helix at a certain moment. A further elaboration of the semiotic triangle is shown in figure 26.

3.3.2 The Sign in semiosis

The previous section made an attempt to solidify the logic of the derivation of the ten classes of signs. By the same token, this one attempted to explicate the operation of the semiotic process in terms of Objects, Signs, and Interpretants. In that context, the immediate Object and the immediate Interpretant were considered fused together in the Sign. That idea is explained further below, based on the ten classes of Signs.70

Before that, Peirce’s concepts of quality and feeling may require a brief recapitulation and a short elaboration. For simplicity, the possibility of internal evocation (imagination, hallucination, etc.), as opposed to initiation of feelings by an external actual source, is omitted here. However, in the current perspective, the internal evocation does not essentially differ from the external one.

In chapter 3.2.2, quality was described as an abstract potentiality, independent of thought, and independent of any particular material thing that possesses it (CP 1.422). Essentially, there is a difference between “the mechanical qualities”, and those “sensible qualities” that make up the universe of phenomena. Since there is no exact correspondence between the two kinds of qualities, the senses, perception and the whole process of semiosis are fallible. Still, the contribution of the qualities in phenomena or in elements of phenomena makes it also possible for the inquiry to succeed in developing habits and beliefs that well correspond to the situations of the actual world (see chapter 1.2.5). The necessary criterion is, that in order for a quality to contribute to semiosis, it needs to be felt.

70 Chapter 3.3.2 is largely based on the analysis of the ten classes of Signs published in Ojala 2006.
Feeling, in turn, was quoted to be “the material quality of a mental sign” (CP 5.291), “excited condition” of nerve-cells (CP 6.22), “sensation minus the attribution of it to any particular subject” (CP 1.332), although sensation is only “the initiation of a state of feeling” (idem), after which feeling is carried forward in the nervous system (see CP 1.386). Qualities of feelings may or may not relate to the changing characteristics of the actual world—they may more or less convey some of the characteristics of the actual objects, but may also be results of imagination (CP 1.304).

According to Peirce, both quality and feeling belong to the category of Firstness. However, their Firstnesses are different. Quality is in itself independent of any realization, only potentially existing, seeming to wait for its manifestation. Feeling, in turn, exists, it even embodies quality, but it is a First in that it has the potential of contributing to representation by virtue of its qualities. (See chapter 3.2.2.)

The newly manifested feelings of qualities are isolated, unconnected with each other, distinct, unattached representations of qualities, regardless of their origin in the same situation. For each situation which we perceive or experience, there is therefore the problem of how we construct a unified perception or experience from contributing feelings of qualities, from fragments of representation that are like a “shattered puzzle” (Revonsuo 1994, 250). This seems to refer to the binding problem of neuroscience. Earlier, the theory of conceptual spaces by Peter Gärdenfors, provided one view of how properties and concepts were structured from perceived qualities. One task of the analysis of the Sign is to address this kind of issues in semiotic terms (see later chapter 3.3.3).

The environment of a semiotic organism always involves qualitative differences, i.e. there always exists some kind of distribution of objects and their qualities. This complex, variable set of relations between objects or their characteristics has here been referred to as spatiality. The dynamical Object always involves spatiality since it involves the objects of the actual world.71

This actual spatiality may be experienced to a certain degree. In any case, the object structure of the world is revealed to us through the causal relations of actual objects, ourselves included, as suggested in Määttänen’s s-model (Määttänen 1993a). But it is a somewhat different thing, to what degree the qualities are conveyed and represented in feelings of qualities, and how spatiality is altered in the semiotic process. And even if spatiality were more or less intact somehow, it does not mean that any particular aspect of it would necessarily be somehow meaningful. Nevertheless, a key argument of this book is that the semiotic process can be approached

71 The semiotic term Object (with a capital ‘O’) should be understood broadly, not necessarily as a single particular object, but as spanning from characteristics of particular actual objects to complex situations of actual objects encountered in semiosis.
in terms of transformations of spatiality through the semiotic triangle and the ten classes of Signs.

To facilitate the reading of the next paragraphs, the three-dimensional illustration and the table of the ten classes of Signs presented earlier (chapter 3.2.3, figure 18 and table 7), are shown again here as figure 27 and table 9.

What follows is a closer look at the ten-fold classification, the goal being to analyze the role of each class in semiosis, and keeping in mind the elaborated semiotic triangle as the overall model of semiosis. The ten classes are approached in terms of the six boundaries or transitions that distinguish

A the three SinSigns from the Qualisign,
B the six Legisigns from the three Sinsigns,
C the four Indices from the three Icons,
D the three Dicents from the six Rhemes,
E the three Symbols from the four Indices, and
F the Argument from the three Dicents.

Figure 27. A two-dimensional projection of a three-dimensional model of ten classes of signs. Qualisign (I) at the bottom front and left; Argument (X) extreme top, right.
Mental processes are spatially embodied

TABLE 9. The ten classes of Signs as yielded by the triply trichotomous classification (CP 2.243–264). The “reversed” order of the First and Third Correlate; i.e. that the Third Correlate concerns the Sign in itself, and the First Correlate the relation of the Sign to its Interpretant, seems justified based on the understanding that each Interpretant $n$ serves as Representamen $n+1$, that is, as an element of possibility for interpretation in the Sign $n+1$. (See chapter 3.3.1.) From that perspective, the relation of the Sign to its Interpretant is initially the relation of the Sign to its Representamen, which belongs to the category of Firstness. Hence that relation is the First Correlate. Also, based on the conception of the Sign as the complete, complex set of relations between the Object and the habits that enable the interpretation, the Sign in itself definitely belongs to the category of Thirdness. Hence “the Sign in itself” is the Third Correlate. CP 8.341 lists the ten classes in a reverse order.

<table>
<thead>
<tr>
<th>First Correlate: The relation of the Sign to its Interpretant</th>
<th>Second Correlate: The relation of the Sign to its Object</th>
<th>Third Correlate: The Sign in itself</th>
<th>Full name of the class</th>
<th>Number of class</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Argument</td>
<td>3 Symbolic</td>
<td>3 Legisign</td>
<td>Argument (Symbolic Legisign)</td>
<td>X</td>
</tr>
<tr>
<td>2 Dicent</td>
<td>3 Symbolic</td>
<td>3 Legisign</td>
<td>Dicent Symbolic Legisign</td>
<td>IX</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>3 Symbolic</td>
<td>3 Legisign</td>
<td>Rhematic Symbolic Legisign</td>
<td>VIII</td>
</tr>
<tr>
<td>2 Dicent</td>
<td>2 Indexical</td>
<td>3 Legisign</td>
<td>Dicent Indexical Legisign</td>
<td>VII</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>2 Indexical</td>
<td>3 Legisign</td>
<td>Rhematic Indexical Legisign</td>
<td>VI</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>1 Iconic</td>
<td>3 Legisign</td>
<td>Rhematic Iconic Legisign</td>
<td>V</td>
</tr>
<tr>
<td>2 Dicent</td>
<td>2 Indexical</td>
<td>2 Sinsign</td>
<td>Dicent Indexical Sinsign</td>
<td>IV</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>2 Indexical</td>
<td>2 Sinsign</td>
<td>Rhematic Indexical Sinsign</td>
<td>III</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>1 Iconic</td>
<td>2 Sinsign</td>
<td>Rhematic Iconic Sinsign</td>
<td>II</td>
</tr>
<tr>
<td>1 Rhematic</td>
<td>1 Iconic</td>
<td>1 Qualisign</td>
<td>Rhematic Iconic Qualisign</td>
<td>I</td>
</tr>
</tbody>
</table>

Reminder: the ten classes of Signs are here discussed in the context of “theoretical semiotics”, that is, in the context of studying the development and constitution of complete Signs and their operation. The classes are referred to as Signs, although a Sign proper always involves all ten classes and it might be more appropriate to refer to the classes as elements, factors or phases of the fully developed Sign. The tradition of discussing the ten classes as Signs instead of elements of Signs is evidently based on the context of “applied semiotics”, which studies Signs in which all aspects are present, and how those Signs are used (see chapter 3.2.3). Following this look at the ten-fold classification, the next section relates the classification with the ideas of spatial embodiment presented earlier.
Qualisigns, sinsigns, and legisigns.

The concepts of quality and feeling seem to match the first two classes of signs, Rhematic Iconic Qualisign and Rhematic Iconic Sinsign, respectively. It should be clarified that neither all qualities nor all feelings end up contributing to semiosis. Only those that do are Signs (or elements of fully developed Signs). The dynamical Objects possess qualities that we are simply unable perceive. A quality that can be sensed and is thereby possibly perceivable, is a Qualisign if it actually “makes it all the way” by contributing to a complete Sign and its Interpretation. This does not, by far, happen to all qualities.

What differentiates the Qualisign (class I) from the Rhematic Iconic Sinsign (class II) and other sinsigns, is the embodiment of the Qualisign in the Rhematic Iconic Sinsign, which is “an actual existent thing or event which is a sign” (CP 2.2.45; transition A in figure 28). According to Peirce’s definition, a Qualisign is a quality that is a Sign, but since it is a First in all respects, it can “only form a sign through being actually embodied” (idem). This embodiment is the sinsign, a feeling that actually contributes to a Sign.

Figure 28. Qualisign, sinsigns and legisigns. Transition A between the Qualisign and the three sinsigns. Transition B between the sinsigns and the six legisigns.
Peirce’s description of feeling (see CP 1.306, for instance) limits it to a rhyme and an icon, categories of Firstness in Sign’s relation to both its Object and to its Interpretant. Since a feeling is an instance, it cannot be a legisign. Also, because it manifests qualities, it is no longer a mere potentiality (as a Qualisign is) but an actual instance, a sinsign. Peirce’s description of feeling as a Firstness is hence insufficient. This suggests, that feeling, in terms of the first trichotomy, the Sign in itself, is a Second. Consequently, in terms of the ten classes of Signs, feeling corresponds to the Rhematic Iconic Sinsign.

This may seem to contradict Peirce’s example of the Qualisign in CP 2.254. But the example of “feeling of ‘red’” should be taken as Qualisign only as far as it is a possibility, without manifestation or embodiment. And once a Qualisign or “several Qualisigns” (CP 2.245) are embodied, we have a Sinsign. In insisting on such an abstract, intangible element as the Qualisign, Peirce may seem overly meticulous. However, the necessity of the class of the possibility inherent in Qualisign seems justified for the simple reason, that if there were no possibilities for the qualities to become interpreted as a Sign, both semiosis and the process of inquiry would seem logically impossible. The denial of the Qualisign would deny the possibility of determination of the Sign by the Object.

Sinsigns exist as particular instances. They are actually existing Signs. The Rhematic Iconic Sinsign represents the possibly interpretable Object by virtue of its characteristics, by virtue of the embodied Qualisigns. Yet, the Rhematic Iconic Sinsign, although actually existent, is insufficient for semiosis, since alone it stands in relation to nothing, except for the qualities it embodies. It needs to be compared with other, relevant sinsigns, i.e. with a relevant accumulation of sinsigns. This takes us to Thirdness: law and interpretation. A sinsign is consequential and functional only in relation to a corresponding legisign, which reciprocally needs its sinsign (its replica) in order to signify (CP 2.246). Hence, the instance of the Rhematic Iconic Sinsign (class II) is paralleled by the accumulative Rhematic Iconic Legisign (class V).

It is by those means, that sinsigns are distinguished from legisigns (transition B in figure 28). A legisign “is a law that is a Sign” (CP 2.246). A legisign is the general type, of which a sinsign is a token (and Qualisign, in Peirce’s terms, a tone; cf. CP 3.360).

The law-like character of the legisign is pivotal, because it provides the semiosis with the expansion of the *hic et nunc* of the sinsign into accumulations of representations, thus giving way to past and future, temporality in toto, and creates a basis for such key phenomena as memory and learning.
The selective transition from icons to indices.

The three iconic signs (Qualisign, Iconic Sinsign, and Iconic Legisign; classes I, II and V) are characterized by the fact that they denote by virtue of their characters “just the same, whether any such Object actually exists or not” (CP 2.247). In contrast, the indexical signs (classes III, IV, VI and VII) have a real connection with the Object, i.e. a connection in which the Sign is “really affected by that Object” (CP 2.248; boundary C in figure 29).

Now, what constitutes a real connection? Peirce described index as a sign having “a direct physical connection” between “the sign and the thing signified” (see e.g. CP 1.372, CP 2.299), the regular example being a weathercock as an indicator of wind (e.g. CP 2.286, 2.428). This example, however, applies more to mutual relations of two actual objects (the weathercock and the wind, one standing for the other), and less to the development of thought-signs, which we are dealing with here.\(^{72}\)

In the context of thought-signs, the directness or physicality of the relation between an index and the Object of the Sign should be considered in terms of

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\(^{72}\) The weathercock is also given as an example of the Dicent Sinsign (CP 2.257, CP 2.265).
experience, phenomenally, and in terms of the relation of the Sign to its Object is concerned, since that is what the second trichotomy is about (chapter 3.2.3). According to Peirce (MS 797, 10; quoted in Bergman 2004, 426),

I have defined index or indication as a sign by virtue of physical connection. Experiential connection would be more explicit; for I mean by physical connection that the sign occurs in our experience in relation to the when and where of the object it represents.

In other words, while the three icons (Qualisign, Rhematic Iconic Sinsign and Rhematic Iconic Legisign) provide the possibilities for the Objects to become interpreted and thereby to contribute to the representation in the Sign, the four indices (being Seconds in the trichotomy) actually account for the representation of each Object in the Sign to the degree, that the Object becomes experienced. The Secondness of the indices means that the Object being interpreted becomes phenomenally real for the Interpreter, in a compelling way (see CP 2.336). Peirce described index as “[a]nything which focusses the attention” (CP 2.285), having “the being of present experience” (CP 4.447). The transition from Icons to Indices seems to be a transition of filtering or amplifying or selecting in other ways the phenomena that are actually experienced from all the possible, sensed or otherwise evoked ones.

According to CP 2.256, the Rhematic Indexical Sinsign “is any object of direct experience so far as it directs attention to an Object by which its presence is caused”. The Rhematic Indexical Legisign, in turn, “is any general type or law, however established, which requires each instance of it to be really affected by its Object in such a manner as merely to draw attention to that Object”. Hence the difference between the Rhematic Indexical Sinsign (class III) and the corresponding Rhematic Indexical Legisign (class VI) lies in the mutually dependent particularity-generality relation of sinsigns versus legisigns, as before. The legisign is the accumulation of past and present features, while the sinsign conveys the actual, existent features of the current situation.

Dicents join selected feelings of qualities into a unified representation of Object.

The two remaining indices (classes IV and VII) takes us beyond the rhematic signs, to dicents. While the indexical rhemes draw attention to the Object, they, as all rhemes, are only fragmented sets of representations, having only the potential of forming a unified interpretation of the Object, a unified experience, a complete Sign. Hence, what differentiates the rhematic signs (such as the Rhematic Indexical Sinsigns and Legisigns of classes III and VI) from the dicent signs (such as the Dicent Indexical Sinsigns and Legisigns of classes IV and VII), is the actualization of the potential of the rhematic signs in the dicent signs (transition D in figure 29).
A rheme may “afford some information; but it is not interpreted as doing so” (CP 2.250), while a dicent sign is “a Sign of actual existence” (CP 2.251).

In addition to indices, dicents and sinsigns are also Seconds but differ in that sinsigns are the signs that actually exist as instances (as compared to Qualisigns that need the sinsigns in order to be embodied), whereas dicent signs are signs whose Objects appear to be in actual existence; i.e. they convey the representations of actual Objects.

With the dicent signs, the interpretation of the Object in the semiotic system reaches a truly phenomenological level, with the construction of the world as it is experienced. It also reaches a level of intentionality, in the sense that the representation is truly about something, not just in terms of features or characteristics that are perceived irrespective of each other, but in terms of representations of (relatively) complete objects (which, however, does not mean that the representation would be complete).

In the dicent signs, the different feelings of qualities that have succeeded in the transition to indices, are unified into a complete experience, regardless of the possible absence (or lack of intensity or formedness) of a number of aspects in the representation of the Object. Following the logic of past experience, the same mechanism that unifies the shattered puzzle into a phenomenological organization, fills in the missing gaps with representations which appear to be logical in that situation, based on the dicent legisigns. We understand a black-and-white picture of an apple as a picture of an apple even without the color information, assuming that we are familiar enough with other pertinent characteristics of apples. If this is true, the natural semiotic systems have a built-in core engine for construction of metaphors, by which an incomplete rhematic sign may become a complete dicisign and convey a complete, unified experience. Thus sound, for instance, when perceived, can stand for a fully-experienced situation (cf. also the notions of symmetry and bivalent logic in Matte Blanco 1975, 1988; and chapter 2.2.6).

The symbolic level.

As we move from the Secondness of indexical signs to the Thirdness of symbols (the remaining three classes of signs VIII, IX and X; boundary E in figure 30), we enter the domain of conventions and associations as habits. Peirce defined symbol as “a sign which refers to the Object that it denotes by virtue of law, usually an association of general ideas, which operates to cause the Symbol to be interpreted as referring to that Object” (CP 2.249). Symbols are legisigns, but legisigns without corresponding sinsigns. Instead, they have the indexical sinsigns as their indirect
Mental processes are spatially embodied replicas, as their particular instances, and “through the association or other law”, the symbols are “affected by those instances” (idem).

Symbols are Thirds in the second trichotomy of Signs, i.e. Thirds “according as the relation of the sign to its object” (CP 2.243). In Indices, the representation of the Object has already developed into a Second, namely into the representation of the factual, particular aspects of the Object as it is represented in the Sign (i.e. aspects of the immediate Object). In contrast to indices, in symbols the representation of the Object has developed into a Third, into a representation of not only the particular Object, but into a representation of the Object in relation with all representations that are or become associated with it. In other words, the indexical legisigns are combined with other, associated legisigns of other interpreted Signs (which in turn have or have had their own sinsigns as their instances). Thus Symbols form a mutually interconnected cluster of legisigns (and are no longer in need of corresponding sinsigns of their own). Peirce defended this notion of symbol as “throwing together” the legisigns in CP 2.297:

The word Symbol has so many meanings that it would be an injury to the language to add a new one. I do not think that the signification I attach to it, that of a conventional sign, or one depending upon habit (acquired or inborn), is so much a new meaning as a return to the original meaning. Etymologically, it should mean a thing thrown together, just as embolon (embolum) is a thing thrown into something, a bolt, and parabolon (parabolum) is a thing thrown besides, collateral security, and upobolon (hypobolum) is a thing thrown underneath, an antenuptial gift. It is usually said that in the word symbol the throwing together is to be understood in the sense of “to conjecture”; but were that the case, we ought to find that sometimes at least it meant a conjecture, a meaning for which literature may be searched in vain. But the Greeks used “throw together” (sum-ballein) very frequently to signify the making of a contract or convention.

The indexical representations, in which the Interpreter is “really affected” by the Object, is expanded to representations that are associated with each other. This takes two routes. On the one hand, unincorporated features (Rhematic Indexical Legisign) are connected with their own associations (hence Rhematic Symbol, class VIII). Each association has a potential (as is characteristic of rhemes) for what could be called subjective qualities or emotional content, although those are not the best choices of words. Thorough emotional content, or rather, the “big picture” of how all this relates to the organism and his or her situation in the world seems possible only when the experience is unified. The transition from Rhematic Symbols to Dicent Symbols (class IX) corresponds to this unification.
The factual aspect, without symbolic associations, is established already in indexical dicents. The indexical dicents stand for the perceived and experienced particular, factual objects or situations (the Dicent Indexical Sinsign, class IV) and their categories (the Dicent Indexical Legisign, class VII). By association—and this is the second route—the representation of the particular object in the Indexical Dicent turns into a subjective understanding of the Dicent Symbol as the associations are attached to the experienced, factual situations.

In either route, the unassociated sinsigns of particular qualities or objects, that have been correlated with corresponding legisigns, are now put in the perspective of all the associated legisigns. According to Peirce, these “inner associations” between legisigns are “based on the habits of the inner world” (CP 4.157). It would seem reasonable to go one step further, and maintain, that symbols not only incorporate habits (CP 4.531) but that the legisigns constitute the habits of feeling, action, and thinking (see CP 2.261, CP 8.335). Note that, in this perspective, symbol as a Sign or element of a Sign has nothing to do with whether the Sign is linguistic or not.73

Figure 30. Indices versus symbols, dicents versus the Argument—transitions E and F, respectively. Symbols are legisigns that associate the Sign with other Signs. The Argument expands the Dicent Symbol and semiosis into a level of intentional communication.

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73 A closer analysis of the multifarious concept of ‘symbol’ is beyond the scope of this book.
The last transition and the revelation of the semiotic process.

According to Peirce’s distinction of the last class in the trichotomic classification, “an Argument is a Sign which is understood to represent its Object in its character as Sign” (CP 2.252). The Argument is a logical continuation of the Dicent Symbol, revealing its operation as a Sign. The Argument does not only convey the factual issues of being and acting in the world, or the associations with all pertinent past and present experiences. It becomes a domain of reflection, of contemplation, and of the exploration of the semiotic process itself (boundary F in figure 30). In a way, this last transition takes the Sign into a metalevel. Instead of mere formation of meaning, there opens the understanding the significance of the Object as a Sign, of acknowledging its applicability for the subject, according to the pragmatic maxim. It allows for an understanding of the semiotic process, and provides a basis for intended communication—for praxis, guided by phronesis and sophia (see chapter 1.3.4).

By now, we have definitely reached the immediate Interpretant. Representation is developed in each transition from the Qualisign through the Argument. Through the interplay between sinsigns and legisigns, and through symbols, an understanding of the Object has been revealed in the Sign. The Sign produces an Impression (CP 8.315), as the sinsigns are interpreted in comparison to the legisigns, i.e. to the accumulated laws that maintain the criteria for the interpretation of the sinsigns. At the same time, the sinsigns have their effect on the structures of the legisigns. In addition to the symbols as associative structures, this interplay is what interpretation of the Sign is about.

The immediate Object is infused in the ten classes of signs. The immediate Interpretant begins to take form as soon as the Rhematic Iconic Sinsign is put into relation with its legisign. For the interpreting subject, an Argument consists in the weighted options of the perceived situation, insight as to the roles of the participants of the situation, reflected against past experience, and impregnated with subjective associations, and therefore already permeated by interpretation. The immediate Object and the immediate Interpretant are immersed into each other. This is the logical connection between perception and action, that constitutes the Sign.

This completes the crude analysis of the Sign and semiosis, that shapes an organism into an interpreter, a subject. I would like to emphasize, that the transitions or boundaries are not separating factors, but rather unifying ones, and it is difficult if not impossible to draw a clear line where one ends and the other begins (cf. Bergman 2004, 244). Still, for the current purposes, the triply trichotomous classification of Signs seems enough, and there seems to be no adequate reason to continue here to the possible subdivisions either of generic triadic relations or of signs, as suggested
by Peirce (CP 2.238–239). Also, it does not seem necessary to incorporate Peirce’s tentative decimally trichotomous classifications yielding a division of Signs to sixty-six classes (see e.g. 1.291, 8.342–376; Weiss and Burks 1945).

Esthetic, practic and semiotic, and the ten-fold division of the Sign.

Based on Aristotle, Peirce, and Dewey, chapter 1.3.4 presented a synthetic view of esthetic, practic and semiotic. It addressed the phenomenal connection between perception of object and action upon object on a very general level. Peirce’s ten-fold classification of the Signs, as understood above, does the same, but in a more detailed way. How do these relate to each other? And how does Peirce’s theory of perception fit in?

In chapter 1.3.4, esthetic was taken as “as strictly perceptual, only relating to Peirce’s concept of feeling, sensation without the attribution of it to anything, perception in its infancy without recognition or analysis”. The practic was regarded as consisting in two kinds of action: “poiesis is action effecting the state of the objects of the actual world, while praxis is action effecting the states of the phenomenal worlds of other semiotic organisms, which subsequently are also potentially capable of sharing their (possibly altered) states”.

Since sharing phenomenal worlds, experiences or mental representations necessarily involves communication by means of actual objects (and only those, in the naturalist perspective), praxis necessarily involves poiesis, in the way that the actual objects are made common (poiesis), and, through these objects, something is delivered to other subjects (or the subject herself) to be experienced (praxis).

In the same context, semiotic was considered to comprise “three kinds of knowledge: sophia, phronesis, and techne, which underlie the activities of theoria, praxis, and poiesis, respectively”. In the naturalist perspective, theoria, as far as it is an activity, exists as action only indirectly, through praxis and poiesis. Sophia, the wisdom regarding perennial questions, develops by virtue of action and perception. It governs phronesis and techne, and thereby, indirectly, the organization of actual objects, and the potential perceptions of them. Sophia, phronesis, and techne constitute the ability to guide the organism’s being in the actual world. This competence was termed mind.

If esthesis is considered only as relating to the concept of feeling, without attribution of the sensation to anything, it is limited to icons (figure 31; CP 1.574, CP 5.129).74

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74 In my opinion, this is not in contradiction with Peirce’s statements such as CP 5.140, according to which “[e]sthetic goodness, or expressiveness, may be possessed, and in some degree must be possessed, by any kind of representamen – rhema, proposition, or argument.” In the context of CP 5.140,
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Figure 31. A simple model of proto-semiosis with icons only. The Qualisign, Rhematic Iconic Sinsign and Rhematic Iconic Legisign connect the dynamical Object with action. The system is capable of perceiving and acting, but the representation is only rudimentary and action is limited to simple poiesis, to predetermined reactions. The Interpretants are undifferentiated, as are habits of feeling, action, and thinking. While the trichotomy according to the Sign in itself is effective, the trichotomies according to the relation of the Sign both to its Object and to its Interpretant are as yet mere possibilities (and thereby Firsts). There are only icons and rhemes. Compare with figure 3b, which illustrates the emerging rupture that renders this simple model into the fully developed ten-fold model of the Sign in figure 32 below.

Namely, in the second trichotomy of icons, indices and symbols, icons are Signs, in which the representation of the Object is a First, a potentiality. Only in the indices does the relation of the Sign to its Object become that of actuality, a fact. That is, in icons, the perceived qualities are not yet attributed to anything. At the same time, a genuine Qualisign is unfit for a Sign of feeling, since feeling is the material quality of a mental sign (CP 5.291).

With these elements (of icons together with considerations of esthesis and poiesis), a simple model of proto-semiosis is conceivable, in which the system is capable of perceiving and acting, but not fully capable of representing, in terms of thorough development of the Sign into unified, associated experience and recognition of the semiotic situation (fig. 31). In the simple model, there is a dynamical Object, which determines (to a great extent, if not completely, in addition to the sensory constraints) the immediate Object, i.e. the Object as far as the Sign represents it. In the simple model, that representation would consist only in the undifferentiated, unintegrated feelings of qualities, which are interpreted only as being compared to other, uncategorized earlier experiences of the same class (cf. figure as in many other cases, the representamen is not a thought-sign, but an actual object as a sign, such as a proverb, diagram, picture, physical sign or symptom (see CP 5.138).
Consequently, the action evoked would only be a straightforward reaction to a stimulus. Not only would the organism be unable to fully represent—it would also be incapable of praxis. Its knowledge would be only rudimentary, technical, limited only to simple poiesis. There would be no real distinction between the immediate, dynamical and final Interpretants, since action would be determined already and only by the habits of feeling. At the same time, in the simplicity of the connection between perceivable object and action, it seems that the immediate Object and immediate Interpretant indeed coincide.

This kind of simple model comes close to the simplifying models of artificial neural networks (e.g. simple feedforward perceptron ANNs) connected to motor control, and especially to what Peter Gärdenfors (2000) referred to as the decision procedure involving simply “a direct coupling between perception and action” (see chapter 3.1.2). It also relates closely to the s- and p-models suggested by Pentti Määttänen (1993a, see chapter 3.2.4).

The s-model, the simplest of Määttänen’s semiotic models of mind (chapter 3.2.4), is causal and spatial, subcognitive and preperceptual. The operation of the model is controlled through causal relations between the organism and the environment. In the contrasting p-model, thought, cognition and meaning emerge, as the perceived qualities can be attached to the object structure provided by the s-model, motor action is guided more intentionally by the perceptual representations and less causally by the properties of the actual world. In this way, the balance of the determination in the semiotic triangle is moved from the environment to the emerging subject. There hardly is a clear line between the s-model and the p-model, since it is impossible to exactly delineate what constitutes a system capable of perception. The simple model suggested above (fig. 31) would seem to be close to the s-model in the sense, that the object structure is given by the hard facts affecting the organism and in that there is no capability to (fully) represent objects nor to interpret the representations as objects. However, in the simple model, there are simple sensory (and motor) capabilities, and rudimentary means of representing, which are features of Määttänen’s p-model rather than the s-model.

In the simple model, the semiotic situation and communicative context cannot be revealed to the subject. As a matter of fact, there would not even be a subject. There are no associations characteristic of subjective experience, not even unified experience of the Object, and therefore no phenomenal world that could really stand for situations or events of the actual objects, the organism itself included. Social life and communication would not be possible in the simple model. However, all these abilities would well serve the organism’s adaptation to the environment and the community. In other words, there seems to be a natural need for the development
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of the semiotic wedge (chapter 1.3.4), that is, for the full development of the Sign as the complex relationship between feeling and action.

While poiesis was defined broadly as any action effecting the state of actual objects, praxis was taken as communicational in that it is action that has an effect on other subjects (or the same subject in different context), as noted. And this is possible only through the manipulation of actual objects. While praxis as action thus necessarily involves poiesis, it is also more demanding in terms of the representation abilities of the subject-organism than simple poiesis. That is, the intellectual virtue of phronesis that underlies praxis is a more sophisticated and complex system of representation than that of techne, the intellectual virtue underlying poiesis.

Again, there can hardly be a strict line of demarcation between poiesis and praxis. Instead, they should be understood as a continuum of between two opposing poles, in which poiesis at its simplest is indeed any effect of action on actual objects (or even lack of effects), and praxis which may be based on complex phronesis, being cognizant of the ramifications of the communicative action. All action, in the naturalist perspective, is in the final analysis manipulation of actual objects. The differences between praxis and poiesis are more present in their underlying intellectual virtues, in phronesis and techne. Nevertheless, the development of both praxis as action and phronesis as the underlying intellectual virtue can be understood in terms of the emergence of the semiotic wedge.

The emergence of the semiotic wedge is about the development of the Second and Third trichotomies of the Sign, that is, the development of the relation of the Sign both with its Object and with its Interpretant, and the advent of indices and Symbols, Dicents and Argument. The development of representation towards “higher” classes of the Sign hence correspond to the aspects that ultimately differentiate between phronesis and techne. Let us work from top to bottom (see figure 32).

The Argument (class X) was attributed with the acknowledgement of the communicational situation. That is, in the Argument, the subject understands the semiotic situation—understands that her actions may under certain conditions have this or that kind of ramifications on other subjects (or on herself). The question of whether the Argument is therefore necessary for developing phronetic habits of action (habits that yield praxis as instantiation of action) coincides with the question of whether the intended experience in communication is produced on other subjects accidentally or intentionally.

Chapter 1.3.4 noted, that “artistic perception may take place even if the action is not intended to be artistic”, and that “we can well do without the further necessary requirement of awareness of artistic perception”. Similarly, there seems to be no
reason to hold Argument as a necessary class of Sign for the developing of phronetic habits of action. Even without recognizing the situation, the Interpreter may well end up acting in ways that produce experiences in other subjects. In fact, particularly in social situations, it may be hard to avoid this.

Figure 32. The fully developed Sign connecting perception and action.
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A solution to this question was already suggested (in chapter 1.3.4), according to which, “scientific inquiry provides an enhanced means of inquiry, in virtue of its methods, rigor, and scope. Similarly, the arts are an enhanced means of producing artistic experiences.” More broadly, the general understanding of the communicational situation, i.e. the sign class of Argument, greatly improves the chances of successful praxis. Without this acknowledgment or realization, the activity of the subject in her attempts to communicate would be merely random actions as far as the perception and experience of those actions are concerned. At the same time, the surpassing of phronesis by the Argument would seem to point to the notion, that the Argument would (in Aristotelian terms) correlate with the wisdom concerning perennial questions, i.e. with sophia.

It seems that the natural necessities of social interaction with other subjects especially are the driving force for the development of representation to the last of the classes. Experience is constantly gathered from the perceived ramifications of action in communicational situations. Indeed, quite early on children realize the fact that there are other subjects that communicate and think in ways more or less similar to ourselves. This already suggests, that in effect, all classes of Sign are involved in the every day semiosis of (at least) humans, supposing that the process is fully developed and normal. In other words, the process of signification in all practical inquiry involves all ten classes of Sign.

The remaining six classes (dicent and rhematic indices and symbols) are also relevant to praxis. Without the associations of the Dicent and Rhematic Symbols (classes IX and VIII), there can be no subjective experience as understood here, and consequently, the attempt of praxis would be based solely on indexical factuality, without considerations as to the subjective interpretation of the hard facts.75

While the indexical factuality may be befitting to communication of plain facts (such as “This chair is yellow”, although the linguistic ability is not an issue here), it hardly is sufficient for communication expressive of more thoroughly interpreted issues and in that respect of more subjective matters. In particular, as far as the Sign stands for something metaphorically (as opposed to being itself a representation of an actual situation, and not more than that), the symbolic classes appear to be necessary. And this usually seems to be the case in complex representations and particularly in music and the arts, as argued in parts two and four. Whether the

75 The inherent affiliation of feelings with the rhemes should not, in my opinion, lead to affiliation of subjective experience only with rhemes. Namely, subjective experience as experience encompassing emotional contents, so to say, seems possible only with dicents. This is because in dicent signs the experience is unified, and that seems to be a requisite for acquiring the big picture of how the situation relates to the subject and her situation in the world—what practical bearings the situation has for the subject-organism.
subjective interpretation of matters account for knowledge pertaining to perennial questions, i.e. whether to consider the expressive communication sophia or phronesis seems to be a matter of the practical bearings of the communication and, finally, a matter of critique of the lasting inquiry.

As noted earlier, the transition from rhemes to dicents is the transition from the representation of separate qualities into a unified representation of Object. In dicents, Object is interpreted as having actual existence (CP 2.251). In this distinction between rhemes and dicents seems to loom an analogy with the major distinction between the primary and secondary process, and with the distinction between subconscious and conscious, assuming that consciousness is understood as awareness, “in terms of the organism being reflectively knowledgeable of the existence of objects of the world or their qualities”, as suggested in chapter 1.2.3. However, this path of thinking calls for more elaboration, in another context.76

Yet, the factual aspect of the indexical signs, without any symbolic associations, is important—not only for understanding the Sign, but also in terms of habits of action. Namely, communication necessarily involves manipulation of the actual objects (as praxis involves poiesis and phronesis involves techne). Since the indexical dicents account for the perceived experienced particular objects, situations, and their categories, they (the Dicent Indexical Legisigns, class VII especially) also constitute the knowledge required of acting upon the actual objects, thus conveying the communication, for instance.

The unified representation of (perceived or manipulated and then perceived) object, in turn, is impossible without the representation of its qualities. That is, the communicational act of praxis necessarily requires the representation of the different feelings of signifying qualities by rhematic indices (especially by the Rhematic Indexical Legisigns, class VI), for they account for the representation of the qualities of the conveyed object.

Finally, the legisigns are the laws, the general types that constitute the accumulating categories of representation, according to which the particular sinsigns are put into perspective. The accumulative characteristic of the legisigns, which gives basis for memory and learning (and representation in the sense of the Representamen, as discussed earlier), also gives basis for the competence of estimating hypothetical future situations, i.e. for imagination, pending on the functionality of the legisigns, that is, on their correspondence with the actuality (see chapters 1.2.5, 1.2.6 and 1.3.4).

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76 In this respect, Julia Kristeva’s usage of the term ‘semiotic’ appears conflicting: her semiotic would seem to correspond best to the Peircean notion of rhematic, while her symbolic might correspond to the Peircean notion of dicents and argument, in this context. At the same time, the term chora is very descriptive of the domain underlying verbal, “rational” signification. See also chapter 1.3.4 and the question of awareness of artistic expression and experience.
In brief, the legisigns are the domains of patterns of behavior, styles, traditions—habits of feeling, habits of action, and habits of thinking.

In terms of action, imagination as an ability to estimate future situations has its technical and practical aspects of estimating the outcomes of particular acts upon actual objects and the effects of those on subjects. These, however, develop only through the recognition of the (manipulated) object structure and through the perception of the qualities of the actual objects. In other words, there is no direct feedback for testing legisigns or imagination in action, other than perception in the helix of semiosis (in addition to complying to the hard facts concerning the organism).

On the one hand, in Peirce’s theory of the phaneroscopic categories (see chapter 3.2.1), Secondness always involves Firstness, and Thirdness, in turn, always involves Secondness. The notion of legisigns as habits then leads to the notion, that as the semiotic wedge expands the “direct coupling” into well-developed semiosis, the different classes of legisigns constitute the laws and the accumulation of experience into habits of feeling, action, and thinking. It would provisionally seem feasible to attribute the habits of feeling to Rhematic Legisigns, habits of action to Dicent Legisigns, and habits of thinking to Argument. This would not seem to disagree with the notion of interchanging Representamen and Interpretant. Instead, the legisigns would appear to be the elements of the Sign in charge of both representation and interpretation, as far as the law-like character of semiosis is concerned.

The theory of phaneroscopic categories is founded on the idea that the higher categories are inclusive of the lower categories in the sense that Thirdness necessarily involves Secondness, and Secondness necessarily involves Firstness. In that respect, the complex legisigns always involve the simpler ones, so that the Rhematic Indexical Legisign is based on Rhematic Iconic Legisign, and so on through Argument, which involves all other legisigns.77

Similarly, habits of thinking involve habits of action and habits of feeling. And similarly, sophia involves phronesis, which in turn involves techne. These, of course, match the idea of degenerate Firstness in Secondness, and degenerate Secondness in Thirdness. But in terms of the ten-fold classification of the Sign, and its six legisigns, there seems to be no exact one-to-one match, but rather, a continuum in which the purely technical extremity (pertaining to poiesis as any manipulation of actual

77 An intriguing juxtaposition exists between the Rhematic Symbol (class VIII) and the Dicent Indexical Legisign (class VII), which are both involved in Dicent Symbol (class IX), and which both involve Rhematic Indexical Legisign (class VI). The Rhematic Symbol accounts for an ununified representation, but includes the subject’s associations to the represented qualities. In the Dicent Indexical Legisign, the qualities are unified into a factual representation of the Object, but without subject’s associations to the Object. This juxtaposition would seem to relate to the juxtaposition of bruteness of perceived facts versus subjective feelings—perhaps even emotional dispositions in perceived situations.
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objects) is affiliated with the Iconic Legisign, and the purely sophical extremity (pertaining to the perennial questions) with the Argument. While the Argument is a Third according to all three trichotomies, the Iconic Legisign is a First according to the relation of the Sign to its Object, and to its Interpretant, and only in terms of the Sign in itself, it is complete, a Third. Consequently, as far as the Iconic Legisign can determine action, it is limited to very rudimentary habits, since it does not involve the associations of the Symbols, nor the unification of the Dicents (cf. the simple model above).

The Aristotelian notions of techne, phronesis and sophia need not correspond one-to-one to the Peircean classes of the Sign. The perennial character of wisdom is subject to critique in future inquiry, and evidently the criteria are not set only by individual subjects. The knowledge underlying praxis does not necessarily become instantiated. Also, the ability to represent Object fully and the awareness of the communicational situation does not necessarily lead to an ability to do what is commonly good. Should one nevertheless wish to pinpoint the loci of techne, phronesis and sophia within the ten-fold classification, here is a possible solution.

Taking into account the characteristics of the two forms of action, the main candidate (should there be one) for the legisign determining poiesis in the regular sense (of intentional making or manipulating of actual objects but not more than that) would apparently be the Dicent Indexical Legisign (class VII). In it, the representation of Object is unified, and the Sign is interpreted in its actuality. The Dicent Symbol (class IX), then, would extend the representation with subject’s associations, including those relating to the interpretation of the Sign in terms of subjective experience. Consequently, the Dicent Symbol would seem capable of determining praxis. In other words, the best candidates for the legisigns determining poiesis and praxis and thereby hosting techne and phronesis seem to be the two Dicent Legisigns, which is in concord with the idea, that the Dicent Symbol is attributed with the habits of action. Furthermore, since the Argument, to which habits of thinking could be attributed, necessarily involves the Dicent Legisigns, but extends the interpretation of the Sign to the understanding of the communicational or semiotic situation, it would indeed seem a good candidate to host the wisdom concerning perennial questions, i.e. sophia.

Peirce’s theory of perception and the ten classes.

The last thread of this chapter is the question of how Peirce’s theory of perception, summarized in chapter 3.2.2, could be consolidated with the theory of the Sign. It seems rewarding if the theory of perception is found commensurate with the theory of thought-signs and the current interpretation of Peirce’s ten-fold clas-
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sification of the Sign. As noted, the theories of perception and semiotics are two different theories with different objectives. Nevertheless, the brief proposal below summarizes some of the connecting points, based on the ideas above.

The notions of quality and feeling and their compatibility with the notions of Qualisign (I) and Rhematic Iconic Sinsign (II) were already discussed at the beginning of this chapter. A quality is a Qualisign if and only if it contributes to semiosis, i.e. if it develops into a full representation. As described in chapter 3.3.2, feeling as the material quality of a mental sign (CP 5.291) is limited to the Rhematic Iconic Sinsign, since it is a rheme and an icon, but differentiated from both Qualisign and legisigns in that it is particular, not general.

According to Peirce, feelings, “these elements of Firstness are perceived to be connected in definite ways” in the percept (CP 7.625). Percept being particular, this would point to the Dicent Indexical Sinsign (IV). Likewise, a Dicent Indexical Sinsign combines elements of Firstness, namely rhemes, and thereby represents its Object not merely in its characters as a rheme does, but in respect to its actual existence as an object (CP 2.252).

Particular percepts perform only “the function of conveying knowledge of something else”, and “have to be combined and generalized to become useful knowledge” (CP 5.607). This implies perceptual judgment, in which percept is put into perspective and generalized. Logically, the class in the ten-fold classification corresponding to perceptual judgment would be the Dicent Indexical Legisign (VII), the replica of which is the Dicent Indexical Sinsign (IV), the class of percept. Or to be more precise, perceptual judgment would seem to correlate to the relation between the Dicent Indexical Sinsign and the Dicent Indexical Legisign, each determining the other. Hence both the momentary aspect (sinsign) and the persisting aspect (legisign) of perceptual judgment would be present in the fully developed Sign (cf. chapter 3.2.2). Perceptual judgments are concerned only with perceptual facts and not with their ramifications to the subject, i.e. not with subjective experience, for instance. This is in concord with the idea, that subjective experience and other associations come on the stage only in the symbolic classes. And since there are no associations nor subjectivity involved, perceptual judgment cannot be deliberate, which seems to explain “the forcefulness of the perceptual judgment” (CP 7.628).

Nevertheless, whereas as the Dicent Indexical Sinsign is the replica for not only its own legisign but for the Dicent Symbol (IX) and the Argument (X) as well, perceptual judgment is the beginning of “all critical and controlled thinking” as suggested in the first cotary proposition (CP 5.181; chapter 3.2.2). The idea, that inferences in critical thinking are made from the perceptual judgments, does not argue against the idea, that the factual aspects represented in indexical dicents are turned
into subjective understanding in the Dicent Symbol, as associations are attached
to the factual situations, thus (possibly) leading the revelation of the roles of the
participants of the communicational situation in the Argument.

Based on the above, Peirce’s theory of perception seems to neglect some aspects
of perception, which his theory of the Sign, as elaborated here, could take into
account. In particular:

1. The interplay between sinsigns and legisigns could account for the compara-
tive matching of the feeling and percept with earlier feelings and percepts that
have accumulated in experience. Peirce might have meant this when he wrote
about the principle of generalization or the tendency to form habits (e.g. CP
6.21, 6.268, 6.585, 7.515) but the connection is not made explicitly in terms of
sinsign and legisigns.

2. The transition from icons to indices could account for issues of categorization
(in Gärdenfors’s sense) and feature extraction, issues apparently neglected by
Peirce.

3. The two-forked route to the Dicent Symbol (IX) and the juxtaposition
between the factual but un-subjective representations of object in the Dicent
Indexical Legisign (VII) versus the qualitative and subjectively associated, but
object-wise incoherent representation in the Rhematic Symbol (VIII) might
correlate to the juxtaposition between “quasi-objective”, factual representation
of object and the subjective or perhaps even emotional impressions raised in
the interpretation of the Object.

4. The last class of Argument (X) could account for complex social relations
through the revelation of subjects participating in the communicative interac-
tion.

5. Finally, the complex relations of the sinsigns and legisigns with the notions of
Representamen and Interpretant, as well as the relation of the legisign with
habits of feeling, action and thinking could account for the relations between
perception, action, and experience.

### 3.3.3 The spatial embodiment of the Sign

The previous chapter argued how the Sign connects the perceivable Object with
habits of action, in terms of Peircean semiotics and the ten-fold classification of the
Sign. This chapter proposes how the ten-fold classification can be thought to relate
to phenomenal (or conceptual) spaces, which connect perception with action for
the subject from actual objects to back to actual objects of the world. The chapter
addresses the spatial embodiment of mind on semiotic terms, and attempts to find
possible compatibilities between some aspects of the current account of semiosis and related cognitive accounts of representing.\(^7^8\)

To recall the four notions of embodiment of mind as summarized in chapter 3.1.3:

1. **Ontological embodiment**, according to which there is no autonomous faculty of reason, or superphenomenally metaphysical mind as an independent entity;

2. **Implemental embodiment**, maintaining that there is a representative mechanism (such as the nervous system) that forms the connection between perception of and action upon the objects of the actual world;

3. **Corporeal embodiment**, meaning that the characteristics of the bodies that host the representative systems, and their relations to their environments evolve and change, thus effecting the representative system and its representations; and

4. **Spatial embodiment**, referring to the idea, that the representations operate on spatial terms, so that (relatively) universal and particular representations of qualities, objects and concepts can be thought of as dynamic constructs of spaces and points in spaces.

