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Religion Explained?

A Philosophical Appraisal of the Cognitive Science of Religion

Aku Visala

ACADEMIC DISSERTATION

To be presented, with the permission of the Faculty of Theology of the University of Helsinki, for public examination in the lecture theatre of Arppeanum (Helsinki University Museum), Snellmaninkatu 3,
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Abstract

This study examines philosophically the main theories and methodological assumptions of the field known as the cognitive science of religion (CSR). The study makes a philosophically informed reconstruction of the methodological principles of the CSR, indicates problems with them, and examines possible solutions to these problems. The study focuses on several different CSR writers, namely, Scott Atran, Justin Barrett, Pascal Boyer and Dan Sperber. CSR theorising is done in the intersection between cognitive sciences, anthropology and evolutionary psychology. This multidisciplinary nature makes CSR a fertile ground for philosophical considerations coming from philosophy of psychology, philosophy of mind and philosophy of science.

I begin by spelling out the methodological assumptions and auxiliary theories of CSR writers by situating these theories and assumptions in the nexus of existing approaches to religion. The distinctive feature of CSR is its emphasis on information processing: CSR writers claim that contemporary cognitive sciences can inform anthropological theorising about the human mind and offer tools for producing causal explanations. Further, they claim to explain the prevalence and persistence of religion by cognitive systems that undergird religious thinking. I also examine the core theoretical contributions of the field focusing mainly on the (1) "minimally counter-intuitiveness hypothesis" and (2) the different ways in which supernatural agent representations activate our cognitive systems. Generally speaking, CSR writers argue for the naturalness of religion: religious ideas and practices are widespread and pervasive because human cognition operates in such a way that religious ideas are easy to acquire and transmit.

I raise two philosophical problems, namely, the "problem of scope" and the "problem of religious relevance". The problem of scope is created by the insistence of several critics of the CSR that CSR explanations are mostly irrelevant for explaining religion. Most CSR writers themselves hold that cognitive explanations can answer most of our questions about religion. I argue that the problem of scope is created by differences in explanation-begging questions: the former group is interested in explaining different things than the latter group. I propose that we should not stick too rigidly to one set of methodological assumptions, but rather acknowledge that different assumptions might help us to answer different questions about religion. Instead of adhering to some robust metaphysics as some strongly naturalistic writers argue, we should adopt a pragmatic and explanatory pluralist approach which would allow different kinds of methodological presuppositions in the study of religion provided that they attempt to answer different kinds of why-questions, since religion appears to be a multi-faceted phenomenon that spans over a variety of fields of special sciences.

The problem of religious relevance is created by the insistence of some writers that CSR theories show religious beliefs to be false or irrational, whereas others invoke CSR theories to defend certain religious ideas. The problem is interesting because it reveals the more general philosophical assumptions of those who make such interpretations. CSR theories can (and have been) interpreted in terms of three different philosophical frameworks: strict naturalism, broad naturalism and theism. I argue that CSR theories can be interpreted inside all three frameworks without doing violence to the theories and that these frameworks give different kinds of results regarding the religious relevance of CSR theories.

Acknowledgements

When I started working on this study, I had no idea what it was about and where I was going with it. I was so far from finding the murderer that I did not even realise a murder had taken place. I could not imagine what my argument would be or even how to approach the problems. At that point, the completion of a dissertation seemed to be a grand achievement which would give life-long bragging rights to anybody superior enough in intellect to achieve this mystical goal. It took me about a year to realise what was going on in the cognitive science of religion, another year to find out a way to approach it and a year and a half to say something about it and write it down. Gradually, the aura of mystique surrounding the idea of obtaining a dissertation withered and finally evaporated. In retrospect, I see that what I actually needed was not so much intellect and inspiration as drudgery and perspiration.

I can see now that finishing my dissertation scarcely gave me bragging-rights for life or the satisfaction that I had hoped for; in fact its flaws loom much more largely for me than any of its possible strengths, and I only see what I did not achieve, what this study could have been. I *do*, however, take pride in the fact that I actually managed to finish it. For the first time, I felt I was facing the real possibility of being defeated by an academic assignment, and pulling through – even if just barely – feels good.

In the course of a long project, such as this study, a great many debts of an interdisciplinary and intradisciplinary kind accumulate. I cannot settle them, but I can acknowledge them here.

First of all, I must thank my diligent and acute supervisors Prof. Simo Knuuttila and Doc. Ilkka Pyysiäinen for their support and relentless (and sometimes heavy handed) guidance without which this study would not be even half of what it is. Both gave me a hard time when I was getting complacent and reassurance when I hit rock bottom.

Very special thanks go to the Cognition, Religion and Theology project and its members – Justin Barrett, Roger Trigg, Emma Cohen, the late Nicola Knight and David Leech – at the University of Oxford for their open-mindedness in welcoming a total novice into their midst for a whole year and letting him see how the cognitive science of religion works from the inside. I was given the opportunity to present many of my ideas to the group and received feedback that helped me to formulate my arguments. I was also given the once-in-a-lifetime opportunity to draw on what was best in Oxford ranging from philosophy to evolutionary psychology. For the experience gained and the lessons learned, I am deeply indebted.

In particular, I must extend my gratitude to Dr. David Leech who not only helped me with the intricacies of the English language but also went through the manuscript with a fine tooth-comb without asking anything in return. I also thank him for the countless conversations we have had on topics related to the cognitive study of religion and philosophy (and life) in general. He has been my guide in my adventures through English culture and the Oxbridge system.

In the course of this study, I have enjoyed numerous conversations with Prof. Emeritus Heikki Kirjavainen, Prof. Risto Saarinen, Doc. Timo Koistinen, Doc. Sammeli Juntunen and numerous other people working in the Department of Systematic Theology at the University of Helsinki. One could not have hoped for more interesting colleagues. Some of my colleagues I also have the privilege of calling my closest friends. This is the case with my "untalented" friends Rev. Antti Mustakallio, Doc. Olli-Pekka Vainio, Researcher Mikko Sammalkivi and Dr. Topi Heikkerö. I am particularly grateful to these individuals for their continuous attempts to fend off my self-pity, the numerous discussions on philosophical topics and for their faith in the consolations of philosophy.

It is hard for me to even imagine my life without my beloved friends who have had to carry some (and occasionally, most) of the psychological spillage produced by the clash of

the pressures of my research and my shaky psyche during the past four years. My pains and joys have spilled into to my free time with Markus Ukkola, Aleksi Rytkönen, Antti Peltoniemi, Sauli Hurri and Jani Salomaa who have not only endured, but also helped me to endure. I have been a pain, I know, but I apologise and thank you for your persistence and company during the countless nights of watching bad movies and playing computer games. Without you and our common activities, I would have had no relief.

I also have to thank the Trends in Intellectual Integration project run by Professors Uskali Mäki and Petri Ylikoski and the members of the Philosophy of Science group in the Department of Social and Moral Philosophy at the University of Helsinki for introducing me to developments in philosophy of science and giving me the possibility to discuss my feeble ideas. My hanging out with the group turned out to be crucial for my research, because I ended up participating in a week long workshop on philosophy of neuroscience by Carl Craver on September 2007 which gave me a completely new perspective to things – a perspective that paid off in multiple ways.

This study has been generously funded by the Finnish Cultural Foundation, Alfred E. Kordelin Foundation, Finnish Graduate School of Theology and the Academy of Finland. Without their generosity, my sleepless nights spent thinking about reductionism, moments of despair at 4am when the arguments fail and the endless, tedious and boring hours day after day after day spent grinding the mill would not have come to pass. Without these desperate and boring hours, there would not be a study for you to read.

Finally, my greatest thanks go to my parents Heikki and Eeva-Liisa who have continued to support me throughout my life even though they have not always understood what I was doing. By their example, I have learned what self-sacrificing love is. This book is dedicated to them.

Oxford, All Saints' Day 2009
Aku Visala

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1. Introduction

The cognitive science of religion (henceforth CSR) is an inter-disciplinary research program that spans over the fields of cognitive sciences and the study of religion. During the last 20 years, the writers in this field have applied theories from cognitive sciences and evolutionary psychology to explain the general forms of religious ideas and behaviour.[1] The work at hand is a philosophical examination of the claims and background assumptions of scholars associated with the field of CSR.

In their introduction to a collection of articles aimed at presenting the CSR to anthropologists, professors of anthropology James Laidlaw and Harvey Whitehouse set the scene in the following way:

> [w]ithin the large and loosely integrated fields of cognitive science and evolutionary psychology, there has emerged a relatively tightly-knit group of scholars engaged in what has become known as the "cognitive science of religion". This group of scholars enjoys an unusual measure of agreement on shared presuppositions, methods, and problems. Over the last twenty years or so they have succeeded in establishing not only a paradigm for their research, but also several institutional centres around the world, a journal and a book series, and a substantial literature based on new empirical research that has given rise to a series of new research problems.[2]

Several scholars are associated with CSR of whom the most prominent ones are E. Thomas Lawson, Robert McCauley[3], Harvey Whitehouse[4], Pascal Boyer and Justin Barrett. In addition, scholars such as Scott Atran, Ilkka Pyysiäinen[5], D. Jason Slone[6], Stewarth Guthrie[7], Todd Tremlin[8], Jesse Bering[9] and Brian Malley[10] are also regularly associated with CSR.[11] In

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[1] For general introductions to the field, see Tremlin 2006; Pyysiäinen 2001, 2004a; Slone 2004. For collections of relevant articles, see Andresen 2001; Boyer 1993; Pyysiäinen & Anttonen 2002; Slone 2006; Whitehouse & Laidlaw 2007.

[2] Whitehouse & Laidlaw 2007, 13.

[3] Lawson's and McCauley's *Rethinking Religion: Connecting Cognition and Culture* (1990) is widely considered as the starting point of CSR for two reasons: firstly, the book developed the first theory in the CSR, the ritual form hypothesis; and secondly, it laid out the basic methodological assumptions for connecting the study of religion to the study of cognition. See also the follow up *Bringing Ritual to Mind: Psychological Foundations of Ritual Forms* (2002a). Lawson is professor emeritus of Comparative Religion in West Michigan University, USA. McCauley is a philosopher of science who is currently working at Emory University in Atlanta.

[4] Whitehouse has formulated the "modes of religiosity" theory (1995, 2000, 2004) and contributed to methodological discussions of the field (2001). The "modes of religiosity" theory has generated a considerable discussion. See, e.g., Whitehouse & McCauley 2005; Whitehouse & Laidlaw 2004; Whitehouse & Laidlaw 2007. Whitehouse is Professor of Social Anthropology and Head of the School of Anthropology and Museum Ethnography at the University of Oxford.

[5] Pyysiäinen has published extensively about different aspects of the CSR spanning from overviews and methodological discussions (2001, 2004a, 2006, 2009) to other themes and experiments (2002, 2003, 2004b, 2004c, 2005a; Pyysiäinen *et al* 2003). Pyysiäinen is working as researcher in the Helsinki Collegium of Advanced Studies at the University of Helsinki, Finland.

[6] Slone 2004.

[7] Guthrie is difficult to classify because historically he was the first to use the term "cognitive science of religion" in his article from 1980. Nowadays, he does not clearly associate himself to the CSR. However, some of his claims – especially those dealing with anthropomorphism - have had a considerable impact on CSR writers. See, e.g., Guthrie 1993, 2002.

[8] Tremlin 2006, 2004.

[9] Bering is the director of the Institute of Cognition and Culture in Queen's University Belfast and has

addition to these writers working inside CSR, we should also mention some important people outside the CSR who have had a profound influence to the central claims of CSR writers. Developmental psychologist Frank Keil[12] is one of these important figures as well as anthropologist Dan Sperber. Some CSR writers are also closely related to writers in Evolutionary Psychology such as Leda Cosmides, John Tooby and Steven Pinker.

This work will focus on the writings of Scott Atran, Justin Barrett, Pascal Boyer and Dan Sperber. I have chosen these writers because they share a relatively stable set of methodological assumptions and theories. Despite the shared assumption, we should not overestimate the similarities between these writers: we will see that CSR writers have major differences in background assumptions and as such do not necessarily constitute "a relatively tightly-knit group". Rather we can observe certain recurring themes in the writers and these themes will be the object of this study.

Pascal Boyer is an anthropologist and psychologist who is currently the Henry Luce Professor of collective and individual memory in Washington University St. Louis. He is one of the pioneers of CSR and has been involved in the formation of the field from the beginning of the 1990s. My focus will be on his monographs *The Naturalness of Religious Ideas: a Cognitive Theory of Religion* (1994) and *Religion Explained: Evolutionary Origins of Religion Thought* (2001). The former is a quite technical overview of the possibilities of applying cognitive science in the anthropology of religion, whereas the latter is a semi-popular take of the whole CSR with a strong emphasis on Evolutionary Psychology. Boyer has also produced a relatively large corpus of articles about the CSR ranging from empirical experiments (e.g., Boyer & Ramble 2001, Boyer 2000a) to popular overviews (2003a) and clarifications (1996a, 1996b, 1996c, 1998, 2000b, 2000c, 2002, 2003b, 2006). In addition, his publications deal with cognitive development and cultural evolution in general (e.g., Boyer & Barrett 2005, Bergstrom & Moehlmann & Boyer 2006). In this work, the focus is on the part of Boyer's work that is explicitly dealing with CSR: the two books (1994, 2001), especially the latter, will be in the centre of focus and the articles are used to supplement and clarify the ideas in the books.[13]

Scott Atran is a cognitive anthropologist working at the Research Centre for Group Dynamics in the Department of Anthropology at the University of Michigan and also holds the positions of adjunct professor at the Department of Psychology, visiting professor at Ford School of Public Policy and *Directeur de Recherche* at the *Centre National de la Recherche Scientifique* in Paris. Atran's work has focused on folk biological categorisations (Atran 1990, 1994, 1998, 1999; Atran & Medin 2004; Atran *et al.* 2002; Atran & Norenzayan *et al.* 2006), terrorism (e.g., Atran 2006b, 2006c; Magouirg *et al.* 2008) and cognitive anthropology in general (e.g, 2000, 2005, 2006a). In the context of this work, his book *In Gods We Trust: Evolutionary Landscapes of Religion* (2002) and the related article *Religion's evolutionary landscape: counterintuition, commitment, compassion, communion* (2004) represent the most relevant part of Atran's work. *In Gods We Trust* develops several theories about the evolution of religious beliefs, rituals and sacrifice that are based on research in the CSR and in psychological commitment theories. Although Atran shares a lot of common ground with other writers in

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published extensively on afterlife beliefs and folk psychological notions of soul (2002, 2003, 2006, Bering *et al* 2004, 2005, 2006).

[10] Malley is a psychologist currently working at the University of Michigan. See Malley 2004; Malley & Knight 2008.

[11] We might also mention Paolo Sousa (2006, 2001, Knight *et al.* 2004, Sousa *et al* 2002), Emma Cohen (2007a, 2007b) and Joseph Bulbulia (2009a, 2009b, 2007, 2004).

[12] See, e.g., Keil 1989, 2003. Keil is a of professor psychology at the University of Yale and the head of Cognition & Development Lab.

[13] Homepage: http://artsci.wustl.edu/~pboyer/PBoyerHomeSite/index.html

the CSR, his interest in religion seems to be a by-product of his interest in the cognitive foundations of culture in general.[14]

Justin Barrett is an experimental psychologist who is currently working as a senior researcher in the Centre for Anthropology and Mind in the Institute of Cognitive and Evolutionary Anthropology at the University of Oxford. He has conducted several experimental studies (1998, 1999, 2001, 2002; Barrett & Keil 1996; Barrett & Nyhof 2001; Barrett *et al.* 2003; Barrett & Richert 2003) and written numerous overviews of the field (2000, 2004, 2007). Barrett's *Why Would Anyone Believe in God* (2004) is an overview of the CSR written by an "insider" and one of its special features is the strong evidence from developmental psychology that suggests the primacy of theistic god-concepts.

Dan Sperber is an anthropologist working in the *Institut Jean Nicod* in Paris and is considered one of the pioneers of cognitive anthropology. His book *Rethinking Symbolism* (1975) constitutes a starting point for many contemporary cognitive approaches to religious material and it had a profound influence in the subsequent emergence of CSR in the 1990ties. In his works, Sperber is attempting to create a framework that would combine anthropology and cognitive sciences in a naturalistic research program which would explain cultural evolution based on individual cognitive mechanisms (1985, 1994, 1996, 2006a, 2006b). In his *Explaining Culture: A Naturalistic Approach* (1996) he summarises his "epidemiology of representations" which conceptualises the study of culture as a study of widespread mental representations in human populations and insists that human cognitive systems have a significant role in explaining cultural diversity and stability. Sperber's epidemiology is explicitly adopted by Atran and Boyer and other writers make references to his works. Sperber has also produced a cognitive theory of communication - the relevance theory - in collaboration with Deirdre Wilson (1988, 2004). The relevance theory is strongly connected to the epidemiology of representations as it attempts to show how the selection processes of representations are based on the principle of relevance.[15]

As we can see from the diverse backgrounds of CSR writers CSR theories draw from several different disciplines and fields of research that are mainly dealing with the development and structure of human cognition. In their account of the historical development behind current CSR writers, Laidlaw and Whitehouse present four developments that are relevant for the emergence of the CSR. Most of these four developments have their roots in the "cognitive revolution" and its subsequent effects in the emergence of such fields as cognitive psychology and cognitive anthropology. In addition to the explosion of cognitively oriented disciplines, there are also developments in anthropology, especially emerging models of cultural evolution and other evolutionary approaches to anthropology, that have had a profound impact on the CSR.[16]

The general background for all cognition-based approaches is the cognitive revolution in psychology and computer science which led to the emergence of cognitive psychology and cognitive sciences from 1950ties onwards.[17] One of the founding fathers of cognitive science was Noam Chomsky who claimed that language acquisition and structures of human languages are strongly constrained by innate, psychological capacities of language

[14] Homepage: http://sitemaker.umich.edu/satran/home
[15] Homepage: www.dansperber.com.
[16] Whitehouse & Laidlaw 2007.
[17] The basic idea of cognitivism is, very roughly, that human thought as a computational process – a form of information processing in which individual symbols are transformed to other symbols according to a set of rules. Traditionally, this "symbolic processing" paradigm has been the starting point of cognitive science theorising, although from the 1970s onwards we have seen the emergence of another basic paradigm, "connectionism". Connectionism is not committed to cognitivism as a claim according to which thinking equals processing physical symbols in the brain: instead, it claims that thoughts are holistic states of neural networks. For an overview of the development of the cognitive sciences, see Bechtel *et al.* 1998.

processing. Thus Chomsky was the first to formulate the basic idea of "innateness" or "nativism". According to Whitehouse and Laidlaw,

> [t]he defining and foundational premise of the cognitive-science approach is that the mechanisms by means of which humans learn, think, perceive, remember, and so on, affect the content of their thoughts and behaviour.[18]

In other words, Chomsky and other pioneers of cognitive sciences argued that the mind is not a "blank slate" which only passively records and memorises the information which is presented to it. Rather, the human mind comes with innate biases, schemas, models and mechanisms that actively shape the acquisition and transmission of information.[19]

The second major development behind CSR was the emerging consensus from cognitive psychology according to which the innate biases and information processing tendencies of the human mind have different effects in different domains of knowledge. The basic idea of this "domain-specificity" hypothesis is, again very roughly, that in the very early stages of human development we can already see very specialised and context sensitive cognitive mechanisms at work. It follows that rather than consisting of "domain-general" mechanisms, which would be applied to all domains of learning and information processing, the mind consists of numerous "domain-specific" mechanisms, which have highly specialised functions.[20]

The third essential development contributing to the birth of CSR was the emergence of cognitive anthropology as a reaction to the developments in cognitive psychology. Several anthropologists realised how the cognitive revolution could benefit anthropology: if the human mind actually had an effect to the content of the information which was acquired and transmitted, then this might provide a starting point for explaining why cultures exhibit recurrent patters. According to this view, the human mind does not just acquire and memorise all information that is available to it in a given cultural environment, but rather it transforms this information and thus transforms its cultural environment. According to this way of thinking, the relationship between culture and mind is not a one-way process in which cultural input explains all individual psychological processes as some social constructivists had argued. What the cognitive sciences had shown was that the relationship was actually a two-way process: the mind not only acquires cultural information, but also transforms it. In the light of cognitive psychology, the anthropologist could now assume that underlying all cultural forms and diverse belief systems, there was a single cognitive architecture shared by all humans.[21]

The fourth development that contributed to the emergence of the CSR was the emergence of Cultural Darwinism, namely, theories that applied conceptual resources from Darwinian evolution to model cultural evolution. Usually three different theories are mentioned in this context: Memetics, gene/culture co-evolution and Sperber's epidemiology of representations. What is common to all of these theories is their commitment to "selectionism": they conceptualise culture as widespread individual representations in people's heads and set out to explain why some representations have been selected instead of some others. According to this view, cultures are not "entities" or "structures", but widespread ideas in a given population. This starting point makes it possible to explain these

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[18] Whitehouse & Laidlaw 2007, 7.

[19] For introductions to the cognitive sciences, see, e.g., Bechtel & Graham 1998; Stilling *et al.* 1995; Thagard 1996. Chomsky's claim was presented in the context of linguistics where it soon spread to other disciplines as well.

[20] The seminal work in this area is Hirschfeld & Gelman 1994.

[21] For the development and central topics of cognitive anthropology, see D'Andrade 1995.

ideas with the conceptual tools of evolutionary biology which explain why certain traits are widespread in some animal populations.[22]

The CSR combines all four developments and puts them to work in explaining cross-culturally recurrent patterns in religious beliefs and behaviour.[23] The basic idea is that religious beliefs and practices are informed by our non-religious cognitive systems working in different domains. Thus there is not a single "religious cognition" or "religious module" in the head, but rather

> the effects we call religion are, they claim, explained severally by a wide range of different mechanisms, operating in the context of certain environmental inputs, and interacting with each other. These are the same general causes that explain other, non-religious, features of human cognition.[24]

Laidlaw and Whitehouse conclude that

> [t]he cognitive science of religion is thus theoretically and methodologically fully a part of the general enterprise of cognitive science, but has so far taken as its special subject matter – this is therefore how "religion" is operationally defined for the purposes of much of the research initially undertaken – beliefs and behaviour concerning culturally postulated supernatural beings and entities. Since these entities, being supernatural, are particularly underdetermined by the usual "inputs" to human cognition – the environment as experienced and perceived by the human animal – cognitive mechanisms are likely ... to play an unusually large part in accounting for the "outputs", and this is where the special challenges and opportunities lie for the cognitive science of religion.[25]

If we hold that CSR is a paradigm or a research program of some sort, we can identify three different levels in it: its "core" theoretical contributions, its auxiliary theories and broad philosophical frameworks. First of all, the core of the paradigm is formed by the actual hypotheses and theories the writers in CSR have put forward. If we look at the whole field, these theories and hypotheses include at least (1) the minimal counter-intuitiveness hypothesis (MCI) of Boyer[26], (2) the notions of Hypersensitive Agent Detection Device (HADD)[27] and (3) Theological Correctness[28] of Barrett, (4) the Intuitive Theism hypothesis[29] of Deborah Kelemen, (5) the hazard precaution model of ritual behaviour[30] by Boyer and

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[22] The basic ideas of Memetics were originally presented by Richard Dawkins (1978, 1983), but it has been subsequently developed by several other authors. See, e.g,. Blackmore 1999. For a critical discussion on Memetics, see Aunger 2000. One of the most influential forms of the gene/culture co-evolution theories has been formulated by Robert Boyd and Peter Richerson (1985, 2005a, 2005b). For overviews of evolutionary theorising in human sciences, see, e.g., Haines 2007 and Laland & Brown 2002.

[23] Atran's account of the roots of the CSR is similar to Laidlaw's and Whitehouse's. His list includes five different developments: (1) computational thinking, (2) the idea of domain specificity, (3) nativism, (4) adaptationism and (5) cultural epidemiology. See Atran 2002, 243-247. Although Atran's terminology is little different, the developments which he tracks are essentially the same as the Laidlaw & Whitehouse account: we have the cognitive revolution as the outbreak of computational thinking, the innateness of cognitive architecture (=nativism), its specialised and context sensitive mechanisms (=domain-specificity) and population thinking (=epidemiology).

[24] Whitehouse & Laidlaw 2007, 7-8.

[25] Whitehouse & Laidlaw 2007, 8.

[26] Boyer 1994, 2001; Boyer & Ramble 2001; Barrett & Nyhof 2001.

[27] Guthrie 1993; Barrett 2000.

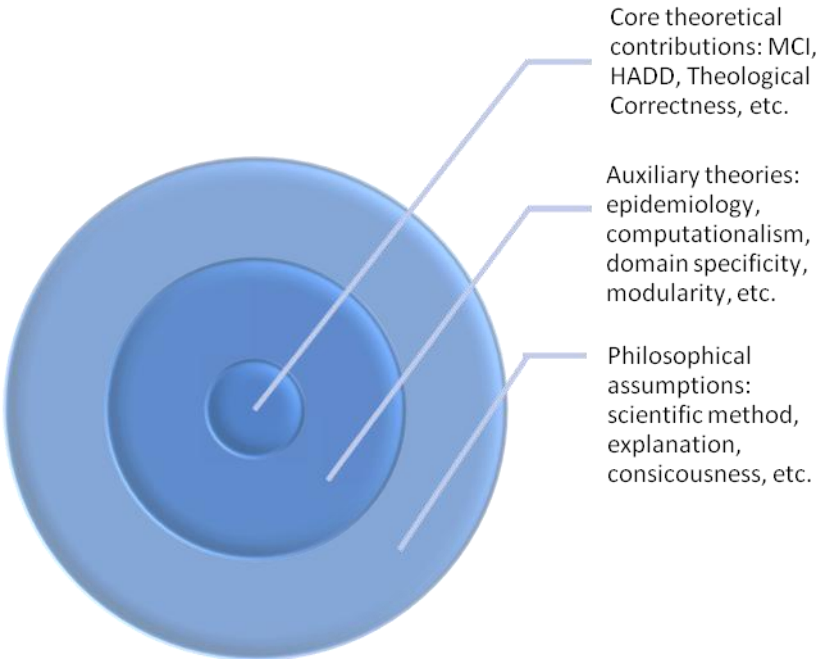
[28] Barrett 1999; Barrett & Keil 1996.

[29] Kelemen 1999a, 1999b, 1999c, 2004; Kelemen & DiYanni 2005. See also, Boyer & Walker 2000. Barrett sometimes talks about "the preparedness hypothesis". See Barrett & Richert 2003.

[30] Boyer & Lienard 2006a, 2006b.

Pierre Lienard, (6) Lawson's and McCauley's ritual form hypothesis[31], (7) Modes of Religiosity theory[32] of Harvey Whitehouse and (8) hypotheses concerning afterlife beliefs[33] by Jesse Bering and his associates.[34] It is useful to distinguish these hypotheses and theories from the level of auxiliary theories that CSR writers assume and use when they formulate their own hypothesis. Such theories include at least Sperber's epidemiology of representations[35], computationalism, domain specificity, modularity, nativism and adaptationism. Generally speaking, it is possible to put Evolutionary Psychology and evolutionary biology here as well. Finally, we have the level of underlying philosophical assumptions concerning the nature of scientific knowledge and method and their relationships to extra-scientific claims and enquiries. Distinguishing these three levels will help us in the future to see the big picture better and provide orientation for philosophical engagement with different aspects of CSR.

Figure 1. Three levels of CSR theorizing.



At this point, it must be mentioned that CSR is closely related to other cognitive and evolutionary approaches to cultural material. I am thinking particularly about Evolutionary Psychology from which some CSR writers – especially Boyer and Atran – draw extensively. As several views associated with Evolutionary Psychology come up in this work, a brief overview is useful here. First of all, we must notice that there is no single "evolutionary psychology". Rather we should distinguish Evolutionary Psychology the paradigm (with capital letters) from the field of evolutionary psychology, as David Buller suggests.[36] Evolutionary psychology as a field of research is a broad and loosely connected group of diverse disciplines such as behavioural ecology, human etology and evolutionary anthropology. In this sense, evolutionary psychology is a general term for approaches that

[31] Lawson & McCauley 1990, 2002a, 2002b.
[32] Whitehouse 1995, 2000, 2004.
[33] Bering 2002, 2006; Bering & Bjorklund 2004; Bering & Johnson 2005; Bering & Parker 2006.
[34] For an overview, see Knight *et al.* 2009.
[35] Sperber 1985, 1996, 2006a, 2006b.
[36] Buller 2005a, 8-12.

use contemporary evolutionary theory as background for psychological, anthropological or neuroscientific theorising.[37] However, Evolutionary Psychology (with capital letters) is used to refer to a certain paradigm advocated by a group of scholars with relatively well defined theories and background assumptions. The main persons in this group are psychologists Steven Pinker, David Buss and Leda Cosmides, and anthropologist John Tooby. The central idea of this approach is that the human mind is a massively modular system whose modules (specialised systems) were created by natural selection to solve adaptive problems in our ancestral environment. Today these once adaptive modules are used in different tasks and they form the basis of our cultural forms. These writers understand Evolutionary Psychology as an attempt to integrate social and cultural sciences with behavioural and biological sciences.[38]

Now, one might ask what philosophy has to do with all of this. Although CSR clearly has a strong naturalistic and scientific outlook, I will try to show that under the surface there are several questions and problems to which a philosopher can draw attention and perhaps even try to solve. In addition, the results of the CSR raise questions that may have impact on theology and philosophical reflection of religious phenomena. How then should a philosopher engage with cognitive sciences – or any science for that matter? Philosopher Alvin Goldman distinguishes three modes of engagement in the case of cognitive sciences. First, philosophers can present their contributions for these sciences to use. Philosophical tools, such as logic and semantic theories, are now used in AI and cognitive linguistics. Further, philosophical theories concerning the mind-body relationship or propositional attitudes, for instance, now have a life of their own in various sub-disciplines of the cognitive sciences. Second, philosophers can provide methodological criticism by revealing background assumptions, explicating ontological commitments or otherwise bring insights from the philosophy of science. In this function, the philosopher attempts to clarify concepts and methods that scientists use by relating them to more general discussions in philosophy of science. Third, philosophers can be consumers of theories and results of cognitive sciences and use them to reformulate, or perhaps even answer, mainline philosophical questions.[39]

Goldman's distinctions are useful for explicating the intentions of the work at hand as well. First and foremost, my aim is to clarify and sometimes criticise methodological issues that emerge from CSR writers. This is what philosophers of special sciences normally do: they clarify central concepts and analyse background assumptions of theories by relating them to a more general framework of philosophical questions and discussions. In addition to identifying problematic concepts and assumptions, I will also present insights from several different fields of philosophy that might help to resolve the issues.

From a philosophical point of view, CSR as a field of research spans over at least three different disciplines or groups of disciplines that all have their distinctive philosophical problems and discussions: study of religion, socio-cultural sciences, such as anthropology and sociology, and cognitive sciences. Furthermore, we must note that the CSR is not the only field of research which attempts to combine insights from natural and behavioural sciences to explain socio-cultural phenomena: as we have already pointed out, Evolutionary Psychology, for instance, is engaged in similar activities and it has also attracted some philosophical discussion that is to some extent relevant for CSR as well.

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[37] For overviews, see Barrett & Dunbar & Lycett 2002 and Barrett & Dunbar 2007.

[38] The basic assumptions of Evolutionary Psychology are similar to the CSR: (1) computational theory of mind, (2) strong nativism, (3) adaptationism and (4) massive modularity. The seminal work of this group is Cosmides & Tooby & Barkow 1992. Others include Buss 1995 and Pinker 1997, 2003. Buss 1999 is the new "bible" of the group. Cosmides & Tooby 1997 is a good source for their basic methodological assumptions. For criticisms of Evolutionary Psychology, see, e.g., Buller 2000, 2005a, 2005b; Buller *et al.* 2005; Richardson 2007.

[39] Goldman 1992, 2-3.

The study of religion has its own distinctive set of methodological questions and problems that are reflected in the CSR. Perhaps the most contested issue is the concept of "religion" itself. Several writers have argued that the way we currently use the concept of "religion" is misleading and therefore we should try to avoid the concept completely and replace it with concepts like "tradition" or "practice".[40] Others have claimed that we can have a definition of religion that is adequate for scientific purposes, but we must at the same time acknowledge that there cannot be a waterproof definition of religion.[41] As we will see, CSR writers' answer to this problem is somewhere in between of these alternatives. There is also another much debated problem known as the insider/outsider problem. What is at stake here is the way in which scholars of religion approach religious phenomena: several scholars have argued that religion should be studied as a kind of autonomous thing in itself (*sui generis*) whereas others have claimed that religion should be studied and explained with non-religious categories. The former group, "religionists", is convinced that the latter group, "naturalists", is reducing religion to something that it is not, whereas "naturalists" criticise "religionists" for lack of engagement with the sciences.[42]

The philosophy of the social sciences is in its current state a thriving discipline of philosophy: recent years have seen the diverse influence of natural sciences in fields traditionally held by the social sciences and ongoing methodological debates about the nature and aims of social sciences.[43] There are at least two problems that are relevant to our subject. First, there is the long standing question of the ontology of socio-cultural phenomena. Should we take cultures and societies as something more than the sum of the individuals that constitute them? If we answer "yes", then we are saying that societies are something "above" individuals. If we answer "no", we are claiming that society is "just" its individuals and its structures and development can be explained by describing individual behaviours. This debate between "methodological individualists" and "methodological holists" has had a prominent place in the philosophy of the social sciences.[44] Secondly, there is the question of the relationship between natural and social sciences: do social sciences have their own methods and subjects that are distinct from natural sciences? Again, we have several answers to this question. "Methodological monists" claim that there is no essential methodological difference between natural and social sciences even though their scopes might be different, whereas "methodological pluralists" or "dualists" argue for a meaningful difference between natural and social sciences.[45]

Finally, we have the diverse field of cognitive sciences which includes disciplines such as cognitive linguistics, cognitive psychology, cognitive neuroscience, artificial intelligence studies, cognitive modelling and cognitive anthropology. It is fair to say that "cognitive science" is an umbrella term for loosely related approaches to information-processing systems. Moreover, cognitive considerations have become standard tools in neuroscience and psychology as well as more "humanistic" disciplines such as education. It seems almost as if

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[40] See, e.g., Smith 1964, 1979.

[41] Saler 2000.

[42] "Religionism" has deep roots in the study of religion. See, e.g., Otto 1958; Eliade 1960, 1971. "Naturalism" is defended by, e.g., Segal 1992, 1999; Wiebe 1991, 1999. Most of the classic articles in this debate are reprinted in McCutcheon 1999.

[43] For overviews, see Kincaid 1996; Trigg 2001; Manicas 2006.

[44] See, e.g., Rosenberg 1986.

[45] Most notable "naturalistic" approaches have been motivated by evolutionary or psychological considerations. For example, Edward O. Wilson stirred a big debate with his *Socio-biology* (1975) in which he claims that the social structures and behaviours of humans can be explained in terms of adaptation and natural selection in the same way the behaviour of animals can. For the debate, see, e.g., Alcock 2001. In addition to evolutionary models, there are several approaches that have been motivated by the booming development of the cognitive sciences and cognitive psychology. We have seen the rise cognitive anthropology (D'Andrade 1995) and Evolutionary Psychology to name just a few.

there would be a cognitive approach to X for any possible X.[46] As philosophers have been involved in cognitive sciences from the beginning it is not a surprise that it has its own thriving philosophical discussions. Usually these discussions are conducted under the heading of philosophy of psychology or philosophy of mind and cognition. First, there are several questions concerning the central ideas of the cognitive sciences, namely, "mental representation" and "computation". How are mental representations implemented in the brain? How do they acquire their content? How are they processed? Second, there are discussions that deal directly with particular topics like modularity of mind, implementation of representations in the brain and the role of consciousness.[47] Finally, there are philosophers who have challenged the foundations of the cognitive sciences completely and claimed that information-processing approaches in general cannot grasp what human thinking actually is. John Searle, for instance, has argued that information-processing cannot account for the qualitative character of conscious experience (qualia) and the intentional nature of thinking.[48]

Finally, philosophy of science is a branch of philosophy that deals with general questions concerning science. It seems that most of the philosophical questions and problems in the study of religion, cognitive sciences and social sciences can be subsumed under philosophy of science.[49] Of recent developments in philosophy of science, the most relevant for the CSR are discussions about the nature of scientific explanation, especially the recent interest in mechanisms in explanations and interdisciplinary and inter-theoretic relationships.[50] In addition, there are large discussions going on about the unity of scientific methods and knowledge. Several philosophers are arguing for strong forms of naturalism where all scientific knowledge and scientific methodologies would be unified under one scheme, whereas others argue for a more pluralist approach and independence of the special sciences. This debate takes different forms in social and behavioural sciences: should social sciences be combined with behavioural sciences? Should the study of religion be unified within a single methodological framework?[51]

Even this very brief overview shows how philosophically contested the fields from which CSR draws its inspiration are. To anticipate, we can say that this fact creates considerable difficulties for CSR writers since there is no consensus over important philosophical background issues such as the nature of consciousness and the adequacy of computationalism. Not only is the philosophical ground contested but the scientific ground is as well: many of the assumptions of Evolutionary Psychology – massive modularity and

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[46] For an overview of approaches and topics in cognitive science, see Bechtel & Graham 1998.

[47] Although philosophy of mind is closely related to cognitive sciences, it is useful to distinguish philosophy of mind from philosophy of psychology (or philosophical psychology, as it is sometimes called). Philosophy of mind usually focuses on broader and generally metaphysical questions whereas philosophy of psychology deals with questions that are more closely related to the actual research conducted by cognitive scientists and neuroscientists. A quick look into introductory books about these subjects suggests that philosophy of mind deals with subjects such as the mind-body problem, intentionality, consciousness and physicalism, namely, topics that deal with metaphysics of the mind. See, e.g., Crane 2001, Kim 1996. On the other hand, introductions to philosophy of psychology deal with topics like modularity of mind, folk psychology, mental representation, language of thought and questions of representational content. See, e.g., Botterill & Carruthers 1999; Bermudez 2005. However, in the end we cannot make a clear cut difference between these fields of philosophy and they are sometimes even introduced together. See Braddon-Mitchell & Jackson 1996.

[48] See Searle 1984, 1992, 2000, 2001 2004. For more criticism of cognitive science, see Fodor 2000, 2005 and answers from Pinker (2005a, 2005b). For an overview of these discussions, see Braddon-Mitchell & Jackson 1996. Stainton 2006 is a good introduction to recent debates in cognitive sciences.

[49] For overviews, see Chalmers 1999; Rosenberg 2004.

[50] For explanation, see, e.g., Craver 2007; Woodward 2003a, 2003b.

[51] Wilson (1998) argues for a comprehensive and unified scheme of all scientific knowledge and inquiry. Dennett (1995) makes similar points as well. Evolutionary Psychology argues for "conceptual integration" or "vertical integration" which would make social and behavioural sciences mutually consistent and continuous with natural sciences (Cosmides & Tooby & Barkow 1992). The relative independence of special sciences is defended by Fodor (1974, 1991a, 1997), for instance.

adaptationism, for instance - have created fierce debates that are far from over. These considerations suggest that CSR should not be understood as a firmly established scientific discipline, but rather as a loosely related set of assumptions and approaches spanning over different disciplines that might face considerable revisions in the future. In other words, there is no single, universally accepted theory that is the cognitive science of religion nor is there a methodological manifesto or a creed which would be professed by all those who are associated with CSR. Finally, it must be pointed out that the study at hand is not intended as an overview of the diverse philosophical questions and problems presented in the preceding paragraphs. Rather, I will take up some of these questions and problems to the extent to which they are relevant for understanding the prospects and boundaries of CSR as well as the criticisms that have been directed against it.

My study will proceed as follows. In chapter 2 (Cognition and Culture), I will focus on the recurring methodological assumptions of CSR writers by contrasting their approach with other approaches to religious beliefs and practices. We will see that the assumptions of CSR writers are not uniform, but rather consist of general "rules of thumb" and shared antipathies towards hermeneutical and sociological approaches prevalent in current religious studies. In this chapter, we are thus operating on the level of auxiliary theories of CSR. Chapter 3 (Religion and Cognition) summarises the core claims and theoretical contributions of CSR writers and examines criticisms levelled against them. The subsequent chapters take up two problems that come up in the first two chapters: the problem of scope and the problem of religious relevance. In chapter 4 (The Problem of Scope), I will outline what I call the problem of scope, that is, the problem concerning the boundaries and scope of application of CSR explanations. Further, I will point out how the answer to this problem depends heavily on our philosophical views concerning explanation and integration of disciplines and draw inspiration from current discussions in philosophy of science that might help us with the issue. Finally, chapter 5 (The Problem of Religious Relevance) will examine the problem of religious relevance, that is, the question of the religious impact of CSR theories. This question is interesting because it can be used as leverage to reveal the philosophical assumptions of CSR writers and those who interpret CSR's results. In conclusion, I will summarise the points made along the way and reflect on the future prospects and boundaries of CSR.