While the focus is on spatial embodiment, some references are made to the other three kinds of embodiment (see chapters 3.1.3 and 2.2.5). In particular, the embodiment of mind is approached in terms of the six transitions of the ten-fold classification of the Sign (A through F), as explained in chapter 3.3.2 (see also figures 28–30 and 32). To recapitulate, the six transitions are those between:

A. the Qualisign and the three Sinsigns,

B. the three Sinsigns and the six Legisigns,

C. the three Icons and the four indices,

D. the six Rhemes and the three Dicents,

E. the four indices and the three Symbols, and

F. the three Dicents and the Argument.

**A: Sinsigns manifest representations of particular qualities.**

Since the Qualisign is a First in all respects, it can “only form a sign through being actually embodied” (CP 2.245). As noted earlier, being a First in all respects entails that a Qualisign is a possibility on all three accounts: it is a possibility for the actual existence of the Sign in itself, a possibility for the representation of the Object in the Sign, and a possibility for the interpretation by the interpreting subject.

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\(^7^8\) Some of the main points of chapter 3.3.3 have been published earlier as Ojala 2008.
While the Qualisign, being a quality, is phenomenally a “mere possibility”, there is no reason to eradicate it as unnecessary or to neglect it. A Qualisign is not any quality, but a quality that is a Sign (CP 2.244, 2.254). Consequently, this character of Qualisign as a possibility for signification points to the idea, that semiosis is possible to begin with (thus rejecting scepticism or denial of semiosis). In the naturalist perspective this can only lead to the idea of ontological embodiment of the mind. The ontological embodiment cannot be described only by negation of the autonomous faculty of reason or denial of the metaphysical mind. Part one discussed the main means of how naturalist pragmatism attempts to overcome the mind–body problem by relying on the interaction between the organism and its environment as a basis for signification. The process of interaction both as a causal process between the organism and other actual objects, and as inquiry by the subject in her environment operates by virtue of the corporeal embodiment, according to the naturalist pragmatism. Already through the hard facts, interaction provides the subject-organism with the object structure of the actual world. But a Qualisign needs to be *manifested* in order to contribute to semiosis. This leads to the idea of implemental embodiment.

In terms of implemental embodiment, the Rhematic Iconic Sinsign can be regarded as the first *actual* level of representing. Within the trichotomy of the Sign in itself, the Rhematic Iconic Sinsign is a Second, a Sign of actual existence, as opposed to the Firstness of the Qualisign. Due to the causal relation between the organism and other objects, some of the characteristics of objects are sensed. The characteristics—or qualities—do not actually exist, only the objects of their origin always exist and constitute the spatiality of the actual world.79

In natural organisms with sensory abilities, the causal relations between the organism’s sensory mechanisms and other actual objects produce instances of neural activity thus imperfectly transforming the qualities of actual objects to feelings of qualities. Although research certainly continues, modern sensory physiology, neurophysiology and neuropsychology provide an abundance of theories supported by empirical and clinical evidence as to how this embodiment takes place in natural semiotic systems, i.e. what and how various characteristics of different dynamical Objects conveying the qualities are transformed into elementary neural representations by the sensory organs.80

79 Even in cases of paradoxes, hallucinations or dreams, there is some kind of actual object that causes the sensation, be it a transformation or distortion of objects so as to convey the unusual setting of qualities, a chemical or other ingredient effecting the representative system, or a natural part of semiosis.
80 There is no reason to get too involved here with the nervous (or any other) implementation of the representative systems in this context. Obviously, the mechanisms of operation are different in various sensory systems, and in each, the mechanisms of transformation define the limits, resolution and accuracy, if not verisimilitude, of the representation. These are, in part, the constraints that
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In spatial terms, this transition can be thought of as a tensor operation (see e.g. Churchland 1992, 446–449), an imperfect, limited transformation of the distributions of the qualities from the coordinate system of the actual characteristics of objects to the coordinate system of the sensory signals. Nevertheless, this is only the beginning of spatial embodiment, in the sense understood here.

B: Sinsigns are points in the spaces of legisigns.

There is a dynamic interplay between sinsigns and legisigns, in that each legisign signifies only “through an instance of its application” (CP 2.246, also CP 8.334), that is, through a sinsign that is a replica of the legisign. In its character as a law, legisign is established and modified by its instances, and the instances cannot signify by themselves without the referral to the law that governs them (see e.g. CP 1.23–26). As general types, the legisigns are yardsticks for the comparison, measurement and judgment of particular sinsigns.

As noted, spatial embodiment of mind is here understood as the idea, that the representations operate on spatial terms, in that (relatively) universal and particular representations of qualities, objects and concepts can be thought of as dynamic constructs of spaces and points in spaces.

I suggest, that the relation of sinsigns and legisigns is a spatial construct, in such a way that legisigns are phenomenal spaces in which sinsigns are points. Some of these spaces are simple, others are more complex and elaborate, some are metric and categorized, some are not, and some of them are integrated and associated with other spaces. Hence, the relation between sinsigns and legisigns is a relation of mutual definition.

Consequently, the spatial characteristics of the legisigns would correspond to the quality spaces and other conceptual spaces in the sense described by Gärdenfors (2000; see chapters 3.1.2 and 3.1.3). The differences between Gärdenfors’s notion of spaces and points pertaining to qualities, properties and concepts seem to agree with the differences between the semiotic notions of legisigns and sinsigns. However, further discussion is required to determine exactly how Gärdenfors’s spatial notions of qualities, properties and concepts might be congruent with the six legisigns.

In neural vocabulary, in turn, the natural or artificial sinsigns seem to correspond to the instances of natural or artificial neural activation, which shape the patterns of synaptic connections and their weights, that “are usually regarded as encoding the system’s knowledge” in connectionist systems (Smolensky 1988, 1). Reciprocally, the result in the internal determination of the immediate Object, and, to a degree, the fallibility of the representation.
instances of neural activation are transmitted based on synaptic connections and weights, which again seem to correspond to legisigns.\textsuperscript{81}

As understood here, legisigns are necessary for mind and imagination. As legisigns account for the persistence of representations, they enable the subject-organism to rely on semiosis. Once objects and associations become involved, and the communicational situation is revealed, the representative character of legisigns and their means of estimating future situations by virtue of their character as a law comes close to what is here understood by imagination (see chapters 1.2.3 and 1.2.5).

C: Icons are processed to indices.

Chapter 3.3.2 introduced a simple model of proto-semiosis and a model of fully developed Sign. An organism of the former kind is capable of only “direct coupling” of perception to action and unable to fully represent. In a subject-organism of the latter kind, both the relation of the Sign to its Object, and the relation of Sign to its Interpretant are fully developed. In the ten-fold classification of the Sign, the pivotal distinction between the models is in the transition from icons to indices. In icons, the relation of the Sign to its Object is only a possibility, while in indices, it is an actuality. In the context of thought-signs, this implies that in indices the Object of the Sign becomes actually represented as an object. This seems to agree with Peirce’s description of “a real connection” between an index and its Object (see CP 5.75, CP 2.286–287).

In order to represent the perceived features of an object as an object, it is first necessary to select the separate features attributable to the particular object from the immense, continuous stream of all perceived features, and, second, to integrate the selected features in a coherent way. These tasks comprise the feature extraction, feature detection or feature selection problem of various sensory modalities (see e.g. Broadbent 1958; Treisman 1964) and the binding problem of unified experience in psychology and other mind sciences (see e.g. Treisman and Gelade 1980; Damasio 1989; Treisman 1988; 1996; Revonsuo 1999; Zimmer, Mecklinger and Lindenberger 2006).

It seems that, in terms of implemental embodiment, the transition from icons to indices is the semiotic counterpart for the feature selection process. The transition from the Rhematic Iconic Sinsign (class II) to the Rhematic Indexical Sinsign (class III) corresponds to the transition from the unselected instances of neural activation at an instance to those that have been evaluated useful enough to pass the “feature gate” of perceiving. Similarly, the change from the Rhematic Iconic Legisign (class

\textsuperscript{81} Also, one could foster the idea of sinsigns (implemented as instances of neural activation) somehow being related to short-term memory, and legisigns (implemented as synaptic weights) to long-term memory, in the tradition of Broadbent (1958).

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V) to the Rhematic Indexical Legisign (class VI) corresponds to the change from the rudimentary patterns of synaptic connections involved in the direct sensorimotor coupling to the more sophisticated and more extensive network patterns.

Overcoming a critical threshold (or set of thresholds) is required of any instance of neural activation in order for it to have a real effect in pragmatic terms. The advantage of representing only the selected features is that rising above the chaotic noise of the iconic signs allows for efficient forming of a representation of the Object. By virtue of the object representation, action upon objects can be targeted more exactly once the essential features are selected. Also, it may be that associations and other rewarding cognitive processes are practically possible only between (a relatively limited amount of) selected features and features of other Signs as opposed to unlimited streams of perceived features. The associations between features also seem beneficial, regardless of whether they constitute unified representations of Object or not.

In spatial terms, the difference between the Rhematic Iconic Sinsign as a point in the space of Rhematic Iconic Legisign, on the one hand, and the Rhematic Indexical Sinsign as a point in the space of Rhematic Indexical Legisign, on the other, seems to be in the categorization. This entails that the spatiality of the iconic signs is topologically structured, but not metric. Namely, the relation of an Iconic Sinsign within the accumulated aggregate of the Iconic Legisign is a matter of such issues as betweenness, continuity, connectedness and dimensionality, and of homeomorphism. The process of selecting or filtering matches the employment of a metric on a phenomenal space, creating conceptual distance between particular Indexical Sinsigns within the Indexical Legisign (as the law governing its replicas). The metric quality of the rhematic indices tessellates the iconic spatiality into categories, as described by Gärdenfors (2000, see chapter 3.1.2).

In brief, then, it appears that the indexical legisigns constitute the categories of qualities, properties and concepts, and the indexical sinsigns the particular instances of the same, in the sense described by Gärdenfors (2000). While the Iconic Legisign already constitutes a primitive conceptual space as “a set of quality dimensions”, the indexical legisigns, by virtue of the categorization based on the employed metric, amount to categorized conceptual spaces.

D: Dicents account for binding.

In binding, the distinct features in different sensory modalities, each carrying clues to the relations of the Object (and to relations between the Object and the subject herself), are combined into a unified experience, in a more or less coherent way.

82 Note that the possible naming of the categories is altogether a different thing.
Within and across each sensory modality, the different features are synchronized. A failure in this process evidently may result in a nonunified experience of the world, and thereby contribute e.g. to psychopathological states. Normally, however, the features conveyed and unified tend to correspond to each other, since the actual world being perceived has the relatively consistent “logic” of causal relations. In contrast, an unexpected situation of the actual world (such as accidents, catastrophes, traumas), or perceived situations not based on the causal relations of the actual world (such as dreams and hallucinations) may yield “illogical” results. The consistency that enables binding is important for the subject-organism, as it provides the basis for an organism’s ability to develop habits and imagination, and thereby a basis for the subject’s logical operation in the world. Hence there seems to be a phylogenetic and ontogenetic as well as a sociogenetic demand (for the sake of succeeding in joint action) for the coherent unification of experience and object representation.

Without going to the detailed dynamics or ways of implementation, Gärdenfors’s (2000) approach to the binding problem was that the conceptual space representing an object is a combination of the subspaces representing the properties of the object. A property, in turn, is a region of one domain, i.e. a region in a set of integral quality dimensions (see chapter 3.1.2). This and other approaches to the binding problem attempt to resolve the “shattered puzzle” (Revonsuo 1994, 250) of how to integrate the selected features, both within one sensory modality and between different modalities, in a coherent way for a representation of the object.

In terms of thought-signs, the transition from rhemes to dicents seems to correspond well with the process of binding. A dicent represents “its object in respect to actual existence”, while “a Rheme is a sign which is understood to represent its object in its characters merely (CP 2.252). In other words, the pre-perceptual process to indexical rhemes is continued by the unification of the selected features in indexical dicents. Hence dicents would seem to consist of combinations of rhemes, coordinated as to contribute to the interpretation of the Sign as an object. In this sense, the Dicent Indexical Legisign would be a combination of the categorized spaces of the Rhematic Indexical Legisigns, and the Dicent Indexical Sinsign, similarly, a combination of the different instances of the Rhematic Indexical Sinsigns which contribute to the same Object.

This seems to be in concord also with Peirce’s notion, that the Dicent Indexical Sinsign is a replica for not only the Dicent Indexical Legisign, but also for the Dicent Symbol and the Argument. Namely, the Dicent Indexical Sinsign, being a Second in all three trichotomies, represents the object in its actuality and is interpreted as an object in its actuality. In other words, in the Dicent Indexical Sinsign, the object is
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represented and interpreted as an object, insofar (and only insofar) as it is an actual object in the actual world, based on Peirce’s description of actuality (CP 1.24):

If I ask you what the actuality of an event consists in, you will tell me that it consists in its happening then and there. The specifications then and there involve all its relations to other existents. The actuality of the event seems to lie in its relations to the universe of existents. A court may issue injunctions and judgments against me and I not care a snap of my finger for them. I may think them idle vapor. But when I feel the sheriff’s hand on my shoulder, I shall begin to have a sense of actuality. Actuality is something brute. There is no reason in it. I instance putting your shoulder against a door and trying to force it open against an unseen, silent, and unknown resistance. We have a two-sided consciousness of effort and resistance, which seems to me to come tolerably near to a pure sense of actuality. On the whole, I think we have here a mode of being of one thing which consists in how a second object is. I call that Secondness.

Hence, the Dicent Indexical Legisign seems to be the Sign of the basic-level categories in the sense described by Lakoff and Johnson (chapter 3.1.2). And as noted in chapter 3.3.2, it seems that the transition to dicents accounts for filling in the missing parts and gaps with representations that appear to be logical in each situation. Depending on the familiarity with the object and the context, the sensory modalities need not be in full use for object representation: We understand a black-and-white picture of an apple as a picture of an apple even without the color information. Thus, the built-in engine for the construction of metaphors, by virtue of which sound, for instance, when perceived, can stand for a fully-experienced situation.

E: Symbols account for subjective experience.

Here, the term ‘symbol’ refers to quite a different concept than it traditionally has done in the mind sciences. In the early cognitive science, and especially in the so-called good old-fashioned artificial intelligence (GOFAI), cognitive operations were believed to be formal operations on symbols with little or no regard to what those symbols mean. During the past decade or two, deserved critique has been presented towards the rigid idea of mind as a symbol manipulating computer, among others by Lakoff and Johnson (1999), Gärdenfors (2000), and Määttänen (1993a). The pragmatist notion of the Symbol, Peirce being loyal to the scholastic tradition, relies more on the original idea of “throwing together” the Sign with its associations and conventions (see chapter 3.3.2).

In the indexical sinsigns, the representation of the Object reached its actuality. Now, at the level of symbols, there are no sinsigns. As noted, this is no wonder, since there is nothing to be added to the relation of the sinsign with its particular Object:
the Object is what it is at that instance happens to be, it is represented as an object. In contrast to that, what there is to be added, is the relation of the Object to interpreter’s other (earlier) experiences that do not contribute to the representation of Object as an object, but that are nevertheless connected with the Object, by means of law, in the Peircean sense. Symbol as “habit is natural or conventional” (CP 2.307), that is, the law may be “acquired or inborn” (CP 2.297). The relation between the indexical legisign of the Object and the associated legisigns may be caused by arbitrary contract (as in alphabets in their relation to phonemes), simultaneous pairing (as in classical conditioning), habitual convention (as in spoken words and their denotations), or other means that have previously joined the experiences together.

Consequently, in terms of implemental embodiment, the functional correlates that contribute to Symbols might be found in the complex operation of the cortical association areas of the nervous system. In spatial terms, the transition to symbolic level draws a line between those subspaces of a concept that have to do with the actuality of the object and the subspaces that are associated with the representation of the actual object based on subject’s accumulated experience. Hence, in the representation of ‘apple’, for instance (see chapter 3.1.2), the domains of color, shape, texture, taste (and even sound), which represent the perceived features of the Object, would not be associated in this symbolic sense, but would correspond to indices. In contrast, the domains of fruit and nutrition, which have been established, not on the grounds of perceiving the object itself, but by learning of the object indirectly, would be added to the representation of the Object at the symbolic level. The same holds for the commercial values and affiliations of apple with knowledge, wisdom, sin etc.—all the connotations of apple, beyond the apple itself as a factual object in the category of apple, beyond ‘apple’ as a basic-level category (see chapter 3.1.2). It should be stressed that in both the current view, and in the theories of cognition that underwrite to the embodiment of cognition (such as Lakoff and Johnson, Gärdenfors, or Määttänen), also the associated representations (such as the concepts of wisdom or the commercial values of apples) are, despite their possible complexity, understood as being (spatially) embodied.

According to the pragmatic maxim, the object’s conceivable effects, that have practical bearings, are our conception of the object (see e.g. CP 5.2; chapters 1.2.6 or 2.1.1). Since the adaptation of the semiotic subject-organism to the everchanging environment is the key driving force of semiosis, the most important associations are presumably those that relate the represented object with the action (potentially) taken by the subject or affecting the subject. In other words, the most essential associations are those that contribute to subjective experience, i.e. to one’s experiences of oneself in relation to other actual objects, relating to the various aspects of survival,
“shown in its rudimentary forms of pleasure versus discomfort, and described in its more refined forms as examples such as ‘feeling warm’, ‘foul smell’, ‘discomfort’, ‘relief’, or ‘force’”, as described in chapter 3.1.2. In short, the symbols account for subjective experience.

Hence, as we approach the conclusion of the ten-fold classification, the participation of subjective experience in the development of probably every thought-sign agrees with Peirce’s idea that “the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign” (CP 5.314).

F: The argument.

Subjective experience is requisite for the last transition, the maturation of the Sign into Argument. Earlier, Argument was described as “the acknowledgement of the semiotic situation”, estimating and understanding of the ramifications of (habits of) action on the subject herself and on other subjects. A thorough revelation of the semiotic situation includes understanding of the roles of the participants in communication. Communication is possible without that revelation, but it certainly improves the chances of successful praxis, as noted in chapter 3.3.2.

From that perspective, the Argument can be thought of as an extended subjective experience, in which the conceptions of self and others have been matured. In terms of spatial embodiment, the circle is about to close in a way, as the Argument necessarily involves objects, or rather, habits of action upon objects. Namely, the acknowledgment of the semiotic or communicational situation entails realizing that the means of interaction with the environment and with other subjects are limited to action upon available actual objects, and that the ramifications of action depend on how the manipulation of the actual objects are perceived and by whom.

In this context, there is no point in hazarding a guess on possible implemental embodiment of the Argument. Also, as far as the phenomenal spaces are concerned, it appears that structurally, there is not much new, in comparison to the Dicent Symbol. The difference between the Dicent Symbol and the Argument in the spatial embodiment is apparently in that the conceptual spaces that are associated in the Argument include those constituting the representations of self and others, i.e. the functioning participants of the communicational situation. The communicational situation necessarily takes place in the actual world, which takes us back to actual objects and closes the circle. The Object of the Sign has now been fully represented and interpreted. The habits of feeling, action, and thinking have been updated with yet another phase in inquiry, driven by the irritation of doubt that demands reaction, or, as the subject is now capable of deliberate thinking, change in the habits of action.
A remark on tools.

Määttänen (1993a, 120–) observed, that tools are external signs as follows (see also chapter 3.2.4). Depending on their physical properties, certain objects in the actual world can be used to affect other actual objects, whether inanimate objects or cognizant subject-organisms. The potential effect of action is embodied in the tool and there is an objective reference relation between the tool and its effect. If the relation between the tool and its effect is revealed to the subject, the tool becomes an external sign for its effect: a hammer stands for the potential action of hammering. Consequently, “it classifies objects to those that can be hammered and to those that cannot be hammered” (ibid., 121).

Consequently, a tool as a sign becomes “a medium of communication” (ibid., 123). The user of the tool may have another subject as the target of the tool. From this viewpoint, Määttänen develops his third model, the l-model, to account for the (verbal) symbol function and language game. However, the instrumental use of external signs as tools in order to affect other subjects needs not be limited to verbal language. For instance, a baby can use crying in order to achieve a state of affairs where a parent is present. In this case, sound is used as an external sign, as a tool to affect the parent’s habits of action. It does not matter whether this is done knowingly or not. Also, using tools to communicate or to express needs in this manner as well as the use of sound as the tool are evidently learned very early in life and have a tremendous impact on the later development of the subject (see e.g. Kohut and Levarie 1950; Spitz 1965; Winnicott 1982/1971, 1982/1960). Regardless of that, this kind of use of tools with another subject’s mind (or the own mind), since the goal seems to be a key factor in the communicative ability of sharing meanings.

A remark on metaphors.

As noted in chapter 3.1.2, according to the metaphor theory of cognition, complex thought processes are based on simpler, spatially embodied interaction by means of primary metaphors, and complex metaphors constructed of the primary metaphors.

While the complete representation of any Object involves all ten classes of Sign, it seems that especially the complex metaphors transpire by virtue of the symbolic associations, as understood here. If “a metaphor expresses an identity in topological or geometrical structure between different domains” (Gärdenfors 2000, 176; see chapter 3.1.2), it follows that the spatial embodiments of Signs participating in a metaphor are somehow structurally similar.

It appears that the ability to construct metaphors is not accidental or somehow suddenly emergent in the “higher” levels of signification. It might be too much said
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that there would be an innate metaphor engine in any form of semiosis, but there are nevertheless several factors in the development of the thought-sign through its ten classes, that seem to prepare way for the construction of metaphors.

First, due to the categorization process (transition C from icons to indices), any member of a category may be interpreted as a representative of all instances of the category—not necessarily only the prototype of the category (if there actually is one). Thereby an instance of the category may end up standing for the lot of the category.

Second, as already mentioned, the binding process (transition D from rhemes to dicents) can be assumed imperfect, in the sense that all possibly available rhemes are not necessarily needed for a unified representation in a dicent. If we do not need all the sensory modalities or all perceived features possibly available to construct a complete representation of a particular Object, the question arises: How much is needed? Is the sound of an apple being eaten enough to evoke the right Dicent Indexical Sinsign as a replica of the Dicent Indexical Legisign that represents the category of ‘apple’? As mentioned, a black-and-white picture certainly is, and so might the scent of an apple be.

Third, if the associative character of the symbols is driven by the pragmatistic need of adaptive inquiry, it seems that the natural quest for the efficiency of representing would favor associative structures that are topologically or geometrically similar. The process of categorizing yields finite sets of discrete representations, which evidently simplifies remembering, reacting, decision making etc. Likewise, it seems very efficient to represent complex situations by sharing the existing topological or geometric identities with simpler structures, that is, by means of metaphors.

All in all, there seems to be an inherent tendency for the abstraction of representations in the continuum of the ten classes of Signs, as more and more means are available that may distance the representations from the Firstness of qualities and Secondness of the hard facts of particular actual objects. This, however, does not need to mean that the representations would finally be somehow severed from the practicalities of the actual world. Abstraction simply reduces the complexity of the encounters with the actual world, and seems therefore evolutionarily justified. Recall that in the Peircean perspective, Thirdness always involves Secondness, and Secondness involves Firstness. In that sense, both the esthetic and the practic aspects are always necessarily present in thinking. It appears, that the ability of representing in different levels from icons to symbols and from rhemes to the Argument, is what accounts for better chances of diversified habits, and thereby to better chances of adapting to living in changing environments.
3.4  Summary of the second premiss: the logical connection of semiosis and space

This section contains a summary of the major premiss of this book: how mental processes are spatially embodied. Building on the framework of naturalist pragmatism, the third part has presented an abductive account of how semiosis connects perceivable objects with action. The presented Peircean view of mind as a spatially embodied semiotic system seems to agree quite well in its main points with both the views stemming from “the morphological turn” of cognitive sciences and philosophy of mind, and with the common contemporary understanding of the neural implementation of mind as a dynamic representative system.

The current pragmatist conception of space is a thoroughly relativist one. Space is a conceptual tool for better comprehension of the world. Spatiality consists in perceived and experienced relations. A space is a conceptual structure constructed dynamically from instances and their relations. A space consists in instances as its points, and reciprocally each instance is defined by its relation to other points, thereby taking its position in the space. Spatial structures are used to grasp both instances and categories of objects, characteristics of objects and sets of objects. Based on both sensory perception and motor action, the actual world is conceived to contain objects and their characteristics in certain relations. However, the object structure of the world is revealed already through the causal interaction between the organism and other objects in the actual world.

Space is a means of semiosis, of the signifying operation which involves the interplay between the actual world and the representations pertaining to it. Metaphors provide the means for complex representations by virtue of identities or similarities shared by the spatial structures of the source and target domains (Lakoff and Johnson 1999). Metaphors express identities or similarities between structures of different phenomenal spaces (cf. Gärdenfors 2000, 176).

In the framework of naturalist pragmatism, Peirce’s phaneroscopic categories of Firstness, Secondness and Thirdness provide the basis for the study of semiosis. Here, the focus has been on thought-signs and their constitution, that is, on theoretical semiotics and the development of the Sign as representation, as opposed to applied semiotics and the different usages of the Sign. The ten-fold classification of the Sign, sufficient for a contemporary theory of semiosis, results when the phaneroscopic categories are applied to the tripartitions of the Sign in itself, the Sign in its relation to its Object and the Sign in its relation to its Interpretant. The ten-fold classification is displayed better as a three-dimensional model than a two-dimensional one.
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Peirce’s theory of perception, while dating from the early days of psychology, may provide support for a contemporary Peircean theory of semiosis. However, what is more important, is that support for the current semiotic view of spatial embodiment of mind is found in the theories of mind that subscribe to the “morphological turn” in the cognitive sciences and philosophy of mind. Peirce’s theory of perception, while lacking in certain respects, nevertheless fits in the semiotic theory.

Close to Määttänen’s s-model, a system with a “direct coupling” between perception and action is capable of rudimentary representations, in which the Sign in itself has evolved into a Thirdness, but neither its relation to its Object nor its relation to its Interpretant are fully developed. Instead, the representation of the Object as an object and its interpretation in terms of its effects with conceivable practical bearings are mere possibilities, Firsts.

In full development of the Sign, the semiotic wedge splits the direct coupling and opens avenue for representation of the Object as an object and for interpretation of the Object by a subject. A fully developed thought-sign involves all ten classes. A main point of part three is that the current view of the fully developed Sign has noteworthy correspondences with the morphological theories of mind and with Gärdenfors’s idea of the spatial embodiment of the mind. Furthermore, it seems to correspond well with the knowledge of the (natural) neural networks as implementations of representative systems.

The potentialities of representing Object in the Sign (i.e. qualisigns) are manifested in sinsigns. The sinsigns depend on legisigns as the laws that govern them. Reciprocally, legisigns are constantly constructed and updated by sinsigns, the replicas of the legisigns. The categorization of icons into indices simplifies and improves the efficiency of representation. The unification of rhemes to dicents allows for interpretation of the Object as an object, which enhances the possibilities of action upon actual objects. Symbols consist in indices with associations, which in turn opens avenue for subjective experience. Finally, the Argument is an extension of the associative character of the symbols in the sense, that the participants of the communicational situation and their roles in semiosis are revealed.

Between the ten classes, there are six transitions. The simple model of direct coupling involves only the three icons (and thereby only rhemes): the Qualisign as the possibility of semiosis, the Iconic Sinsign as the manifestation of the Sign, and the Iconic Legisign as the law that governs the sinsign. Hence there are only two transitions between the classes of signs in the simple model. The causal relations between organism’s sensory systems and (other) actual objects compel the first transition: manifestation of the possibilities of the Qualisign in the feelings of quality of the Iconic Sinsign. The dynamic relation of the Iconic Legisign and the
Iconic Sinsign corresponds to that of a space and a point in the space, the initial conceptual (or phenomenal) space.

In spatial terms, the semiotic rupture takes place by means of the remaining four transitions from simpler spatial structures to more elaborated, more complex ones through categorization, unification, and affiliation or association of the phenomenal spaces. Each of the six transitions between the ten classes have their correspondences in cognitive theories, such as feature selection, binding, and association.

This view of the Sign also calls for some reconsiderations of the semiotic triangle. For instance, the immediate Object and the immediate Interpretant (or emotional Interpretant) are regarded as being fused into each other in the ten classes. In addition, the conceived role of habits (of feeling, action and thinking) as Representamens makes a separate notion of collateral experience unnecessary. The need for a separate notion of Representamen is also questionable, since each Representamen\textsubscript{n} can be thought of as Interpretant\textsubscript{n-1}, that is, as the habits pertaining to the Interpretation of the Sign\textsubscript{n}.

The semiotic process is spatially embodied, from the actual space to phenomenal spaces and back to the actual space, seemingly as an “endless series” of Objects, Signs, and Interpretants (CP 1.339, 8.225fn10). Semiosis is cyclic, or rather, helical. Subject’s interaction with the actual world and with other subjects residing in it can be thought of as operating by means of relations between the objects, features of objects and sets of objects, both in the actual space and in the subject’s phenomenal spaces.

Consequently, praxis as instrumental action with an intention of affecting some subject’s habits also operates by means of spatiality. The topic of the fourth part of this book is how this takes place in music.
4 Music and musical composition process are spatially embodied

Parts two and three presented the minor and major premisses of the syllogism that constitutes the general form of this book: how is it, that musical signification process is a mental phenomenon, and how is it, that mental phenomena are spatially embodied.

Let us begin by recalling the main points of the minor premiss. Outlining a pragmatist conception of music, part two described music as real, communicative, representative, useful, embodied, and non-arbitrary. Music is real in the sense, that it is a process of interaction involving subjects as organisms and sound as actual object. Music is considered a part of subject’s existence, as in the process, subject estimates and designs hypothetical future situations, experiences them, and acts accordingly. The epistemic connection between action, sound, and perception is well-established in ways similar to the ways in which organism generally interacts with the actual objects of the environment.

Music is communicational by virtue of both poiesis and praxis. Musical praxis is action that effects the subject’s or others’ experience by possibly causing an experience (see chapters 1.3.3, 1.3.4 and 2.2.2). Subordinate to praxis, musical poiesis is the action pertaining only to the making of the sound. Whether an experience, or not, the experience is compelled by the hard facts of sound. By shaping and reshaping, the sound and the ways of experiencing it may be adjusted towards wanted situations. Music is representative in the sense, that the sound may be perceived as standing for actual or possible situations.

Consequently, music is a useful process. Situations in music may be experienced as if they were situations of actual life. Music may provide a safe testing ground for real-life and virtual situations, which enhances the possibilities of adaptation to the actual situations challenging subject’s existence. In this sense, instead of existing for the sake of itself, music appears to be a form of inquiry, akin to play (see chapter 2.2.4).

In addition to the role of sound as the object compelling the experience, it is specific to music that it is non-arbitrary. Of the different notions of embodiment, the corporeal embodiment is central for musical semiotics: musical representation operates fundamentally in virtue of isomorphisms or analogies, as opposed to being arbitrarily negotiated, as is the case with verbal language. Isomorphic character of musical representation suggests that spatiality is an essential concept for analysis of musical semiosis. (See part two and the summary section 2.4.)
The major premiss was outlined in part three and summarized in the previous section (3.4). To review: the current pragmatist conception of space is a thoroughly relativist one. Spatiality consists in perceived and experienced relations. A space is a conceptual structure constructed dynamically from instances and their relations. Whereas a space consists in instances as its points, each instance is reciprocally defined by its relation to other points, thereby taking its position in the space. The spatial structures are used to grasp both instances and categories of objects, characteristics of objects and sets of objects. Based on both sensory perception and motor action, the actual world is conceived to be comprised of objects and their characteristics in certain relations. However, the object structure of the world is revealed already through the causal interaction between the organism and other objects in the actual world, regardless of sensory capabilities.

Space is a means of semiosis, of the signifying operation which involves the interplay between the actual world and the representations pertaining to it. Metaphors provide the means for the complex representations by virtue of identities or similarities shared by the spatial structures of the source and target domains (Lakoff and Johnson 1999). Metaphors express identities or similarities— isomorphisms or analogies—between structures of different phenomenal spaces (cf. Gärdenfors 2000, 176). (See part three and the summary section 3.4.)

In this syllogism in the mood of Barbara, the validity of the inference from the premisses to the result is of no concern. If the premisses hold, the result holds. This fourth part presents the result of the syllogism. As a consequent of the second and third parts, it argues for the spatial embodiment of musical semiosis. It discusses various issues of musical spatiality through a selection of relevant studies (section 4.1), and examines what spatial embodiment entails in musical signification and in musical praxis (section 4.2), in the current framework of naturalist pragmatism.

Spatiality in musical semiosis is considered a subset and a special case of general spatiality in semiosis. It is a subset in that the general semiotic process contains all the necessary elements and features of musical signification, and as a process, musical semiosis is inseparable from semiosis at large. At the same time, musical semiosis is also a special case of general semiosis, in that it brings into play elements and features of general signification in its own unique ways of representing imagined, hypothetical situations for interpreting and experiencing, mediated by sound. In this way, music may be beneficial for the subject’s adaptation to and operation in the world, and thereby to the organism’s survival in the actual world and to the well-being of the subject’s society. These signifying processes can be understood to operate by means of spatiality and by virtue of metaphors.
4.1 Space in music – music in space

The introduction to this book gave two opposing examples of conceptions of musical spatiality, one by Machlis (1955), the other by Brant (1967). The former typified the conceptions of musical spatiality as “space in music,” when Machlis attributed musical space to the combination of melody and harmony. In Brant’s conception of musical spatiality as “music in space,” the “space factor” dealt with issues such as performer placement and sound projection in the actual environment. As the examples suggest, there are those who conceive musical spatiality as referring to the spatial aspects of subject’s perception and experience of musical sound, and there are those for whom musical spatiality refers to the spatial aspects of the sound as the actual vehicle of musical communication.

Unfortunately, the case is not as simple as the juxtaposition above might imply. The apparent bipolarity between the phenomenal spaces and the actual space is but one issue in the inquiry. The concept of space has proven flexible enough to be used in a variety of meanings also in the context of music. When a multitude of writers have approached the topic of musical spatiality from their own, sometimes very idiosyncratic standpoints, it is not surprising, that there is no common agreement on what is meant by space in the context of music. Consequently, it seems that in discourse on musical spatiality, never shall the two trains of thought meet.

In addition to the complexity of the term ‘musical space’ alone, we are faced with an abundance of terms such as acoustic space (e.g. Schafer 1991; Tohyama, Suzuki and Ando 1995), auditory space (Blauert 1983/1974), composed space (Smalley 1991), compositional space (Morris 1995), conceptual musical space (McDermott 1972), diffused space (Smalley 1991), external space (Smalley 1997), feature space (Toiviainen, Kaipainen and Louhivuori 1995), headspace (Smalley 1991), implied space (Emmerson 1998), informational space (Drew 1968), information-sound space (Barrass 1996), instrumental space (Emmerson 1998), internal space (Smalley 1997), listening space (Smalley 1991), literal space (Emmerson 1998), logical space (Morgan 1980), metaphorical space (Emmerson 1998), methodological space (Morton 2005), multidimensional music space (Juhász 2000), notational space (Morgan 1980), parameter space (Feiten and Behles 1994), personal space (Smalley 1991), real space (Emmerson 1998), solution-space (Di Scipio 1995a), sound space (Barrass 1996), sonic space (Wishart 1996; Emmerson 1998), spectral space (Smalley 1986), state space (Goguen 2004), superimposed space (Smalley 1991), virtual acoustic space (Wishart 1996) and so on. The confusion is augmented when many terms refer to the same concept (e.g. natural, physical, empirical, external, extrinsic, acoustic, and sound space all referring to the actual space). On other occasions a single term may
be used for altogether different concepts (musical space). Furthermore, the list could be continued with space terms pertaining to musical parameters such as pitch space (Lerdahl 1988, 2001), timbre space (Wessel 1979; Grey 1977), melody space (Todd 1992), rhythm space (Desain and Honing 2003), and with other space-related terms such as dimension, axis or distance. Finally, the terms of musical spatiality do not necessarily translate directly from one language to another. It seems that, in so far as words express thoughts, music as a thought process is saturated with spatiality.

Maja Trochimczyk (Harley 1994a) presented an extensive history of conceptions of space in music, with an emphasis on recent Western art music. According to her, the theories of musical spatiality in the 20th century can be divided into four large thematic areas (Harley 1994a, 44–98, 338–341):

1. Theories in which space is “perceived while listening to music without noticing the location of sounds in auditory space” (Harley 1994a, 338). This thread of ideas, potentially leading to ideas of disembodied musical space, makes its way from Mersmann (1926) and Kurth (1947/1931) to Lippman (1952), Zuckerkandl (1956) and Clifton (1983), among others.

2. Theories which view space as “the epitome of stasis”, as suggested by e.g. Adorno (2003/1948), McDermott (1966) and Morgan (1980). These theories tend to contrapose musical space with musical time, and at times draw critical if not judgmental conclusions as to the prevalence of the two in different styles.

3. Theories which equate space with pitch, either in terms of pitch set or as an “analogue to the spatial dimension of height” (Harley 1994a, 339), but nevertheless as constituting a two-dimensional spatiality with time as its counterpart. While apparently utilitarian in terms of the close connection with Western common practice notation and handy visualization of musical analyses, for instance (see e.g. McDermott 1966, Bernard 1999), the difficulties arise from the alliance of the notion with “Western art music” (Harley 1994a, 340) and, within the Western tradition, from conceiving both pitch and time as simply one-dimensional. Consequently, this problem has given impetus to a generalization from two-dimensional models to multidimensional models in music, and to the employment of mathematical tools in musical composition and analysis (see e.g. Cage 1973/1961; Boulez 1971/1963; Xenakis 1992/1971).

4. Theories which associate musical space “with the space in which music is performed and heard” (Harley 1994a, 341; e.g. Brant 1967). The electroacoustic traditions have expanded this notion of musical space from the traditional, “enclosed space providing the acoustic environment for music” (Harley 1994a, 341; Smalley 1991).
Clearly there are many more examples to be found for each thematic area in addition to those given by Harley and listed here. Instead of adding to the variety of examples, it may prove more fruitful to try to elaborate on the thematic areas and to extract issues important for conceiving musical spatiality, irrespective of the conceptual clashes between the differing notions of musical space. It is also to note that the thematic areas by Harley are not mutually exclusive, nor did she claim they would be.

The first thematic area, or the question I would like to call the acousmatic dilemma (cf. Schaeffer 1966, 90–99), and the associated question about the disembodiment of musical space in terms of its separation from actual spatiality, deserves critique from the viewpoint of naturalist pragmatism. Also, the topic of the relation between musical time and musical space is known to be controversial, not the least in the sense that musical time and musical space are separated in some opinions, and joined into one spacetime in others. This disagreement is considered here as being akin to disagreements between absolutist and relativist conceptions of actual space concerning the roles of space and time. As far as how the spaces are structured (pitch space being the prime example here), and what dimensions (if any) constitute musical spaces, pinions are widely divided and the ideas by experts often do not meet. In short, there is no strict contraposition between “music in space” and “space in music”. The thematic areas suggested by Harley are more or less intertwined, and deciphering their mutual relations calls for further study in any case, as the whole conception of musical spatiality appears to warrant investigation.

4.1.1 Studies on musical spatiality

The cornucopia of space-related terms and heteroglossia of spatial concepts in musicological discourse are present in the vast and motley literature on musical spatiality. Writings on musical spatiality have been published by both musicologists more or less concerned with spatiality, and by musicians and philosophers reflecting upon the issue of musical space, whether assuming the roles of composers, performers, or audience. The research reports and the reflections address the issue of musical spatiality either explicitly, or more often by implying certain kinds of conceptions of musical spatiality. This chapter takes a brief look at some of the main sources in this respect. The focus here is on those works that are explicit in examining the concept, and which contribute to the extraction of key issues of the concept of space in the context of music. The remaining subchapters of this section probe these writings (and some others) in order to express the key issues of musical spatiality.
Despite (or perhaps due to) the inherent prevalence of spatiality in music and the multiplicity of the concepts, relatively few researchers have explicitly taken up the topic of musical spatiality in a systematic way. From the current perspective, the recent major sources are the doctoral dissertations by Edward Lippman (1952), Vincent McDermott (1966), Maria Anna Harley (1994a), and Arnie Cox (1999). These focus systematically on the topic of musical spatiality, each from a different perspective. The four dissertations are backed by the discourse on musical space carried out in Germanic musicology during the 1920s and 1930s (e.g. Kurth 1947/1931 and Wellek 1963/1934).

Edward Lippman and the question of intrinsic musical space.

Edward A. Lippman’s work (1952) is divided into three parts. The first deals with “space of performance”, i.e. with sound in the actual environment and its perception especially in terms of localization. The second part contemplates “intrinsic musical space,” and, as Harley put it, “attempts to describe music ‘as heard’ – in a phenomenological manner, yet without the complex terminological apparatus of phenomenology” (Harley 1994a, 57; cf. Clifton 1983). The third and final part deals with “the relationships between music and various other types of spatial experience and conception” (Lippman 1952, 255) and addresses issues such as synesthesia and the relation of music with dance.

Lippman maintained that, in the “double spatial experience” of music, the experience of “auditory perceptual space” is secondary, but nonetheless part of the “truly dual experience” (ibid., 254). Contrary to the past tradition of merely speculating on the concept, Lippman made a meticulous effort to incorporate the physiological, psychological and acoustic studies of the time into his treatment of auditory space.

Yet, in the second part, psychoacoustic studies are largely disregarded. For according to Lippman (ibid., 112), the primary experience in music “cannot be described in terms of localization and perception”, but is “another spatial experience whose nature is open to question”.

Lippman (1952) used a variety of spatial concepts and pursued ontological justifications for many of them without always unambiguously explaining the concept (see also Harley 1994a, 56–57). The conceptual inconsistencies, e.g. in ‘perception’ and ‘sensation’, tends to impede understanding of the logic behind Lippman’s extensive endeavor. Also, his work is deeply rooted in and limited to the Western perspective of art music. Consequently, he presented musical space as something that pertains to some aspects of music (mostly pitch and volume of the musical sound), but withheld from analyzing the concept in detail. Yet, the main contribution of Lipp-
man’s work comes from the fact that the answers he suggested to the question of
the primary spatial experience in music articulated many issues present (but not
always attended to) in the discourse on musical spatiality both before and after him.
In this respect, his work has been a trailblazer, published quite concurrently with
the drastic developments of the Western art music in the past mid-century (see also
McDermott 1966, 4; Harley 1994a, 57).

Vincent McDermott and the issue of musical space-time vs. time-space.
The greatest part of Vincent McDermott’s dissertation scrutinizes “the spatial
articulation of western music from organum to the present” (McDermott 1966, xx).
The work presents a general theory that Western art music has evolved from
a temporally dominated style to a modern, spatially dominated style. His leading
idea is, that in “the period of time-space” from about Josquin to Wagner, “goal-
motivated direction” is the “basic shaping force” in music, and the temporal flow
in music is metrically persistent and cadence-directed (McDermott 1966, 57–58).
In that respect, musical space is subordinate to musical time. In contrast, in our
period of “space-time,” the “temporal continuity disintegrates under a disruptive
durational articulation,” and “the composer can choose to organize his work around
spatial relations” (ibid., 55). Hence, musical time has become subordinate to musi-
cal space. The transitional period between the two styles “corresponds roughly, on
its earlier side, with the period of change from romantic music to modern; on its
later, however, it stretches beyond the usual text-book division to include com-
paratively recent composers”, according to McDermott (1966, 107).

Unfortunately, the terms ‘space-time’ and ‘time-space’ in McDermott’s usage are
not only confusing, but unnecessary choices. They may be descriptive of one stylistic
shift in one music culture, but not necessarily more than that. More important, for
McDermott (1966), musical space consists in primarily two dimensions: pitch and
time (see chapter 4.1.4). Since he simultaneously contrasted time with space, he
ended up with the concept of musical space referring irreconcilably to (1) atemporal
“pitch relations alone, (2) pitch changes intermixed with duration forming ‘lines,’
and (3) lines conjoined with still other non-pitch elements” (ibid., 52). However,
in an article published a few years later, McDermott expressed a much broader
conception of musical space (1972, 491):

I have found that the spatial image is exceedingly complex and its parts highly
interrelated. Every pitch, timbre, dynamic, every group of tones, every formal
intricacy, every durational emphasis, even every rest—in sum, everything about
a piece of music—contribute in some manner, substantially or only slightly, to
the spatial organization of the work.
The analyses substantiating McDermott’s view of the transition from “time-space” to “space-time” interpret a selection of works plotted on graph paper. For the current endeavor, more beneficial seems the preambular presentation of the topic of musical space, and in particular the suggested principles providing for music’s spatialization: “Objectification of the sound material and disassociation of spatial articulation from a compelling temporal progression” (ibid., 183). With this, McDermott (1966) seems to have initiated a new phase in the analysis of the relation of musical time and space (see also Harley 1994a, 64).

Maja Trochimczyk’s history and analysis of spatialization in contemporary music.

Maja Trochimczyk gave a comprehensive history of the concept of space in the 20th century musical thinking in Harley (1994a). The first two chapters unravel the conceptual twinings of space in music, and present the four thematic areas of conceptions of musical space mentioned above. The next three chapters work on the theory and practice of the last thematic area, “music in space”, redefine spatialization and outline its developments, and introduce a typology of spatial designs in contemporary music. The last three chapters delve into the spatialization in the music by Henry Brant, Iannis Xenakis, and R. Murray Schafer.1

The main objectives of Harley were (1994a, 13):

1 to present the plurality of the meaning of space;
2 to trace the history of the idea of ‘space’ in the musical thought of the 20th century;
3 to clarify the conceptual contexts and interrelationships of the various theoretical constructs of space in music;
4 to outline the historical development of the idea of ‘spatialization’ in the theory and practice of contemporary music (after 1950);
5 to propose a new definition of spatialization and a new classification scheme for spatialized compositions;
6 to present, in detail, three different approaches to spatialization (Brant, Xenakis, Schafer);
7 to highlight the unity of time and space in contemporary music by an analytical focus on perceptual and temporal aspects of musical spatiality; and
8 to document contemporary music ‘in statu nascendi’ by expanding the knowledge of the music (analyses) and of the views of the composers (interviews).