2. Cognition and Culture

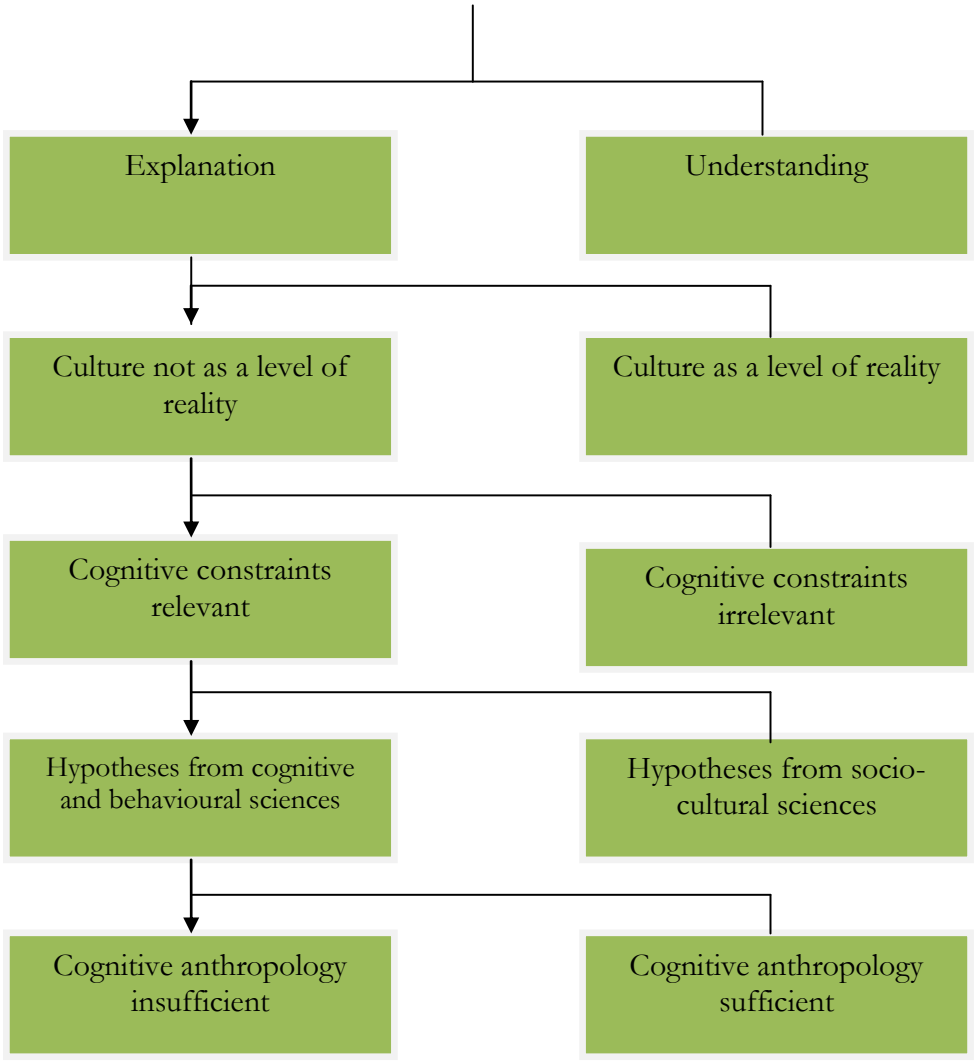
This chapter will focus on the recurrent methodological background assumptions of CSR writers. In his *Cognitive Aspects of Religious Symbolism* (1993), Boyer presents a useful list of five methodological claims that are, in his view, central for the whole project. I will discuss each claim in their respective sections and, although these claims are very general in nature, they are, I will argue, more or less shared by CSR writers. This treatment has two functions: firstly, it is to situate the CSR methodologically in the nexus of existing approaches to religious phenomena; and secondly, it is supposed to show how CSR writers themselves understand their relationship to existing approaches. The reader would do well to remember, however, that I will not go through all possible approaches to religion, because this task would be too much for obvious reasons. Instead, I have compared the CSR to approaches that the scholars in the CSR themselves criticise. Furthermore, my account is based on how the scholars in CSR see their methodological assumptions: critical analysis is not the function of this chapter. So, with these restrictions in mind, we can now turn to the five methodological claims as formulated by Boyer:

(1) The study of religion is explanatory in nature, rather than interpretative.
(2) Culture is not an independent level of reality. Religious phenomena consists of nothing more than special configurations and distributions of people's ideas, discourse and action.
(3) Cognitive study of religion assumes that cognitive constraints (universal properties of the mind-brain) are relevant.
(4) Relevant properties of human minds are approached by formulating independent hypotheses of the human mind. Hypotheses are not to be formulated on the basis of cultural data acquired in socio-cultural sciences in an *ad hoc* manner, but rather the hypotheses should be grounded in the cognitive and behavioural sciences.
(5) Religious representations differ from everyday domains of knowledge such as folk psychology and folk biology. Cognitive science of religion is needed because the theories of cognitive anthropology are not sufficient.[52]

Boyer's claim can also be presented as a step-by-step diagram where every step rules out another methodological position. When a step on the left hand side is taken, a possible step on the right hand side is ruled out.

[52] Boyer 1993a, 7.

Figure 2. Five methodological choices and their alternatives (Boyer 1993a, 7).



Section 2.1 examines Boyer's first claim, namely, the claim that the study of religion should aim to explain rather than to understand religion. The claim implies that the phenomenon of religion is not to be considered as *sui generis*, as a category of its own. It also entails that the study of religion cannot be independent of other social science disciplines (such as anthropology or sociology) or natural sciences (such as cognitive science or neuroscience). Thus religion is, in CSR, considered a part of human culture and human nature – that is, religion is seen as a natural phenomena. Section 2.2 describes the implications of Boyer's second claim in detail. CSR writers argue that the domain of culture and society depends on non-cultural and natural factors such as psychological mechanisms. Indeed, the whole enterprise of the socio-cultural sciences (to which the study of religion belongs to) cannot proceed without help from the behavioural and natural sciences. Most CSR writers adopt Dan Sperber's idea of cultural epidemiology as a framework which integrates the study of culture to cognitive psychology. Furthermore, Sperber's epidemiology provides a way to re-conceptualise the whole socio-cultural domain in naturalistic and materialistic terms. Section 2.3 describes Boyer's third and fourth claim and their implications. CSR writers argue that the architecture of the human mind/brain strongly constrains the acquisition and transmission of representations and thus explains why some representations achieve population-scale distribution – that is, become "culture". Hypotheses that concern the

cognitive architecture of the mind/brain should be adopted from cognitive sciences and other behavioural sciences, rather than from social sciences. Finally, section 2.4 continues to discuss the architecture of the human mind and describes how some CSR writers apply evolutionary hypotheses in explaining the origins of human cognitive architecture and its culture producing capabilities.

Boyer's fifth claim (existing social sciences, such as anthropology or sociology, are not sufficient to explain religious phenomena) is the topic of chapter 3. This claim implies that there is, after all, a place for a science of religion and there are phenomena in the world that can legitimately be called religious. These phenomena require their own field of research, namely, the study of religion. Although CSR writers claim that the study of religion should be more closely integrated with other social and behavioural sciences, it does not endorse elimination of the study of religion.

2.1. Explanation and Understanding

Boyer's first methodological choice is made between two approaches that are supposedly alternatives, namely, between understanding the meaning of religious ideas and actions and explaining them in terms of non-religious patterns of behaviour. He insists that if we take contemporary cognitive sciences into account, then the basic assumptions behind approaches that endorse strong forms of "understanding" or interpretation turn out to be insufficient, or at least misguided. Rather than attempting to understand the "meaning" of religious ideas and behaviours in terms of those who have them, we should aim to explain causally why religious ideas and behaviour exhibit certain recurrent patterns. Furthermore, he claims that currently available explanatory and naturalistic theories of religion are not enough to do the job even though they possess valuable insights. The greatest shortcoming of previous approaches is that they do not take the human mind into account.

The historical and philosophical background of the explanation/understanding distinction is highly complex and keeps coming up in different parts of this work. The distinction revolves around the methodology of the humanities and social sciences which deal with human action, beliefs and human products.[53] Two strands of this complex set of problems interest us here. First, there is the insistence of the hermeneutical scholars on the strong separation of the humanities from the natural sciences which is based on a certain notion of human action. Secondly, there is the question of whether religion has its own "essence": several scholars of religion have claimed that scientific enquiry into religion should proceed by methods that take account of this "essence" which is argued to be irreducible to non-religious categories such as biology or sociology.

According to Boyer, the core of the interpretative or hermeneutical approaches is the claim that cultural phenomena in general and religious phenomena in particular are somehow

[53] According to Russell McCutcheon (2002), there are four possible positions which can be adopted concerning the relationship between insider/outsider problem in the humanities and social sciences. According to hermeneutically oriented scholars (1), the study of human ideas, cultures and actions should be conducted with a special method, "understanding", because humans are creative and as a result their products such as cultures and religions do not exhibit simple patterns and cannot be subsumed under general laws. The naturalist (2) insists that human behaviour, cultures and ideas are parts of the natural world and as such they exhibit law-like patterns and can be explained by theories that posit entities and processes that are outside of the subject's first-person point of view. Methodological agnosticism (3) represents an intermediate position between the first two when it claims that the scholar of human actions and cultures should deliberately avoid making value or truth judgements. Finally, there is the position – usually associated with strong forms of postmodernism (4) – which is basically a sceptical version of the first position. According to hermeneutically oriented scholars, it is possible to understand why people think and do what they to, whereas the postmodernist acknowledges the tentativeness of all understanding, because the observations of the observer are necessarily intertwined with self-referential statements of the observer.

special and as such they cannot be subjected to causal explanations of the type that natural sciences successfully endorse. The reason for the rejection of causal explanation by the hermeneutical approaches, in Boyer's view, is the claim that cultural and religious phenomena cannot be understood in terms of physical phenomena, but rather they inhabit a world of their own – the world of meaning. However, as plausible this premise might seem, it is a mistake, Boyer claims:

> The hermeneutic stance is based on the fundamental premise that phenomena of meaning cannot be the object of explanation because they cannot be causally related to other, notably physical phenomena. Against this framework, the "naturalised" view of cultural phenomena is based, precisely, on the assumption that "meanings", or in less metaphysical terms, thought events and processes, are the consequence and manifestation of physical phenomena.[54]

The explanatory point of view, Boyer insists, grounds cultural phenomena, such as religions, in natural properties, namely, properties of human minds, their environments and so on.

In order to understand why Boyer argues for a naturalistic approach to human culture and religion – that is, an approach that emphasises the continuity between human actions, cultures and ideas on the one hand and natural phenomena such as human biology, psychology and ecology on the other – we should take a brief look at the hermeneutical approach against which he is reacting.

Boyer names the anthropologist Clifford Geertz as one of the most eminent representatives of the interpretative approach. According to Geertz, human action cannot be causally explained in terms of physical events because human action occurs in a meaningful context of ideas and reasons.[55] In his classic article *Thick Description: Towards an Interpretive Theory of Culture* (1973) he points out that his concept of culture is a semiotic one. He writes:

> [b]elieving, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of a law but an interpretive one in search of meaning.[56]

Geertz seems to be claiming that the descriptions of these "webs of meaning and significance" cannot be given in terms of observable behaviour and insists that such behavioural descriptions must be informed by "thick descriptions". Geertz borrows the term "thick description" from philosopher Gilbert Ryle who uses it to highlight the difference between action descriptions and behaviour descriptions.[57] Behaviour consists of reactions, but actions have reasons and intentions that supersede their physical descriptions. His famous example involves two boys which both contract their eyelids rapidly: in one, this is an involuntary twitch; in the other, a conspiratorial signal to his friend. As movements they are identical but the difference in terms of meaning is enormous: one is a communication with a special message and the other is meaningless.[58] If the idea of thick description, namely, that describing actions includes descriptions of the reasons and intentions of the actors

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[54] Boyer 1993a, 8.

[55] Geertz's anthropological theory and his theory of religion can be found in essays collected in his *Interpretation of Cultures* (1973). In his numerous later works, he develops the themes presented in these essays. See, e.g., Geertz 2000a, 2000b. For an overview of Geertz's methodological assumptions and his approach to religion, see Pals 1996.

[56] Geertz 1973, 5.

[57] Ryle 1971.

[58] For the whole story, see Geertz 1973, 6-7.

themselves, is taken seriously, then, Geertz argues, we should see actions as interconnected in a web of cultural meaning. He writes that

> [c]ulture, this acted document, thus is public, like a burlesque wink or a mock sheep raid. Though ideational, it does not exist in someone's head; though unphysical, it is not an occult entity. ... Once human behaviour is seen as (most of the time; there *are* true twitches) symbolic action – action which, like phonation in speech, pigment in painting, line in writing, or sonance in music, signifies – the question as to whether culture is patterned conduct or a frame of mind, or even the two somehow mixed together, loses sense. The thing to ask about a burlesque wink or a mock sheep raid is not what their ontological status is. ... The thing to ask is what their import is: what it is, ridicule or challenge, irony or anger, snobbery or pride, that, in their occurrence and through their agency, is getting said.[59]

The point is here that culture can be seen as if it is a text or a document.

Later in his article Geertz opposes what he calls ethnoscience or cognitive anthropology, which claims that culture is located in the heads of individuals and it can be described in terms of knowledge structures. According to Geertz, this claim is a form of "cognitivist fallacy", which reduces culture to individual's knowledge of culture. Instead he claims that cultural products, such as Beethoven's string quartet, are not "in anybody's head", but rather they are public since meaning is public.[60] The aim of anthropology, in Geertz's terms, is to enlarge the universe of human discourse by describing – giving thick descriptions of - how cultures as systems of construed signs provide a context for meaningful human actions. In Geertz terms, "Understanding a people's culture exposes their normalness without reducing their particularity"[61]. Finally, Geertz points out that in addition to interpreting social discourse, anthropological description is dealing with microscopic events: anthropologists are dealing with particular persons, events and actions rather than whole societies or civilizations. Thus Geertz is highly sceptical towards all attempts to construct some sort of complete theory or an image of some culture or society as a whole; the data that the anthropologist can gather deals with individuals and their actions.[62]

Now, some points have to be made explicit before we go forward. Notice how Geertz's analysis leads to the rejection of causal explanation. In his view, there can be no causal theory of actions because intentions and reasons do not exhibit law-like regularities. Instead of seeking and comparing general patterns of behaviour across cultures, we should, according to Geertz, go as deeply to the micro-level, to particular actions, as possible. This rejection of causal explanation also entails the rejection of prediction as an aim of anthropology: theories in anthropology uncover the conceptual structures that inform subjects' acts and construct a system of analysis which shows how such structures stand out against other determinants of human behaviour.[63] Such theories will not predict future actions or cultural development. In addition to not being predictive, such theories do not

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[59] Geertz 1973, 10.

[60] Geertz 1973, 11-13. Geertz' assumption that meaning is essentially a public than rather than private can be traced back to Wittgenstein who famously argued against the possibility of a "private language".

[61] Geertz 1973, 14.

[62] Geertz 1973, 20-23.

[63] Geertz 1973, 27. Note that Geertz does not in any way believe that only culture determines human behaviour. Humans have a psychological and biological nature which is innate to all humans but that nature has no direction or self-control: human nature without cultural symbolic systems is functionally incomplete, "a chaos of spasmodic impulses and vague emotions". Culture is needed to give a direction and means to deal with natural impulses. See Geertz 1973, 55-83, 99.

make progress in the same way that natural sciences do: cultural analysis is always incomplete and contestable; it refines the discussion rather than creates a consensus.[64]

Geertz approach is deeply rooted in a certain notion of human action – a notion that rises from the tradition of hermeneutical philosophy.[65] This notion includes the claim that when we are explaining human actions we are explaining something different than movements of physical objects. Philosopher Georg Henrik von Wright systematises these assumptions in his book *Explanation and Understanding* (1971). The basic idea is that accounts of human actions include normative elements that are lacking from causal explanations. Instead of causal explanations that seek general laws and are unable to grasp the particularity and the meaningful context of human actions, we should aim at rational or intentional explanations. The normative judgement included in action descriptions, von Wright holds, is based on the assumption that humans are rational agents, that is, humans have reasons to undertake certain actions and these reasons involve goals and beliefs about those goals. Note the normativity of this statement: a human agent has a reason to believe or act, if given her other psychological states, the belief or action in question is justified. Understanding the action consists of explicating this justificatory link. Thus actions are explained by describing the goals that the actors set out to achieve and the beliefs which they had about how those goals are best met. What makes actions different from mere behaviour is, therefore, their teleological or intentional nature. The connection between beliefs, desires and actions is made by what von Wright calls practical reasoning which was made famous by Aristotle under the title of the "practical syllogism".[66] The job of the one who attempts to understand an actor is to reconstruct the practical reasoning behind the actor's action.

What Boyer disapproves of in this whole scheme is that it presupposes that reasons, beliefs and inferences cannot be accessed from a third-person perspective, that is, in terms of psychology or biology. Instead of allowing metaphysical dualism of this kind, he suggests that reasons, beliefs and inferences should be seen as mental representations processed in the physical brain. This is a move from implicit dualism between the mind and the body and between psychology and culture to a more naturalistic (or materialistic) view facilitated by the cognitive sciences:

> What is new about the cognitive science 'paradigm' is that it makes at the least the *principle* of the connection intelligible, by observing that the rule-directed manipulation of tokens of abstract symbols by machines of whatever nature (mechanical, electronic or biological) can simulate some regularities in thought processes. In other words, the shift to 'physicalist' or materialist interpretation of cognition is made possible, because cognitive science has at least a minimal 'causal

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[64] Geertz 1973, 29.

[65] Hermeneutics have been a central topic of the continental tradition, where it has been developed by writers such as Paul Ricouer (see, e.g., Ricoeur 1981) and Hans-Georg Gadamer (1975). For a historical overview, see Palmer 1969. See also Bleicher 1980. On the analytic side, hermeneutical reflections have stemmed from Wittgenstein's later philosophy and its applications to the social sciences especially by Peter Winch (1958, 1970).

[66] Von Wright's practical inference (1971, 96) is of the following form. From the premises that "from now on A intends to bring about p at time t" (goal, desire) and "from now on A considers that, unless he does a no later than time t´, he cannot bring about p at time t" (belief), we can infer that "as soon as A thinks time t´ has arrived, A sets himself to do p, unless he forgets about the time or is prevented." Von Wright's systematisation of the hermeneutical position basically just spells out our folk psychological commitments in the language of scientific methodology. At this point, we should remember that both Geertz and von Wright understand causal explanation in terms of the Deductive-Nomological model of explanation. They argue that causal explanation requires the existence of universal laws of nature (as the D-N model suggests) and as it seems that such laws are not available in the case of most human actions we should conclude that the whole notion of causal explanation of action should be abandoned. Today, however, most philosophers have abandoned the D-N model of explanation and see no major problems in interpreting actions as a result of causes, some mental and some non-mental. We will return to this topic in chapters 4.3 and 4.4 at some length.

> story' to explain how thought processes can be actualised in material processes, as well as some practical implementations of that story.[67]

What Boyer – and other scholars in the CSR as well – want to argue here is that human actions and their products such as cultures and religions need not be considered only as a class of first-person objects, but rather are at least to some extent open to third-person analysis that is based on natural categories. In this sense, cultural and religious ideas are not out of reach of the natural and psychological sciences.[68] The precise extent to which human action should be explained in terms of non-intentional factors is at this point left relatively open. All the CSR wants is to refute the claim that non-intentional factors play no a role in explaining human action and cultures at all. We will return to this topic at length later.

We can now turn to the second relevant aspect of the explanation/understanding divide: the problem of "religious essence" or, as it is sometimes put, the *sui generis* nature of religion. As I already pointed out, the CSR assumes that non-intentional, natural factors should play a role in explaining the recurrent features in religious behaviour and thinking. This claim implies that enquiries into religion should not be limited to approaches that start from some religious "essence" behind all religion. Rather than presuming some general underlying principle of all religion, such as the "sacred" or "holy", we should approach religious ideas and behaviours as natural products of non-religious and non-cultural (natural) factors. Naturalistic theories that attempt to explain recurrent patterns in religious ideas and behaviours should link religious ideas and behaviours to non-religious and natural factors.[69]

Such naturalistic theories contrast heavily with *sui generis* theories. These scholars - sometimes also called anti-reductionists or religionists - claim that religious ideas and behaviours are spiritual and imaginative creations that are highly resistant to explanations based on non-religious or psychological, social or biological factors. Mircea Eliade, for instance, insists that such "reductionist explanations" miss the religious nature of religion, that is, the aspect of the sacred. Eliade's program also attempts to describe the recurrent patterns in religious symbols in different cultures and religious traditions: religious beliefs and practices symbolise the sacred in different ways. The task of the scholar of religion is to interprets these systems of symbols and analyse them by comparing them to symbols of the same type in other cultures and traditions. The results of these analyses should be relevant or at least acceptable to religious subjects themselves.[70]

Geertz's theory of religion expresses similar sentiments. His claim is that religion should be considered as a collection of sacred symbols that synthesise people's ethos and their world view. Thus

> [i]n religious belief and practice a group's ethos is rendered intellectually reasonable by being shown to represent a way of life ideally adapted to the actual state of affairs the world view describes, while the world view is rendered emotionally convincing by being presented as an image of an actual state of affairs peculiarly well-arranged to accommodate such a way of life.[71]

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[67] Boyer 1993a, 9.

[68] See also, Atran 2002, 4-10, Sperber 1996, 9-16. Lawson and McCauley (1990, 17) insist that explanation and understanding do not rule each other out, but rather they belong together: we should include both in our explanatory scheme.

[69] Boyer 1994a, 4-9.

[70] Pals 1996 158-192. See also Eliade 1960, 1971.

[71] Geertz 1973, 90.

In short, Geertz is arguing, that religious symbols connect a particular way of life and a specific metaphysic and thus sustaining both of them. He reduces his approach to religion to a definition which states that religion is

> (1) a system of symbols which act to (2) establish powerful, pervasive, and long-lasting moods and motivations in men by (3) formulating conceptions of a general order of existence and (4) clothing these conceptions with such an aura of factuality that (5) the moods and motivations seem uniquely realistic.[72]

As we have already seen, in Geertz's terms, symbols are carriers of meaning that can be publicly observed and understood. Religious activities involve symbols that create moods and motivations, that is, liabilities to perform particular classes of actions or have feelings of some particular kind and increase the probability of persons' falling in certain moods, such as "reverential" or "worshipful". What makes these symbols, moods and motivations religious is that they refer to something that is of the most universal and ultimate kind, some transcendent order. Transcendent order is needed because chaos – lack of moral certainty and analytic capabilities - threatens human life everywhere. What is important in the idea of transcendent order, Geertz maintains, is that it sustains faith in the intelligible world: no matter how strange or painful things are, they are somehow understandable. Religious man thus moves from a perception of disorder to believing in fundamental and ultimate order thus taking a religious perspective on the world. This religious perspective is aimed towards what is "really real", an ultimate metaphysic, and connecting it to a certain way of life.[73]

Both Geertz and Eliade can be criticised along the lines of Sperber in his early book *Rethinking Symbolism* (1975). According to Sperber, the problem is that such approaches assume that religious ideas symbolise some hidden meanings rather than straightforwardly refer to the external world. Religious ideas, in this scheme, are symbols whose hidden meaning the observer interprets with a specific method. Sperber also points out that such symbolic interpretation also presupposes the existence of a special religious domain where the laws of normal reasoning do not apply and thus recreate the distinction between religious and non-religious. There are two fallacies here, argues Sperber: the "domain-specificity fallacy", and the "cryptological fallacy". With the domain-specificity fallacy Sperber refers to the assumption that religious thinking is based on different cognitive mechanisms than everyday thinking. The fallacy here is that some kind of "religious cognition" is presumed even though no psychological evidence exists. Opposing this view, Sperber argues that "symbolism" is not domain-specific and it operates on cognitive mechanisms that can be found in ordinary thinking as well. Second, if one considers symbolic ideas as substitutes for other ideas, one has committed the cryptological fallacy. The trouble, again, is that there is no psychological evidence that would reveal the existence of these hidden, unconscious processes.[74] The result is that both central assumptions of the *sui generis* approaches, namely, that there exists a special religious domain of thinking and that there is some essence in all religion, seem to be mistaken.

We can now summarise the results of the previous discussion. First of all, CSR rejects the idea that religious ideas and behaviours are non-natural, namely, that natural factors, such as psychology and biology, do not play a role in explaining them. Instead, it claims that there is at least a minimal causal story behind the formation of religious ideas and practices. Second, from the assumption that a minimal causal story is possible, it follows that the religious domain is not completely independent from other, non-religious and natural

[72] Geertz 1973, 90.
[73] Geertz 1973, 91-123.
[74] Boyer 1993a, 23-27; Sperber 1975, 85-148.

domains. Therefore, *sui generis* approaches that presume a special essence of religion must be only partially true, if not mistaken completely.

2.2. Cognition and Culture

Boyer's second methodological choice is made between two mutually exclusive positions. According to the first position, cultures and religions are "levels of reality", that is, they are somewhere over and above individual psychological processes. As we have already seen, for Geertz culture cannot be "reduced" to what people think about culture. The second position - endorsed by Boyer and other CSR writers – emphasises naturalism: rather than being "levels of reality", cultures and religions are a special class of cognitive processes. In short, there is no gap between culture and cognition: they are, in fact, identical. I will begin by giving a short description of one popular form of the "level of reality" position and proceed to contrast it with CSR's position.

Traditionally, positions according to which cultures, religions and societies exist relatively independently of individual minds are called methodologically holistic. One classical example of such an approach is Emile Durkheim's sociological program. Durkheim's methodology is based on two claims: the first claim is that the nature of society can be systematically studied, and the second claims that the social world consists of "social facts" that are external to the individual. Whereas a natural scientist studies the facts of nature, sociologists study the facts of social life that are as stable as natural facts. So in this scheme, societies (norms, institutions) have priority over individuals. Further, Durkheim's program proposes that these social facts can be explained by describing their function and beneficial effects in the society. Durkheim's theory of religion illustrates his methodological convictions neatly: religion, in his view, is integral to all societies. At the heart of religion is a distinction between the sacred and the profane which is symbolised in the collective behaviour of the community. Durkheim then claims that the sacred is in fact an image of the community itself: by worshipping the sacred reality, the community is really symbolizing the structure and the priority of the community over the individual.[75]

Although holistically oriented sociology often assumes, as Geertz does, that cultural systems are extra-individual, it does not assume, contrary to Geertz, that human action and culture require a special method of understanding. On the contrary, Durkheim sees no qualitative difference between natural and social sciences. Differences are in scope rather than in methodology. If social facts should be approached as facts of nature, then sociology should be considered as an explanatory endeavour: patterns of human action are explained by invariances in the structures of societies. For the purposes of explanation, the methodological holist adopts a functionalistic stance: the existence of an institution, norm, or a practice is explained by its beneficial consequences to society in general. In other words, the holist explains macro-level events (cultures, societies) with other macro-level events. As a consequence, individual actions with their micro-level causes do not interest the holist. Finally, we must emphasise that methodologically holistic social science is naturalistic in the sense that it assumes that societies are parts of nature even though biological or psychological causes do not explain certain features of societies. The rationale behind this approach seems to be that when the complexity of a social system reaches a certain level, it surpasses the intentions and behaviours of individual humans.[76]

According to Boyer, the holistic reasoning contains several problematic psychological claims. First, the relationship between the descriptions of normative cultural systems and what individuals actually think and do is vague. An anthropologist can say, for instance, that

[75] Pals 1996, 88-118.

[76] For defences of this type of social sciences, see, e.g., Kincaid 1997 and Little 2007.

the Zande tribe believes that the capacity of witchcraft only inherited from the mother's side. The anthropologist's claim is based on interpretations made from native behaviour and native statements of their own ideas. However, in the course of this interpretation the anthropologist brings in his implicit, folk psychological assumptions of, e.g., rationality and the connection between beliefs and actions (rational explanations described in section 2.1) that may distort the picture considerably: the interpretations of the anthropologist are not necessarily identical with the actual representations in natives' heads.[77] Furthermore, when the holist assumes that cultural realities are distinct from individual representations of them, she completely ignores the way in which human cognitive capacities influence cultural realities. Boyer writes that

> [t]he fact that psychological realities are "shared" by many people, more precisely, that they have important similarities in many people, does not by itself make them non-psychological, or implies an essential difference, between "ideas", "desires", "inferences", etc., as described in anthropology and the corresponding objects in psychology. It suggests, on the contrary, that cultural anthropology should comprise some hypotheses about the mechanisms whereby ideas are represented, stored and transmitted.[78]

Boyer's point is here that anthropological theories (theories of culture and theories of religion) have implicit psychological assumptions and that these assumptions are not necessarily true in the light of cognitive science. A psychologically more plausible approach would begin by describing how the processes of human cognition constrain cultural content.

In addition to making problematic psychological assumptions when presuming the independence of cultures, societies and religions, the holist grounds her theory of religion on the idea that there can be a general or universal principle that explains all phenomena under the category "religion":

> The hypothesis of rich universals has often led anthropologists to adopt generative models, in the specific sense explained above. They posit certain processes, either mental or social, such that their operation would be sufficient to account for the occurrence of those supposedly universal religious ideas.[79]

Several scholar of religion have suggested that religion everywhere should be explained in terms of its essence - principles like the "sacred" in Eliade or the "holy" in Otto. Holists, like Durkheim, suggest that religions serve a certain function in all societies, that is, they uphold social cohesion.[80] The problem with these explanations is that they presume the existence of

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[77] Boyer 1993a, 11-12. Boyer distinguishes what he calls "epistemic" from "cognitive" approaches. In epistemic approaches, individual beliefs are seen as parts of a way of thinking or a mode of reasoning characteristic of the domain in question. In the case of religion, an epistemic approach would assume that religious thinking and reasoning constitute a category of its own or a particular religious world-view. The cognitive approach, however, does not confuse the anthropologist's interpretative descriptions with the real representations in native's heads as the epistemic approach does: "A cognitive description of religious representations should focus on the mental representations involved, rather than on their abstract descriptions in terms of "theories," "conceptions", "worldviews," and so on. Such intellectual constructions do *not* constitute cognitive phenomena; they constitute their analytical description, from an epistemically optimal viewpoint. Otherwise, whatever explanations we put forward are likely to be about imaginary objects rather than real processes." Boyer 1994a, 51.

[78] Boyer 1993a, 13.

[79] Boyer 1994a, 13.

[80] Boyer claims that existing naturalistic theories are not satisfactory because they all make the "magic bullet" mistake, that is, they presume that there is one principle that can be invoked to explain all religious phenomena. Boyer (2001, 6-30) describes at least four different groups of naturalistic theories of religion. The first

events and processes that are not acknowledged by other fields of research, such as psychology. Durkheimian social facts cannot be observed in psychology and the same thing goes for "urges" or "needs" postulated by other theories. In all cases, finally, there is one "magic bullet" that explains all there is to explain about religion. Contrary to "magic bullet" approaches, Boyer suggests that we should not presume that "religion" is a homogeneous category at all, but rather a collection of different kinds of activities, events, concepts and representations. As there can be no single explanation for individual representations of things as diverse as rituals, god-concepts, religious specialists, misfortune and so on, there cannot be a single "theory of religion".[81]

One final point should be made. If the category of religion does not pick out an entity in the world, how can we say that it picks out anything at all? Boyer's answer is that there really are recurrent patterns in transmission and processing of representations that seem to have something to do with what we usually call religion. Ideas about non-observable agents and their communications with ordinary humans, beliefs that a non-physical component of a person survives death, rituals associated with non-observable agents are all are cross-culturally widespread in human populations.[82] These patterns do not necessarily coincide with what we normally call religion, but that does not really matter, in Boyer's view, as long as they can be identified with scientific categories and explained.[83]

In sum, one could say that, in Boyer's view, "magic bullet" theories of religion are based on dubious psychological assumptions of distinct domains of thinking or modes of reasoning. We should instead hold that religions, societies and cultures do not exist as non-physical systems outside human mental processes but the other way around: it is the structure of human mental capacities that makes some ideas stable in populations and thus candidates for being "social facts". Thus, Boyer claims, in order to study religion, we need an account of how the human mind actually forms and transmits ideas.[84] The tools for such

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group starts from the explanatory function of religious ideas: religion functions as explanation of natural and psychological phenomena. The second group of theories explains religion by referring to the comfort and security that religion brings about in a world full of turmoil and death. The third group refers to the social function of religion: religious ideas increase social and moral cohesion. Finally, the fourth group of theories explains religion as neglect of human rationality. In addition to the "magic bullet" mistake, the main problems of these theories are as follows. First, religious explanations do not really explain anything, instead they create relevant mysteries. Second, religion creates terror as much as security: supernatural worlds can be terrifying as much as they are comforting. Third, social and moral orders are independent from religion because they are based on spontaneous intuitions of the mind that would exist without religion. Fourth, religions are not results of neglected rationality because everyday thinking neglects rationality as much as religious thinking. Lawson & McCauley (1990, 32-44) make the same points with slightly different typologies. They categorise current theories of religion as intellectualistic, symbolistic or structuralistic. Intellectualistic theories correspond to the first group of theories that Boyer describes and symbolistic and structuralistic theories to the third group. For an overview of historical naturalistic theories of religion, see Preus 1996.

[81] Boyer (1994a, 40-42) calls the assumption that religious ideas constitute a system "theologistic bias". Theologistic bias is a tendency to assume that religious beliefs exist as parts of a theological system with abstract claims such as "gods exist". This bias is mistaken for several different reasons, Boyer argues. (1) Religious representations do not necessarily consist of general principles, but, e.g., of particular episodes. (2) Religious representations are context bound. This means that they are difficult to describe in general or abstract terms. (3) Religious representations – as well as other representations that people have – are not necessarily consistent at all. (4) Religious representations have individual variations and individuals might be sceptical about their truth.

[82] Boyer 1994a, 29-37.

[83] In the study of religion, the definition of religion is a hotly debated topic. Some scholars of religion - e.g. Russell McCutcheon, and Benson Saler - have argued that scholars create religion as they observe it. This would imply that religion is an academic construct, not a something "in the world". See McCutcheon 1997, viii; Saler 2000, 212-13. If this claim were true, it would seriously undermine religion as an analytic category. Although the CSR does not assume that religion is an autonomous, non-physical entity in the world, it claims that the category of religion can be meaningfully regarded as picking out something in the world.

[84] Boyer's critique of approaches in anthropology of religion is mainly borrowed from Sperber. See, e.g., Sperber 1985; Sperber 1996, 32-55, 77-97.

selective explanations are given by Sperber in his epidemiology of representations which we will describe next.

In the beginning of his *Explaining Culture* (1996), Sperber draws an analogy between explaining culture and explaining the spread of diseases, that is, "epidemiology":

> Though the word 'epidemiology' is long and rare, the idea it expresses is simple and general. Say you have a population (for instance, a human group) and some interesting property (for instance being diabetic, having white hair, or believing in witches) that the members of this population may or may not have. An epidemiological approach would consist in describing and explaining the distribution of this property in this population.[85]

The epidemiology of representations presupposes that culture consists first and foremost of contagious ideas. To explain culture is to explain why certain ideas are more contagious than other ideas. The task of the epidemiology of representations is to describe and explain a property of some human population, or the whole human population, that makes the distribution of some ideas easier than others.[86] Sperber continues to clarify the idea:

> All epidemiological models, whatever their differences, have in common the fact that they explain population-scale macro-phenomena, such as epidemics, as the cumulative effect of micro-processes that bring about individual events, such as catching a disease. In this, epidemiological models contrast starkly with 'holistic' explanations, in which macro-phenomena are explained in terms of other macro-phenomena – for instance, religion in terms of economic structure (or conversely).[87]

Boyer introduces the idea of a "constraint" to the scheme: Constraints are factors that contribute to the selection process of representations and, thus, explain the recurrence and patterns in transmission of representations:

> The notion of *constraint* plays a central role in a cognitive account of religious ideas. Selective models are based on the assumption that a set of general constraints can be described, such as they would constitute a plausible causal explanation for the observed recurrence and patterns of transmission. They would explain, in our case, why certain types of cultural representations are more likely than others to be acquired, represented and transmitted.[88]

In the case of religion, these constraints should constitute an explanation for the fact that religious representations have high frequency of acquisition and transmission. Therefore, explaining cultural phenomena, such as religion, consists of describing the cognitive systems involved in the formal processing of input information and constraints which these systems impose on the structure and content of the information.[89]

In Sperber's account, culture consists of physical movement of objects, the movement of human beings (behaviour), and different kinds of representations. Representations are relations between three factors: that which represents, that which is represented and the user of the representation. Basically there are three types of representations: cultural representations, public representations, and mental representations.

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[85] Sperber 1996, 2.
[86] Sperber 1996, 1-6, 77-98.
[87] Sperber 1996, 2.
[88] Boyer 1994, 14.
[89] Boyer 1994, 10-21.

Mental representations in individual minds have priority over public and cultural representations. Public representations are created from individual mental representations by sound (spoken language) or by some other tools (text, pictures, artefacts, etc.) Moreover, public representations presuppose a system of interpretation which should be considered as mental representation rather than abstract, non-psychological entities as in hermeneutic approaches. Some public and mental representations can become so contagious that they spread and, in the end, are entertained in almost all minds in a certain group. In this case, these widely distributed representations are called cultural representations, that is, culture.[90] Such an account highlights why there cannot be unambiguous criteria for what is religion and what is not: even in principle, there is no way of distinguishing individual representations from cultural representations, because the latter are widespread groups of the former. As there are no abstract entities such as "Navaho culture", there are no abstract religions such as "Islam". Both are abstractions of a large number of individual similarities between individual representations.[91]

Sperber's epidemiology is developed in a larger context of explaining human communicative performance. Communication in general aims to create a resemblance between the communicator's and the audience's thoughts. Sperber insists that the process of transmission of representations, namely, communication, is not a process of copying but a process of constant transformation and distortion. In order to represent the content of representation A, the mind produces a representation B with similar content. The content of the representation A is interpreted not duplicated or copied. Thus interpretation is a representation about a representation based on the similarity of content. Communication is hence a process of interpretation that goes (1) from public representations to mental and (2) from mental to public. Individual mental representations are somewhat easy to interpret, even scientifically, but the problem of anthropology has been that anthropologists usually form interpretations of collective representations which are, in fact, not entertained as such by any member of the studied group.[92]

The interpretation of representations is based on relevance. Sperber holds that the "relevance theory" is an attempt to explicate Paul Grice's claim that communication is based on expressing and recognizing intentions. The communicator of a message produces evidence of his intentions from which the receiver attempts to infer the intention. Relevance is something that the human cognitive system is geared for. Any input-information can be relevant to an individual depending on his context and already acquired information. The more positive cognitive effects a piece of information has the more relevant it is. Positive cognitive effects consist of making a worthwhile difference to the individual's representation of the world. However, the greater the processing effort required by a representation, the less relevant the input will be.[93] The principle of relevance is crucial for the explanation of the recurrence of religious representations as we will see in section 3.1.

At this point, it is useful to notice the sort of naturalism which these writers offer. The central tenets of Boyer's and Sperber's attempt to connect cognition and culture (and religion) are the rejection of ontological dualism and the introduction of causal explanation

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[90] Sperber 1996, 24-25. Cognitive psychologists usually argue that mental representations are more basic than public representations. It must be possible for a public representation to be represented mentally but not the other way around: one can have mental representations without any public expression. Traditionally, social scientists and social constructivist philosophers have argued that public representations are more basic because the meaning of a representation is a public thing, it transcends the individual. The latter position draws heavily on Wittgenstein's argument against the possibility of private language.

[91] In Sperber's view, cultures are not "closed systems", but wide open: cultures and religions do not have clear boundaries and they are not necessarily stable "systems" at all.

[92] Sperber 1996, 31-36.

[93] Sperber 1996, 83-85. Sperber presents a detailed account of communication and relevance in Sperber & Wilson 1988. For an updated and shorter version, see Sperber & Wilson 2004.

and ontological materialism that goes with it. First of all, Boyer and Sperber reject not one dualism but two: the distinction between culture and the mind and the distinction between the mind and the brain.[94] Both writers insist that anthropology of religion should take cognitive sciences as their paragon and reject non-physical causes and effects. According to their "minimal materialism", the entities and processes posited in theories of anthropology and theories of religion should be either observed or deduced from accepted theories in physics, natural sciences or psychology.[95] The basic idea here is that Boyer and Sperber want to reject the possibility that there could be explanatory principles, events or facts in social and cultural phenomena that are invisible to psychology or impervious to "lower-level" analysis. If one does not insist that cultural systems or their properties are materially realised in individual minds and public artefacts, then one is adopting a dubious form of idealist ontology, they claim. Idealists, in Sperber's view, have two different and ontologically distinct worlds: the social world and the natural world. Atran sums up the basic idea nicely:

> [n]aturalism in cognitive anthropology describes the attempt to causally locate the commonsense objects of study – cultures – inside the larger network of scientific knowledge. This approach posits no special phenomena, ontologies, causes, or laws beyond those of ordinary material objects and their inter-relationships. It studies the structure and content of representations, both private and public, and their variously patterned distributions within and between human populations.[96]

Sperber's "minimal materialism" is basically just a different title for what philosophers call "non-reductive materialism" in which mental representations are considered as functional states of the human brain. The non-reductive materialist holds that individual representations are products of material interactions between other representations and the environment without being identical with a single physical state of the brain.[97] We will return to different forms of materialism and physicalism later at length. For now, it is sufficient to remember that cognitive systems produce internal representations about the environment on the basis of physical interaction with the environment, as Sperber stresses. Based on these interactions, mental representations are connected to what they represent, thus, they have semantic properties, a meaning. Public representations are connected to what they represent only through the meaning attributed to them by their users: public representations have meaning only through being associated with mental representations. Similar meanings are attributed to public representations to the extent that people have the same knowledge; people think in a similar way. It is this similarity described in abstract terms which we in everyday life call culture: culture is a name for similarity.[98]

Materialism of this kind leads to a certain notion of causal explanation. As we have seen, the epidemiological study aims to identify mechanisms that enhance the probability of

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[94] These two interfaces – between culture and mind and between mind and brain – correspond to relationships between socio-cultural and behavioural sciences and behavioural and biological sciences respectively.
[95] Atran 2002, 4-13; Boyer 2001, 116-123; Barrett 2004, ix; Sperber 1996, 12-16.
[96] Atran 2002, 10. Atran goes on to claim that "[c]ultures and religions do not exist apart from the individual minds that constitute them and the environments that constrain them, any more than biological species and varieties exist independently of the individual organisms that compose them and the environments that conform them. They are not well-bounded systems of definite clusters of beliefs, practices, and artifacts, but more or less regular distributions of causally connected thoughts, behaviors, material products, and environmental objects. To naturalistically understand what "cultures" are is to describe and explain the material causes responsible for reliable differences in these distributions"
[97] Sperber (1996, 12-15. 24-27) does not commit himself to type-type identity between brain states and mental states. For him, some form of material realisation thesis and type-token identity are enough to guarantee the possibility of genuine materialism.
[98] Sperber 1996, 77-82.

some representations achieving a cultural level of distribution and to produce a causal explanation of cultural phenomena. An explanation is

> mechanistic when it analyses a complex set of causal relationships as an articulation of more elemental causal relationships. It is naturalistic to the extent that there is good ground to assume that these elementary relationships could themselves be further analysed mechanistically down to some level of description at which their natural character would be wholly unproblematic.[99]

Sperber goes on to emphasise that he is not after universal reduction of the cultural to the psychological and the psychological to the biological and so on, but rather he is seeking to close the gap between natural sciences, behavioural sciences and social sciences.[100] However, the assumption that only entities and processes that can be identified through the natural sciences have "causal power" can be problematic. We will return to this point later when we discuss the topic of explanation more carefully.

To sum up the discussion so far we can say that the CSR rejects all approaches that assume that cultural systems and artefacts, religions, norms and so on can be described and explained independently of psychological processes that uphold them. Thus, it rejects attempts to approach cultures and religions as levels of reality or coherent systems of ideas. Instead, Sperber and Boyer offer a selectionist framework which links cognitive processes with macro-level cultural phenomena and explain culture in terms of the distribution of representations. Finally, their rejection is based on a certain type of ontology, namely, non-reductive materialism, which requires material the realisation of culture.

2.3. The Architecture of the Mind: Modularity and Domain Specificity

My purpose in the previous section was to describe how writers in the CSR construe the relationship between cognition and culture. I have attempted to show that they reject the idea of cultures and religion existing independently of individual minds and the cognitive processes going on in those minds. This result shows how these writers align themselves with Boyer's third methodological position according to which cognitive constraints are relevant for explaining cultures, societies and other macro-level phenomena. This section explicates Boyer's third and fourth methodological claims. First, Sperber's and Boyer's approach outlined in the previous section rests on the idea that cultural level phenomena are grounded in cognitive processes going on in individual minds. Second, it claims that we should not regard anthropology or other social sciences as legitimate sources of psychological data because they are saturated by everyday psychological assumptions that are sometimes in conflict with the way psychological science understands how human minds work.

As we have already seen, Boyer insists that anthropologists usually have implicit psychological assumptions that can contradict the findings of the cognitive sciences. Folk psychological assumptions, such as the validity of rational explanations, may sometimes be misleading or even mistaken. The basic assumption of what Boyer calls the "anthropological theory of non-cognition" is that "people who grow up in a certain group just "absorb" whatever cultural models are held valid in that culture, and that this process of absorption is both simple and passive."[101] In addition to the assumption that minds just copy ideas that are around, there is another folk psychological assumption that seems mistaken in the light of

[99] Sperber 1996, 98.
[100] Sperber 1996, 98-100.
[101] Boyer 1993a, 14.

recent developments in the cognitive sciences, that is, the assumption that the processes of the human mind are transparent for those who have them. Whereas hermeneutical approaches, such as Geertz's, emphasise what is normally called "first-person authority" in judging what is going on in an individual's mind, cognitive science insists that some cognitive processes are totally invisible to individuals themselves. They are what Fodor calls "doxastically impenetrable", or in more commonsensical terms "going on in the mental basement".[102] Boyer emphasises the same point when he writes that "this is the most important point – the workings of the inference systems are not something we can observe by introspection"[103]. In sum, the folk psychological understanding of the mind is misleading in two senses: first, it assumes that minds do not have an effect on the information they process, and second, it assumes that introspection has complete access to the processes that form our representations.[104]

It is useful to realise that what we see here is a certain problem that in the philosophical literature usually goes under the name of the "interface problem". The interface problem concerns the relationship between the common sense – or folk psychological – understanding of the mind and the explanations of thinking and behaviour given in the cognitive sciences and neurosciences. Different solutions to this problem produce different kinds of ideas on how human thinking and behaviour should be explained. For our topic this problem is very important and we will return to it at length later (section 4.3). For the time being, it suffices to note that writers in the CSR usually try to avoid folk psychological notions as much as possible.

Instead of a "general purpose learning machine" that is transparent to introspection, we humans, CSR writers claim, have minds that actively shape, select and distort information in different ways in different domains of knowledge.[105] Barrett sums up this view of the human mind as follows:

(1) Basic functions of the human mind do not vary across cultures because human minds emerge from similar biological foundations (brains) in basically uniform natural environments.
(2) Human minds are not "general purpose learning machines", but rather house a great number of cognitive systems that perform highly specialised tasks.
(3) Specialised cognitive systems shape our perceptions, inferences and sometimes even distort them rather than faithfully just recording "what is out there".
(4) Specialised cognitive systems produce recurrent patterns in human thinking and behaviour by constraining and informing possible ways of thinking and acting. Thus,

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[102] Boyer (2001, 93-94) illustrates the "mental basement" claim by the simile of an English mansion where the guests upstairs are oblivious to the operations of the staff working downstairs. For the guests, meals appear in time and clothes appear washed, but to achieve this remarkable efficiency there has to be numerous, highly specialised people working downstairs. In this sense, Boyer concludes, our relationship to the workings of our mind is the same as quests' understanding of the staff working in the basement. Barrett's analogy of choice (2004, 3) is a workshop: the human mind is not a general purpose tool, but rather it houses great numbers of different, specialised tools, that operate automatically and outside of introspection for most of the time.

[103] Boyer 2001, 18.

[104] This, of course, raises the question of causes and reasons of behaviour. Boyer (2001, 94-05) writes that "[a]nother misconception is that we can explain people's having particular thoughts if we can understand their *reasons* for holding them. ... But the mind is a complex set of biological machines that produces all sorts of thoughts. For many thoughts there are no reasonable reason, as it were, except that they are the inevitable result of the way the machines work." In other words, folk psychology can mislead us to think that all our thoughts have reasons, Boyer argues. Recall that the fact that some beliefs have causes rather than reasons is not controversial. Rather, the controversial question is whether causes "go all the way up" in the sense that reasons do not enter into the picture at all.

[105] See, e.g., Atran 2002, 57-59; Boyer 2001, 93-106.

> recurrent patterns in, say, religious thinking and acting can be explained by evoking these systems.[106]

What follows is an overview of human cognitive architecture and information processing as they appear in writers in the CSR. I will show how the somewhat diverse views of the human mind that different CSR writers have can be organised under the notions of "modularity" and "domain specificity". This is to clear the "conceptual landscape", as it were, by unifying the terminology of the CSR. Although the latter notion is more central, I will begin by providing a brief sketch of the "modularity hypothesis". But before we can go into the modularity hypothesis itself, we must make a brief detour into the basic assumptions behind the cognitive approach to human thinking.

The "computational/representational theory of mind" (CRTM) which forms the backbone of CSR theorising about the mind is based on the idea that thinking is a process where symbolic representations are formed and computationally processed in according syntactic rules. I will use the CRTM as an umbrella term for several different approaches that regardless of their differences more or less share three assumptions: computationalism, representationalism and functionalism.[107] The CRTM is a theory about thinking and reasoning. First, a theory of mind is computationalist in as much as it assumes that thinking (mental states and events) is based on the processing of symbols according to their syntactic properties. In this sense, thinking resembles the algorithms of digital computers: symbols are organised and altered according to their physical or some other syntactic (non-semantic) properties. Second, a theory of mind is representationalist when it assumes that symbols form complex representations that are the subjects of computational processes and that such representations are connected to the world (have semantics). According to this view, intentional mental states are relations between a thinking subject and representations of states of affairs. For example, believing that my friend loves me is to be related to the representation "my friend loves me" in a certain manner (holding it true). Such a state would be distinguishable from a state in which I hope that my friend loves me: the representation is the same but the relation would be different (hoping). In sum, the main point of representationalism is that there are symbolic structures (be they conscious concepts, propositions or intentions or sub-personal mechanism, processes, perception or the like) in the mind that can be distinguished from each other on the basis of their semantics. Finally, the CRTM is based on a functionalistic account of the nature of mental states. Functionalism comes in many different forms but the basic idea is that mental states are not identified by their internal constitution, but rather by the way the mental state functions as a part of some larger system (or theory). Functionalism as well as the whole CRTM attempts to form a mediating position between dualism and type-identity theory. An additional feature of functionalism is that functional states are multiply realised: mental states as functional states are distinct from their material implementation. Thus, in principle the same mental state can be realised in human brains, Martian brains, silicon chips or some other material.[108]

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[106] Barrett 2007, 59.

[107] For overviews, see, e.g., Thagard 1996 and Bechtel & Graham 1998.

[108] For overviews of functionalism and computationalism, see, e.g., Braddon-Mitchell & Jackson 1996 and Crane 2001. David Marr (2982), for instance, exemplifies computational analysis well when he insists that computationally operating information processing systems can be analysed in three distinguishable but interrelated levels. The first level is computational. First, the task performed by a cognitive system is broken down into individual problems that need to be solved in order to perform the task (functional decomposition) and second, the possible constraints of any solution to the information-processing problems must be worked out. Thus, computational analysis produces accounts which describe system's input information and output information (or behaviour). The second level of analysis is the algorithmic level: algorithmic analysis produces an account of the individual information-processing steps that are needed to get the system from the input-state to the output-state. For instance, the input might be the distribution of light in the visual field and the output

The "modularity hypothesis" concerns the architecture of cognition, that is, the nature of cognitive systems and their relationships to one another. The hypothesis itself can be formulated in several different ways, but the basic idea is that the human mind consists of "modules" (units or individual systems) that are relatively independent and have specialised functions. Modularity of the mind is one of the most hotly debated topics in cognitive science and in the philosophy of cognitive science today. The debate is basically about the extent, rather than the existence, of modularity: is it the case that only some cognitive processes are modular or does modularity go "all the way up"? The difficulty of the debate is, however, that definitions of what it takes for a process to be modular are different.[109]

Philosopher Jerry Fodor formulated the idea of modularity in his *Modularity of Mind* (1983), in which he claimed that the mind consists of central processes, such as reasoning, judgement and decision-making, that are not modular and peripheral systems, such as different kinds of visual and perceptual systems, that are modular. According to Fodor's view, the input processes, operating in the fringes of cognition, can be reasonably held as modular, but most of the information processing work is still done by central processes – simply put: thought (or conceptual processes) – that are necessarily non-modular because they flexibly combine and process outputs of numerous input systems. "Fodorian" modules are identified by having properties such as domain-specificity (specialisation), mandatory application (reflex-type response), shallow outputs (non-conceptual outputs), fast operation, informational encapsulation (modular processing is not affected by other processes), fixed neural architecture (distinct regions in the brain) and specific breakdown pattern.[110]

Recently, a certain version of the modularity hypothesis has been advocated by Evolutionary Psychologists as well as by Sperber, who argue that not only peripheral processes of the mind are modular, but the central processes as well. The massive modularity hypothesis extends the idea of modular structure to all cognitive processes whereas Fodor's original idea of modularity denied the possibility that "higher-level" thought could be understood in modular terms.[111] However, as Barrett and Kurzban point out, massive modularity theorists loosen Fodor's rigid definition for modular processing: in Steven Pinker's view, for instance, modules are characterised by functional specialisation: "modules should be defined by the specific operations they perform on the information they receive, rather than by a list of necessary and sufficient features."[112] Similarly, Carruthers also ends up endorsing a view according to which

> modules might be isolable function-specific processing systems, whose operations are mandatory, which are associated with specific neural structures, and whose internal

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would be a group of three-dimensional representations of the environment around the perceiver. The third level of analysis is implementation: the main task of implementation is to find a physical realisation for the algorithm. Physical realisation means identifying the physical structures (such as packs of neurons) that perform the computational task. For an overview, see Bermudes 2006, 17-27.

[109] For an overview of this messy debate, see Barrett & Kurzban 2006. See also the debate between Peter Carruthers (defending massive modularity), Jesse Printz (arguing against all modular architecture) and Richard Samuels (defending restricted modularity) in Stainton 2006.

[110] It must be pointed out, however, that in Fodor's view, it is not necessary for a module to have all the aforementioned features. Processes can be modular to "a greater or lesser extent". For Fodor, the most important features of modules were informational encapsulations and automaticity. Recently, Fodor (1997, 2000) has argued fervently against those who endorse the massive modularity thesis and criticised the cognitive sciences in general. Especially revealing is his debate with Steven Pinker who defends massive modularity. See Fodor 2005 and Pinker 2005a, 2005b.

[111] The most extensive and systematic defence of massive modularity is Peter Carruthers' *Architecture of the Mind* (2006a). For other defences, see Pinker 1997 and Sperber 1994, 1996, 2005.

[112] Barrett & Kurzban 2006, 629. Carruthers (2006b) also points out that if the massive modularity thesis adopts the Fodorian definition of modules, then the idea of "massive modularity" is surely impossible, and also suggests functional specialisation as the defining characteristic.

> operations may be both encapsulated from the remainder of cognition and inaccessible to it.[113]

This definition of a module allows massive modularity theorists to seek modular processing across the board without specifying how modules actually process information (Fodorian mandatory application or informational encapsulation).[114] As the difference between the Fodorian definition (automaticity and informational encapsulation, for instance) and the massive modularity definition (functional specialisation) of modules is considerable, Barrett and Kurzban conclude that these positions are mainly talking past each other. Finally, massive modularity theorists assume that there are great (even vast) numbers of modules. Take Cosmides and Tooby, for example, who write that "our cognitive architecture resembles a confederation of hundreds or thousands of functionally dedicated computers (often called modules)"[115].

So, we might conclude that the massive modularity view entails three claims: (1) cognitive processes are to some extent (if not completely) modular, (2) modules are functionally specialised and mostly automatic systems and (3) modules come in great variety and numbers. One of the reasons why the massive modularity thesis has been defended by Evolutionary Psychologists and others has been its assumed evolutionary applications. We will return to these applications in the next section (2.4.). Generally speaking, the reason why I find the modularity debate interesting is that it is connected to the way in which human behaviour is to be explained. The Fodorian scheme in which modules inhabit only the peripheral regions of the mind leaves much room for conscious reasoning and decision-making, whereas massive modularity reduces this "wriggle room" considerably: most reasoning and decision-making processes are, according to this view, strongly constrained by automatic mechanisms. This is also a topic which we will take up later at length.

With this preliminary sketch in mind, we can now argue that writers in the CSR insist that (1) there are specialised systems that have cognitive effects across the board from perceptual to conceptual processes that (2) most operations of these specialised systems are inaccessible to introspection and that (3) most specialised systems operate automatically. Apart from these claims, CSR writers have slightly different takes on modularity and especially the terminology.

Sperber allies himself closely with Evolutionary Psychologists when he claims that there is no reason for us to presume that higher-level thought processes could not be, at least partially, modular. In his view, it is possible that there are modules that take conceptual input and produce conceptual outputs. The end result is that the architecture of the mind is quite complex:

> We are now envisaging a complex network of conceptual modules. Some conceptual modules get all their input from perceptual modules, other get at least some of their input from conceptual modules, and so forth. Every piece of information may get combined with many others across or within levels and in various ways (though overall conceptual integration seems excluded).[116]

So, in Sperber's mind, there seems to be no central process, or one central cognitive system in the Fodorian sense. Rather, the mind is a mixed bag of more or less interconnected, semi-

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[113] Carruthers 2006b, 7.
[114] Sperber (1994, 2005) shares Pinker's view of functional specialisation and massive modularity. For Sperber's arguments against Fodor, see 1996, 119-150.
[115] Cosmides & Tooby & Barkow 1992, xiv.
[116] Sperber 1996, 130.

automatic modules that all have their specialised functions and domain-specific input conditions.[117]

Given the close relationship of Atran and Boyer to Evolutionary Psychology and Sperber's massive modularity view, it seems plausible to think that their view of modularity is close to the massive modularity thesis. Boyer's term of choice for a module is "inference system", because he is especially interested in concept formation and in the way in which cognitive systems inform the process of acquiring and representing conceptual information:

> So the mind does not work like one general "let's-review-the-facts-and-get-an-explanation" device. Rather, it comprises lots of specialized explanatory devices, more properly called *inference systems*, each of which is adapted to particular kinds of events and automatically suggests explanations for these events.[118]

Again, the idea is that the architecture of the human mind is modular to a large extent, that is, the mind is a "bundle of explanation machines" that operate relatively independent of each other. Moreover, even the term "inference system" clearly implies that modular systems process not only perceptual input, but conceptual input as well. Similar assumptions about modular structure can be seen in Atran as well when he writes that

> [a] naturally selected, mental module is functionally specialized to process, as input, a specific domain of recurrent stimuli in the world that was particularly relevant to hominid survival. The module spontaneously produces, as output, groupings of stimuli into categories as well as inferences about conceptual relationships between these categories.[119]

Furthermore, Atran uses the term "module" throughout his works quite consistently and connects it explicitly to the notion of massive modular architecture.[120] This is especially clear, if one looks at Atran's anthropological works on folk taxonomies of biological species where he argues that such taxonomies exhibit cross-cultural similarity because they are all based on similar underlying assumptions.

For Barrett, the central notions are those of a "mental tool" and a "specialised system":

> The notion that the adult human brain possesses an array of specialized tools is scarcely debated anymore. Instead of having one powerful multipurpose mental tool, we have a number of specialized ones. Most of the *mental tools* operate automatically, without any conscious awareness. They efficiently and rapidly solve lots of problems without concentration or angst, much the same way that computer programs solve problems in a swift, effortless fashion.[121]

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[117] Sperber shares Pinker's view of modules as functionally specialised units. Sperber (1996, 120) defines a module as "a genetically specified computational device in the mind/brain ... that works pretty much on its own on inputs pertaining to some specific cognitive domain and provided by other parts of the nervous system (e.g. sensory receptors or other modules)". For Sperber's whole account, see his 1996, 119-134.

[118] Boyer 2001, 17.

[119] Atran 2002, 57.

[120] Atran (2002, 57-58) distinguishes four types of modules: (1) perceptual modules that process sensory input, (2) primary emotion modules that respond to particular stimulus-situations automatically by producing certain bodily states (fear, etc.), (3) secondary affect modules that produce "higher-level" emotions and (4) conceptual modules that have conceptual outputs of other modules as their inputs.

[121] Barrett 2004, 3.

Barrett seems to intentionally avoid using the term "module". However, his idea of a "mental tool" summarises the notion of module quite well: tools are functionally specialised and independent of each other. Barrett also maintains that there are specialised tools working not only in perceptual processes, but in conceptual processes as well. In his view, there are three categories of mental systems: categorisers, describers, and facilitators. Categorisers are systems that process sensory input and their function is to determine what sort of thing we have perceived. The "agency detection device", for example, looks for evidence of beings that act intentionally rather than only respond to stimuli. Describers are devices that automatically infer properties of any given object the categorizers have identified. Objects are automatically presumed to be solid, and bounded. For example the "agent describer system", known also as the "Theory of Mind", generates a host of intentional and mental descriptions of objects categorised as agents. Describers generate expectations even if the object itself is previously unknown. The third group of systems, facilitators, coordinates social activity and behaviour that depends in context and not merely on the identity of the things involved. For example the "social exchange regulator" tries to make sense of who owes what to whom.[122]

The previous statements from writers in the CSR suggest quite clearly that their modularity does not correspond to the Fodorian modularity for at least two reasons. First, CSR writers assume that modules, or mental tools, can have conceptual inputs and outputs, that is, they are not "shallow" in the Fodorian sense. Second, they exist across the cognitive spectrum: modular processing can be found everywhere in cognition.

The reason why I have dwelt on modularity this long is that the idea of modular architecture is crucial for understanding the notion of "domain specificity" which is, in turn, crucial for the CSR. Domain specificity can be understood as a claim about the way in which information is processed in the mind. Hirschfeld and Gelman summarise the idea very well:

> According to a long predominant view, human beings are endowed with a general set of reasoning abilities that they bring to bear on any cognitive task, whatever its specific content. Thus many have argued, a common set of processes apply to all thought, whether it involves solving mathematical problems, learning natural languages, calculating the meaning of kinship terms, or categorizing disease concepts. In contrast to this view, a growing number of researchers have concluded that many cognitive abilities are specialized to handle specific types of information. In short, much of human cognition is domain-specific.[123]

The connection between domain specificity and modular architecture becomes obvious at this point: if a cognitive system has a modular structure, it is necessarily domain specific. Note, however, that domains and modules rarely coincide: although all modules have their own domain-specific input conditions, domains are usually held to be more general and broader than the domain of a single module. The term "domain" itself is defined as "a body of knowledge that identifies and interprets a class of phenomena assumed to share certain properties and to be of a distinct and general type."[124] This definition would allow domains such as physical entities and processes, substances, living kinds, numbers, artefacts, mental states, social types and the like. According to this understanding, domains (1) partition our world (classifying things, concept formation), (2) operate as functional and widely distributed devices (cognitive competencies arise to solve particular adaptive problems) and (3) have dedicated mechanisms (modules operate outside conscious awareness).[125]

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[122] Barrett 2004, 3-6.
[123] Hirschfeld & Gelman 1994, 3.
[124] Hirschfeld & Gelman 1994, 21.
[125] Hirschfeld and Gelman (1994) trace the roots of domain specificity to several developments in different fields: (1) Chomsky's theory of generative grammar in linguistics, (2) modular approaches to cognition, (3)

The domains that interest the CSR most are folk (or intuitive) psychology, folk biology and folk physics, because such domains of intuitive knowledge strongly constrain our acquisition and formation of representations. According to Boyer, cognitive domains, or ontological categories in his terminology[126], form the background against which our categorisations of entities and processes in the natural world develop:

> Minds that acquire knowledge are not empty containers into which experience and teaching pour predigested information. A mind needs and generally has some way of organizing information to make sense of what is observed and learned. This allows the mind to go beyond the information given, or in the jargon, to produce *inferences* on the basis of information given. Complex inferences allow children and adults to build concepts out of fragmentary information, but inferences are not random. They are governed by special principles of the mind, so that their result is in fact predictable.[127]

The special principles that govern inferences are codified in sets of domain-specific knowledge structures that are based on the modular architecture of the mind. When we are talking about religion, the most important categories are, according to Boyer, the following: PERSON, ANIMAL, PLANT, and OBJECT.[128] The idea is that these categories correspond to inference systems that automatically produce expectations, that is, intuitions about entities and processes in the world and such intuitions guide and inform our learning.[129] Boyer gives a simplified example. If we say to a child that "a zygoon is a predator of hyenas", we do not have to tell to the child that "zygoons" eat, sleep, give birth to baby zygoons and so on, because the child automatically knows this. The reason is that the information "a zygoon is a predator of hyenas" activates inference systems dealing with the category ANIMAL and such inferences create a concept of "zygoon" based on default inferences of the category ANIMAL. Thus, intuitive knowledge – in this case, assumptions such as animals eat, sleep and give birth to babies similar to themselves – has a crucial function in creating new concepts.[130]

The category of PERSON is the most important one for it features prominently in religions.[131] The central idea here is that we have a large amount of cognitive machinery producing intuitions about persons as agents, their goals and their beliefs. As Atran puts it:

> Agents are entities that instigate and control their own actions as well as those of other objects and agents. Developmental and cognitive psychology have experimented with several related theories how humans come to make sense of one

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constraint studies in psychology, (4) studies of intuitive (or common sense) theories, (5) expertise studies, (6) animal studies and (7) cross-cultural studies.

[126] Boyer's terminology is quite unstable. On the one hand, he talks about templates, concepts and ontological categories (in 2001). On the other hand, he talks about domain-level concepts and kind-level concepts (as in 2002). Finally, in his earlier writings (1993, 1994) he does not refer to categories at all, but talks about conceptual structures. Nevertheless, the idea in all cases is the same: there are networks of pre-existing knowledge that inform and constrain the acquisition and formation of new knowledge and these sets of pre-existing knowledge are largely independent of cultural influence.

[127] Boyer 2001, 42.

[128] Boyer 2001, 78. There can be different sets of possible categories: Boyer also mentions categories of NUMBER and TOOL.

[129] Boyer 2001, 99-101. When a certain sort of information enters the system, it automatically triggers all the systems whose input-conditions the information fills. This is what is meant when an object is said to belong in a certain category. For example, a perception of a solid object activates the system processing information about solid physical objects and a perception of an agent triggers the "Theory of Mind" systems.

[130] Boyer 2001, 57-61.

[131] Boyer 2001, 60-61, 95-96.

another. An overarching theoretical framework has emerged, known as folkpsychology, naïve psychology, or theory of mind. The central idea is that people, and perhaps other animated objects, are *intentional agents* who act, and cause others to act, on the basis of *internal motivations*.[132]

Not only persons activate our folk-psychological machinery, but animals and other animate objects, such as dots on a screen do this as well.[133] We will return to this topic in the next chapter where I will describe the way in which the CSR explains the prevalence of agent concepts in religions.

Atran and Norenzayan have presented a useful matrix (table 1) of how to relate ontological categories to underlying domains of intuitive knowledge. Although it differs from Boyer with respect of the amount of categories, it indicates how ontological categories (and the modular systems that constitute them) are linked to domains of intuitive knowledge.

Table 1. Ontological categories and domains of intuitive knowledge (Atran & Norenzayan 2004).

	Domain of intuitive knowledge				
Ontological category	Folk-physics	Folk-biology: vegetative	Folk-biology: animate	Folk-psycho-logy: psycho-physical	Folk-psychology: epistemic
person	+	+	+	+	+
animal	+	+	+	+	-
plant	+	+	-	-	-
substance	+	-	-	-	-

In the matrix, "+" represents an activation and "-" a non-activation[134] of systems dealing with a particular domain in connection with a given category. For instance, when the category ANIMAL is activated, then several modular systems, such as folk physics, folk biology and folk psychology, start to produce inferences about animal bodies as physical objects and biological functions as well as goals and desires. We already described briefly how the category ANIMAL works in terms of folk psychological assumptions. Boyer gives further examples of how non-agent-like, solid objects, like rocks, trees, plants, and humans, activate folk physics. One of the basic systems of folk physics is a system specialised in generating intuitions about the behaviour of physical objects. In addition, there is a system specialized in physical causation between objects. The mind also contains a system that links together the function and properties of an object. For example, if an object's function is to beat something, it is automatically assumed that the object itself is harder than the things it is used to beat. It seems that animals possess some kind of mental tools that correspond to folk physics whereas only humans have highly advanced folk psychology. Humans, in general, are very efficient in representing the mental states of other humans and animals because humans

[132] Atran 2002, 59.

[133] There are several extensive discussions going on about the nature of folk psychology. For an overview of the debate, see, e.g., Carruthers & Smith 1996. One strand of the debate concerns the mechanism by which folk psychology operates: Do we attribute goals and beliefs (and mental states in general) on the basis of simulation (imagining what we would do in similar circumstances) or on the basis of a certain kind of theory (inferring from abstract principles)? The debate here is between "simulation theory" and "theory-theory". In the case of the CSR, at least Boyer and Atran seem to fall on the theory-theory side on the basis of their vocabulary. Other debates concern about how folk psychological terminology, such as the notions of belief, desire and goal, should be understood. Here the debate is mainly between realists and anti-realists. For a clarifying discussion of the notion of folk psychology, see Bermúdes 2005, 172-207.

[134] The most commonly used terms in CSR literature for the activation of an inference system (or a module or a mental tool) are "triggering" and "firing".

are innately social. The mind includes a vast number of social systems, such as the "agent detector device" and the "agent describer system". The function of folk psychology is to form representations of other people's representations, to attribute beliefs, desires and ideas to others in order to explain and predict their behaviour.[135]

Summing up the discussion so far, we can conclude that according to domain specificity the pre-existing structures of the human mind constrain acquisition and transmission of information in different domains. The mind is not a "blank slate" that simply copies all information around, the argument goes, but rather a collection of specialised subsystems that activate under certain conditions. Furthermore, the architecture of the mind is basically the same cross-culturally: when we are talking about how the mind works we are talking about systems that can be found in all normal human heads. The idea here is that the modular architecture and the domains of intuitive knowledge built upon them help organisms to adapt and understand the natural world in way which contributes to their survival. [136] This formulation points to evolutionary considerations which will be the topic of the next section.

2.4. Evolutionary Roots of Cognition and Culture

This section describes how CSR writers' ideas about cultural evolution and the modular architecture of the mind come together. Note, however, that not all writers have the equal amount of interest in this topic. Atran and Boyer put forward large numbers of evolutionary hypotheses whereas Barrett (and others) seldom pose(s) evolutionary questions. We will be focussing on Atran's and Boyer's ideas and as they have been strongly influenced by Evolutionary Psychology (EP) we will provide a very brief look into EP as well. The basic idea is that religious beliefs and behaviours are by-products of the modular cognitive systems and that each had an adaptive function in our ancestral environment. Rather than being an adaptation, religion is a by-product of systems selected for other functions.

At this point, it is very important to notice that evolutionary ideas are used in two different ways by CSR writers:

(1) Cultural evolution is conceptualised and explained in terms analogous to those of biological evolution.
(2) The emergence of the architecture of the human mind is explained in terms of natural selection.

The first issue was discussed in section 2.2 where it was pointed out that epidemiological and other selectionist models are based on an analogy between natural selection and cultural selection. The latter issue, however, is separate from the former and it opens up another domain of discussion that is connected with EP. Some clarity can be achieved in this issue by

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[135] Boyer 2001, 96-98. Sometimes Boyer suggests that we could call our categories "minitheories" of the world. His idea (1994a, 66-67) is based on a certain theory of concepts usually called the "theory-based" theory of concepts. See, e.g., Keil 1989. According to this theory, concepts form networks through causal connections (inferences) between concepts. Not only do concepts carve the world into different classes, but their connections are based on assumptions about the natural world. In this scheme, concepts and their networks are not just tools to understand the world, but they also carry information about the world.

[136] Boyer even talks about domains of intuitive knowledge as being a sort of natural "metaphysics" that resembles Aristotelian genus-species metaphysics. He (2000b, 291-292) writes that "the evidence suggests that concept acquisition most likely does not require a sound epistemic attitude, but rather some robust metaphysical prejudices, supporting quasi-theoretical inference processes that are in principle defeasible but in practice extremely stubborn. If such prejudices are a plausible outcome of evolution through natural selection, 'natural metaphysics' is the outcome of a species' particular history and of the species-typical needs of its members, and is therefore natural only relative to that particular species."

introducing a distinction between two interfaces that correspond to the interfaces of scientific disciplines and the interfaces of phenomena in the world. Although we will see later that equating of scientific disciplines with "levels" in reality is far from clear, we can nevertheless make use of such a distinction here. The first interface is between the human mind and cultural systems and the second between the human mind and biology. The latter interface is where EP comes in. Boyer and Atran, for example, introduce extensive evolutionary considerations on the latter interface – that is, the evolution of the human mind and culture – whereas Barrett does not seem to be interested in it at all. This distinction between these two interfaces reveals quite clearly that in order for CSR theories to function, they need only deal with the former interface, not with the latter.[137]

With these warnings in mind, we can begin by contrasting the "religion as a by-product of adaptations" claim of Atran and Boyer with the "religion as an adaptation" claim.[138] David Sloan Wilson, for instance, has argued for an adaptationist theory based on the idea of "group selection" in his *Darwin's Cathedral: Evolution, Religion and the Nature of Society* (2002).[139] Wilson's group selection theory starts from the idea that group-level attributes might have significant effects on the transmission of genes. Although genes are the basic means of transmission of an organism's design, individuals and groups are vehicles for genes to act on. Natural selection, in Wilson's view, works on multiple levels: the fitness of groups can affect to the selection of genes as well as genes affecting the fitness of the group. The explanation of religion can be given in these terms in the following way. It is claimed that religious practices enhance altruistic behaviour in human groups and when altruistic behaviour increases, then groups become more cohesive and integrated. It follows, the argument continues, that religious groups have a selective advantage over non-religious groups. In the long run, this would result in religious groups outlasting the non-religious ones, because religious groups are the ones whose genes get transmitted. In this view, religion as an altruistic device would, therefore, be somehow build into our genes.[140]

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[137] One might even go so far as to claim that there are two interpretations of CSR's relationship to Darwinian evolution. According to the first interpretation, CSR does not need evolutionary biology and hence it does not need to take the evolutionary background of the human mind and human culture into account. In this view, the closest scientific partners would be found from cognitive psychology and developmental psychology. According to the second interpretation, evolutionary considerations and especially evolutionary psychology are crucial for the CSR: CSR has a story to tell about the evolution of religion and the evolution of the human mind. Evolutionary considerations are almost completely missing from the 1990s works in the CSR. Lawson and McCauley's *Rethinking Religion* (1990), for instance, does not even have the word "evolution" in its index. Even in the case of Boyer's early works, *The Naturalness of Religious Ideas* (1994) for example, evolution comes up only when it is connected to discussions about selectionist models of explanation; evolution of cognitive systems is not discussed at all. Although Boyer went on in 2000s to discuss evolution, the divide between evolutionary and non-evolutionary preferences remained. Atran and Boyer clearly find such considerations important whereas Barrett, Lawson and McCauley do not. Barrett (2007, 59) just mentions briefly that "evolutionary theoretical foundation is not strictly necessary" for CSR. Based on our distinction between the two interfaces, we should agree with Barrett, but at the same time acknowledge that if CSR theorising were to be linked with evolutionary considerations, it would increase its plausibility.

[138] Sometimes these two views are called "spandrelism" (or by-product theory) and "adaptationist theory". The term "spandrel" comes from Stephen Jay Gould and Richard Lewontin who in their famous paper (1979) argued against the prevailing "adaptationism" of their time, namely, the claim that natural selection is the only driving force behind evolutionary change. Contrary to this view, Gould and Lewontin maintained that from the fact that an organism has in its current state an adaptive trait of some kind it does not follow that we should hold that trait as a product of natural selection. It may very well be an accidental by-product of an adaptation (or adaptations) or a product of some other non-adaptationist process (genetic drift, etc.).

[139] David Sloan Wilson should not be confused with the famous biologist Edward O. Wilson. Edward O. Wilson is very famous for his views on what he calls sociobiology (1975, 1998). Sociobiological accounts of religion are in fact continuous with group selection theories in the sense that they both explain religion in terms of its biological function.

[140] Wilson 2002. For group selection, see also Sober & Wilson 1998. There is an extensive discussion going on in the philosophy of biology about the possibility of different "units" or "levels" of selection. On the one

There are two central methodological assumptions underlying Wilson's approach that are also shared by most adaptationist theories of religion. The first assumption is that societies, norms and belief systems can be explained in terms of adaptation and selection pressures. Societies and cultures are patterns in human behaviour, the argument goes, and as such they are parts of our biological nature and products of natural selection. The second assumption is biological functionalism, namely, the idea that practises and social structures can actually be seen as properties of groups rather than individuals. These properties in turn are seen to enhance the fitness of the group that has them.

Atran has the most elaborate critique of adaptionist theories of religion (mainly sociobiology and group selection). In his view, the two aforementioned methodological assumptions are crucially flawed. The problem with the first is that it lacks mechanisms that connect genetic traits and cultural systems whereas the problem with the second is that it postulates norms, rules, social structures, or beliefs as units of selection.

According to Atran, group selectionists do not provide a proper mechanism which would show how the designs encoded in our genes influence cultural systems. Thus, adaptationist explanations of cultural, social or religious practices "leapfrog the mind" or are "mind blind". He writes that

> sociobiological accounts often invoke ordinary material causes (genetic adaptations for carnivorous behaviour) to explain ordinary material causes (cannibalism). Nevertheless, they fail to provide a hint of how the putative distal causes (genetic) enter into known material relationships with more proximate causes (mental and public representations) to actually produce the forms of behaviour to be explained (religious beliefs and practices are causally connected within and between human minds and bodies).[141]

The root of the problem is that the explanatory scheme of biological functionalism jumps from the beneficial effects of cultural practices to genetic inheritance. Further, the functionalist usually presupposes that social institutions and systems are "extra-individual", namely surpass individual psychology.[142]

The "mind blindness" of adaptationist theories of religion creates yet another problem, Atran argues. Even though adaptationist theories posit norms and rules as functional units of cultural selection, they fail to show how these norms and rules are represented in individual minds and how they causally produce behaviour. Atran argues that there is no psychological evidence for the existence of specially encoded knowledge structures that would correspond to norms or rules:

> Norms are not shared rules and human societies and cultures are not clustered and aggregated sets of rules that functionally determine some definitely bounded "social systems" or "cultural worldview". At best, norms are public representations that help to orient causal analyses of cultural phenomena – for the person in the street as well as for the social scientist – by stereotyping those public exhibitions and performances whose recurring tokens are especially relevant to social communication and coordination.[143]

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extreme, there are those, like D. S. Wilson, who argue for multi-level selection: selection can occur on many different levels, such as of the level ofgroups, societies and genes. On the other extreme, the "hard-liner" Neo-Darwinians claim that only genes are the proper units of selection. For a useful overview of the debate and relevant literature, see Lloyd 2005.

[141] Atran 2002, 202.

[142] Atran's critique of both sociobiology and group selection theories can be found in Atran 2002, 199-236.

[143] Atran 2002, 234-235. Atran continues to emphasise that norms and group-level traits are abstract notions, not natural kinds. By this token, the idea of cultures as superorganisms promoting their own survival – that is,

Hence we should not consider norms and rules as units of selection, but as abstractions of cognitive functions. In this view, norms, rules and cultural as well as religious systems are no more than abstractions of vast numbers of cognitive processes. Further, they should not be used to explain anything causally because as abstractions they cannot have physical effects. Shared norms and rules are only signposts of behavioural tendencies; this applies even to norms and rules considered as absolute or sacred. The behaviour of individuals and groups is not regulated by abstract representations but by intuitively generated representations based on particular situations. Norms and rules are abstract descriptions of these intuitions and function as creators of group identity. Without sharp boundaries or clear reference, norms and rules cannot replicate themselves to any degree required by Darwinian genes, Atran concludes.[144]

Instead of adaptationist accounts of the emergence of religion (or culture), Atran and Boyer suggest a "by-product" account. The basic idea is that recurrent features in religious beliefs and practices are considered as by-products of cognitive systems that have originally evolved for some other tasks. So there are two questions here: (1) how did the modular architecture of the human mind come about and (2) how does it explain recurrence in cultural evolution?

Boyer begins by stating that the starting point of EP is the evolutionary past of cognitive architecture:

> Once we realize that different species have different takes of what is around (different categories and inference systems), it makes sense to consider that this must have to do with the history of these different species - in other words, with *evolution*. Our inference systems may be there because they provide solutions to problems that were recurrent in normal human environments for hundreds of thousands of years. ... This matters because we bear the traces of this evolutionary past in many features of our behaviour and most importantly in ways our minds are organized.[145]

Cosmides and Tooby make the same point by claiming that the human mind/brain is a bundle of specialised modules and each module has been formed in the process of natural selection to solve a particular problem in our ancestral environment.[146] Note how this formulation neatly highlights the connection between of innateness (nativism) and massive modularity: as adaptations, modules are innate in the sense that they develop automatically for all normal humans. However, Boyer points out that we should stay clear of "naive" accounts of innateness according to which humans are somehow born with adult cognitive capacities. Rather than being somehow "already in the brain" at the point of birth, the modular architecture develops from "skeletal assumptions and biases" if the environment is right:

> [a] normal environment is indispensible to development if you have the right genetic equipment that prepares you to use resources from that environment, to build your

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increasing their "cultural fitness" – is vague because cultures are abstractions without sharp boundaries.

[144] Atran 2002, 199-235. For the same reasons Atran also rejects Dawkins' and Blackmore's Memetics. Memetics presupposes units of selection, "memes", which inhabit human minds. According to Atran, memetics, therefore, presupposes that human communication is a process of copying information. This is not true, Atran continues, because communication is a process where information is constantly reconceptualised and transformed. Further, memetics does not explain why some ideas are better replicators than others because it is "mindblind" as well. See Atran 2002, 236-243. For Sperber's critique of memetics, see Sperber 1996, 100-106; Sperber 2000.

[145] Boyer 2001, 116.

[146] Cosmides & Tooby 1997.

> teeth out of normal nutrients and to build up your syntax out of normal linguistic interaction with competent speakers.[147]

This is also the reason why, in Boyer's mind, it is futile to contrast nature and nurture: nurture does not produce anything without some material to work on and nature does not produce anything by itself. The end product (in this case adult cognitive capacity) is always a product of the interplay of many factors.[148]

The project of EP can be broken down into four stages. First, problems demanding adaptation in our ancestral environment are reconstructed. Second, hypotheses are formulated that deal with computational principles that allow the mind to solve these problems. Third, cognitive psychology and neurophysiology are used to test these hypotheses. Finally, theories that explain how specialised systems have developed from more general systems and how these systems provide selective advantages to those who have them are constructed.[149] Pinker's metaphor of choice, "reverse engineering", catches the basic idea very well: Scholars take the mind to pieces and try to find out how the different parts were created and for what purpose. Modern culture and ways we today use our minds and abilities that make everyday thinking possible are by-products of systems that were originally designed to solve different problems. Hence the slogan of Cosmides and Tooby is that "we have stone aged minds in our modern heads".[150]

Now the question is how it is possible for modules that were selected for other purposes to function in our contemporary environment which is very different from the environment where these modules supposedly were originally born. The answer that Evolutionary Psychologists as well as Boyer, Atran and Sperber give is, roughly, that at some point of human evolution, modules developed the capability of transgressing their original domains of function.

Let us begin with Sperber's arguments again. According to him, the recurrent patterns in human cultural diversity can be explained in terms of massively modular cognitive architecture. The basic idea is that "a cognitive module is an evolved mechanism with a distinct phylogenetic history"[151] In other words, every single module in the human mind has a distinct history and a specialised domain of function – this is what domain-specificity means. However, the original function of the module cannot be understood without accounting for the environment in which the organism lived. Thus, there must be a distinction between a module's proper domain and its actual domain.[152] Sperber writes that

> The *actual domain* of a conceptual module is all the information in the organism's environment that may (once processed by perceptual modules, and possibly other conceptual modules) satisfy the module's input conditions. Its *proper domain* is all the information that it is the module's biological function to process.[153]

Sperber goes on to point out that because humans constantly change their environment through culture and natural selection fails to keep up, it is unlikely that actual domains of conceptual modules correspond even approximately to their proper domains. It makes sense, in Sperber's view, to talk about cultural domains of modules in addition to actual and proper domains. A module's cultural domain is something that the module itself has created:

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147 Boyer 2001, 114.
148 Boyer 2001, 106-116.
149 Boyer 2001, 118.
150 Cosmides & Tooby 1997.
151 Sperber 1996, 123-124
152 Sperber 1996, 134-138.
153 Sperber 1996, 136.

> A cognitive module stimulates in every culture the production and distribution of a wide array of information that meets its input conditions. This information, being artefactually produced or organized by people themselves, is from the start conceptualized, and therefore belongs to conceptual domains that I propose to call the module's *cultural domain(s)*. In other words, cultural transmission causes, in the actual domain of any cognitive module, a proliferation of parasitic information that mimics the module's proper domain.[154]

Sperber's point here (buried under his rather obscure terminology) is that recurrent patterns in cultural evolution are by-products (or "parasites") of modules. Take music, for instance. It is highly plausible, in Sperber's view, that humans have modules that identify complex sound patterns, rhythms and pitch variation for the purpose of speech recognition. The proper domain of these modules is hence the acoustic properties of human communication. However, the input-output conditions of the proper domains of such modules can be stimulated artificially by other man made sounds that are more distinct such as steady rhythms and regulated pitch variations, thus giving birth to a rich cultural domain called music. In this way, music as a cultural domain (and actual domain of some of our modular systems) is a by-product (or a "parasite") of our modular architecture.[155]

When explaining how cultural variation could arise from massively modular architecture, Sperber also introduces the notion of "metarepresentation". The idea is that "humans can mentally represent not just environmental and somatic facts, but also some of their own mental states, representations and processes"[156]. Thus metarepresentations are understood as representations about the products of other conceptual modules.[157] The reason why metarepresentations are so important is that without them massive modularity theorists would not be able to explain why it is the case that most of our thinking and believing involves content that is not simply an outcome of one module or restricted to one domain of thinking. Writers in CSR use the notion of metarepresentation in different ways and employ different terminologies, but the basic idea is roughly the same, namely, that metarepresentational ability is crucial for the development of culture because it makes it possible for modules to be used radically outside their proper domains.

Boyer takes up Sperber's idea of metarepresentation when he talks about "decoupled cognition". He claims that humans can easily "decouple" cognitive processes from their standard inputs and outputs and use those systems to generate imaginary scenarios, form representations of fictional situations and characters and plan and predict the future, to name just a few. Further, communication (representing the intentions of others) and public and material representations (drawings, pictures, signs) depend on metarepresentational abilities. The ability to decouple cognitive systems from their original functions makes it possible to arouse these systems through mimicking their input conditions. Material art, for example, stimulates modules that are geared to discover shapes in the natural world by presenting distinct geometrical shapes and perfect symmetry that is not found in nature.[158]

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[154] Sperber 1996, 141.

[155] Sperber 1996, 138-146. For more examples, see Boyer 2001, 131-134.

[156] Sperber 1996, 71.