From the current perspective, Harley’s unraveling of spatial concepts in music is especially significant and, as such, unprecedented. Harley varied and collated ideas

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1 Maja Trochimczyk became known as Maria Anna Harley between 1987–2000. Here, her works are cited as Harley (year) or Trochimczyk (year), depending on the date of publication.
Music is spatially embodied

of musical spatiality come from an extensive selection of literature, and while her focus was on the uses of the actual sounding environment in contemporary music, the analysis of the theories and other utterances on musical space answers to the needs of a systematic approach, adequately unbiased toward the “quasi-introspective mode of description” by Kurth, “phenomenological-metaphysical speculation” by Zuckerkandl, “mathematical formalizations” by Xenakis or any other choice that reflects “what music is or should be” (Harley 1994a, 92; see Harley 1994b).

In the analysis of musical spatiality, the current work addresses issues stemming from Harley’s delineations of internal musical space, musical space as stasis and pitch, multidimensional musical space, and musical space of performance.

Arnie Cox and the introduction of the cognitive metaphor theory to musicology.

Arnie Walter Cox’s dissertation ushers the cognitive metaphor theory into the scrutiny of musical motion and space, in that it “utilizes Lakoff and Johnson’s theory of metaphor to analyze the logic behind these basic musical concepts” (Cox 1999, iv; cf. chapter 3.1.2). Cox maintained that concepts of motion and space emerge in music as listeners “map experience in the domain of actual motion onto the domain of musical experience” (idem).

In the four chapters of the book, Cox gave an account of musical verticality, based primarily on the conceptual metaphor More Is Higher, and introduced “the mimetic hypothesis”, according to which “we understand music in terms of our own experience of making vocal sounds and via tacit imitation of the vocal sounds and gestures of performers” (idem). Subsequently, the role of metaphor was examined in the context of Kaluli and Ancient Greek music theories.

Finally, in the last chapter Cox demonstrated “how musical motion and space emerge from the same logic that gives us temporal motion and temporal space” (ibid., 192), that is, from the phenomenal motion and space in general. For that, Cox relied on Lakoff and Johnson’s metaphor theory, the notion of cross-domain mappings, and metaphors such as States Are Locations, and Change Of State Is Motion Between States. It seems that these general metaphors are directly applied in music. As a result, we get “a grounding of music epistemology in embodied experience, embodied cognition, and embodied metaphoric reasoning,” Cox (ibid., 258) maintained.

In terms of this book, Cox’s contribution gives substantial support to the ideas that musical semiosis is a subset of semiosis in general, that semiosis is spatially embodied by virtue of metaphors, and that, consequently, musical semiosis is spatially embodied. In contrast to the current work, Cox’s study is not semiotic in the sense that it does not utilize semiotic concepts, but rather, applies only the widely
corroborated metaphor theory of Lakoff and Johnson and its nomenclature to musical verticality and musical motion. While Cox’s focus is on pitch and motion, the suggested grounding of the epistemology of music seems valid in broader understanding of the embodiment of musical spatiality, as well.

Other studies on music, space and metaphor.

As the lengthy list of references in Lippman (1952), McDermott (1966), Harley (1994a), and Cox (1999) illustrate, the literature on musical spatiality is much too large to be reviewed in its entirety here. Yet, relatively few researchers have explicitly taken up spatiality in the context of music as their subject matter, as noted above. Most writers simply use the traditionally given or individually developed conceptual apparatus of spatiality for the benefit of conveying their thoughts, with little or no regard to the genesis or purport of the concepts. This is perhaps emblematic of how space as a conceptual tool is deeply embedded in the musical and musicological discourse. Consequently, the literature employing the spatial concepts extends to a wide variety of different domains of musicological research.

Examples of the explicit applications of the spatial conceptual apparatus in musicology span from an unconventional, naturalist theory of music listening (Christensen 1996) to a metaphysically transcendent interpretation of music (Zuckerkandl 1956), and from culture-analytic studies of architecture in and around music (Dyrsen 1995) to graphic analyses of musical works in terms of time and spectrum of sound (Cogan and Escot 1976), and histories of serial music (Nauck 1997), among others.²

A particular thread of spatially oriented utterances can be found in composers’ descriptions, both in their own writings and in interviews, varying from the poiesis of a particular piece to more in-depth reflections of their personal musical thinking of the composition process and of music in general. However, for composers, the conceptual apparatus of spatiality in the utterances seems to be first and foremost a tool for expressing personal views of composing and music (down to detailed descriptions of processes of particular pieces). Explicit examinations of musical space beyond the personal perspective are relatively few (see e.g. Boulez 1971/1963; Bayer 1987/1981; Wishart 1996).

Western serialist techniques and experimental endeavors of the 20th century have evidently had an impact on what can be described as the emancipation of spatiality in Western thinking about music. Significant impetus has also been given by the

² See the comments on Zuckerkandl in McDermott (1966, 7; 1972, 490) and Harley (1994a, 57–59). In his own words, Zuckerkandl’s “purpose is not a rationalization,” but “to outline what may be called a musical concept of the external world,” where “the musical view of the universe” is thought “as a bridge between the scientific and the religious views” (Zuckerkandl 1956, 6, 363, 374; emphasis original).
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developments in electronic and computer music (see Harley 1994a, 73). The needs for controlling musical sound and sound synthesis have led to the adoption of a Schaefferian paradigm of sound object (or sonic object, objet sonore, Schaeffer 1966 and 1977a, 1977b; see also e.g. Carpenter 1967; Chion 1983; Guigue 1997; Palombini 2001; Kane 2007). The sound object paradigm has flourished in research into sound morphology (particularly spectromorphology—see Smalley 1986, 1997), and also in analysis, production and synthesis of music, music representation as well as composition and the development of performance systems. The research on sound synthesis and sound simulation, in turn, has advanced to studies on instrument modeling and virtual instruments, and the expanding of the concept of instrument to rooms, a further branch of research within the electroacoustic domain has emerged from the study of acoustics of actual and virtual spaces and their simulation (see e.g. Malham 1998 for a tutorial; Pulkki 2001). Exploration of virtual musical spatiality, together with the fact that contemporary composers have richly utilized (and many also reported) the possibilities of spatialization in terms of performer and audience placement and room acoustics during the past decades, curiously seems to close the circle that started from the age-old history of actual spatiality in music.³

Nevertheless, there are studies, that explicitly focus on musical spatiality per se, in addition to the four dissertations mentioned above. Notable examples, again with varied viewpoints, can be found in the anthologies edited by Noack (1931), Bräm (1986), Dhomont (1998/1988 and 1991), and Szendy (1994), and in the special issues of the journals such as *Computer Music Journal* (vol 31 no 2, vol 25 no 4, vol 19 no 4), *Organised Sound* (vol. 3 no. 2), *Positionen* (vols. 8, 9, and 54), and *Die Reihe* (vol. 7). Also, there are valuable sections or articles in monographs, e.g. by Helmholtz (1954/1863, 370–371), Kurth (1947/1931, 116–141), Wellek (1963/1934, 28–58, 81–82 and the 1934 appendix on pp. 295–334), Boulez (1971/1963, 83–98), Tärasti (1994b, 77–97), Padilla (1995b, 105–122), as well as numerous journal articles, beginning from Révész (1937a, 1937b).

In addition to Cox (1999), studies on music from the viewpoint of the cognitive metaphor theory and the affiliated theory of conceptual blending include the monographs by Michael Spitzer (2004), Lawrence Zbikowski (2002), and Marion Guck (1981a), and articles by Gur (2008), Rautio (2007), Spitzer (2003), Brower

³ For the electroacoustic lines of these developments, the first-rate sources of current research by the electroacoustic community (see e.g. Richard 1997) are journals such as *Computer Music Journal*, *Organised Sound*, and *Leonardo Music Journal*, together with *Journal of New Music Research*, *Contemporary Music Review*, and *Perspectives of New Music*. The key sources also include the more technically oriented *Journal of the Audio Engineering Society* and the *IEEE Transactions on Signal Processing*, and the proceedings of the International Computer Music Conference, the NIME (New interfaces for musical expression), IEEE, and AES conferences, and, last but not least, the pertinent publications of IRCAM.

Together, these writings and the four dissertations summarized above provide fruitful ground for investigation into musical spatiality in the remainder of this section. Many valuable perspectives are unavoidably omitted in the investigation, some perhaps unintentionally, but some intentionally. With a couple of exceptions, the omitted perspectives include utterances by composers (e.g. Arnold Schoenberg, Karlheinz Stockhausen, György Ligeti, Mauricio Kagel, George Rochberg), and writings by many musicologists and philosophers (e.g. Theodor W. Adorno, Suzanne K. Langer, Roman Ingarden, Leonard B. Meyer). The reason for the omissions is not in regarding them as less pertinent in this context. Rather, there are many additional threads that would deserve a closer look through the spectacles of naturalist pragmatism (see section 5.2); rather, practical reasons prevent us from taking them into account here.

In addition to the four thematic areas of theories of musical space outlined by Harley (see above), there are several recurring issues in the history of the notion of 'musical space', according to Harley (1994a, 47):

1. separation of 'musical' from 'auditory' space,
2. comparison of such musical space to the three-dimensional space known from experience and geometry,
3. static character of space,
4. spatial character of pitch and pitch relationships,
5. spatial representations of pitch,
6. spatial features of musical time.

In what follows, these and some additional issues of musical spatiality are examined from the viewpoint of naturalist pragmatism, although not quite in that order nor with that division. Beginning from chapter 4.1.2, the main issues are:

1. What is the relation of actual and phenomenal spatiality in music?
2. Is there an autonomous or intrinsic musical space?
3. What is the constitution of phenomenal spatiality in music, if any?
4. How do musical time and space relate to each other, based on the investigation so far?
5. What are the epistemic grounds for musical spatiality? How can the cognitive metaphor theory be consolidated with the pragmatist conception of musical spatiality?

### 4.1.2 Actual and phenomenal spatiality in music

Symptomatic of the discourse on musical spatiality is the fact that it seems necessary to discuss the relation and even the existence of both actual and phenomenal spatiality in music here. From the viewpoint of naturalist pragmatism the issue of
actual and phenomenal spaces in music seems basically quite clear, however. As far as “musical semiosis is a subset of semiosis at large” (chapter 2.2.1), it involves both the phenomenal spaces of the subject and the actual space inhabited by the organisms and other objects, i.e. both complements of the pragmatist account of spatiality (see 3.1.1–3.1.3). This suggests a reconciliation between the disparate views of “music in space” versus “space in music”.

The acousmatic dilemma.

Temporality is inherent in music, to such a great degree that it is not surprising if doubts are expressed even as to whether there musical spatiality exists at all. Contrasting time against space, and different art forms against each other has attributed temporality to music, but not spatiality to the same degree. In this sense, musical spatiality may end up neglected.4

Meanwhile, there seem to be no serious doubts concerning the actual existence of sound or of the existence of the participants of musical communication, except as exercises of scepticist sophism. Sound is commonly agreed to be the vehicle of musical communication, thus connecting action to perception (see chapter 2.2.1). But whether the existence of the sound in the actual space and the perceived properties of sound pertaining to location and ambience have anything to do with musical spatiality has been in dispute.

Illustrative of this, Edward Lippman (1952) made the distinction between “space of performance” (space pertaining to musical communication and perception of sound in the actual environment) and “intrinsic musical space” mentioned above. Lippman maintained, that while “the spatial layout and the surroundings of the performers and the audience can certainly enter into the musical experience in decisive manner, and always are of some influence even on more properly musical matters, there is in spite of and it seems largely independent of these spatial arrangements, another spatial experience whose nature is open to question” (Lippman 1952, 112).

At the same time, the ability to determine the distances, directions and ambience of sound has been and continues to be useful if not vital in many situations of practical life, both within and without music. The question then is: On what grounds is it feasible to neglect the practically significant aspect of the origin of the sound in the actual space in the context of music? What enables the distinction between “intrinsic musical space” and “space of performance”? 

4 Cf. Rousseau in his Essai of 1781: “Ainsi chaque sens a son champ qui lui est propre. Le champ de la musique est le temps, celui de la peinture est l’espace.” (Rousseau 2003/1781, 57; “Thus each sense has its own field which belongs to it alone. The field of music is time, that of painting is space.”)
Whatever the grounds may be, the disinterest in the origin or immediate cause of the sound in the actual space, and the rejection of the developmentally meaningful attitude of “causal listening” (Chion 1994, 25) is balanced by the emphasis and attention given to the properties of sound other than those immediately connected with the location and ambience of the sound object in the actual space, and vice versa. The spatiality in music becomes detached from the actual spatiality, if the sound in music is not experienced (primarily) as logically connected to an actual object emanating the sound. Consequently, from this perspective, space in music could “be understood in a somewhat metaphorical sense” (Tarasti 1994b, 77). This seems to open avenue for the common conception of musical space as pitch space (Helmholtz 1954/1863; Kurth 1947/1931; Lippman 1952; McDermott 1966, etc.). Alternatively or additionally, in principle any phenomenal space related to musical practices could consequently be conceived as musical space.

Nevertheless, even in Lippman’s perspective, the perception of the instrument as the sound source is secondary, although it is “nonetheless part of the experience” (Lippman 1952, 254). Let us return to this acousmatic dilemma shortly.

Objectification versus spatialization.

During the 20th century, the contraposition between ‘space in music’ and ‘music in space’ in the Western art music was escalated by two contrasting but quite concurrently surfaced developments relating to music and musical sound: objectification (McDermott 1966) and spatialization (e.g. Harley 1994a).

Pierre Schaeffer’s magnum opus Traité des objets musicaux (1966) is a keystone of the development of objectification, which began at the latest with the advent of the serialist techniques and has continued to our days. New esthetic liberty, technical innovations, and cultural globalization necessitated a revision of the means of musical experience, key elements serving to experience being objects, structures and languages (Schaeffer 1966, 16–38). The discourse of objectification brought forward different dimensions and criteria for musical perception, both in terms of analysis and synthesis of the sound object. Sound, musical sound in particular, became a parametrizable object. For Schaeffer this meant perceptual criteria such as mass, dynamic, harmonic timbre, melodic profile, mass profile, granularity and speed situated and calibrated within height, intensity and duration as the dimensions of musical field (ibid., 580–591). For others, the (musical) sound object could be constituted from different complexes (see e.g. the discussion on form-bearing elements in Contemporary Music Review, vol 4 no 1). Apparently, the Schoenbergian rise of the twelve-tone technique and the post-war serialist parametrization of pitch, dynamics, duration, articulation, register, and whatnot (Babbitt, Messiaen, Boulez,
Stockhausen etc.) played an important role in this development, but the development does not seem to be limited only to the serialist and postserialist traditions.

In any case, both in music itself and in discussion about it, the objectification brought forward a notion of musical sound as object and emphasized the role of sound structures in music, regardless of how the structures are conceived and how they are called. As but one example of how the objectification is displayed in composers’ descriptions, Edgard Varèse described music as he conceived it as “the movement of sound-masses, of shifting planes” and “transmutations taking place on certain planes ... to be projected onto other planes, moving at different speed and at different angles” (Varèse 1966, from a lecture of 1936).

The objectification of musical sound concerns the sound mostly as a perceived entity. The distinction to the more traditional notions of themes and motifs is not necessarily in the magnitude of the object (which has varied from the microlevel internal to a single sound to the macrolevel of a complete work), but rather the release of the sound object from its context. In conjunction with Western tonality, McDermott (1966, 205) described sound object as not being “pushed by earlier events and pulled by later in an inexorably directed process in which any one element’s status is immediately interwoven with its neighbor’s; instead the new groupings take more the shape of self-substantiating units within the compositions.” Thereby, the spatial articulation is disassociated from a compelling temporal progression (McDermott 1966, 183). In Western art music, this idea might have been present already in the floating impressions of Claude Debussy’s music and the meditating explorations of Franz Liszt’s late piano works.

In contrast, terms such as ‘theme’ and ‘motif’ are loaded particularly with the Western tonal context, in which the structural element is attached to the functions of tonality (idem; cf. Stockhausen 1961/1959, 59). Hence the liberated sound object is potentially independent of the tonal débrayage/embrayage between center and periphery, i.e. independent of the interplay of centripetal/centrifugal tendencies away and toward the tonal center, and freed from its context (cf. Tarasti 1994b, 78–79).

The notion of the sound object adopts the conceptual apparatus of spatiality to grasp the perceptual features of sound. However, the perceptual aspects of sound relating to the actual space, i.e. the perceived direction, distance and ambience of the musical sound tend to be less of a concern.

McDermott (1966, 183) referred idiosyncratically and somewhat confusingly to the combination of “objectification” and “disassociation of spatial articulation” as “spatialization”. More commonly, however, spatialization refers to the employment of actual spatiality in the performance of music. Subsequently, McDermott (ibid.,
considered “temporal stasis and objectification” as “the two aspects central to spatialization”, which suggests identification of temporal stasis (i.e. stasis in general) with the disassociation of spatial articulation by McDermott.

Harley defined spatialization as (1994a, 179–180, emphases original):

the compositional introduction of the quasi-spatial structure. In this dissertation, the term spatialized music refers to music with a quasi-spatial structure defined by the composer in the score or in another medium of sound coding (digital or analog recording, specific software). This quasi-spatial structure can assume different forms, including ensemble dispersion, the movement of sounds, performers or audience, and the juxtaposition and interaction of real and virtual sound sources. The presence of spatialization can be recognized in every situation in which the spatial positions of the sound sources (separation into groups; directions and distances) and the acoustic quality of the performance space have compositional importance.

While Harley’s definition implies an assumption of the Western music context with a concert setting, roles of composer, performer and audience, as well as possible access to music technology, the definition clearly points out the intentional use of the actual space as a form-bearing element of music. In other words, in spatialized music, according to the definition, the actual spatiality of sound contributes to the meaning of music.

Consequently, the term ‘musical space’ “completely changes its meaning”, “if relationships of sound distance and direction, as well as patterns of distribution and movement may be musically significant,” according to Harley (1994a, 96–97). But even if the actual space is utilized as a meaningful element in music, it does not mean that there should be any conceptual equivalence set between the use of the actual space in music and the notion of musical space. In “spatialized music”, the use of the actual space is not the only means of expression. As a result, the expression ‘musical space’ referring only to the use of actual space in music is “rare,” and terms such as ‘spatialization’ or ‘spatial music’ more common (Harley 1994a, 95).

Harley’s definition is not based on fiction. Especially during the 20th century, for many Western composers, the use of actual space became a meaningful element of musical praxis, “yet another feature” of music (Harley 1994a, 159), and “an essential aspect of musical composition” (Brant 1967, see also Stockhausen 1961/1959; Boulez

While the terms ‘spatialization of music’ and ‘spatialized music’ are quite well established, they also suggest a twofold inaccuracy. First, they imply that already existing music has somehow been made spatial, as if spatiality in the music would be an add-on feature, something that could be added to it post factum. In most cases, there is no reason to assume, that the actual spatiality would not have been an inherent part of the musical expression to begin with. Second, the tradition portrayed above is not about spatiality of music, but instead about spatiality of sound. To be exact, we never listen to music, we listen to sound, if we follow the description of music given in part two. Therefore it would be preferable to talk in this respect about (musical) sound in space, as opposed to music in space.
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1971/1963). Today, composers habitually more or less accurately specify the performance settings, including the locations of sound, performers, possible loudspeakers and audience. Some still settle for not specifying, leaving that to the performers and organizers of the performance.

The poietic means for the praxis of actual spatiality in Western art music have varied from 1) maintaining but revising the traditional concert setting (e.g. Gustav Mahler, Charles Ives, Henry Brant, Edgard Varèse) to 2) removing the concert context by replacing it with urban or rural outdoor environments and authentic or autochthonous “performance rituals” (e.g. John Cage, R. Murray Schafer, Alvin Lucier), and from 3) enhancing the traditional setting by new, possibly dynamic setting of performers and audiences (e.g. Pierre Boulez, Karlheinz Stockhausen, Iannis Xenakis) to 4) substituting the actual performance space with virtual sound sources whether by means of loudspeaker or headphone listening, particularly in electroacoustic music (cf. Harley 1994a, 341; Harley 1994b).

Furthermore, as far as the experience of actual spatiality in music is concerned, musical communication may assume different guises of spatial imagery. For instance, as Harley (1994a, 226) pointed out, in Ultimos Ritos by John Tavener, the shapes of circle and cross function as culturally determined religious symbols, while the circles and spirals in Terretektorb by Iannis Xenakis (ibid., 280–291) are apparently less culturally contextualized (by the composer, at least) and in that respect intended to leave more subjective latitude for interpretation by the listener, despite the reference to waves made by Xenakis himself (see also Harley 1994b; Trochimczyk 2001).

Two viewpoints may be discerned concerning the observation of the actual spatiality in music: one emphasizing the “objective”, i.e. descriptions of the acoustic and other physical properties of the performance settings and the roles of the participants in the actual space as the vehicle for music, and the other emphasizing the “subjective”, i.e. investigations into the perceptual and experiential aspects and the effect of the actual spatiality in music (cf. Harley 1994a, 345). In addition, the actual spatiality as a meaningful factor in music suggests several themes for research, e.g., those listed by Brâm (1986, 8):

1. musical space from the historical point of view;
2. “visual” music (or, preferably, the interplay of sensory domains in the arts);
3. musical space from the contemporary point of view of composers and interpreters;

And by Harley (1994a, 102 and 341):

1. the association of the performance space and sound quality with different genres and types of instrumentation,
the location of sound sources within the space of performance (dispersion of sound—and musicians—in space)

“the nature of performing and listening” by “body-subjects”, i.e. “the ‘lived’ bodily-spatial experience of the listeners and performers (religious rituals).”

Virtual acoustics.

The possibilities of spatialization were first limited by the physical properties of the performance space, by the practicalities of situating the sound sources at the site of performance, and by the unassailable conventions of performance practices. Advances in psychoacoustics and the advent of electronic techniques of sound manipulation, amplification, and projection has revolutionized the possibilities of exploring the habits of perceiving sound source location and ambience. This outbreak has added the possibility of utilizing, not only actual, but also virtual acoustics of musical sound.

The rationale behind virtual acoustics is that the spatial perception of sound relies on perceptual cues, which import information about the distance and direction of the sound source, and about the room ambience or the lack of it.

In ambient hearing, perceptual cues are used to infer characteristics of the sound in relation to the environment in which it propagates. In rooms (reverberant enclosures as opposed to free fields), a sound signal travels directly from the sound source to the listener, but also from the sound source to one or more reflecting surfaces and finally to the listener. The listener receives first a direct signal from the source, followed typically by the first order reflections (first reflections from room surfaces—an empty room with the regular shape of a cuboid yields six first order reflections), then the more and more intermixed second, third, and higher order reflections. Refections of different order do not necessarily arrive in the succession by the order, but are intermingled. Each of these reflections differs from the direct signal by being delayed, attenuated and spectrally altered due to the distance traveled and to the absorption by reflecting objects. Thereby each reflection imports its own information contributing to the perception of the room ambience. In addition to this,

6 Perceived location of sound, or localization of sound refers here to the phenomenal direction and distance of sound in respect to the listener. Ambience, in turn, refers to the perceived size, shape and material characteristics of the actual space (closed or open), and to the perceived positions of the sound source and listener within that space. Jens Blauert’s seminal monograph, Spatial Hearing, on the psychophysics of human sound localization (Blauert 1983/1974) was first published in German already in 1974. It has been followed by a tremendous surge of specialized and generic studies in psychoacoustics of space and cognitive psychology of sound localization and ambience. Based on the studies in room acoustics and psychoacoustics, the research on spatial manipulation of sound has been booming, which has made it possible to convincingly create virtual acoustics and virtual reality for musical purposes. (See also Moore 1982.)
moving sound sources are cued by the Doppler effect in addition to the changes in other cues.

The primary perceptual cues relating to distance hearing are the reverberation cues (or reflection cues), amplitude cues (intensity cues), and cognitive cues (Begault 2002). The energy ratio between the direct sound and its reflections already provides quite an accurate cue to distance, apparently due to our habituation to the environment (Bronkhorst and Houtgast 1999, 518). Also, we are habituated to the inverse square law of sound intensity, i.e. to the fact that when the distance from the sound source increases (for instance by the factor of two), the power of the sound propagation is divided on a larger area (by the factor of four), resulting in the decrease of the sound intensity (to one fourth). The cognitive cues to distance hearing include combinations of visual, tactile or other sensory information with the auditive information, and the judgments of the sound in comparison with the other past or present sound sources.7

Lateral directional hearing is based on the fact, that the sound has to travel a little longer to reach the contralateral ear as opposed to the ipsilateral ear. Due to this, the contralateral ear receives the signal a little later (interaural time difference, ITD), somewhat attenuated (frequency-dependent interaural intensity difference, IID, or, proportionate to that, the interaural amplitude difference, IAD, or interaural level difference, ILD). In addition, the spectrum of the sound arriving at the two ears is different, because of the filtering characteristics of the listener’s head and torso (head-related transfer function, HRTF), providing cues especially to the hearing of elevation and front-back discrimination. (See e.g. Blauert 1983/1974; Moore 1982; Begault 1994; 2002.)

The perceptual cues to spatial hearing are today quite well known, and can be quite accurately simulated in sound synthesis (see e.g. Chowning 1971; Moorer 1979; Moore 1983; 1988; Malham and Myatt 1995; Kendall, Martens and Decker 1989; Begault 1990; Giguère and Abel 1993; Gardner and Martin 1994; Huopaniemi et al 1994; Huopaniemi 1995; Kendall 1995). Consequently, the use of virtual acoustics in music is not limited by the physical practicalities of the environment. Instead, it is possible to cause paradoxical perceptions and perceptions beyond the natural, non-artificial experience, as the properties of sound can be modified beyond regular human experience. Hence the term ‘virtual’ seems appropriate (see chapters 1.2.6, 1.3.4 and 2.2.3). For instance, it has for some time been possible to create illusions of sound that appear to contain several different rooms at once (common in popular music to the degree of being almost unnoticed: for instance, the bass player appears-

7 For nearby sources (approximately one meter and less), the perceptual cues are somewhat different. See e.g. Shinn-Cunningham 2000.
ing to play in a tiled room, the guitarist on a stadium, and the singer in some kind of fantastic auditorium shaped like a 400 meters long and 15 meters wide hollow sausage);

2 seem to incorporate inexistent material qualities (e.g. so-called ‘outer space echo’—an infinite echo, implying wall materials and air that would not realistically absorb the sound—basically the case also in *I’m sitting in a room* by Alvin Lucier, for instance);

3 seem to exist in rooms, the physical measurements or materials of which vary over time (e.g. *Kontakte* by Karlheinz Stockhausen); 8

4 otherwise defy the physics of the actual space or the physiology of the listener (e.g. through reverse reverberation, in which the reflections arrive in reverse order and before the direct signal, or perceived ambient space diminishing to a room smaller than the listener’s body, or sound perceived to emanate from inside the listener’s head as an in-head-localization).

Although the accurate employment of the perceptual cues and virtual modeling of acoustic phenomena certainly does require the aid of computer technology, it does not seem viable to define “virtual acoustics” according to the means of modeling (cf. Huopaniemi 1999, 27). Namely, if virtual acoustics is regarded as any intentional manipulation of acoustical phenomena in order to affect the perception of the direction, distance or ambience of the sound source, numerous examples of it can be found in music before the modern digital and analog sound technologies.

Perhaps the prime example in this regard is the echo effect. Compared to the direct signal, a naturally echoed sound presents the distance cues mentioned above, i.e. the sound is delayed, is less intensive, has an altered timbre, and arrives at the listener from a more or less different direction, in most cases. Typically in a traditional musical echo effect, a fragment is delayed by about the time interval of its own length, performed with a softer dynamic, and possibly with a different timbre, instrumentation or articulation. Also, unless a solo performance, ensemble dispersion has more or less been used in the sense that the echo is played by a different performer, and hence in a slightly different location. The effect is perhaps not as verisimilar as is possible with the sophisticated digital reverb and delay effects of today, but is nevertheless an indication of the use of perceptual cues, whether obvious or not. Hence, a phenomenon more or less similar to a natural phenomenon of echo has been modeled, but without the actual environment required for the genuine, natural echo experience. In this sense, the traditional echo effect creates a virtual auditory space in music.

8 There is a plethora of examples of this in electroacoustic music (and in popular music as well), but before electroacoustics, any kind of fast change in room acoustics was practically impossible.
Music is spatially embodied

The echo effect constitutes a relatively clear-cut effect making use of the naturally developed perceptual cues in music. It seems that there are many more, less obvious but fundamentally common musical features, where the perceptual cues to the actual spatiality of sound have been used in music, thus following the idea of virtual acoustics. Take, for instance, the use of our habituation with the inverse square relation between sound intensity and distance: each diminuendo and crescendo of a musical line (decrease and increase of the intensity level of an independent auditory stream) may imply respectively a decrease and increase of the distance between a virtual sound source and the listener, without the sound source or the listener actually needing to move.

Towards reconciliation of actual and phenomenal spatiality in music.

Two viewpoints were discerned above concerning the observation of actual spatiality in music. One emphasizes the “objective”, i.e. the physical properties of the sound, performance settings and the roles of the participants. The other emphasizes the “subjective”, i.e. the phenomenal and experiential aspects, and the role of perceived spatiality in music. This separation of “the physical” from “the perceptual” may be useful (see Harley 1994a, 345), but that necessitates a clear distinction between sound and music. Based on the conception of music given in part two, the “objective” viewpoint deals with sound, and with music only in terms of poiesis, the making of the object. Sound as actual object functions as the vehicle of musical communication connecting action to perception. In contrast, music as “humanly organised sound” (Blacking 1977/1973), necessarily involves the participating, perceiving subjects who produce and interpret the sound as sign (see chapter 2.2.1). Hence, the “subjective” viewpoint deals with music in terms of esthesis, praxis and semiosis: perception yielding an experience (in Deweyan terms), and action aiming at the construction of the experience through poiesis.9

Hence, there indeed seems to be no grounds for the strict contraposition between “music in space” and “space in music” in the sense suggested earlier. From the viewpoint of naturalist pragmatism, both are necessarily perceptual and intertwined, since we are dealing with music. Both also involve the actual environment and actual spatiality. Some interpretations of perceived sound may just be more literal in terms of (one assumes) referring more directly to experienced objects and their direction, distance and ambience in the actual space. Other interpretations may at the same time be based on more complex, abstracted inferences from the perceived sound, but

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9 As recalled from chapters 1.3.3 and 1.3.4, in Dewey’s notion of an experience, there is an experienced flow from something to something, with a satisfactory solution, a sense of unity, a vivid consciousness, all in virtue of an act of expression which is perceived as somehow meaningful, not as a means for an ulterior end but as making the “human intercourse more rich and gracious” (LW 10:69).
Space in Musical Semiosis

while being abstract, the grounding of the abstraction—or the metaphor, assuming the validity of the cognitive metaphor theory—seems to be based on a more literal perception, the experiencing of actual objects (see below chapter 4.1.6).

As Harley pointed out, “music has always been spatial” (1994a, 100). The whole process of music takes place in the actual space, in which the sound and the perceiver of the sound necessarily exist (cf. ibid., 96). When the sound is perceived, we also perceive the location and ambience of the sound in the performance space—it seems to be a matter of how much attention we end up paying to the actual spatiality. And how that aspect of spatiality has been marked (Hatten 1994), has varied in different styles.10

In Western contemporary music, the actual spatial features of sound have (again) become a suitable possibility for expression and a more realizable and significant factor than earlier. When talking about musical spatiality, the effect of distribution of sound sources, or other aspects of the actual spatiality of sound should not be ignored. The localization of different sound sources is a naturally developed, but complex process, especially when complex sound streams are concerned. The direction, distance and ambience of sound are perceived by virtue of factors such as intensity, time and timbre differences. In other words, the perception of the actual spatiality of sound, whether in music or not, folds back to interpretation of more “traditional” parameters of perceived sound, in intricate ways. Consequently, the perception of actual spatiality in music is a question of phenomenal spatiality.

If one perceptual aspect of sound does not contribute significantly to experience, attention is paid to others. Hence pitch may become more pronounced than direction, for instance. Or vice versa. In any case, from the perspective of naturalist pragmatism, music and musical spatiality cannot escape the embodiment of semiosis. Instead, the spatial embodiment of semiosis applies for music as well, regardless of how abstracted the musical sound is from its source.

Despite the fact that the inclination to contrast the actual with the phenomenal tends to persist in our days, in the framework of naturalist pragmatism there is no reason to segregate the two or to neglect one in favor of the other, neither in investigation of semiosis in general, nor in musical semiotics. Also, there is no reason

10 Harley 1994a gives a good historical overview of the development of spatiality in Western art music, emphasizing the 20th century. According to Lippman (1952, 87), especially the “sound-ideal of romanticism in general seems based essentially on the lack of localization of the source,” whereas in the music of the 20th century, sound sources “become objects of perceptual attention, especially in their positional separateness. This is a sound-ideal which discards the veil placed over music by reverberation; its goal is individualized sources, and it abandons fusion to achieve clarity” (ibid., 88). The analysis of style-specific esthetics and the philosophical underpinnings as related to musical spatiality (e.g. Kant in relation to the Romantic ideals and the idea of disembodied space in music) would require another context.
to regard the actual spatiality and phenomenal spatiality in music as opposed to each other, but as issues intricately tied together. This leads to questions relating to phenomenal spatiality, e.g. questions about the literal versus abstract character of musical spatiality (e.g. Tonraum, Musikraum), and to questions concerning the structures and dimensions of phenomenal musical space(s).

4.1.3 The quest for autonomous, intrinsic musical space

The previous chapter dismissed attempts to exclude actual spatiality and the perception of direction, distance, and ambience of sound from musical experience. In our days, the role of actual spatiality as a potential form-bearing element in music need not and cannot be denied. This chapter continues the discussion on the acousmatic dilemma first by addressing the issue of autonomous, intrinsic musical space. Following that discussion are speculations about answers to the dilemma.

As argued above, musical spatiality is a thoroughly phenomenological issue. It is a question of the subject’s experience and habits of perceiving, regardless of the objective viewpoint of actual spatiality of sound as the vehicle of musical communication. In fact, Lippman’s distinction between “space of performance” and “intrinsic musical space” is really a phenomenological distinction within the subjective viewpoint, between the perceived directional, ambient spatiality of sound (which Lippman admitted does “enter into the musical experience” although being secondary) and a more ambiguously conceived phenomenal spatiality, that of musical space proper.\(^{11}\)

Lippman’s intrinsic musical space.

Exemplified by Lippman’s distinction, some ideas in the investigation into musical space come across as justifications or defenses for an autonomous or independent space that is intrinsic to music. Lippman (1952, 135; emphasis added) reasoned as follows:

The explanation of the spatial aspects of musical experience is obviously not to be found directly in perceptual or empirical space, but there is apparently no meaningful concept of space other than this. Can music be spatial in some way apart from truly spatial experience? The only answer seems to be the postulation of an intrinsic musical space....

This intrinsic nature or immanence of musical space was approached by Lippman in two ways: first, by exclusion of auditory perceptual space from musical space (see previous chapter), and, second, by an inclusive attempt to demarcate intrin-

\(^{11}\) In contrast, Harley 1994a, for instance, dealt more clearly with the objective viewpoint, i.e. with the actual spatiality of sound, with less concern about the subjective perception of the actual spatiality.
sic musical space by defining its relation with motion in music, by delineating its constitutive dimensions (see next chapter), and also by attempting to determine its relations with mathematical and empirical spaces. Lippman (1952, 231–232) maintained, for instance, that spatial concepts such as ‘order’, ‘relation’, ‘structure’, or ‘interval’ are “not merely acclimated”, but “indigenous to music”. Akin to mathematics, music is also “separate from physical reality”, and both music and mathematics express formal properties of the “empirical and physical space” (idem):

Music becomes connected with empirical [i.e. the actual] space, then, not only by virtue of its experienced quality, but perhaps more closely by virtue of its formal similarity; it possesses the structural features embodied in “formal space,” ... and it is spatial in this sense to the extent that the mathematics of space is spatial.

Kurth’s independent musical space.

Earlier, Ernst Kurth, too, emphasized the separation of musical space proper from the localization of sound as “external” space (1947/1931, 128, emphases in italics added):

It namely seems, that until now, tone psychology, Stumpf included, has linked the feeling of space even with the so-called localization of the tones; which is understood as the ability to recognize the location of the source of the tone in the external space, e.g., to specify the direction of sound even with eyes closed, and likewise the approximate distance from the ear (which already played a role with the distribution of orchestral instruments, as mentioned). But because the conception of space, which is under discussion here, constitutes a purely internal, psychic phenomenon, these external localizations do not come into question at all (or do at the most associatively); considered purely as impressions, they have nothing to do with the riddle-infested internal construction of space of musical hearing.

Kurth argued (ibid., 134), that the “space of the internal hearing world” (Raum der inneren Gehörs Welt) is “an independent music-psychological phenomenon” (selbständiges musikpsychologisches Phänomen). In addition to the implied independence as a domain of study for the psychology of music, for Kurth, the independence of musical space was connected to what was above described as the acousmatic dilemma. According to Kurth (ibid., 136), the recognition of the direction

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12 Kurth’s original: “Es scheint nämlich, daß die bisherige Tonpsychologie, Stumpf mit einbegriffen, die Raumempfindungen sogar mit der sogenannten Lokalisation der Töne verknüpft; darunter versteht man die Fähigkeit, den Standort der Tonerzeugung im äußeren Raum zu erkennen, z. B. auch mit geschlossenen Augen die Richtung, aus der ein Schall kommt, angeben zu können, ebenso ungefähr die Entfernung vom Ohre, (was ja schon bei der erwähnten Verteilung auf Orchesterinstrumente mitspielte.) Da aber die Raumvorstellung, von der hier die Rede ist, eine rein innerliche, psychische Erscheinung darstellt, kämen für sie diese äußeren Lokalisationen gar nicht (hochstens assoziativ) in Betracht; sie haben, rein als Eindrücke betrachtet, nichts mit dem rätselreichen inneren Raumaufbau des musikalischen Hörens zu tun.”
Music is spatially embodied

and distance of external sound sources is denied independent character, since it allegedly relies on visual and tactile spaces.13

In contrast, in the case of “the internal psychic space impressions of music” (den inneren psychischen Raumindrücken der Musik), it would be best to speak of “energetic space” (vom ‘energetischen Raum’), since it “emanates directly from the psychic kinetic energies” (psychischen Bewegungenergien). In other words, musical space proper is detached from the actuality, and “[o]nly at its borderline aspects does it dissolve into concrete moments; that they partly bring about diverting associations, is an additional proof, that the true musical space experience is not triggered by them” (Kurth 1947/1931, 136).14

However, for Kurth as well, the detachment of the musical space from the actuality did not mean total separation. Just like motion in music is an analogy to the actual motion, argued Kurth (1947/1931, 120), so is the emerging feeling of space (entstehende Raumgefühl) also an analogy to the concrete space, “not identical with it and not a translation of its laws to the Inner; but something else, only related to it.” According to Kurth (ibid., 121), “music has its own inner geometry, which is different from the perception of the external space and which determines the structures of intervals, chords, forms of melodic lines etc.; and that evokes altogether different laws for its internal dynamics...”15

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13 As a semiotic-historical curiosity, Jakob von Uexküll, the Estonian pioneer of biosemiotics, happened to be one of the participants of the 1930 Hamburg congress on time and space in the arts by the German Society of Aesthetics. In his comment to Hermann Friedmann’s speech, von Uexküll, too, emphasized that only from the “combination of visual space (Sehraum), motor space (Spielraum) and haptic space (Tattraum), one forms the conception of space (Raumananschauung)” (Noack 1931, 67).

14 Kurth’s original: ”Unter Gehörsraum versteht die Psychologie auch nicht diesen innern Raum, sondern jenen, welcher durch dies Schall-Lokalisation (Erkennung von Richtung und Entfernung äußerer Tonquellen) entsteht; man hat ihm allerdings selbständigen Charakter abgesprochen, indem er sich an Gesichts- und Tattraum anlehnt. Allen diesen Erscheinungen gegenüber wäre bei den inneren psychischen Raumindrücken der Musik wohl am besten vom ‘energetischen Raum’ zu sprechen, da er unmittelbar aus den psychischen Bewegungenergien hervorgeht. Erst an seinen Grenzerscheinungen löst er sich in die anschaulichen Momente auf; daß sie zum Teil ablenkende Assoziationen hervorrufen, ist ein Beweis mehr, daß das eigentliche musikalische Raumerlebnis von ihnen nicht ausgelöst ist.”

15 Kurth’s original: “Wie die musikalische Bewegung nur eine Analogie zur äußeren, so ist das mit entstehende Raumgefühl auch nur eine Analogie zum anschaulichen Raum, nicht identisch mit ihm und nicht etwa eine Übertragung seiner Gesetze ins Innere; etwas anderes, ihm nur verwandte.” (Kurth 1947/1931, 120.); and: “die Musik hat ihre eigene innere Geometrie, die von der äußeren Raumanschauung verschieden ist und die Strukturen von Intervallen, Akkorden, melodischen Verlaufsformen usw. bestimmt; und das ruft ganz andere Gesetze für ihre Innendynamik, auch für die Tonsymbolik hervor.” (Kurth 1947/1931, 121.)
Wellek’s tripartition of spaces in music.

Albert Wellek continued from Kurth’s ideas and provided an intermediary conclusion to the discourse on musical space carried out in Germanic musicology from the late 1920s to the early 1930s. He distinguished three kinds of spaces in hearing, summarized as (Wellek 1963/1934, 334):

1. **hearing space (der Gehörraum):** the aurally mediated spatial orientation, an incomplete “image” of the objective, physical space;
2. **tonal space (der Tonraum):** an unsteady, indistinct structure or ordering schema (*Ordnungsschema*) in three dimensions, of which
   1. is multimeaning (*mehrdeutig*) and non-linear
   2. is one-directional, irreversible (because time-based)
   3. is contestable and in any case notably less distinct in experience
3. **musical space (der Musikraum):** a “pure” feeling space idiosyncratic (*eigentümlich*) of music, feeding itself from the previous (the tonal space, but also the hearing space), substantially though based on expression of feelings in music as such (and as absolute music indeed). In this third, superordinate space are thus all kinds of musical spatiality (*Raumhaftigkeit*) connected to each other to a complex combined result (*komplexer Gesamtwirkung*).

Of the suggested three dimensions of the tonal space, as described by Wellek, the first, “vertical” one corresponds (primarily) to pitch, and the second, “horizontal”, to time and temporal order. Yet, according to Wellek, the multidimensionality and the number of dimensions of the tonal space, as well as the possible character of the more ambiguous third dimension, that of “depth” (*Tiefendimension*) can be called into question. The dimensionality of the phenomenal spaces in music will be returned to in the next chapter.  

Wellek drew attention to the distinction between tonal space and musical space. For him, “the kind of space one experiences with the ‘stream’ of music is not simply that, which is described with such two or three dimensions” of tonal space (ibid., 318). Instead (idem),

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16 Harley (1994a) translated ‘Gehörraum’ as ‘auditory space’ and ‘Tonraum’ as ‘sonic space’. Here, the translation attempts to bring forward Wellek’s original choices of wording, emphasizing the historical connection of these ideas to the Western tonal music.

17 Wellek’s original: “... die Art ‘Raum’, die man beim ‘strome’ der Musik erlebt, nicht einfach das ist, was mit solchen zwei oder drei Dimensionen beschrieben ist und in sie zu analysieren wäre. In diesem phänomenal ganz qualitativ erlebten Musikraume wirken wohl alle diese mehr oder minder anschaulichen oder anschaubaren Dimensionen und Dimensiónchen irgendwie zusammen und durcheinander: unscharf, unklar, unsystematisch, und nur deshalb so wohl verträglich; jedoch darüber hinaus gibt es noch alle möglichen anderen Raumhaftigkeiten mit dabei, die sich nicht in solcher Weise aufgliedern und zusammenordnen lassen.”
Music is spatially embodied

in this phenomenal, entirely qualitatively experienced musical space operate surely all these more or less observed or observable dimensions and dimension-like somehow together and intermingled: unsharply, unclearly, unsystematically, and only therefore so probably consistently; still beyond those, there are additionally all other possible spatialities, which do not divide and constitute in such way.

Hence, for Wellek, the essential difference between musical and tonal space was that “musical space, which we see thus as independent, contrary to the tonal space, is more purely ‘a feeling space’” (idem). In turn, tonal space would be, if not objective, yet a more neutral ordering schema, based on the perception of the characteristics of sound. The character of musical space as a feeling of space (Raumgefühl) instead of perception of space (Raumvorstellung), was already suggested by Kurth (1947/1931, 116–136; see Wellek 1963/1934, 318). Wellek also had no objections to Kurth’s idea, that musical space is “autogenic” (autogen) rather than developing “through detours of any observed representation” (idem).  

Despite the conceptual contrasting of the “tone-psychological” and “music-psychological” spaces, both Wellek and Kurth regarded the total musical experience as an outcome of the total spatiality united in music. In Wellek’s words (ibid., 318–319), it seems, that the feeling space of music somehow feeds on the tone-psychological space (that is, on the spatial attributes of the tone impression), but still not by any means only from this. Thereby it is possible to bring forth more or less consciously a single effect of tonal space, as in “empty” intervals and wide setting of the harmonies (as in the beginning of the 9th Symphony by BEETHOVEN) for a spatial effect of music, similar to that of localization in the hearing space, as for instance with the opposing placement of choirs already in the so-called polychorality of the 17th-century church music. And moreover these tools mean only single traits
of a total spatial effect, which cannot be comprehended from these alone, but rather only from the dynamic totality of each musical entirety.

While both Kurth and Wellek considered the musical (and tonal) spaces ambiguous and unclear, Wellek did not share Kurth’s belief that “the indistinctness, inaccuracy, immeasurableness, inconcinnity, contradictoriness already of the tone-psychological space” could not be analyzed. However, both Kurth and Wellek believed that “the ‘music-psychological space’ as a pure feeling space (not a representation space), completely withdraws from any clear and unequivocal dimensioning from the beginning.” (Wellek 1963/1934, 319).

The speculative logic of musical space as a space.

Succinctly put, the advocates of intrinsic, autonomous musical space seem to have relied on this kind of reasoning:

Premiss 1: Spatial hearing (localization of sound) is imperfect and subordinate to visual and tactile spaces.

Premiss 2: Visual and tactile spaces are congruent with and closely attached to the actual space.

Result A: Consequently, hearing is imperfectly congruent with the actual space.

Premiss 3: Musical space is something else than localization, it is more of a subjective feeling involving spatiality than a perception of an actually existing space.

Result B: Consequently, musical space proper must be separated from imperfect spatial hearing, which is tied to the actual space.

Result C: Consequently, musical space is detached from the actuality, implying transcendence and ambiguity to the degree of unanalyzability.

However, the reasoning seems somewhat imprecise. To begin, from the viewpoint of naturalist pragmatism, it is contradictory that musical space could at the same time be detached from actuality while being connected to the human life (or else, music would unavoidably be meaningless to us, which does not hold by definition, as defined in part two). This is further complicated by the simultaneous separation and mutual inclusion of the hearing space and tonal space in musical space. Also, there seems to be no reason to surrender to the complexity of musical semiosis and to settle for unexplainable ambiguity of musical spatiality.

As far as the premisses are concerned, there seems to be no compelling reason to assume that hearing would be subordinate to other senses. From the perspective

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20 Consequently, Wellek searched support from Dürckheim’s notion of “lived space” (der gelebte Raum). A history of ideas of the Germanic discourse of musical space and its Romantic undertones would deserve separate treatment.
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of naturalist pragmatism, the object structure of the actual world is endowed to us already by the causal relations of subject-inhabited organisms and other objects of the environment (as suggested by Määttänen’s s-model, see chapter 3.2.4), and not by vision, for instance. The qualities perceived imperfectly in each sensory domain are attached to the “objective” object structure, which constitutes the hard facts of the actual world, and which is revealed to us through more or less goal-oriented and more or less successful action. Depending on the situation in the interaction with other objects, different senses may prove useful and thereby significant. Nevertheless, hearing space, understood as the perceived location and ambience of sound, seems to be imperfectly congruent with the actual space. Yet, the development of habits of perceiving and acting adjusts according to the imperfectness of hearing (and other senses). In other words, the relative fallibility of inquiry applies (see section 1.2).

Also, as discussed in chapter 4.1.2, the actual spatial features of sound are an existing means for expression and a realizable and significant factor in music. True, musical space is evidently something more than just localization, but that should not lead to exclusion of the actual spatiality of sound from tonal or musical spatiality. As far as the relations of Wellek’s musical space, tonal space and hearing space are concerned, contrasting and separating them analytically should not overthrow the idea of their mutual inclusion, in that in the actual process of music, musical space feeds on tonal space. Furthermore, since the spatial perception of sound is indeed a means for expression, the relation between hearing space (space in terms of “the aurally mediated spatial orientation”) and tonal space (space in terms of the ordering schema on which musical space feeds) should be reevaluated. The tripartition together with the inclusive relation between tonal space as an ordering schema and musical space as the complex combined result suggests a possibility of a Peircean rendition.

Paradoxically, a move towards naturalist pragmatism might also resolve the contradiction mentioned above, that musical space seems simultaneously detached from actuality and yet connected to the human life. The paradoxicality is due to the naturalist (and materialist) stance, that only the actual objects exist, which necessarily means that the subject’s representations of the world are also based (primarily) on the actually existing objects. Now, in music, the references seem to point (primarily) to structures without definite, corresponding object structure in the actual world (with the exception of certain extremities of program music or certain “iconic” idioms such as imitations of birds or other identifiable sound sources). Yet music may evoke meaningful subjective experiences. As already Kurth put it (1947/1931, 120; see above): the emerging feeling of space is an analogy to the actual (or “concrete”) space, “not identical with it and not a translation of its laws to the Inner; but
something else, only related to it.” Hence we return to the major questions of, first, what and how music represents, and, second, what makes musical representation and specific musical space possible (without resorting to disembodied conceptions of music or conjectures about existence of metaphysical entities)? In this respect, the question of musical space is connected to the question of musical semiosis. At the same time, from the viewpoint of spatiality, the question of what and how music represents leads to the question of topology and dimensionality of musical space, discussed in the next chapter.

Return to the acousmatic dilemma.

The thoughts above take us also back to the acousmatic dilemma: What is the logic behind the detachment of musical spatiality from actual spatiality, and the specific, if not autonomous character of musical space? According to Lippman, the independence of the “more properly musical matters” from actual spatiality results from the ability of sound to free itself from its source, by intruding “its own sensuous properties to the extent that they become objects of interest in their own right”, while “the fact that they originate in some object goes unattended” (Lippman 1952, 112). Hence, musical sound proper would indeed be acousmatic, listened to with no regard as to the immediate cause or origin of the sound (Scheffer 1966, 90–; Chion 1983, 18–19). Consequently, the sound perceived in music “may become, then, more easily non-representational, and this is certainly of central importance in its relation to space,” according to Lippman (ibid., 113).

Lippman’s abstruse explanation of sound intruding its own properties seems overly nebulous. Instead of trusting that the other properties of the sound would simply be enthralling enough to cause the disinterest in perceived direction, distance and ambience, one is more likely to begin searching for the answer to the acousmatic dilemma in the performance settings, recognition of the settings, and the conditioning concerning the settings as well as in the process of auditory perception.

But first, what Lippman means by music becoming “non-representational,” should perhaps be taken—not as becoming void of representing at all—but as not representing definite, concrete and static object structures of the actual world. Lippman rightly stressed the dynamic as opposed to static character of musical representation in the same context. He namely maintained (idem), that sound “offers us less a

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21 Referring to the two types of “objective” functions of listening, in which the sound object is taken as a concrete index or abstract sign (Schaffer 1966, 116), Schaeffer maintained, that “one needs an altogether particular effort to draw aside these ordinary aimings, in order to turn the attention on the sound object itself. This reduced listening seeks to appreciate its making (trace of the agent) and its contexture (reserve of potential values)” (Schaeffer 1966, 675–676; emphasis original.)
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static situation than an event; it is more closely bound up with change and motion” as opposed to vision picturing something that “is”.22

As noted in chapter 2.2.8, musical situations and events, regardless of the how they are represented, are amalgamations of interaction of the agent and patient. According to Tarasti (1998b, 49), music “draws listeners into this situation and forces them to participate in it.” This is evidently due to the fact that all changing situations, acoustic-musical or not, demand interpretation. This is a fundamental feature of inquiry. Unless settled, sound remains an irritating doubt (see chapter 1.2.5). But in music, interpretation does not tie the sounds (necessarily) to specific actual objects, or to the actual sound sources. Consequently, there is an inherent need to search for a settlement for the irritation of the musical sound in one way or another, to interpret and try to attach the perceived qualities of sound to some sort of imaginable object or some sort of imaginable activity of objects. From the naturalist perspective, there is no other feasible alternative but to relate the qualities, one way or another, to those activities of the natural interaction between subject-organism and the environment, whether previously perceived and experienced as such or hypothesized feasible, based on previous experience and habits of perceiving. Any possibility for disembodied interpretation is excluded. Meanings are unavoidably tied to experience. For everyday situations, we have developed habits of interpreting sound as being caused by this or that, but musical sound can be different by being acousmatic.

To speculate on what may enable the detachment (or distancing) of musical space from the actual space, let us first consider how the conventional performance setting is acknowledged. For instance, in many performance traditions such as the Western concert situation or the like, the settings are constructed so that each participant recognizes the actual acoustic environment as a performance space for music, the habitual performers’ position on stage, and the listeners’ positions in the audience as well as the roles of each participant. We become accustomed to the various rituals of attending a performance, whatever the role may be, and consequently we become habituated to the fact that the sounds to be heard are not to be taken “for real”. The settings are similarly acknowledged when making music for and when listening to music in other, culturally more or less stable performance settings, including those of recorded music and home equipment, car stereos, Walkmans or media players that liberate musical performance from its fixed performance premises (see Hoffman-Axthelm 1986, 24). In fact, this conditioning seems not only cultural but a natural

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22 Lippman’s statement, that musical sound “stands less and less for external events of biological significance as it becomes increasingly regular in vibration form” (1952, 113) implies a certain, aesthetically loaded conception of musical sound and separation of culture and nature incompatible with naturalist pragmatism.
part of childhood development: just like the situations in playing are not taken “for
real”, neither need the sounds made in playing be taken. Participation in the commu-
nicative situation of music is not merely accidental. We grow into being participants
in musical communication as we learn its benefits, the practical bearings it may have.
Hence an attitude that in interpreting sound in certain contexts, one need not be
concerned with the hard facts of life, that is, with the origin of the sound.²³

Although, obviously, conditioning may automate attitude, the attitude alone
does not seem suffice. There needs to be something in the properties of the sound
itself that initially may enable the detachment from the reference to actual object
structures. The conjecture is as follows (and here I reinterpret Lippman’s idea of
sound intruding its own properties, to a certain degree).

A possible answer to the acousmatic dilemma is suggested by the relative com-
plexity or simplicity of the perceptual cues to direction, distance and ambience in
comparison to perception of volume, timbre or pitch. The majority of world musics
use changes in pitch, timbre and volume as significant, “form-bearing elements”.
While their correlation to the actual frequency, spectrum and intensity of the sound
is not simple, the organ of hearing of the cochlea does provide a spectral analysis
of sound, including information of relative intensities at different frequencies. The
tonotopic organization of hearing is thus initiated. While complex auditory stimuli
apparently require a multistage process for the formation of volume, timbre and
pitch, and of intricate systems of pitch relations, among other complex musical fea-
tures, the fact that the multiple tonotopic maps of the auditory cortex (Talavage et al.
2003) are initiated in the most peripheral parts of the auditory system suggests that
some kind of representations relating to frequency/pitch, amplitude/volume and
spectrum/timbre are available already at the earliest stages of auditory processing.

In comparison, direction, distance and ambience of the sound in the actual
space is inferred from the spectral information provided at the cochlear level. The
processing of the interaural time and level difference, necessary for spatial hearing,
necessarily requires the comparison of the stimuli of both ears. In the auditory
pathways, this is possible at the earliest after the second order afferent neurons
(from ventral cochlear nucleus to both ipsilateral and contralateral superior olive
and accessory superior olive; e.g. Warren 1982, 14), that is, at about halfway to the
primary auditory cortex. Consequently, it would seem that, while spatial hearing
is useful for the survival of the human species (both biologically and socially) and
a valid means for conveying musical experience, it is cognitively secondary to the
even more fundamental “spectral hearing”. In this sense, spatial hearing supervenes
on spectral hearing.

²³ Note that the participant need not be aware of her attitude or acknowledgment of the situa-
tion.
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For instance, far as visual space is concerned, the corresponding sensory information at the rudimentary levels seems more closely connected to the actual object structures, as the retinal image processing (at the ganglion cells) already deals with information about the changes in light intensity (and hues), leading to differentiation between two-dimensional projections of light from objects. In vision, depth is the only dimension out of the three (ordinary) ones that unquestionably needs to be inferred.

While this conjecture is in need of much deeper neuropsychological and neurophysiological (as well as neurophilosophical) insight, it nevertheless may account, first, for the differences between hearing and other senses in their relation to actual spatiality; second, for the seeming separation of tonal (and musical) space from the elementary spatiality of hearing; and, third, for the prominence of pitch, volume and timbre as elements of music in many music cultures, as opposed to direction, distance and ambience, for instance.

However, this does call for a reevaluation of both tonal space and hearing space, to put it in Wellek’s terms. In terms of musical spatiality, the most fundamental spatial structures seem to be the initial structures in the perception of timbre, pitch, and volume, instead of Wellek’s “hearing space”, an incomplete image of the objective, physical space, based on aurally mediated spatial orientation. However, the spatial structures relating to pitch or frequency, for instance, would apparently be very simple and straightforward at the initial level. Also, “tonal space” is not simply a three-dimensional structure or ordering schema (Ordnungschema) as described by Wellek, but might consist in various spatial structures refined and inferred from the elementary structures of “spectral hearing”, including the structures for direction, distance and ambience.

The conjecture is in concord with the tripartite idea, that elementary spatiality of hearing serves as a ground for the more developed, perceptual ordering schemata of sound objects (akin to Wellek’s tonal space), which in turn feed the more subjective spatial structures, the musical space proper, described by e.g. Wellek and Kurth as feelings of space. In this perspective, musical spatiality is logically connected to motion and actual objects in that the structures of hearing represent properties of causally related to actual objects,

\[24\] Consequently, instead of the term ‘tonal space’, which is closely affiliated with the Western tonal music, indeed a better expression might be ‘sonic space’ or ‘sound space’, corresponding to the construction of the perceptual ‘sound object’. Below, the term ‘conceptual sound space’ or ‘sound space’ for short are used, to mark the close relation with ‘sound object’ and the conceptual aspects of ‘phenomenal spatiality’ discussed earlier.
in the rudimentary sense that one object causes another to vibrate or to
propagate pressure changes in specific ways, and that the causality leads to the
formation of the elementary spatiality in hearing;

in the inductive and deductive sense that various, meaningful features per-
taining to the actual objects (not only their direction, distance, ambience, but
also features such as speed, size, material, etc.) can be inferred from the simple
and complex spatial structures in hearing (and other senses), and reversely, the
spatial structures can be developed based on perceived features; as well as

in the abductive sense that, due to habits developed in inquiry, features of
sound not pertaining directly to the actual objects can be interpreted as per-
taining to situations that may or might be, and associated with the subject’s
other experiences.

The conjecture does not seem to require other major changes to the idea of musical
space as a superordinate feeling space, feeding from the tonal space and the hearing
space, and constituting a complex combined result of the ordering schemata and
subjective experience.

As such, the conjecture would well fit in both the Peircean view of semiosis and
Gärdenfors’s theory of conceptual spaces described in part three. In this sense, the
“complex combined result” of musical space can be considered a complex of conceptual
sound spaces. Of these, the most elementary “hearing space” could be considered
iconic (in terms of the phaneroscopic categories and classes of the Sign as described
in chapters 3.3.2 and 3.3.3), the secondary ordering schema of “tonal space” indexi-
cal, and the ternary “musical space” symbolic, associating to subjective experience
(see chapter 4.2.1).

4.1.4 Structures of sound spaces in music

In this chapter I examine the structuring of conceptual sound spaces in music. Car-
rying on with the ideas of musical spatiality presented in previous chapters, we first
have some examples of how the ordering schemata of conceptual sound spaces have
previously been conceived in the context of music, reflecting the complexity of the
issue in the musicological tradition. Certain problems associated with these
conceptions lead the way to presenting the current understanding of conceptual
sound spaces in music.

The previous chapter discussed, among others, Wellek’s tripartition of spaces
in (musical) hearing:

1 hearing space as incomplete image of the three-dimensional actual space,
2 tonal space as a (ambiguously) three-dimensional ordering schema, and
3. **musical space** as a subjective space feeding itself from the previous, and associated with feelings.

In the previous chapter, the suggested answer to the acousmatic dilemma revised these into a tripartition of conceptual sound spaces in music:

1. simple initial spatial structures relating to the perception of pitch, spectrum and volume, endowed by the elementary “spectral hearing”;

2. more complex auditory structures inferred from the previous for the benefit of constructing perceptual sound objects, phenomenal structures which then may be associated with the subject’s experience one way or another,

3. musical space as conceptual space in which the dynamic sound object structures are associated with other experiences thus “constituting a complex combined result” of a feeling-like subjective experience.

How this is in concord with the Peircean view of semiosis introduced earlier, will be addressed in chapter 4.2.1. Here, the focus is generally on the constitution and dimensionality of musical sound spaces and sound objects.

**The dimensionality of conceptual sound spaces in music.**

The conception of musical spatiality is inescapably related to the ruling, general conception of spatiality. In the past, if not still today, the uttered conceptions of musical spatiality often reflected the idealizations or practically viable approximations of the actual space, namely those of the absolute conception of space with height, breadth and depth as its three dimensions (see chapter 3.1.1). Consequently, phenomenal spatiality of music was commonly assumed three-dimensional, as well.

In fact, at times, the past discourse on musical spatiality seems to have been almost obsessed with the problem of what constitutes the three dimensions, particularly the “obligatory” third one, the allegedly self-evident two dimensions usually being pitch and volume or pitch and time. At the same time, musical spatiality certainly was not thought to reproduce the actual space as such. Hence, musical spatiality needed to be similar enough, but not too similar with the conceived spatiality of the actual world. It seems, that it was the strong empiricist-positivist scientific tradition of the modern society and the scientific (or pseudo-scientific) aspirations of the 19th- and 20th-century musicologists that led to this preoccupation of connecting the absolute conception of space of the natural sciences with the spatiality of music (cf. Harley 1994a, 87). It also seems, that even some time after the breakthrough of the relativist conception of the actual space and the mathematical
discovery of manifolds, there was no general conception of space available at hand for inquiry on musical space other than the absolute Newtonian paradigm.25

Pitch, especially, seems to have fit well to the “absolute” three-dimensional conception of musical (sound) space, as it has been traditionally connected with the dimension of height. Other dimensions have been more problematic. For instance, Siegfried Nadel (1930) suggested, that the two dimensions adding to that of pitch (Höhen) would be volume (Volume) and (sic!) “qualities” (Qualitäten). For Ernst Kurth (1947/1931), the third one was “depth” (Tiefen) described as a combination of dynamics (Dynamik) and timbre (Klangfarbe). Wellek’s conception was already summarized above.

Other alternatives have also been suggested. According to Robert Cogan and Pozzi Escot (1976), the linear shapes and motion in music differ from (mathematically or practically conceived) one-dimensional geometrical lines in that musical lines require both pitch and time. Consequently—and disregarding other features—‘musical space’ (undifferentiated from ‘acoustical space’, both practically referring to conceptual sound space) appears two-dimensional, the constituting one-dimensional elements being pitch and time. Along the same lines, but excluding time from space, Gisèle Brelet maintained, that sound space (l’espace sonore) is one-dimensional, like time (Brelet 1949, 93; cf. Harley 1994a, 53).26

Even further apart from the three-dimensional Euclidean ideal has been the idea of zero-dimensionality (or non-dimensionality) of musical space or musical sound space, or the idea of denying musical spatiality altogether. According to Géza Révész (1937b, 435), again subordinating hearing to vision,

[s]ounds, tones, and noises are all localized in visual space. It would never occur to the naïve observer to assume, besides a visual and tactual space, a phenomenally independent auditory space, where tones and noises find their place in the same manner as do the space objects in the visual-tactual space. Upon a close analysis it becomes apparent that the doctrines of a specific auditory space ... are completely untenable.

25 See, for instance, Wellek 1963/1934, 311: “Still more paradoxical, however, is that we do not reliably know, of what the three actual (not temporal) dimensions of this space should now consist, and to what extent it is still reasonable to speak of space to if such three dimensions cannot be indicated.” (Original in German: “Noch paradoxer aber dadurch, daß wir nicht sicher wissen, worin nun die drei eigentlichen (nicht zeitlichen) Dimensionen dieses Raumes bestehen sollen, und wieweit es noch Sinn hat, von Raum zu sprechen, wofern solche drei Dimensionen nicht aufweisbar sind.”)

26 The ideas of both Cogan and Escot, and Brelet raise the question of the relation between temporality and spatiality. The former include time in sound space, the latter excludes it. See chapter 4.1.5. Other examples of “grid notation” analyses building on pitch and time as the two dimensions of musical sound space include McDermott 1966, and the Ligeti analyses by Jonathan Bernard (e.g. Bernard 1999). However, Bernard identifies space with pitch, not pitch and time.
Yet, Révész himself had suggested a three-dimensional (or really two-dimensional) model of pitch space (see below, chapter 4.1.6). Mersmann (1926, 9) associated the temporal succession of tones with horizontality and simultaneous tones with verticality, but also paired space (Raum) with force (Kraft), the former being feminine, non-developmental, static, ambiguous and evasive, negation of and subordinate to the latter, thus a complementary background for force (ibid., 87). For Mersmann, “form is projection of force in space.” (ibid., 630). However, the idea that space is a negation of force leads to the notion that, according to Mersmann, space in music is not dimensional at all (see Kurth 1947/1931; Harley 1994a, 48).

Lippman (1952, 216), in turn, suggested four attributes for simple tones (pitch, loudness, volume and density) and at least three additional ones for complex tones (brightness, full[1]ness, and roughness), but maintained that the “characterizations basic to musical experience” can be derived from “the spatial continuum of sensations” in two mutually linked dimensions, the “low-high dimension” of pitch and the “large-small” dimension of volume (Lippman 1952, 236–237; see the critique in Harley 1994a, 56–57). However, the two “tonal dimensions of pitch and volume” are supplemented by “harmonic frequency-relationships” and a number of additional features which contribute to the spatial nature of music “although they are attributes of other types of experience as well”, temporality being one in particular (ibid., 238). In other words, Lippman held on to the tradition of pitch and volume as the prescribed dimensions and thereby essentially agreed with, e.g. Nadel’s conception (see also Lippman 1977, 49–57). At the same time, he left the door ambiguously open for an indefinite number of supplementary dimensions of other “qualities”, suggesting the possibility of a more complex and more dynamic conception of conceptual sound spaces in music (Lippman 1952, 222):

Because music represents such a complex experience, musical space [here: conceptual sound space] must also be complex, and because the significance of music is a historical variable, the features of musical space must have a changeable aspect. Certainly this space must have both a dynamic and a morphological side, for any phenomenon is capable of being apprehended in these two ways.

Lippman’s steps toward a more flexible and complex conception of musical spatiality were continued by McDermott, although he, too, hung on to pitch and volume as the two obligatory dimensions, and emphasized pitch and contrapuntal lines in his analyses (1966, 40; see also McDermott 1972):

However, this emphasis cannot preclude the contributions of other elements which are decidedly important to the shaping of the spatial image [of sound]. Insofar as the spatial image is the mind’s eye view of a work, everything that varies the individual sounds also effects the total image. But elements other
than pitch-in-time are built on a subtler, much more complex, and less easily measured basis. According to McDermott (1966, 41), the variables affecting the total sound image include “variations among the different lines in timbre, intensity, and pitch and rhythm, as well as the use of formal recurrences, i.e. the hearing of certain relations again.” Finally, another affecting variable named separately is “the location of the sounds source in physical space” (idem).

Pitch space as an epitomic domain of conceptual sound spaces.

At least in the context of Western music and musicology, there has traditionally been quite a widespread agreement that pitch constitutes one dimension of musical sound spaces. However, the pitch dimension is not without its own problems. Namely, it appears, that pitch may constitute, not only one linear and continuous dimension from low to high pitches, but more complex spatial structures in itself. Also, the self-evidence of the pitch dimension is questionable.

For instance, Révész argued (in 1913) for a three-dimensional model of pitch space together with the two-component theory of pitch (Zweikomponententheorie, see Révész 1946, 67–75 and compare with Révész 1937b). The model distinguishes between pitch height and pitch chroma, which are presented as two dimensions, one linear (pitch height) and one circular (pitch chroma, comparable with pitch-class), thereby constituting a cylindrical, or rather, helical space of pitches (figure 33).27

As conceptual spatial structures, Révész’s helical pitch space and the spindle-shaped color space discussed in chapter 3.1.2 have structural similarities: both have a circular dimension (pitch chroma and hue), and a linear dimension (pitch height and brightness). On Gärdenfors’s terms, this kind of similarity of conceptual spaces may allow for more or less intimate metaphoric relations between pitch and color, which indeed have been expressed particularly through various reports of synesthesia and chromesthesia. Yet there are differences as well, since the Révész model lacks the radial quality dimension (corresponding to saturation). Because Révész’s pitch space helix has an undetermined radius, it is, as it stands, really a two-dimensional model.

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27 For pitch space models that have been elaborated particularly in the context of Western tonal music, based on the Eulerian tradition of tone nets (Tonnetz), towards multidimensional helical, toroidal and other models, see Shepard 1982; Lerdahl 1988; 2001; Noll 1997; and also Mazzola 2002. Fittingly, the sanskrit word ‘rāgā’ (रागा) and its other forms in classical Hindustani and Carnatic music translates, e.g. as ‘color’ and ‘coloring of the mind’.
Human hearing is especially sensitive to the frequency of sound. Many if not most musical instruments worldwide are constructed to afford detailed control of sound frequency. Accurate production and perception of pitch is an important factor in most musical practices, which is also reflected in the import of music-theoretical concepts, such as scale, mode, rāga or maqām.  

The hegemony of pitch organization over other factors (or dimensions) in analyses and descriptions of musical sound spaces is understandable. The concept of pitch space has been a useful conceptualization, an efficient tool for understanding and operating with the pitch organization, with temporally changing situations of “pitch objects” of different kinds of sets. However, despite its importance, the assumption that conceptual sound spaces in music necessarily involve one- or multidimensional pitch space is precarious. Even a greater mistake would be to equate pitch space with conceptual sound spaces in music, let alone with musical spaces.

Towards a relativist paradigm of conceptual sound spaces.

Indeed, it seems that we cannot take pitch or any other perceptual feature of sound as being an indispensable, a priori dimension of musical sound space even if the majority of world musics do use pitch, timbre and volume in different ways as form-bearing elements. Also, we cannot take the topological structures of any of the dimensions

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Illustrative of the embodied conceptual spatiality of pitch, ‘maqām’ (مقام) in turn, translates also as ‘space’, ‘place’ and ‘location’ in addition to being the Arabic word for key or tonality.
for granted, although certain basic structures evidently exist due to the physiology
of human (or more broadly animal) hearing. Generalizing structures conceived in
the context of Western tonal praxis directly to different musics of the world is risky
not only due to the vast variety of music cultures, but also in view of how Western
art music itself has not fit within the tonal boundaries over the past century, and
even earlier.29

As examples denying the ruling role of pitch in Western art music, think for
instance of the *Klangfarbenmelodie* in *Farben* op 16 no 3 from *Fünf Orchesterstücke* by
Arnold Schoenberg or *Quattro Pezzi per orchestra* by Giacinto Scelsi—or any music
with mostly unpitched sounds, whether traditionally instrumental, experimental or
environmental. It seems more likely that the perceptual features of sound, which
account for the complex auditory structures of sound objects and their relations,
are pragmatically selected by the participants of the process in each context and
tradition, according to their habits, so that the poiesis of the sound would yield
good praxis, i.e. musical experience.

When habits of perceiving and producing musically significant auditory struc-
tures are established, these habits constitute the individual and social musical styles,
i.e. musical styles generated in the small scope of particular works, dynamically
established by persons or groups of persons, or affiliated with the people of particular
geographical areas, cultures or subcultures, and of past or present time periods. In
short, it seems that the dimensions and other structures of sound spaces cannot
be taken for granted or be preestablished for good. Instead, they are dynamically
constructed in musical praxis through the participants’ individual and shared habits
of perception and action.

Along these lines Pierre Boulez (1971/1963, 83–84) made insightful remarks on
musical space, “valid for all organisations: duration, dynamics and timbres, as well
as pitch”, in saying

> It seems to me that one of the most urgent objectives of present-day musical
thought is the conception and realization of a relativity of the various musical
spaces in use. ...[T]he time has obviously come to explore variable spaces, spaces

29 The main theme in McDermott’s (1966) work is that, in “the music of time-space” (i.e. Western
pre-tonal and tonal music), “pitch change is the primary shaping element; intensity and timbre are
focused upon it”. Contrary to that, in the Western post-tonal music of “space-time”, “the leadership
of pitch is lessened considerably. The association of timbre, intensity, and duration to pitch is a great
deal freer, more independent; at times (e.g. *Atmosphères, Farben*), the alteration of pitch or of pitch
ordering is of relatively little consequence” (McDermott 1966, 245). Consequently, the musical “shape
in space-time is less a matter of pitch outline and more a web of equal-valued relations among the vari-
ous parameters.” (McDermott 1966, 246). McDermott commented this transition and quoted Boulez
saying “that ‘voice’ has not been lost from contemporary music, but instead has been transformed.”
(ibid, 282; see Boulez 1971/1963, 153).
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of mobile definition capable of evolving (by mutation or progressive transformation) during the course of a work.

Although Boulez continued with considerations “for the moment, from the point of view of pitch”, the demand for moving from an absolute paradigm to a relativist paradigm of musical sound space is clear. According to Boulez, the “variability of musical [sound] space is associated with the complexity and density of the internal structure, the interlinking, distribution or superposition of the sound phenomena”, “with the general tempo governing the pace at which the structures are expounded”, and “with the proportional relationships between intervals” (ibid., 83). It is also noteworthy, that Boulez called for spaces capable of evolving during the course of a single work, which entails that the stylistic habits of perceiving and producing the conceptual structures could be established (“by mutation or transformation”) even in the small scope of particular works.

In addition to his reference to conceptual spaces, Vincent McDermott was explicit about the relativist approach as well (1966, 40–41n1; see McDermott 1972), although from the viewpoint of naturalist pragmatism, there is no need for the physicalism implied:

The ‘dimensions’ of musical space can all too easily be bandied about when compared point by point with those of ordinary physical space. Perhaps the manifold relations of modern relativistic physics—the complex dimensions of the space-time continuum—may fare better as aids in developing a theory of the dimensions of musical space, but in the meantime, the musical entity is too complex, I feel, for the simple application of length, depth, breadth, and height measurements.

The relativist account of spatiality summarized in section 3.4 described space as “a conceptual structure constructed dynamically from instances and their relations. A space consists in instances as its points, and reciprocally each instance is defined by its relation to other points, thereby taking its position in the space”. The object structure of the actual world is revealed to us through the causal interaction with the environment, whereas the conceptual spaces account for the dynamics of cognitive representations (and semiosis in that respect). In this perspective, the relativist account leads to conceiving the conceptual sound spaces as conceptual spaces in music as well.

Conceptual sound spaces in music as conceptual spaces.

The complex structures of conceptual sound spaces appear now as dynamic conceptual spaces, in Gärdenfors’s meaning of the word, constructed based on instances of sound objects, features of sound objects and groups of sound objects. Features of particular sound objects are represented as points in conceptual spaces of different
dimensionalities and dimensions structured in different ways. Dimensions may be grouped to domains, and categorized into regions through prototyping. Reciprocally, then, the conceptual sound spaces consist in the instances and dimensions and domains (and their regions and prototypes) of sound objects. New instances are introduced constantly in musical processes, and new dimensions and domains are added (and perhaps also abandoned) as phenomenal features of sound form new habits of action, i.e. as we discover new ways of constructing meanings. The meanings, in turn, depend on how the sound spaces are interpreted and associated in the subject’s experience. This way the process of structuring of the conceptual sound spaces in music is tied to meaning in music (see Gärdenfors 2000, 103; chapter 3.1.2).

Hence there seem to be similarities in the logic of how conceptual spatiality is constructed in musical sound and in the representation of ‘apple’, for instance. Table 5 in chapter 3.1.2 presented the domains and regions in the representation of ‘apple’ as an example of domains and regions of conceptual spaces. The regions of the first four domains of ‘apple’ (color, shape, texture and taste) are each connected with a specific sensory modality and learned first. As experiences accumulate, the regions in the domains are further expanded (or possibly also contracted), and the structures of domains, simple or complex, refined through continuing prototyping and categorization.

The same goes for the conceptual spaces of musical sound, although by definition only the auditory modality is involved. The possible extents of the basic regions depend on the perceptual abilities in the sensory domain and on the gathered experience. We have rudimentary representations of “spectral hearing” as the basis for conceptual spaces. Through participation in musical processes, the basic structures of “spectral hearing” may be refined into more complex pitch spaces, timbre spaces, etc. These are comparable to conceptual spaces of color, shape, texture and taste. The structures of these primary domains may become refined through experience: for instance, the pitch domain may develop from a simple one-dimensional conceptual structure (high–low) to a structure combining the pitch chroma within an octave (or other modulus), (modular) registers, and even more refined hierarchies (of tonal or modal Western structures, rāgas, maqāmat etc.). The subject may learn to discern aspects of the timbre space, i.e. to construct different dimensions for the timbre space, and to label them, for instance in terms of roughness, brightness, harmonicity, or brightness; or in terms of known instrumental or other environmental sounds.

More domains, such as those for distance, direction and ambience of sound, may be developed by virtue of inference from the elementary structures of hearing. The degree to which the distinct domains of pitch, timbre and volume, for instance, are
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effective, and how the regions in the domains are refined, prototyped and categorized, depends on the subject’s accumulated experience. Just as the ‘taste’ domain of ‘apple’ may be totally ineffective if one has never tasted an apple, the ‘timbre’ domain of musical sound may be nonexistent if timbre has not been significant for the subject—if one has not explored and played with the different possibilities of timbre due to timbre having been stylistically subordinate to pitch, for instance.30

In fact, spatialization of sound may serve as an example of how dimensions of conceptual sound spaces in music may be added and abandoned, at one magnitude of musical styles (or habits). Despite the sporadic occurrences of, e.g. antiphonal styles of ensemble dispersion (such as in the polychoral style of the San Marco school of the late Renaissance and early Baroque Venice), the performance settings of the Western music in the era of tonality were established so that the direction and distance between the sound source and listener were simple and practically constant during performance. And once musical performances were no longer designed for specific performance spaces (exceptions notwithstanding), the ambient characteristics of the sound were not controlled in detail. By necessity then, the direction, distance and ambience of the sound were left relatively constant within each performance and similarities between performances in different performance spaces were only incidental. Consequently, the spatiality of sound could not have much informative value, so to say: being constant or random, it could not significantly contribute to musical events, situations or narrative. There was no reason for the listener to pay attention to the actual spatiality of sound, nor was it used in ways contributing to the perception of sound and thereby to the musical experience. The actual spatiality of sound became neutral. (See Lelong 1994; Hoffman-Axthelm 1986.) This, of course, strengthened the acousmatic separation of sound from its origin.

But as soon as perceivable changes were made in the actual spatiality of sound, there emerged possibilities to interpret those changes in meaningful ways. Not only indeliberate (candy paper noise or the like) but also deliberate (off-stage music etc.) disturbances of the established setting could cause significant ruptures, of which fact composers have repeatedly taken advantage, Mahler and Ives as but two examples of the Western tradition of art music during the past century or so. And when the performance settings have become such that the actual spatiality affords the possibility of being actually used (as in the polychoral music of the San Marco school,

30 In Schoenberg’s words, “the tone becomes perceptible by virtue of tone color [here: timbre], of which one dimension is pitch. Tone color [timbre] is, thus, the main topic, pitch a subdivision. Pitch is nothing else than tone color [timbre] measured in one direction” (Schoenberg 1983/1911, 421). From this perspective, pitch can be considered subordinate to (or supervenient on) timbre. In a sense, the same goes for volume. Hence the term “spectral hearing” describing the rudimentary stages of auditory perception.
or in music by Mahler, Ives, or by Stockhausen, for instance), then that spatiality has become “an essential aspect of musical composition”, event before Brant’s (1967) days. The electronic means of sound projection and sound synthesis have then provided new habits of spatialization for the musical praxis. Analogous examples of rise and fall of other musical features, elements or parameters can surely be found in other music cultures.

**Conceptual sound spaces – törend bewegte Formen?**

The changes in the construction of conceptual sound spaces take place in different magnitudes of styles, i.e. in different scopes of praxis from changes of habits due to individual performances and the subject’s momentary personal contexts to large-scale transitions of human cultures (and species). Consequently, there can be several dynamic processes of “shaping and reshaping” of the conceptual structures of sound spaces taking place in different magnitudes at the same time in the same personal or social context.

The conceptual sound spaces in music need not be directly isomorphic with actual spatiality. By being relative and flexible, they afford ways of being analogous or metaphorical of other situations experienced or potentially experienced by the subject; that is, they afford ways of being metaphorical of other conceptual spaces. We recall that, according to Gärdenfors (2000, 176), “a metaphor expresses an identity in topological or geometrical structure between different domains.” This leads back to the acousmatic dilemma and to the idea that, from the naturalist perspective, there is no other alternative but to settle the irritation of musical sound. The irritation of doubt need not be settled (only) by directly representing definite, concrete and static object structures of the actual world. The settlement may relate the perceived sound to any experience accumulated in the past natural interaction with the environment and, based on that, hypothesized for the future in imagination (see chapter 4.1.3).

Without foreseeing the cognitive metaphor theory and limited by the absolute conception of space, for Lippman, the natural tendency for embodiment seems to have been obvious (1952, 235):

> The tendency of musical [sound] space to seek embodiment in conceptions of empirical space is so readily understandable as not to require explanation; an identity of structure and of sensational character, and the dominance of utility in establishing meanings are the chief underlying reasons.

All structures of conceptual sound space will be interpreted in relation to the subject’s experience, in one way or another. However, what is and is not feasible in musical communication can be inferred from how past and future experiments with sound are experienced in praxis. And according to the conception of music
Music is spatially embodied

outlined in part two, action becomes musical action if and only if action yields an experience (see chapter 2.2.2).

Hence, there seems to be some ground to consider music as “tönend bewegte Formen” (Hanslick 1986/1854)—as forms resulting from the complexes of sound objects in conceptual sound space, as far as the forms and their phenomenal spatiality are regarded as the subject’s complex and dynamic conceptual constructions as opposed to canonically given, fixed constructions. However, the subjective experience of music—each an experience of music in Deweyan sense—requires more than the tonally moving forms, namely the association of those forms in subjective experience for the benefit of the “complex combined result” that constitutes an experience.31

Particular sound objects in conceptual sound spaces.

Each feature of a particular individual sound object constitutes a point in a quality dimension or domain. However, it seems difficult to determine in the context of music in Gärdenfors’s terms which quality dimensions are integral and which are separable from others (thus forming domains), if even the basic dimensions of simple pitch and volume are indeed derived from the common phenomenal foundation of “spectral hearing”.

Gärdenfors’s theory of conceptual spaces (2000; chapter 3.1.2) maintains that basic adjectives of natural languages are represented as natural properties, i.e. as regions of one domain (consisting of integral quality dimensions), and the basic lexical expressions (nouns) as natural concepts, i.e. as one or several separable subspaces. If perceived pitch, timbre, volume, distance, ambience etc. are considered natural properties of the sound object (and there is no apparent reason not to do so), it seems that each of them would constitute a domain, and the combination of them—the sound object—a natural concept. Hence terms for ‘pitch’, ‘volume’, ‘timbre’ and other concepts would emerge, based on the domains of conceptual sound spaces as ‘elements’ of music. And even if the properties of the sound object are inseparable (i.e. integral, like adjectives in that sense), the properties nevertheless constitute quality dimensions and integral, intertwined collections thereof.

Briefly put, conceptual sound spaces seem to mature from rudimentary auditory representations constrained by the sensory mechanisms, and they evolve by virtue of their practical affordance—the meanings of the sound objects. In this respect,

31 Note that since the conceptual sound spaces as depicted here are not (yet) associated with subject’s accumulated experience, this view of form in music corresponds with the notion of musical form as portrayed in the tradition of music analysis that tends to exclude subjective experience and focus on “objective” perception of musical sound (cf. Lippman 1952, 244; Kurth 1947/1931, 87). The problem with that is that an experience in music requires subjective interpretation of the sound.
the construction of the conceptual sound spaces seems to follow the general logic of the construction of conceptual spaces. Similarly, the objectification of musical sound would correspond logically to the construction of object representation in general. This also supports the idea that the possible correspondences, similarities or references between musical experience and the actual world should be sought, not necessarily in the similarities between “objective” properties of sound and the objects of the actual world, but rather between the representations of musical sound (in terms of conceptual sound spaces) and representations of the actual world (in terms of other conceptual spaces), i.e. between the structural similarities of the phenomenal spaces pertaining to music and the actual world.

Taking pitch again as an example (which again does not mean there should always be a pitch domain), the simple, one-dimensional linear pitch space (for instance in the traditional Western designation high–low, see 4.1.6 below) is topological by being ordered (from one extreme to the other) and (usually) metric by having a distance function. The distance function of pitch may be simply homogeneous (as in the equally tempered chromatic scale in which the distance corresponds primarily to the logarithm of frequency) or heterogeneous in various ways (as in diatonic, pentatonic and other scales and modes with unequal steps). The fact that pitch ordering and distance are results of not only the real or implied fundamental frequency of the actual sound is irrelevant as far as the structuring of the conceptual space is concerned.

Complexities in pitch space arise, e.g. due to the fact that pitch may appear as discrete or continuous. Even in the same musical context, categorized, discrete pitch may be intermixed with continuous pitch in the form of bends, glissandi, vibrati and like. In such musical textures, the discrete pitches may appear as points of gravity between and around which the continuous changes in pitch may occur. Alternatively, the conceptual structure may possibly differentiate the discrete pitch as a dimension (or domain) of its own, and the continuous aspects of bending the pitch as another one, more or less separable from the discrete pitch, the pitch “proper”. In other words, depending on the habits of perception and action invested in a musical praxis, the discrete pitch and the coloring (sic!) of the discrete pitches (through vibrato, ornamentation or like) may or may not be separable. For instance, the Western classical tradition (also evidenced through common-practice notation and the MIDI standard) has focussed separately (and firstly) on the discrete pitch domain, while small, continuous variations of pitch (vibrato, glissando, pitch bending and other ornamentation) are either put aside or represented separately. In contrast, there are examples of vocal music traditions that do not differentiate bet-
ween discrete pitches and ornamentation in such a distinct way (e.g. some Karelian singers of *itkuvirsi* laments).

In addition, the distance relations of different pitches tend to be weighed differently, so that octaves, fifths and other intervals corresponding to simple harmonic relations of frequency (with certain accuracy) tend to be perceived inherently differently from those corresponding to complex harmonic or inharmonic relations, thus leading to complex structures of pitch space, such as Révész’s pitch helix or the tone nets in Western tonal music with inherent tonal functionality for each discrete pitch class in respect to a tonic. It is a goal of cognitive musicology and music psychology to decipher to what degree the reasons for this are phylogenetic, ontogenetic or sociogenetic, i.e. how they might be due to the acoustical characteristics of frequencies with harmonic versus inharmonic relations or due to the mechanics and basic psychoacoustics of hearing, including the critical bandwidth, or the habits developed in the social interaction of musical praxis and the subject’s (or subjects’) accumulated experience. In any case, once the tonal functions and other complex pitch relations enter the picture, it becomes difficult if not impossible to distinguish between what are “purely” auditory structures (akin to Wellek’s tonal space) and what are “complex combined results” of the auditory structures and their associations with the subject’s experience. At some point it just seems reasonable to start speaking of musical space instead of conceptual sound spaces and “purely” auditory structures.

Similarly we could approach other elements, such as volume, for instance, as domains of their own, as suggested—in a Gärdenforsian way—by Stanley Smith Stevens (1934, quoted in Lippman 1952, 196, emphases in Lippman): 32

> We are justified in saying that volume is a phenomenal dimension of tones. It is a dimension in terms of which an observer is able consistently to make discriminable judgments, and in terms of which he is able to equate two tones which differ in respect of every other phenomenal dimension. It is better to call it a *dimension* than an *attribute*, because the word *attribute* has historically more specific connotations. The word *dimension* signifies that a tone can have any number of ‘sizes’; that is to say, volume is one of the aspects in terms of which a tone can undergo continuous variation.

**Complexity of sound object structures as musical reality.**

Instead of single, distinct sound objects, musical processes rather involve complexes of sound objects. Sound objects appear and disappear dynamically, possibly mutate

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32 The appropriate remark by Stevens is strangely contrasted, to say the least, by how he ended up with his conclusion, an argument of his being “that an observer who is congenitally blind can be trained to observe volume”.

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during their appearance, thus constituting complex dynamic combinations, that is, compositions. Several narratives may be going on simultaneously, overlapping, fore- and backrounding one another, and nested in each other. For example, the changes in pitch space may be different from that of volume or timbre space, and there may be several distinct lines of melodic acts or harmonic events going on simultaneously. Depending on our perceptual abilities, we reach and participate in each narrative that is accessible to us.

Illustrating the dynamic complexity of conceptual sound spaces, the Finnish musicologist and music techno-logician Kalev Tiits (2002, 37) has described human reception of music (or reception of musical sound) as follows:

A characteristic feature of the human reception of music is one that might be called kaleidoscopic reception. The listener’s attention is often divided between a number of things: simultaneous progression of musical form on several hierarchical levels, harmonic ambiguities, more than one melodic line (counterpoint), to name only few. Discussions about the dimensions and data representations of musical communication sometimes confuse representations of music with representations of individual notes in a score or MIDI flow, which can indeed be closed representations, characterized by necessary and sufficient conditions. Music is a multi-faceted, multi-dimensional phenomenon, however, where concepts with necessary and sufficient definitions are often not very usable. Reception of musical communication must be just as multi-faceted and multi-dimensional – open to the point that the number of dimensions and facets may be constantly variable.

Consequently, it is not an easy task to generalize what constitutes a sound object. In some cases it may be a perception of a single tone (or its extension, e.g. a harp arpeggio; see Chion 1983, 35). In others it may be a motif or a theme. It may also consist of a larger structure, e.g. be a composite cloud as in the micropolyphony of Ligeti or the stochastic music by Xenakis, or even comprised of the complex stream of texture of an auditory landscape. This leads to the psychological topics of spatiality of auditory events (Blauert 1983/1974), auditory scene analysis (Bregman 1990), and auditory object analysis.

Griffiths and Warren (2004, 887) suggested “four general principles of object analysis that might serve as a basis for the neuroscientific study of object analysis in any sensory domain”:

1. “object analysis involves the analysis of information that corresponds to things in the sensory world” (or, here: the actual world);
2. “object analysis involves the separation of information related to the object and information related to the rest of the sensory world”;
“object analysis involves the abstraction of sensory information so that information about an object can be generalized between particular sensory experiences in any one sensory domain”; and

“object analysis involves generalization between senses, such as the face and the voice of the same individual.”