[157] Sperber holds that metarepresentational ability is a product of a specialised module which also provides the capability to ascribe mental states to other people, that is, folk psychology (or theory of mind). Hence metarepresentational abilities would be by-products of folk psychology. See Sperber 2000a.

[158] Boyer (2001, 129-131) and Atran (2002, 107-112) give numerous examples of how metarepresentation is necessary for "higher-order" cognitive functions. Boyer also refers to the archaeologist Steven Mithen (1996) who claims that about 75 000 years (give or take 10 000) a "symbolic explosion" happened and certain evolutionarily "useless" behaviours and objects such as burying rituals, rock paintings and statues started to appear. According to Mithen, the symbolic explosion was the latest human evolutionary step and this step

Boyer concludes that information and behaviour that mimic or stimulate the proper input-output conditions of our modular systems can easily be acquired and transmitted and thus becoming salient "cultural gadgets":

> [t]hese activities [cultural gadgets] recruit our cognitive capacities in ways that make some cultural artifacts very salient and likely to be transmitted. These salient cognitive artifacts can be extraordinarily primitive, like glass beads or pieces of shiny metal whose only merit is to provide unusual visual stimulus. But ideas too and their abstract relations can constitute such artifacts. ... Once we understand how brain evolution resulted in the design of a brain with these particular inference systems, we can better understand why humans are sensitive to *these* particular artifacts rather than others. That there are pure tones in music and symmetries in visual art is certainly no coincidence, given the way our brains were designed by evolution.[159]

In short, the explanation for recurrent cultural patterns, in Boyer's, Atran's and Sperber's view, is the evolutionary history of our species and especially our brains.

This section has discussed several topics. We began by looking at the critiques that the advocates of the by-product account have directed against the adaptationist accounts of the emergence of religion. The main critical point was that adaptationist accounts of cultural evolution do not explain how genetic traits have effects on cultural systems. To remedy this defect, the advocates of the by-product account suggest that the massively modular architecture of the human mind, which is itself a bundle of adaptations, gives rise to all cultural forms – religious or otherwise.

2.5. Evolutionary Landscape

In the previous four sections, we have looked into the auxiliary theories and hypotheses of CSR writers. My reason for all this has been to explicate and systematise the more or less implicit methodological assumptions of CSR writers. We examined the background commitments of CSR writers by looking at the first four methodological choices presented by Boyer. Section 2.1 described how CSR writers usually contrast their own approach with interpretative approaches and emphasise the role of causal explanation. The motivation behind this insistence, as we saw, was the assumption that there is no essential difference between the sciences and the humanities. Further, CSR writers also insist that religion is not *sui generis* in the sense that natural and behavioural sciences are totally unable to grasp it. On the contrary, they claim that natural and behavioural sciences may be highly relevant for the study of religion. In section 2.2, we examined how CSR writers understand the relationship between cognition and culture. The question was whether culture should be seen as a level of reality. The argument of CSR writers was that the socio-cultural "realm" or "level" should not be viewed as independent of the natural "realms". Again, it was argued that explanations for recurrent patterns in cultural evolution should not be sought at the socio-cultural level, but rather at the micro-level processes of human cognition. The section also provided a brief

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involved the emergence of the ability to transcend the borders of ordinary cognitive domains, what he calls symbolic thinking. This symbolic thinking (metarepresentation in Sperber's and Atran's terms and decoupling in Boyer's terms) creates the necessary background for the emergence of abstract thinking, signs and symbolic communication (language) and so on. See, e.g., Boyer 2001, 322-324. This is also the reason why, according to Boyer and others, the search for "a primitive" or original religion is futile. There is no primitive religion because there is no single moment of emergence of religion. As long as there has been symbolic thinking, there have been representations that can develop into religions. For discussion of origin scenarios, see Anttonen 2002 and Guthrie 2002.

[159] Boyer 2001, 133.

look into epidemiological models and their underlying ontology. Section 2.3 examined the two core ideas behind CSR's theory of mind, namely, the notions of modularity and domain specificity. CSR writers claim that we should not take the socio-cultural sciences as our source of data about the human mind. Rather, they argue that we should look to the cognitive sciences according to which the human mind is a collection of specialised systems that operate largely outside of our awareness. Finally, section 2.4 described the different uses of evolution in CSR arguments. We pointed out how Boyer's and Atran's understanding of the evolutionary background of cognition, culture and religion contrasts with adaptationist models. We also noted how closely they were linked to those of Evolutionary Psychology.

To sum up the discussion so far, we can say that CSR writers give an outline of a naturalistic and multi-disciplinary research program that is situated somewhere in between the disciplines of cognitive sciences, anthropology and the study of religion. This research program is committed to explaining recurrent patterns in religious thinking and behaviour as by-products of non-religious cognition. Atran highlights this basic idea neatly with his metaphor of a "evolutionary landscape":

> Think metaphorically of humankind's evolutionary history as a landscape formed by different mountain ridges. Human experience that lies anywhere along this evolutionary landscape converges on more or less the same life paths, just as rain that falls anywhere in a mountain landscape converges towards a limited set of lakes or river valleys.[160]

He then goes on to show how we could understand the biology of human beings – their bodies and their brains – and their environment forming the ridges of the landscape. Human thinking and behaviour - human cultures and religions included - adapt themselves to biological and ecological constraints. The result is that all human thinking and behaviour converge in the valleys of the landscape like falling rain. In this landscape, cognitive constraints form several different ridges: given enough time, cognitive systems, such as folk psychology, social interaction schemas and folk physics, channel the possible cultural and religious expressions towards certain convergent forms.[161]

[160] Atran 2002, 10-11.
[161] Atran 2002, 10-13.

Table 2. Approaches in the study of religion

Approach	***Methodology***	***Explanatory strategy***	***Ontology***	***Religion***	***Interest***
Interpretative approaches: Geertz, Eliade.	Dualism or pluralism: interpretation as a method.	Folk psychology: intentional explanation	Pluralism	Religion as a spiritual and personal creation	Increased understanding; less tension between groups.
Sociology of Religion: Durkheim.	Monism: methods from the natural sciences but different scopes	Macro-level: functionalism; micro-level: folk psychology. Holism	Dualism: socio-cultural facts are independent of natural facts	Religion as the glue of society	Predictive improvement; better social structures
Religion as adaptation: D.S. Wilson (group-selection).	Monism: same methods, same scope	Evolutionary biology, methodological individualism	Monism: everything is material or reducible to material causes	Religion as an adaptation increases social cohesion	Advance of scientific knowledge
Religion as by-product: CSR, EP.	Monism: same methods, same scope	Cognitive psychology, methodological individualism	Monism: everything is material or reducible to material causes	Religion as a by-product of ordinary cognition	Advance of scientific knowledge

We can now sum up the similarities and differences between the approaches that we have considered in the preceding sections. Recall that our discussions are by no means complete or exhaustive: there are many approaches to the study of religion that have not been discussed here at all. First, we should highlight the similarities between CSR and other approaches. We have already noted that some CSR writers, such as Atran and Boyer, seem to align themselves quite closely with Evolutionary Psychology, whereas others, such as Barrett, do not. However, it is still quite plausible to claim that even though we should not equate CSR with EP as some do[162], we should see EP as the closest ally of CSR in its current form because they share several background assumptions, such as domain-specificity, massive modularity and connect cognition and culture in similar ways. Further, the fact that CSR has much common ground with approaches, that view religion as an adaptation, can easily be overlooked due to the heated debates back and forth.[163] Underlying the debates, however, is a considerable body of shared assumptions concerning the nature of the scientific study of religion and the relationship between socio-cultural sciences, behavioural sciences and the natural sciences. CSR, EP and "religion as an adaptation" approaches all share the idea that the scope of natural and behavioural sciences can and should be extended to domains previously regarded exclusive as the domain of the socio-cultural sciences. Third, the most prominent concern in CSR, EP and "religion as adaptation" approaches is to produce theories that connect religious behaviour and thinking to a broader naturalistic framework, rather than providing religious insights or guidelines for organising society. Nor do they attempt to provide theories that religious people themselves can appropriate or even accept. These kinds of interests are not usually shared by those working in the interpretative tradition, for instance, since they emphasise the more personal and personally edifying function of interpretation. Finally, CSR falls clearly on the naturalist side of the naturalism/religionism debate in its critique of the *sui generis* assumption. In this regard, it is actually in the same boat with many socio-cultural approaches, such as Durkheim's theory of religion.

Although CSR shares a lot of common ground with other naturalistically oriented approaches to religion, there is one major difference: the emphasis on cognitive psychology. Most traditional theories of religion, CSR writers claim, operate on folk psychological, rather than scientific, assumptions of how the human mind works. In interpretative approaches, meaning attribution cannot be construed as a causal process at all. The same goes for action: an individual action cannot be identified and understood without references to the conscious goals and beliefs of rational individuals. In Durkheim's sociology, it is the society that explains human action: the norms and ideologies of the surrounding society are acquired by the individuals in the process of "socialisation". No reference to individual psychology is needed. The argument of CSR writers is that other approaches (not including EP) either

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[162] Theologian Niels-Henrik Gregersen, for instance, considers CSR as a part of Evolutionary Psychology in his 2006 article *What Theology Might Learn (and Not Learn) from Evolutionary Psychology: A Postfoundationalist Theologian in Conversation with Pascal Boyer.*

[163] Jeffrey Schloss (2009) emphasises this point and argues that cognitive approaches and adaptationist approaches should not be viewed as rigid alternatives for several reasons. First of all, the fact that X is an adaptation is a matter of degree and a matter of considerable debate as the notion of adaptation is not as clear as it first seems. Second, cognitive explanations of religion seem to be on a different level than the evolutionary ones since they mostly describe proximate mechanisms of religion whereas evolutionary explanations deal with ultimate causes. For these reasons, Schloss suggests that rather than seeing spandrelist and adaptationist explanations of religion as competitors, they can be seen as complementary. Richerson & Newson (2009, 177) make also the same point when they write that "[i]n the face of biological and cultural complexity and diversity, phenomena like religion are unlikely to support sweeping generalizations about adaptation versus maladaptation." Despite Schloss' well meaning points, arguments between spandrelists and adaptationists are still quite common. Writers like Atran, Barrett and Boyer go for spandrelism whereas others, e.g., Bulbulia (2004, 2009a) and Richard Sosis (e.g., Sosis 2004; Sosis & Alcorta 2003; Alcorta & Sosis 2005) go for more adaptationist models.

exclude psychological notions *a priori* (the interpretative approach) or consider them as irrelevant for explaining socio-cultural systems (holistic sociology). A similar exclusion of psychological notions is also characteristic of "religion as adaptation" approaches in which genes exert influence over the behaviour of individuals in a direct manner without any account of the mediating mechanisms at the cognitive and neuronal level. What the evolutionists are doing wrong, from the CSR point of view, is that they fail to describe the exact manner in which our genetic inheritance influences behaviour.

The discussions in this chapter have also revealed the diversity of terms and background assumptions of CSR writers. We pointed out that the biggest differences could be seen in the use of evolutionary considerations: Atran and Boyer have much to say about the evolution of the human mind whereas Barrett and others seldom refer to evolution. This also betrays another difference with regards to Sperber: Atran and Boyer openly acknowledge themselves as Sperberians whereas Barrett only makes very general references to "selectionism". These differences suggest that we should resist the temptation to describe the CSR as a theory or even a "tightly-knitted" paradigm. Rather, we should acknowledge the differences between writers and note that their methodological convictions allow different kinds of positions. One could even say that these convictions are quite general "rules of the thumb" rather than being axioms from which a program is deduced. However, the differences between writers should not be overplayed to the point where CSR writers would be represented as having no common ground at all.

We should also note the provisional nature of CSR theorising. This provisional nature is a result of the links that CSR theorising has to its auxiliary theories and disciplines: if the auxiliary theories, such as domain specificity, were to lose their plausibility as working hypotheses, then CSR theories would face considerable pressure of reformulation or even elimination. For this reason, it seems peculiar that CSR writers accept their auxiliary theories, such as computationalism, epidemiology and massive modularity, relatively uncritically. The various criticisms of these auxiliary theories, their different interpretations and their competitors are largely ignored or downplayed (especially in more popular works) to give the impression that the auxiliary theories are irrefutable scientific truths.

These discussions highlight CSR's ambivalent relationship to other approaches to religious phenomena. On the one hand, CSR writers seem to be quite critical and even dismissive towards other approaches to religion, such as phenomenology or sociology of religion. On the other hand, when Boyer is stating his methodological claims, he acknowledges that "the cognitive framework is not the only rational option"[164]. Nevertheless it is difficult to see how exactly CSR extends or complements other approaches whose methodological background assumptions it strongly criticises. My point here is that if CSR really wants to collaborate with other approaches rather than to replace them, it should engage more seriously with the results of other approaches and clarify the scope and nature of its own explanations in discussion with others. This lack of proper engagement with others seems to be the reason why the intentions of CSR writers are often misinterpreted either as wanting to take over the whole field of the study of religion or as being inherently anti-religious. Perhaps the dismissive and critical attitude of some CSR writers towards other approaches can be seen as an attempt to create "elbow room" in the academy. If this were the case, then we should expect CSR writers to turn to other approaches for positive engagement after they have established themselves.

Finally, we can raise another critical point. So far we have dealt mostly with the auxiliary theories of CSR, rather than its own theoretical contributions. CSR can be subjected to the same criticism originally directed against these auxiliary theories such as

[164] Boyer 1993a, 8. Pyysiäinen (2009, 126) agrees with Boyer when he states that "[t]he recent cognitive theories of religion, for example, should be seen as *extending* the more traditional social scientific explanations, rather than eliminating and replacing them".

computationalism and neighbouring disciplines such as EP. Discussions concerning EP are especially relevant here because many of its central assumptions have been fiercely criticised and some of those central assumptions are shared by CSR as well.[165] Philosophical discussions surrounding both cognitive science and EP are so extensive that it is impossible to deal with them all in the course of this work. We must be content here to offer just a brief look into some critical points. One of the most high-profile opponents of EP, David Buller, claims that EP suffers from several crucial flaws. First, Buller claims that the massive modularity thesis is not plausible because recent studies in brain development suggest that blueprints of psychological modules are not genetically determined. If all modules were adaptations, they would have to be genetically based, but this does not seem to be the case. Secondly, human brains seem to develop more plastically than EP would allow. Buller writes that

> [h]uman psychological adaptation does not consist in "hundreds or thousands" of "genetically specified" modules. Rather, the fundamental adaptation is the brain's developmental plasticity, which is capable of producing a wide variety of problem-specialized information-processing structures. Additional adaptations lie in the minimal learning biases instantiated in the early stages of brain development.[166]

This point, if true, challenges the way in which massive modularity theorists, such as Sperber, link modularity with evolution. Thirdly, Buller claims that there is no reason to assume that human brains have not developed from our hunter-gatherer days. And even if there would not have been any development, we would not be justified in assuming that our cognitive systems have remained the same because of the brain's plasticity. Finally, Buller points out that all of the preceding considerations decrease the plausibility of a uniform human nature. In his view, adaptations are not necessarily species-general, which means that we should not presume that all human beings have similar cognitive architecture.[167]

We can easily see how relevant these critical points are for the CSR. If the massive modularity hypothesis and the hypothesis of the uniformity of species-general cognitive architecture turn out to be problematic, then the whole CSR project would be severely undermined. If there is no extra-cultural cognitive underpinning, there can be no extra-cultural cognitive constraints. CSR writers can bypass some of the critique directed towards EP by claiming that CSR need not be committed to massive modularity or adaptationism in the first place. We have already noted that although evolutionary considerations feature prominently in both Boyer and Atran, some writers, such as Barrett, are of the opinion that they are not strictly speaking necessary. Further, it is true that although CSR writers seem to have a shared commitment to some sort of massive modularity and it is explicitly defended by Atran and Boyer (and Sperber) they could perhaps manage with more modest assumptions. Bypassing these criticisms in this way would be quite effective against the critique of EP but they would lead to radical changes in CSR theorising as it is now being done. So if, therefore, it turns out, as Buller claims, that the developmental plasticity of the human brain is so great that conceptual systems vary significantly cross-culturally, then it is difficult to see how the current CSR theories could be left standing.

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[165] Most of the criticism has come from two directions: philosophers of biology and other forms of evolutionary psychology. The main criticisms have been that Evolutionary Psychologists (1) operate with a too rigid form of adaptationism, (2) reduce all social and cultural structures to psychological structures too straightforwardly, (3) put too much faith on the massive modularity hypothesis and (4) have too loose a concept of fitness. For critical discussion, see, e.g., Sterelny 2003; Sterelny & Fitness 1999; Richardson 2007. Buller 2005a summarises all the main critical points. For shorter spin-offs of Buller's extensive critique, see Buller 2000, 2005b; Buller *et al.* 2005.

[166] Buller 2000.

[167] For more discussion, see Woodward & Cowie 2004.

3. Religion and Cognition

The previous chapter dealt with the level of auxiliary theories and assumptions of CSR writers. Now it is time to turn our attention towards their actual core contributions which deal with cognitive mechanisms that make religious ideas easier to learn and transmit than other ideas. Recall that according to Boyer's fifth methodological claim religious representations differ from everyday representations to the extent that we can justifiably identify a category of "religious" ideas. The basic notion is that religious representations include "counter-intuitive" elements which at the same time make religious representations salient but also easy to learn. The notion of counter-intuitiveness is used to signify a special relationship between particular representations and the domains of intuitive knowledge. The idea of counter-intuitiveness is described and discussed in section 3.1. However useful the notion of counter-intuitiveness might at first seem, it is not a sufficient (and not perhaps even a necessary) condition for a representation to be religious, for there are many counter-intuitive representations that are not associated with religious ideas. CSR writers bring in the notion of agency – especially supernatural agency – at this point: religious representations refer to supernatural or counter-intuitive agents with special powers such as invisibility and omniscience. Supernatural agents are the topic of section 3.2. Finally, when representations of supernatural agents are connected with certain events in ordinary social life and they spread across the population, a religion is born. Section 3.3 looks into the additional factors that CSR writers use to explain how these developments happen. It will, therefore, be argued that CSR writers see religion as characterised by minimally counter-intuitive representations with reference to supernatural agents that are subsequently linked with episodes and representations about morality, social interaction, misfortune and death.[168]

3.1. Counter-Intuitiveness

One (if not *the* one) core contribution of CSR writers has been the notion of counter-intuitiveness. Simply put, the idea is that representations that are slightly or minimally counterintuitive are transmitted and acquired more successfully than merely intuitive representations and representations that are highly counterintuitive. In the case of intuitive representations, minimally counterintuitive representations (MCI) are more salient and attention-demanding, and in the case of highly counterintuitive representations, MCI representations do not overload our cognitive systems that much. Subsequently, the notion of counter-intuitiveness has become a sort of flagship of CSR theorising and it has claims to

[168] Notice that CSR writers do not really define religion any more specifically than this general description. Take Atran for example who distinguishes four aspects of religion which demand an explanation. He states (2002, 13-15) that the aim of his project is to explain the existence and prevalence of (1) widespread counterfactual belief in supernatural agents (gods, ghosts, goblins, etc.), (2) hard-to-fake public expressions of costly material commitments to supernatural agents, that is, sacrifice (offerings of gods, time, other lives, one's own life, etc.), (3) a central focus on supernatural agents dealing with people's existential anxieties (death, disease, catastrophe, pain, loneliness, injustice, want, loss, etc.) and (4) ritualised and often rhythmic coordination of (1), (2), and (3), that is, communion (congregation, intimate fellowship, etc). For discussion, see Atran & Norenzayan 2004 and especially the comments. In Atran's view, it is not enough to explain the first aspect and focus on the widespread nature of religious ideas. Rather, one should also aim to explain why people hold counter-intuitive representations worthy of commitment in terms of time and effort. He actually accuses "pure cognitive theories" (such as those of Boyer) of falling prey to the "Mickey Mouse problem": they cannot explain the difference between fictional and mythical entities (such as Mickey Mouse) and entities, such as gods and spirits, that are objects of religious worship.

be seen as one of the most foundational notions of the field.[169] It is Boyer who introduced the notion originally so we will follow his lead.

Boyer stipulates that

> [r]eligious representations are particular combinations of mental representations that satisfy two conditions. First, the religious concepts *violate* certain expectations from ontological categories. Second, they *preserve* other expectations.[170]

We already have the necessary conceptual tools in place to understand this statement. Humans, according to this view, possess large domains of intuitive knowledge pertaining to different domains of life such as social relations, physical objects and mental states of others. As we saw in section 2.3., these domains of knowledge are based on a rich array of modular machinery of the human mind that produces domain-specific intuitions automatically. Now, the twist with religious representations, according to Boyer, is that the events, agents and things that they represent include violations to the intuitions of the specific category or domain that they activate.[171]

Some examples should clarify the matter. Take the notion of an "all-knowing God", for instance. Such an idea, according to Boyer, is represented by activating the ontological category of PERSON and adding the violation "special cognitive capacities" in the following way:

PERSON + VIOLATION: OMNISCIENCE (special cognitive capacities) = all-knowing God

The result is a representation about a certain type of person: a person that is otherwise a person just like any other, but who nevertheless knows everything. The notion of spirit is also very common in religious traditions and it can be analysed in a similar way:

PERSON + VIOLATION: INVISIBILITY = spirit

Spirits and gods involve violations of the category of PERSON, but counter-intuitive representations, according to Boyer, can also involve a transfer of properties from one domain to another. This is the case when mental properties are attributed to inanimate objects. Take the notion of a statue that listens to conversations:

ARTIFACT + VIOLATION: COGNITIVE FUNCTIONS = listening statue

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[169] For accounts of counter-intuitiveness, see, e.g., Pyysiainen 2002, 2005a; Norenzayan *et al*., 2006; Tremlin 2006; Tweeney*, et al*., 2006; Upal, *et al.* 2007.

[170] Boyer 2001, 62.

[171] Boyer 2001, 62-65. See also Boyer 2003, 119-120; Boyer & Ramble 2001, 537; Barrett 2004, 22-24 and Atran 2002, 95-100. Atran (2002, 96) provides the following definition: "Religious beliefs are counterintuitive, hence also necessary counterfactual, because they violate innate, modular expectations about basic ontological categories, such as those of LIVING KIND (ANIMATE [PERSON, ANIMAL], PLANT) and STUFF (ARTIFACT, SUBSTANCE). ... Religious representations nonetheless remain integrally bound to factual, commonsense beliefs and inferences. ... As a result, *religious concepts need little in the way overt cultural representation or instruction to be learned and transmitted.* A few fragmentary narrative descriptions or episodes suffice to mobilize an enormously rich network of implicit background beliefs." Barrett (2004, 22) describes the idea in a similar, albeit more commonsensical, fashion: "These MCIs may be characterized as meeting most of the assumptions that describers and categorizers generate – thus being easy to understand, remember, and believe – but as violating just enough of these assumptions to be attention demanding and to have an unusually captivating ability to assist in the explanation certain experiences. These MCIs commonly occupy important roles in mythologies, legends, folktales, religious writings, and stories of peoples all over the world."

Boyer gives numerous examples of different kinds of minimally counter-intuitive representations, but the basic idea is always the same: successful religious representations are neither oddities (highly counterintuitive) nor simply intuitive representations.[172] We can now return to Atran's matrix again (table 1.). A violation can be created by replacing "+" with "-" or vice versa. The more changes, the more counterintuitive a representation becomes. It is also possible to include "super" attributes such as omnipotence (super folk psychology) that could be described as adding "++" to our matrix.[173]

Table 1. Ontological categories and domains of intuitive knowledge (Atran & Norenzayan 2004).

	Domain of intuitive knowledge				
Ontological category	Folk-physics	Folk-biology: vegetative	Folk-biology: animate	Folk-psycho-logy: psycho-physical	Folk-psychology: epistemic
person	+	+	+	+	+
animal	+	+	+	+	-
plant	+	+	-	-	-
substance	+	-	-	-	-

The most important thing to note here is that violations are meaningful only to the extent that cross cultural categories and domain of intuitive knowledge exist. Without these intuitive "backgrounds", such as folk psychology, folk physics and folk biology, religious representations would not be possible at all. This brings us the second part of Boyer's definition, namely, that "[t]he religious concept preserves all the relevant default inferences except the ones that are explicitly banned by the counterintuitive element."[174] Although such representations are counterintuitive, they are easy to understand because they only include only one violation. A spirit is still a person with all kinds of beliefs, goals and desires and can usually be located in some space even though it does not have a body. Spirits can also remember, know and intend to achieve things just like a normal person. We can illustrate the idea further with the concept of a zombie. A zombie can be analysed in the following way:

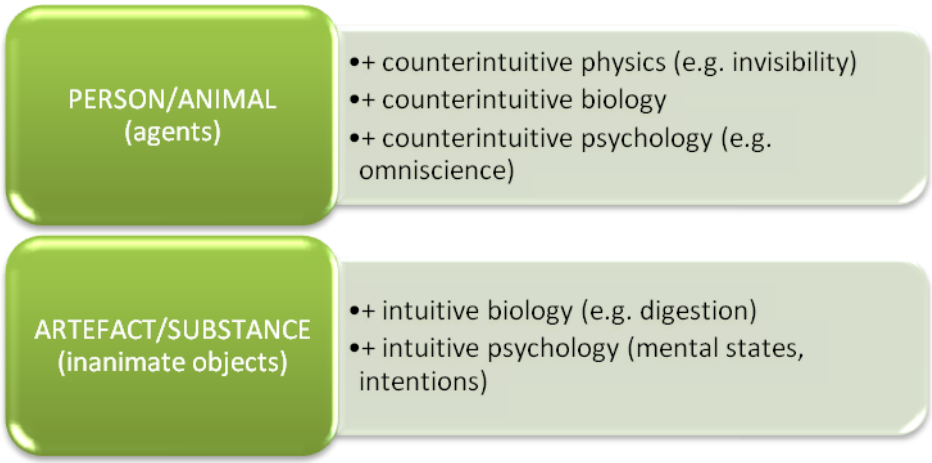
PERSON + VIOLATION: NO FOLK PSYCHOLOGY = zombie

Thus, zombies are represented as persons without beliefs or conscious awareness. However, there are a lot of things we can know about zombies, according to Boyer, even if they do not have higher cognitive functions. These include that zombies are physical objects and adhere to the laws of physics (folk physics), that they are living beings (folk biology)[175] in the sense that they move around, pick things up and their body parts can be cut off (or blasted away with a well-aimed shotgun shot) and so on. In any case, the point of this example is to show that most of the intuitions concerning the category of PERSON as well as folk physics and biology still hold despite the one counterintuitive violation.[176] Therefore, according to Boyer, the catalogue of successful religious representations is actually quite limited. Most of them involve either a breach of the intuitive expectations of the category of PERSON, or

[172] For more examples, see, e.g., Boyer 2001, 63-64, 71-72.
[173] See Atran 2002, 98.
[174] Boyer 2001, 73.
[175] This depends on your chosen definition of a zombie. What is usually known as "a philosophers' zombie" is a total replica of an individual human being who at the same time lacks all conscious experience. The second kind of zombie – the zombie that Boyer seems to have in mind – is something like "a living dead zombie", that is, a body that walks around eating flesh even though "the person" is dead.
[176] Boyer 2001, 71-75.

transference of mental properties (that is, properties normally attributed to PERSON category) to other categories.

Figure 3. The catalogue of supernatural templates according to Boyer.



After this initial overview of the notion of counter-intuitiveness, we will clarify some points about the way in which Boyer and others understand the idea. First of all, counter-intuitiveness should not be taken to refer simply to strangeness or "oddity". Boyer brings the point home by insisting that

> [c]ounterintuitive is a technical term here. It does not mean strange, inexplicable, funny or extraordinary. What is counterintuitive here is not even necessarily surprising. That is, if you have the concept of cologne-drinking, invisible persons, and if everyone around you talks about these visitors, you cannot really register puzzlement or astonishment every single time it is mentioned. … But these concepts are still counterintuitive in the precise sense used here, namely "including information contradicting some information provided by ontological categories."[177]

By the same token, counter-intuitiveness does not refer to falsehood, he claims. Religious representations feel perfectly normal and ordinary for those who use them. Counter-intuitiveness, in Boyer's view, should be understood as a purely technical term and does not imply that religious representations are false in the way that they represent reality. Religious representations are counter-intuitive because they include information that contradicts the intuitive expectations of the activating ontological category.[178]

Furthermore, Boyer emphasises that people who form counter-intuitive representations or commit to them have the same everyday ontology as anyone else. He writes that

> [t]hese people do not have a fantastic ontology in which mountains *in general* are live organisms with digestion, in the same way than llamas, people and goats. The

[177] Boyer 2001, 65.

[178] Boyer suggests that the term "counter-ontological" would be more appropriate but rejects it "as too heavy". Note also that the term "ontology" as it is used here by Boyer and others refers to everyday ontological assumptions – that is, to our largely implicit everyday assumptions about the constitution of our world - rather than to any philosophically reflected ontological position.

> supernatural concept specifies that *this* mountain has *some* physiological features. The other mountains are inanimate objects like rocks and rivers quite literally *goes without saying* in the Andes as it does everywhere else in the world. Indeed, the notion of *one* mountain having physiology is attention-grabbing only against this intuitive background.[179]

The point is that counter-intuitive representations refer only to some special entities with counterintuitive properties and thus such entities are always exceptions from normal states of affairs.

The reason why the notion of MCI representations is crucial for CSR writers is that MCI representations are "cognitively optimal" for cultural transmission. Barrett describes the idea in the following way:

> MCI's, then, constitute a special group of concepts – concepts that largely match intuitive assumptions about their own group of things but have a small number of tweaks that make them particularly interesting and memorable. Because they are more interesting and memorable, they are more likely to be passed on from person to person. Because they readily spread from person to person, MCIs are likely to become cultural (that is, widely shared) concepts.[180]

To understand why MCI representations are attention-grabbing, we need to recall the idea of "relevance" introduced in section 2.2. The basic idea was that the more positive cognitive effects (e.g. applicable in many domains and contexts) a piece of information has the more relevant it is. On the other hand, the more cognitive processing effort a representation requires the less relevant it will be. A cognitively optimal representation requires minimal processing effort and at the same time has extensive cognitive effects. According to Boyer,

> [i]n order to create religious representations that have some chance of cultural survival, that is, of being acquired, memorized, transmitted, one must strike a balance between the requirements of imagination (attention-demanding potential) and learnability (inferential potential). If religious concept comprises only counterintuitive claims, it will fail on the second criterion. ... Conversely, a concept that confirms only intuitive ontologies is, ipso facto, nonreligious and has little attention-demanding power. One of the optimal ways of striking the balance is to take all intuitive ontologies as confirmed, except a few assumptions that are then explicitly described as violated in the case of the religious entity.[181]

According to this view, a representation that includes a single violation of some domain of intuitive knowledge is extraordinary, but easily understandable at the same time. Extraordinary knowledge is always more relevant than ordinary knowledge because the human mind is geared to find new information about its context.[182]

Based on this assumption concerning the cognitively optimal nature of MCI representations, Boyer and others can hypothesise that highly counter-intuitive representations rarely achieve cultural level distribution compared to MCI representations.

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[179] Boyer 2001, 66.
[180] Barrett 2004, 23.
[181] Boyer 1994a, 121-122.
[182] Note that, as with all selection explanations, the thing which gets selected is only selected in favour of something else. In this case, MCI representations are salient and easy to learn only in contrast with fully intuitive representations and highly counter-intuitive representations. Although Boyer and others talk about easiness and salience, what they mean is that MCI representations are "easier" and "more salient" than others.

The memory recall and identification of counter-intuitive representations have been empirically tested. Boyer, Atran, Pyysiäinen and especially Barrett, have conducted several experiments to test the hypothesis that MCI representations have better recall than intuitive concepts and "weird", highly counter-intuitive concepts. Some experiments showed that counter-intuitive representations with minimal violations had an advantage in recall above highly counter-intuitive and intuitive representations cross-culturally. The best recall occurred when MCI representations were embedded in stories and tales that included mainly intuitive representations.[183] However, it has recently been pointed out that the results are far from conclusive and some studies have failed to produce the effect.[184]

One major factor that seems to support the cognitive optimum hypothesis is Barrett's "theological correctness" effect.[185] The basic idea here is that more complex, that is, more counterintuitive, notions of gods are more difficult to process than MCI representations. Barrett noticed that although religious people reflectively affirm that they believe God to be omniscient, omnipresent and all-powerful, they still tend to revert to more intuitive, that is, anthropomorphic understandings of God in situations that demand rapid inferences. For example, when asked about the attributes of God, Christians normally offer "theologically correct" attributes such as omnipresence. However, in situations that demand rapid inferences the same people tend to use god-concepts that are easier to process with the category of PERSON, that is, god-concepts that include less counter-intuitive properties than theologically correct ones. In the case of omnipresence for instance, God is represented as being in one place at one time, rather than being everywhere all the time, as the notion of omnipresence requires. Barrett concludes that although highly complex counterintuitive concepts can be distributed through teaching and learned through reflection to achieve a high level of distribution, they still depend on the intuitive support of our automatic systems.[186] The theological correctness effect highlights how our normal cognitive capabilities constrain our religious representations and thus create a tendency for god-concepts to evolve towards MCI forms.

The human capability to form counter-intuitive representations is based on the existence of two different kinds of information processing strategies in the mind. We have touched on these in section 2.4 where we discussed the notions of metarepresentation and decoupling. Again, Barrett's theological correctness effect reveals this neatly: people can have consciously formed highly counter-intuitive representations of God, for instance, but in situations that demand rapid inferences more intuitive representations kick in. Thus, it seems that there are at least two information processing strategies and corresponding sets of beliefs at work in these cases: (1) the theological strategy that is based on reflective reasoning and (2) the basic strategy that is grounded in our automatic systems. On the one hand, the theological and reflective strategy produces complex beliefs that are explicitly held and verbally reported but such representations are abstract and hence slow to process. On the other hand, basic level strategy produces intuitive beliefs that are normally implicitly held, simple and are usually about objects in our everyday life. Such representations are relatively easy to process because they closely coincide with our automatic cognitive systems. The

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[183] Barrett 2004, 24-25; Boyer 2001, 78-87. For experiments, see Boyer & Ramble 2001; Boyer 2000; Barrett 2001; Pyysiäinen & Lindeman & Honkela 2003; Atran & Norenzayan 2004. For discussion, see Pyysiäinen 2002.

[184] Knight *et al.* 2009.

[185] Barrett & Keil 1996; Barrett 1998, 1999. See also Slone 2004.

[186] Barrett (2004, 11) writes that "People seem to have difficulty maintaining the integrity of their reflective theological concepts in rapid, real-time problem solving because of processing demands. Theological properties such as being able to be in multiple places at once, not needing to perceive, being able to attend to an infinite number of problems at once, and not being bound by time, importantly deviate from the nonreflective beliefs that mental tools freely generate. As such, these reflectively held concepts are more difficult to use rapidly than nonreflective beliefs."

theological or reflective strategy produces reflective beliefs and the basic or intuitive strategy produces intuitive beliefs. The distinction between these two types of beliefs is crucial for CSR writers since they emphasise the role of implicit cognitive processing (intuitive beliefs) in explaining why people tend to form certain types of reflective beliefs.[187]

Table 3. Dual-process model of religious reasoning according to Barrett & Keil (adapted from Tremlin 2006, 174).

	Theological level	Basic level
Representation	1. Explicit 2. Analytical 3. Abstract	1. Implicit 2. Intuitive 3. Inferentially rich
Computation	4. Slow 5. Reflective 6. Conscious	4. Fast 5. Reflexive 6. Automatic

Barrett attempts to clarify the notions of intuitive and reflective beliefs and he begins by highlighting the differences between these two types of beliefs.[188] Intuitive beliefs are generated rapidly in everyday circumstances, whereas reflective beliefs take time to form. Further, intuitive beliefs are generated automatically in every situation without conscious effort while reflective beliefs, on the other hand, are formed only when conscious decisions or solutions to specific problems are needed. When people give verbal statements of their beliefs, they are usually reporting their reflective beliefs, rather than their intuitive ones. However, intuitive beliefs can easily become reflective beliefs if someone asks us to report what we currently see before us, for example. Barrett also points out that as reflective beliefs are produced by conscious reflection and learning they are highly dependent on culturally transmitted information, personal experiences and subject's other beliefs. It follows that there can be dramatic differences between sets of reflective beliefs between individuals and cultures. By contrast, intuitive beliefs show little variation from culture to culture or person to person. Finally and most importantly, reflective beliefs do not necessarily have a bearing on the subject's behaviour at all, Barrett claims. For example, people usually believe

[187] What seems to be emerging here is a "dual processing model" of cognition which has received much attention in the study of social cognition. See, e.g., Deutsch & Strack 2006; Smith & DeCoster 2000. For an overview, see Tremlin 2006, 172-192. Consider an example from Barrett. He tells a story about a man called Doug who was cleaning his grain silo when the silo exploded due to the leaking propane tank. At first he was trapped in the burning silo and realising that there was no way out he prayed to God to "take him home". Suddenly he heard a voice saying "not yet" and felt that he was thrown out of a window that was higher than he was able to jump and landed safely outside the silo. Immediately afterwards, the silo exploded into pieces. After the incident Doug was sure that God had sent angels to help him, in other words, he was sure that God had interfered. What interests us here is that Doug's reflective belief in the existence of angels is irrelevant. It suffices that Doug had the concept of an angel or a god, not that he would hold the existence of such agents true. According to Barrett, his automatic cognitive systems would use the concept of an angel anyway as a plausible candidate for the instigator of Doug's supernatural rescue: "When reflectively forming a belief, angels made intuitive sense as the most likely explanation for the event. Thus, reflective belief in angels was strengthened." (Barrett 2004, 35) Barrett's example highlights the dual-process nature of religious thinking: even in the case where Doug does not hold religious ideas plausible reflectively, his intuitive machinery continues to produce material that enhances the plausibility of religious ideas.

[188] The terms were originally introduced by Sperber (1996, 146-150). The intuitive/reflective distinction pops up in CSR literature under different headings and in different terms but the basic idea does not change. Boyer (e.g. 2001, 305) makes the same point by highlighting the difference between intuitive and reflective processing. Finally, Barrett talks about "nonreflective" and "reflective" beliefs. In what follows, I will be using the terms "intuitive" and "reflective" as they are the shortest and correspond to Sperber's original presentation. For discussion, see Pyysiainen 2004b.

reflectively that "beauty is only skin deep" but at the same time psychological experiments show that people have a strong tendency to overestimate the social and intellectual abilities of physically attractive children. The theological correctness effect is another example of an effect of this sort.[189]

The reason why the intuitive/reflective distinction is relevant here is that it is one way to explicate the relationship between automatic processes and conscious reflection. Barrett further elaborates the idea by describing how intuitive beliefs can influence the formation of reflective beliefs. First of all, intuitive beliefs act as defaults for reflective beliefs. What Barrett means by this is that our conscious belief formation process "reads" the output of our implicit mental systems and forms a reflective belief based on the output of these implicit systems. Second, intuitive beliefs make some reflective beliefs more plausible and others implausible. When an explicitly formed belief "fits" with our intuitive beliefs, it feels more reasonable. Finally, intuitive beliefs shape our experience and memory. The human memory, Barrett emphasises, does not just save information about the environment but combines elements and processes them: there is no "pure" perception or "complete" informational structure in memory. Memories are already processed by the systems that produce intuitive beliefs.[190] In sum, Barrett claims that intuitive beliefs and intuitive knowledge form the background for reflective and conscious processing. This makes it possible, in his view, to explain the plausibility of certain reflective beliefs, such as religious beliefs, by referring to intuitive and implicit processing.[191]

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[189] Barrett 2004, 7-9. See also Boyer 2001, 305-306. We must remember that the intuitive-reflective distinction does not have any bearing on the truth-value of the beliefs in question: both can be true or false. In fact, reflective beliefs are more often false than intuitive beliefs that are usually true or at least practical. Intuitive beliefs are generally reliable because they are produced by systems that have maintained humans over considerable period of time. However, Barrett points out that in the end mental systems produce only "best guesses" about the identities and properties of objects and cause-effect relationships in our everyday environment. Mental systems are geared for everyday things, rather than for quantum physics or philosophy.

[190] Barrett 2004, 11-17. One interesting result of the distinction between intuitive and reflective processing is that some intuitive assumptions are extremely persistent in everyday life and behaviour. All ideas (intuitive and reflective) can be meaningfully challenged in a debate but most intuitive ideas cannot be ignored in the practices of our everyday lives. A philosopher can, if she wishes, declare that she does not believe in the independent existence of the world, but she cannot stop behaving in a way that implies it. A belief that "there exists a world independent of my conceptions of it" is a reflective belief but it receives considerable intuitive backing from our everyday intuitions. Such a belief can be rejected by reflective reasoning that is based on arguments (and many have rejected it) but the intuitions produced by our mental systems cannot be shut down.

[191] Some philosophers have also made the same distinction by distinguishing direct (or non-inferential) and indirect (or inferential) knowledge: direct knowledge is knowledge that is not consciously inferred from any other type of knowledge, whereas indirect knowledge is based on inference. In some theories, perceptual knowledge of everyday objects is considered direct knowledge. A good example of indirect knowledge is knowledge obtained through reasoning. However, the details of the direct/indirect distinction are under considerable debate in epistemology (especially in the context of perception). Some theorists argue that knowledge obtained through perception is also indirect: it is knowledge about sense-data or the like whereas other theorists are of the opinion that our knowledge of the objects of perception is direct, namely, not mediated. For an overview of the debate see BonJour 2002, 125. In the CSR's scheme indirect knowledge, such as reasoning, would correspond to reflective beliefs that are acquired through conscious deliberation and learning. Our opinions are mostly reflective as well as our knowledge of general facts like the fact that "Moscow is the capital of Russia". In this sense, reflective beliefs are what we in our everyday context simply call "beliefs" whereas intuitive beliefs are seldom called beliefs at all. Intuitive beliefs such as "if I throw something in the air, it will fall back down" or "if I am hungry, I should eat" are rarely consciously inferred or generated.

Table 4. Intuitive and reflective beliefs according to Barrett (adapted from Tremlin 2006, 137).

Intuitive beliefs	**Reflective beliefs**
Concrete, commonsense description of the world	Explanations and interpretations of the world.
Perception and spontaneous inference	Deliberate thought and sources of authority
Usually implicitly held	Usually explicitly held
Support conscious reasoning and guide behaviour	Embedded in intuitive beliefs and other reflective beliefs
Universal, homogenous and consistent	Local, heterogeneous, and variable

At this point it should be noted that when CSR writers use terms like "intuition", "counter-intuitiveness" and "belief", these terms are used rather differently than philosophers tend to use them. In philosophical discussions, belief is usually analysed as an attitude of assent towards a certain proposition.[192] Given this definition, it is rather misleading to call intuitive beliefs beliefs in the first place. Moreover, the notion of "intuition" in philosophy has a long and problematic history. Usually intuition refers to something like an immediate apprehension understood as absence of conscious inference, cause or justification. Again, CSR writers' notion of intuition is somewhat different. In addition to the fact that intuitions are preceded by unconscious inferences, CSR writers see intuition as something like an apprehension of the plausibility of a representation. One could say that intuition understood in this way verifies or disconfirms a particular propositional content. The existence of an intuition or intuitions can present itself as a subjective feeling of an immediate apprehension of something or as a feeling about the plausibility of a claim. If this is the case, one could ask whether intuition involves propositional knowledge. CSR writers do not really discuss this, but it seems quite plausible to me to understand intuitions as probabilities of acquiring certain types of beliefs.