Without our going into analytic details here, these principles seem to underlie the constitution of the conceptual sound object in music as well. However, in some degree an exception to this is the first principle. There is no objection to the principle as far as speech, for instance, is concerned. In that context, sounds are identified with their more or less familiar sources for the benefit of interpreting the sound (for instance family members recognizing each other in everyday discussions). But in music, as argued earlier (see the acousmatic dilemma in chapter 4.1.2), emphasis and attention tend to be directed to aspects of sound other than those immediately connected with the source of the sound object in actual space, i.e. listening is reduced (écoute réduite; Schaeffer 1966; Chion 1983). The correspondence with things in the actual world is indirect. In fact, Griffiths and Warren did moderate their first principle as far as “normal musical imagery” and certain pathological phenomena (tinnitus and musical hallucinations) are concerned: “our first criterion for auditory-object analysis still applies in such cases, as object analysis still involves the analysis of information that could correspond to things in the sensory world” (Griffiths and Warren 2004, 890, emphasis added). If the moderation indeed entails that “information” in music corresponds to hypothetical situations of the actual world (this rephrasing Griffiths and Warren), the first principle deserves no objections, from the viewpoint of naturalist pragmatism. As a matter of fact, it then reinstates the idea of the play theory of music.

The other three principles seem to match well what takes place both in musical analysis and listening. For instance, Griffiths and Warren (2004, 888) remark, that “there is no reason why the auditory system could not analyse all sounds as if they were objects or combinations of objects”. Sound objects are separated from one another by perceptual boundaries, the initial ones beginning at each particular instance at the rudimentary frequency-time representation generated at the cochlear level of “spectral hearing”. The abstraction of sensory information from particular instances to a generalization of a sound object with an identity and “object constancy” capable of withstanding object manipulation (e.g. transposition, augmentation and diminution, inversion, even retroversion, fragmentation, and concatenation, etc.) is possible through object templates (cf. Griffiths and Warren 2002; Näätänen et al 2001), brought about by different kinds of habits of perception (e.g. stream segregation and auditory scene analysis, accustomed stylistic characteristics etc.).
This is another way of describing the construction of conceptual spaces from the initial dimensions, the domains consisting of integral dimensions, the prototypical categorization of dimensions and domains, and the combination of the prototype regions in quality dimensions and domains into phenomenal sound objects. Finally, the sound object is generalized “between senses” by becoming correlated with objects in other conceptual spaces, i.e. through its interpretative relation with the subject’s accumulated experience. (See chapter 4.2.1.)

In each particular case, the perceptual construction of a sound object means the construction of an instance in dynamically established conceptual spaces, their domains, quality dimensions as well categories and their prototypes, which in turn depend on their conceivable practical bearings, according to the pragmatic maxim. As such, this is well compatible with the complexity of perception of the actual world: at one end, we extract perceptual features and combine them in order to construct representations of clearly distinguishable objects (an apple, a chair, a ball), and at the other end, complex summary textures of complete representations of environments, which are coherent enough to be perceived as consisting of elements logically connected to each other. Consequently, it is no wonder that the concept of form pervades musical analysis, both as an explicit music-theoretical discipline and as implicit, tacit knowledge in musical praxis, just as the concept of form pervades our everyday life. The difference, however, is in that, form in music is provided by the formation of the sound objects, differentiation of the perceived sound objects (i.e. auditory objects), their sufficiently distinct identities and sufficient object constancy, whereas the object structure of in our everyday life is brought about by causality and revealed to us by the hard facts of the actual world.

Analysis and enumeration of the dimensions of musical sound spaces and sound objects now appears as a descriptive task possible post factum on a case by case basis rather than a general, prescriptive one. The attempts to directly match the topology of musical sound space with that of the Newtonian three-dimensional actual space seem outright vain.

In addition to the dynamic complexity of particular sound objects, the kaleidoscopic complexity is a result, as Tiits suggested, of the complexity of combinations of a number of sound objects, which can be related to each other in complex ways by being successive, simultaneous, or nested. Consequently, the issue of temporality

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33 These, in turn, are evidently effected by the subject’s ability to discern auditory features and habituation to object constancy in general.

34 Lippman (1952, 251) foresaw this in admitting the difficulties of instituting correspondences between actual spatial dimensions and particular tonal dimensions: “a moment’s reflection will reveal that the dimensions of music, could we but tabulate them all, probably would be too great in number for such treatment.” Consequently, tabulating the domains of conceptual sound spaces in music is clearly a mission impossible.
cannot be avoided in the context of musical spatiality. Once we take into account the
dynamic changes—the vicissitudes—of the sound objects, inhabiting and determin-
ing the multidimensional conceptual sound spaces and interacting with each other
simultaneously, in succession, and nested within each other, we are another step
closer to understanding the logic of how musical narrativity is based on metaphors
of possible situations of the actual world.

4.1.5 About musical space and time

The dynamic character of sound objects is an essential part of the process character
of music. Temporality and spatiality are inseparably intertwined both in terms of
music as a semiotic process as well as in terms of actual sound objects as vehicles
of music. In the semiotic process of music, the dynamic complexes of phenomenal
sound objects, determined both by the actual objects of sound and by the sub-
ject’s habits of perception, enter into a relationship with the subject’s experience.
In terms of music being a semiotic process, then, the temporality in music is partly
due to the general temporality of the subject’s experience and interpretation. In
terms of sound objects, in turn, temporality comes about in different levels from
the microlevel of particular sound objects to the macrolevel of musical styles and

Consequently, when music appears as “situation rather than as a fixed object”
(Tarasti 1998b, 43; see Tarasti 1996b, or chapter 2.2.8), it pertains both to situations
of the subject’s experience in general and to situations of phenomenal sound objects
specific to music. This chapter first briefly addresses the notion of situation in music,
followed by some thoughts on temporality of phenomenal sound objects, stasis
and motion, as well as musical spacetime. The next chapter deals more specifically
with the question of how the situations of sound spaces in music and situations of
phenomenal spaces in the subject’s general experience are connected to each other
by virtue of metaphor.

Music as situations.

Combining Tarasti’s and Kaipainen’s notions, chapter 2.2.8 described situations as
particular instances or states of continuous complex holistic configurations that,
by virtue of the subject’s interaction, represent—stand for something—in their
contexts. The configurations may represent via their internal relations and via their
relations to other configurations of the world, which is also inhabited by the sub-
jects involved in the situation. The configurations of objects in situations are not
meaningful by themselves. They become meaningful only, and always, in their con-
texts, which are established during the process of semiosis—in cognition. And that process of semiosis or cognition is the process of interaction with the actual world by the subject.

In this respect, the participants in musical processes are indeed in a relationship with a world via their own situation (cf. Tarasti 1998b, 45) when they interact by means of sound events, i.e. configurations of sound objects. But in music (as well as in other arts, and other forms of intersubjective communication), the encountered world is not primarily the actual world of ordinary situations and everyday life, but a fabricated, fictitious, virtual one, made up for us to experience. In music, the virtual world is generated by means of sound, acoustically detached from the actual world (see 4.1.2 and 4.1.3 above). Still, when sound objects become interpreted in the subject’s experience, it holds that “[s]ituation is the whole of all those phenomena, objects and states of affairs under which and by which a person’s organic and conscious existence is realized”, as Tarasti (1998b, 45) described. And, as befits the idea of music as inquiry (or the play theory of music, see chapter 2.2.4), musical situation, too, “consists of a space of play—a Spielraum—of various factors” (idem, see chapter 2.2.8).

*Spielräume* of phenomenal sound objects.

Just above and in chapter 2.2.8 the notion of situation was considered holistically, from a Peircean point of view. Now it seems beneficial to differentiate conceptually between phenomenal objects as they are perceived and the interpretation through which they become meaningful. This is for the sake of distinguishing between the momentary actuality of a state of affairs (belonging to the category of Secondness) and the accumulation of habits pertaining to the contextual interpretation of the situation as states of affairs (belonging to the category of Thirdness). Here, this Peircean distinction has been followed by our making a distinction between conceptual sound spaces as (see 4.1.3)

the complex auditory structures inferred from the simple initial spatial structures of “spectral hearing” for the benefit of constructing perceptual sound objects, phenomenal structures which can be associated with the subject’s experience one way or another

and musical spaces as

the conceptual spaces in which the dynamic sound object structures are associated with other experiences thus “constituting a complex combined result” of a feeling-like subjective experience.\(^{35}\)

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\(^{35}\) A necessary implication of this is that the phenomenal sound objects in music are not meaningful in themselves, but represent by means of being interpreted in relation to subject’s experience. This,
It appears, that the persistence of objects, necessary for the development of habits and reliance on beliefs, may have the side effect of digging the customary conceptual moat between space and time. Actual objects necessarily occupy certain extents of the actual space throughout their existence, although their positions and other features tend to be perceivably more time-variant. Especially in contrast to solid actual objects (such as apples), the time-variance is more thorough and more complete when one deals with sounds as actual objects. Besides the fact that actual sound as mechanical vibration is temporal by definition, a perceived natural sound object is always time-variable in terms of its fluctuating spectrum, intensity and even pitch, as the history of sound analysis and synthesis has concretely shown (see e.g. Strang 1970).

During a musical performance, each perceptual sound object begins and ceases to exist, and constantly changes in between, more or less. Sound is also always caused by some event or someone’s action, which we learn very early on. Consequently, sound affords representations of not simply static objects but of any changes in objects’ existence and actions upon them. This inherent time-variability of sound objects, isomorphic to events and actions rather than mere objects of practical life, empowers (and even enforces) music to stand in a logical manner for possible situations of everyday life, both the more active acts and the more passive events (see Tarasti 1994b, 1996b, 1998b).

Situations of practical life are complex agglomerations of sequential, simultaneous and nested acts and events, interrelated in intricate ways. Similarly, musical sound spaces are not usually made up of atomistically separable particular acts or events of particular sound objects, but of complex combinations of interrelated objects: composed sound objects.

McDermott (1966, 37; emphases added) maintained that particularly pitch has a place in a musical spatial realm, i.e., in the conceptual field which a composition and a tradition of compositions instills and articulates. The place of pitches in this space, furthermore, is conceptually akin to the place of objects in physical space, especially as these latter sites are seen to lack the permanence which ordinary discourse dogmatically puts upon them. The structural contour of a piece of music – its spatial articulation – is determined largely by our grasping of groups formed by pitch succession.

As already noted, there is no need to assume generally any absolute hegemony of pitch as a form-bearing element, although it admittedly plays a major role, so to say. And while some conceptual structures of sound spaces in music may be embodied in the actual spatiality of the everyday environment, others may be “conceptually however, does not rule out the possibility of representation also through the “internal” or mutual relations of sound objects.
akin” to the actual spatiality in other ways, or they may be “conceptually akin” to the so-called higher level properties, i.e. to the more abstract conceptual structures of general semiosis. Also, a succession of pitches (or any other neutral, objective or uninterpreted series of occurrences within the musical sound spaces) becomes meaningful only when interpreted as a progression away or towards something, resistance to such progression, or the like.

However, the main objection to McDermott’s statement above is the adherence to succession alone at the cost of simultaneity and hierarchy, which necessarily contribute to the construction of the combination of sound objects—the compositional fabric—and thereby to the complete situation. As evidenced, for instance, by John Cage’s famed 4’33” or by shakuhachi honkyoku music, simultaneously with any perceptual sound object or even in the absence of such, there exists concurrently its sounding context, a collection of corresponding, defining points of reference pertinent to that particular situation. In concrete terms, the reference is often provided by the juxtaposition of sound objects in the foreground and those in the background (e.g. the interplay between the vocal line and the piano part in a performance of a Schubert Lied or the bansuri flute part versus the mridangam and the drone of the sruti-box in a session of Carnatic music). If no other point of reference (homophonic, polyphonic or heterophonic) is given, the subject’s perception by is nevertheless directed by the habituated expectations dwelling in the network of alternative chains of events at each moment (see chapter 2.2.8; or Tarasti 1998b, 51).

At least in relatively short time-spans, the perceived and anticipated chains of events seem to become organized hierarchically, based on similarities and differences between sound objects and sound object groups. Tillman and Bigand (2004, 211, 219) argue, however, that, at least in the Western cultural context, both trained and untrained listeners alike are “very smart when dealing with fine musical structures in short temporal windows”, but both encounter “huge difficulties in processing large-scale structures” lasting over 30 seconds. To the best of their knowledge, there are no available data supporting the assertion that small hierarchical substructures would be integrated into larger hierarchical organizations covering the overall musical piece (ibid., 219).

Awaiting further discussion and new neuro- and psychoacoustic insight on that issue, it nevertheless seems unlikely that the perception of large-scale musical forms would solely need to rely on explicit propositional knowledge concerning stylistic features and commonly known habits of poiesis. I believe we may experience the essence of the tonal and thematic drama of a late 18th-century sonata form regardless of whether we are explicitly aware of the formal structure of the piece in advance. Similarly, we may anticipate a return to the theme, not totally unlike coming home.
Music is spatially embodied from an adventurous outing after a lengthy jazz solo, without prior propositional knowledge of the particular performance of the piece. Neither case assumes explicit propositional knowledge, but both do assume certain habits, which may or may not be expressed in propositional or even verbal ways. The principles of construction shared by most musics, such as repetition and recapitulation, varied repetition and contrast, seem to have endured in cultural evolution by being useful in serving the double duty of securing the grounds of both the listener’s process of perception by providing situations familiar and unfamiliar enough to relate to, and the composer’s process of expression by providing means of balancing similarly between “information” and “redundancy”. Regardless of some past aesthetic decisions and stylistic trends of avoiding any repetition in Western contemporary art music, we evidently cannot “step twice into the same river” in the Heraclitean sense, neither in our practical lives nor in music (cf. Tarasti 1994b, 62). But the need for economic interpretation of the semiotic flux by limited perceptual capacity calls for efficient means of representation.

It seems natural that the same factors behind the process of tessellations of space and other divisions of space into category regions (see chapter 3.1.2) are also operative in attempts to process the temporal folding and unfolding of situations into intermediate and large-scale hierarchical structures, despite the difficulty of the task. And detours and returns toward already more or less familiar situations do seem to account for the natural processing into hierarchical large-scale structures, although the capacity of how complex structures are feasible certainly depends on the subject and her habits concerning each particular performance, style and culture of music. The inclusion of the temporal aspect does not change the fact that the process of discretization into finite sets of categories eases the cognitive load and speeds up learning. Also, again, classes can be given labels; i.e. the categories can be named by linguistic and other terms, as is traditionally done in musical analysis.

In terms of conceptual spaces, the hierarchical structures of sound objects can be conceived as nested objects, structurally comparable to the hierarchical constructs of apples as fruits (see chapter 3.1.2). However, since we are accustomed or perhaps even ontogenetically and phylogenetically conditioned to perceiving our environment as objects, and to perceiving what happens to the objects or what they do, it may be (and it may be good for us) that in short temporal windows of music, we perceive the phenomenal sound objects in their small-scale forms as objects and their relations, but in long temporal windows, we rather perceive what happens to the already perceived objects, what they do, and how they are transformed. This habituation to object structures versus their temporal history might be the logical ground for
motifs, themes, and actoriality in musical narrativity. (This may also be a clue to the problem raised by Tillman and Bigand.)

The construction of hierarchical structures also opens the gates to interpretation and association of the perceived object with subjective experience. The fruit-ness of ‘apple’ is no longer only a matter of the actual object being perceived, but a matter associated with other experiences of fruits. Similarly, the hierarchical structuring of phenomenal sound objects takes a step away from complexes of conceptual sound spaces, towards musical spaces as subjective interpretations of sound objects.

Hence the relation between dynamically changing complexes of sound objects, pregnant but only pregnant with meaning, and the complexes of representations of the everyday life innately leads to the question of so-called musical “taste”, i.e. to the issue of preferences of habits of musical perception and action, as well as personal and collective style histories and stylistic shifts. Namely, if the meaning of music is in its use and music represents possible situations of life in meaningful ways, each individual and each social group is bound constantly to develop those habits of music-making that best suit her or their needs, as opposed to accepting established, preset, traditional ones without due critique. The needs, of course, depend on the situation, that is, on “that part of the world with which one enters into a relationship” (Tarasti 1998b, 45). If“all those phenomena, objects, and states of affairs under which and by which a person’s organic and conscious existence is realized” (ibid.) remain unchanged from the previous day, phase of life, generation or living environment, there may be no need to change the ways music probes the possible situations of life. Consequently, there is no need to change the tradition being naturally passed along intact. But this rarely is the case, and consequently different musical situations become meaningful in different situations of life.

This may account for the needs of shifts in musical styles both in personal and in social scope. Also, this may account for the need to search for musical novelty and innovation, on the one hand, and to guard traditions, on the other hand, since as far as music as a process does have a general meaning, that meaning is in how it changes the habits of those who participate in it. That, in turn, means that music, being meaningful, reciprocally may change or keep the life situations of those who take part in it (see chapter 1.3.4). All in all, it seems that there is a built-in process of balancing between innovation and tradition in music (cf. Heiniö 1984) in terms of sound objects, their form-bearing elements and use, due to the logical relation between musical and general semiosis.
Spatiality, temporality, stasis and motion.

Much past discussion on musical space and time has expressed an attitude that feeds on the opposition of the temporal versus the spatial. Exemplary of this, modernist directions of Western art music were criticized in the past for abandoning dynamic motion and direction (of tonal music) in favor of directionlessness or suspended animation. In similar contexts, often with pejorative undertones, musical spatiality has been associated with stasis (see e.g. McDermott 1966, 184 et passim).

Maria Anna Harley (1994a, 75) described the identification of musical space with stasis as being based on a radical conceptual opposition of space and time, staticity and development, Being and Becoming. These binary pairs are useful within their immediate contexts, even though they simplify a complex network of relationships which interconnect such “polarized” entities. The “static” spatialization of music, postulated and described by various authors, takes place in the context of the disembodiment of musical material. This limitation of music to a skeleton of pitch and time underlying the doctrines of spatial stasis also provides a foundation for the identification of musical space with pitch...

The argumentation is the following (Harley 1994a, 93):
1. music occurs in motion
2. motion has to happen somewhere
3. musical space in the ‘where’ in which motion is taking place

If music could be reduced to the skeleton of pitch and time, i.e. to atemporal spatiality of pitches, on the one hand, and musical time in which pitch changes occur, on the other, motion in music would consequently be equated with pitch changes, which in the tonal context would follow the tendencies set by the tonal functions. If no change, or only little change occurs in the pitch space over time, there would be no motion, and what would remain would be an empty container, i.e. the empty pitch space as the musical space—a void. Consequently, music would be considered static, or not music at all. Somewhat paradoxically, the same would hold if there were changes, but the changes would not fit in the established structures of the tonal pitch space as the musical space, i.e. if the motion were to violate customary habits of functional tonality. Hence, according to critiques uttered from the skeletonized perspective, the alleged abandonment of motion has taken place either by means of “[i]ndependent entities floating, disassociated, dismembered, in a timeless space of entities” (McDermott 1966, 215) or through the exhaustive flow of “constantly traversing the entire realm of experience in a very short time” (Stockhausen 1961/1959; see also Nyman 1980). The abandonment of the traditional sense of motion has consequently been conceived as abandonment of the
essential in music. That essential being temporal, the abandoned, if not corrupted music became easily labeled as spatial, the conceived opposition of temporal.

From this limited perspective it might consequently seem logical to identify stasis in music with a tonally empty or otherwise tonally incompatible pitch space and the abandonment of temporality. However, contrary to that stance, Riezler (1931, 194) accused Debussy of destruction of “tectonic structures” and “melodic equality of tones”, the outcome being, wrote Riezler, that “a clearly dimensioned tonal space no longer exists”. In other words, in a contradictory way, abandoning the directionality of functional tonality led, for some, to the abandoning of temporality, for others, to the abandoning of spatiality.\footnote{At the same time, with the modernist transition, Western music seems to have become liberated from the apparent necessity that musical narrative follow the traditional dramatic principle of departing–adventuring–returning, so strongly present in the Western tonal music (e.g. in exposition–development–recapitulation), but not necessarily in other musics. This can evidently contribute to the sense of abandoning motion and temporality of music to stasis and spatiality, from the traditional perspective of tonal music. This is also the core of McDermott’s (1966) work: observation of the stylistic shift of praxis and poiesis in the Western art music through temporal stasis as “the release of music from the dominance of dynamic control” and objectification as “the projection of static groups in which spatial relations are paramount and which are in turn viewed as nearly independent, self-enclosed entities, ultimately as almost solid objects within the conceptual image” (McDermott 1966, 109). However, the shift can also be understood, not only as a stylistic shift in one music culture, but as a paradigmatic shift in approaching musical space and time, the two conceived not as separable and contrasting absolute elements, but as a unified, relativist musical spacetime, similar to the paradigm shift from the absolutist to the relativist conception of the actual space.

Riezler’s original, with original emphases (1931, 194): “Débussy, der mit einem sehr freien, die Tonalität ganz im koloristischen Sinne verwendenden Impressionismus beginnt, ersetzt bei seinen späteren Werken die Diatonie durch die Ganzztonleiter, innerhalb derer es horizontal gesehen keine Gliederung durch Leitton, vertikal gesehen keine funktionelle Harmonik gibt. Der Gegensatz gegen jede tonal gebundene Musik, auch gegen die harmonisch freieste, ist sehr groß, obwohl der übermäßige Dreiklang, also der Grundakkord der Ganzztonleiter, auch innerhalb der Tonalität auf der dritten Stufe der Molltonleiter vorkommt. Alle tektonischen Gliederungen sind aufgehoben, die Töne sind melodisch gleichwertig und gleich gewichtig, von verschiedenen ‘Richtungen’ im Raume kann nicht mehr gesprochen werden, – der klar dimensionierte Tonraum besteht nicht mehr.”}
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*mutatis mutandis* in the case of the spatial aspects of time-space. Time as steady direction is lost, but time as a mark of and relative to different spatial situations has been gained. Indeed perhaps it is possible to make some association with the matter of relativity in modern physics.37

With no reference to Peter Gärdenfors’s theory of conceptual spaces, McDermott (1966, 12, emphasis added) also regarded musical space as conceptual space:

> I shall consider the *musical space* developed in this paper as a conceptual space shaped by sounds as they are imprinted upon my mind, and give no heed to its “actual” whereabouts, whether, with other words, it lay somehow in the music or in me.

In other words (McDermott 1972, 489), reminiscent of Einstein’s description of the concept of space, musical space is a conceptual tool, a framework of the mind’s eye, created and shaped by the very sounds comprising a piece of music and by the manner in which we organize and comprehend these sounds.

Consequently McDermott suggested, that musical concepts such as “line, density, range, depth, counterpoint, even repetition ... are all spatial relations” (idem). Similarly, in the present understanding, accepting the relativist account of musical spacetime (or timespace) leads to acceptance of a broad conception of musical spatiality and temporality in terms of conceptual spaces. This is opposite to the limited views of musical space as either that of the actual space of sound projection or as pitch space. Spatiality (and temporality) of musical sound is a result of the relations of the perceived and interpreted sound objects—there is no need to assume a pre-existing, *a priori* musical space in which musical acts and events would be contained, occurring there at certain points in time (see also Harley 1994a, 93). Musical space is a space *a posteriori*.

The relativist conception of musical space and the idea of amalgamated musical spacetime also leads to a relativist conception of musical time. An *absolute conception of musical time* would typically regard musical time as a given, immutable and eternal one-dimensional line (or cycle, for instance) on which acts and events, that is, changes of the spatial positions of objects, features of objects and sets of objects are situated. Opposed to that, in a relativist conception of musical time, it is the relative changes of the spatial positions of objects, features of objects and sets of objects, that constitute the configurations which we experience in their contexts, by virtue

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37 Lippman, in turn, seems to have been imprisoned by the concept of the Newtonian absolute actual space (or empirical space in his words) to the degree that he suspected that “it does not seem permissible to speak of various types of space except as a linguistic convenience”, right after having suggested the postulation of “an intrinsic musical space” as the “only answer” to the question of spatial aspects of musical experience (Lippman 1952, 135).
of our habits, as the ‘becoming’ (as well as ‘being’) of musical time (cf. Tarasti 1994b, 59–). Just as there is a reciprocal relation between musical space and musical sound objects, musical time is a result of the changes perceived and a means for relating events to each other. “We experience vicissitudes, especially. We cannot experience the vicissitude without experiencing the perception which undergoes the change,” as Peirce expressed it (CP 1.336). In these terms, musical time seems to fit in (and generalize) the conception of musical spatiality as expressed above. Akin to the relativist conception of actual spacetime, musical (and more broadly phenomenal) space and time are ultimately inseparable (see chapter 3.1.1 and below), although on a surface level, “for all practical, down to earth matters”, musical time and space are habitually distinguished from each other, in terms of meter and rhythm versus pitch, volume and timbre, for instance. Due to the inseparability, however, it makes sense to talk about musical spacetime, or to consider temporality as a part of musical spatiality.38

Charles Seeger and musical spacetime.

Fitting the current view that musical semiosis is a part of general semiosis, Charles Seeger (1977, 8) proposed that “elaboration of a concept of music timespace rests upon its distinction from a concept of general spacetime” and outlined the relations of general spacetime and music timespace as follows (1977, 8–9):39

1 Occurrence. General spacetime is universal, music timespace occurs within it.
2 Provenience. General spacetime is given, music timespace is man made.

38 Cf. Jammer (1970/1954, 3) and Lakoff and Johnson (1999, 139). According to Lakoff and Johnson, “[v]ery little of our understanding of time is purely temporal. Most of our understanding of time is a metaphorical version of our understanding of motion in space.” (Lakoff and Johnson 1999, 139). In addition, the very first example of a quality dimension endowed with a geometrical structure given by Gärdenfors is that of time (2000, 6–7). Thus he includes time as a part of the conceptual spaces. However, it seems that musical time (and phenomenal time in general) may well end up being more complex than the suggested one-dimensional structure “isomorphic to the line of real numbers”. Meanwhile, Iannis Xenakis’s approach was to segregate and integrate the temporal and the spatial pending on the needs of poiesis of sound objects with the ideas of algebra outside-time and algebra in-time. For Xenakis this meant assigning vectors with values for each dimension of the vector space of the “sonic entity”, time included in algebra in-time and excluded in algebra outside-time. (Xenakis 1992/1971.) Even though phenomenal temporality would largely be organized in terms of spatial conceptual apparatus, in order to develop that apparatus, a joint timespace is needed.

39 Here, the variant spelling spacetime is preferred over the options of timespace, space-time, and time-space. Seeger’s proposition is also abductive in the sense, that “until it can be tested in many particular cases, claims for its universal validity should not be made. The present proposal, then, is advanced as valid for the Occidental art of music as of the mid-twentieth century alone.” (Seeger 1977, 6.)
Music is spatially embodied

3 Identity. General timespace is unique; “music timespace ... is multiplex: there are as many particular music timespaces as there are distinct structures (compositions).”

4 Continuity. General spacetime is a uniform continuum (as far as we know); music timespace is a continuum that varies infinitely among various structures.

5 Control. General spacetime is entirely outside our control; music timespace is entirely within it.

6 Measurability. “General timespace ... is not itself constituted by any known norms of its own. Music timespace, in contrast, ... is itself constituted by norms of the art of music known by the carriers of the music tradition or traditions in which any structure is cast.”

7 Variability. “The norms of speech used in measurement of music timespace viewed ... as performance [in general timespace] refer ... to invariables (cycles, seconds, etc.). Those used with respect to music timespace itself refer to variables ... .”

In spite of the different starting points and emphases, Seeger’s proposition shares many ideas with the present relativist conception of musical spacetime. However, in this context, it is possible to make only some brief points of confirmation, clarification or objection from the perspective of pragmatist naturalism and the current view of musical spatiality and temporality.

First, musical spacetime does indeed occur within the general spacetime, since music is a part of the subject’s inquiry, which takes place by the interaction of the organism with the environment which, in turn, in its entirety, produces the general spacetime through the relations of the actual objects. The organism exists in the general spacetime as an actual object. As to the universality of the general spacetime, it can be fully assumed only at the level of actuality (despite some surviving sceptics; see Määttänen 1993b or chapter 1.2.1).

Consequently, second, the objects of general spacetime can be thought to exist as they do regardless of what we think of them, while musical spacetime is constructed in the process of inquiry. More accurately, the concept of general spacetime is a way to conceptually organize the actual objects of brute force and hard facts, and musical spacetime is part of each subject’s phenomenal world connected to the actual world through sound as the means of communication and through the virtuality of the musical spacetime as a means of exploring possible situations of the actual world.

Third, the general spacetime of the actual world is unique, as far as we know, and so is each musical spacetime. The uniqueness or particularity of musical spacetimes is not tied to the distinct structures of compositions, although they certainly
partly define it, but also to each subject’s habits of perception, thinking and action, the reciprocal accumulation of the perceived into the experience. In that sense the collection of musical spacetimes is multiplex.

Fourth, the general spacetime in its actuality is not a uniform continuum, as far as we know. Already Bernhard Riemann noticed in the 19th century that the Riemannian uniformity of general spacetime does not take into account the existence of matter (see Jammer 1970/1954, 161). The evidence for Einstein’s general theory of relativity confirms this non-uniformity. At the same time, since each musical spacetime is unique by being individual, and dependent on perception and experience, musical spacetime has the potential of varying infinitely, to the degree of being idiosemiotic.40

Fifth, general spacetime is partly under our control, since through action we affect objects of the actual world (more than they effect us, by Peirce’s definition). At the same time, musical spacetime is not entirely in our control, since the brute force of actual objects affects our experience and thus also affects each musical spacetime. Also, our habits of perceiving, thinking and action—musical habits included—are formed in the interaction with the actual world, other subjects (and thereby the social) included.

Sixth, general spacetime is constituted by causal relations among actual objects of the actual world. The concept of general spacetime is constituted in experience, as a conceptual tool to grasp the experienced, actual world. Measurements made of general spacetime are experiential and therefore fallible. Still, all knowledge regarding the actual world is knowledge *a posteriori*, and our habits of action, successful and less successful, are based on that knowledge in crucial ways. Musical spacetime involves cultural traditions and social norms, but in a larger perspective, musical spacetime, like any cultural phenomenon, is based on the natural evolution of the organism, on the organism’s existence in the actual world, and on the subject’s being in the world. The printed tenth measure of Beethoven’s *Eroica* is a piece of paper, and what the tenth measure of *Eroica* is musically, depends on each subject as the music is experienced. Again, music is a safe laboratory for experiencing, in the sense that each different interpretation of the *Eroica* does not lead the subject to take life-threatening risks (at least not immediately), unlike different interpretations of the situations in actual spacetime in general may do.

Seventh, the norms of speech used in measurement, of either occurrences in the general spacetime or occurrences in musical spacetimes, are always variable. Specifically referring to Seeger’s note (1977, 9) that “[i]t is plainly that of a fixed system (general) and a variable system (music), both reported in a second variable system

40 Preference is here given to the word idiosemiotic rather than idiolectic, as musical processes are not lects, although similarities are notable.
(speech)”, one must answer that there is no opposition of fixed system and a variable system in this sense. There is a general spacetime of the actual world, (a small) part of which is music-related sound. All objects of the actual world are more or less significant as far as they are experienced. There is a subjective process of inquiry, the subject’s being in the world, which develops and evolves in the interaction with the actual world. Neither the actual world nor all the phenomenal worlds are fixed systems, but inseparable, dynamic ones.

But this, however, does not seem to be what Seeger was after with the notion of (in)variability: he indicated that both general spacetime and any musical spacetime, i.e. both actual and phenomenal aspects of music, would be “of equal importance to study” (ibid., 14), but variability or invariability appears an imperfect choice of words. Granted that the actual world is shared, and measurements of the general spacetime can therefore be repeated and shared, while the same cannot easily be done with musical spacetime, since it (more or less) varies by subjects, and “measurements” of musical spacetime can be shared only indirectly through sound, utterances, graphs or other objects of the actual world. At the same time, musical spacetime can be accurately felt and understood subjectively without measurements by the participating subjects, while the measurements of the general spacetime involve a degree of error. The subjectivity of musical spacetime does not need to lead to idiosemiosis, however. Rather, similarities in habits of perceiving, thinking and acting, as well as the possibility to share actual objects, speak for similarities of not only general but musical semiosis as well—for relative universality and particularity of musical spacetime.

### 4.1.6 Embodiment, metaphor and epistemology of musical space

Parts one and three presented a pragmatist view of how mental processes are spatially embodied, and how complex representations are constructed from simpler ones by means of metaphor. Part two outlined a pragmatist conception of music, according to which music and musical composition process are mental processes. As the syllogistic grand scheme of this book stands, music and musical composition process are spatially embodied, based on the premisses. Music, the complex process of representing and signifying, operates by means of metaphors.

The previous chapters of this section have examined musical spatiality from the perspective of naturalist pragmatism, on the one hand, and past studies on musical space, on the other. The present chapter examines musical spatiality from a slightly different perspective, namely that of morphological theories of cognition, together with the pragmatist conceptions of semiosis, space and music as presented above.
The pioneering studies on musical spatiality by Kurth (1947/1930), Lippman (1952), and McDermott (1966), among others, started out from the context and vocabulary of musical composition, performance, and reception. The key issues included those of perceived or sensed motion and force, raising needs of explaining the origin of such space-related notions. The traditional views limited musical spatiality either to a Newtonian, absolute conception of actual space and to spatiality of sound in terms of distance, direction and ambience in such an absolute space, or, more often, to the perceived pitch space (with the weak addenda of e.g. volume by Kurth and others, as summarized above). This is reflected, for instance, in Lippman’s conception of the “unclear” musical space (1952, 246): “If we experience an acting and intertwining of forces, we also experience purely psychically a ‘somewhere’ in which this takes place”, but if “the distance impression of intervals … were the basis of the space of music, this would be as clear as geometric space, and even subject to the formal laws of external [that is, actual] space.” (Lippman 1952, 247–248.) From the current perspective, the narrow conception of spatiality seems to have been a stumbling block in the search for a sustaining epistemology of musical spatiality.

The “morphological turn” (see chapter 3.1.2) in semiotics, cognitive science and philosophy of mind seems capable of removing the obstacle. The cognitive metaphor theory and the theory of conceptual spaces (as well as the theory of conceptual blending) embrace a broad, relativist conception of spatiality and open new views to the epistemology of musical spatiality and musical signification.

The embodiment of pitch space.

Let us return to the skeletonized perspective of music as pitch and time for a while (see chapter 4.1.5). Attempts have been made to account for the traditional association of pitch with the dimension of height. The idea of vertical pitch space (or pitch dimension) has been regarded as being rooted in the acoustic properties of instruments. In stringed instruments, the frequency of the sound is typically regulated by pressing the string against a fingerboard (or by stopping the string otherwise as is the case in the Finnish jouhikko, for instance) thus controlling the length of the vibrating part of the string.41

Hence, different pitches correspond to different stopping positions (on the same string). In musics with discrete pitches (i.e. categories of pitch space), the string is pressed only in certain positions in order to get accurate pitch. (This, of course, is manifested in musical instruments as various fret constructions of the strings.) Consequently, the distance between stopping positions serves as ground for con-

41 Other possible ways of regulating the pitch are to control the linear mass (density or thickness), or the tension of the string, i.e. to use several materially different strings (as in guitar) or to retune the string (e.g. musical bow).
Music is spatially embodied

receiving the difference in pitch as discrete or continuous distance, i.e. as spatial (and also temporal) interval between different positions. 

The same applies, e.g. for wind instruments with shortening-hole systems for pitch control. Each (discrete) pitch has its position or place, and pitch organization becomes a spatial organization of stop positions. But while with such wind instruments the height of the decisive stopping position in basic registers usually corresponds with ‘height’ in pitch when played more or less vertically (e.g. end-blown flutes, recorders, clarinets, and oboes), for vertically played string instruments (such as the cello, sitar or jouhikko), the opposite holds: the higher the stopping, the lower the pitch. Nevertheless, in both cases we end up with a linear and vertical conceptual space for pitch.

Géza Révész’s approach to the embodiment of pitch space was even more bodily, as he suggested (Révész 1946, 77), that the expressions ‘high’ and ‘low’ concerning pitch come about from the impressions of localization of sound vibration in body: ‘low’ pitch resonates in lower abdominal cavities, ‘high’ pitch in higher cavities of the head. 

In addition, the difference between the conductivity of sound waves through ground versus air may account for the verticality of pitch space. In ground transmission, the long sound waves corresponding to ‘low’ pitch are not attenuated as much as the short waves, i.e. ‘high’ frequencies and ‘high’ pitch. Consequently, the propagation of the same sound through ground versus air accentuates the ‘low’ frequencies, due to the attenuation of ‘high’ ones. Cox (1999, 33) maintained, that “[f]or sounds that are low enough and intense enough to be perceived in this way, this is a plausibly relevant basis for musical verticality”, or here: for the verticality of pitch.

These are examples of the embodiment of pitch space in the acoustic properties of actual objects, whether instruments, resonating body cavities, or sound mediating substances. In all three, the acoustic properties of actual objects literally correspond to conceived verticality of pitch space. This is in direct opposition to e.g. Iannis Xenakis’s claim that the connection between verticality and pitch is “completely

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42 Hence the definition of musical interval as distance between pitches (see e.g. Boëthius I.195, Boëthius 1989/c. 500, 16). Combining the mathematical and instrumental aspects, Claudius Ptolemy, in his Harmonica (of mid-2nd century CE) used both λόγος (ratio, proportion) and διάστημα (distance, space) in definition and classification of intervals and tetrachords (Düring 29.7–8, 20, 26–27, 29, 32; Boëthius 1989/c. 500, 176n56).

43 Révész’s original: “Meiner Ansicht nach verdanken die Ausdrücke «hoch» und «tief» innerhalb der akustischen Sphäre ihr Entstehen den Lokalizationseindrücken der Schallvibrationen im Körper. «Hoch» und «tief» beziehen sich also wirklich auf räumliche Verhältnisse, nur nicht auf «Räumlichkeit» (Raumhaftigkeit) der Töne, sondern auf gewisse Regionen der Körpers, in denen die durch Töne erzeugten vibratorischen Empfindungen am deutlichsten bemerkt werden.” (Révész 1946, 77.) However, for Révész’s denial of the specific auditory space, see Révész 1937b, or chapter 4.1.4.

Metaphor theory and pitch space.

Cox (1999, 18–) explicated the conception of musical verticality as a conceptual blend of three literal and seven metaphorical ways of embodiment:

1. Verticality of notation
2. Vocal Verticality (head voice and chest voice)
3. Verticality in the Propagation of Sounds
4. ‘Higher’ Frequency of High Notes
5. ‘Higher’ Perceived Loudness Levels of High Notes
6. ‘Higher’ Quantity of Air in High Notes
7. ‘Higher’ Magnitude of Effort in High Notes
8. ‘Higher’ Degree of Tension in High Notes
9. ‘Higher’ Emotional ‘Levels’
10. ‘Higher’ State-Locations

Although Cox (1999) initially included verticality of pitch in Western common practice notation among the literal sources of embodiment of verticality in pitch space, he subsequently argued that “verticality predates notation”, since already in musics of the Kaluli and the ancient Greeks, the verticality of pitch has emerged logically, without a common-practice notation system. Still, notation certainly can “reinforce the concept” of verticality in music, and “serve as one source [of embodiment] among others” (Cox 1999, 49; see ibid., 136–185).

Cox’s account is based the conceptual metaphor theory by Lakoff and Johnson (1999, see chapter 3.1.2), and specifically on metaphors More Is Higher, Greater Is Higher, States Are Locations, and Change Of State Is Motion. According to Cox (1999, 50) the logic of the conceptual metaphors offers “a strong basis for the logic of musical verticality in that they are reflected both in everyday thought and in descriptions of music”, thus leading to “what appears to be a fundamental shift in music epistemology”. The conceptual blend of the literal and the metaphorical is spatially embodied, in that the concept of pitch is understood in terms of a continuum of literal and metaphorical vertical ‘state-locations’ (see idem).

Cox showed how all the meanings found for ‘high’ in (American) English “are united by our literal and metaphoric use of the concept of ‘verticality’.” (Cox 1999, 28). For example (ibid., 23), literally

more wood stacks higher
Music is spatially embodied

more pancakes stack higher (hence a tall stack)
more water in the river means a higher water level

while metaphorically
more money is higher income (we have salary raises)
more tension is higher tension (hence uptight and high-strung)
more emotion is higher emotion (or heightened emotional state)
more cycles per second means higher frequency

Cox reasoned that, since the metaphor More Is Higher is “so pervasive and fundamental to our everyday thinking that we may not even be aware that we are speaking metaphorically when we speak of concepts such as ‘higher’ number” (Cox 1999, 24), then “it would be surprising to find that the musical meaning ‘high’ and ‘low’ were not tied to the same metaphoric thought” (ibid., 29). When the metaphor More Is Higher is taken into account, the question of pitch height “becomes that of what is more or greater about high notes” (ibid., 35).

This way, musical verticality may be embodied metaphorically in different ways, in addition to the literal ways of embodiment. Out of Cox’s list of seven suggested metaphorical ways of embodiment for musical verticality, ‘higher’ frequency of ‘high’ notes (list item 4 above) is tied to the vibration rate of strings, membranes, air etc. in musical instruments, requiring knowledge of acoustics or observation of properties of vibrating objects or both.

‘Higher’ perceived loudness levels of ‘high’ pitches (item 5), in turn, is tied to the relative sensitivity of human hearing, depending on the sensitivity of the organ of hearing to different frequencies. Based on equal-loudness measurements (Fletcher and Munson 1933, Robinson and Dadson 1957 or ISO 226:2003), human hearing becomes gradually most sensitive towards the frequency span between ca. 2000 and 5000 Hz corresponding to ca. the interval of a tenth between b^1 and d^5, i.e. to the fundamental frequencies of the ‘highest’ registers of ‘high’ instruments. While hearing is less sensitive at the ‘lower’ end of frequencies, it is also becomes rapidly less sensitive in frequencies ‘higher’ than ca. 5000 Hz. Nevertheless, within the range of pitches commonly used (at least in the Western traditions), it more or less holds, that ‘higher’ pitch correlates to ‘higher’ sensitivity of hearing, assuming equal intensity of the sound heard.

For each way of embodiment of pitch verticality, whether literal or metaphorical, one can find counter-examples, such as the inverted correspondence between the height of stopping position and the ‘height’ of pitch in the vertically played string instruments, or between the height of organ pipes and pitch (cf. Cox 1999, 31 and 36). However, Cox’s concern was “how we get musical ‘verticality’ in the first place” (Cox 1999, 19), without excluding other alternatives. Cf. the discussion on ‘Höhe’ versus ‘Helligkeit’ below.
More directly attached to subjective experience seem to be the metaphors connected to the action of singing or playing: producing a ‘higher’ pitch tends to require ‘higher’ quantity of air (item 6), ‘higher’ magnitude of effort (item 7) or ‘higher’ degree of tension (item 8), be it tension of muscles, vocal cords, strings, membranes or embouchure.

As far as items 9 and 10 are concerned, Cox (1999, 44) suggested, that in musical praxis, “ascent and increase correspond to higher emotional states”, in terms of the dramatic and emotional intensity of listener’s experience. Some exceptions, e.g. fear allowed, this tendency constitutes a special case of the general verticalization of emotional states and the fundamental Location Event-Structure Metaphor, underlying metaphors such as Happy Is Up, Sad Is Down (see Lakoff and Johnson 1999, 178–197). I read Cox’s notion of ‘higher’ emotional ‘levels’ as referring to the general intensity of the all-embracing “subjective experience”, to one’s experiences of oneself both as an organism in the actual environment and as a subject in her world of living, relating to various aspects of survival, shown in forms of pleasure versus discomfort etc. (see chapter 3.1.2). The ‘height’ of emotional ‘level’ is based on the subject assessing her situation in the world, and situations with ‘high’ emotional intensity are associated with matters of survival, increased alertness and efforts of action and perception, increased muscular tension and release. Consequently, ‘higher’ pitch becomes a metaphor of an intensified emotional state, due to the fact that the experience of more air, effort, and tension needed for producing ‘high’ pitch, as Cox noted (1999, 35; cf. Zbikowski 2002). The same could hold for perhaps any extremity in any feature of musical sound. This is clear with dynamics: ‘high levels’ of emotional intensity tend to correlate to ‘high levels’ of acoustic intensity, but possibly also to extremely ‘low levels’ of dynamics. In any case, generally speaking, different climaxes and culminations would seem to be extreme state-locations in different conceptual spaces pertaining to subjective experience (cf. Lakoff and Johnson 1999, 178–).

In the last part of his dissertation, Cox (1999) analyzed musical motion and space in terms of the conceptual metaphor theory. In the analysis, Cox equated musical space with pitch space (which is a limited view, as noted), built on the conceptual blend of the verticality of the pitch space and utilized Lakoff and Johnson’s ideas of metaphorization of time (Lakoff and Johnson 1999, 139–169).

The starting point for metaphorization of time according to Cox is the view that cognitively, “time is metaphorically conceptualized in terms of motion” (ibid., 140), i.e. that cognitively (or phenomenologically), motion is primary to time, which is in opposition to the common conceptualization (see the discussion on the relation of space and time in chapter 4.1.5). This is supported by the observation that our
perceptual system is endowed with an area to detect motion, but there is no corresponding area for detection of global time in our central nervous system, according to Lakoff and Johnson (idem). According to Lakoff and Johnson (idem), the Time Orientation metaphor is the most basic metaphor for the conceptualization of time:

- The Location Of The Observer → The Present
- The Space In Front Of The Observer → The Future
- The Space Behind The Observer → The Past

Experiences of time and temporal changes are conceptualized by the Moving Time metaphor or the Moving Observer metaphor. Both metaphors embody the relation between the observer and the events in time. The difference between the two is in their figure-ground relations. In the Moving Time metaphor (a.k.a. ‘As Time Goes By’ metaphor; ibid., 141),

there is a lone, stationary observer facing in a fixed direction. There is an indefinitely long sequence of objects moving past the observer from front to back. The moving objects are conceptualized as having fronts in their direction of motion.

In the Moving Observer metaphor (a.k.a. Time’s Landscape metaphor; ibid., 145–146), in turn,

the observer, instead of being fixed in one location, is moving. Each location in the observer’s path is a time. The observer’s location is the present.