As counter-intuitiveness and the cognitive optimum hypothesis are so prominently featured in CSR literature, they have also been the subject of much criticism. One criticism levelled against the notion has been that it assumes that religious ideas must be false. Leo Näreaho, for instance, speculates in his critical article *Cognitive Science of Religion: Philosophical Observations* (2008) whether religious representations of supernatural agents would be counter-intuitive if such supernatural agents actually existed. Näreaho seems to be concerned that the notion of counter-intuitiveness carries with it an implication of falsehood. Based on the way in which Boyer and others present the notion, it would seem to me that at least *prima facie* counter-intuitiveness does not imply falsehood since it can be easily argued that many scientific representations are also counter-intuitive. Nevertheless, the matter is not perhaps as simple as this. We will return to this topic later, but to anticipate, we could say that the views of some CSR writers are difficult to make out. Atran, for instance, seems to think that counter-intuitiveness implies counterfactuality. Further, he claims that as religious ideas are

[192] For discussion, see, e.g., Benson Saler's article *What We May Believe about Beliefs* (2001). Saler argues that there have been two main theories about beliefs: the sentential theory and the behavioural theory. According to the sentential theory, beliefs are affirming attitudes towards propositions. Sentential theory thus commits us to the existence of mentally represented states of affairs. The behavioural theory (or dispositional theory) does not include such commitments since it analyses a belief in terms of behavioural tendencies. According to this theory, to believe something is to be likely to behave in a certain way. More specifically, if we ascribe a belief that X to a person A, what we mean is that person A has a disposition to exhibit behaviour (linguistically or otherwise) congruent with believing that X. Note that believing in this sense does not require any reference to internal mental states or any "idealised" entities. Saler claims that although the behaviourist theory enjoyed some success among philosophers in the first part of the 20th century, the advance of the cognitive and psychological sciences have again vindicated the more traditional – sentential – theory of beliefs.

counterintuitive their content is necessarily "quasi-propositional".[193] Others, such as Barrett (and Boyer in some moods), do not seem to have any difficulty in regarding religious ideas as at the same time counterintuitive and proper candidates for being true.[194]

Another critical point comes from "inside the house". In his recent article *Coding and quantifying counterintuitiveness: theoretical and methodological reflections* (2009), Barrett claims that empirical studies of MCI representations have tended to presuppose different views of how to identify and generate public representations of counterintuitive concepts and as a consequence have mixed views of what counter-intuitiveness actually is and where it is situated. Barrett points out that when we are trying to identify MCI representations we are trying to guess how public representations are represented privately. The reason why this is important is that even though a public representation of X may be classified as counterintuitive, it does not necessarily mean that the private representation of the same X in the head of a person A is counterintuitive. Barrett suggests a heuristic with six steps for quantifying how counterintuitive an idea is.[195] We can skip the details of Barrett's proposal here; suffice it to say that the notion of counter-intuitiveness is not without its problems and future work is needed to analyse its exact function.

The usefulness of counter-intuitiveness as a diagnostic tool for identifying religion is limited by the fact that not all counter-intuitive representations are considered religious. Dreams and fairy-tales include MCI representations, but are not necessarily associated with religion. Highly abstract scientific representations can be considered counter-intuitive as well. CSR writers have suggested different answers to this problem. Boyer, for instance, suggests that what distinguishes religious MCI representations from other counter-intuitive representations is that they are concerned with violations or transference of attributes of the category of PERSON and that they are associated with morality and other aspects of social and practical life. Boyer writes that

> [l]egends about Santa Claus or the Bogeyman are interesting, even arresting, but they do not seem to *matter* that much, while people's notions of God seem to have direct and important effect in their lives. We generally call supernatural concepts "religious" when they have such important social effects, when rituals are performed that include these concepts, when people define their group identity in connection with then, when strong emotional states are associated with them, and so on. These features are not always present together, but in most places one finds these two registers: a vast domain of supernatural notions and more restricted set of "serious" ones.[196]

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[193] Atran (2002, 95) states that "Religious quasi-propositions may have truth value but they are not truth valuable in the sense of being liable to verification, falsification, or logical evaluation of the information".

[194] See, e.g., Barrett 2004, 122-123. The fact that counter-intuitiveness is not necessary connected to falsehood is implied by Boyer (2001, 68) when he states, e.g., that "Many aspects of the real natural world are in fact counterintuitive relative to our biological expectations." Barrett (2009) points out that what is intuitive (and thus what is also counterintuitive) depends on the empirical study of domains of intuitive knowledge. If empirical studies at some point in the future change our understanding of the domains of intuitive knowledge, then the notion of counter-intuitiveness also changes.

[195] First, one should identify the basic level membership of an entity. Basic level membership is usually recognised as the first-learned label for an object, such as "dog", "book" or "chair". Second, one should identify the ontological category or categories. Barrett offers five ontological categories: (1) spatial entities, (2) solid objects, (3) living things, (4) animates and (5) persons. They correspond to activations of five different expectations sets: (1) spatiality, (2) physicality (folk physics), (3) biology (folk biology), (4) animacy (folk psychology: psycho-physical) and (5) mentality (full folk psychology). Third, one should note transfers of attributes from one domain to another. As noted before, counterintuitive representations sometimes transfer intuitions from one domain to another such as in the case where mental properties are attributed to inanimate objects. Fourth, one should note breaches or violation of intuitions. Finally, one should note that there can be breaches within breaches.

[196] Boyer 2001, 90.

This can be explained by the fact that the idea of an agent (or mind) has tremendous "inferential potential", as Boyer puts it. When some object is classified as an agent, a massive amount of information becomes available. Further, representations of agents are extremely relevant for two reasons: the first reason is that the possible presence of an agent affects the behaviour of the subject and the second reason is that information concerning agents is easy to produce. The human mind has a tendency to form representations of agents and this tendency makes representations of supernatural agents very relevant.[197] This leads us to our next topic: supernatural agents.

3.2. Supernatural Agents: HADD and Social Cognition

This section and the subsequent section examine the notion of supernatural agency and how CSR writers explain the prevalence of supernatural agent representations in religious traditions. The basic idea of such explanations is that representations of supernatural agents are highly relevant for individuals and groups in everyday contexts of social relations, morality, death, misfortune and ritual. This is because supernatural agent representations activate multiple cognitive mechanisms that deal with different domain of intuitive knowledge.

The notion of a "supernatural agent" is highly important to CSR writers because the notion makes it possible to distinguish those MCI representations that are usually not associated with religion from those that are. Boyer makes the point in claiming that "[r]eligious concepts are those supernatural concepts that *matter*. The world over, people entertain concepts of beings with special qualities and special powers".[198] Barrett makes a similar point when he writes that

> [f]or MCIs to successfully compete for space in human minds and thus become "cultural", they must have the potential to explain, to predict, or to generate interesting stories surrounding them. In short, MCIs must have good *inferential potential*. ... Concepts that are most likely to have strong inferential potential, activating large numbers of mental tools and exciting reasoning, are those that qualify as intentional agents.[199]

The fact that representations of agents are relevant explains why supernatural agent representations are found in all human groups. The relevance of supernatural agent representations also increases the likelihood of such representations being held true. Here we encounter the principle of relevance again: the more cognitive systems a representation activates the more likely it is to be held true.[200]

Before we go into this idea in detail, we should remember that CSR writers do not view religion as a cultural system or a systematically constructed world-view. On the contrary, religious beliefs are usually considered to be very much practical, rather than theological or theoretical. Boyer writes that

> [f]or now, let me just emphasize that doctrines are not necessarily the most essential or important aspect of religious concepts. Indeed many people seem to feel no need for a general, theoretically consistent expression of the qualities and powers of

[197] Boyer 2001, 70.
[198] Boyer 2001, 137.
[199] Barrett 2004, 25.
[200] Boyer 2002, 68; 2003, 120.

> supernatural agents. What all people do have are precise descriptions of how these agents can influence their own lives, and what to do about that.[201]

Boyer's point is that religious representations are associated with particular situations and types of situations in ordinary life such as morality, social behaviour and death. The home of religion is social life rather than metaphysical or cosmological speculation.[202]

In the following, we will examine four ways in which CSR writers hold that cognitive mechanisms associated with representing agents and social situations support religious representations.[203] First, religious representations evoke systems that have evolved with attempts to survive in the presence of predators. One of these systems is the aforementioned hypersensitive agent detection device (HADD). Second, religious representations activate systems that have evolved to regulate social interaction and to represent mental states of agents (that is, theory of mind) and these systems give an enormous amount of inferential potential to supernatural agent representations. Third, supernatural agent representations are associated with moral intuitions generated by folk psychology and related mechanisms. Finally, supernatural agent representations are associated with episodes of misfortune, death, ritual and other anxieties. We will examine the first two in this section and last two in the next section.

Barrett argues that the human cognitive system is biased towards representing its environment as human-like. He writes that

> our ADD [agent detection device] suffers from hyperactivity, making it prone to find agents around us, including supernatural ones, given fairly modest evidence of their presence. This tendency encourages the generation and spread of god concepts and other religious concepts.[204]

Experimental evidence suggests that agent detection needs only that an object moves by itself in a way that implies a goal. When an object is perceived violating folk physics and to behave in goal directed manner, then the agent detection device fires and the object is automatically categorised as an agent. If agent detection is positively completed, then folk psychology is triggered. Barrett describes this process in a following way:

> When HADD perceives an object violating the intuitive assumptions for the movement of ordinary physical objects (such as moving on non-inertial paths, changing direction inexplicably, or launching itself from a standstill) and the object seems to be moving in a goal-directed manner, HADD detects agency.[205]

It must be noted, however, that there is no need for the actual object to be perceived in order for HADD to detect agency, since HADD can also detect traces of agency. When an event occurs that folk physics or folk biology cannot account for, then agent detection kicks in seeking evidence of agents that could have caused the event. Supernatural agents are good candidates for causes of unusual events, Barrett hypothesises, because they satisfy intuitions that postulate agency and their presence or activities cannot be directly perceived. In this sense, they are cognitively more relevant than normal persons or complex naturalistic explanations of folk physics and folk biology. Finally, Barrett points out that there is an evolutionary rationale for the hypersensitivity of HADD: as it was developed in the course of

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[201] Boyer 2001, 140.
[202] Boyer 2001, 137-142.
[203] This classification is presented by Boyer (2002, 70-71).
[204] Barrett 2004, 31.
[205] Barrett 2004, 33.

predation and evasion behaviour, "false positives" were evolutionary speaking a small evil compared to one missed predator. A person can be mistaken nine times out of ten about a tiger sneaking around, but if one is wrong even once, then one ends up as tiger food.[206]

Barrett's account of agency detection develops Stewart Guthrie's idea of anthropomorphism as a central feature of our cognitive system. Guthrie argues that anthropomorphism is a functional strategy for human minds because they are designed to produce as much relevant information as possible about the environment. Again, we see here the emergence of the principle of relevance. Guthrie points out that persons and agents are the most complex objects that our cognitive systems know because we have a massive number of cognitive systems for processing social interaction.[207] Boyer explains our anthropomorphic tendencies by natural selection: agents are more relevant for self-preservation and adaptation than objects or artefacts. Another reason for this hyperactivity is that if an object is categorised as an agent (a person or an animal), then folk psychology kicks in and provides a multitude of assumptions that can be tested. Therefore, in order to acquire new information about the environment, it is economical to categorise agents as much as possible.[208]

The exact scope of the HADD hypothesis is somewhat ambiguous since it seems that it is sometimes used to explain the high frequency of the formation of supernatural agent representations, that is, to explain the origin of supernatural agent representations, whereas sometimes it is used to explain why supernatural agent representations persist.[209] Barrett himself seems to think that rather than contributing to the formation of supernatural agent representations, HADD is just one factor that reinforces their plausibility.[210] Barrett notes that there is also another reason why HADD's explanatory force is not very strong, namely, its hypersensitivity:

> Indeed, HADD may be most likely to find agency if given ambiguous inputs in urgent or frightening contexts, and HADD's agent detection may be subsequently disengaged or left without identifying a satisfactory agent (Hmm, I thought someone was there …).[211]

HADD is constantly producing intuitions that are in almost all cases "false positives" and quickly disconfirmed by reflective reasoning.[212]

In sum, Barrett and other CSR writers argue that the HADD system which evolved in the course of natural selection for evading predators increases the plausibility of representations of supernatural agents. The agent detection device creates a strong bias in the human mind towards agent-driven concepts. Supernatural (counter-intuitive) agent concepts exploit this fact: sudden changes in the environment, unidentified noises and the like function as evidence for the presence of invisible agents.

Now we will turn to the second way in which supernatural agent representations work: they activate systems that have evolved to regulate social interaction and represent

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[206] Barrett 2004, 32-39. For studies and discussion of attribution of agency, see, e.g., Barrett 2000; Barrett & Johnson 2003; Scholl & Tremoulet 2000.

[207] Guthrie 2002, 56-61. See also Guthrie 1993.

[208] Boyer 2001, 142-144. See also Barrett 2004, 31-44. According to Atran (2002, 67), developmental studies suggest that hyperactive agency detection is a result of natural selection that has formed our brain to provide rich information about the environment based on fragmentary and poor data. Further, developmental studies have provided evidence for the fact that an agency detection system is already present and active in children under one year of age.

[209] This point is made in Knight, *et al.* 2009.

[210] Barrett 2004, 39-39.

[211] Barrett 2004, 41.

[212] Atran 2002, 59-71; Barrett 2004, 41-44; Boyer 2001, 146-148; 2002, 76-77.

mental states of agents. These systems, CSR writers claim, play a major part in explaining the high distribution rate of supernatural agent representations. Further, the operations of these systems explain why supernatural agent representations tend to develop towards certain forms. The numerous cognitive systems involved in social interaction are constantly active and providing new information about all agent representations, both real and fictional alike.

Boyer argues that humans have a highly developed social mind: humans are very good in activities such as monitoring social exchange, representing other people's personalities, representing and building social hierarchies, building and maintaining coalitions and transmitting information about surrounding social networks. Boyer cites psychological evidence for the existence of functional systems that do precisely these things.[213] The details need not concern us here; it is sufficient to note that all agent representations, irrespective of whether those agents are real, fictional, religious, or something else, can be processed through the same cognitive systems that provide intuitions about intentions, beliefs, goals and emotions of such agents. When talking about social cognition, Boyer writes that

> [a]lthough we are not aware of it, the inference systems that manage our interaction with other people are full-time workers. We constantly use intuitions delivered by these systems. Indeed, we also use them when we are not *actually* interacting with people. ... In fact, we can run such decoupled inferences not only about persons who are not around but also about purely imaginary characters.[214]

Boyer points out that even a small child can interact with fictional characters and give personal features to inanimate objects like teddy-bears. The same systems make it possible for us to make inferences about the beliefs, emotions, desires and other mental states of supernatural agents.[215]

Another factor that contributes to the relevance of supernatural agent representations is that supernatural agents can be represented as having a large amount of information concerning the social context where the individual is situated. According to Boyer,

> information that feeds to the social mind systems is only *part* of the information handled by the mind. It makes sense to distinguish between this socially neutral information and the specific information that activates the social mind inference systems. So here is a general definition: *Strategic information is the subset of all the information currently available (to a particular agent, about a particular situation) that activates the mental systems that regulate social interaction.*[216]

Note that this definition of "strategic information" entails that what information is considered as strategic changes relative to the context and the persons involved. For example, the combination of representations whose content is that "Cardinal Ferrari drives a red sports car" is strategic information for me in contexts where the social status of Cardinal Ferrari is relevant for my behaviour in my social network. Next, Boyer claims that ordinary agents are represented as having imperfect access to strategic information: we assume that

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[213] For Boyer's overview of different social systems, see Boyer 2001, 122-129.

[214] Boyer 2001, 149.

[215] Boyer 2001, 130-131; Boyer 2002. Barrett (2004, 46) makes a similar point by claiming that in addition to folk psychology "anthropologists and psychologists have also suggested that we have mental tools responsible for such activities as moral reasoning, identifying who has high social status so we might learn from them to improve our own activities, and reasoning about other as members of groups and classes and not just individuals. We may also have a mental tool responsible for social exchanges and activities conditional on social qualifications. ... These social mental tools have no difficulty reasoning about gods, even when the gods are never seen."

[216] Boyer 2001, 152.

normal humans know things that they have some sort of access to.[217] Back to Cardinal Ferrari. If I remove the keys to his Ferrari from his pocket when he goes to the toilet, then I assume that he does not know about the missing keys. I do not have to think about this reasoning at all because, as Boyer claims, we have our folk psychological systems that do such inferences for us. Now, Boyer claims that "[i]n interaction with supernatural agents, people presume that these agents have *full* access to strategic information."[218] So if some piece of information is strategic for me in a particular situation, then supernatural agents know it. The point that Boyer wants to make here is that full access to strategic knowledge is both highly relevant and easier to process than agents represented as having restricted access or agents having access to all possible information (omniscience). Normal agents or omniscient agents take cognitive effort to represent. First, one must figure out what a normal agent knows by analysing agent's social context and so on. Second, omniscient agents are hard to process because they know too much: a large part of the information that an omniscient agent possesses does not have any consequences for my behaviour. Even if official theologies were to promote belief in omniscient agents, people in everyday situations that demand rapid inference have a tendency to represent omniscient agent's knowledge only to the extent that it is relevant for their behaviour.[219]

Barrett summarises Boyer's reasoning when he claims that supernatural agents who have full (or perfect) access to strategic information are highly relevant for the behaviour of individual and groups for three reasons. The first reason is that when a supernatural agent knows so much about us and others, then it has the potential to become a powerful ally or a dangerous enemy. The second reason is that humans automatically pay more attention to people of high social status and supernatural agents qualify for high social status because their superior access to relevant information makes them highly attention-demanding. Finally, agents with full access to reasons of individuals and relevant background knowledge can operate as guarantors of morality.[220] With this last point, we come to morality and supernatural agents that are the subjects of the next section. But still there is one further matter to be addressed.

So far we have dealt with supernatural agents that are more closely related to gods, ancestors and spirits, that is, supernatural agents that are MCI representations with just one or two violations. As the aforementioned theological correctness effect shows, the theistic concept of God seems to be highly counterintuitive on account of its "omni-attributes" such as omniscience and omnipresence. However, Barrett has argued that the theistic concept of God is not actually as counterintuitive as it first seems. This "preparedness hypothesis" (or "intuitive theism hypothesis") is true especially in the case of small children who seem to be able to think and reason about the God of theism quite easily.[221] In Barrett's words, the basic idea is that

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[217] Boyer (2001, 155) writes that "*In social interaction, we presume that other people's access to strategic information is neither perfect nor automatic.* ... Humans generally spend a great deal of time and energy wondering whether other people have access to some information that is strategic from their own standpoint, wondering what inferences, intentions, plans, etc. these other people draw from that information, trying to control their access to such information, trying to monitor and influence their inferences on the basis of such information."

[218] Boyer 2001, 156.

[219] For Boyer on strategic information, see Boyer 2001, 150-167.

[220] Barrett 2004, 49-52.

[221] For discussion and empirical work, see Barrett & Richert, & Driesenga 2001; Richert & Barrett 2005; Barrett & Newman & Richert 2003; Knight *et al.* 2004; Makris & Pnevmatikos 2007. The discussion is usually framed in terms of Jean Piaget's (1960) "anthropomorphism" hypothesis which states that children represent god by first representing human persons and adding "super" attributes to those representations. The preparedness hypothesis opposes itself to Piaget in claiming that folk psychological systems attribute "super" attributes to most agents before a certain age.

> [e]arly-developing mental tools (such as the Theory of Mind [ToM]) are *not* specifically for representing humans and, in fact, actually facilitate the acquisition and use of many features of God concepts of Abrahamic monotheisms.[222]

The result is, Barrett claims, that

> [t]he godly properties of infallible beliefs, superknowledge, superperception, creative power, and immortality are quite intuitive, at least for young children. Concepts of God are easily accommodated because they play on many on these default assumptions rather than violate them.[223]

Take what Barrett calls "superknowledge" as an example. He claims that in developmental psychology there is a widespread consensus about the fact that children younger than four years have difficulties understanding false beliefs. At the age of five, such reasoning does not pose a problem for children anymore. There seems to be development whereby children pass from the assumption that everyone has the same beliefs as the child herself to understanding that people's beliefs are representations of what might be the case. If this is true, it would make the assumption of a superknowing or infallible agent intuitive rather than counterintuitive for children under the age of four.[224] In addition, Barrett points out that some psychological results suggest the existence of an "intelligent design bias" of some sort in children:

> [s]tudies have led many psychologists to suspect a bias, arising in childhood, to accept the natural world as created by nonhuman superbeing. Kelemen has even raised the possibility that children naturally develop as "intuitive theists," and religious instructions merely fills in the forms that already exist in children's minds.[225]

The idea here is that complex natural things, such as trees and leaves, are easily understood by children as not having being made by humans since they rarely mistake natural things with human made artefacts. Further, children account for the properties of natural objects, and especially their functional properties, by invoking God's intentions which creates a tendency to see purpose and design in nature. [226] It is, therefore, clearly the case, Barrett argues, that children can represent God as having nonanthropomorphic creative powers. Barrett concludes that

> [a] tendency to see the world as created by a nonhuman superbeing and the ease with which children understand God as the cause of the natural world make acquiring a God concept including supercreative power fairly easy for children. Consequently, a God concept with these powers stands a strong likelihood of successful vertical transmission, ensuring its survival across generations. Further, these early-emerging biases may make a God who has created the world very intuitive and easy to believe in, both in childhood and in adulthood.[227]

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[222] Barrett 2004, 77.
[223] Barrett 2004, 77. Barrett's whole argument can be found in Barrett 2004, 75-93.
[224] For an overview of the discussion concerning superknowledge, see Barrett 2004, 78-81. These studies and discussions about folk psychological development and the capacities of children revolve around the "false belief" test. See .e.g, Wellman & Cross & Watson 2001.
[225] Barrett 2004, 85. Barrett is referring to the studies of the psychologist Deborah Kelemen (1999a, 1999b, 1999c, 2004).
[226] Keleman refers to this tendency as "promiscuous teleology". See, e.g., Kelemen 2004; Evans 2001. Psychologist Paul Bloom has also defended the existence of a "design bias". See, e.g. Bloom 2009.
[227] Barrett 2004, 85.

We began this section by pointing the importance of the notion of a supernatural agency for CSR writers. We also noted that the reason for its importance was their claim that gods, spirits and other religious agents are represented as counterintuitive persons. The upshot of this is the claim that folk psychology and related social cognition systems inform and constrain religious representations of supernatural agents. If representations of supernatural agents are around, then they can be easily be embedded in social networks and information that concerns them can be easily generated and transmitted. Finally, we pointed out how some god concepts that might seem highly counterintuitive can actually be quite intuitive, namely, close to the cognitive optimum of MCI representations.

3.3. Supernatural Agents: Morality, Misfortune, Death and Ritual

The previous section described how MCI supernatural agent representations activate multiple cognitive systems, such as folk psychology and other social mind systems. The argument of CSR writers was that representations of such agents with full access to strategic information are highly relevant for the behaviour of individuals and groups. This section describes the additional factors that CSR writers claim to contribute to the high rate of distribution of such representations. These additional factors include moral intuitions, explanatory intuitions and ritual behaviour.

We can begin once again from Boyer who claims that supernatural agent representations are parasitic on our moral intuitions, namely, intuitions produced by our cognitive systems specialising in social interaction. In his view, moral norms and behaviours are products of the human mind. According to him,

> it seems that moral intuitions and understandings develop in all human beings because of specialized, early-developed mental capacities connected with social interaction. This in turn creates all sorts of moral intuitions about possible courses of action. The intuitions do not require concepts of supernatural agents, but if there are such concepts around, moral intuitions will be associated with them. In other words, religious concepts are in part parasitic upon moral understanding.[228]

Boyer adds that all human minds seem to produce similar skeletal moral principles automatically and, therefore, all human populations have somewhat similar moral prescriptions. Barrett calls this tendency "intuitive morality".[229] The fact that people in general are moral realists also suggests, claim Boyer and Barrett, that morality is natural. The idea is that most humans represent moral norms and rules as immutable and non-arbitrary and see behaviours as essentially morally valuable or reproachable. Hence, humans seem to think that if everyone had full access to relevant facts of social interaction – the motivations and intentions of the persons' involved – then they would agree on what action would be right and what would be wrong.[230] If humans tend to be moral realists and supernatural agents have full access to strategic information, then supernatural agents automatically see the rightness or wrongness of some action, Boyer concludes. This makes supernatural agents

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[228] Boyer 2002, 81.

[229] Barrett 2004, 47.

[230] Barrett 2004, 47-49. Boyer (2001, 176-180) presents a host of developmental evidence for the naturalness of morality. This evidence suggests, Boyer claims, that young children have moral feelings and intuitions that are not formed on the basis of learned conventional rules. See also Boyer 2002, 80-85. Boyer also makes references to the studies of the psychologist Eliot Turiel that seem to suggest that even small children are capable of moral feelings and moral reasoning (distinguishing between principles and conventions, for example). See Turiel 1983, 1998.

plausible candidates for legitimising moral intuitions whose actual origin (social cognition) is beyond conscious access.[231]

Representations of supernatural agents that have full access to strategic information and have moral knowledge are also plausible candidates for causes of unforeseen events, Barrett claims. As we have already noted, CSR writers claim that the human mind is geared to find explanations for life-threatening events and to provide as much information as possible about the environment. Barrett writes that

> [a]s with everything else in life, we automatically, often unconsciously, look for an explanation of why things happen to us (or people close to us), and "stuff just happens" is no explanation. Gods, by virtue of their strange physical properties and their mysterious superpowers, make fine candidates for causes of many of these unusual events.[232]

As human minds are prone to seek reasons for social (or other) causes of fortune and misfortune they can easily use supernatural agent concepts when folk physical, folk biological or normal agent based explanation do not provide the necessary intuitions to explain a particularly salient event.

Further, Boyer emphasises that supernatural explanations do not really contradict physical or other causes, but they address different aspects of a physical event:

> When people find supernatural causes, it is *not* because they have ignored the work of mechanical and biological causes but because they are asking questions that go *beyond* these causes.[233]

These questions are about particular situations, such as "Why was it that I won the lottery?", even though people usually know that someone had to win and their win was by chance. In the case of supernatural agent explanations, Boyer continues, these explanations explain by giving the reason of the supernatural agent rather than a mechanism by which the supernatural agent achieved the effect. He emphasises that

> people do not even think about the *ways* in which the powerful agents act, but they are very precise about their reasons for acting in a particular way. Indeed, these reasons always have to do with people's *interaction* with the powerful agents.[234]

The crucial thing here, Boyer continues, is that one must already construe the causes of misfortune in social terms before it makes sense to use supernatural agents to explain those events. If social cognition already produces intuitions according to which misfortune (and fortune) is a result of "someone doing something", then given that supernatural agents are already represented as members of one's social network and can engage in social exchange their reasons can be used as intuitively satisfying explanations of misfortune.[235]

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[231] Boyer (2001, 190-191) writes that "concepts of gods and spirits are made more *relevant* by the organization of our moral understandings, which by themselves do not especially require gods or spirits. What I mean by relevant is that the concepts, once put in this moral context, are easy to represent and they generate many new inferences. ... [M]ost of our moral intuitions are clear but their origin escapes us, because it lies in mental processing that we cannot consciously access. Seeing these intuitions as someone's viewpoint is a simpler way of understanding why we have these intuitions. But this requires a concept of an agent with full access to strategic information"

[232] Barrett 2004, 52.

[233] Boyer 2001, 196.

[234] Boyer 2001, 197.

[235] Boyer 2001, 200-202.

The reason why supernatural agent representations are associated with misfortune (or fortune), CSR writers claim, is the same as in the case of death: the human mind is geared to find explanations of salient events and when our folk theories fail, we will apply supernatural agent representations because they fit well with our intuitions. The death of a loved one and the dead body itself create a number of conflicting intuitions produced by different mental systems and these conflicting intuitions make death basically highly counterintuitive (at least in Boyer's view). Further, counterintuitive representations about death evoke strong emotions which easily provide plausibility for representations of agents with non-standard physical properties.

Barrett argues that supernatural agent representations are intuitively plausible because our intuitions suggest that mental activity does not end in biological death. The reason for this is that our natural intuitions of death proceed on two distinct routes: biological and mental. Our folk biological knowledge provides us with basic understanding of biological necessities such as eating, reproducing and eventually dying. However, our folk psychological knowledge is produced by a set of different cognitive systems than biological knowledge which makes it possible to dissociate biological and psychological activities. The end of biological activity is intuitive whereas the end of psychological activity is counter-intuitive because our folk psychology does not shut down even when a person is dead. This happens especially in cases where the dead person is very close to us: folk psychological systems do not stop producing intuitions about the mental states of a dead person even though we know that the person in question is really dead.[236]

Boyer explains death rituals as a result of a cognitive confusion concerning the dead body. Similarly to Barrett, he argues that bodies create conflicting intuitions of biological and psychological processes which in turn increases the plausibility of representations of non-physical agents. Boyer further maintains that systems concerned with pollution are also active: humans have cognitive systems that produce intuitions about substances that have to be avoided. Human bodies are major sources of pathogens which would explain why the contagion system is activated when a dead body is present. The activation of the contagion system would explain why there is a sense of urgency and need to "do something with the body".[237]

Moreover, CSR writers claim that communal religious activity, such as rituals, prayer and worship, enhances the plausibility of supernatural agent representations. Rituals have been in the centre of CSR's interest from its beginning as we can see from Lawson and McCauley's book *Rethinking Religion* (1990) which laid out the central methodological assumptions of CSR and developed a specific theory of rituals: the ritual form hypothesis.[238] Further, Whitehouse has offered another influential theory of religious activity, the "modes of religiosity" theory.[239] Despite numerous attempts and hypotheses, there seems to be no

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[236] Barrett 2004, 55-59.

[237] Boyer 2001, 204-228. Jesse Bering and his colleagues have conducted several studies on afterlife beliefs. They have put forward the "simulation constraint hypothesis" according to which psychological immortality is a cognitive default for humans. The basic idea is that as no one has experienced of what it is like being dead, imagining it is also very hard. As a result, people tend to assume psychological, but not biological, survival of dead people. See Barrett 2005; Bering 2002, 2006; Bering *et al.* 2005; Bering & Bjorklund 2004.

[238] See also Lawson & McCauley 2002a.

[239] For discussion on the ritual form hypothesis, see e.g., Whitehouse & McCauley 2005. For Whitehouse's modes of religiosity theory, see Whitehouse 2000, 2004. Whitehouse argues that public religious actions evolve towards either "an imagistic mode" or "doctrinal mode". In the imagistic mode, religious actions involve strong emotions and sensory stimuli in order to produce a long-lasting memory. However, the difficulty with the imagistic mode is that only a small amount of propositional information gets stored, whereas in the doctrinal mode religious actions are frequently repeated but their emotional impact is relatively low. The doctrinal mode is thus well-suited for the transmission of religious propositions. The difficulty here is that information transmitted in a doctrinal mode can easily fade from memory because it does not necessarily involve anything personal. Whitehouse's theory is based on a distinction between two forms of memory: individual events are

consensus over the explanation of rituals and other religious activity in CSR. I will briefly highlight some central points from each scholar.

Barrett highlights the importance of communal religious action for religious belief. Not only religious representations cause religious behaviour but behaving religiously strongly increases the plausibility of religious representations. There are several reasons for this. First of all, the human mind attempts to reduce dissonance automatically. This means that if a person behaves in a way that contradicts his beliefs, then the person feels a certain amount of tension to make his beliefs consistent with his behaviour. Therefore, if a person behaves religiously for some reason even though he does not hold religious representations as true, the behaviour creates plausibility for religious representations. Further, Barrett argues that if a person's belief is challenged and the person is able to counter the attack by argumentation, evidence or the like, then the person's confidence in the belief in question strengthens. In a religious setting, the successful defence of religious ideas would count as evidence for their truth. In addition, religious actions increase the number of domains and contexts in which religious representations are activated and thus create additional factors for their plausibility. Finally, coordinated and public religious action enhances the plausibility of religious representations because it enhances the trustworthiness of others sharing that practice, and as other believers are represented as trustworthy their beliefs are more plausible.[240]

According to Barrett, rituals and ceremonies come in two basic forms: ceremonies that are conducted only once in a person's lifetime and ceremonies which are performed constantly. Initiation rites and other ceremonies that are not repeated have a strong tendency to develop towards forms that induce strong emotions and thus create long-lasting memories. Such ceremonies are filled with "sensory pageantry", namely, they include multiple and unconventional sensory stimuli that strengthen the idea that "gods are acting". If a high profile memory of an event of enormous personal significance is seen as an act of god, then a person's faith in god's reality is greatly strengthened. The term commonly used of such memories is "flash bulb memories". Contrary to high-profile initiation rites and rites of passage, most religious ceremonies are frequently performed and do not arouse emotions. In particular, religions with theological doctrines demand conscious reflection and inferences from their members. Frequent ceremonies, such as reciting creeds, repeating central doctrines and other kinds of verbal communication, ensure that theological systems are stored in a member's memory and applied in everyday life. Frequency and reflection is needed because theologically correct systems are not minimally counter-intuitive: they require reflective interpretation and learning.[241]

Barrett does not seek to answer the question of the origins of rituals and ceremonies in general whereas Boyer and Atran dwell on the issue at length. According to Boyer, rituals are "cognitive gadgets" that activate a number of mental modules that originally have other functions and thus are attention-grabbing. Boyer's basic claim is that religious rituals make supernatural agents and their actions explicit and visible. Thus, rituals are places where interaction with supernatural agents is taking place. Three features of rituals require an explanation. First, rituals are performed with a sense of urgency, that is, there is a feeling that rituals must be performed in a very precise way even though the link between the effect of the ritual and the performance of the ritual is vague. Second, rituals are usually associated with social events and they signify a change in social status. Third, supernatural agents are usually associated with rituals.[242]

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saved to episodic memory and encyclopaedic information to semantic memory.

[240] Barrett 2004, 61-65.

[241] Barrett 2004, 66-73. Barrett's account draws heavily from Whitehouse's modes of religiosity theory and the ritual form hypothesis of Lawson and McCauley. Atran is somewhat critical towards Whitehouse's theory whereas Barrett is sympathetic. See Atran 2002, 150-154.

[242] Boyer 2001, 232-236.

Boyer claims that the sense of urgency can be explained by the fact that rituals mimics evasion behaviour: the sense of purity and the danger of being polluted are associated with precautionary rules and boundaries. Rituals with their precise patterns of behaviour invoke such rules and thus activate cognitive systems whose original function is to avoid contamination and pollution.[243] The reason for rituals being associated with events in social networks is that our cognitive capacities of representing for social networks are limited. Our "folk sociology" represents our immediate social structure quite well but representations of relationships other than our nearest kin have a tendency to simplify. This simplification creates representations of different groups and levels that do not actually exist. Rituals are neat cognitive gadgets to remedy our baffled intuitions: rituals provide clear roles for everyone and simple representations of how the social network changes. Finally, Boyer emphasises that there are no sharp boundaries between religious and non-religious rituals. Rituals exist in human groups for reasons that have nothing to do with religion. However, supernatural agent representations fit into our intuitions of ritual very well: when people perform and participate in rituals they feel the sense of urgency but cannot really understand how the ritual produces the intended effects. Therefore, there is a cognitive gap between the performance of ritual and its effects which a representation of supernatural agent can easily fill. Our intuitions say that rituals must be performed in a precise way but offer no reason for it. Supernatural agents can act as mediators between the causes and effects of rituals' because their causal influence in general is considered as non-standard.[244]

According to Atran, rituals reveal a social hierarchy which is common in all groups of social mammals. He argues that religious rituals convey the fact that an individual is emotionally committed to communion with supernatural agents and with other individuals in the group. This display of commitment makes the individual a trustworthy partner of exchange in the eyes of other individuals in the group. Thus religious rituals and religious commitment serve a social function: religious practices and commitments facilitate the minimising of free-riders and cheaters in populations.[245] Atran also claims that rituals invoke and satisfy emotions associated with existential anxiety. Human beings face inevitabilities and threats in the form of death, sickness and other natural events that invoke strong feelings of fear. Religious rituals mimic natural situations which create such anxieties and when these rituals have a positive outcome, the participant's belief in order and survival over the arbitrariness of life strengthens.[246]

In sum, religious actions both increase the plausibility of supernatural agent representations and constrain their features. Barrett presents some general mechanisms of how this happens. Boyer argues that rituals emerge naturally in human societies because our minds cannot make sense of complex social networks. Supernatural agents can easily be associated with rituals because our cognitive systems produce conflicting intuitions. Atran's point seems to be that human groups require rituals to represent the identity of the group and social relations in it as well as to relieve existential anxieties.

In conclusion, one point remains. As we have already seen, CSR writers claim that highly counterintuitive and abstract theological thinking is not necessary for having representations of supernatural agents. If this is the case, one can ask where organised religions come from. Boyer answers to this question by claiming that institutional religions are products of specialisation in the development of societies. In his view, theological doctrines, creeds and larger theological systems are products of the reflective reasoning of religious specialists and they usually contain representations that are quite far away from

[243] Boyer has further developed this idea into what is usually called the "hazard precaution model" of ritualised behaviour. See Boyer & Lienard 2006a, 2006b.
[244] Boyer 2001, 237-263.
[245] Atran & Norenzayan 2004, 717. See also Atran 2002, 130-146.
[246] Atran 2002, 150-164.

easily transmitted MCI representations. Further, cultural transmission of such higher-order and reflective representations demands institutions, teaching, frequent rituals, ceremonies and reflective processing. However, in order to become successful and have a high level of distribution, higher-order and reflective theological ideas must make some use of underlying cognitive capacities. If theological ideas are highly counter-intuitive and completely bypass our intuitions, they become meaningless and people stop holding them true. Moreover, institutional religions with their doctrines, creeds and theologies make it possible to belong to a certain religion, that is, they make "religion" a distinct public domain of a society. Boyer writes that

> [h]aving a religion does not necessarily imply that one has 'a' religion with particular doctrine. Those features that we find straightforward and natural are in fact the outcome of a very specific history. In some historical conditions, religious specialists group themselves in institutionalized associations (churches, castes, etc.) and diffuse a particular description of what their function is. It then becomes clear to everyone, first, that there is a such a thing as 'religion' as a special domain of concepts and activities; second, that there are different 'religions', that is, different possible ways of practicing religion, one of which is more valid; third, that adopting a particular religion means joining a social group, establishing a community of believers, emphasizing the demarcation between us and them.[247]

Boyer maintains that institutional religion arises in societies that develop literacy and specialisation. Institutional religion also gives rise to the concept of "religion": when doctrines and convictions are codified, they can be used to differentiate systems of beliefs and behaviours.[248]

Boyer also highlights the theological correctness effect again when he claims that

> [i]ndeed, when the literary account is too abstract, people just *add* to it the notion that their ancestors or some spirits are around and concerned with people's actions anyway. It is very difficult for literate groups to counter people's tendency to make their religious concepts more *local* and more *practical*. People are never quite as "theologically correct" as the guild would like them to be.[249]

Integrated, deductive and stable theological systems are too general and too reflection-demanding for people to apply rapidly in their everyday situations. Everyday intuitions support local and particular representations rather than global and abstract representations. Being global and abstract, theological systems, according to Boyer, are comparable to philosophical systems or scientific theories that have very little or no relevance at all for everyday life. They are too hard to learn and yield too small cognitive effects. Thus,

> [t]his, then, is the real tragedy of the theologian: not just that people, because they have real minds rather than literary memories, will always be theologically incorrect, will always add to the message and distort it, but also that the only way to make the message immune to such adulteration renders it tedious, thereby fuelling imagistic dissent and threatening the position of the theologian's guild.[250]

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[247] Boyer 2001, 267.
[248] Boyer 2001, 266-285.
[249] Boyer 2001, 283.
[250] Boyer 2001, 285.

The tragedy of the theologian is that as the theologian attempts to keep the theological system as intact as possible ordinary members constantly keep distorting the system by adding more local and practical notions to it.[251]

To sum up the results of this chapter, we can say that the CSR is based on the claim that cognitive processes have an impact on the acquisition and transmission of religious information. In the course of long periods of time and given a massive amount of transmission events, religious representations evolve towards certain forms that have maximised the cognitive effort-effect relationship. Counter-intuitive representations of supernatural agents take minimal cognitive effort to form, but at the same time they provide massive cognitive effects. They activate multiple cognitive systems in different domains of knowledge and thus gain plausibility. Our intuitions concerning human persons, animals, physical objects, moral norms, misfortune, death, social relations and rituals all contribute to the high frequency of distribution of such counter-intuitive representations.

3.4. The Naturalness of Religion

We have now shown how CSR writers build their explanation of why religious ideas are so widespread. The argument began from the idea of the optimal nature of MCI representations in section 3.1. CSR writers argued that representations that included minimal violations of intuitions are more successful in cultural transmission than intuitive or highly counterintuitive representations. At this point, we also made a brief detour into dual-process models of cognitive processing. The subsequent section (3.2) dealt with the relevance of supernatural agent concepts. First we looked at the HADD hypothesis according to which humans' agent detecting device might be hypersensitive and provide supports for supernatural agent representations. We also described how CSR writers make the connection between our social mind systems and supernatural agents: supernatural agents can be represented as having full access to strategic information which makes such representations easy to process and highly relevant. In section 3.3, we described how events in everyday human life (social and individual) support religious representations. CSR writers claimed that moral intuitions both shape and make supernatural agent representations more plausible. Similarly, our intuitions about causes of unforeseen events support supernatural agent representations since supernatural agents can be represented as having non-natural causal powers. Our intuitions about dead bodies and the continuity of mental life after death give further plausibility to supernatural agent representations. We also noted that there is no consensus in CSR about theories of ritual. Finally, it was noted that CSR writers emphasise the difference between intuitive religious thinking and theological (and philosophical) systems.

CSR writers usually summarise their whole approach by saying that religion is natural. Indeed, the "naturalness of religion" can be considered as a slogan of the whole approach.

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[251] Boyer 2001, 277-285. Scholar of religion Donald Wiebe (1991) has also highlighted the difference between theological reflection and real-life religious beliefs. He argues that religious thinking is "mythopoetic" whereas scientific and theological thinking are rational and logical. The tragedy of the theologian is that in her attempts to systematise religious ideas on the basis of philosophical or scientific rationality, religious ideas lose contact with the actual beliefs of believers and become meaningless. Slone also makes similar points in his provocatively titled book *Theological Incorrectness: Why religious people believe what they shouldn't* (2004). This problem, however, is not just a problem for theologians: all scientific education, for instance, faces the same problem. It takes time and effort to learn things like quantum mechanics, biology or psychology because the theories and methods in these fields are usually highly counterintuitive and they do not have much relevance for everyday life. Even after years of training and habituation, professionals can easily "relapse" into thinking in terms of more intuitive categories. This has led some writers to claim that science is highly unnatural for human beings. See McCauley 2000; Dunbar 1996; Wolpert 1992.