In short, according to the conceptual metaphor theory, time is spatially embodied in the sense that it is conceptualized by virtue of metaphors of spatiality (cf. chapter 4.1.5). For instance, in the general mapping of the Time’s Landscape metaphor, time as the target domain is conceptualized based on space as the source domain as listed in table 10.

According to Cox, the fundamental logic of musical motion is that “we do not observe the motion of tones; we anticipate, hear, and remember tones and then understand these relations metaphorically in terms of anticipation, presence, and memory in the domain of actual motion” (Cox 1999, 255). Furthermore (ibid., 255–256),

the perceived and imagined relations of tones—‘before’, ‘here’, and ‘after’, but also ‘higher’ and ‘lower’ and other relations besides—includes perceived and imagined change. The changes are in the tones, in the ‘state’ (condition) of their relation to the listener, and in the perceived and imagined ‘state’ (condition) of relations among the tones. The change of states that we experience while

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45 This metaphor corresponds to the same conceptual space Peter Gärdenfors started with (2000, 6; see also chapter 3.1.2 and discussion on the concept of ‘space’ at the opening of section 3.1).
Space in Musical Semiosis

listening to music is phenomenologically identical to the experience of change of states in other domains.

TABLE 10. Mappings of ‘Time’s Landscape’, the metaphors of time as the target domain on space as the source domain. After Cox 1999, 198 (see also Lakoff and Johnson 1999, 145–147).

<table>
<thead>
<tr>
<th>Source Domain: Physical Motion through Space</th>
<th>Target Domain: Imagined Motion through Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>space</td>
<td>→ time</td>
</tr>
<tr>
<td>– time is a space (through which we move)</td>
<td></td>
</tr>
<tr>
<td>locations</td>
<td>→ times</td>
</tr>
<tr>
<td>– times are places (that we approach and pass by)</td>
<td></td>
</tr>
<tr>
<td>motion through space</td>
<td>→ motion through time</td>
</tr>
<tr>
<td>approached locations</td>
<td>→ approached times</td>
</tr>
<tr>
<td>relations of locations</td>
<td>→ relations of times</td>
</tr>
<tr>
<td>– some times are ahead, some times are behind</td>
<td></td>
</tr>
<tr>
<td>spatial distance</td>
<td>→ temporal distance</td>
</tr>
<tr>
<td>– some times are nearer, some times are farther</td>
<td></td>
</tr>
<tr>
<td>spatial length</td>
<td>→ temporal length</td>
</tr>
<tr>
<td>– times and events are short and long</td>
<td></td>
</tr>
<tr>
<td>– hours are ‘lengths’ of time and ‘spans’ of time</td>
<td></td>
</tr>
<tr>
<td>spatial structure</td>
<td>→ temporal structure</td>
</tr>
<tr>
<td>contained spaces</td>
<td>→ contained times</td>
</tr>
<tr>
<td>nested spaces</td>
<td>→ nested times</td>
</tr>
<tr>
<td>– weeks contain days, days contain hours, hours contain minutes</td>
<td></td>
</tr>
</tbody>
</table>

Without being explicit about the affinity, Cox’s idea of phenomenological identity between changes of states in music and changes of states in other domains clearly suggests topological and geometrical identities of conceptual spaces, i.e. metaphor in Gärdenfors’s (2000) meaning of the word. In any case, the spatial embodiment of time and the notion that our minds work in similar ways in everyday experience and in musical experience (see Cox 1999, 12) allow for the application of general metaphor to music (table 11).

Cox pointed out that it may be difficult to discern whether the source domain for the mapping of time in music is directly the literal domain of actual motion or more indirectly the domain of metaphorical motion of time in general, i.e. the general Time’s Landscape metaphor or the general As Time Goes By metaphor. In the conceptual blend, “the time when an event will ‘take place’ is the same concept as the time at which an event will ‘take place’ (Cox 1999, 199). In the metaphor ‘As Time Goes By’, as applied to music, the figure-ground relation is inverted in comparison to the metaphor ‘Time’s Landscape’, i.e. “the motion of times is the motion of objects,
Music is spatially embodied

including musical event-objects” (ibid., 201), as opposed to the observer moving in what could be called “Music’s Landscape”.

TABLE 11. Mappings of ‘Time’s Landscape’, as applied to the domain of music. (Cox 1999, 199.)

<table>
<thead>
<tr>
<th>Source Domain:</th>
<th>Target Domain:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion through Space</td>
<td>Imagined Motion through Music</td>
</tr>
<tr>
<td>spatial relations</td>
<td>→ relations of musical events</td>
</tr>
<tr>
<td>– musical events are ahead, present, and behind</td>
<td></td>
</tr>
<tr>
<td>locations</td>
<td>→ musical events</td>
</tr>
<tr>
<td>– musical events are places (that we approach and pass by)</td>
<td></td>
</tr>
<tr>
<td>motion through space</td>
<td>→ motion through music</td>
</tr>
<tr>
<td>approached locations</td>
<td>→ approached musical events</td>
</tr>
<tr>
<td>spatial distance</td>
<td>→ distance between musical events</td>
</tr>
<tr>
<td>– some times are nearer, some times are farther</td>
<td></td>
</tr>
<tr>
<td>spatial length</td>
<td>→ length of musical events</td>
</tr>
<tr>
<td>– musical events are short and long</td>
<td></td>
</tr>
<tr>
<td>spatial structure</td>
<td>→ musical structure</td>
</tr>
<tr>
<td>contained spaces</td>
<td>→ contained musical events</td>
</tr>
<tr>
<td>nested spaces</td>
<td>→ nested musical events</td>
</tr>
<tr>
<td>– pieces contain sections, sections contain themes, themes contain motives</td>
<td></td>
</tr>
</tbody>
</table>

The plurality of metaphorical spaces.

To summarize, Cox (1999, 29) argued, that the epistemology of pitch space “is consistent with the role of metaphoric thought in how we understand the world generally”. The principles of “how we come to know ‘high’ and ‘low’ generally and how we conceptualize music” display the grand scheme of metaphor in music (idem):

The first is that we come to know ‘high’ and ‘low’ through basic embodied experience ... and that music conceptualization, likewise, is necessarily an embodied experience. The second is that music conceptualization involves comparison of embodied musical experience with other embodied experience, and that this leads to cross-domain mappings that are motivated and constrained by the metaphoric reasoning we bring to the musical experience. The third is that the metaphoric reasoning involved in music conceptualization is consistent with the role of metaphoric thought in how we understand the world generally.

While not employing semiotic or pragmaticist terminology, Cox’s principles agree (although not one-on-one) with the main points of this book, i.e. that

1 mental phenomena are spatially embodied;
2 music and musical composition process are mental phenomena; and that
3 hence, music and musical composition process are spatially embodied.
In terms of the four notions of embodiment described in part three (chapters 3.1.3 and 3.3.3), Arnie Cox’s account emphasized the corporeal embodiment, i.e. that the characteristics of natural bodies and their relations to their environments evolve and change, effecting the representing hosted by the bodies. It also draws attention to spatial embodiment, i.e. to the notion that mental representations operate on spatial terms, so that representations of particulars and their categories, particular objects and concepts can be thought of as dynamic constructs of points in spaces and spaces consisting of those points (although Cox does not make use of Gärdenfors’s theory of conceptual spaces). Additionally, Cox’s approach agrees with the materialist notion of ontological embodiment and seems at least tacitly to accept the notion of implemental embodiment.

Yet, Cox’s conception of music in his account for “music epistemology in embodied experience, embodied cognition, and embodied metaphoric reasoning” (Cox 1999, 258) limits itself to the ‘verticality’ of pitch space and the ‘horizontal’ dimension of time (see Cox 1999, 185). While logically sound and thorough in the task, it is nevertheless limited to the skeletonized view of musical sound as pitch in time. However, the cognitive metaphor theory does not impose restrictions as to which dimensions and domains of music and musical spatiality it can be applied.

The stance suggested by the theory of conceptual spaces is somewhat more radical than Cox’s. As noted, Cox was ready to apply the general conceptualization of time through spatial metaphor to the musical conceptualization of time based on phenomenological identity between the domains—but without elaborating the grounds for it towards the theory of conceptual spaces (Cox 1999, 256):

The change of states that we experience while listening to music is phenomenologically identical to the experience of change of states in other domains.

As noted above, phenomenological identity between the changes of states in music and the changes of states in other domains suggests topological and geometrical identities of conceptual spaces. This means metaphors in Gärdenfors’s (2000) terminology. According to theory of conceptual spaces, in conceptual representation, qualities of objects are represented in quality dimensions, “endowed with certain geometrical structures (in some cases they are topological or ordering structures)” (Gärdenfors 2000, 6; chapter 3.1.2). Together with the pragmatist conception of music (see section 2.2 or 2.4), this suggests a strong logical connection between features of music and features of representations in general. If both the features of musical events and the features of events in general are represented as conceptual spaces, there is always a possibility that any state of a dynamically evolving conceptual space representing a feature of a musical event or category is or becomes identical with a state of a conceptual space representing an event or category in general.
Music is spatially embodied

Consequently, for a more thorough understanding of musical semiosis, it is not enough to investigate only the verticality of pitch and the horizontality of time as the means of constructing signifying representations. Hence, two remarks.

First, in addition to the conception ‘high’ and ‘low’ pitch, many other bipolar descriptions for pitch have been in use. These include ‘small’, ‘light’ and ‘sharp’, versus ‘large’, ‘heavy’, ‘dark’, ‘flat’, or ‘rough’, e.g., ὀξύς (oxys), acute, aigu or hell versus βαρύς (barys), grave, grob or dunkel (see e.g. Kurth 1947/1931, 117–118; Duchez 1979; Zbikowski 2002, 67–68).

In other words, musical pitch has been conceived through many other ways of metaphorical embodiment than verticality. Wim van Zanten (1986) has reported the usage of ‘tense’ and ‘slack’ in Sundanese music for the description of ‘high’ and ‘low’ pitches, and Anthony Seeger (1987) the rare usage of ‘young’ and ‘old’ for the same by the Suyá of the Amazon basin (young men singing with ‘young’ ‘throat’, i.e. ‘high’ pitch). Finally, according to Steven Feld, among the Kaluli of Papua New Guinea, “terminology for intervals and melodic contours metaphorically derive from waterfall terms” with only one exception (Feld 1981, 28; see Zbikowski 1998; Cox 1999, 139–144). Still there are other conceivable ways to conceptualize pitch in an embodied way: I would not be surprised if it was (or has already been) discovered that in some music culture pitch is conceived in terms of ‘close’ for ‘low’ and ‘far’ for ‘high’ pitches, for instance. (In that kind of conception pitch would retain the asymmetry present in ‘high’ and ‘low’ in the actual world, contrary to the ‘left’ and ‘right’, among others.) 46

It appears that, regardless of the wordings used to describe the pitch dimension, for each description a logic can be found of how the description is embodied, either literally or metaphorically or both. Already Hugo Riemann maintained, referring to the nomenclature used in Western music, that (1992/1914–15, 93; bracketed words by translator-editors)

[all of these designations are certainly understandable when one considers that the vibrating body, which emits the various tones, presents smaller dimensions the higher the tones it produces [become], and larger dimensions the lower the corresponding tones are. The old German name grob [literally, crude or uncouth] for low brings this out very beautifully (for example, in “grobgedakt,” which is

46 An interesting commentary by Wellek (1963/1934, 35–38), following von Hornbostel (1926, 707) on the discussion on pitch ‘height’ versus pitch ‘brightness’ also pointed out structural similarities between pitch space and color space: “It is, if one further compares to the optical, in such a way, as if the colortones [i.e. pitches] became upwards always whiter and whiter, and downwards always blacker, until at the end the white pole at the top and the black pole at the bottom were reached. In this sense a parallel is drawn between tonal and color spectra by von Hornbostel: also ‘at the ends of the visible spectrum, there are only differences in brightness, no longer notable differences in colortones [Farbtons].’” (Wellek 1963/1934, 35.)
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retained to the present day in organ study). The heavy mass of the vibrating body’s lower tones is drawn to the ground, [while] the diminutive dimensions of the vibrating body’s higher tones appear light as a feather, floating weightlessly above.

At this point it becomes understandable why tonal motion is valued as an \textit{upward and downward motion} in space and, at the same time, as an \textit{alteration in strength of light}. Higher is at once brighter, lower at once darker. In this fashion, the hearing of changes in pitch level is transformed into a vision of changes in location, and we already have a presentiment of the \textit{ultimate identification of the essence of visual and aural imagination}.

While this could be understood as a suggestion of affiliation of the auditive with the visual, more accurately, perhaps, Riemann’s expounding speaks for analogies and metaphors between different forms of representing, different forms of interaction with actual objects and representations of the actual world, and embodiments of musical spatiality. In fact, it does not really matter that much what the dimensions of the pitch in music are called, what adjectives of English or other languages are used to describe the poles of this or that feature of sound. What is more important, at least for now, is to note that the representation of it is embodied in our ways of interacting with the objects of the actual world and organized spatially in terms of conceptual spaces and metaphors. Révész (1946, 77) seems to have substantially agreed with this, here referring to the suggestion by Köhler and von Hornbostel that the term “pitch ‘height’ (Höhe) should be replaced by pitch brightness (Helligkeit).\footnote{Révész’s original: “Sobald man sich aber darüber im klaren ist, dass \textit{beide} Worte, Höhe und Helligkeit, blosse Analogien oder Metaphern sind, sieht man die Unfruchtbarkeit einer derartigen Diskussion ohne weiteres ein. Man muss sich nur dessen bewusst werden, dass sowohl das eine wie das andere Wort einzig darum verwendet wird, weil zur begrifflichen Fixierung jener Eigenschaft der Töne uns kein besonderer Name zur Verfügung steht.” (Révész 1946, 77.) See also the previous footnote on Wellek.}

As soon as one realizes, however, that \textit{both} words, height and brightness, are mere analogies or metaphors, one sees the infertility of such discussion without further ado. One must only become aware, that the one and the other word is only used, because for the conceptual grasping of each property of tones, there are no special names at our disposal.

From the current perspective, it seems worthwhile to employ both the Peircean theoretical structures of pragmaticism and semiotics and to put the theory of conceptual spaces into use, for the sake of distinguishing more clearly between the superimposed verbal labels on concepts and the non-arbitrary or non-negotiated underlying non-verbal strata of thinking, among other reasons. This should help to circumvent the potentially problematic assumption that verbal expressions (in
Music is spatially embodied

a particular language) reflect our habits of thinking, so strongly relied on by both Cox (1999) and by Lakoff and Johnson (1999).

Second, and what is more important from a clearly musicological standpoint, the application of the cognitive metaphor theory could well be extended beyond the conception of music only as pitch and time, i.e. beyond the skeletonized conception of music as verticality of pitch and horizontality of time. Based on natural pragmatism, Peircean semiotics, the cognitive metaphor theory and the theory of conceptual spaces, the current approach to music and musical spatiality appears applicable to a large variety musical situations, regardless of the names of the poles of the perceived features of musical sound (i.e. ‘high’ or ‘bright’ for pitch, ‘small’ or ‘soft’ sound for ‘low’ level of dynamics, different conceptual dimensions and categories of timbre, the perceptual features pertaining to direction, distance and ambience of sound, etc.). It also works towards a more general epistemology of musical semiosis and semiotic analysis of musical experience.

Event-Structure Metaphors and situations.

Earlier, the notion of music as situations was discussed in chapters 2.2.8, 4.1.3 and 4.1.5. Subscribing to play theories of music, it was maintained, that music provides a safe testing ground for real-life and virtual situations, enhancing the possibilities of adaptation to actual challenging situations. Situations in music may be experienced as if they were possible situations of actual life. In this sense, slightly paraphrasing Tarasti (1994b, 59), “every musical work is ... like a model of human life”—one possible model, virtual world of becoming, conveyed by sound. In that sense, “[t]o listen to music brings us the illusions of ruling over time, just as at each moment it reminds us of time’s irreversibility and irrevocableness, and of our fate in the course of time” (idem).

The possibility of inquiry by means of playing with virtual worlds is due to music’s relation with reality. In chapter 2.2.1, music was described as being partly anchored in the experiential representation of the actual world (Peirce’s world of fact), and partly due to the imaginative competence of the subject (Peirce’s world of fancy), which again is a consequent of the organism’s ability to experience and to form patterns of expectation. The claim is that music is a part of the subject’s being in the world in the way that in music, too, the subject estimates and designs hypothetical future situations, experiences them, and acts accordingly. The experiential and imaginative situations are real in the phenomenal sense, as the subject’s existence relies on experience and imagination (as discussed in chapters 1.2.6 and 1.3.4). These situations may become real in the materialist sense through action, be experienced by subjects sharing the environment, and potentially have their brute effect on the future action of the subjects.
Conceptual sound spaces and their dynamic configurations of sound objects constitute the events, that in music “create sequences in which one situation may or may not be followed by another one” so that “there emerges a network of alternative chains of events”, a network (Tarasti 1998b, 51; see Tarasti 1996b, 438; chapter 2.2.8). As conceptual spaces, the conceptual sound spaces in music need not and cannot be directly identical with actual spatiality. *Mimesis* is only an option, in that music does not need to imitate nature *literally*. By being relative and flexible, conceptual spaces of musical sounds afford ways of being analogous or metaphoric of other situations experienced or potentially experienced by the subject. Let us recall that, according to Gärdenfors (2000, 176), “a metaphor expresses an identity in topological or geometrical structure between different domains.”

Lakoff and Johnson (1999, 178) proposed that the “fundamental understanding of what events and causes are comes from two fundamental metaphors”: the Location Event-Structure Metaphor and the Object Event-Structure Metaphor. The Location Event-Structure Metaphor allows us to “conceptualize events and all aspects of them—actions, causes, changes, states, purposes, and so forth—in terms of our extensive experience with, and knowledge about, motion in space” (ibid., 179). Hence, the target domain of the metaphor is the domain of events, and the source domain of the metaphor is the domain of motion-in-space, i.e. the domain which represents actual objects moving in the actual space.

According to Lakoff and Johnson (1999, 194–196) these are the main submappings determining the Location Event-Structure Metaphor:

- States Are Locations (interiors of bounded regions in space)
- Changes Are Movements (into or out of bounded regions)
- Causes Are Forces
- Purposes Are Desired Locations (a.k.a. Purposes Are Destinations)

Other submappings listed for the Location Event-Structure metaphor are (ibid., 179 et passim):

- Causation Is Forced Movement (from one location to another)
- Actions Are Self-propelled Movements
- Means Are Paths (to destinations)
- Difficulties Are Impediments To Motion
- Freedom Of Action Is The Lack Of Impediments To Motion
- External Events Are Large, Moving Objects (that exert force)
- Long-term, Purposeful Activities Are Journeys

Together with the Location Event-Structure Metaphor, the Object Event-Structure Metaphor forms a duality. Whereas in the former the states are conceptualized as locations, in the latter, attributes are taken as possessed objects (Lakoff and Johnson 1999, 194–195). Lakoff and Johnson have explained both Event-Structure
Metaphors in closer detail (ibid., 170–234). Here, it suffices to focus on the musical applications of the fundamental metaphors. Namely, the Location Event-Structure Metaphor and the Object Event-Structure Metaphor seem capable of providing a feasible explanation for the identities in topological and geometrical structures between conceptual sound spaces in music, on the one hand, and the conceptual structures pertaining to the subject’s existence in the world, on the other, i.e. for how musical situations metaphorically stand for situations of the actual everyday life. It seems, that the logic of the conceptual sound spaces of music is indeed similar to a great extent with the conceptual spaces of our lives. In other words, the proposal is that situations in music stand for possible situations of the world by virtue of identities between the conceptual structures pertaining to events in different features of sound and different features of the world.\footnote{A thorough study of this would consist in massive amounts of musical analysis from the viewpoint of the current theory, the fundamental metaphors and their submetaphors, with possibly supporting evidence from cognitive musicology and psychology of music. Here, only preliminary remarks and suppositions can be made.}

Hence, there is potentially a double metaphor in music: on the one hand, there is the metaphor that represents the situations of the world (conceptual metaphor especially in the sense of Lakoff and Johnson 1999, e.g. Event-Structure Metaphors), unless the representation is literal, and, on the other, there is the metaphor that correlates the musical situation with that of the actual world by virtue of their similarities and mutual isomorphisms as conceptual spaces (the geometric metaphor, especially in the sense of Gärdenfors 2000).

Location Event-Structure Metaphors and sound objects in music.

Musical praxis is framed by the actual acoustical constraints and the sensory and culturally accustomed ranges for different musical features of sound (i.e. simple and complex phenomenal structures of pitch, dynamics, timbre etc.). These frames constitute the extreme outer bounds for the conceptual spaces of each feature. As maintained in chapter 4.1.4,

features of particular sound objects are represented as points in conceptual spaces of different dimensionalities and dimensions structured in different ways. Dimensions may be grouped to domains, and categorized into regions through prototyping. Reciprocally, then, the conceptual sound spaces consist in the instances and dimensions and domains (and their regions and prototypes) of sound objects. New instances are introduced constantly in musical processes and new dimensions and domains are added (and perhaps also abandoned) as phenomenal features of sound form new habits of action, i.e. as we discover new ways of constructing meanings. The meanings, in turn, depend on how the sound spaces are interpreted and associated in the subject’s experience.
The category boundaries of feature representations constitute the regions for the States Are Locations metaphor. (In case the domain or dimension is not categorized, there is only one region, that of the complete range.) The representation of a feature of musical sound as a point in a particular region is a Location in the States Are Locations metaphor. For instance, the pitch of a particular harmonic sound (e.g. with the fundamental frequency wavering slightly around 439 Hz) may be perceived close enough to the prototype of one pitch class instead of the neighboring one (here, a'). More generally speaking, any perceivable feature of sound can be (more quantitatively) in a bounded region or out of that bounded region, or (more qualitatively) deep in a bounded region, or on the edge of the bounded region (cf. Lakoff and Johnson 1999, 181).

Similarly (but clearly not necessarily in one-to-one correspondence), the States Are Locations metaphor seems to be unavoidable in our everyday thinking of states of affairs and situations of life. Lakoff and Johnson (1999, 180) argued for this by conflict of negation (or rather, by practical impossibility):

Try to imagine conceptualizing a state without its being a bounded region in space. ... We have tried to conceptualize a state without these features of bounded regions in space, but we simply cannot do it. In short, the conceptual metaphor States Are Locations (bounded regions in space) seems to be central to the concept of state. It is not a mere ornamentation or an expendable conceptual extra.

Lakoff and Johnson (1999, 180) lists some examples of the metaphor States Are Locations: “I’m in love. She’s out of her depression. He’s on the edge of madness. He’s in a deep depression. She’s close to insanity. We’re far from safety.” While these examples exhibit verbal utterances of states of subjective experience or conditions of mental competence, the metaphor is functional in both more concrete and more intersubjective situations, as well, as exemplified by Lakoff (2004a):

He is in love.
What kind of a state was he in when you saw him?
She can stay/remain silent for days.
He is at rest/at play.
He remained standing.
He is at a certain stage in his studies.
What state is the project in?

As the complexity and abstractness of the States Are Locations metaphor varies from very literal (and hence not metaphorical) to highly complex and abstract representations of actual situations of the world, so may the complexity of the same metaphor vary in terms of features of musical sound. Due to or by virtue of the acousmatic dilemma (see chapters 4.1.2–4.1.4), there need not be a pre-set, one-to-
Music is spatially embodied

one correspondence between the musical States Are Locations metaphor and the general States Are Locations metaphor. The same holds for other metaphors (see below). Again, from the naturalist perspective, once one has become involved in a musical situation and perceived a particular state of a feature of sound, there is no other alternative but to settle the irritation of the sound by relating the perceived to the experiences accumulated in the past and, based on that, to hypothesize for the future in imagination. Hence the irritation of the musical States Are Locations metaphor is settled by finding the general instance of States Are Locations that best fits the unfolding narrative and its context. This is essentially what the interpretation of musical Sign is about: correlating with a suitable logic the experience of the sound with general experience by means of similarities of conceptual spaces, i.e. by means of metaphors.

When a feature of sound begins to change, its representation eventually changes quantitatively from one category to another, out of one region and into another one. If the domain or dimension is not tessellated into category regions, there is nevertheless a qualitative change in Location, i.e. Movement from the depths of the region towards an edge of the region or vice versa, etc. Hence, a semitone shift in pitch (more quantitatively) from the category of $g^\#1$ to the category of $a^1$, for instance, is a Movement, corresponding to the traditional notion of musical motion. A transposition of a clarinet motif from the low chalumeau to a higher register is a motion from one category of register to another. Pitch bend and vibrato, in turn, are shifts of Location, but typically inside the boundaries of pitch regions (and hence more qualitative). Yet, the Changes Are Movements metaphor is not limited only to pitch in music. Depending on what kind of object identity the sound object has been perceived to have, the same may apply, e.g. for discrete or continuous changes in volume (from ‘pianissimo’ to ‘fortissimo’), or in timbre (from ‘mellow’ to ‘bright’, or from ‘low’ to ‘high’ amount of ‘bite’ in the attack; see, e.g. Grey 1977; Wessel 1979; Grey and Gordon 1978; Gordon and Grey 1978; McAdams and Cunible 1992; McAdams 1999; chapter 4.1.4). Reversely, when a particular feature remains similar or reoccurs, there is no Movement, and the Location, i.e. the State persists.

The examples of Changes Are Movements metaphor in Lakoff and Johnson (1999) are again primarily examples of subjective experience or mental capacities: “I came out of my depression. He went crazy. He went over the edge. She entered a state of euphoria. He fell into a depression. He went deeper into his depression. In the sun, the clothes went from wet to dry in an hour. The clothes are somewhere between wet and dry.” The examples by Lakoff (2004b) are again more broadly varied:

He went from innocent to worldly.
She was nearly insane.
He slipped into a depression.
In terms of conceptual sound spaces, the metaphor Causes Are Forces seems to entail particularly that there is some kind of “gravitational pull” or other dynamic tendency for motion varying between different domain categories. Still holding on to the example of pitch domain for the sake of clarity, this “gravitational pull” is to a great extent the same as the issue of tonality, understood in “the broadest possible sense” as the “systematic arrangements of pitch phenomena and relations between them” (Hyer 2007), i.e. hierarchies between pitches (cf. Kurth 1947/1931, 13 et passim). Here, it is unnecessary to take a stance on the issue of to what degree (the judgments of) pitch hierarchies are related to or determined by the hard facts of acoustics, sensory mechanisms, psychological factors or cultural learning and conditioning (see e.g. Krumhansl 2004). While pitch systems of different musics may vary a great deal (i.e. while the pitch spaces are categorized in different ways), there are nevertheless notable similarities in basic principles or the logic between, say, Western, Arabic, Hindustani or Japanese tonalities (or modalities), in terms of pitch “centers and peripheries”, and tendencies of pitch changes, based on different functions of pitch categories.

In the actual world, some movements require less effort than others. Take the simple example of pushing a car downhill versus uphill. We constantly make efforts and use our forces to win the forces of gravity, and just as often take advantage of our own forces and those of others, as well. We are engulfed by the actual forces effecting objects, including ourselves as objects. The causality of the actual forces is the very starting point of naturalist pragmatism and its view of embodiment of semiosis (see chapter 1.2.1 et passim). The absence versus presence of forces that affect us and our environment, and the ease versus difficulty of encountering, reacting to and exploiting those forces are experienced subjectively for instance as rest and tranquility versus effort and anxiety (or possibly as horror vacui versus soothing satisfaction of sufficient activity).

It seems that changes in pitches, and the existence of pitch hierarchies and functions of pitch categories would be experienced as resulting from forces affecting the pitch, even if we were to learn that there are no psychoacoustic reasons for postulating such forces. This is since in the actual world they do exist in such manner, based on our experiences. It is enough that some movements are preferred to others, and we are prone to conclude that there must be something that causes this, some kind of
forces that lead to the “behavior” of the material in this or that manner, because we wish to find a cause for the change. In fact, as soon as two or more distinct pitches, for instance, are used, it is difficult to avoid a hierarchy, due to the temporal character of musical narrative: even in the simplest case, there has to be a first pitch and a last pitch (or a top and bottom pitch of simultaneous pitches), which already sets up preferences of one over other(s), thus leading to inequality of the pitches.\footnote{Some of the esthetic problems encountered in the serialism of the late 1940s and early 1950s vouch for this as well.}

For again, as the way out of the acousmatic dilemma above suggested, there is an inherent need to search for a settlement of the irritation of the musical sound in one way or another, to interpret and to try to attach the perceived qualities of sound to some sort of imaginable object or to some sort of imaginable activity of objects. From the naturalist perspective, there is no other feasible alternative but to relate the qualities to the natural interaction between subject-organism and the environment, whether previously perceived and experienced as such or hypothesized feasible, based on previous experience and habits of perceiving. (See chapter 4.1.3.)

This way, not only the functional tonality of the major-minor diatonicism in Western musics, but other hierarchical pitch structures as well come across as being naturally emerging dynamical systems, hierarchical systems of sound objects and forces effecting them (cf. e.g. Kurth 1947/1931, 76–). Furthermore, as noted, pitch space was here taken again as but one example of all the possible domains contributing to musical signification.

In cognitive metaphor theory, causation, or “caused changes of state are understood as forced movements from one state to another” (Lakoff and Johnson 1999, 184). The cognitive metaphors Causes Are Forces and Causation Is Forced Movement are reflected in verbal expressions such as (idem):

- FDR’s leadership \emph{brought} the country out of the depression. The home run \emph{threw} the crowd into a frenzy. He \emph{drove} her crazy. Their negotiations \emph{pulled} both sides from the brink of war. That experience \emph{pushed} him over the edge. Her speech \emph{moved} the crowd to rage. The news \emph{propelled} the stock market to record heights. The trial \emph{thrust} O.J.’s attorney into the limelight.

There is a systematic relationship between “the logic of forced movement and the logic of causation” (ibid., 195), which, according to the conceptual metaphor theory, accounts for the construction of the complex representation of causation by an event or by an action by someone (target domain) based on the more literal experience of the forces affecting actual objects (the source domain). In general, the ability to interpret and to understand perceived changes in states as being caused by a force, and furthermore, as being caused by some event or action, improves the chances of adapting to the environment. In the context of music, if the changes in
pitches or other features of sound are experienced as being caused by a force (e.g. by the tonal “gravity”), it easily follows that the changes in pitches are interpreted as being caused by a force exerted in some event or action, as well. And here, the cause is not searched from the player of the instrument or the amplifier driving the speaker cone, as described in the acousmatic dilemma. Rather, the cause is searched in terms of the logic of the situations of the sound objects as they might stand for situations of the actual world. In other words, the metaphors Causes Are Forces and Causation Is Forced Movement become available tools in musics by virtue of the identities between the topological and geometrical cognitive structures of general dynamics of objects and the perceived dynamics of sound objects, exhibited already by the States Are Locations and Changes Are Movements metaphors. This way, the possibilities of musical narrative take a leap from perceptual features of sound towards Signs of acts and events.

This also enables actorial narrativity; that is to say, pitch (or other musically relevant) changes may be interpreted as being caused by something or someone. More broadly, the sound may be interpreted as an instance of action by something or someone, pursuing goals or fulfilling purposes, facing difficulties, searching for solutions and resolving the difficult situations encountered. Namely, in the Location Event-Structure Metaphor, actions are interpreted “as movements that an agent carries out under the agent’s own force” (Lakoff and Johnson 1999, 187). Transferred to music, this seems to be in concord with the inner elements in Tarasti’s (1998b, 1996b) model of the communicational and significational structure of narrative music, in which agent/patient relations are recursively embedded into concentric levels (see chapter 2.2.8). In a way, then, rather than “objectification” of sound (see McDermott 1966, chapter 4.1.2), we are here dealing with “subjectification” of sound: the movements from a feature category of sound to another and the movements within each category are interpreted as being caused by a force, which in turn is interpreted as being possessed by something or someone. The “behavior” of sound objects suggests causation by inanimate objects, but also by living, perhaps even conscious, self-regulating beings. Hence musical actoriality and narrativity. Again: due to the topological and geometric similarities, musical situations may stand for possible situations of the actual world.

Tables 12 through 14 present the remaining relevant submetaphors derived from the basic Location Event-Structure Metaphor and some general examples of the metaphors as they are reflected in verbal speech (in English) as presented by Lakoff and Johnson (1999). These are metaphors of action, difficulties, freedom, purposes, aims, external events and long-term activities, all aspects pertinent to actoriality in a narrative, to representations of an agent (or patient) or a subject.
Music is spatially embodied


<table>
<thead>
<tr>
<th>Metaphors</th>
<th>General examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aids To Action Are Aids To Movement</td>
<td>Getting the grant gave us just the boost the project needed.</td>
</tr>
<tr>
<td>Manner Of Action Is Manner Of Movement</td>
<td>We’re skipping right along. We slogged through it.</td>
</tr>
<tr>
<td>Careful Action Is Careful Movement</td>
<td>He is walking a fine line.</td>
</tr>
<tr>
<td>Speed Of Action Is Speed Of Movement</td>
<td>Things have slowed to a crawl. She is going by leaps and bounds.</td>
</tr>
<tr>
<td>Difficulties Are Impediments To Movement</td>
<td>She’s trying to get around the regulations. It’s been uphill all the way. He’s carrying quite a load. He’s holding her back. We’re running out of steam.</td>
</tr>
<tr>
<td>Freedom Of Action Is The Absence Of Impediments To Movement</td>
<td>I don’t want anything to tie me down. Break out of your daily routine.</td>
</tr>
<tr>
<td>Suspension Of Action Is The Stopping Of Movement</td>
<td>They halted the project. The work came to a standstill.</td>
</tr>
</tbody>
</table>

While the examples of submappings in Lakoff and Johnson (1999) focus on a singular subject (appearing almost solipsist), they do not by any means exclude representations pertaining to praxis or purposeful action by and upon other subjects (see chapter 1.3.1). Rather, each of these metaphors seems applicable to musical narration as well. One could easily find examples of, e.g. melodic patterns, motifs, or metric and rhythmic means analogous to the general examples in tables 12–14. While analyses of musical narration have been carried out for long, music analysis from the specific perspective of cognitive metaphors or conceptual spaces are only taking first steps (see e.g. Gärdenfors 1988; Saslaw 1996; Zbikowsky 2002; Eitan and Timmers 2006). The aim here is not to analyze existing works—that never ending task needs to be set off in another context (see section 5.2). Here, it suffices to describe how cognitive metaphors and conceptual spaces can provide an epistemological basis for musical signification, i.e. what may be the logic underlying the semiotic process of creating sound objects for perception and interpretation of those sounds as Signs.
TABLE 13. Metaphors of purposes and aims, with examples of each. Submappings of the metaphors Purposes And Destinations and (combining that with the metaphor Actions Are Self-propelled Movements) Purposeful Action Is Self-propelled Motion To A Destination. After Lakoff and Johnson (1999, 190–192; emphases original).

<table>
<thead>
<tr>
<th>Metaphors</th>
<th>General examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieving A Purpose Is Reaching A Destination</td>
<td>We’ve reached the end. We only have a short way to go.</td>
</tr>
<tr>
<td>Lack Of Purpose Is Lack Of Direction</td>
<td>She is drifting aimlessly. He needs some direction.</td>
</tr>
<tr>
<td>Means Are Paths</td>
<td>Do it this way. She did it the other way.</td>
</tr>
<tr>
<td>Starting A Purposeful Action Is Starting Out On A Path</td>
<td>We are just starting out. We have taken the first step.</td>
</tr>
<tr>
<td>Making Progress Is Forward Movement</td>
<td>We are moving ahead. Let’s keep moving forward.</td>
</tr>
<tr>
<td>Amount Of Progress Is Distance Moved</td>
<td>We’ve come a long way. We’ve made it this far.</td>
</tr>
<tr>
<td>Undoing Process Is Backward Movement</td>
<td>We are sliding backward. It is time to turn around and retrace our steps.</td>
</tr>
<tr>
<td>Expected Progress Is A Travel Schedule; A Schedule Is A Traveler Who Reaches Prearranged Destinations At Prearranged Times</td>
<td>We got a head start on the project. I’m trying to catch up. I finally got a little ahead.</td>
</tr>
<tr>
<td>Lack Of Progress Is Lack Of Movement</td>
<td>We are at a standstill. We aren’t going anywhere.</td>
</tr>
</tbody>
</table>

TABLE 14. Metaphors of external events and long-term activities, with examples. The metaphors External Events Are Large Moving Objects and Long-Term Activities Are Journeys. After Lakoff and Johnson (1999, 192–194; emphases original). Examples of the latter are actually given by Lakoff and Johnson (ibid., 64) in the context of the related metaphors, A Purposeful Life Is A Journey and its submapping Love Is A Journey, presented already in chapter 3.1.2.

<table>
<thead>
<tr>
<th>Metaphors</th>
<th>General examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Events Are Large Moving Objects</td>
<td>Things seem to be going with me, rather than against me these days. Things are going my way. You gotta go with the flow. We’re all in the same boat. Wild horses couldn’t make me go.</td>
</tr>
<tr>
<td>Long-Term Activities Are Journeys</td>
<td>Look how far we’ve come. It’s been a long, bumpy road.</td>
</tr>
</tbody>
</table>

To summarize: based on the above, musical signification takes advantage a) of our habits of interacting with actual objects, b) of our literal conceptual constructs for location, movement, forces and causes, and c) of our ways of constructing abstract representations through metaphors (in the sense described in the cognitive metaphor theory). The way music takes advantage of these general cognitive and semiotic structures is, again, by means of metaphor in the sense described by the theory of conceptual spaces: as topological and geometrical identities between conceptual spaces.
Object Event-Structure Metaphors and sound objects in music.

So far, only the contribution of the Location Event-Structure Metaphor to musical signification has been considered. Its counterpart, the Object Event-Structure Metaphor, also seems to contribute to musical signification. In the Object Event-Structure Metaphor, attributes are seen as possessed objects, as noted above (Lakoff and Johnson 1999, 194–195). The main submappings of the Object Event-Structure Metaphor are:

- Attributes Are Possessions
- Changes Are Movements Of Possessions (acquisitions or losses)
- Causation Is Transfer Of Possessions (giving or taking)
- Purposes Are Desired Objects

The dual character of the underlying basic metaphors (States Are Locations and Attributes Are Possessions) was exemplified by Lakoff and Johnson (1999, 195) by the comparison of two verbal examples:

Harry’s in trouble. (States Are Locations)
Harry has trouble. (Attributes Are Possessions)

While in some cases both metaphors may be applicable to construct the representation of the same situation, Lakoff and Johnson (idem) noted, that “[t]he difference can be seen as a figure-ground shift. In the first case, Harry is a figure and trouble is the ground with respect to which the figure is located. In the second case, Harry is the ground and the figure, trouble, is located with respect to him.” Beyond this figure-ground shift, the Object Event-Structure Metaphor is extended very similarly to the Location Event-Structure Metaphor (ibid., 195–196):

If an attribute is conceptualized as a possessible object, then adding Changes Are Movements makes change metaphorically the acquisition of a possessible object (where the object moves to you) or the loss of a possessible object (where the object moves away from you). Hence, Harry cannot only have a headache, he can get a headache or lose his headache; that is his headache can go away.

Given this view of change as acquisition or loss, the Causes Are Forces metaphor yields a conception of causation as the forced movement of a possessible object to or from some entity. That is, causation can be seen as either giving or taking. Hence, a noise can give you a headache and an aspirin can take it away.

Furthermore, in the Object Event-Structure Metaphor, purposes become conceptualized as desired objects, instead of desired locations or destinations.

It may seem difficult (and perhaps unnecessary, due to the similarities in their logics) to draw a strict dividing line between the Object Event-Structure Metaphor and the Location Event-Structure Metaphor in music. The difference in the figure-ground relation (see Lakoff and Johnson 1999, 198–200) is certainly a determining
factor, but with sound objects, a slightly different understanding, elaborating on
the idea of the figure-ground relation, seems possible. What makes things rather
complicated in music, is that, first, the identities of sound objects are flexible in the
sense, that unlike actual objects, they may at any time fade in and out, merge into
and split from one another, and in particular, exist in different magnitudes and even
change their magnitudes.

A sound object may be embedded in another sound object. For an example, a
melodic-rhythmic motif may consist in, say, four distinct pitches—it may possess
the four pitches. The motif, then, may function as a part of a larger melodic structure
(such as a theme)—it may be possessed by the larger structure. The larger structure,
again, may be part of yet another, larger hierarchical structure (to the limits of
perception and memory). At different levels of magnitude, we tend to have seve-
ral simultaneous sound objects, sometimes interacting (i.e. exchanging features or
elements), sometimes not. Such a situation is more than the sum of its parts—the
relations of the sound objects need to be taken into account (which typically is then
a feature of the higher level in hierarchy). Also, in the smaller scale, each distinct
pitch may contain elements of ornamentation, varying vibrato or bending, or pitch
envelopes (with time-varying glissandi), etc., counting here only the pitch-related
features of sound. In other words, there is not just one figure-ground relation, but
several recursive or embedded levels of figure-ground relations of different mag-
nitude, several levels of possession (of the smaller element by the larger) or location
(of the smaller element in the larger), akin to the recursive levels of narration (al-
though these two should not be regarded as perfectly identical).

The second complicating factor is the multidimensionality and (partial) sepa-
rability of dimensions of conceptual sound objects. This means that, since any
dimension or domain of conceptual sound spaces may contribute to the musical
signification (i.e. pitch space is, again, not the only form-bearing domain), and since
they seem to be at least partly separable, the different dimensions and domains may
either conflict with or corroborate each other. For instance, in a “crescendo” passage,
the dynamics might become gradually louder, tempo gradually faster and (linear)
pitch (chromatically) higher all at the same time, in a constant, linear fashion, each
corroborating and contributing together to an “elevated” state of experience, using
metaphors such as States Are Locations, More Is Higher, Changes Are Movement,
Causes Are Forces, Means Are Paths, Freedom Of Action Is The Lack Of Impe-
diments To Motion etc. Alternatively, the narrative of the various dimensions or
domains of conceptual sound spaces may be altogether different, separate from each
other, changes in features taking place asynchronously, and by means of different
metaphors.
In simple cases, there may, for instance, be timbral consistency with rapid pitch changes or rapid timbral changes with pitch constancy. A more conflicting case might use the metaphor Difficulties Are Impediments To Motion in one domain (e.g. the dynamics implying direction for movement but sustaining the movement by means of repeating pairs of crescendi and decrescendi, each yet each swell becoming gradually bigger or smaller than the previous one), and the contrasting metaphor Freedom Of Action Is The Lack Of Impediments To Motion in another domain, possibly in synchrony or at a different rate (e.g. an uncomplicated shift from sul tasto to sul ponticello in strings, or a slow, gradual, effortless increase or decrease in tempo). As another consequent, it may become difficult if not impossible to delineate in certain cases the identity of the sound object. Sound objects may vary in magnitude, and they may vary in terms of activity (thus bringing up the distinctions between acts and events, and between agents and patients; see chapter 2.2.8). Sound objects and their features may merge to each other or split. In other cases, the identity may be well-defined and easily distinguishable, with a clear-cut duration, with a distinct contour for pitch, timbre, dynamics or other dimensions.

In this respect, a situation in music may end up being very simple or utmost complex. Furthermore, through simultaneous representations of conflicting elements, the logic in a musical situation may verge on bivalent logic (cf. the example of bilogic in conflicting formal structures of melody versus harmony in chapter 2.2.6). At its simplest, the logic of a musical situation may also display logic similar to simplistic causation—parallel to situations in the actual life if perceived to be as simple as the statements “Harry has trouble” or “Harry’s in trouble” indicate. However, once all the effects that might conceivably have practical bearings have been considered, as the pragmatic maxim (CP 5.438) calls for, the situation involving Harry and the trouble would most likely be perceived to have more interdependent elements than the binary relation of possession/location (or agent/patient). How complex the situation becomes, depends of course on the subject interpreting the situation and on how the situation has been produced. As far as music is concerned, again, the conceptual sound spaces afford to any degree of complexity. All this speaks once more for the play theory of music, and for the idea that situations in music stand for possible situations of the world by virtue of identities between the conceptual structures pertaining to events.
4.2 Music as spatially embodied semiosis

The previous section discussed various aspects of musical spatiality. Because actual objects belong to the functional organization of mind (see e.g. Määttänen 1993a or chapters 1.2.3, 3.1.1, 3.2.2), the distinction between actual and phenomenal spatiality in music (deriving from the distinction between sound as causal propagation of atmospheric disturbances versus sound as perceived and related to experience) replaced the division between “external” and “internal” in music, as well. The three levels of musical spatiality suggested in particular by Wellek were subsequently elaborated to three-tiered spatiality of 1) “spectral hearing” of simple initial conceptual structures, 2) construction of more complex sound objects, and 3) musical spatiality in which the dynamic sound object structures are associated with other experiences thus “constituting a complex combined result” of subjective experience. Section 4.1. addressed the conceptual sound spaces and sound objects, their dimensionality and the unavoidable question of temporality, as well as the role of metaphor as the means of associating sound objects with other elements of experience, i.e. as the means of interpreting sound objects in music.

What remains to conclude the syllogistic structure of this book, is the examination of how musical spatiality as discussed above fits in the Peircean view of semiosis outlined in section 3.3, and what the idea of spatial embodiment as discussed in part three entails in terms of musical spatiality, signification and praxis.

The discussion on the quest for autonomous, intrinsic musical space (chapter 4.1.3) led to the idea that, unlike in everyday practical inquiry, interpretation in music does not tie the sounds (necessarily) to specific actual objects. Consequently, (as worded in chapter 4.1.6)

there is an inherent need to search for a settlement of the irritation of the musical sound in one way or another, to interpret and to try to attach the perceived qualities of sound to some sort of imaginable object or to some sort of imaginable activity of objects. From the naturalist perspective, there is no other feasible alternative but to relate the qualities to the natural interaction between subject-organism and the environment, whether previously perceived and experienced as such or hypothesized feasible, based on previous experience and habits of perceiving.

In other words, meanings in music are unavoidably tied to experience, either more directly (as seems to be the case in the idea of programmatic music), or more indirectly (as in the idea of absolute music). At the same time, musical semiosis employs the same basic principles as semiosis in general, being its subset. Consequently, musical semiosis seems to be spatially embodied in ways similar to the
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spatial embodiment of semiosis in general, while adhering to its distinctive characteristics as sound-mediated, non-arbitrary communicative praxis.