We can see that such a claim can be understood in many ways that do not depend on one another. Consider the following claims:

(1) Religion (or at least some part of it) is natural in the sense that it can be studied by the methods of the natural and behavioural sciences.
(2) Religion (or at least some part of it) is natural in the sense that it depends on cross-cultural or pan-human constraints rather than specific cultural constraints.
(3) Religion (or at least some part of it) is natural in the sense that acquiring, representing and transmitting religious ideas are easy for human beings.
(4) Religion is natural in the sense that it is not a supernatural creation; it is "nothing more" than a natural phenomenon.

The assumptions behind the first claim were examined in section 2.1. The point was that religious beliefs and activities should be seen as parts of the natural world to the extent that they are constituted by psychological and biological processes. We also pointed out how this way of approaching religious phenomena was connected to a broader vision of how the socio-cultural domain should be understood. This reading of "the naturalness of religion" claim is clearly directed against those who argue for the irrelevance of natural factors in explaining religious phenomena. The second claim was examined in section 2.2 and in the subsequent sections. The idea was that underlying all cultural variation there is a pan-human, modular cognitive architecture that constrains the acquisition and transmission of all representations. This second reading of "naturalness of religion" claim is directed against those who argue for the irrelevance of natural factors in explaining socio-cultural phenomena in general. Chapter 3 examined the arguments in favour of the third claim, the basic idea of CSR which simply being that religion is natural because it is easy - or as Barrett puts it

> widespread belief in God arises from the operation of natural processes of the human mind in its ordinary human environments. Belief in God does not amount to anything strange or peculiar; on the contrary, such belief is nearly inevitable.[252]

The fourth and final reading of the "naturalness of religion" claim is related to the truth of religious claims. I will return to this claim later in chapter 5 where I will be examining the possible religious relevance of CSR theories. For the time being, we should be careful not to mix these four meanings of the "naturalness of religion" claim, because they are not logically connected to each other and they can be defended and criticised independently of each other.

Before we conclude this chapter, we should deal with some critical points. As CSR makes it a central part of their project to produce empirical theories, it is reasonable to ask whether CSR so far has been able to achieve this goal. The critique that CSR has made bold theoretical claims without evidential support is raised from both inside and outside of CSR.[253] Barrett for instance, who is arguably CSR insider, notes that

> [a]lthough one of the attractive promises of Cognitive Science of Religion is to inject the study of religion with empirically testable theories, theoretical projects have outpacked empirical ones. Consequently, many theories in the area rest on weak evidential footing.[254]

[252] Barrett 2004, 122.
[253] For criticism coming from the outside, see, e.g., Oviedo 2007.
[254] Barrett 2008, 296.

Barrett even goes on to chastise his own work by saying that his *Why Would Anyone Believe in God* (2004) includes a massive amount of under-supported but testable empirical claims. Barrett suggests that the future of the CSR depends on how well it is able to back up its theoretical claims with empirical results.[255]

To answer this question, we should take a brief look into the empirical work already done. Boyer's cognitive optimum theory has been cross-culturally tested.[256] The standard interpretation of these experiments is that minimally counter-intuitive representations have better recall rate than either highly counter-intuitive or simply intuitive representations. Further, Barrett's claim that people seem to abandon their theologically correct ideas in situations which demand fast inference and apply more anthropomorphic ideas of supernatural agents has received some experimental support.[257] Moreover, several experiments have been devised to reveal how children conceptualise gods and how these concepts are connected to innate assumptions.[258] There are some experimental results that deal with afterlife beliefs and especially souls surviving death and they suggest that humans have a strong tendency to assume that there is a component in human beings, namely, the soul, which survives death.[259] Finally, Lawson's and McCauley's ritual form hypothesis has received some experimental support.[260]

A recent article by Nicola Knight, Emma Cohen and Barrett (2009) which assesses the empirical support of core CSR theories, surprisingly concludes that

> it is evident that the development of the field of CSR has been affected by its fast rate of growth. Attempts have been made to provide a theoretically integrated picture before sufficient evidence has been gathered to support its assumptions. Of the eight topics reviewed, perhaps three (Afterlife beliefs, God concepts, and Teleo-functional reasoning) could be said to have received significant levels of empirical confirmation; the other five are not as strongly supported.

The most disturbing thing from CSR's point of view is that the most central (or at least most talked about) theories, such as the cognitive optimum theory (counter-intuitiveness hypothesis) and HADD, have not obtained clear support. [261] The article points out that

> the mnemonic advantages of minimally counterintuitive concepts are often taken as fact in theoretical discussion, but these effects have been found only in a handful of methodologically heterogeneous studies.[262]

In the light of this point, it is easy to concur with Barrett, that more theoretical claims have been confidently stated than the evidence would justify and that the CSR is very much "work in progress" rather than a verified theory or a discipline. If this assessment is close to the truth, then some of the carts are still in front of the horses. It is probably safe conclude that

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[255] Barrett 2008, 295-299.

[256] Barrett & Nyhof 2001; Boyer & Ramble 2001; Atran & Norenzayan *et al.* 2006; Pyysiäinen & Lindeman *et al.* 2003. See also experiments presented in Atran & Norenzayan 2004.

[257] Barrett 1999; Barrett & Keil 1996.

[258] Barrett & Richert 2003; Barrett & Richert et al. 2001; Bering & Parker 2006.

[259] Bering 2004, 2006; Bering & Bjorklund 2003. For a popular exposition of "natural dualism", see Bloom 2004.

[260] Barrett & Lawson 2001; Barrett 2004b; Malley & Barrett 2003. In addition, Whitehouse's "modes theory" is directly based on ethnographic material and, as such, represents the first cognitively oriented theory that is not created "a posteriori" from ethnographical data gathered for some other purpose. See Whitehouse 1995, 2004.

[261] These also include the ritual form hypothesis of Lawson and McCauley and the "modes of religiosity" theory of Whitehouse.

[262] Knight *et al.* 2009.

the future of CSR depends on the experimental evidence it is able to produce and in its present state many claims of the CSR are merely hypotheses waiting to be tested. That being said, most of the CSR hypotheses certainly seem worth testing and there exists enough evidence to justify future research.

As CSR theories are strongly dependent on Sperber's ideas it will be useful to take a brief look at the criticisms directed towards the epidemiology of representations approach. In his critical book review of Sperber's *Explaining Culture* (2001), philosopher Kim Sterelny points out some problems in the approach. Although Sterelny is positively disposed towards Sperber's aim, namely, formulating a naturalistic approach to cultural material, and basically agrees with Sperber about the problems of more traditional, interpretative and sociological approaches, he is less enthusiastic towards Sperber's own proposal. First, he cautions against seeing intuitive and reflective beliefs as two clearly defined categories. Instead they should be viewed as "two ends of a continuum" in which most beliefs are situated somewhere in the middle. This is because "[o]bservation, unreflective inference, reflective inference, and testimony will play a role in the formation of most of our beliefs, but in varying proportions."[263] Sterelny suggests that if we look at particular cases, it might be quite difficult to classify a particular belief in either of these classes. If this is the case, then the explanatory force of intuitive machinery can be rather vague and/or minimal. This point is also relevant for CSR, for the automatic and innate nature of intuitive beliefs is much emphasised by Barrett, Boyer and Atran.

Second, Sterelny claims that Sperber's account of massive modularity is incoherent and his attempts to remedy the lack of central, domain-general cognition by introducing the notions of "actual" and "proper domains" of modules fail. Similarly to Fodor, Sterelny claims that in the case of massive modularity it does not make sense to talk about "modules" anymore and that the attempt to define modules in terms of "domains" does not solve the problem either because "domains" are quite vague as well. Without a more substantial definition of a module, Sterelny claims, the strong form of the massive modularity hypothesis turns into a truism. The reason why Sperber defends the massive modularity hypothesis seems to be that "[i]f the mind were a general purpose device, psychology would play no interesting role in explaining culture."[264] This highlights the foundational nature of the whole notion of massive modularity for CSR as well: without a proper formulation of this auxiliary hypothesis, the whole project as apparently endangered.

Anthropologist Tim Ingold has also criticised Sperber's psychological assumptions in his article *From the Transmission of Representations to the Education of Attention* (2001). Ingold claims that Sperber's full-blooded cognitivism in which "knowledge exists in a form of 'mental content'"[265] is somewhat misleading and ignores the role of environmental factors in the transmission of cultural information. Ingold's argument proceeds along the lines of those cognitive scientists who argue for a more context situated and embodied cognition than the advocates of a more traditional cognitivism.[266] First, Ingold argues that it is not plausible to assume the existence of strictly innate mental modules that develop independently from the environment. Instead, we should make more room for the ontogenetic development of the mind which is strongly informed by particular environmental factors and practices.[267] Ingold claims that

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[263] Sterelny 2001, 849.

[264] Sterelny 2001, 850.

[265] Ingold 2001, 113.

[266] For developments in this direction, see, e.g., Clark 1997, 2008. Clark's approach is a good example of a more general tendency in cognitive psychology and cognitive sciences towards more context situated and practical models of cognitive operations.

[267] One critical point can be made against Ingold here: he might be considering Sperber and other advocates of the massive modularity hypothesis too "nativistically"- that is, Ingold might be putting too much emphasis on the innateness of modules. In order to argue for the massive modularity hypothesis one need not necessarily

> [f]or Sperber, a design for the mind is copied, along with the DNA of the genome, at the inception of every new lifecycle. And this design, prior to being opened up to the differentiating influences of the environment, magically turns itself into concrete mechanisms in the brain, ready and prepared to process relevant environmental input. I have argued, to the contrary, that copying is itself a developmental process, that this process takes place in an environmental context, and that it alone provides a link between the genome and the formal properties of the organism – including those of its brain. ... This is not to deny that the resulting neural organization may take modular form; it is to insist, however, that *modularity develops*.[268]

Ingold's critique is also connected to his more general critique of the Neo-Darwinist account of natural selection as he seeks to dismantle the idea that genes somehow include "a design for the organism". The phenotype of an organism, according to Ingold, is not simply a product of the underlying genotype but a combination of complex causal factors in ontogenetic development. Finally, Ingold also criticises Sperber's notion of "representation" for being vague. Sperber seems to assume that cultural knowledge can be completely understood in terms of representations that are "stored within the containers of universal psychology"[269] and that such representations somehow include blueprints of how they turn into behaviours. Ingold's point is to show that Sperber's understanding of the interaction between mental representations and their public tokens is too simplified. Ingold claims that rather than being codified in mental representations in our minds, a large part of our "cultural knowledge" consists of skills and embodied actions (enactments) that include complex interactions between perception, action and cognitive content.[270]

The aforementioned critical points highlight the fact that there is much work to be done in the domain of CSR's auxiliary theories, for we have seen that neither the conceptual formulation of Sperber's epidemiology nor its psychological assumptions are generally accepted. Further, the criticism suggests that CSR writers would do well to consider more carefully possible alternatives for their auxiliary theories – especially recent moves towards a more context situated theory of cognition.[271] However, CSR writers might be reluctant to revise their view of human cognition because the more human cognition is viewed as context situated the less explanatory power cognition has in cross-cultural contexts. Thus, crucial questions are (1) how responsive is the architecture of the human mind to environmental context and (2) can we understand all cognitive operations in terms of symbolic processing inside the brain or should we "extend" our considerations of cognitive processes to encompass the specific environments and bodies in which brains are situated.

As we have now constructed a picture of what CSR in its current form looks like and we can move forward to analyse CSR more carefully. My account so far has attempted to describe as well as clarify the central ideas and methodological assumptions more or less shared by most CSR writers. In what follows, I will take up two related problems in CSR that have not, in my mind, been adequately discussed. The first problem is related to the scope of CSR's explanations. There is much confusion about the extent to which explanations based

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argue for strict genetic determinism of mental modules. It would be enough to argue that under similar environmental conditions human minds tend to develop similar modular architecture. Thus modular architecture would emerge as a result of both genetic and environmental factors.

[268] Ingold 2001, 130-131.

[269] Ingold 2001, 143.

[270] Ingold (2001, 146) writes that "the neurological structures and artefactual forms that Sperber calls representations are not causes and effects of one another, but emerge together as complimentary moments of a single process – that is, the process of people's life in the world. It is within this process that all knowledge is constituted" For a broader outline of Ingold's approach, see Ingold 2000.

[271] For situated and expanded cognition, see, e.g., Clark 1997, 2008.

on cognitive systems can explain actual religious behaviour. As we will see, this is a thornier issue that at first appears and it will lead us into the deep waters of philosophy of science and philosophy of psychology. The second problem that I will examine is the problem of religious relevance. Again, there is much confusion about the religious implications of CSR theories. These confusions betray the fact that the general philosophical frameworks in which CSR's theories are interpreted have considerable impact on this issue.

4. The Problem of Scope

It is understandable that those who advocate a novel scientific approach to some phenomenon have high hopes and expectations for its usefulness and explanatory power. This is also the case with the writers in CSR which we have been looking at. Candidly speaking, we can say that most CSR writers are adamant in proving that their approach is more "scientific" than other approaches to religion and that the cognitive approach will finally solve age-old mysteries by turning them into "empirically solvable problems". Some have even claimed that CSR will revolutionise the whole field of religious studies by providing an overarching methodological framework for the study of religion in general, in a firmly naturalistic register, of course. However, there are many who do not share this enthusiasm, but insist that the explanations offered by CSR writers are rather meagre in their explanatory power and consider them as rather useless in explaining religious phenomena. In this chapter, we will be looking at this problem, what I will be calling "the problem of scope" and argue that in order to answer this problem – that is, to assess the explanatory scope and explanatory power of CSR theories – we must clarify the philosophical background assumptions of CSR theorising. Further, I will be highlighting some problems in these background assumptions as they currently stand and suggesting that more refined assumptions can be adopted from recent discussions in philosophy of science. Finally, as we proceed I will be pointing out how more or less implicit methodological choices in these background issues result into different interpretations of the explanatory power and scope of CSR theories.

Section 4.1 will outline the problem of scope as I see it and suggest that we need to analyse the notions of "explanation" and "integration of disciplines" to find an answer to the problem. In section 4.2, we will be looking at epidemiological explanations more carefully with the help of recent discussions about selective explanations in philosophy of biology. Section 4.3 will be looking at how psychological explanations work and the crucial relationship between personal and sub-personal types of psychological explanation. The notion of causal explanation is taken into consideration in section 4.4 which provides an outline of CSR writers' views about explanation and then describes a more refined account of causal explanation, the "interventionist model of causal explanation". In section 4.5, we will move from explanation to integration of disciplines and analyse and criticise the models of integration that have motivated several CSR writers. Section 4.6 will continue to develop the themes of the previous section and provide a more developed model for inter-theoretic and interdisciplinary relations. The section will focus on explanatory pluralism and the idea of multi-level mechanistic explanation.

4.1. Problems with Scope

The problem of scope is a product of the enthusiasm of CSR writers on the one hand, and the pessimism of the critics on the other hand. If we look at CSR writers, examples of such enthusiasm and overblown estimates of the explanatory scope of CSR abound. Take Boyer, for instance, when he claims that

> [t]here cannot be a magic bullet to explain the existence and common features of religion, as the phenomenon is the result of aggregate relevance – that is, of successful activation of a whole variety of mental systems. Indeed, the activation of a panoply of systems in the mind explains the very existence of religious concepts *and*

> their cultural success *and* the fact that people find them plausible *and* the fact that not everyone finds them so *and* the way religion appeared in human history *and* its persistence in the context of modern science.[272]

In this one passage, he claims that CSR is capable of answering the following questions:

(1) Why religious concepts exist in the first place?
(2) Why religious concepts are so widespread in human populations?
(3) Why people find religious concepts plausible and hold them true?
(4) Why some people do not find them plausible and do not hold them true?
(5) What are the origins of religion?
(6) Why does religion persist even in modern societies, where modern science provides "a more efficient way of thinking about the world"[273]?

In other places, Boyer also mentions additional questions such as:

(7) Why does religion trigger such strong emotions that people are willing to kill for it?
(8) Why are there several religions rather than just one?

All these questions are not only answered by CSR but these answers are more comprehensive and "scientific" than all previous answers. Furthermore, he points out that whereas these questions used to be mysteries – from a scientific point of view – they can now be addressed as problems that can be given answers through empirical study.[274] Finally, Boyer seems to think that CSR can answer these questions by invoking psychological mechanisms revealed by cognitive scientists and cognitive psychologists.

If CSR theories can and will answer all the aforementioned questions, it seems that their explanatory scope and explanatory power are relatively large and that a fully developed theory of religion along the lines of CSR would explain most of the interesting features of religious traditions. Now, we can ask whether it is plausible for an approach which is based on identifying non-conscious cognitive constraints of cultural transmission to provide answers to all these questions. Indeed, several critics have pointed out that the methodological assumptions of CSR make its explanatory scope much more modest than its optimistic advocates – such as Boyer – would like to think. Scholar of religion Michael Day, for instance, claims in his article *Let's Be Realistic: Evolutionary Complexity, Epistemic Probabilism, and the Cognitive Science of Religion* (2007) that cognitive mechanisms can explain only population-level tendencies rather than particular cases of religious beliefs, practices or traditions. Day points out that probabilistic language is quite common in CSR writers: they talk about "the likelihood of transmission" and "cognitive systems usually operational" and so on.[275] He further notes that Boyer's model especially is so statistically tentative that

> the scientific aspiration to explain religion may stumble over the inability to produce interesting generalizations. The implications of this for the budding cognitive science of religion is as obvious as it is stark. Given the persistent lack of universality, the necessity of *ceteris paribus* clauses, and the long list of exceptions and counterexamples that often obtain in psychological models, the cognitive scientific aspirations to explain religion – full stop – could be epistemically quixotic. On its best day, it would be a vital *instrumental* science that mirrors biology by offering us a powerful set of

[272] Boyer 2001, 298.
[273] Boyer 2001, 49.
[274] Boyer 2001, 48.
[275] Day 2007, 59.

> statistically reliable heuristic devices for coping with other cognitive agents; unfortunately, these devices would yield surprisingly limited generalizations and meagre predictive power.[276]

Day's assessment of the possibilities of CSR contrasts heavily with those who advocate CSR. Day especially emphasises that CSR may only be an instrumental science rather than providing approximately true insights in how religion actually works. Day also highlights Geertz's claim that large-scale anthropological programs have little or nothing to give to the study of particular cultural traditions because the generalisation that such programs produce are not very interesting. Anthropological universals like "people everywhere have views about differences between sexes" or "all societies have systems of social rankings" are not very helpful in explaining some particular conception of differences between the sexes.[277] Day concludes his article by asking whether "the cognitive program leaves us only with the soggy empirical generalization *People everywhere believe in non-obvious, extra-human beings because they have human brains*? Only time will tell."[278]

Day's critique raises an important question about the aim of anthropological inquiry in general. If the aim of such an inquiry is to understand particular ideas and practices in particular traditions, then, Day's argument continues, population-scale explanations framed in probabilistic terms do not really help us because they do not give us any clue of how general mechanisms work in real historical and social contexts. This is because accounts of population-scale tendencies do not give us tools to identify the actual causal histories of particular occurrences of religious belief and practice.

Similarly, James Laidlaw has argued in his article *Well-Disposed Social Anthropologist's Problem with the 'Cognitive Science of Religion'* (2007) that as CSR deals with general features of religious thinking and behaviour its contribution to the study of actual religions equals "the contribution that technical knowledge about materials can make to aesthetics and the history of art."[279] Laidlaw's point here is that CSR theories specify only very general tendencies in the workings of human minds and exclude "everything that humans think and do in the reflective exercise of capacities [like] reason, imagination, and will"[280] According to Laidlaw, this methodological exclusion is perfectly productive provided it does not lead its practitioners to suppose that other factors are absent or trivial in religion.[281]

Laidlaw makes another point about the scope of CSR's explanations when he claims that CSR theories seem to deal with phenomena that we do not usually associate with religion at all. His basic idea is that while cognitive science can provide a causal account of some religious phenomena, this does not constitute "an explanation of religion" because virtually all distinctive features of religious traditions as well as what religious people themselves identify as "religious" falls outside the CSR's scope.[282] He insists that

> [t]he phenomena under discussion here are, it is convincingly claimed, so widespread in human populations because their causes – evolved mechanisms of cognitive

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[276] Day 2007, 60.
[277] Geertz 2000, 134-137.
[278] Day 2007, 62.
[279] Laidlaw 2007, 213.
[280] Laidlaw 2007, 214.
[281] Laidlaw acknowledges the fact that CSR's exclusions should be taken methodologically rather than metaphysically. Despite this acknowledgement, he claims (2007, 214) that CSR "involves implicit denial of the reality of human reason, imagination, and will". He further argues that "under the causal description – as the outcome of mechanisms of information processing" CSR cannot account for religious beliefs guided by reflective reasoning. Finally, he claims (2007, 230) that current CSR cannot "account for the contingent historical creations of reason, imagination, and will".
[282] Laidlaw 2007, 212.

> architecture – are universal to humans. Thus they are to be seen, albeit in locally variable forms, everywhere. But if they are indeed very widely distributed across societies, and of incontestable importance, they do not come near to constituting all that we might reasonably call religion. This fact is partly disguised by, and possible also from, practitioners of the cognitive science of religion by the virtually unanimous agreement among them in defining religion as beliefs and practices relating to spiritual or supernatural beings.[283]

Simply put, Laidlaw is saying that the *explanandum* of CSR is what is traditionally called superstition, rather than religion.[284]

Although Day's and Laidlaw's comments (especially Day's) are at times unfair to the achievements of CSR, their general observation about the problems surrounding the scope of CSR explanations seems valid. This observation is that CSR is mainly dealing with recurrent features of religious thinking and behaviour at the most general level and the exact relationship between general tendencies and particular occurrences of religious thinking and behaviour is not properly worked out.[285] Laidlaw writes that

> the demonstration of a propensity, which ... must take the form of establishing a statistical probability, by its very nature cannot be an explanation for why the feature in question is respectively present and absent in particular instances.[286]

In short, what we need, in Laidlaw's view, is an account of how exactly general tendencies relate to actual historical and socio-cultural occurrences of religious thinking and behaviour.[287] Laidlaw's and Day's critique could also be formulated in a more exact way by saying that CSR theories do make a plausible case for the fact that cognitive factors come in at some point during acquisition and transmission of representations, but they are unable to show where these factors actually come in when we consider the causal histories of actual beliefs and practices. If this is the case, then when we are looking at particular occurrences of religious thought and behaviour we can never be sure to what extent they are in fact products of cognitive constraints rather than some other factors.

Day's and Laidlaw's critique of CSR may be somewhat unfair because CSR writers do not in fact claim to explain religion "completely" since they think that religion is not a single category to be explained as we already noted in chapter 2. This being the case, some of the critique misses the point. Furthermore, most CSR writers acknowledge quite clearly that their explanatory model is not suitable to explain particular cases, but general tendencies. After making the point that all we can explain are the factors that contribute to "likelihood of religious belief" Boyer writes that

> All this is of great interest if you are like me a social scientist – that is, if you want to explain vast trends in human groups. ... The probability of a single event does not satisfy our appetite for explanations, which hankers after a definite causal chain that would have led this person to have this particular religious attitude. But if the intuitive plausibility of religious concepts is a matter of aggregate relevance, of activating different systems in different ways, then it is *in principle* futile to try to

[283] Laidlaw 2007, 220.
[284] Laidlaw 2007, 228.
[285] The claim here is NOT that CSR would have nothing to say about particular instances of religious thinking and behaviour, but rather that CSR's explanations would only play a relatively marginal role in such explanations.
[286] Whitehouse & Laidlaw 2007, 24.
[287] CSR writers have applied their theories to particular cases. See, e.g., Cohen 2007a and Malley 2004.

> identify that causal chain. All we can describe are trends in groups, which is certainly frustrating.[288]

Prima facie such acknowledgements might seem to nullify Day's and Laidlaw's critique completely, but this is not the case. The critique of these writers can be understood as saying that the aspects of religious belief and behaviour that CSR is able to explain are not interesting or that they are marginal to the interests of anthropology of religion.

Although I will be addressing the theoretical and methodological side of the problem of scope, it must be emphasised that the problem itself cannot be solved by theoretical means only. It will be the task of future empirical research – especially research into actual religious beliefs and practices in their particular contexts – which will partly determine whether CSR theories have major relevance or not. However, the problem of scope is also a methodological and theoretical one in the sense that our understanding of the auxiliary theories and related assumptions gives us expectations about the future results of the CSR. In these terms, Boyer's view is that we should expect CSR to give satisfactory answers to most of the questions he poses whereas the more pessimistic view of Laidlaw's and Day's would claim that Boyer's general questions are of minor interest and even if CSR theories were equipped to answer them, those answers would not constitute a complete or a satisfactory answer.

4.2. Explaining Cultural Selection

Recall that in the discussions in section 2.2 we pointed out how CSR employs a certain type of selective explanation that invokes cognitive constraints to explain the prevalence of a certain type of ideas. In this section, we will be examining the nature of selective explanations and their relationship to other types of explanations. We will be looking at one popular way of making this distinction, namely, distinguishing ultimate and proximate explanations. Traditionally, in the case of human behaviour ultimate explanations have been understood as explanations that invoke events in the human evolutionary past, whereas proximate explanations invoke developmental or psychological mechanisms.

Recall that selective explanations employed by CSR writers are not biological or evolutionary explanations (section 2.2). For the sake of clarity, we should follow Valerie Haines who makes a distinction between evolutionary analogies and evolutionary explanations:

> Evolutionary explanations theorize or explore empirically how natural selection shaped human social behaviour, social organization, social change, and cultural evolution by causing humans to behave in ways that maximize their inclusive fitness in past and current environments. Evolutionary analogies use the logic of natural selection to offer sociological and anthropological answers to sociological and anthropological questions.[289]

As we have already seen (section 2.4.), CSR writers do not think that evolutionary explanations (understood in the aforementioned way) go all the way. They claim that evolutionary explanations are useful in explaining why human cognition is what it is, but it is the cognition that explains why culture is what it is. Instead of evolutionary explanations of human culture, they propose that we adopt an evolutionary analogy (understood in the aforementioned way). Namely, that we can explain cultural evolution as if it was analogous to

[288] Boyer 2001, 319.
[289] Haines 2007, 249.

biological evolution. Although CSR writers acknowledge that there are several differences between cultural and biological evolution, they maintain that cultural evolution can be explained in terms of "selection pressures" of cognitive and environmental constraints.[290] However, evolutionary analogies are troubled by the same problem as proper evolutionary explanations, namely, that general descriptions of selection pressures are not enough to explain why individual organisms have the traits they have.[291]

To highlight the difference between population-scale explanations and individual-scale explanations evolutionary biologist Ernst Mayr introduced the notions of "ultimate" and "proximate causation".[292] According to philosopher André Ariew, Mayr understood the difference as a difference between the decoding of a genetic program (proximate causes) and changing of a genetic program by evolution (ultimate causes). Behind this distinction is Mayr's attempt to defend evolutionary biology against developmental studies which had considerable influence at the time he was writing.[293] Without going in to the details of this muddled discussion, I will simply report Ariew's conclusions.[294] First it must be noted that he is quite sceptical of the application of the terms "ultimate" and "proximate" in the sense that Mayr uses them and suggests that we replace them with "evolutionary explanation" (ultimate) and "individual explanation" (proximate). Despite Ariew's well meaning rejoinder, we will continue to use the ultimate/proximate distinction but we will take those terms to mean what Ariew wants them to mean. So, Ariew suggest that the terms "ultimate" and "proximate" refer to different kinds of explanations that answer different kinds of questions.

Proximate explanations are explanations that answer questions about an organism over its lifetime. These explanations are causal and are based on the structural elements of individual organisms and their development as well as adult capabilities. Proximate explanations seek to answer functional questions like "how does X operate?", or developmental questions like "how does X come into being?"[295] Conversely, ultimate explanations are answers to questions like "how come trait X is prevalent in a population?" or "why does trait X remain prevalent in a population?" and as such they are based on similarities between individuals in a population. Ariew claims that ultimate explanations are not reducible to individual-level causal explanations since ultimate explanations refer to

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[290] The biggest difference is that cultural transmission is more variable than genetic transmission. In genetic transmission the rate of mutation is very slow which means that transmission is mainly replication. In cultural transmission, the rate of mutation, at least according to Sperber (1996, 98-106) and Boyer (1994, 274-285), is very high indeed. Sperber and Boyer insist (see chapter 2.2.) that cultural transmission consists of continuous distortion and reconstruction rather than replication.

[291] This problem is by no means exclusive to CSR. On the contrary, the problem is very common both in philosophy of social science and in philosophy of biology. No consensus has been achieved and some have even insisted that the whole ultimate/proximate distinction should be completely dropped. One could point out that the problem itself is not going to dissolve even if we get rid of the terms. For discussion, see, e.g., Marchionni & Vromen 2009; Mitchell 1992; Mitchell & Dietrich 2002; Francis 1990.

[292] Mayr introduced these notions in his article *Cause and Effect in Biology* (1961). See also Mayr 1977, 1993. For an overview of the ultimate/proximate distinction in Mayr, see Beatty 1994.

[293] Ariew 2003, 553-555.

[294] According to Ariew, Mayr's account has several problems. In regards to proximate causes, Mayr's idea of what developmental biology studies and explains is too restricted. Mayr claims that developmental biology studies how the "genetic program is decoded", but this is clearly inadequate. Ariew points out that explaining development is not just based on genetic decoding because other factors, such as environmental and other extra-cellular factors, come into the explanations as well. In regards to ultimate causes, Ariew claims that Mayr makes several unfounded assumptions. First, Mayr presupposes that natural selection is the only factor that explains why some traits are prevalent in populations. This is not true because other factors, such as migration, mutation, genetic recombination and drift, also explain the same phenomena. Second, Mayr assumes that ultimate explanations (evolutionary explanations) are historical, which is, again, false because rather than being based on individual histories, ultimate (evolutionary explanations) are based on statistical similarities of individuals in a population. See Ariew 2003, 554-560.

[295] Ariew 2003, 556-557.

common properties in individuals in a certain population. This point can be highlighted by introducing two different notions of fitness: individual fitness and trait fitness. Ariew writes that "individual fitness is a propensity of an individual to survive and reproduce in its environment given the traits it possesses"[296] and as such individual fitness is the proper domain of proximate explanations, that is, explanations that explain the properties of individuals by their structures. Trait fitness, on the other hand, is "an *average* (individual) fitness of individuals possessing a particular trait. As an *average*, trait fitness does not reflect a property that any individual necessarily possesses (e.g no human couple has 2.3 children)."[297] Ariew's point here is that as individual fitness is a property of an individual, trait fitness is a property of a population, and populations are the things that evolve whereas individuals develop.[298] So Ariew's conclusion is that

> [t]he point of natural selection explanations of evolutionary population changes is to explain those changes by citing varying features of the population. Those features are what some ensembles of individuals have in common that vary from other ensembles, namely varying traits. Consequently, natural selection provides an explanation of *what several evolutionary events have in common*.[299]

Ariew's basic result is that proximate explanations and ultimate explanations are different kinds of explanation altogether. Proximate explanations explain the properties of individuals, whereas ultimate explanations explain the properties of populations. In this sense, populations are not ensembles of individuals but statistical descriptions of the similarities between actual individuals in a population. He goes on to say that even if we could have a complete causal story of an individual organism X from its birth to its death, this causal story would only constitute a proximate explanation. There would still be a plenty of room for ultimate explanations that would explain why a population of organisms has the similarities it has.[300]

In Ariew's work, ultimate and proximate explanations seem to be distinguished on the basis of their targets. This is not the only possibility. Indeed, we can analyse any given explanation by asking three questions:

(1) What does the explaining (*explanans*)?
(2) What is the target of the explanation (*explanandum*)?
(3) What is the "mode of explanation" (how does it explain)?

If we apply these questions to Ariew's analysis, the following picture emerges. In biology, ultimate explanations explain traits that are shared in a given population by invoking similarities between evolutionary events, that is, events that all individuals of the population have in common. The mode of explanation is functionalistic as such explanations invoke the beneficial reproductive effects of adaptations. Conversely, proximate explanations in biology are explanations of individual traits which invoke events in individual development, structure and environment. The mode of this explanation is causal.[301]

Now, if we apply this scheme to cultural evolution instead of biological evolution, I suggest that we get the following results. Ultimate explanations of culture (explanations of cultural evolution) explain recurrent patterns in thinking and behaviour in human population

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[296] Ariew 2003, 562.
[297] Ariew 2003, 562.
[298] Ariew 2003, 560-563.
[299] Ariew 2003, 563.
[300] Ariew 2003, 561.
[301] Such explanations can also be constitutive. We will return to this point later.

by invoking species-general cognitive mechanisms. The mode of explanation is "cognitive functionalism" since it explains the existence of a recurrent pattern by its high cognitive effects (optimal effect-effort ratio). What about proximate explanations of culture? We might suggest that proximate explanations of culture would be explanations of individual instances of behaviours and thoughts, namely, explanations that we normally call psychological explanations. Such explanations explain individual traits, such as beliefs, by invoking individual development and environment (individual's history) as well as personal or sub-personal psychological explanations. Note that cognitive mechanisms have different functions in these schemes and they should not be confused. In the case of ultimate explanations of culture (explanations of cultural evolution), cognitive mechanisms serve as ultimate causes as they explain why certain ideas are more "catchy" than others. In the case of proximate explanations of culture (explanations of individual behaviour and thinking) however, cognitive mechanisms can serve as candidates for proximate causes.

In the case of CSR explanations, the aforementioned questions (1)-(3) should be answered in the following way. The recurrent patterns in religious thinking and behaviour (2) are explained by the architecture of the human mind (1) – or more specifically, by the operation of a particular cognitive mechanism or a set of mechanisms. Finally, the way in which cognitive mechanisms explain recurrent patterns is by showing that some ideas have selective advantage over other ideas.[302]

The discussion so far suggests several consequences for CSR explanations. First of all, we can say that CSR writers are working with abstract models rather than historical descriptions of events. Critics are right to point out that CSR theories are quite abstract. Second, if CSR explanations are truly ultimate explanations of cultural evolution, then there is room for proximate explanations. In explaining particular instances of religious behaviours and beliefs, ultimate explanations of cultural evolution are basically useless: if we want to explain, for instance, why is it that John believes in God, then we quickly realise that an answer in terms of cognitive similarities and cultural evolution is far from being sufficient. Indeed, it might even be misleading. Events in John's history, his conscious reflection and specific situations in which John has found himself are all factors that might better explain his belief. Let us take another example. CSR writers puts forward theories that explain why ritual behaviour is so widespread (section 3.3.) by showing how cognitive systems make ritual behaviour possible and probable. As such, these theories answer only some questions about rituals. They do not explain why particular rituals have the particular forms they have, or why some people attend to rituals and others do not and so forth. Specific questions, such as Why John attended this ritual rather than stayed home or Why the Zande tribe sing during their rituals and the Zimbo tribe do not, cannot be answered by the tools provided by CSR's scheme. Further, there is room for other ultimate explanations as well: even in the case of biological explanation, natural selection is not the only explanatory factor of evolutionary change.[303]

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[302] One important terminological point must be made. The term "ultimate" may have the connotation that ultimate explanations are somehow "deeper", more "final" or fundamental than proximate explanations. This is simply not true: ultimate explanations do not reveal the "ultimate" meaning or basic motivations or anything the like.

[303] In addition to the ultimate/proximate distinction, there is also another quite famous classification of explanation-begging questions in biology. This four-question classification has been given by Niko Tinbergen (1963) and it is usually combined with the ultimate/proximate distinction by including the first two questions in the category of ultimate explanations and the latter two in the category of proximate explanation. The question can be presented as follows: (1) function (What kind of selective advantage does trait T give for a population of Y's? The answer is given in terms of selection pressures, environmental conditions and contesting traits), (2) evolution/phylogeny (What is the history of the population of Y's and how does it compare to other species? The answer is given in terms historical evidence and comparisons), (3) causation (How does organism Y operate? The answer is given in terms of mechanisms that underlie the operations of Y) and (4) development/ontogeny (How does organism Y come into being? The answer is given in terms of genetic codes,

My central point here has been to show that selective explanations only answer questions that concern population-scale developments and use abstract models to answer them. A corollary of this point is that having an ultimate explanation tells us very little about actual proximate events and vice versa. Now, the interesting question is where the actual transition between these modes of explanation takes place. Or put in another way: at which point should we start talking about trends?

We are now in a position where we can reframe the problem of scope. The point of the critics of CSR is not so much that the scope of CSR is narrow, but that it does not give us tools to distinguish between "how possibly" explanations and "how actually" explanation. Again, this problem is common to all selective explanations.[304] Further, evolutionary stories are speculative in the sense that they seldom describe actual historical processes and give accounts that outline the way in which certain adaptations might have developed. All these points apply to ultimate explanations of cultural selection as well. Descriptions of cognitive constraints and predictions that are based on them in "laboratory conditions" do not go a long way in showing what role these constraints play in real world situations. This is because we have no tools for distinguishing between situations where cognitive constraints play a significant role and situations where some other factors might be invoked to explain why recurrent patterns arise.

We now have a preliminary picture of what selective explanations explain and how they explain. The ultimate/proximate distinction was introduced as an attempt to clarify the nature of selective explanations of cultural evolution. It was also pointed out that the mode of selective explanations resembles functional explanations since they invoke beneficial cognitive effects as causes of the prevalence of religious ideas. This result might seem strange as CSR writers usually emphasise strongly that they are in the business of giving causal explanations rather than functional ones (section 2.2.).

4.3. Explaining Cognitive Capacities

The preceding section examined the problem of scope in the light of philosophy of biology. In this section, we will shift our point of view from evolutionary considerations to psychological ones. It has been pointed out several times in the course of this work that CSR writers argue strongly for the relevance of non-conscious (and non-intentional) cognitive mechanisms for explaining cultural selection. According to the critics of the CSR, psychological explanations of this kind do not go very far in explaining cultural products, ideas or practices as these explanations rule out "everything that humans think and do in the reflective exercise of capacities [like] reason, imagination, and will", as Laidlaw puts it. Laidlaw's view seems to be that shared practices and ideas are mostly "reflective exercise of capacities [like] reason, imagination, and will" and as such are out of the reach of psychological explanations based on "mechanistic computational operations". In order to clarify the issue, this section will recast the problem of scope in terms of the relationship between two kinds of psychological explanations, namely, personal and sub-personal explanations.

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interactions with the environment and other ecological factors).

[304] The explanatory power of natural selection is under considerable debate in philosophy of biology and evolutionary psychology. Generally speaking there are three positions: (1) "hard-liner" Neo-Darwinians (or adaptationists) claim that all complex organisations are products of natural selection, (2) "spandrelists" claim that natural selection is an important but in most cases not the driving force behind evolutionary change and (3) the occupants of the middle position seek to strike a balance between natural selection and other factors. For discussion, see, e.g., Sober 2004.

Several writers have suggested that the psychological sciences offer explanations of human behaviour and information processing capabilities in three different "levels of explanation":[305]

(1) personal explanations that explain individual behaviour and thinking by folk psychological categories,
(2) sub-personal explanations that explain similarities in behaviour and thinking by unconscious cognitive mechanisms,
(3) biological (i.e., neuroscientific) explanations that explain how cognitive mechanisms are realised by physical structures.

Personal explanations (1) are explanations of behaviour that posit intentional states such as beliefs, desires or other propositional attitudes. In short, personal explanations assume that the explained behaviour is a product of a rational mind. In section 2.1 when we first encountered this type of explanation we called it intentional or rational explanation. Sometimes in philosophical literature it is also called commonsense psychological explanation or folk psychological explanation. Further, cognitive theories of mind posit computational and automatic mechanisms (section 2.2) which would inhabit the sub-personal level of explanation. Finally, neuroscientists who study the actual physical interactions going on in the brain are dealing with the biological (3) level of explanation.[306] Now, the basic idea is that these levels of explanation are usually thought to form a hierarchy of explanations as presented in figure 4.

The philosophical consensus seems to tend in the direction of claiming that folk psychology in everyday contexts is first and foremost an explanatory theory.[307] Folk psychological vocabulary which includes terms such as belief, desire and reason is used whenever we want to predict, explain or describe the intentional behaviour of others. Such terms refer to states that are difficult to localise into sub-personal or biological explanations as they seem to have normative aspects: personal explanations are based on the assumption that humans are rational agents and that their behaviour is systematically caused by and explainable in terms of beliefs, desires and related propositions.[308] Note that such states can have an explanatory role because of their content, that is, they represent the world as being in a certain way. Further, personal explanations seem to suggest that intentional states causally bring about behaviour and those behavioural regularities that personal explanations pick out

[305] Dennett introduces the distinction between personal and sub-personal explanations in his *Content and Consciousness* (1969). Dennett (1987) also distinguishes explanations from three different *stances* that we can take: the intentional stance, the design stance and the physical stance. Explanations from the intentional stance consider a system as a rational agent that attempts to solve a particular problem or perform a certain task. We identify the constraints of the given task as well as strategies that might be used to perform the task. In the design stance we consider the design of all possible systems that might solve the task at hand. Finally, in the physical stance we look at how a system that might perform the task at hand might be physically structured. See, Bermudez 2005, 17-18, 27-31. Similarly, philosopher Robert Cummins distinguishes five types of psychological explanation (2000, 127): (1) folk psychological explanations, (2) computational explanations, (3) connectionist explanations, (4) neuroscience explanations and (5) evolutionary explanations. The first type of explanation would correspond to personal explanation, the second and the third type would be alternative models of sub-personal explanation and neuroscience explanations would correspond to biological explanations. Evolutionary explanations could also be understood as a form of biological explanation.

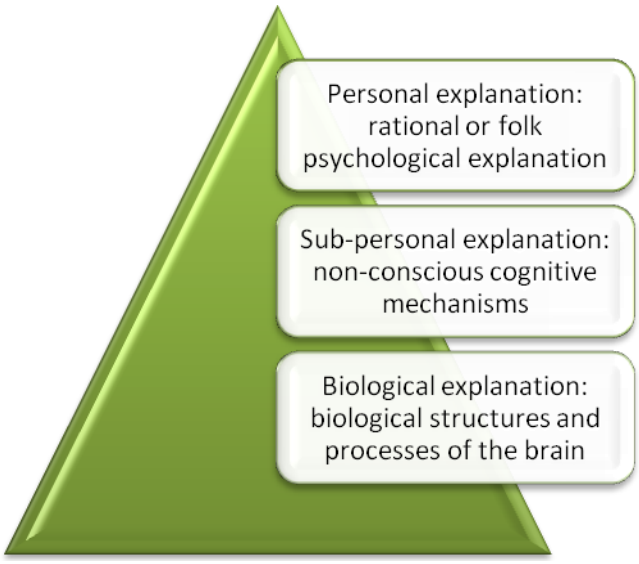
[306] For an overview, see, e.g., Bermudez 2005, 27-29.