The following is an abductive attempt to accommodate musical semiosis as described in section 2.2 within the Peircean view of mind and the model of ten-fold division of the Sign as expressed in section 3.3. Chapter 4.2.1 centers on the musical Sign, and chapter 4.2.2 on the musical process of communication and its context within the process of inquiry involving action and experience, esthesis, praxis and semiosis.

4.2.1 The musical Sign

The Peircean view of the Sign recollected.

For the sake of clarity, let us recollect the reading of Peirce’s theory of the Sign from section 3.3. The current reading of the Sign arose from the phaneroscopic categories and the ten-fold classification of the Sign. For convenience, the three-dimensional model of thought-signs (fig. 32 in chapter 3.3.2) is given again in figure 34.

The ten-fold division of the Sign involves six transitions (see chapters 3.2.3 and 3.3.2; figure 34; figures 19–21, 28–30, 32), namely those between
A the Qualisign and the three Sinsigns,
B the three Sinsigns and the six Legisigns,
C the three Icons and the four Indices,
D the six Rhemes and the three Dicents,
E the four Indices and the three Symbols, and
F the three Dicents and the Argument.

Transition A from the Qualisign to the Rhematic Iconic Sinsign corresponds to the implemental embodiment of the Sign, in that the Qualisign as a possibility for signification becomes actually manifested in the sinsign in virtue of the causal relations between the objects of the actual world. Hence within the trichotomy of the Sign in itself, the Qualisign is a First and the Rhematic Iconic Sinsign a Second. On spatial terms, transition A can be thought of as a tensor operation or an imperfect, limited transformation of the distributions of the qualities of the actual objects to the spatial system of the subject’s representation of them.

Transition B, or rather, the mutual relation between the sinsigns (as Seconds) and the legisigns (as Thirds) consists of the dynamic interplay of legisigns as the law-like general types, i.e. structures of Gärdenforsian quality spaces and other conceptual spaces, on the one hand, and of sinsigns as the particular instances, i.e. points in those conceptual spaces. Sinsigns and legisigns define each other.
Transition C from icons to indices seems to account for feature extraction and categorization (in Gärdenfors’s sense of the word, through tessellations of conceptual quality spaces). Evidently, efficient filtering and discretizing of the continuous
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(or pseudo-continuous) dimensions of quality spaces eases the cognitive load and thereby speeds up learning. In terms of “the Sign in relation to its Object”, in transition C, the causally evoked representation in an icon (a First) becomes a factual representation of the object’s features in an index (a Second).

Representing the Object as an object (as opposed to representing merely different, uncoordinated features of the Object) requires binding of the separate features into a coherent whole. This takes place in the transition D from rhemes to dicents, when the elements of interpretation (a First) are unified into a genuine interpretation (a Second), in terms of “the Sign in relation to its Interpretant”. In terms of conceptual spaces, object representation is a combination of the regions of domains representing properties, that is, a combination of the regions in sets of integral quality spaces pertaining to the object.

Without transition E, the factual object representation (in its Secondness) does not comprise a full Sign. The particularity of the Sign reaches its limits in indexical sinsigns, but the indexical legisigns, that is, the categorized conceptual spaces pertaining to the particular instance, can be further correlated with other legisigns, i.e. associated with other categorized conceptual spaces. In other words, symbolic legisigns (in their Thirdness) account for the inclusion of new perceptions into the subject’s accumulating experience. (Note, that transition E applies both to bound and unbound indexical legisigns, that is, to both the Rhematic Indexical Legisign and the Dicent Indexical Legisign.)

Finally, the transition to the Argument (transition F), is the acknowledgment of the semiotic situation, including, when thorough, the understanding of the roles of the participants in communication. Spatially, the Argument (a Third) extends the association of conceptual spaces of the situation to include those representing self (vs. others), the subject’s conception of her own phenomenal world (vs. the conception of the actual world), and habits of thinking (vs. habits of action) as elements of communication and semiosis, and the practical ramifications of semiosis. (Chapters 3.3.2 and 3.3.3.)

The ten-fold division of the musical Sign.

Based on how music was described in part two and musical spatiality in section 4.1, relevant notions of musical space appear to fit in the Peircean view of the spatially embodied Sign, as is appropriate considering the idea that musical semiosis is a subset of semiosis in general. This leads to a sketch of the Sign in musical semiosis, the musical Sign.

In part two, six characteristics highlighted the concept of music. To begin, music was described real in the sense, that it is a process of interaction involving subjects as
organisms and sound as the actual object mediating the interaction. Music involves both perception and action. Hence in music, as in semiosis in general, the transition \( A \) between the Qualisign and other rhemes corresponds to the beginning of the actual process of representation. In music, this refers to the initial perception of sound—the initial phase of non-arbitrary auditory perception.

Due to the causal relations between the subject as organism and the sound as actual object, the distributions of potentially significant qualities of the actual sound (including but also going far beyond those of the actual spatiality of sound) are transformed (although imperfectly) into the rudimentary *phenomenal spatiality* of “spectral hearing”, “simple initial spatial structures relating to the perception of pitch, spectrum and volume”, as described in chapter 4.1.4. In terms of the Sign in itself, the musical Sign emerges as instances of sinsigns of sound in relation to their corresponding legisigns, instead of merely being possibilities for signification.

Together with the naturalist epistemology of representation, which is based on the revelation of object structures through causality of interaction, the relation between the sinsigns and the legisigns (transition \( B \)) accounts for the *spatial embodiment* of music. It has been argued here, that semiosis in general, and consequently musical semiosis as well, is *spatially embodied*, i.e. that mental representations operate on spatial terms, so that representations of particulars and their categories, particular objects and concepts can be thought of as dynamic constructs of points in spaces and spaces consisting of those points (see 4.1.6). In representation of sound, the instances of different features and their combinations are interpreted based on their relation to other instances accumulated in the legisigns. Reciprocally, the legisigns are constantly effected by the particular instances of sinsigns. For instance, each pitch is perceptually defined—represented and interpreted—in relation to the accumulation of pitches and their mutual relations already experienced, and, reversely, the accumulated pitch space is (more or less) effected by each perceived instance. Although focusing only on combinations of “tones”, as opposed to all possible characteristics or parameters of sound, Edward Lippman seems to have described the relation of musical sinsigns and legisigns when writing (Lippman 1952, 247, emphases original):

\[
\text{The individualities [of single tones] are only functions of the totality; they are primarily effective spatially as individualities within an encompassing space feeling. Nor does this complex whole which is the space feeling rest on the summation of all those space-forming events which previously were separated out individually. The inner-dynamics summon up an embracing space relationship.}
\]

As argued in section 2.4, musical representation operates fundamentally in virtue of isomorphisms or analogies, as opposed to being arbitrarily negotiated, as is the case with verbal language. According to the theory of conceptual spaces, this
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means, that the categorization of musical sound (transition C) is based on tessellation of quality dimensions of sound into “well-behaved regions”, possible exceptions notwithstanding (see chapter 3.1.2). In other words, the represented properties of musical sound are principally natural. Consequently, this non-arbitrary, natural character of musical representation potentially allows for a great number of associations to other, non-arbitrary conceptual spaces by means of metaphor, metaphor expressing “an identity in topological or geometrical structure between different domains” (Gärdenfors 2000, 176). Identities between arbitrary topological or geometrical structures seem unlikely or at least less probable, whereas identities between naturally tessellated conceptual spaces seem possible, to say the least, due to the object consistency of the actual world and the persistence of perceptual mechanisms. Herein also lies the foundation to the usefulness of music, in that, based on the possibilities of metaphor, musical sound is able to represent—able to stand for something.

As noted earlier (chapter 4.1.4), it seems, that the objectification of musical sound, while not indispensable, would nevertheless correspond logically to the construction of the object representation in general, i.e. to the binding transition D between rhemes and dicents.

Here, objectification should not be taken as a stylistic issue of Western modernism, as McDermott suggested (McDermott 1966, see chapter 4.1.2), but simply as perception of sounds more or less well delineated entities rather than as mixtures of separate qualities, regardless of how complex the conceptual sound spaces are (see chapters 4.1.4 and 4.1.5). In short, we are here dealing with “phenomenal structures which can subsequently be associated with the subject’s experience one way or another”, that is, with the “complex auditory structures” inferred from “spectral hearing” (chapter 4.1.4).

Indeed, the association of the conceptual sound spaces with the subject’s accumulated experience may take place in one way or the other. It even seems that a full process of objectification, or the process of binding of rhematic indices to dicent indices, is not necessarily needed in music, as was hinted above. Namely, the next transition in the maturing of a complete Sign (transition E) applies both to bound and unbound indexical legisigns. Consequently, and depending on the situation (e.g. musical style or context and the subject’s habits of perception), the symbolic process of associating the current conceptual spaces pertaining to the particular instance at hand with other conceptual spaces accumulated in experience earlier may take place either “rhematically” (the Rhematic Indexical Legisign to the Rhematic Symbolic Legisign) or “dicentwise” (the Dicent Indexical Legisign to the Dicent Symbolic Legisign), that is, between separate, unbound qualities or between...
distinct phenomenal objects, entities in which the separate qualities are already bound together. In other words, both separate features of sound and sound objects comprised of its features may evoke associations of accumulated experience. In the former case, it seems, a process parallel to binding may then take place in the symbolic level (Rhematic Symbolic Legisign to Dicent Symbolic Legisign), thus forming a “complete complex result” that is characteristic of the “feeling-like subjective experience” in music, metaphorically representing a possible situation of life (cf. chapter 4.1.3, 4.1.4).50

Hence, the tripartition of spaces in music based on e.g. Wellek (1963/1934) and revised in chapter 4.1.3 (see also 4.1.4) seems to fit well in the Peircean conception of the Sign, and particularly in the tripartition of the Sign in relation to its Object:

1 first, the simple initial spatial structures of “spectral hearing” as iconic possibilities of representation;
2 second, more complex auditory structures, particularly the phenomenal sound objects as factual, indexical representation; and finally,
3 third, musical space “proper”, i.e. conceptual spatiality in which the complex sound structures are associated with the subject’s experience as symbolic object representation with associations.

In comparison to Wellek, a more hermeneutic approach to musical spatiality might emphasize the perspective of the Sign in relation to its Interpretant: the development from rhemes to dicents to the Argument. And continuing the comparison, a more neurally-inspired approach (or an implemental approach), in turn, might emphasize the perspective of the Sign in itself: the Qualisign as features potentially represented, the Sinsign as instances being signified (e.g. by means of neural activation) and Legisigns as signifying categories (e.g. synaptic weights). This suggests that musical semiotics may provide tools for discovering the common ground between, e.g. socially aware hermeneutic, neurally aware cognitive, and practically aware systematic approaches to music.

In any case, in the transition from indices to symbols, musical sound comes to stand for something: if indeed situations in music stand for possible situations of

50 The two paths to symbols would seem to point to stylistic differences between those aspects of musics that emphasize e.g. “coloristic” treatment of timbre or other distinct features and those aspects of musics that are more prone to object-like experiences of motifs, themes or other well-defined objects in which the distinct aspects are readily bound together. For example, the former might point to subject’s associations or interpretations of the peacefully evolving timbral stretch between the somberness and scintillance of the opening of Pagodes from Claude Debussy’s Estampes for piano. The latter might point, e.g. to the interpretation and experience of the joyful obsessive totality of the saxophones’ playing on triads and the contrasting brass punches combined with the relaxed swing of rhythm section in the main theme of In the Mood by Joe Razaf and Andy Garland, made popular by the 1939 recording by Glenn Miller and his orchestra.
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the world by virtue of metaphors, by virtue of identities between the conceptual structures pertaining to event, it means, that the conceptual spaces of the indexical legisigns in music are topologically or geometrically identical or similar enough to the conceptual spaces of the indexical legisigns pertaining to the actual or possible situations of the world. Hence, the musical Sign stands actually for the general Sign with all its potential associations in the subject’s experience. And thereby at the symbolic level, it becomes possible for musical sound to stand for something for someone and thereby to produce an experience, in Deweyan terms.

Finally, in the transition to the Argument (transition F), the semiotic situation in and of music is revealed or acknowledged. This means that it is understood that the sound being perceived and interpreted in musical process is not “for real”, not a part of the actuality demanding immediate reaction (for instance, the audience really need not prepare for a milk queue due to the Almglocken in Mahler’s 6th Symphony). Instead, the situation is a useful, safe testing ground for the actually existing and potentially existing real-life situations. This realization is possible only through some kind of understanding of the communicative process and of the roles of both the sound and the origin of the sound, understanding of the roles of possible performers and composers, as well as the role of the listener, the subject herself. In this respect, it seems, that already the relatively passive participation in musical processes as a listener can scaffold and support, sustain and strengthen the subject’s conceptions of herself as a subject encountering various situations of life. And if musical communication manages to search answers to perennial questions and thereby succeeds in producing an experience and in changing the subject’s habits of action, we evidently have encountered sophia, excellence in arts.

4.2.2 Composition as musical praxis and semiosis

Threads of inquiry, goals of understanding, and the task of the current study.

This study has been an amalgamation of one primary task of theory construction, two goals of improved understanding, and three intertwined threads of inquiry. The primary task has been the construction of an explanatory hypothesis concerning musical composition process as a semiotic process. Chapter 2.3.1 provided a rough summary of past theories and models of musical composition. It was learned that the main deficiency of past theories lies in their neglect of musical signification and musical semiosis.

Traditional synchronic theories of composition tend to focus on “technical descriptions of musical structure, or pre-compositional formulae” (Tormey 1988, 254),
i.e. on the stylistically correct musical work and its \textit{com-position} while disregarding how the work actually comes into being. Diachronic process theories (relying on sketch analyses, for instance) in turn emphasize the temporal evolution of the work, but fail to give a full account of the role of the subject both as the maker of the work and as the one experiencing the work. As noted in chapter 2.3.1, theories in these two categories embrace the actual object of the process, and while they necessarily more or less include the aspect of poiesis, the aspects of esthesis and praxis tend to be neglected, thus disallowing the explanation of the musical process as a cyclic process of inquiry.

In comparison, psychological theories of musical composition process (e.g. Sloboda 1985; Emmerson 1989; Roozendaal 1993) do consider the interplay between the subject as the maker of the musical work and the musical work as object. However, psychological theories take too little account of how musical meaning emerges and what significance musical processes have. These theories may thoroughly describe the behavior of the composer during the composition process, but what remain unaccounted for are the origin of ideas to be communicated, the criteria of ‘rightness’ in their shaping and reshaping, and, more generally, the emergence of the possibilities to convey meanings in the communication. In other words, although psychological theories of the musical composition process are cyclic, in the sense that the subject is involved in a process of interaction with the environment (as is characteristic of inquiry), the roles of esthesis, praxis and semiosis are not fully considered, from a semiotic viewpoint (cf. chapters 2.3.1–2.3.2). Nevertheless, psychological theories seem capable of providing a good basis on which to develop theories of the composition process further.

Part three described at length how mental processes—whether considered from the cognitive or the semiotic perspective—are spatially embodied, and how meanings emerge by virtue of spatial embodiment. Due to the inseparability of semiosis and spatiality, the task of constructing a semiotic theory of the musical composition process has been a task with a dual goal.

One goal has been an improved understanding of spatiality in semiosis, and, particularly in musical semiosis. In this respect, composition was taken as an epitome of musical processes, since it involves all the key ingredients of musical semiosis: sound as musical object, habits of perceiving, habits of thinking and habits of action (cf. section 2.3).

The other goal has been a bettering understanding of musical semiosis, the process of musical signification. It appears that spatiality (as understood here) is a useful, if not unavoidable conceptual tool for understanding of musical processes and other signifying processes of mind.
Consequently, one of the three threads of inquiry has addressed the problem of semiosis, especially that of musical semiosis, and the role of space in it. As far as semiosis in general is concerned, in part three, the fusion of the pragmatist conception of space (section 3.1) and the semiotic approach to mind (section 3.2) led to a Peircean view of mind, in which spatiality is cast in a major role (section 3.3).

Another thread has deliberated on how we conceive space and spatiality, particularly in the context of music. Part three having addressed spatiality on general terms, section 4.1 gave an account of musical spatiality as a logical intersection of the pragmatist conception of music developed in section 2.2, and the Peircean view of mind as described in part three.

The third thread has been that of musical composition and its process character, including its relation with musical semiosis and with the communicational praxis of music. The previous chapter gave a summary of the pragmatist conception of musical semiosis, the interpreting and understanding of the musical Sign. The remainder of this chapter attempts to embed the view of musical Sign into the view of musical praxis and semiosis. As such, it continues the recapitulation of some of key issues of this study as started in the previous chapter, and concludes the current effort of taking one step towards a fully developed theory of musical semiosis and the musical composition process.

Composition process and the double metaphor.

In this study, music has been considered a signifying process, a special case of semiosis in general, describable as real, communicative, representative, useful, embodied and non-arbitrary (section 2.2). Contemplation on the usefulness of music resulted in references to the play theory of music, or (translating that into a more pragmatist vocabulary) to the idea of music as inquiry and to the Deweyan notion that the meaning of music is its use (chapter 2.2.4). The process of musical composition is considered a continuous sequence of purposeful actions geared towards the production of an entity of sound for us or others to experience (section 2.3). Hence, composition can also be taken semiotically as a process with the intent of producing the Sign for ourselves or for others to interpret as possible situations—as imagined situations of the world. The interpreted situation of sound may result in an experience in the Deweyan sense (chapter 2.2.2), which means that the sound may yield changes in the experiencing the subject’s habits of feeling, habits of thinking, and habits of action. Consequently, by virtue of its abductive logic, music is useful as it may cultivate or enhance organism’s ways of interaction with and adaptation to the environment. Thereby, it may contribute to the survival of the organism or species without the perils of the actual world (chapter 2.2.5).
Although there is always a chance that the end-in-view in the act of expression is different from the actual end or outcome of the action (LW 13.216; chapter 2.2.2), there is reason to assume that an intended, purposeful and designed act of expression, especially when placed in the context of musical or artistic communication, is more likely to be efficient in producing an experience. In other words, composition is indeed a sequence of purposeful actions geared towards producing sound objects that are intended to stand for possible situations of the world, as imagined by the composer, the maker of the sound.

As suggested in chapter 4.1.6, it seems that what makes this musical signification possible is the double metaphor of music. This means that, on the one hand, thought processes in general are spatially embodied, as maintained by the cognitive metaphor theory: literal representations of actual objects serve as a basis for primary metaphors, which in turn are combined for more complex representations (chapter 3.1.2). Hence, abstract and complex domains of thinking are understood by means of simpler and more concrete domains (cf. Lakoff and Johnson 1999). On the other hand, there is the musical metaphor in the sense, that musical situations are correlated with situations of the actual world by virtue of their similarities and mutual isomorphisms as conceptual spaces (cf. Gärdenfors 2000). Hence the proposition in chapter 4.1.6 was that situations in music stand for possible situations of the world by virtue of identities between the conceptual structures pertaining to events. (See chapter 2.2.8 for the concept of situation.)

From this perspective, composition appears as a construction of metaphors—as a praxis of producing and interpreting metaphors of possible situations in the world, by means of sound as the sign vehicle. The construction of a musical metaphor entails shaping and reshaping of features of sound in such ways that the features may be perceived as quality spaces topologically or geometrically identical to and consequently potentially metaphorically associated with other, meaningful quality dimensions and domains. In terms of the ten-fold classification of the Sign, this seems to entail construction, preservation and activation of such rhematic or dicent indexical legisigns that may be associated with other legisigns accumulated in experience (in the transition from the indexical legisigns to symbols, see chapter 4.2.1).

Of the different features of sound potentially contributing to musical metaphor, the verticality of musical pitch was explicated by Cox (1999, chapter 4.1.6) as a cognitive blend of three literal representations of verticalities and seven metaphors, based on primary metaphors such as More Is Higher and States Are Locations. Cox’s work gives an account for the epistemology of pitch space as a conceptual space with (at least) one dimension, that of verticality (see chapter 4.1.4). In this respect, Cox’s account deals with the cognitive metaphor of pitch space, part of the first half of the
double metaphor. Now, as soon as the conceptual space of pitch becomes established (and while it is continuously updated), it may serve as a domain hosting the musical metaphor: as a domain in which a whole variety of cognitive structures are referred to by the pitch (and changes of pitch), in virtue of topological or geometrical identities therebetween. This is the second half of the double metaphor.

While the fusion of the cognitive metaphor theory, the theory of geometry of thought, Peircean semiotics and naturalist pragmatism seems to open a whole new avenue of musical analysis, that endeavor is well outside the scope of this book. However, to catch but an initial glimpse of what such analysis might entail, consider, for instance, the relation between pitch or pitch changes (directed stepwise motion, wholesteps versus halfsteps, steps versus leaps) in figure 35 and metaphors such as States Are Locations, Changes Are Movement, Control Is Up, Moral Is Up – Immoral Is Down, Good Is Up – Bad Is Down, High Status Is Up, Helping Is Raising – Harming Is Lowering, Happy Is Up – Sad Is Down, and, finally, Life Is A Journey (see Lakoff and Johnson 1999, 178–197).

The short, single-part fragment seems to utilize a whole variety of pitch metaphors already in the one-dimensional linear pitch space, e.g. metaphors of state, change, control or lack thereof (at syllables “Not” and “tiefe”), humbleness, morality and help (“ich zu Dir”), goodness and high status (“Dir”). Note, for instance, the positions of “tiefe” as the low earthly (or subterranean) tonic and “Not” as the highest point overseeing and thus having control over other pitches and conflicting with the dominant (with the only halfstep of the passage), “Dir”, i.e. God as the dominating dominant, and the subject “ich” between God and the depth, as mediator, the one between.

The situations in pitch space correspond in many ways to the meaning of the words, and hence the musical setting is logically consistent with the text, based on preliminary metaphor analysis of a single dimension of conceptual spatiality. The words of the chorale melody (or, in this case, the fugue subject) go hand in hand with the suggested narrative in the pitch domain. The lines of thought portrayed in the example in figure 35 easily remind one of the doctrines of affects and figures.
(Affektenlehre, Figurenlehre) of Western Baroque music. While some affinities exist with such doctrines of musical rhetoric, in musical metaphors, as in musical semiotics, it is not simply assumed that there would be, for some reason, an objective, mechanistically predetermined and direct relation between musical idioms (particularly figures of pitch and time) and the evoked feelings, such that the correct idioms and the corresponding feelings could be enumerated and classified. Instead, in applying the cognitive metaphor theory to music and semiosis, we approach the reason or logic of how the relation between a sound idiom and its interpretation by the listener may come into being. And as noted, that is essential for understanding the musical composition process and musical semiosis in general, regardless of the musical genre, style, or culture.

Metaphor and the analytical and compositional praxis.

There seems to be no reason to exclude this kind of metaphor analysis (see figure 35) from the selection of possible analytic tools for any other music or for musical features other than pitch. In fact, metaphor analysis seems a quite promising tool for music analysis, from the current perspective. We should, however, know enough of which features of sound may become meaningful in the musical practice, and how, as well as which general cognitive metaphors are present in the subjects of the culture, even if the cognitive metaphors are inherently spatially embodied. Namely, as noted earlier, any dimension or domain of conceptual sound spaces may potentially contribute to musical signification, and the dynamic construction of a conceptual space is, in the final analysis, a matter of each subject, although the similarities in our semiotic processes do not in any means seem to rule out relative universals. Hence, we are faced with the subjectivity and multidimensionality of conceptual sound spaces in musical praxis.

As far as the dynamic structures of conceptual sound spaces and pitch in monophonic melodies alone is concerned, the praxis of producing musical Sign may entail, beyond the simple linearity of pitch, considerations
1 of using more or less definite versus indefinite pitch;
2 of discrete versus continuous pitch; and
3 of simple versus complex structures of pitch space, such as Révész’s pitch helix or the tone nets of Western tonal music with inherent tonal functionality for each pitch in respect to a tonic or like (chapter 4.1.4).

In addition to a monophonic pitch, an isolated conceptual sound object may of course consist in more or less complex time-varying domains of harmony (in two or more parts), volume, timbre, as well domains of location, distance and ambience (as perceived). But as long as these considerations deal with the production
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of sound alone, with no regard to how the sound may be experienced or what kind of conceivable effects the sound may have, all these considerations are, in fact, considerations of musical poiesis, of making or manufacturing the sound, subordinated to musical praxis. That is, in terms of habits of action, they are considerations of musical techne subordinated to musical phronesis (see the discussion on technique and expression in chapter 1.3.1).

As noted in chapter 2.2.2, musical praxis as communication (versus autocommunication) requires the ability, the intellectual virtue of estimating, imagining, and simulating patterns of perception and action of others. This, in turn, seems effectively possible only if the composer herself has first developed musical competence which enables her to experience the perceived or imagined sound. Only then can composer begin to successfully hypothesize how others may experience the sound. Clearly, this ability of musical phronesis develops in the semiotic process of interaction, i.e. in the cyclic process of inquiry involving object, perception, thought and action in which the sound, the ways of producing it, and the ways of experiencing it are constantly adjusted—in musical praxis (section 2.4).

The crux of this feedback loop of shaping and reshaping is what Roozendaal (1993) meant by the notion of “editing”, what Emmerson (1989) described as “TEST procedure”, and what Sloboda (1985) described as “judgment”, “goal alteration”, and “detailed working-out” (see chapter 2.3.2). Hence this takes us back to the critique directed at the psychological theories of composition: from where do the initial ideas emanate, and whence the criteria for “rightness”? Emmerson’s (1989, 136) solution was: “It doesn’t matter”, which may well suffice for a practitioner of composition. But in order to understand the process more thoroughly, further considerations are necessary.

The notion of musical metaphor suggests a solution to the problem of initial idea and its emanation. Namely, the initial idea for musical composition can be understood as a basic metaphor from which the construction, shaping and reshaping of metaphors commences. An initial metaphor is here understood as a meaningful cognitive structure—a Sign—yet often merely gestural, inarticulate, wanting in its manifestation in perceptual qualities of sound, and possible even lacking its temporal magnitude (as in terms of becoming a micro-, intermediate or macrolevel event in the musical narrative). The initial metaphor may be pregnant with significance in many levels at the same time, potentially referring to abstract constructs, representing complex situations, but at the same time being embodied in the primary metaphors, and even literal representations of the actual objects. The suggestion is, that the initial idea may be an instance in any conceptual space, any literal representation or any metaphor of the subject’s accumulated collection of experiences, each tied to
the continuum spanning from the literal representations of the actual world to the primary metaphors and the complex metaphors, that among other things constitute the subject’s conception of herself.

Hence, the emergence of an initial idea is no miracle, since the composer is constantly involved with the process of inquiry, in that the composer’s subject exists by virtue of the interaction with the environment. Even if the composition process starts off with, say, toying with actual, sounding pitches, and—as stupid as it might initially seem—a pattern of three pitches falling (as in *Three Blind Mice*) becomes selected for further labor, the selected initial motif is pregnant with all the potential uses of the metaphors of falling (in this case) from the simplest to the most complex ones in the subject’s accumulated experience by virtue of sharing topological similarity with other conceptual spaces, i.e. by virtue of metaphors. (In this respect the initial idea is like a Qualisign.) Even if the “inspiration” stems from some visual, tactile or perchance gustatory sensation—even then the transition to working with sound is logical, by virtue of the topological or other similarities between the conceptual spaces of the “non-musical” source of inspiration and the sound. That is, musical “inspiration” seems to operate by virtue of metaphors. (Cf. Matte Blanco’s 1975 notion of symmetrical logic; chapter 2.2.6.)

This diminishes or dissolves the problem of emanation of the initial idea but augments the problem of whence the criteria for ‘rightness’, and moves the focus from the ephemeral notions of *Einfall* and inspiration to significance and semiosis (which hopefully are less ephemeral, at least by now). In fact, it may be altogether unnecessary to speak of an “initial structure”, “initial idea” or “initial metaphor”, since the sieving and selecting initial metaphors or initial ideas may be so internalized, or rather, so inherent in and saturated with composer’s being-in-the-world, that it cannot be distinguished from the composer’s everyday practical inquiry (cf. chapter 2.2.8). (And in this respect composers hardly differ greatly from non-composers.) Instead, the defining characteristic of the composition process may be the composer’s ability to foster the affording initial ideas into more mature forms of musical communication. But how does one then know when the initial, intermediate or close-to-final situations of conceptual sound objects sound ‘right’, i.e. how do the everchanging conceptual structures change when they settle the irritating doubt of the maturing virtual situations satisfactorily?

Two solutions to the problem of ‘rightness’ criteria.

The discussion on the communicational character of music in chapter 2.2.2 seems to offer two solutions, depending on whether the composition process yields an experience or not, that is, whether the process is *artistic* or not. Chapter 2.2.2 con-
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cluded, that the artistic in music might well be identified with a successful combination of techne, phronesis, and sophia, but that sophia might not be a necessary condition for the operational process of musical composition. To remind, for Aristotle, sophia meant both excellence in art and the knowledge concerning perennial questions of life in general, e.g., akin to personality and world view. In answering the questions of good and bad, phronesis is governed by sophia (see chapters 2.2.2 and 1.3.4), but sophia can be actually manifested only through praxis and poiesis, through the manipulation of actual objects. Being concerned with perennial questions of life, sophia is not similarly directly connected to the practical exigencies of life or hard facts of the actual world. Dewey made the progressive requirement for art more explicit in maintaining that artistic experience is meaningful as it makes the “human intercourse more rich and gracious” (LW 10:69, chapter 2.2.5). Hence, the artistic criteria of ‘rightness’ come from sophia, the subject’s knowledge concerning perennial questions of life. In contrast, the stylistic criteria of ‘rightness’ come from phronesis (and techne), either being subordinate to sophia and the artistic criteria, or not being guided by sophia.

If the stylistic criteria are not guided by sophia, the process of shaping and reshaping merely adheres to an established, existing style, existing habits of perceiving (esthesis), existing habits of producing sound (poiesis), and, hence, to existing habits of action that has the goal of effecting the listener (praxis). The sound is interpreted, i.e., associated with other experiences in a habitual way, which, when revealed as communicational situation, may be experienced as familiar and secure, but also as redundant and decadent. The habitual way of interpretation means that the composer has established habits of perception and interpretation (as any member of the audience) as well as purely poietic habits of action of producing sound that becomes perceived and interpreted fitting to the habits pertaining to the style. In other words, the composer has become acculturated to the musical style. Hence, we are here faced with criteria that conserve styles, or rather: conserve the subject’s habits and social traditions. The habits and traditions provide continuity necessary for coherent semiosis, but their inertia is countered by the force of the hard facts and everchanging situations of the world.

When the stylistic criteria are subordinate to artistic criteria, that means that they are guided by sophia, the subject’s knowledge concerning perennial questions of life. This enables the testing and decision making or judgment of the initial and intermediate forms of sound objects to head for directions in which the sound is experienced in ways that renew, repair, refresh, and reconstruct the habits of perception, interpretation and action when the sound is being shaped and reshaped in the cyclic process of composition. Hence, here we meet with criteria that strive for creativity
and progression (should one wish to use such terms), either from individual subject’s or the surrounding cultural community’s point of view (cf. chapter 2.2.7).

As far as it holds, that situations in music stand for possible situations of the world by virtue of identities between the conceptual structures pertaining to events in different features of sound and different features of the world (chapter 4.1.6), in making judgments on sound, an artistic composer works towards artistic expression, i.e. in such ways that the interpretation of the sound may yield an experience in Dewey’s sense, in other words so that the sound may change the interpreter’s habits of feeling, action and thinking. When the composer shapes and reshapes (possibly jointly with communities of interest, as Emmerson 1989 suggested), she is (together with each member of the community) a listener, a member of the audience and an interpreter herself, potentially experiencing the changing of the habits (chapter 2.2.3). By virtue of the musical metaphor, these changes of habits pertain not only to sound but to actual world in general, and may hence contribute to composer’s and other subjects’ habits of feeling, thinking, and action in general. Consequently, the changes in habits may also reflect and respond to changes in the constant flux of the subject’s being-in-the-world.

In comparison, a non-artistic composer acts only to satisfy the criteria set in the established style with no specific guidance from her knowledge concerning perennial questions of life. Assuming that others, the potential members of the audience, are similarly encultured in the style, by fulfilling only the stylistic criteria, the composer serves the needs of maintaining and conserving the habits, but by excluding sophia, the process lacks in providing an experience and in contributing to the adaptation to changing situations of the world.

**Composition and musical semiosis.**

Finally, to put all this more tightly in semiotic terminology (and recalling the close alliance of the cognitive metaphors and the spatial embodiment of Signs in general and musical Signs, in particular): In terms of the ten-fold classification of the Sign, in both solutions, the criteria seem to emerge in the domain of musical space, in the symbolic legisigns, in which the “complete complex result” that is characteristic of the “feeling-like subjective experience” in music is formed. The difference between the two solutions lies in whether or not the symbolic legisigns change in the process for the benefit of the subject’s adaptation to the world.

If the criteria are such, that they merely follow existing stylistic habits, the legisigns remain intact and unaltered (and reinforced). (The existing stylistic habits, of course, must have been first established by some subject or subjects.) In such cases, the indexical sinsigns (the Rhematic and the Dicent Indexical Sinsign) do not alter
the corresponding indexical legisigns in their dynamic interplay (of sinsigns as particular instances and legisigns as general types; chapter 4.2.1). Consequently, what remain intact as well, in this respect, are the symbolic legisigns, in which the indexical legisigns are associated with pertinent legisigns of other accumulated experience (by virtue of e.g. topological similarity as in metaphors, or possibly also due to arbitrary relations such as synchronous occurrence as in classical Pavlovian conditioning). While the sound does signify in the sense that it stands for something by virtue of becoming interpreted by symbolic associations to accumulated experience, it in this case produces no change in the legisigns, which means that the subject’s habits of feeling, thinking and action remain intact. Hence, the sound is unable of yielding an experience but functions as a tool of conservation of habits, even regression. Namely, at the same time, the subject’s other, non-musical experiences of the actual world do push for changes in the legisigns (since the actual world hardly remains the same for the subject-organism, herself included in it). To give a simple yet general example, a very familiar song, sung as it always has been sung (or remembered as such), be it a lullaby, a children’s song, a football club anthem or a patriotic song, or the like, solidifies the established associations, strengthens the old habits of feeling, thinking and action and defies the forceful, possibly threatening changes in the subjects life thus providing safety, empowering and giving trust to continuity, by virtue of not changing the legisigns and by reconfirming the categories and prototypes of conceptual spaces. The less changes, the more stable conceptual spaces of the subject.

Conversely, an experience results, if the criteria of shaping and reshaping the sound are such that when the sound is perceived and interpreted, the Rhematic and Dicent Indexical Legisigns are altered in their interplay with the corresponding, particular sinsigns, which instantiate the representation of the sound. Consequently, the corresponding symbolic legisigns (the Rhematic and Dicent Symbols) are changed since the indexical legisigns become associated differently in the accumulated experience. A new point redefines the structure of the space, and becomes itself reciprocally defined by its position in space, i.e., through its relation to other points. Hence, the subject’s habits of feeling, thinking and action are not the same they used to be. Consequently, the subjects changed habits may be better adjusted for the changes in the subject’s being-in-the-world in general. And hence, the musical sound has meaning.

Whether the change (or lack thereof) posed by the perception of sound seems to be for the better or for the worse for the subject, is perhaps not really a problem as far as the praxis of musical composition and musical semiosis are concerned (although it indeed a central issue of musical taste), and as long as the communicative character of the process is revealed to the subject.
This revelation takes place in the Argument (see chapters 3.3.2, 3.3.3 and 4.2.1). In such a revelation, the subject realizes (by virtue of her experienced position in the context) that the situation is not merely an actual situation of everyday life, but a make-believe situation, a sound-based virtual reality, in which the subject may identify herself as a more or less agent or patient and work on situations potentially encountered in life. In other words, this way the subject may intentionally use music as a safe testing ground for real-life and virtual (possible and perhaps even impossible) situations in order to better adapt to the situations of the actual world (cf. chapter 2.2.4). Even if the communicational character of the process is not fully (consciously) realized, the subject’s experience of the situation, which is equal to the changes in the symbolic legisigns, either repels or attracts the activity of encountering similar situations. Consequently, the listeners are attracted to or repelled from contexts of different musical styles depending on the usefulness of the musics. And the ability of the composer to find ways of evoking experiences that attract listeners towards encountering similar situations seems to be the composer’s imagination—the ability estimate future situations and thereby to create imagined states of affairs, which may or may not be experienced and found useful and rewarding by others (see chapter 1.3.4 and opening of section 2.3).

Hence it seems, that in any case, by virtue of the musical Sign and the double metaphor of music, the composer is more or less capable of effecting the audience—herself included—by producing changes in the symbolic legisigns, by composing sounds, features of sounds and groups of sound, which become represented first by the iconic sinsigns, indexical sinsigns and their counterparts of iconic and indexical legisigns, and which then result in changes of interpreting subjects’ habits of action. Hence, based on pragmatist maxim, the meaning in music and the meaning of music is in the habits of action music ensues (cf. chapter 1.3.2).51

4.3 Summary of the inferred proposition: space and metaphor in musical thought

The first part of this book outlined the framework of naturalist pragmatism. Within that framework, the second, third and now the fourth part have constituted the main structure of this book, in the form of a syllogism. The fourth part

51 See also the notion of logical Interpretant in chapter 3.3.1. Since the logical Interpretant is a habit, the changes in logical Interpretant are habit-changes, “meaning by a habit-change a modification of a person’s tendencies toward action, resulting from previous experiences or from previous exertions of his will or acts, or from a complexus of both kinds of cause” (CP 5.476). This is also in concord with Peirce’s belief that “[t]he whole function of thought is to produce habits of action.” (CP 5.400).
has presented the conclusion of the syllogism, inferred from the minor and major premisses: music and musical composition process are spatially embodied.

Section 4.1 focussed on musical spatiality, first (in chapter 4.1.1) by reviewing some earlier, relevant studies on musical spatiality and metaphor in music (such as Lippman 1952; McDermott 1966; Harley 1994a; and Cox 1999). Subsequently, some of the main issues of musical spatiality were discussed in closer detail. The discussion on the relation of actual and phenomenal spatiality in music (chapter 4.1.2), sketched out the acousmatic dilemma, the dilemma of how perception of sound in a musical context, unlike perception of sound in everyday practical inquiry, may become detached from the actual spatiality. Also, the issues of objectification and spatialization were described. An answer to the acousmatic dilemma was then suggested in chapter 4.1.3, in conjunction with an analysis of the traditional quest for autonomous, intrinsic musical space, as exemplified by Lippman (1952), Kurth (1947/1931) and Wellek (1963/1934).

Chapter 4.1.4 gave an analysis of some of the key issues pertaining to the structuring of conceptual sound spaces, such as dimensionality and the role of pitch space as an epitomic domain of conceptual sound spaces. The relativist conception of spatiality was applied to music, and the spatiality of conceptual sound spaces and sound objects was regarded as thoroughly relativist, yet embodied in the actual spatiality of the world. The spatial structures in musical thinking emerge as dynamic conceptual spaces, construction of which is based on instances of sound objects, features of sound objects and groups of sound objects. Consequently, by being relative and flexible, sound objects afford ways of standing for other situations experienced or potentially experienced by the interpreting subject. This is enabled by the cognitive metaphor, which “expresses an identity in topological or geometrical structure between different domains”, as Gärdenfors (2000, 176) defined it. Hence the notion of composition process as a process of shaping and reshaping sound objects for ourselves or others to experience is not totally unlike the Hanslickian notion of music as “tönend bewegte Formen”. That holds as far as the shapes, configuration and situations resulting from the complexes of conceptual sound objects are considered dynamic and subjective albeit spatially embodied, as opposed to canonically given, fixed constructions, and as far as conceptual spatiality in music is logically founded in the subject’s being in the world (chapter 4.1.4).

Chapter 4.1.5 touched the topics of space and time in music, and related issues, such as stasis and motion. It was argued, that instead of contrasting space against time in music, a relativist conception of an integral musical spacetime seems more fruitful. In the relativist conception, musical time is a result of the changes perceived and a means for relating events to each other, not unlike the reciprocal relation
between musical space and musical sound objects, atemporally considered. The relative changes of and in objects constitute the configurations which we experience in their contexts, by virtue of our habits. Hence, although temporality seems omnipresent in music, the notion of musical time “seems to fit in (and generalize) the conception of musical spatiality” (chapter 4.1.5). The chapter finished with correlating the present view of musical spacetime with that of Charles Seeger (1977).

The last chapter of the first section in the fourth part (chapter 4.1.6) examined musical spatiality from the perspective of morphological theories of cognition, together with the pragmatist conceptions of semiosis, space and music. The spatiality of pitch, an epitomic element of musical sound, was examined in the light of the cognitive metaphor theory. In this, Cox’s work (1999) provided a good basis by explicating the epistemology of pitch space through literal and metaphoric embodiment. Yet, Cox’s account for music epistemology limits itself to the (one-dimensional) ‘verticality’ of pitch space and the (likewise one-dimensional) ‘horizontal’ dimension of time. The current stance is more radical in inferring, that “there is always a possibility that any conceptual space representing a feature of a musical event is or becomes identical with a conceptual space representing an event in general” (chapter 4.1.6). Hence different situations in music may stand for situations that are represented in like manner, i.e. for situations with structural similarities as conceptual spaces. At the same time, the musical context does not pose the subject to the perils of the actual life. Hence, music provides a safe testing ground for real-life and virtual situations and enhances the possibilities of adapting to the actuality and its hard facts, now or in the future. In terms of the cognitive metaphor theory, this means that by virtue of the flexibility of sound, the various Event-Structure Metaphors can be employed for the benefit of the musical “testing ground”. The discussion on the relation of Event-Structure Metaphors (Lakoff and Johnson 1999) versus musical spatiality and sound objects concluded the first section of the fourth part.

Concluding the syllogism of the book, section 4.2 examined how musical spatiality fits the Peircean view of semiosis and what spatial embodiment entails in terms of musical semiosis. Chapter 4.2.1 centered on the musical Sign, in applying the Peircean view of the mind and the ten-fold division of the Sign (chapters 3.3.2 and 3.3.3) in music. The ten-fold division of thought-signs, its six transitions, and their relation to the cognitive metaphor theory were find applicable to music as well. This is no surprise since musical semiosis has been considered a subset of semiosis in general. Concomitantly, the tripartition of spaces in musical hearing, that appears and reappears in the quest for intrinsic musical space (chapters 4.1.3 and 4.1.4), seems to match quite well the tripartition of the Sign in relation to its Object, i.e. the tripartition between icons, indices, and symbols in signification. Other matches are
Music is spatially embodied

possible. A more neurally-inspired approach might focus on sinsigns and legisigns (and qualisigns as well), while a more hermeneutic approach to musical meaning could emphasize the changes from rhemes to dicents and arguments.

In chapter 4.2.2, then, an attempt was made to embed the understanding of musical Sign into the view of musical processes as processes of signification and action, i.e. as semiosis and praxis. This meant closing in on the main objective of this study, the musical composition process as the epitome of signifying processes in music, and recapitulating key topics addressed in the study earlier. The psychological theories of musical composition were criticized for their lack of explications of the origin of ideas and of criteria of ‘rightness’ in shaping and reshaping of sound. These are essentially issues of musical signification and hence matters of musical semiotics. Chapter 4.2.2 elaborated the idea first introduced in chapter 4.1.6, that what makes musical signification possible is the double metaphor in music. This means that, on the one hand, thought processes in general are spatially embodied, as maintained by the cognitive metaphor theories. On the other hand, the idea of musical metaphor maintains, that musical situations are correlated with experienced or imagined situations of the world by virtue of their similarities and mutual isomorphisms as conceptual spaces. Hence, situations in music may stand for possible situations of the world by virtue of identities between the conceptual structures pertaining to events in different features of sound and different features of the world.

Consequently, the process of musical composition appears as a process of constructing metaphors—as praxis of shaping and reshaping different features of sound, representable as different quality dimensions and possibly categorized, complex domains. Since, in principle, any instance of any conceptual space, whether metaphorical or literal, may be chosen for elaboration in this sense, this view puts little weight on the emergence of an initial idea, or the problem of inspiration, the Einfall. However, a distinction was made, both in pragmatist and more technical semiotic vocabulary, according to whether the criteria for ‘rightness’ are artistic or not. In the latter case the composer’s habits of action merely follow established conventions. This suggests, that a demarcation may be made between artistic and non-artistic depending on whether the practical bearings of the renewal or conservation of habits of feeling, thinking and action, by virtue of artistic communication, are good or bad for the experiencing subject and for the subject’s community (cf. chapter 2.2.7). In this sense, music is here considered to have such effects on us, that their conceivable practical bearings helps us to reorganize our habits of feeling, habits of thinking and habits of action. These habits, in turn, constitute our existence as subjects and our being as living organisms in the actual world. And this is what this study has been about: musical signification.
5 Conclusions

It is time for this book to draw to an end. At this point, it has hopefully become evident that a combination of Peircean semiotics and naturalist pragmatism, along with morphological approaches to cognition, may well serve as a basis for understanding music, and also for understanding semiotic processes in general. It seems both possible and worthwhile to address a whole variety of issues central to musicological inquiry in the framework of Peircean naturalist pragmatism. Among these issues are those of musical practices and the composition process, musical style and culture, esthetics of musics, and the relation of music and verbal language. This book has presented a theory of the musical composition process, considered here an epitome of musical semiosis.

Naturally, many questions of musical semiosis and musical composition process remain unclear and require further study. Some issues pertain to the study of music within the framework. What are the exact mechanisms, in different musics, by virtue of which musical meaning is formed, and how do these relate to the sign-producing subject and sign-interpreting subject and their life-worlds? How can various social aspects of music, and social musics (sacred music, popular music, ritual music, media music etc.) be interpreted in terms of the present framework? In this approach, what are the roles of certain entities that are present in the practical music life, such as musical work, musical performance and performer, existing sound versus various representations thereof? If the theory is completed, how can it be tested? And finally, how can it be revised or replaced, if necessary?