[307] In the following, I assume that mental activity consists of, roughly, intentional and non-intentional states and processes. For instance, propositional attitudes such as beliefs and desires are intentional states whereas perceptions and emotions are non-intentional. The cognitive/representational theory of mind (chapter 2.3) argues that all mental activity can be understood as representations and processes that are operated on these representations. Mental representations in this sense would cover both intentional and non-intentional states.

[308] This is what Cummins calls "Leibniz's gap": folk psychological notions do not seem to map onto notions about brains and bodies or other internal structures.

cannot be picked out at the level of sub-personal explanation.[309] Finally, folk psychological states that personal explanations refer to are states to which individuals themselves have some sort of "privileged access": I have knowledge of my own propositional attitudes in a direct way (my mental states are transparent to me) whereas others come to know my mental states in an indirect way, such as by inferences drawn from my utterances and actions.[310]

Figure 4. The hierarchy of psychological explanations.



Now that we have some idea of how personal explanations work we can take a brief look at sub-personal explanations. Philosopher Robert Cummins gives a useful outline of psychological explanation in his article *"How does it work?" versus "What are the laws?": Two Conceptions of Psychological Explanation* (2000). Cummins strongly criticises accounts of psychological explanation that are based on the existence of explanatory laws as the deductive-nomological model of explanation suggests. After pointing out that psychology is not interested in seeking explanatory laws, but psychological effects, he writes that

> [w]hat I have been calling "psychological effects" are not the only, or even the primary, *explananda* of psychology. I have been concentrating on effects because I have been criticising the idea that psychological explanation is subsumption under law; and psychological laws specify effects. The primary *explananda* of psychology, however are not effects (psychological laws) but *capacities*.[311]

[309] Bermudez (2005, 34) calls the former aspect "distinctive taxonomy" (personal explanations posit states that are not detectable at a sub-personal level of analysis) and the latter "distinctive regularities" (personal explanations posit behavioural regularities that cannot be specified in non-folk psychological terms).
[310] Botterill & Carruthers 1999, 31-38; Horgan & Woodward 1985, 197-198. The nature of folk psychology is widely debated in contemporary cognitive psychology, cognitive science, and in philosophy (in philosophy of mind to be exact). Debates rage over the function of folk psychology, the extent to which it should be used in scientific psychology, and its role in explaining human behaviour in the social sciences. See, e.g., Carruthers & Smith 1996.
[311] Cummins 2000, 122.

Cummins' point is that psychological explanations do not explain psychological phenomena on the basis of law-like regularities but rather such regularities of psychological phenomena (psychological effects) are targets of psychological explanations. Thus the *explanandum* of a psychological explanation is usually a capacity that creates the regularity. These might include capacities like seeing depth, understanding a language or planning the future. These capacities (and others) cannot be explained by general laws since psychological laws are just descriptions of regularities in such capacities. Moreover, Cummins suggests that to explain a dispositional property, such as a capacity of a system, one should proceed by "functional analysis":

> Functional analysis consists in analyzing a disposition into a number of less problematic dispositions such that programmed manifestation of these analyzing dispositions amounts to a manifestation of the analyzed disposition. By "programmed" here, I simply mean organized in a way that could be specified in a program or flowchart.[312]

The basic idea corresponds to that of "functional decomposition" advocated by Dennett. Functional analysis or decomposition breaks a function into smaller sub-functions until a level is reached where functions are relatively simple and can be instantiated by some physical system.[313] Such an analysis is usually given in the form of a flowchart or what is sometimes called a "boxological" chart.[314]

We are interested in the exact relationship between personal and sub-personal explanation – a problem that Bermudez dubs as the "interface problem". According to him, the interface problem can be stated as follows:

> How does commonsense psychological explanation interface with the explanations of cognitive and mental operations given by scientific psychology, cognitive science, cognitive neuroscience and the other levels in the explanatory hierarchy?[315]

One way to understand the relationship between personal explanations that explain behaviour by invoking intentional mental states and sub-personal explanations that explain general psychological capacities by revealing underlying mechanisms was already presented in the form of "explanatory hierarchy". If we can situate personal explanations at the top of an explanatory hierarchy, then we can understand its relationship to sub-personal explanations by distinguishing horizontal explanations from vertical ones. According to this view, horizontal explanations are singular causal explanations that invoke temporal and spatial sequences of events or states to explain a singular event. Normally, when we ask why X happened we are looking for a horizontal explanation. Why did the window break? It broke because the neighbour's son threw a baseball through it. In the case of personal explanations, such explanations would usually invoke intentional mental states. Why did the neighbour's son throw the ball through the window? He hated the evil uncle that lived in the house and wanted to annoy him. If horizontal explanations are singular causal explanations, then vertical explanations (or constitutive or structural) explanations explain why some of the

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312 Cummins 2000, 125.

313 In his article *Artificial Intelligence as Philosophy and as Psychology* (1978) and in his later works, Dennett describes this approach as postulating more and more stupid homunculi until a level is reached where the tasks performed by these homunculi are so simple that they can be done by a very simple process.

314 If Cummins is right in claiming that psychological explanations explain capacities, then we might say that CSR attempts to explain the human capacity for religious belief and behaviour. Further, the argument of CSR writers would be that our capacity for religious belief and behaviour would be constituted by the same systems that constitute many of our non-religious capacities.

315 Bermudez 2005, 35.

regularities invoked in horizontal explanations work in the first place. Vertical explanations do not refer to temporal sequences but to the structure or organisation of the disposition. Why did the window break? It broke because the physical structure of the window is such that when it is hit by a physical object with a velocity V it will shatter.[316]

When we attempt to work out the relationship between personal and sub-personal explanation we quickly end up asking how folk psychological terms and their referents should be understood. Roughly speaking, we have three different views which to choose: realism, anti-realism (or interpretationalism) and eliminativism (figure 5.). Folk psychological realists posit that in explaining and predicting people's actions and reactions on the basis of their intentional states (beliefs, desires) we are committed both to there being such things as intentional states (as types or kinds) and to these states having causal effects. Anti-realism comes in many forms but all deny the existence of causally relevant intentional states (types). Finally, eliminativists claim that not only are folk psychological terms vacuous but personal explanations will eventually be completely eliminated.[317]

Figure 5. Folk psychological terms and their referents



Folk psychological realists argue that folk psychology commits us to certain kinds of inner structures:

> We can sum all this up by saying that folk psychology is committed to people having intentional states, and to the claim that those intentional states are forms of intentional content in which actual or possible items are presented to a subject in various ways, and conceptualized in various ways. … There are also – and this seems to be the very belief/desire core of folk psychology – characteristic causal connections between intentional states and actions.[318]

This formulation commits the realist to the existence of intentional states in the mind. Usually those, such as Fodor, who advocate a representational theory of mind based on the Language of Though hypothesis, readily accept such commitments.[319] Realists are also

[316] The vertical/horizontal distinction can be found in Bermudez 2005, 31-33.
[317] Botterill & Carruthers 1999, 24-26.
[318] Botterill & Carruthers 1999, 38.
[319] See Fodor's classic *Language of Thought* (1975) and its sequel *LOT II*: *The Language of Thought Revisited* (2008) for details. According to the LoT hypothesis, propositional attitudes and other personal level states are vehicles

committed to the existence of different classes of intentional states based on the intrinsic properties of these states. This implies that intentional states have conceptual content in virtue of their structure. Finally, realists are committed to the claim that mental states are causally active, that is, they can be seen as causes of behaviour. In the realist picture, reasons and beliefs can be construed as causes of action because inferences that lead to actions can be construed as a causal process.[320]

Diametrically opposed to realism is eliminativism that comes in two basic forms. The first form, eliminative materialism, argues that personal explanations are based on theory-like structures that are clearly mistaken and should be replaced with neuroscientific explanations. According to this view, there are no intentional states or anything that correspond to them in the mind. The argument further claims that eventually both scientific psychology and everyday psychology will be replaced by neuroscience. Philosopher Paul Churchland is one of the most famous advocates of eliminative materialism.[321] A softer version of eliminativism is proposed by Stephen Stich who argues that psychology and neuroscience should be developed further before we can decide our proper attitude towards folk psychology. In principle, it is possible that the sciences of the mind/brain finally vindicate our folk psychological intuitions. Stich concludes that this alternative can be hoped for but it currently does not seem very probable.[322]

Folk psychological anti-realism is a mediating position between realism and eliminativism. According to anti-realists, such as Dennett and Davidson, folk psychology is a theory or an interpretative schema that allows a person to produce mini-theories of the mental states of others. Davidson's position stems from his anomalous monism which states that our common psychological vocabulary does not allow law-like generalisations because the norms of rationality are constitutive in our attempts to explain the behaviour of others.[323] This would mean that states that personal explanations posit cannot be mapped onto states and processes of sub-personal levels of explanation at all. Personal explanations, in his view, would be based on inevitable normative assumptions about human beings. According to Dennett, the practice of folk psychology consists of taking a certain kind of stance towards other people: the intentional stance. People adopt the intentional stance towards other people because it is useful and seems to predict behaviour quite well. According to this view, intentional states such as propositional attitudes are abstractions and postulates generated by automatic inferences in the mind of the interpreter. This is why intentional states do not have causal effects and thus cannot be used as explanatory factors in science. Despite the fact that there is no connection between the practical utility of folk psychology and the real causes of behaviour, the intentional stance is nevertheless still useful and cannot be eliminated from everyday discourse.[324]

Based on these different positions concerning folk psychological terms three views about personal explanations emerge:

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for sentences in the sub-personal language of thought. Fodor's LoT hypothesis was originally put forward to vindicate and clarify the notion of propositional attitude against connectionism. In the literature, the language of though itself has subsequently been dubbed as "Mentalese". See Botterill & Carruthers 1999, 194-207.

[320] Botterill & Carruthers 1999, 34-38. The realist interpretation of folk psychology has been defended by, e.g., Fodor (1987, 2000) and Peter Carruthers (2006). In their famous article *Why Folk Psychology Is Here to Stay* (1985), philosophers Terence Horgan and James Woodward also defend a form of folk psychological realism.

[321] See Churchland 1990, 1995.

[322] See Stich 1983.

[323] Davidson's articles on this issue are reprinted in Davidson 1980.

[324] See Dennett 1987, 1991. According to Botterill and Carruthers, Davidson's position is problematic because the constitutive nature of the norms of rationality seems to make irrational behaviour impossible. The problem with Dennett's account is instability: Dennett's mix of interpretationalism and realism is in constant danger of reducing itself either to realism or to eliminativism: on Dennett's view, there is no reason for the practical utility of folk psychology. See Botterill & Carruthers 1999, 27-31.

(1) personal explanations refer to actual states in the mind and they can be conflated with sub-personal explanations (folk psychological realism),
(2) personal explanations do not refer to actual states in the mind nor can they be conflated with sub-personal explanations (folk psychological anti-realism),
(3) personal explanations and sub-personal explanations do not refer to actual states in the mind nor can they be conflated with biological explanations (folk psychological eliminativism).

According to position (1), personal explanations are similar to sub-personal explanations and as such personal explanations are irreducible and can feature in scientific theories. Opposing this view, anti-realists (2) agree that personal explanations do not map onto sub-personal explanations, but they have different takes on what this means. Davidsonians claim that personal explanations need not refer to states that can be mapped onto states of sub-personal explanations and psychology is thus unable to give sub-personal accounts of personal level phenomena. However, Dennettians conclude that sub-personal explanations explain the same things as personal explanations without assuming problematic intentional states. Finally, advocates of position (3) claim that both personal and sub-personal explanations should be eliminated because the states that they posit cannot be mapped onto states posited by biological explanations.

From these general points we can conclude that the philosophical jury is still out: the relationship between personal and sub-personal explanations is (and will probably remain) vague in the sense that no general account of that relationship can be given. All three positions are philosophically possible and each has different consequences for the scope of CSR explanations. Despite these differences, I suggest that we could at least accept the position suggested by Botterill and Carruthers when they point out that

> [the] difference which we find between folk psychology and scientific psychology is that whereas the folk theory is geared to the minutiae of individual cases, scientific theory is interested rather in general *kinds* of processes. Thus, I might be concerned whether that look on your face shows that you have recognised me as I attempt to sneak out of some disreputable haunt. What scientific psychology is interested in explaining is how our capacity for recognising faces operates in general.[325]

As sub-personal explanations explain general capacities (which in turn create tendencies) we should not think that such explanations can substitute personal explanations. In this sense, the critics of CSR are right when they claim that "everything that humans think and do in the reflective exercise of capacities [like] reason, imagination, and will" is out of reach for sub-personal explanations. In explaining singular works of art, ideas or actions personal explanations are irreplaceable. On the other hand, the critics are wrong in claiming that sub-personal explanations have nothing to say about ideas and actions based on "reflective exercise of reason, imagination, and will". Personal explanations might work well with singular events but sub-personal explanations should be invoked to explain general tendencies or patterns that singular events, actions and ideas exhibit.

On the one hand, it seems plausible that the cognitive capacities that underlie our conscious thinking and action have some effect on the content of our ideas and thus create patterns and tendencies. Thus it would be a mistake to deny *a priori* the explanatory relevance of such mechanisms for explanations of cultural diversity and stability. On the other hand, as sub-personal explanations are mostly models explaining capacities and as we do not have any idea how sub-personal or biological explanations could replace or eliminate personal

[325] Botterill & Carruthers 1999, 47.

explanations we should not assume that sub-personal explanations would "go all the way up" in explaining behaviour and thinking. There is an extensive philosophical debate going on about these issues so taking strong positions is not advisable. On the one end are those who claim that personal explanations are mostly autonomous and cannot be mapped onto sub-personal or biological explanations. At the other end of the spectrum one finds writers according to whom biological explanations will eventually remove all personal and sub-personal explanations. Previous considerations suggest that we should avoid both extremes and leave our options relatively open at this point. It would seem best to proceed on a case-by-case basis, that is, by putting forward hypotheses at different levels of explanation and testing them in individual cases, rather than deciding *a priori* either that sub-personal explanations can be invoked to answer all questions about shared behaviour and ideas or that sub-personal explanations are completely irrelevant for such considerations.

4.4. Rethinking Causal Explanation

This section examines the notion of causal explanation in CSR writers and attempts to flesh out their assumptions with the help of philosophical theories of scientific explanation. We have already pointed out in section 2.2 that CSR writers seek causal explanations and noted how they connect causal explanations to physicalistic assumptions. Their assumption seems to be that causal explanations of this type are a norm in science and such explanations should be applied in the study of religion as well.

Recall Atran's formulation of his position:

> [n]aturalism in cognitive anthropology describes the attempt to causally locate the commonsense objects of study – cultures – inside the larger network of scientific knowledge. This approach posits no special phenomena, ontologies, causes, or laws beyond those of ordinary material objects and their inter-relationships. It studies the structure and content of representations, both private and public, and their variously patterned distributions within and between human populations.[326]

He insists that

> [c]ultures and religions do not exist apart from the individual minds that constitute them and the environments that constrain them, any more than biological species and varieties exist independently of the individual organisms that compose them and the environments that conform them. They are not well-bounded systems of definite clusters of beliefs, practices, and artifacts, but more or less regular distributions of causally connected thoughts, behaviors, material products, and environmental objects. To naturalistically understand what "cultures" are is to describe and explain the material causes responsible for reliable differences in these distributions.[327]

The central point here is that a properly naturalistic account can only accept causes and effects that are material or physical. These material causes seem to include psychological, ecological and evolutionary factors, but not social or cultural factors. Recall that Sperber understands the issue in a similar fashion when he insists that an explanation is causal and mechanistic when it analyses a complex causal relationship as an articulation of more elemental relationships. The idea here is that a good naturalistic explanation shows how the elemental causal relationships can be given a natural description in terms of some natural

[326] Atran 2002, 10.
[327] Atran 2002, 10.

science (section 2.2.). It seems that these claims are an attempt to get rid of all "vague" entities and "higher-level" causes that populate the socio-cultural sciences (cultures, abstractions, urges, etc.).

Sperber's emphasis on causal explanation leads him to reject three dominant explanatory strategies in anthropology. First, he claims that the strategy of hermeneutical anthropology - "interpretative generalisation" - attempts to describe the meaning of some practice or institution in abstract and interpretative terms. After the meaning is described, it is usually generalised and compared to similar interpretations from other cultural contexts. He singles out Geertzian "thick descriptions" as prototypes of such an approach (section 2.1). The problem is, Sperber points out, that general meanings and interpretations attributed to local institutions, practices or symbols by anthropologists cannot be causes of local inhabitants' actions. This is because interpretations are construed by the anthropologist himself and they exists in his mind only. Locals behave and act on the basis of what is in their heads rather than on the basis of the anthropologist's interpretation. This is why Sperber concludes that interpretative generalisations are not explanations at all: they cannot be tested so they are not even proper hypotheses.[328]

Second, Sperber claims that even though the explanatory strategy of structuralism is an improvement on interpretative generalisation, it does not do well in causal analysis. He points out that structuralist explanation is based on the idea that in the diversity of cultural material there are some underlying themes. Thus, structuralist explanations start from interpretive generalisations, but attempt to go beyond them: their goal is to identify similarities between representational structures. But, again, the problem is that structuralist explanations ground themselves on the interpretations of anthropologists: these interpretations are causally vague because they are abstractions of what is actually going on in the locals' minds, Sperber claims. What we want is an account of causal factors that explains why cultural representations exhibit similarities cross-culturally. So, Sperber's conclusion is that structuralism has identified the thing that is in need of an explanation, but is unable to explain it in causal terms. Finally, Sperber rejects the most dominant explanatory strategy in past and present social sciences: functionalism. He grounds his rejection in the claim that functional explanations are not properly causal, because they explain the existence of some population-level property, such as a particular social structure or institution, by its beneficial effect for the population in general. Without a plausible feedback mechanism, effects of institutions or practices cannot be their causes.[329]

Sperber's ideas of explanation coincide quite neatly with the causal-mechanism model of scientific explanation which has been developed by several writers, especially by philosopher Wesley Salmon.[330] The causal-mechanism model is based on the idea that there are actual causal relationships in the world and the function of our explanations is to track

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[328] Sperber 1996, 41-43. Anthropologists such as Mary Douglas and Claude Levi-Strauss practice interpretive generalisation, in Sperber's opinion. Clifford Geertz and other hermeneutically oriented scholars could be included in this group also. One critical point: Sperber seems to assume that Geertz and other advocates of interpretative anthropology are interested in "explaining" things, but this does not seem to be the case. Geertz, for instance, does not claim to explain anything at all; for him interpreting the web of cultural meaning surrounding humans is a way to understand their actions. See Geertz 1973, 5-10. It seems pointless to criticise Geertz for giving bad explanations when he is not interested in giving explanations at all. Furthermore, McCauley & Lawson point out that we cannot escape interpretation completely: in order to explain action, we must always interpret what is going on in participant's heads. See Lawson & McCauley 1990, 22-23.

[329] Sperber 1996, 41-49. There is a considerable amount of discussion of functionalist explanations. Several philosophers have defended the use functional explanations on different levels of social science by identifying it as a sub-species of causal explanation. See, e.g., Kincaid 1996, 2007.

[330] See Salmon 1984, 1989. Usually theories of scientific explanations are divided very roughly into two groups: the first group bases explanations on laws (or law-like dependencies), whereas the second group grounds explanation to causes. The former group is sometimes said to have an epistemic idea of explanation whereas the latter group has an ontic idea.

those relationships. In this sense, the model is strongly realistic: explanations are not arguments that are based on universal laws of nature as in the deductive-nomological model (D-N model) of explanation[331] or schemes which unify separate areas of knowledge as in Philip Kitcher's model of explanation as unification[332]. Salmon's formulation of the causal-mechanism model is strongly materialistic: he claims that in the world there are physical causal processes and interactions between these processes. To explain a phenomenon P is to track the causal process and causal interactions between processes that led to the emergence of P. Take the movement of billiard balls, for example. The movement of a cue ball on the billiard table is a causal process that carries with it a potential for causal interaction. A causal interaction occurs when the cue ball hits another ball which starts moving instead. The causal interaction event transmits the causal power or energy from one process to the next.[333]

Originally the causal-mechanism model was developed to answer the problems which besed the D-N model. Indeed, the causal-mechanism model has certain benefits that make it appealing. First, causal explanations in this scheme invoke causes that are independent and temporally prior to their effects. This ensures that causal relationships can be properly tested by empirical methods. Second, the causal-mechanism model does not presume the existence of universally valid laws of nature as the D-N model does. The problem with universal laws is that they seem very rare in sciences other than physics: even natural sciences such as biology lack universal laws.[334] Third, the causal-mechanism model ensures that scientific explanations and the results of scientific inquiry can be subsumed under one ontologically physicalistic framework thus keeping the social and natural sciences together.

Now, it seems relatively clear that the causal-mechanism analysis of explanation helps us to clarify the assumptions behind Sperber and CSR writers. These basic assumptions can be summed up by the claim according to which to explain a phenomenon P is to describe the causal/physical processes and interactions preceding the phenomenon P. However, such an account of explanation faces severe challenges that have led many philosophers to abandon it. The first weakness of the model is that it is unable to identify those causal relations that are relevant for explaining a phenomenon. For each given phenomenon to be explained, we have numerous causal/physical processes that are irrelevant for the purposes of explanation. What we want is not a description of all causal processes that temporally precede the effect and contribute to its emergence, but rather an account of explanatorily relevant causes. We

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331 The D-N model was introduced by philosopher Carl Hempel (1965). For an outline of both the D-N model of explanation and subsequent (massive) criticism, see Salmon 1989, 11-116. The basic idea of the D-N model is that explanations are arguments that have an *explanandum* sentence that describes the explained phenomenon, an *explanans* sentence that is supposed to account for the phenomenon and sentences that describe relevant background conditions. Two conditions must be fulfilled for the explanation to be successful. First, the *explanandum* must be logical consequence of the *explanans* and the *explanans* must be true. Thus, explanation should be valid deductive argument. Second, the *explanans* must contain at least one "law of nature" or some other type of general law. The claim is basically that in order to explain X, one must construct an argument where X is subsumed under some universal constant. Thus, the D-N model assumes the existence of general laws or some law-like constants. The motivation behind the model is based on the idea of "nomic expectability": scientific explanations make things expectable on the basis of their lawful connections.

332 For accounts of the unificationist model of explanations, see Kitcher 1989, 1991. The basic idea of the unificationist account of explanation is that explanations should relate previously unrelated and unconnected phenomena to the body of knowledge we already have. The process of explanation, thus, would be a process where constantly growing group of unrelated phenomena is subsumed under constantly diminishing group of principles.

333 Woodward 2003a gives an excellent overview of the D-N model, causal-mechanism and unificationist models and their subsequent criticism. One of the basic problems of the causal-mechanism model has been that the idea of causal interactions between processes turned out to be extremely hard to conceptualise. Salmon's view is that causal interactions leave some kind of a "mark". A mark is a local change in the structure of a process such as a dent in a car bumper. This mark distinguishes "pseudo-processes" from genuine causal processes. However, it is difficult to say what this "mark" actually is. For discussion, see Craver 2007, 72-86.

334 For discussion of explanation in biology, see, e.g., Rosenberg 1994.

need an explanatory account which describes those causes that we need to know. Take a car crash, for instance. A car crashes into a tree because the driver tries to dodge a cat running across the road. If we do not have an account of how to distinguish explanatorily relevant causal processes from irrelevant causal processes, we might as well say that the car crashed because the physical constants of our universe are what they are. It is true that if the physical constants of our universe had been different, then the car would not have crashed. In some sense this is true, but it somehow seems to be an unsatisfactory answer to why the car crashed. The fact that this explanation does not seem to tell us what we want to know about the car crash shows that it is not enough to cite just one physical process as the single cause or make a list of all preceding physical processes.[335]

The second weakness of the causal-mechanism model is its physicalism or "fundamentalism" since it assumes that there is a "basic" level of explanation. In other words, the model presumes that all explanations can be ultimately given in terms of physical interactions between particular physical entities. This creates problems for explaining complex systems, because there are several instances of explanation – even in the domain of the natural sciences – that do not deal with particular physical processes, even though it is usually thought that such processes underlie "higher-level" phenomena. The idea here is that even in physics, when for instance thermodynamics explains the behaviour of gases, explanations do not refer to trajectories of individual molecules, even though it is widely recognised that gases are just collections of individual molecules, but rather to general laws of the behaviours of such collections of molecules and their environmental conditions. This is even truer in biology or economics where complex systems are explained without any reference to individual physical processes.[336] Against this background, micro-reduction and emphasising individual physical processes does not seem to make sense.[337]

Now, if we relate these discussions to CSR, I suggest that we get the following results. It seems that the requirement of actual material causes is far too strong: CSR writers very seldom describe particular physical states or physical processes that explain the distribution of representations in a population. Instead, what can be found are models of psychological and ecological factors that the CSR writers believe to be more likely to be physically realised by some physical structures than entities and processes postulated by traditional socio-cultural approaches. Further, although CSR writers suppose that cognitive systems are realised in the neuronal activity in the brain (sections 2.2 and 2.3), they continue to use cognitive models which very seldom refer to actual physical processes in the brain. Thus, it seems quite plausible to claim that when CSR writers talk about "material causes",

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[335] For discussion, see Woodward 2003a. The problem described here sometimes goes under the name of the "problem of causal relevance". Craver (2007, 78) describes the problem as follows: "Causal relevance cannot be analyzed in terms of exchanges of conserved quantities alone. The causal nexus is a complex reticulum of causal processes and interactions. Only some of them are relevant to any given *explanandum phenomenon*. Providing an etiological explanation involves not merely revealing the causal nexus in the past light cone of the *explanandum phenomenon*. It involves, in addition, selecting the relevant interactions and processes and picking out relevant features of those processes and interactions."

[336] Woodward 2003a. Describing individual causal processes in the case of complex systems is almost impossible, because the individual processes are too complex: "However, it also seems plain that producing a full description of these processes (supposing for the sake of the argument that it was possible to do this) will produce little or no insight into why these systems behave as they do. Again, this is not just because any such 'explanation' will overwhelm our information processing abilities. It is also the case that a great deal of the information contained in such a description will be irrelevant to the behaviour we are trying to explain, for the same reason that a detailed description of the individual molecular trajectories will contain information that is irrelevant to the behaviour of the gases."

[337] Garfinkel 1981, 49-53. According to Garfinkel, micro-reduction includes two claims: (1) for every state, there is a micro-state and (2) for every micro-state, there is a micro-explanation. Usually reductionists hold that micro-states, described in physical terms, are "everything there is" and macro-states are either epiphenomenal or illusory. Thus micro-reductionism could also be called "nothing more than"-reductionism: a complex state is "nothing more than" its micro-state.

they are in fact talking about causes that are not teleological or intentional. So, the claim that explanations should be based on "material causes" seems to amount to a simple exclusion of intentional explanations.

Finally, if these claims have any validity, then CSR writers would do well to examine their background assumptions concerning explanation and causation.[338] It might even be argued that CSR writers' implicit micro-reductionism partly explains the lack of positive engagement between CSR and other approaches, since if it assumed that physical processes are the only possible explanatory factors, then approaches that ground their explanations in models that are not easily decomposed to physical processes seem non-explanatory. Such an explanation might invoke the feeling of not being "properly causal or scientific". However, as the critique of the causal-mechanism model suggests, there are other alternatives available – alternatives that do not have problems in providing grounding for empirical research and acknowledging the explanatory relevance of "non-physical" looking events or processes. The rest of this section will focus on providing a brief outline of one possible alternative to the causal-mechanism model.

The account of causal explanation that I am suggesting goes by several different names, such as the "interventionist theory of causal explanation", "manipulationist theory of causal explanation" or "contrastive theory of causal explanation".[339] Philosopher James Woodward summarises this theory in his book *Making Things Happen: a Theory of Causal Explanation* (2003b) and it has been subsequently applied to many different fields. From our point of view, the most interesting application is Carl Craver's account of neuroscientific explanation in his *Explaining the Brain: Mechanisms and the Mosaic Unity of Neuroscience* (2007). Craver's view is also based on an account of mechanistic explanation that we will deal in the subsequent sections.

We can begin by pointing out that the interventionist theory is thoroughly realistic since it presumes – as does the causal-mechanism model– that explanations track the causal structure of the world: causal relationships are "in the world" and explanations are representations of these relationships. However, the causal structure of the world is not clearly observable to us and, our explanations - that is, representations of explanatorily relevant causal relationships - refer to processes that are beyond our direct observation. Experimental settings are needed to isolate and test the existence of such relationships. Second, interventionist theory assumes that explanations operate inside what Alan Garfinkel calls "explanatory frames". The idea is that all explanations include an implicit (or explicit) conceptualisation of the *explanandum* phenomenon and some possible alternatives to it. In this sense, explanations only explain what they already conceptualise. As explanation explain only the *explanandum* phenomenon "under a certain description" it does not make sense to talk about "a complete" or "ultimate" explanation that will somehow exhaust all other explanations.[340] The third assumption is that explanations are always answers to questions, usually why-questions or sometimes how-questions. An explanation is adequate, if it answers the question satisfactorily. The assumption that explanations are answers to questions makes

[338] Some CSR writers have already considered these issues. See, e.g., Pyysiainen 2009, forth.

[339] Interventionist theory of causal explanation has its roots in several different developments. First, it draws inspiration from pragmatic theories of scientific explanation, such as Bas van Fraassen's idea of explanations as answers to contrastive questions. See van Fraassen 1980; Garfinkel 1981. Second, it is rooted in counter-factual theories of causation of which David Lewis' (1986) theory is the most famous. Third, contemporary interventionist theory is indebted to earlier manipulationist approaches or what were formerly called "agentual theories of causation", developed by, e.g., von Wright (1971). Finally, the interventionist theory has roots in Salmon's causal-mechanism model of explanation. For overviews of the interventionist theory, see, e.g., Woodward 2000, 2003b; Ylikoski 2001, 17-47. For a general account of manipulationist theories of causation, see Woodward 2008a. See also Ylikoski 2006.

[340] Garfinkel 1981, 7-10.

it possible to specify the object of explanation: questions include "contrast spaces" that limit the alternative answers.[341]

This idea of contrasts, or contrast spaces, is extremely important for the interventionist account.[342] Garfinkel highlights the idea with a well-known example. The bank robber named Willie Sutton was serving time in prison and the prison chaplain with the intention of reforming him asked him why he robbed banks. Sutton replied: "That's where the money is." The point of the example is to show that although both ask the same question, their contrast spaces are different. The prison chaplain wants to know why Sutton robs in general, whereas for Sutton the issue is whether banks are better places to rob than some other places. These questions can be reformulated as what-if-things-had-been-different questions to reveal the relevant alternatives, that is, contrasts. Sutton's question is "Why does Sutton rob banks rather than other places (like supermarkets or private homes)", whereas the chaplain's question is "Why does Sutton rob banks rather than not robbing anything". When we look at these formulations, it is easy to see that they require different answers: to explain why Sutton robs banks rather than supermarkets is a different task than explaining why Sutton robs banks rather than living a decent life.[343] Garfinkel concludes that we should not hold *explananda* as simple objects, but rather as states of affairs together with a contrast space which includes a contradictory alternative to it.[344]

The interventionist account of causal relationships is based on the idea of counter-factual support. The existence of a causal relationship can be determined through intervention: if we change the cause factor, we get change in the effect factor. If we are able to manipulate the cause, have co-variance in the effect and can determine that the variance in the effect is not caused by some other factor, then we can infer that there really is a causal relationship between the cause and the effect. In this analysis, causality is ultimately a relationship that holds in different counter-factual conditions.[345] More formally, we can give the relationship between the cause factor and the effect factor in terms of variables:

> Variable X is causally relevant to variable Y in conditions W if some ideal intervention on X in conditions W changes the value of Y (or the probability of distribution over possible values of Y). In the context of a given request for explanation, the relationship between X and Y is explanatory if it is invariant under the conditions (W) that are relevant in that explanatory context.[346]

Variables X and Y are capable of taking on determinate values. Talk of events or processes can be easily translated to the vocabulary of variables: events can be seen as variables that have only two values, 0 or 1, and processes can be seen as variables that can take on any value in a continuum. When the relationship between variables X and Y remains stable in specified conditions, we can safely deduce that the relationship between them is causal.

There are several important points that we have to make about this analysis. First of all, the interventionist account does not require an account of a physical chain of events which would link the cause to the effect. Of course, an account of the precise mechanism(s) that relate the change in cause variable to the change in effect variable would increase the plausibility and comprehensiveness of the explanation, but such an account is not necessary in principle. What is necessary for the existence of a causal relationship is that we can

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[341] Garfinkel 1981, 10-14.

[342] The idea of contrast spaces in some form or another appears in several different sources. The "classical" discussions can be found in Bas Van Fraassen's *The Scientific Image* (1980) under the heading of "pragmatics of explanation" and in Alan Garfinkel's *Forms of Explanation* (1981). For an overview, see Hitchcock (1996).

[343] Garfinkel 1981, 21-41.

[344] Ylikoski 2001, 22-29.

[345] See Woodward 2003b.

[346] Craver 2007, 94.

produce change in the effect factor by producing change in the cause factor. This point about physical connections generalises over descriptions of causes and effects as well: the descriptions of causes and effects need not be given in "physical" (or some other predetermined set) of terms. It is enough that descriptions include states, processes or events that we can change in principle.[347] Furthermore, we need not think that we must be able to produce an intervention in the actual world in order to demonstrate the existence of a causal relationship. It is enough that we can have an idea of what an intervention might look like – an ideal intervention. In many cases, causal claims cannot be tested in laboratory settings; this is especially true in the social sciences where the *explananda* are macro-level events that are impossible to operationalise in the laboratory (e.g., revolutions). However, this does not prevent us from formulating the explanations involved in interventionist terms. We can seek causal factors by describing what would happen, if this or that factor would be removed. Finally, if we conceptualise causal relationships in terms of interventions and variables, we can identify relationships that are not universal, general or even probable. Thus, we can give causal explanations even in conditions where relevant processes are highly context sensitive, stochastic and historically contingent.[348]

It was noted earlier that the causal-mechanism account falls prey to the "problem of causal relevance" – that is, the problem of how to distinguish causally relevant relationships from causally irrelevant relationships. If we take – as the causal-mechanism model suggests – physical interactions as prototypes of such relations, we are faced with the problem of how to distinguish irrelevant physical interactions that precede the effect from explanatorily relevant physical interactions. This is where the idea of contrast spaces comes in again: in order to assess the truth or falsity of a causal claim, it is necessary to explicate the implied contrasts in both the description of the cause and the description of the effect. For the cause variable, the contrast is between the value of the variable when it is not intervened, and the value that the intervention produces. For the effect variable, the contrast is between the value of the effect variable when the cause variable is not intervened and the value of the effect variable when the value of the cause variable is intervened. More plainly stated causal claims are of the form

X, rather than not-X, causes Y, rather than not-Y in condition W.

Hence when we are looking for an explanation, we are looking for causally relevant contrast for the cause-variable which is appropriate for our effect-variable contrast.[349]

We can illustrate the preceding ideas with an example from Craver. Let us imagine that we have a bucket of water in the middle of the room and the room temperature drops to

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[347] This feature of the interventionist account leaves the door open for defences of mental causation and "higher-level" causation taken up recently by several authors independently from each other. See, e.g., Woodward 2008b and Menzies 2008. The basic idea of this argument is that in order for a mental state (or any other "multiply realised" state) to be causally relevant for some event, it is enough that we can produce an intervention that changes the particular mental state. Hence, the "ontological" nature of mental states does not really matter for the purposes of explanation. To show the existence of a causal relationship between, say, a belief and some behaviour, one needs only to produce a change in the belief that will produce a change in the behaviour. If this succeeds, the belief can be considered as an explanation for some behaviour.

[348] Craver 2007, 93-100. The final point is the very reason why Craver thinks that the interventionist account is especially suitable for the biological and psychological sciences as well as the neurosciences where general laws are scarce and mechanisms are highly context sensitive.

[349] Craver 2007, 82, 202-211. Craver (2007, 204) makes this point when he writes that "any time that one searches for a cause or attempts to formulate an explanation, one must specify the effect or the *explanandum* that one is trying to explain. Having done so, one then looks for the objective relations of causal relevance that explain the effect. The contrastive description of the *explanandum* effect is helpful merely to specify as precisely as possible what one is trying to explain – to identify precisely that feature of the world for which a cause is sought."

-18.6 degrees. The result is that the water in the bucket freezes. Now, we can ask, "What caused the bucket of water to freeze?" At least two possible hypotheses come to mind: the temperature dropped to -18.6 degrees or the temperature dropped below zero. What we are looking for here is the causally relevant property that is responsible for the freezing. The obvious way for deciding between these competing hypotheses is to do experiments by making interventions to the temperature and testing what changes are relevant to the state of the water. If the temperature is set to -20 degrees or -10 degrees or any value under zero and the water keeps on freezing, then we can conclude that these values in the cause variable are not causally relevant to the changes in the effect variable. We can continue the example in order to show how the change in contrast classes or explanatory frames changes the explanation. We could seek an explanation to the question "What caused the bucket of water to freeze in precisely t minutes rather than t_1?" Again, we can start by making an intervention by changing the temperature to neighbouring values and measuring the rate of freezing. Changing the temperature from -18.6 degrees to -20 degrees does make a difference in the rate of freezing. This would, in turn, make the different values of the cause variable which are under zero degrees causally relevant properties for the time it takes the water to freeze even when they are causally irrelevant for the water freezing.[350]

The point of the example is that different effect-contrasts help us to identify the relevant cause-contrasts. In our example, one could seek an explanation for the fact that the water froze rather than turned to steam or for the fact that the water froze at some particular rate t rather than at some other rate. Both of these effect-contrasts demand different cause-contrasts: the appropriate contrast for the first effect-contrast is the fact that the room temperature was below zero rather than above zero. What is not appropriate for the first effect-contrast is the fact that the room temperature was -18.6 degrees rather than some other value below zero. This cause-contrast, however, is causally relevant for the second effect-contrast.[351]

The contrastive analysis also helps us to understand better the relationship between micro-explanations and macro-explanations. Garfinkel argues that macro-explanations can be truly explanatory without being placeholders for micro-explanations. Thus, according to Garfinkel's view, the explanatory strategy of micro-reduction (or fundamentalism as Craver calls it) is flawed. Even if we were to accept some form of physicalism or another, it does not mean that every state would be explained by its physical structure:

> So the fact that something materially "is" something else does not mean that we can reduce the explanations involved. From the point of view of explanation there is a relative independence from the nature of the substrate. A macrostate, a higher level state of organization of a thing, or a state of the social relations between one thing and another can have a particular realization … But the explanation of the higher order state will not proceed via the microexplanation of the microstate which it happens to "be." Instead, explanations seek their own level, and typically this will not be the level of underlying substratum.[352]

The problem with micro-reduction is the assumption that only physical relationships are explanatory. This might be due to the fact that only material entities or processes are considered to have "causal powers" or what to be ultimately "real". However, what the interventionist model suggests is that we should cut the metaphysical idea of causation loose

[350] Craver 2007, 205-206.
[351] Craver 2007, 208-209.
[352] Garfinkel 1981, 59.

from the empirical and pragmatic notion of explanatory relevance: we do not need an *a priori* account of "causal powers" or a menu of ultimately real processes.[353]

This confusion between metaphysical constitution and causality makes it difficult for a micro-reductionist to see how useful macro-explanations actually are. Garfinkel's argument here is that macro-explanations change the implicit contrast of the *explanandum*. In short, micro-explanations explain different things than macro-explanations and hence they do not compete. Let us take an example from Garfinkel again. Imagine an ecological system which has two populations, rabbits and foxes, and in which the size of both populations fluctuate. The explanation for the fluctuations is that when the foxes eat most of the rabbits, the fox population runs out of food and it begins to shrink. And when the fox population shrinks and the pressure of the predators is decreased, the rabbit population begins to grow quickly (due to the proverbial capabilities of rabbits to multiply quickly). Finally, when the population of rabbits grows, the population of foxes begins to grow again because there are enough rabbits for the foxes to eat. Now, we can have different explanations for different aspects of this process. Take these two causal claims for instance:

(1) The low level of rabbit population is caused by the high level of fox population
(2) The cause of death of a single rabbit was that the fox population was high.

Note that the first explanation explains a macro-state with another macro-state and the latter explains a micro-state with a macro-state. If micro-reduction were true, then there would have to be micro-explanation for the death of a rabbit. The micro-explanation for (2) would be something like "rabbit r was eaten because it passed through the capture space of fox f". But this micro-explanation is no longer about the same thing as the macro-explanation: the *explanandum* of the micro-explanation is the death of a rabbit at the hands of fox f, at place p, time t, and so on. The *explanandum* of the macro-explanation is why the rabbit was eaten rather than not eaten, whereas the *explanandum* of the micro-explanation is why the rabbit was eaten by fox f at time t rather than by some other fox at some other time and so on.[354]

Garfinkel concludes that macro-explanations are invaluable and irreducible because they describe real counter-factual relationships that can be multiply realised by different physical mechanisms. In the case of foxes and rabbits, we want to know what makes a difference between a rabbit being eaten or not eaten. If I were a rabbit, I would not need to know why a rabbit r was eaten at time t and in place p because this would not really help me to avoid being eaten by a fox. The reason is that if the rabbit r had not been eaten at time t and in place p, then it would have been eaten at some other time and in some other place if the population of foxes is indeed high. So there is a genuine counter-factual relationship between the number of rabbits being eaten and the high level of foxes, a relationship than can be realised in different times and places where rabbits actually are eaten by foxes.[355] In sum, Garfinkel writes that

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[353] Garfinkel 1981, 49-53. Craver presents a detailed discussion of fundamentalism. First he defends his account of non-fundamental explanations against Jaegwon Kim's causal exclusion argument (*Explaining the Brain* chapter 6). We will return to the topic of physicalism and causal closure in chapter 5.2. Craver also defends his account of non-fundamental explanations against explanatory reductionists of different kinds (*Explaining the Brain* chapter 7).

[354] Garfinkel 1981, 55-56.

[355] Garfinkel 1991, 56-66. Garfinkel provides additional examples. There has been a car crash and the driver was drunk. We want to know why the accident happened. We could describe causes that would explain why the accident happened at time t in place p under some conditions c, but this would again change the *explanandum*. If the drunk driver had not crashed the car in time t in a place c, he would have crashed it at some other time or at least the probability of the crash would be higher than in normal conditions. We can take yet another example. I raise my arm. We want to explain why my hand goes up. A micro-reductionist or a fundamentalist would say that the explanation must be given at the level of physical states of the brain and my nervous system. This would again change the *explanandum*: in this case, we would be explaining why my hand went up at time t, in

> [t]he macroexplanation tells us that some realization or other will be the case to bring about Q but is indifferent as to which. The microexplanation tells us the mechanism by which the macroexplanation operated. The structure gives the *why*, while the microexplanation gives the *how*.[356]

In short, a micro-explanation gives us the mechanism by which a given macro-explanation worked, but the macro-explanation can work by several different underlying mechanisms. The result is that micro-explanation does not give us what the macro-explanation does – that is, the event that makes the biggest difference between the rabbit being eaten or not being eaten.