Other issues are issues of developing the framework of naturalist pragmatism itself. For instance, if actual objects, signs and hence other subjects, too, are included in the functional organization of mind, what does it mean to talk about subjects in various cultural and subcultural settings? What new elements or revisions of old elements might further excavations into Peirce’s writing bring into the framework? What recent and future findings in psychology, cognitive sciences, neuropsychology, or other mind sciences might further corroborate or contradict the framework?

On these matters, the previous parts have stated the propositions “into which the economy of endeavor prescribes that, for the time being, further inquiry shall cease”, as Peirce put it (CP 5.589). This fifth part finishes off with a retrospect at the study (section 5.1) and with a prospect of possible avenues for continuing this work in the future (section 5.2).
5.1 The study in retrospect

Elements of the study.

This has been a Peircean study of musical semiosis, musical composition process, and musical spatiality. It has also been a study of the very concept of music, as well as spatiality and semiosis in general. It has been a lengthy study, which might be partly excused due to the magnitude and character of the issues at hand.¹

At the same time, the traits of encyclopedic and loquacious, at times even periphrastic literary style have been a deliberate feature of the Peircean approach. Other such features contributing to the Peircean approach of this study include:

1. the role of pragmatism and especially Peirce’s *pragmaticism* (with Aristotle as a predecessor and Dewey as a successor of Peirce in this respect)
2. the role of Peirce’s phenomenology and his doctrine of *phaneroscopic categories* (as thoroughgoing ideas of the subject’s and thought’s organization)
3. the role of Peirce’s theory of the Sign and his *semeiotic* (albeit *not* having an orthodox, hermeneutic interpretation of Peirce’s semiotics as a goal)
4. the *syllogistic* structure of the book (syllogisms being but a facet of Peirce’s work on logic and syllogisms not being limited to Peirce’s work, by far)
5. the compliance with Peirce’s *classification of the sciences* (in the sense that semeiotic builds on e.g. phenomenology, esthetics and practics, while serving as a foundation for musicology and other special sciences)

Adding to Peirce, other main elements have been provided, on the one hand, by *the morphological turn of the mind sciences*, and, on the other hand, by *the pragmatist conception of music* stemming from the Western contemporary tradition of musicology. The former is typified by the *cognitive metaphor theory*, expressed both by Peter Gärdenfors and by George Lakoff and Mark Johnson and their colleagues. The morphological turn has been of paramount importance in relating Peirce to contemporary thinking, and in enabling the attempted concordance between the phenomenological, semiotic, cognitive and musicological. I feel this fusion of ideas would not have been possible in the past paradigms, neither on behalf of semiotics nor cognitive sciences.

An acute conception of music is, of course, necessary in musicological inquiry. In this work, the conception of music has stemmed from my own accumulated experience as a performing musician, composer, educator and as a member of the audience.

¹ For instance, Wellek described the issue of musical spatiality as “one of the most complex problems in music psychology” (Wellek 1963/1934, 81; Wellek’s original: “Das hiermit angedeutete musikalische Raumproblem ist eines der komplexesten Probleme der Musikpsychologie”).
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While it is impossible (here by definition) to step outside one’s own experience, an effort of broadening the unavoidably limited subjective perspective has been made by taking account of, and perhaps taking advantage of certain views of representatives from cognitive musicology (e.g. Kaipainen and Leman), ethnomusicology, music anthropology or music ethnology (e.g. Blacking, Merriam, Padilla, and Tagg), as well as existential musical semiotics (e.g. Tarasti) and psychoanalytic musicology (e.g. Välimäki). Annexing to this eclecticism, the Deweyan theory of art tries to overcome the insufficiencies in Peirce’s treatment of music and the arts.

Abductive inference and the method of inquiry.

Inquiry has its methods. In scientific and philosophical inquiry they ought to be explicitly utterable. This work embarked for an inquiry that connects with traditions of both musicology and semiotics, that is, both idioscopy of music and logic as a branch of philosophy, according to Peirce’s classification. From the standpoint of logic and logical inference, this study is best described as abductive, despite the book structure of a syllogism in the mood of Barbara (cf. Introduction). According to Peirce (CP 2.270),

> [a]n Abduction is a method of forming a general prediction without any positive assurance that it will succeed either in the special case or usually, its justification being that it is the only possible hope of regulating our future conduct rationally, and that Induction from past experience gives us strong encouragement to hope that it will be successful in the future.

The result of the syllogism presented in the fourth part (“Music and musical composition process are spatially embodied”) necessarily follows from the application of the rule in the third part (“Mental processes are spatially embodied”) to the case of the syllogism in the second part (“Music and musical composition process are mental processes”). While this is “application of general rules to particular cases”, and thereby deductive inference (CP 2.620), the deduction only holds if the premises hold. From that perspective, the validity of the study is tied especially to the validity of the premises, i.e. to the conception of music examined in part two and the Peircean view of mind sketched in part three.

The premises, and consequently the result as well, constitute a hypothesis—or rather, a set of working hypotheses, which “we may not believe to be altogether true, but which is useful in enabling us to conceive of what takes place” (CP 7.534). The goal here has not been the testing of an existing hypothesis. This research process has been a “process of forming an explanatory hypothesis”, which, for Peirce, is abduction (CP 5.171, see also Burks 1946).

Committing to an abductive method of inference in a research process is risky in comparison to the inductive and deductive methods. As stated by Peirce (idem),
“Deduction proves something must be; Induction shows that something actually is operative; Abduction merely suggests that something may be.” Yet, abduction is justified because “[i]t is the only logical operation which introduces any new idea; for induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis” (idem). Consequently, future research may choose to test the hypothesis and the problems or conjectures asserted (cf. CP 5.188, and section 5.2). (See Introduction and opening of part one.)

A certain amount of guess-work is unavoidably included in abduction (CP 7.219), but careful construction of hypothesis is not a matter of wild guesses. A hypothesis of importance is called a theory, and successful theories are guided by reasons (CP 2.638). This work carries the title of a theory, perhaps boldly. Yet, calling the current construction a theory seems also justified, since attempts have been made to “explain all the related facts”, relying on truthfulness of the non-Peircean elements (see above) as “the principal testimonies”. Furthermore, the grand hypothesis—or theory—attempts to explain a large field of facts, and was therefore divided into items, each hopefully based on high probability. (CP 7.225-230; cf. opening of part one.). To be more precise, a great deal of the related facts concerning the musical composition process have, of course, already been explicated in the psychological theories of composition or other theories. This theory adds to the lot by focusing on the semiotic aspects of musical composition process and on musical spatiality as the means of semiosis.

This has been a theoretical work, in the sense of not involving direct observations of live or simulated situations, interviews, analyses of musical sound, or other empiria of musical practices. Consequently, there has been no concern as to the empirical methodology employed. Should there be need, the method employed in this study, might be described as

1 *philosophical*, since philosophy is “an investigating theoretical science which inquires what is the fact, ...[but] which makes no observations but contents itself with so much of experience as pours in upon every man during every hour of his waking life” (CP 5.13p1);

2 *pragmatist and pragmaticist*, since “[p]ragmatism is a method in philosophy”, “a method of reflexion having for its purpose to render ideas clear”, and the study is permeated by pragmatism and especially its original, Peircean flavor (idem, see also CP 5.8);

3 *semiotic*, not only because the subject matter has been thought-signs and signification (especially in music and musical composition process), but because the means of approaching the subject matter have been those of logical, a.k.a.
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... semiotic analysis and construction (in terms of inferring the ten-fold classification of signs from the three phaneroscopic categories, for instance); and finally, and perhaps also more accurately,

4. *a practical elaboration of pragmatism* “into a method in aid of philosophic inquiry game” (CP 5.12), since the current approach is not a hermeneutic endeavor of understanding Peirce, but an adaptation to the present context and purpose.

While the pramaticist methodology might have been perhaps more explicit and more attainable in order to ease the reader’s task, attempts have nevertheless been made to connect the study with traditional philosophical methods: Aristotelian wondering and Cartesian systematic doubt, formulation of problems and arguing for proposed solutions to the problems, advised by the histories of pertinent ideas, as well as participating in the dialectic criticism both during the process in conferences and symposia as well as by publishing these ideas now for an open discussion within the community of interest.

At the same time, the musical subject matter renders the study idioscopic, i.e. as belonging to special sciences and not only to semiotics and philosophy. To paraphrase Peirce, this work “is of the nature of a Working Hypothesis for use in appropriate branches of experiential inquiry in musicology. Unmistakable consequences can be deduced from it, whose truth is not yet known but can be ascertained by observation, so as to put the theory to the test. It is thus at once a philosophy and a scientific explanation of observed facts of music and musical composition process” (CP 8 Bibliography General, Widener VA2).2

Matters of critique.

Scientific and philosophical works are subject to critique—as are works of art as well. Studies such as this, where the actuality of everyday empiria is backgrounded or distanced, attention is drawn to the means of logic and methods of verbal argumentation. Without going to the issue of how accurate or inaccurate verbal descriptions of music and musical processes may be (see e.g. Seeger 1977, 16–50), one of the potential perils in this kind of work is in how consistent and unambiguous the core terminology is, and how logically it is used. As Lippman observed, “[t]here is a particular danger in the use of such general terms as ‘space’”, since we may end up forgetting the “taken-over character” of terms of one field that compensate for the lack of an adequate concept of another (Lippman 1952, 127, 123).

2 In a sense, this study has been a semiotic meta-analysis of musicologists’ utterances about the concept of music, musical spatiality and musical meaning, employing a Peircean arsenal of methods of inquiry.
The vast pastures of spatial, semiotic, pragmatist, and cognitive terminology may give good reasons to use Occam’s razor, but for initial studies plowing the cross-disciplinary fields a certain amount of redundancy might even be advantageous, if only abstrusity and confusion are avoided. The complexity of the issues at hand and the scope of the study necessitated the inclusion of introductory and recapitulatory chapters and paragraphs, and the outlines of the main developments in the thinking of key issues (e.g. the concepts of space and music). Certain redundancy also seemed to promote the internal coherence of the book, repetition being the mother of learning. Glances at the histories of key issues seemed to be needed in order to argue against some of the apparently prevailing misconceptions and to argue for the current pragmatist theory. While such inclusions are intended to ease the orientation in and through the book, they may also add to the strain of the reading experience. I hope the strain has not gone beyond what can be expected of efforts striving for fulfilling the necessary demands of academic thoroughness.

Amidst the deliberations, there is very little music (cf. Cox 1999, 11). Due to the scope of the book, available resources, and for the sake of focus, things had to be prioritized. In this context it has been neither possible nor perhaps reasoned, to go to detailed analysis of how spatiality operates in the semiosis of this or that particular musical work, style, tradition or culture. Although a greater amount of specific, practical examples surely would not have been injurious to the goals, they would have added to the scope of both the book and the underlying analytical work. The practicalities of inquiry necessitated the division of labor. Here, the interest has been to understand how music and musical composition process operate and how the logic of musical space works, which has necessarily led to the problems of the logic of metaphoric thought in general (cf. Cox 1999, 254). I hope future research shall follow this effort with efforts of testing the theory presented, and expose the relations between the current theory and the multitude of musical practices.

The selection of the sources for both Peirce and other writers is also subject to scrutiny. As far as the musicological sources or materials are concerned, those supporting the pragmatist conception of music vary between traditional major works of ethnomusicology (or music anthropology, e.g. Merriam 1980/1964 and Blacking 1977/1973) and relatively new works of cognitive musicology (e.g. Kaipainen 1994) and musical semiotics (e.g. Tarasti 1998b). While it is clearly impossible to encompass and consolidate the plurality of conceptions of music across the wide field of musicology, the selection hopefully succeeds in grasping a sufficient variety of conceptions of music within the experts of the field while not altogether neglecting the challenges posed by the multitude of approaches. Similarly, the main sources of the morphological turn of the mind (Gärdenfors 2000 and Lakoff and Johnson...
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1999), should suffice in delivering the relevant aspects of the current understanding of the role of metaphor in cognition.

For Peirce, the main source has been the Collected Papers (CP), with some additional reference material being the Essential Peirce (EP1 and EP2) and some secondary sources. Unfortunately the important volumes of the Chronological Edition have not been available in the writing of this, nor the Harvard microfilm edition, let alone the original Peirce manuscripts. Consequently, due to the economy of inquiry, one has done with the sources available. While the approach to Peirce’s texts has been—lacking a more accurate word—pragmatic, perhaps even eclectic, I hope not too much violence has been exerted to distort the pragmatist ideas.3

The current study is thoroughly Peircean. Other frameworks or approaches to music and musical composition process might have been possible. Such alternative approaches might yield similar or different theoretical structures, but the selected one has been rewarding, in my opinion. For the current purposes, the Peircean approach seems to have been suitable by providing a logically solid, holistic framework for the construction of the theory of musical composition process and for questions of musical semiosis.

Studies that combine Peircean semiotics with insight from cognitive sciences in order to understand musical signification have been published recently (e.g. Cumming 2000; Tiits 2002; Windsor 2004; Clarke 2005; Reybrouck 2006; 2005; and López Cano 2006, 2004; see chapter 2.3.1).

The current work has not extensively capitalized on such studies. This is not because the other studies would somehow be irrelevant or would need to be dismissed for other reasons. On the contrary, cognitively aware semiotic studies of music, such as those just mentioned, appear to provide a healthy and exhilarating realm for future work (see section 5.2), since in many respects, the current work seems to be quite well in concord with them, while they do display different approaches to the key issue of musical signification (e.g. Cumming 2000 with an emphasis on musical performance and performer’s subjectivity, Tiits 2002 with a model of emergent signification by means of self-organizing feature maps, or López Cano 2004 with an approach incorporating various traditions of cognitive science and semiotics: Neisser, Maturana and Varela, and also Lakoff and Johnson; Uexküll, de Saussure, Eco, and relevant representatives of musical semiotics). The goal with the current work was to start with a clean slate, and by delving to the core of pragmatist and semiotic literature (Peirce), musicology (utterances of the conceptions of music, composition

3 At the time of writing this, six volumes out of the projected 30 ones of Writings of Charles S. Peirce. A Chronological Edition have been published. The published volumes span the years 1857–1890 of Peirce’s output. A great deal of Peirce’s writings apparently useful in this context dates from the first decade of the 20th century.
theories, theories of musical spatiality) and cognitive metaphor theory (Gärdenfors together with Lakoff and Johnson) to avoid distractions due to the abundance of literature and to construct one possible theory of musical signification, considering the composition process the epitome of musical semiosis.

Potential contribution to semiotic and musicological inquiry.

Whether this work will make a contribution to the fields of musicology, semiotics, and musical semiotics, despite its deficiencies, remains to be seen. As far as the inquiry on music and musical composition process are concerned, the study may illuminate the musical processes from the standpoint of musical meaning and serve as a set of hypotheses for quite a range of research topics on musical composition and musical communication (see section 5.2).

As a theory it includes explications of how music means, and how meanings may be communicated in music by means of sound. With musical sign and musical signification as its subject matters, the current work attacks the core problem of musical semiotics.

As an attempt to understand musical semiosis and the signifying mechanisms and laws, the current theory does strive for (relative) universals in music. It does not attempt to describe (or prescribe) particular musics or differences between musics, but shares Cox’s view that (1999, 261)

[w]e are able to understand one another’s personal experience and interpretation not because we share objective facts about the music-itself, but because we share a similar hominid embodiment, a similar environment, a more or less similar culture, and similar metaphoric reasoning processes.

In this naturalist sense, the contribution of the present work to musical semiotics is to continue “to account for the logic in the construction of musical signs” (Cox 1999, 260).

According to the proposed theory, the spatial embodiment of semiosis and metaphors account for the logic in the construction of musical signs and the logic of musical signification. The formation of the pragmatist conception of musical spatiality, essential to the theory, has necessitated an analysis and reevaluation that may make a contribution to the research on musical spatiality. The current combination of the cognitive metaphor theories with Peircean pragmatism and semiotics suggests one possible solution to the “long studied”, but “fundamentally unexplained” question of the logic of musical motion and space (Cox 1999, 7).

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4 Hence, from the current point of view, the accentuation of the ambiguity, inaccuracy and immeasurability of both tonal and musical space by Kurth and Wellek (see e.g. Wellek 1963/1934, 319) does not seem justified. Hopefully some demystification of musical space has taken place since those days.
Conclusions

The import of research of musical space is highlighted by the notion that space—temporality included in the notion of spacetime—has become a new paradigm of music, new ways of organizing ideas in and about music, i.e. new conceptual tools for both musical praxis and musicology. Space is a paradigm for composition (cf. Barrière 1991). Focus on space does not mean abandoning time (cf. Harley 1994a, 33–43; chapter 4.1.5). The emancipation of musical space in both respects may furthermore give new impetus to study of space and time in music and arts in general.

At the same time, the work may contribute also towards music theory—not as a worn-out system of traditional doctrines of times past, concerned with the terminology and elements of music and too often centering on its notation—but as a new music theory, a real, living theory of how music operates and functions, a theory that, according to Cox (1999, 9), “ought to be able to explain, or ought to endeavor to explain, music’s beauty and affective meaning”. In the final analysis, a theory of music that philosophically or scientifically explains how music works, and music theory as a discipline of music students engaged in learning music should not be strangers to one another.

Each study may reinforce the methodology of the field by either revealing methodological deficiencies or by reinforcing the affordance of the methods in the context of the study. A substantial part of the current work consists of articulation of the framework of naturalist pragmatism, Peirce’s phaneroscopy and his theory of the sign (supported by Dewey’s theory of the artistic and by Aristotle’s ideas of intellectual virtues) as well as the Peircean view of mind that embraces spatiality in concord with the morphological turn of the mind sciences. While the task of articulating the framework was carried out for the sake of the understanding musical signification and musical composition process, that output may end up being useful in other contexts and objectives as well.

All in all, the work has trekked the borderlines of semiosis and musicology, and to some extent those of philosophy of mind and cognitive sciences as well. As such, it may particularly strengthen the connections between musicology, cognitive sciences and semiotics. Also within musicology, a naturalistic approach to the issue of musical composition process may be fruitful as it opens certain possibilities for discovering common ground and for opening avenues for reciprocal collaboration between the different research traditions, including systematic musicology, ethnomusicology and cognitive musicology.

Finally, to quote Arnie Cox (1999, 254–255),

[t]he analysis here shows how it makes perfect sense to understand and describe the relations of musical events in terms of ... space because, in the large, we do this with events generally. ... . To put it boldly, what we gain from this kind of analysis is a new epistemology of music, grounded not in shared intuitions about
Space in Musical Semiosis

a little-understood metaphor of musical motion, but in the logic of embodied metaphorical thought. It gives us a way of accounting for the origins of musical motion and space; and to the extent that musical meaning is based on this metaphorical motion and space, it gives us a way of understanding where musical meaning comes from.

This inquiry has been an effort to better understand issues inseparable from one another: musical signification, musical spatiality and musical composition as an epitome of musical communication process. This book attempts to convey that understanding.

5.2 Aspects of future inquiry

Inquiry continues. So does scientific inquiry on space, semiosis, and music. Due to its general, meta-analytical approach, the work at hand suggests several directions for future research. A hypothetical theory has been set forth. The pragmatist framework of the theory stands in need of critique. The theory itself may and should be subjected to testing in many ways, leading to nullification, verification, or—perhaps more likely—something therebetween. This final section sketches out some of the possible paths and affording avenues of inquiry in the future.

Topics relating to the framework of naturalist pragmatism itself.

The current work has been based on the resources available. Delving deeper into original Peirce resources, such as the Harvard microfilm edition of Peirce’s manuscripts, published and outcoming volumes of the chronological edition of Peirce’s writings, and pertinent secondary sources (too numerous to list here) would evidently result in deeper understanding of Peirce. This holds not only for Peirce’s pragmaticism (see section 1.2), but also for synechism, Peirce’s doctrine of continuity (see chapter 1.22), his theory of phaneroscopic categories (chapter 3.2.1), theory of perception (3.2.2), and theory of Signs, and thought-signs in particular (3.2.3). The outcome might be a more insightful articulation of the Peircean elements in the work and an improved expression of the Peircean view of mind (cf. section 3.3).

Deeper excavations into Peirce’s writings might reveal, for instance, aspects that either support or contradict the view expressed here, that each Interpretant \( n \) of a thought-sign becomes the Representamen \( n_{+1} \) of another thought-sign in the continuous stream of Signs (see chapter 3.3.1). There is also a chance, that some constructive ideas concerning the semiotic processes of music and the arts are discovered. In terms of musical narratives and modal logic involved (see e.g. Tarasti 1988, 1994b),
it may be worthwhile to look into Peirce’s existential graphs, and particularly the unfinished gamma system for the pragmatist’s pioneering approach (see CP 4.372–4.373, Zeman 2002/1964, Roberts 1973, Øhrstrøm 1997).

In terms of other pragmatists, the topics for future research seem to go in two directions. On the one hand, a closer, critical acquaintance with both precursors and successors of Peirce may further contribute to the articulation of the framework of naturalist pragmatism. In addition to the obvious keystone figures of Plato, Aristotle, Kant and Hegel, the main precursors in this respect include John Duns Scotus, Baruch Spinoza, John Locke, George Berkeley, David Hume, and Auguste Comte as well as F. W. J. Schelling, Jeremy Bentham, John Stuart Mill, Alexander Bain, even Charles Darwin (see e.g. MS318 or Thayer 1981).

On the other hand, the framework of naturalist pragmatism articulated in this work gives a foothold to analyze and benefit from the other pragmatists’ and neopragmatists’ ideas of signification, spatiality, music and the arts from a Peircean point of view. Directly or indirectly following and reacting to the classical pragmatists contemporary with Peirce (e.g. Chauncey Wright and William James of the pragmatist Metaphysical Club, Lady Welby-Gregory and Josiah Royce, together with the younger generation of John Dewey, F. C. S. Schiller and George Herbert Mead, even George Santayana), interesting neopragmatists or thinkers with pragmatist traits include Clarence Irving Lewis, Joseph Margolis, Richard Rorty, Richard Shusterman and, to certain extent, Hilary Putnam. Directing the work towards what John R. Shook (2003) described as “pragmatic naturalism” seems especially appealing, if one adheres to the emphasis given to empiria.

For instance, William James maintained that there is a “spatial quale” in every sensation, without exceptions (James 1879, 70). James’s spatial considerations precede Gärdenfors’s geometry of thought in an interesting way (James 1879, 199–200; cf. James 1887; 1893):5

Should anyone object that such terms as ‘voluminous’ and ‘massive’ applied to sound and pain, are but metaphorical, and involve no literal spatial import, we may ask him why this peculiarly spatial metaphor is used rather than any other. Evidently because of some quality in the sound or pain which distinctly reminds us of space. If we furthermore hold, as I do, that the only possible foundation of an analogy is a partial identity in the analogous things, we must suppose the voluminousness and massiveness in question to be, at least partially, the same with spatial bulk.

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5 James (1879) even refers to neuralgic pain, likely alluding to Peirce’s agony with trigeminal neuralgia (cf. Brent 1998).
Naturalist pragmatism and the general topics of semiosis and signification.

In the long run, strict adherence to a single semiotic theory may turn out to be inadequate. Especially in cross-disciplinary fields, such as semiotics, it may be beneficial to explore and to integrate aspects of other, sometimes competing traditions in the field. Hence as an endeavor within semiotics, it may be worthwhile to correlate both the current framework and the views of Sign and semiosis to other semiotic traditions. This could entail reinspection of the semiotic concepts and the processes of signification through the current Peircean spectacles, e.g. in the generative semiotics of Greimas, and in the biosemiotics and zoosemiotics of Jakob von Uexküll, Thomas Sebeok, Thure von Uexküll, Kalevi Kull, Dario Martinelli and others. Furthermore, although the relation of the current interpretation of Peircean semiotics to the more linguistically and culturally oriented traditions of semiotics (e.g. de Saussure, Bakhtin, Jakobson, Hjelmslev, Barthes, Eco) is evidently more complicated, meeting the challenge of theoretical analysis and possibly achieving some degree of mutual consolidation might also be that much more rewarding.

A particularly interesting topic in this regard, namely the investigation into the relation of cognitive (e.g. Kaipainen 1994; Määttänen 1993a; 2007a; 2007c; Donald and Andreassen 2007) and existential semiotics (Tarasti 1998b; 2000; 2004) and, in particular, their concepts of situation, communication and signification was already suggested in chapter 2.2.8.

It seems, that in the framework of naturalist pragmatism, there may open an alternative to reconcile some of the main incompatibilities between cognitive and existential semiotics: the unheeded grounding of socially significant interaction into actual reality in existential semiotics, and the seeming solipsism and situational simplicity in cognitive semiotics. The key seems to be found in the explanation for the emergence of the competence underlying communicative act, that is, the epistemology of signification.

Parallel to the American tradition of pragmatism and Peircean semiotics, the European philosophers have been interested in meaning and signification. Particularly the continental phenomenological traditions and, e.g. Martin Heidegger’s concepts such as Dasein (existence), its Räumlichkeit (spatiality), In-der-Welt-sein (being-in-the-world), Zeichen (Sign), Bewandtnis (fitting, involvement, being-destined, or adaptation), Bedeutsamkeit (significance or relevance), Vorhandenheit (presence-at-hand), and Zuhandenheit (readiness-to-hand, instrumentality) seem to motivate comparisons with the pragmatist key notions of object, subject, inquiry, doubt and belief, interaction, Sign, semiosis and spatiality (cf. Heidegger 1986/1927; Rosenthal and Bourgeois 1987; Tarasti 2000). Another important invitation to the inquiry of interrelations is offered by Maurice Merleau-Ponty’s phenomenology of
perception (1998/1962), which raised spatiality and embodiment of experience to an unprecedented status in continental phenomenology, traditionally more interested in time than space (cf. Harley 1994a, 33). 6

Expanding the previous to the wide field of mind sciences (such as philosophy of mind, cognitive science, psychology, neurosciences, system theory, and artificial intelligence research) opens up avenues for future inquiry too many to enumerate. Yet, some examples that again attract to attempt mutual comparison with the framework of Peircean naturalist pragmatism, the current view of semiosis, or the role of space in it, can be pointed out in this context as well.

In educational sciences and educational philosophy, Jean Piaget is often associated with Lev Vygotsky, both born in 1896. Yet, Piaget’s genetic epistemology and his theories of cognitive development, could just as easily be juxtaposed with pragmatism. There appear to be a number of points connecting Piaget with the pragmatists, even beyond the evident influence of Kant on both. 7

For instance, according to Piaget’s basic view of adaptation, human thinking and forms of knowledge are constructed in the process of action and experience, in which the basically biological individual adapts itself/herself/himself to the environment. Consequently, “intelligence finds itself entangled in a network of relations between the organism and the environment” (Piaget 1970/1953, 19). This view is not only constructivist, but also pragmatist in the very Peircean sense described in part one. Other major affinities can be found, for instance, between Piaget’s accommodation and adaptation and Peirce’s inquiry, between Piaget’s equilibrium, disequilibrium and reequilibrium and Peirce’s belief, doubt and settlement of irritation, as well as between Piaget’s schema (Piaget 1932/1926/1923) and Peirce’s habit and legis ign.

For instance, concerning the last parallels, Piaget defined the schema of an action as “the structured group of the generalisable characteristics of this action, that is, those which allow the repetition of the same action or its application to a new content” (Beth and Piaget 1966, 235).

6  While the comparison of the Peircean naturalist pragmatism with Heidegger and Merleau-Ponty and many other representatives of continental phenomenology seems at this point constructive, there are also works that call for thorough deconstructive critique, if not assault, from the current Peircean perspective. One such case—in musicology—seems to be Zuckerkandl (1956), which was already criticized in Harley (1994a, 57–59) and McDermott (1966, 7 and 1972, 490). See chapter 4.1.2.

7  Piaget repeatedly referred to Kant. In fact, his theory of genetic epistemology seems to be organized according to a selection of concepts central to the Koenigsbergian, the main topics of Piaget’s works being, e.g. language and thought, judgment and reasoning (cf. Urteilskraft and Vernunft), world and causality, space and geometry, morality, quantities and numbers, and categorization. Piaget approached the issues from the viewpoint of child’s development. For Peirce, Kant was a major source of inspiration and reference point for philosophy (see e.g. Feibleman 1945). Kant’s psychology was also the topic of John Dewey’s dissertation at the Johns Hopkins University in 1884—the year Hopkins president Daniel Coit Gilman dismissed Peirce, Dewey’s teacher of logic at Hopkins (Brent 1998).
The current theory does not take a stance to how the signifying mechanisms develop in individual organisms. Piaget’s genetic epistemology does that, and therefore an in-depth comparison of Piaget with the current framework appears fruitful. In fact, already Määttänen (1993a, see chapter 3.2.4 and section 3.3) and his ideas of action and experience compare and combine Peirce with Piaget.

In addition to Piaget, there are other psychologically or cognitively oriented perspectives to signification, that may be of interest as regards the future work on Peircean framework of naturalist pragmatism. As one example, Merlin Donald (1991, 2001) has addressed the phylogenetic and sociogenetic questions of the development of the human mind, thus necessarily verging on the emergence of signification. Donald thus complements Piaget’s ontogenetic approach. Donald’s approach is founded on “exuberant materialism” (Donald 1991, 381), and that standpoint seems to agree with the framework here, although differences of opinion certainly exist.

The question of how semiosis is actually implemented in the organism has been avoided in the current work. Opening that neurally oriented Pandora’s box (or jar, rather) means opening connections between the current framework and neuosciences spanning from neurophilosophy to cognitive and computational neuosciences, possibly even neurobiology, neurochemistry, neurology and neuropsychiatry.

The three-dimensional model of the Sign, presented in chapter 3.2.3 and elaborated in section 3.3, for example, implies possibilities of concordance with the contemporary cognitive understanding of the systems of representation implemented in natural and artificial neural networks, in terms of

1 the sinsigns as particular activations in the network and the legisigns as the corresponding synaptic weights;

2 the icons and the indices as activations and activation patterns before and after preperceptual processing, respectively, i.e. before and after the feature extraction processing between the sensory input and the cortical levels of processing, respectively;

3 the rhemes as unbound distributions of activations and activation patterns, and the dicents as bound representations unifying the “shattered puzzle” (Revonsuo 1994, 250); and finally,

4 the symbols as complex relations of representations associated both before binding (rhematic symbols) and after binding (dicent symbols, the Argument)—supposedly at the cortical levels of processing.

Future revisions of the model, if or when necessary, could perhaps be adjusted based on philosophical considerations anchored in neuroscientific empiria (see Churchland 1992) and concrete evidence from the empirical neuosciences and the current understanding of the representative processes in natural and artificial
neural networks (e.g. Gazzaniga 2004; Gazzaniga and Heatherton 2006; Gazzaniga, Ivry and Mangun 2008).

From a humanistic and musicological perspective, the problem of emotions seems especially important, which suggests directing future inquiry in this respect towards neuroscientists such as Antonio Damasio (cf. Damasio 1994; 1999; 2003). Other interesting studies in this respect include Timo Järvelihto’s studies on emotions in interactive systems of organism and environment (e.g. Järvelihto 2000; 2001). His approach to mind and signification is one of systemic psychology, and seems to be quite well in concordance with the pragmatist theories of inquiry and semiosis.

Advances in computational cognitive science, or more precisely, in computational neuroscience and artificial neural networks, add yet another dimension, so to say. Some promising work has already been done in combining Peircean semiotics and practices of artificial neural networks in order to model and to simulate semiosis. See e.g. Queiroz, Emmeche and El-Hania (2005); Gomes, Gudwin and Queiroz (2003), and the special issue of SEED Journal (Queiroz and Gudwin 2003).

Naturalist pragmatism and the topics of embodied signification and space.

The morphological turn of the cognitive sciences and the philosophy of mind has played an important role in this work. It seems reasoned to continue developing the pragmatist framework by monitoring and participating in the developments of the cognitive metaphor theory (Lakoff and Johnson 1999) and the theory of conceptual spaces (Gärdenfors 2000, 2005). Also, it seems worthwhile to integrate aspects of theories of conceptual blending (e.g. Fauconnier and Turner 2002) into the pragmatist framework more than has been done so far. Perhaps the semiotic approach might also reciprocally contribute to the cognitive theories.

One example of the particular topics, that afford addressing in this avenue of inquiry is the problem of quantity and quality. The challenge is in trying to consolidate the concepts of quality and quantity with spatiality. With the absolute conception of space, this seems insurmountable, while the relative conception of space, in which spatiality is about the relations of objects, actually embraces the concepts of quality and quantity: Quality in terms of relations between characteristics of objects, quantity in terms of relations between and among sets of objects, to put it in a nutshell. The combination of the theory of conceptual spaces with Peircean semiotics and the pragmatist conception of space appear adequate in responding to this challenge.

The pragmatist conception of space developed here might deserve a closer comparison to other, more traditional notions of space. For instance, Henri Bergson’s
strict opposition of space (*espace*) with time or duration (*durée*) in human experience seems to be in contradiction with both the contemporary relativist notion of physical spacetime (e.g. Jammer 1976/1954; Reichenbach 1958/1927; Grünbaum 1973/1963; van Fraassen 1985/1970; see Harley 1994a, 30) and with the pragmatist notion of spatiality (see section 3.1 and e.g. Bergson 1950/1889; Harley 1994a, 32). Less contradicting notions seem to prevail in contemporary theories of space (e.g. Lefebvre 2003/1974), which “are concerned with ... first, the *physical*—nature, the Cosmos; secondly, the *mental*, including logical and formal abstractions; and, thirdly, the *social*” (ibid., 11; see also Määttänen 2006b, 2007c and Kilpinen 2000).

**Topics in musical signification and musical esthetics.**

Leaving the general philosophical options for future navigation of inquiry now behind, let us consider some directions for prospective inquiry within musicology. This work has presented a theory of how music signifies and how musical composition process is a process of communication. As such, it hopefully participates in the dialectics of the musicological discourse on communication and signification. For the benefit of that discourse, future work may include analyses of the mutual relations and syntheses of this work and other theories of musical communication or semiosis, such as Meyer-Eppler (1962), Schaeffer (1966), Nattiez (1990), Tarasti (1994b, 1998b) or Di Scipio (1995b). Especially important would be the participation in the discourse with other researchers pursuing Peircean semiocognitive studies of music, e.g. with Rúben López Cano, Erik F. Clarke, Mark Reybrouck, Kalev Tiits, W. Luke Windsor (see chapter 2.3.1 and section 5.1).

It would be particularly inviting to search for a synthesis with the Peircean account of musicianship, performer’s self and subjectivity and the communication of musical meanings by Naomi Cumming, published posthumously (Cumming 2000). The emphases on performance in Cumming’s work and composition in this work might support each other, by virtue of mutual harmony in ideas of music as play of signs, embodiment, attention to the duality of practice and technique, and the role of metaphors in semiosis. Further support for the synthesis could be found in Vincent Colapietro’s Peircean studies on self and subjectivity (Colapietro 1989; 1985).

The continuation of this work is not only limited to purely semiotic views on musical signification. It has also been a deliberate choice, that many classics of musical esthetics have been omitted (although not forgotten) in this work. The reason is simple: many writers deserve to be treated in a context of their own. Two keystone figures particularly interesting from the pragmatist viewpoint in this respect are Susanne K. Langer and Leonard B. Meyer.
For instance, Langer held, that “[s]pace, in music, is a secondary illusion”, “an attribute of musical time”, and thus subordinate to the temporal (Langer 1953, 117). She even went as far as maintaining, that musical space is “thoroughly ‘virtual’” by being “unrelated to the space of actual experience” (idem, see also Harley 1994a, 54). Yet, Langer put forward a well-received (yet duly criticized) consideration of how “music articulates forms which language cannot set forth” (Langer 1951/1942, 198). The meager role of spatiality in Langer seems to be in a curious conflict with the major role of spatiality in the current work.

In addition to the North American post-Kantian estheticians and philosophers of music and the arts, an alternate course for future research is enticed also by the more continental traditions of phenomenological approach to music and the arts. Stemming from, e.g. Husserl’s, Heidegger’s and Merleau-Ponty’s phenomenology, these paths are represented in musicology and arts research by Roman Ingarden, Thomas Clifton, and recently by Juha Torvinen (2007), among others. Ingarden (1989) may be pertinent to the continuation of the work also due to the fact that the problem of musical work (or the problem of the work of art in music) cannot be isolated from the problem of musical esthesis and semiosis. That brings in scholars such as Zofia Lissa and Lydia Goehr but also Pierre Schaeffer, Michel Chion and other representatives of the sound object tradition. The problem of the musical work, again, reconnects with the problems of spatiality and temporality in music (see e.g. Lissa 1968).

In terms of the current work, Clifton’s work (1983) calls for another comparative analysis, especially due to the role of spatiality. According to Harley (1994a, 62),

[t]he comprehensive scope of Clifton’s theory of musical space, not limited by stylistic prejudices against new or early music, seems particularly laudable in comparison with other writings on the ‘phenomenal’ musical space.

In addition to spatiality, Clifton’s other key concepts of time, feeling, and play suggest comparison with the pragmatist view. Torvinen’s (2007) work, in turn, explicates music as Heideggerian existential-ontological anxiety (Angst), which seems to resonate with the Peircean view of music as inquiry, as search for a relief to the irritation of doubt.

There are several references to play theories of music in this work. These point not only to studies deriving from continental phenomenology (e.g. Clifton 1983), but also to those coming from psychodynamics and psychoanalysis (see chapter 2.2.3; Kurkela 1994), and also from pragmatism (e.g. Reichling 1991; 1997). Akin to the continental phenomenological views, there are many unifying factors between the pragmatist view of musical signification and the psychoanalytic views which study music as “as psychic work significantly formed by ... a subject-in-process/on-trial”
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and the textual mechanisms of music “as analogous to the operative mechanisms of the human psyche” (Välimäki 2005, 30). Deepening the relation of the current theory with different utterances of the play theories of music appears fruitful, despite the obvious threats of discrepancies concerning, for instance, the emphasis given to the distinction between the conscious and the unconscious in psychoanalysis and psychodynamics. Here, the signifying processes of music have not been limited to a “lower” consciousness.

Topics in musical spatiality, musical topicality and metaphor in music.

How we conceive space and spatiality especially in the context of music has been one of the thoroughgoing threads in this study. Continuing that line of thinking, one possible direction for future research can be found in the history of ideas of musical space, in the history of ideas of musical spatiality by theorists and practitioners. The former span from Helmholtz’s initial analogy between musical scales and space (Helmholtz 1954/1863) to Adorno’s (pejorative) identification of space with stasis (Adorno 2003/1948) and from the narrow views of musical space as pitch space (see chapter 4.1.4) to Robert P. Morgan’s “generalized musical space” which includes “all the elements of compositional structure” (Morgan 1980).

Also, due to the inseparability of space and place, the study of musical spatiality cannot be separated from the study of musical topos. The study of musical topos has evolved from Ratner (1985/1980) and Allanbrook (1983) to the semiotic tradition represented particularly by Raymond Monelle (2006; 2000), Robert Hatten (2004; 2003; 1994), Susanna Välimäki (2005) and Liisamaija Hautsalo (2008). This tradition is counterbalanced by e.g. the more mathematically oriented tome by Guerino Mazzola (2002). Correlating the presented theory with the semiotic tradition of topical study of music would tie the work closer to the main body of analytical research in musical semiotics and the topics in its contemporary praxis. The move toward Mazzola et alia, in turn, might direct the work towards testing the theory by modeling it artificial systems of representation.

The way Hatten, for instance, described his work on topics could be interpreted in terms of conceptual spaces, quality dimensions, domains and regions in domains (Hatten 2003, 81):

... in an important sense, every topic is already a synthesis of melodic, rhythmic, harmonic, temporal, modal, textural and gestural features that may be considered typical for a style. I have attempted (Hatten 1994) to address the issue of Ratner’s rather unsystematic listing of these style types by categorizing them in terms of marked oppositions (e.g., high/middle/low, or major/minor). Sets of oppositions are often generalizable to such oppositions as simple vs. complex...

Still other possibilities for achieving a typology, as opposed to a mere listing...
Conclusions

of topics, would be along the lines of “fuzzy sets,” or of clustering of properties around prototypes.

Furthermore, the key notion of *gesture*, which Hatten (2003, 83; see also Hatten 1999 and 2004; Cumming 2000) described as “movement that is interpretable as significant, or marked as meaningful, and ... characterized by continuities of shape and force” and as consisting of e.g. melodic, rhythmic, harmonic, articulatory and dynamic components, could be interpreted as *metaphor* in the current sense.

While reviewing other semiotic theories of music from the perspective of the current theory may well be rewarding, the call to monitor and participate in the developments of the morphological turn of the cognitive sciences and philosophy of mind applies, of course, to morphological studies in musicology, as well. The works by Marion Guck (1981a, 1981b), Janna Saslaw (1996), Arnie Cox (1999), Candace Brower (2000), Lawrence Zbikowsky (2002), Zohar Eitan (Eitan and Granot 2006; Eitan and Timmers 2006), Riitta Rautio (2007) and others will surely be followed.

The abductive theory of musical composition process, including the pragmatist concept of musical spatiality partly stems from the personal experience of the researcher as composer. Only a few utterances by expert composers themselves concerning composition process or musical spatiality were taken into account—the empiria in this respect was left for the time ahead. Hence the theory may be tested in the future through studies of how expert and novice composers compose, and how other musicians participate in musical processes, whether these be studies of composition processes based on interviews, observations, sketch analyses or historical documents (see section 2.3), or first-hand sources from the practitioners themselves, such as Schoenberg (1975/1941), Cage (1973/1961), Boulez (1971/1963), Rochberg (appendix II in McDermott 1966) or Emmerson (1982; 1989) have been. The possibilities for research settings in this respect are abundant, as reflected in the past studies of musical composition process (see chapters 2.3.1, 2.3.2). In any case, a close connection with empiria awaits the current theory.

Topics in musical processes and musical praxis, including music education.

Indeed, in addition to working on the ideas of spatiality in music and the theories of composition process, there is a good future chance of actually “getting one’s hands dirty” for instance by analyzing particular musical works and styles, composition procedures and processes, or spatiality in the praxes of different musics, be it actual spatiality of sound from the age-old antiphonality to 21st-century dynamic virtual ensemble dispersions, literal spatiality of sound perception or metaphorical spatiality of music. From a composer’s standpoint this kind of analyses may also lead to
syntheses, i.e. new techne and new phronesis guiding the composition process, to advances in practical inquiry pursued in the art of music. The bold claim is that the theory presented here is general or universal to the degree, that the adjustments needed are more due to the general inaccuracies in the theory rather than narrow, uninformed or misguided conceptions of music, spatiality or semiosis leading to incompatibility with cultures other than the Western contemporary culture of art music, to which the researcher has primarily been acculturated.

The current theory suggests several directions for empirical work. In addition to capitalizing on studies of composition process by other researchers, the theory provides a foothold for original inquiry of composers’ processes, using at least the traditional methods (observations of live or recorded situations with a variety of methods, sketch analyses, interviews, analyses of utterings and descriptions of the process by composers). The theory presented attempts to be holistic in the way that it covers the key issue of musical signification traditionally neglected in composition theories (see section 2.3). As such, it may also open new paths to composition research: for instance, the theory might be subjected to testing through AI modeling or psychological test settings with functional brain imaging.

The major problem of modeling complex processes in artificial intelligence methodology is that the model needs to expand beyond feasible magnitudes. Theoretically, the construction of a “machine that hears as human does” requires the modeling of the human mind in its entirety. However, if the Peircean view of mind embracing spatiality is on right tracks, it may help in the pursuit of modeling of rudimentary artificial semiotic organisms that might be able to express and communicate non-verbally by means of sound (see e.g. Coppock 1995).

Being a theory of musical signification with composition process as epitome of musical semiosis, the theory may be augmented to cover the realm of musical performance and narrowed to the realm of reception in musical communication. Consequently, the future empirical work may also address the problems of musical performance and reception.

As noted above (in section 5.1), a theory of music explaining how music works and music theory as a discipline of music students should not be strangers to one another. Therefore, one task in the future concerns the mutual relations of the abductive theory of musical semiosis and music theory pedagogy: what ramifications might the semiotic theory have for teaching and learning music theory and music analysis, and reciprocally, how might the praxis of music theory pedagogy affect the future work on the theory of musical semiosis. Essentially, both deal with how music works.
Conclusions

Last but not least, the considerations above concern not only the pedagogy of music theory, but music education in general. If it indeed holds, that music and musical composition process are forms of inquiry and spatially embodied as described here, what does that entail in terms of learning and teaching music, both in general, classroom music education and in instrumental or compositional pedagogy? In this regard, too, future work may continue and connect with an established body of research. In fact, while some differences in opinion remain to be settled, this work more or less aligns with the ongoing, yet already substantial stream of studies in philosophy of music education and its “praxial” or rather, “pragmatist” turn, carried out e.g. by the kindred spirits of the Finnish scholars Pentti Määttänen (2000a–b), Heidi Westerlund (2004; 2003; 2002; see also Määttänen and Westerlund 1999), and Lauri Väkevä (2007; 2006; 2004; see also Ojala and Väkevä 2006, and Väkevä and Ojala 1999) and the North Americans Thomas Regelski (e.g. 2007; 1998a–b; 1996; 1981), David Elliott (2005; 1997; 1995), Terry Gates (1991), Wayne Bowman (2002; 1998; 1992), Darryl Coan (2002) and the rest of the MayDay Group of music educators.

Conclusion.

An abductive theory has been set forth. The theory needs to be examined and evaluated, nullified or verified, one way or another, whether by theoretical critique or by experimental verification. “But”, to quote Peirce again (CP 5.197), “just here a broad question opens out before us. What are we to understand by experimental verification?” This final section of the book outlined some possible directions for future research. There are, of course, many other possibilities and methods of inquiry not mentioned. The theory presented here is an attempt to say something about music, to grasp something that is deeply rooted in human experience, and not always directly expressible in words, perhaps not even achievable by the subject. I hope the effort has not been vain. That the future will tell. Hence, the valedictory quotation of Peirce (CP 1.420): “I had it. I imparted it to you.”
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Aristotle: see APo, Categories, DA, DC, NE, Poetics, Rhetoric

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