My argument in this section has been that CSR writers should re-examine their ideas of causality and scientific explanation in order to explicate what their theories explain and how those theories are related to other account of religious phenomena. I argued that CSR writers' assumptions can be understood in terms of the causal-mechanism model of causal explanation which I then proceeded to criticise. Finally, I suggested that an alternative theory of causal explanation – the interventionist theory – might help us to clarify the relationships between different kinds of explanations. The implications of such a theory for CSR was not discussed here since we must deal with other topics first. Here it suffices to point out that what CSR writers hold as one of the most central virtues of their explanations – that is, that their explanations posit "no special phenomena, ontologies, causes, or laws beyond those of ordinary material objects and their inter-relationships" - is somewhat vague and unnecessary as they are clearly referring to phenomena, ontologies and causes that are far beyond any physical theory of material objects.

4.5. Rethinking Integration and Reduction

In addition to the emphasis on causal explanation of religious phenomena, CSR writers are also committed to certain ideals concerning the integration of scientific disciplines that partly drives their assumptions about of the extensive scope of CSR theories. CSR writers constantly combine insights from diverse disciplines, such as cognitive psychology and anthropology, and criticise traditional approaches for not recognising the value of the behavioural and cognitive sciences to the study of religion and not making their methodological assumptions continuous with different branches of such sciences. Although CSR writers have not presented a general account of how such an integration should be achieved, we have already encountered hints of such a view in their writings. In this section, I will try to reveal these assumptions by comparing them to the idea of "vertical integration" in Evolutionary Psychology which shares the same goal.

The idea of "vertical integration" (or conceptual integration) has been advocated by Evolutionary Psychologists Leda Cosmides and John Tooby. According to vertical integration the various disciplines of the social and behavioural sciences should make themselves mutually consistent and integrate their methodological assumptions with the natural sciences. Cosmides and Tooby claim that

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place p and in some specific trajectory c. The object of the explanation is not the specific trajectory of my hand at a certain time, but rather the reason my hand moved at all. For my hand movements in different times and trajectories can all be instantiations of my hand going up.

[356] Garfinkel 1981, 58. In the same page Garfinkel also points out that the micro-explanation is simply "too true to be good" – that is, it does not help us to distinguish the explanatorily relevant physical (or micro-processes) from explanatorily irrelevant processes.

> [t]he natural sciences are already mutually consistent: the laws of chemistry are compatible with the laws of physics, even though they are not reducible to them. Similarly, the theory of natural selection cannot, even in principle, be expressed solely in terms of the laws of physics and chemistry, yet it is compatible with those laws. A conceptually integrated theory is one framed so that it is compatible with data and theory from other relevant fields.[357]

Compatibility in this sense means that biological theories, for instance, do not assume physical processes that are not at the same time acknowledged in the theories of physics or chemistry. According to Cosmides and Tooby, integration should be seen as multidisciplinary consistency and multilevel compatibility of theories. However, they explicitly deny that conceptual integration would be a form of "classical theory reduction": theories cannot be reduced to each other but their presuppositions can be consistent. Whereas natural sciences are mutually consistent, social sciences are not, Cosmides and Tooby argue. Anthropology and psychology, for instance, are construed as isolated disciplines and their theories are not integrated. Vertical integration of these disciplines would mean that anthropological theorising should not assume psychological processes or events that cannot be approached by cognitive psychology. Further, psychologists should not restrict their theories to individual minds but focus on the culture generating aspect of human cognition. Finally, conceptual integration takes the natural sciences as paradigmatic sciences in the sense that social and behavioural sciences should construe their theories in such a way that they do not contradict theories in the natural sciences.[358]

The goal of conceptual integration is to create a multidisciplinary and multilevel approach to socio-cultural phenomena. Cosmides and Tooby see Evolutionary Psychology as an attempt to create an integrated approach of the sort that would construct a bridge over "the dark waters" that separate biology from psychology and psychology from social sciences. The reason why integration is so important is that

> [c]onceptual integration generates this powerful growth in knowledge because it allows investigators to use knowledge developed in other disciplines to solve problems in their own. The causal links between fields create anchor points that allow one to bridge theoretical or methodological gaps that one's own field may not be able to span. This can happen in behavioral and social sciences, just as it has happened in the natural sciences.[359]

The idea is that unification of all disciplines of science contributes to scientific progress: the social and behavioural sciences should aim towards integration because integration in the natural sciences has led to powerful growth in knowledge. For example, the atomic theory altered the way that chemists view thermodynamics and connected Newtonian mechanics with kinetic theories of heat and so on.

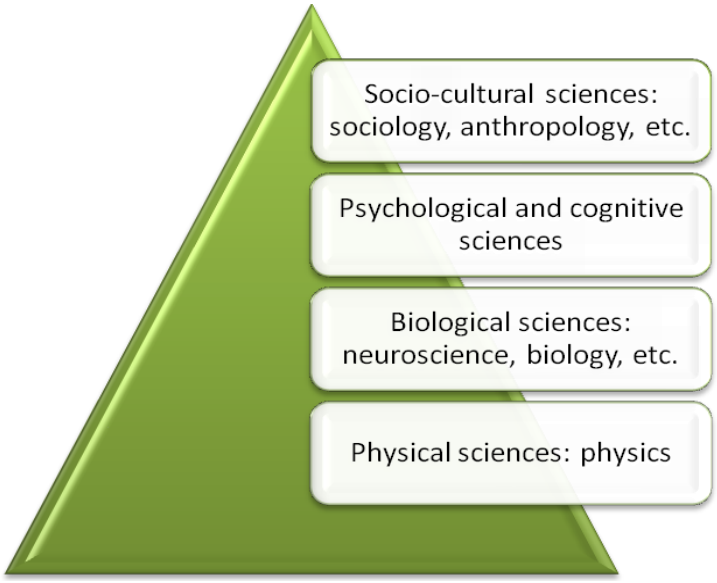
Vertical integration can proceed in at least two ways. First, it can seek to overcome methodological dualism, that is, the distinction between the natural and social sciences and thus maintain the unity of science. In this sense, conceptual integration requires that the domain of socio-cultural phenomena is "naturalised", that is, re-conceptualised in terms of some natural science. The most relevant natural science has usually been either biology, as in the case of evolutionary approaches, or psychology as exemplified by Sperber's epidemiology of representations. Secondly, conceptual integration attempts to facilitate interdisciplinary and inter-theoretic research by advocating the use of causal explanation. The idea here is that

[357] Cosmides & Tooby & Barkow 1992, 2.
[358] Cosmides & Tooby & Barkow 1992, 1-6.
[359] Cosmides & Tooby & Barkow 1992, 12.

one of the reasons why social and cultural sciences cannot be integrated into the natural sciences is that they both presume ontologically vague entities and use non-causal explanations. According to this view, proper causal explanations, as we have seen in the previous section, explain phenomena ultimately as effects of physical processes and their interactions. In this view, naturalisation and re-conceptualisation of the socio-cultural domain would amount to causally explaining why humans have the mental representations they have.

Vertical integration presumes that particular scientific disciplines exist as parts of a larger structure of hierarchically organised disciplines of science. Disciplines at lower levels of the hierarchy deal with laws and principles of a very general nature. The higher a discipline is situated in the hierarchy, the more particular its laws and principles are and the more restricted its scope is. Thus, the laws and principles of the most fundamental discipline, namely, physics, apply to chemical and biological phenomena but not vice versa. Cosmides and Tooby emphasise that compatibility does not entail reduction: higher level disciplines have their own laws and principles but they should be compatible with the ones situated at the lower levels.[360] This hierarchical structure of scientific disciplines can be understood as a pyramid as depicted in figure 6.

Figure 6. Hierarchical organisation of scientific disciplines.



Cosmides and Tooby outline their conceptually integrated approach to behavioural and social science by contrasting two models: the Standard Social Science Model (SSSM) and the Integrated Causal Model (ICM). They argue that SSSM presupposes that collective representations, emotions and tendencies are not caused by certain states of consciousness of individuals but by the conditions in which the social group, in its totality, is placed. Further, they claim that SSSM assumes that socio-cultural systems are abstract wholes that supersede individual psychology. SSSM also includes psychological assumptions according to which complex and diverse behaviour and thinking is absent from infants which implies that the adult mental capacity and organisation originates from the social world itself. These social and cultural elements mould individual psychology and cognition in different cultures in different ways. The central point of SSSM, as Cosmides and Tooby understand it, is that these powers are extra-genetic and extra-somatic, emergent processes only visible at a

[360] Cosmides & Tooby & Barkow 1992, 15. Especially note 1.

population-level analysis.[361] Furthermore, the motivation behind SSSM seems to be to secure the autonomy of the social sciences: the subject matter of social sciences is independent from the subject matter of the natural and behavioural sciences and thus theories of the social sciences cannot be reduced to theories in the natural sciences. According to this view, SSSM would be committed to methodological holism, namely, the existence and non-reducibility of "social facts" (section 2.2).[362]

Cosmides and Tooby propose that SSSM should be replaced with the Integrated Causal Model of social science. If the central conviction of SSSM is the independence of social facts, ICM by contrast is based on the dependence of socio-cultural phenomena on psychological states. According to Cosmides and Tooby, eight distinct claims characterise ICM:

(1) the human mind consists of a set of evolved information-processing mechanisms instantiated in the human nervous system;
(2) the mechanisms, and the developmental programs that produce them, are adaptations, products of natural selection in our ancestral environments;
(3) many of these mechanisms are functionally specialised to produce behaviours that solve particular adaptive problems;
(4) to be functionally specialised, many of these mechanisms must be richly structured in a content-specific way;
(5) content-specific mechanisms generate some of the particular content of human culture;
(6) the cultural content generated by these and other mechanisms is then presented to be adopted or modified by psychological mechanisms situated in the other members of the population;
(7) this sets up epidemiological and historical population-level processes;
(8) these processes are located in particular ecological, economic, and intergroup social contexts or environments.[363]

According to Cosmides and Tooby, ICM leads to the view that

> culture is the manufactured product of evolved psychological mechanisms situated in individuals living in groups. Culture and human social behaviour is complexly variable, but not because the human mind is a social product, a blank slate, or an externally programmed general-purpose computer, lacking a richly defined evolved structure. Instead, human culture and social behaviour is richly variable because it is generated by an incredibly intricate, contingent set of functional programs that use and process information from the world, including information that is provided both intentionally and unintentionally by other human beings.[364]

The idea of the ICM is that human culture in all its diversity rests on certain psychological mechanisms which themselves are products of natural selection for different functions in our ancestral environment.

If we compare the arguments of CSR writers to those of Evolutionary Psychology, we see clear affinities, many of which have been noted in previous chapters. As we have already covered most of these themes, I will just give a brief list of the most salient ones. First, both CSR and Evolutionary Psychology claim that the socio-cultural domain is not an

[361] Cosmides & Tooby 1992a, 24-30.
[362] Rosenberg 1986, 115-128.
[363] Cosmides & Tooby 1992a, 23-24.
[364] Cosmides & Tooby 1992a, 24.

explanatorily independent domain, but rather causally connected to psychological and biological domains. Second, Evolutionary Psychology and CSR presume that culture consists of widely distributed mental representations in people's heads. Third, Evolutionary Psychology and CSR assume that the human mind has specialised architecture and this architecture is relevant in explaining cultural content. Finally and most importantly, both presume that human culture is a by-product of evolved cognitive systems.

The commitment to integration is a commitment towards what is usually called the "unity of science". Taken as a general claim, the unity of science can mean at least two different things. First, the unity of science can refer to some sort of ideal state of science, usually achieved somewhere in the future. In this ideal state, scientific disciplines would be totally consistent and scientific language and laws would be the same regardless of disciplines. Secondly, the term "unity of science" can refer to intellectual trends in contemporary sciences which seek to fulfil this ideal.[365] From this point of view, vertical integration can be regarded as a meta-scientific idea that attempts to drive actual scientific theorising towards a future consilience to produce a single body of knowledge from the results of the natural and social sciences. Usually the advocates of this view have in their minds picture of what that consilience would look like and they hope that the sciences will come together to fill the gaps in that picture.[366] We will return to this topic later in section 5.2 where we will provide a brief outline of the philosophical assumptions that motivate this kind of meta-scientific theorising. Finally, when Cosmides and Tooby talk about possible progress achieved through integration, they are assuming that socio-cultural sciences are not making meaningful progress in their present "non-integrated" form and this lack of progress is a sign of their impotency as scientific disciplines.[367]

There are several points of convergence between the vertical integration of Evolutionary Psychology and the assumptions of CSR writers. First, it is presumed that all scientific disciplines should construct their methodology in such a way that their assumptions do not contradict disciplines or theories at lower levels. We can clearly see this tendency in its programmatic form when Atran writes that "[t]his approach posits no special phenomena, ontologies, causes, or laws beyond those of ordinary material objects and their inter-relationships." We pointed out in the preceding section how this claim is based on a philosophical commitment to a physicalist interpretation of causal explanation and how it is more confusing than helpful. In any case, the point that Atran is making here is that in CSR theorising it is a virtue to avoid "phenomena, ontologies, causes, or laws that go beyond those of ordinary material objects." This claim seems to assume an picture of scientific

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[365] Oppenheim & Putnam make this distinction (1991, 404).

[366] We can distinguish different aspects of the unity of science: (1) the unity of scientific method, (2) the unity of scientific goals, (3) the unity of subject matter, (4) the unity of explanatory laws and (5) the unity of scientific knowledge. According to claim (1), scientific disciplines are methodologically unified to the extent they share a basic method or a set of methodological principles. The three basic views are methodological pluralism, dualism and monism. According to claim (2), scientific disciplines can be unified in terms of goals: in a unified science, there would be only one goal. What this goal should be has been a matter of serious debate. Usually scientific realists claim that the goal of science is truth, namely, the construction of true theories about the empirical world. This position is usually called "verism". Many opponents of realism, such as constructive empiricists, have claimed that truth should not be the goal of science, but rather science should aim at systematisation of empirical knowledge which would amount to "instrumentalism". Claim (3) entails that all scientific disciplines have ultimately the same subject matter. One way of understanding this claim would be to posit that the subjects of particular scientific disciplines consist of physical parts of some sort. According to claim (4), all explanatory laws or law-like regularities should be compatible or, in the best possible case, reducible to a small set of core laws. Classical reductionism reflects this idea very well: the scientific theories of higher level disciplines can be reduced to theories of lower level disciplines which finally reduce to a single set of physical laws. Finally, according to claim (5), the unity of science can be seen as the unity of scientific knowledge. The basic idea is that science, in its future ideal form, should not include any contradictory statements.

[367] See, e.g., Cosmides & Tooby 1992a, 22-23.

disciplines as a hierarchically organised structure in the sense indicated earlier in this section. The very term "vertical integration" gives the idea away: we should aim to close the gaps and seek connections between disciplines related vertically in an organised hierarchy. In this hierarchy, there is a fundamental level or a discipline – physics – that has the most general laws and explanatory framework which provides constraints for all theorising of higher levels. Hence, there should not be a discipline or a theory anywhere in science which would contradict any statement or theories in physics. Second, both CSR and Evolutionary Psychology argue that all scientific disciplines should share the same goal, namely, description and explanation of the natural world. They also share the idea that the natural world is best revealed by our current theories in the natural sciences, mainly physics and evolutionary biology. Since socio-cultural systems are part of the same world described in physics and biology, these systems can be seen as patterns of individual behaviour that, in turn, are physical phenomena consisting of physical movement and the interpretations given to them. The goal of the behavioural and social sciences would be to describe and explain such phenomena. The point here is that the primary goals of all disciplines of science should be epistemic (true descriptions and explanations) rather than practical. Furthermore, Evolutionary Psychologists claim that it is the intrusion of practical goals, such as emancipation, enhancement of social structures or attempts to increase understanding between religious groups, that is responsible for the poor scientific quality of the social and cultural sciences. Practical goals should not be totally excluded, however, because they can be side-effects of accurately achieved epistemic goals, but they should not be considered necessary.

Vertical integration can be seen in the light of a certain set of general philosophical positions dealing with the nature and unity of science. The set of assumptions that we are interested in her are those related to what McCauley calls the "classical model of theory reduction" whose modern advocates are known as New Wave reductionists.[368] These discussions have been conducted mostly in the context of the relationship between psychology and neuroscience (psychoneural identity) but they generalise easily to create a bigger picture of how scientific theories should be related. The benchmarks and starting points for these discussions are the classic article *The Unity of Science as a Working Hypothesis* (1958)[369] by Paul Oppenheim and Hilary Putnam and Ernest Nagel's *The Structure of Science* (1951). Although the view of inter-theoretic reduction put forward in these texts is not a very popular one among philosophers, it has set the stage for current discussion and some of its assumptions are alive and well.

The aim of the classical model is to guarantee the unity of scientific theorising and knowledge. The basic idea is, very roughly, that scientific theories at one level should be reducible to theories underlying them at a more fundamental level. Inter-theoretic reduction is a deductive process whereby the laws of one higher level theory are reconstructed as deducible from the laws of a lower level theory. This inference requires "bridge laws" that spell out the systematic connections between the laws of both theories. In this sense, inter-theoretic reduction is a way to explain the laws of one theory in terms of the laws of some more fundamental theory and as such it can be understood as a form of deductive-nomological explanation where the *explanandum* is not a natural event, but a law of another

[368] My discussion proceeds along the lines of McCauley's article *Reduction: Models of Cross-Scientific Relations and Their Implications for the Psychology-Neuroscience Interface* (2007). McCauley's critique of New Wave reductionists shares many points with that of Craver (2007). Both Craver and McCauley consider the models of inter-theoretic reduction put forward by, e.g., John Bickle (1998, 2003), Paul Churchland (1988) and Patricia Churchland (1986, 2002) as prototypes of New Wave reductionism. See also the discussions in McCauley 1986 and 1996. The term "New Wave" reductionism comes from Bickle's book *Psychoneural Reduction: the New Wave* (1998) where Bickle puts forward his self-appointed "ruthlessly reductionistic" model. See also Bickle 2003.

[369] Reprinted in, e.g., Boyd *et al.* 1991.

theory.[370] In this scheme, science as well as the world is seen organised hierarchically according to levels of complexity. Further, classical reduction postulates a fundamental or "basic" level – an assumption which we already encountered in the previous section in the context of micro-reduction. The assumption is that scientific theories form a structure in which the physical theory forms the foundation and other theories come on top of it. The idea of the organisation is that a given theory at a lower level takes the entities and processes posited by a higher level theory as its explananda. In other words, lower level theories explain the constituents of higher level theories until one gets all the way down to the basic level of fundamental physics. The resulting structure is considered to represent the structure of the natural world as well.[371] Finally, the reduction ends with physics which explains the most fundamental constituent parts of reality. In addition to guaranteeing the unity of science, classical reduction has two other aims: first, to promote reduction as a viable research strategy in all sciences; and second, to provide a grand framework in which all scientific inquiry and knowledge can be situated.[372]

The classical model has several problems that have led later reductionists to develop the model further.[373] The most important modification is that later reductionists gave up the search for bridge laws and claimed that the deductive relationship between the reduced theory and the more comprehensive theory was too tight. Instead they proposed that the functions and the targets of the reduced theory are taken over by the reducing theory: the theory that is being reduced should be reconstructed within the framework of the theory into which the theory is reduced. In short, as McCauley puts is, "reduction, is in effect, the mapping of particular models and their intended applications across two theories".[374] Despite these concessions the New Wave reductionists preserve most assumptions of the classical model. They claim, for instance, that sciences can be characterised best in through their theories and that a single model can be given to characterise inter-theoretic relationships across the board. Finally, New Wave reductionists also hold on to the hierarchical organisation of scientific disciplines.[375]

Note that vertical integration shares much common ground with these reductionistic models. They both assume that the organisation of scientific theories and disciplines reflect the organisation of nature: nature (or the world) consists of interrelated levels of complexity and every level of complexity has its own scientific discipline or "level of analysis". Further, both models assume a certain kind of unity of science according to which lower-level disciplines and theories should constrain upper-level theory formation and, finally, that physical theories should constrain theorising in all sciences. These claims reveal a third

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[370] McCauley 2007, 108-110. For other accounts of classical reductionism, see, e.g., Carnap 1991.

[371] This point is made in Craver 2007, 172-177.

[372] The program of micro-reductionism described in section 4.4 is basically driven by the classical view of inter-theoretic reduction in the sense that it attempts to fill in gaps between theories and disciplines.

[373] The biggest problem was that despite numerous attempts philosophers were not able to produce one single generally accepted case of inter-theoretic reduction that would fulfil the constraints. In particular, the formation of bridge laws turned out to be nearly impossible. Another reason for the failure of classical reductionism was that its account of the history of science – as a progress towards more integrated disciplines and successful reductions – was not considered plausible. Finally, when logical positivism with which the classical model was closely connected lost its popularity among philosophers of science in the 1970s, reductionism was also abandoned in favour of anti-reductionist models that usually defended some form of non-reductive materialism and the "multiple realisation" thesis (see section 5.2 for further discussion. One of the most famous critiques of classical reductionism is Jerry Fodor's article *Special Sciences, or The Disunity of Science as a Working Hypothesis* (1974).

[374] McCauley 2007, 112. In the New Wave reductionists' account of inter-theoretic reduction, reduction is a matter of degree. McCauley points out that there seems to be a continuum of inter-theoretic mapping: on the one end of the continuum are the cases in which inter-theoretic mapping proceeds smoothly and on the other end are the cases in which inter-theoretic mapping is non-existent. In the latter case, New Wave reductionists suggest that the higher-level theory can be completely eliminated. See the figure in McCauley 2007, 113.

[375] McCauley 2007 112-115, 120-127.

similarity: both models exhibit commitment to physicalism and micro-reduction as an explanatory strategy.

As vertical integration is closely related to the New Wave reductionist account it can be subjected to the same criticism that has been directed towards the New Wave model. First we should point out that "compatibility" is not very illuminating because Cosmides and Tooby do not give any criteria for successful cases of compatibility. One way to understand the notion would be through theory-reduction, but this move is explicitly denied by Cosmides and Tooby. Another way to interpret the notion of compatibility would be by invoking the idea of logical compatibility: two claims can be held compatible, if there is no contradiction in holding them both true. If we apply this idea to theories, we could say that two theories are compatible if it is the case that holding them both true does not generate a contradiction. However, this interpretation seems too loose for Evolutionary Psychologists, for it would allow the existence of theories that are about different things and assume different entities.[376] In any case, it seems that Evolutionary Psychologists construct compatibility as some sort of naturalistic constraint for theory development: theories of the natural sciences should constrain theory development in other disciplines. In other words, there should be no theorising anywhere in the academy that would totally reject insights from the natural sciences. Another general problem with vertical integration is that it remains unclear what the basic units that are supposed to be compatible actually are. Are we talking about theories, background assumptions of disciplines or methodological principles to name just a few? Cosmides and Tooby seem to take the terms "discipline", "theory" and "science" as interchangeable.[377] This understanding is quite problematic as McCauley's and Craver's critical remarks show.

4.6. Explanatory Pluralism and Multi-Level Mechanisms

We have been highlighting some problems in reductionist models of interdisciplinary and inter-theoretic relationships and will now proceed to suggest some alternatives. We will be examining McCauley's "explanatory pluralism" model and proposals from recent "mechanistic philosophy of science", mainly by Craver and William Bechtel. McCauley suggests a relatively pluralistic model in which inter-level co-operation is important but it is not understood as a form of reduction or elimination. Pluralism of this kind leads to a general picture of scientific disciplines that develop theories relatively autonomously but seek convergence with neighbouring disciplines. Craver's and Bechtel's propositions are based on a very developed notion of mechanism and on the interventionist account of explanation.

McCauley presents his explanatory pluralism as an alternative to the New Wave reductionist account.[378] In a nutshell, McCauley's explanatory pluralism has three core ideas. First, he claims that reduction or elimination of established scientific theories or disciplines is highly unlikely as established disciplines have usually uncovered relatively stable causal relationships. Further, McCauley also opposes fundamentalist tendencies where all explanations are reduced to some basic level. Similarly, he argues that constraints in theory development should not proceed from the "bottom-up" only, but rather from both directions.

McCauley's explanatory pluralism model requires that there are relatively fixed "analytic levels" that usually correspond to a "level of complexity" in the natural world much

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[376] The nature of the required consistency is mentioned briefly by Cosmides & Tooby & Barkow 1992, 13 (note 1.)

[377] In one single paragraph (1992, 4), they move from talking about conceptually integrated disciplines to conceptually integrated laws and finally to conceptually integrated theories. These moves do not seem warranted as integration between disciplines, laws and theories can be undertaken in different ways.

[378] McCauley develops his ideas in his 1986, 1996 and 2007 articles.

in the same way as in figure 5.[379] The main point of explanatory pluralism is that "analytic levels" are considered relatively autonomous – that is, reductions and eliminations happen mainly between theories in the same analytic level rather than between theories or disciplines that are on different analytic levels. McCauley thus distinguishes inter-level contexts from intra-level contexts. In one single analytic level, we get theoretical evolution that can occasionally turn into theoretical revolution when new theories replace (eliminate) or radically reformulate (reduce) previous theories. The analytic level of the physical sciences, for instance, has seen several scientific revolutions where new theories have radically changed and sometimes eliminated old theories' concepts. In situations of elimination, new theories usually explain the same data as old theories but more elegantly or broadly and thus incorporate old theories into a larger framework as in the case of Newtonian mechanics and the theory of general relativity. Therefore, in intra-level contexts, McCauley claims, we can sometimes witness reductions that New Wave reductionists so fervently seek. However, in inter-level contexts, revolutions or reductions of this kind seldom happen. It is more common that theories persist in different analytical levels even in the case that theories in neighbouring levels do not map onto each other at all. Although it is possible that theories in neighbouring analytic levels might constrain each other quite strongly – as in the case of thermodynamics and statistical mechanics, for instance – and thus have extensive inter-level mapping, this is not a necessary state of affairs. And even in these cases where neighbouring theories are closely related, there is seldom a reduction involved.[380]

Although McCauley argues that micro-reduction is not something to be aimed at for its own sake, theorising about "heuristic identities" might constitute useful research program for developing inter-level connections. In collaboration with Bechtel, McCauley has developed the "heuristic identity theory" to accompany his explanatory pluralism. The idea is, roughly, that despite the relative independence and autonomy of disciplines in different analytic levels we should attempt to form heuristic identities between entities and processes postulated in different levels. In other words,

> [e]xplanatory pluralism holds that cross-scientific hypothetical identities are perfectly common means for abetting the study of some phenomenon at multiple levels of explanation. They enable scientists working at one analytical level to exploit the conceptual, theoretical, methodological and evidential resources available at another. ... To repeat, hypothetical type-identities (of comparable grain) are heuristics of discovery that inspire multi-level programs of research.[381]

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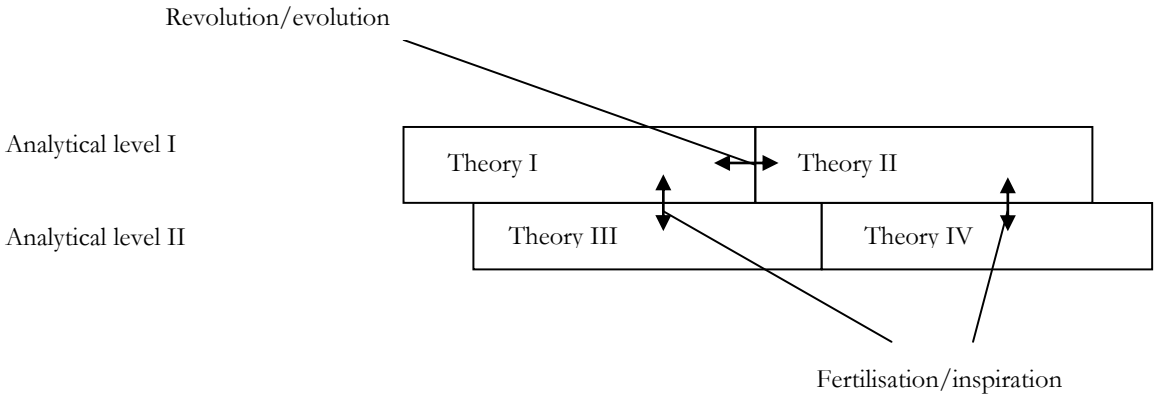
[379] McCauley (2007, 124-125) gives several criteria for distinguishing analytical levels: (1) analytical levels correspond to levels of complexity (or organisation) in nature, (2) theories in lower analytical levels are more widespread or "basic" (have larger scope) than theories in higher levels, (3) analytical levels are organised in such a way that entities in lower levels are parts of the entities in higher levels and (4) analytical levels also correspond to the chronological order in natural history – that is, lower levels appear earlier in evolutionary history than the higher ones. Finally, McCauley (2007, 126-127) identifies four families of sciences: (1) socio-cultural sciences, (2) psychological sciences, (3) biological sciences and (4) physical sciences.

[380] McCauley 1996, 29-33, 35-39. Elsewhere McCauley (1996) reiterates his explanatory pluralism in terms of co-evolution of scientific theories. He distinguishes three types of co-evolution of theories. In micro-reduction (1), two theories in the inter-level context become so tightly knit that the lower level theory describes the constitutive parts of the higher level theory. In elimination (2), the higher level theory is incommensurable with the lower level theory (abysmal inter-level mapping) and subsequently becomes eliminated in favour of the lower level theory. Finally, in pluralism (3) each analytic level has its own theories that need not map onto each other and constraints of theory formation flow in all directions.

[381] McCauley & Bechtel 2001, 753.

Contrary to New Wave reductionists, McCauley and Bechtel claim that such "heuristic identities" do not constitute a reason for reducing or eliminating theories, but are meant to enhance inter-theoretic and cross-disciplinary work.[382]

Figure 7. Explanatory pluralism according to McCauley.



Finally, explanatory pluralism rejects the fundamentalism inherent in reductionist models and the related idea that theory development in one analytical level should be constrained by theorising in its neighbouring lower level. In other words, according to the reductionists and eliminativists constraints of theory development will always come from the "bottom-up". This is not the case with explanatory pluralism. McCauley writes that

> [a]s a first pass, where co-evolution$_m$ [elimination] anticipates increasing intertheoretic integration largely guided by and with default preference for the lower level, co-evolution$_p$ [pluralism] construes the process as preserving a diverse set of partially integrated yet semi-autonomous explanatory perspectives – where that non-negligible measure of analytic independence rests at each analytic level on the explanatory success and epistemic integrity of theories and on the suggestiveness of empirical findings. Co-evolution$_m$, in effect, holds that selection pressures are exerted exclusively from the bottom up, whereas co-evolution$_p$ attends to the constraints imposed by the needs and demands of theories operating at higher levels.[383]

McCauley's point here is that inspiration and fertilisation should flow in all directions in inter-level contexts. One discipline could, for example, form hypotheses about inter-theoretic

[382] For details, see McCauley and Bechtel 2001 and McCauley 2007, 150-154. McCauley (McCauley & Bechtel 2001, 736) explains his motives for developing explanatory pluralism: "[e]xplanatory pluralism offers a picture of cross-scientific relations that highlight the benefits to each of separate inquiries occurring simultaneously at multiple analytical levels in the empirical sciences. Explanatory pluralism aims to establish a middle ground between the theoretical and ontological parsimoniousness of reductionists, on the one hand, and the metaphysical extravagances of antireductionists, on the other." By the "metaphysical extravagancies of antireductionists" McCauley seems to refer to different forms of non-reductive materialism or emergentism.
[383] McCauley 1996, 27.

identities with a lower level discipline and adopt problem-solving strategies from it or use its theories to formulate new research questions. But in order to carry out such activities the discipline on the higher analytical level must be independent from the lower level discipline.[384]

In conclusion, McCauley highlights the pragmatic nature of explanatory pluralism when he writes that

> [f]or the explanatory pluralist, all explanations are partial explanations; all explanations are from some perspective, and all explanations are motivated by and respond to specific problems.[385]

In his emphasis on the pragmatics of explanation, the explanatory pluralist is very much going in the same direction as those who advocate the interventionist theory of explanation we introduced earlier.

Now, there are several lessons to be learned from McCauley's explanatory pluralism. Although McCauley's pluralism is developed in the context of the psychology/neuroscience interface, the moral of explanatory pluralism can be easily applied to the relationship between psychology and the socio-cultural sciences and the study of religion. The most important result, of course, is that from the fact that theories of religion or other socio-cultural phenomena do not map onto theories about cognition it does not follow that the former theories should be reduced or eliminated in the favour of the latter. Psychological theorising can inform socio-cultural theorising and vice versa, but it is not reasonable to demand complete inter-theoretic mapping. Even in the case where theorising about religion was strongly informed by psychology or evolutionary biology, the study of religion itself would retain its autonomy in the sense that its theories need not necessarily map onto those of neighbouring disciplines.

This point raises the question of where we should locate CSR theories in this scheme. On the one hand, the fact that most of the auxiliary theories of CSR are psychological theories would suggest that CSR theories should be located on the same analytical level as psychology. On the other hand, as CSR seeks its inspiration from those approaches that have attempted to find connections between psychological and cultural sciences and since it aims to inform theorising about socio-cultural phenomena we could situate its theories somewhere in between the analytic levels of psychology and the socio-cultural sciences. If this is the case, we could understand CSR theorising as an attempt to create inter-level connections and inform theorising in both behavioural sciences by pointing out how the study of religious phenomena might provide new material for psychological theories by suggesting more psychologically plausible background assumptions. In addition to creating inter-level connections between the socio-cultural sciences and psychological sciences, some CSR writers have attempted – with the help of Evolutionary Psychology – to create connections to the biological sciences, mainly evolutionary biology. This multiple-level approach of CSR can be understood as reflecting the nature of religion as a phenomenon that can be understood in many different levels. Religious phenomena are not solely restricted to the socio-cultural domain, but rather they can be identified and studied by other disciplines in other analytic levels as well.

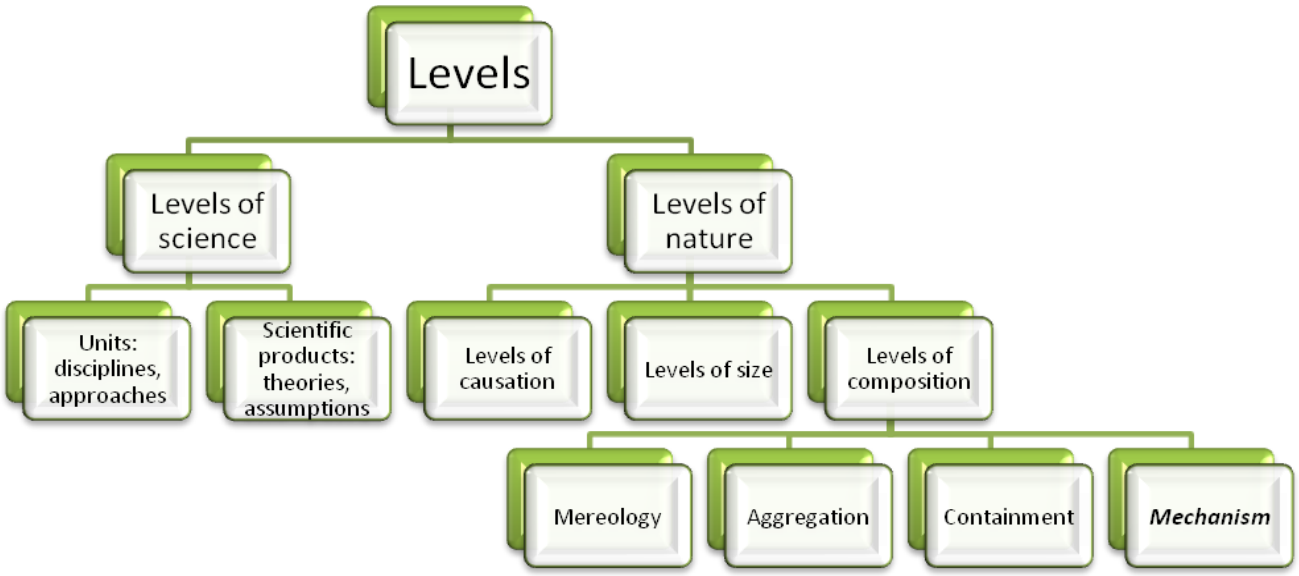
McCauley's explanatory pluralism depends heavily on the notion of "level". The "levels metaphor" is very commonly used in discussions in philosophy of science and philosophy of mind in an unreflected way. Craver has provided us with a useful account of the different ways in which the level metaphor is used to show how his own view – levels of mechanism – differs from other ways of understanding levels. Craver's own account of levels

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[384] McCauley 1996, 31-34.
[385] McCauley 2007, 150.

of mechanism is connected to his notion of mechanistic explanation as the best means of giving answers to why- and how-questions in neuroscience. Although his mechanistic account is constructed mainly in the context of neuroscience, it can be expanded to include other approaches that attempt to explain regularities in terms of the constitution and structure of capacities. In this sense, Craver's account has the same aim as Cummins' "functional analysis", namely, to provide a model of explanation that does not explain in terms of "laws of nature", but rather by describing the activities and organisation of the constituent parts of the *explanandum* phenomenon.

Figure 8. A field-guide to levels (Craver 2007, 171).



We will proceed from left to right in figure 8 and look at all the other views of levels before examining Craver's own levels of mechanism.[386] Craver begins by distinguishing levels of science from levels of nature (or the world). In his mind, it is quite common, but not unproblematic, to equate the hierarchical organisation of scientific disciplines to the ontological structure of nature. This assumption already came up several times in the preceding section. There are several reasons for Craver's scepticism. First of all, he claims that the world is too complex to correspond neatly to the organisation of scientific disciplines and he even suspects that there is no neat way to organise scientific disciplines into some kind of a whole at all. Actual scientific practices are so diverse that they cannot be so easily stratified into a hierarchy of disciplines and theories. It is very common, for instance, that scientist use theories from multiple disciplines to explain events in one single "level of nature". Moreover, when we are talking about science we can take different "basic units" as our starting points: we can talk about scientific units such as research programs, disciplines and paradigms or scientific products such as theories and hypotheses. As scientific disciplines usually have multiple theories and fields of research which examine different aspects of the same phenomena and as the relationship between theories and approaches

[386] Craver suggests (2007, 170,172) that when we are analysing any given account of "levels", we should ask three questions: what kind of things are sorted into levels, what is the interlevel relation and by virtue of what are any two items at the same level?

even in one single discipline is usually far from clear we should not assume that we can sort disciplines (units) or their products (theories) in some neat hierarchical structure. These brief points give at least some reason to think that there is no self-evident way to organise scientific units and products into a unified structure or assuming that this structure might correspond to levels of natural phenomena – "to carve nature at its joints", so to speak.[387]

Craver proposes that "we start by thinking of levels as primarily features of the world rather than as features of the units or products of science."[388] Candidates for inhabitants of different levels might then include entities, activities, properties and mechanisms of different kinds. Similarly, causation, size and composition would be candidates for possible inter-level relations. Regarding causation, sometimes the level metaphor is used to distinguish between different stages of a task or a causal process, such as the flow of information in the human visual system. Such accounts are usually given in terms of a flowchart and they describe temporal and spatial sequences of events or processes. However, as this understanding of levels is quite far from the way in which we have been talking about levels up to this point we will not dwell on it any further. The most popular use of the level metaphor is arguably to distinguish between entities of different sizes. In this scheme, smaller things are on lower levels and bigger things are on higher levels. The problem with levels of size is that they easily confuse the relationship between bigger and smaller things to that between the whole and its parts. Usually parts of a whole are smaller than the whole, but this is only a contingent by-product rather than a necessary property of the whole/part relationship. It is of course possible, according to Craver, to arrange entities in the world in levels of size but such accounts do not say anything about causal interactions between entities of different size or restrict the focus of one scientific discipline to one level of size. Therefore, Craver suggests that we restrict the use of the level metaphor to different levels of whole/part relationships.[389]

We now approach Craver's own idea of levels as we come to levels of composition. Compositional relationships are relationships between wholes and their parts. There are at least four ways in which such relationships can be understood: mereology, aggregation, mere spatial containment and mechanisms (levels of activities and component parts of those activities). To begin with, Craver rejects the usefulness of traditional mereological theories, such as the classical reflexivity theorem "every object is part of itself", as guides for scientific practice because they are mostly based on abstract notions. Next he considers aggregation which is a possible way to understand levels of material and spatial containment. Craver writes that "[i]n levels of aggregates, the relata are properties of wholes and the properties of parts, and the relation between them is that higher-level properties are sums of lower-level properties."[390] The mass of a pile of sand, for example, is an aggregate of the masses of the individual grains that constitute the pile of sand. However, Craver points out, that aggregative properties are rarely interesting. After dismissing aggregativity as a model for a mechanistic organisation, Craver argues that levels of simple material/spatial containment fail as well. According to this understanding, things are in a lower level if they are inside the material boundaries of things in a higher level. However, the problem here is that material/spatial containment "does not allow one to distinguish between mere *pieces* of a system and its *components*. Dividing a system or mechanism into material/spatial pieces any which way will not break it into components."[391] Therefore, Craver concludes, none of the

[387] Craver 2007, 172-176.
[388] Craver 2007, 177.
[389] Craver 2007, 177-183.
[390] Craver 2007, 186.
[391] Craver 2007, 187.

aforementioned accounts of whole/part relationship helps us when we are seeking to identify component parts of a mechanism.[392]

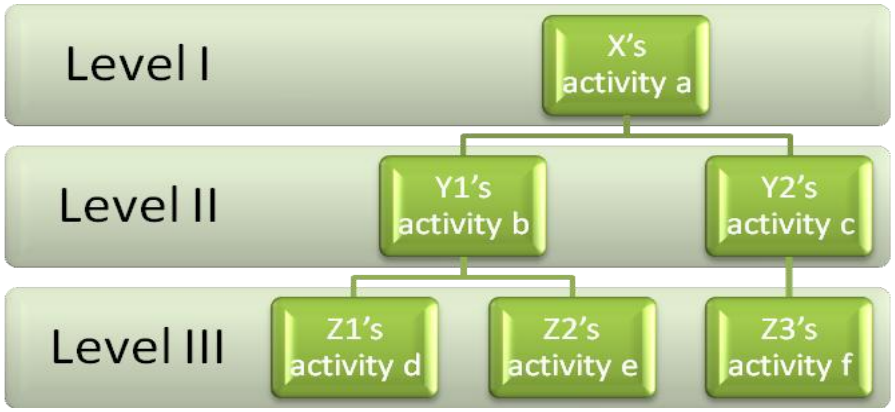
Finally, we come to Craver's levels of mechanism and to the nature of mechanistic explanation in general. In what follows, I will give an outline of how mechanisms are understood by Craver and other advocates of the "new mechanistic philosophy of science"[393]

Craver writes that

> [l]evels of mechanism are levels of composition, but the composition relation is not, at base, spatial or material. In levels of mechanisms, the relata are behaving mechanisms at higher levels and their components at lower levels. These relata are properly conceived neither as entities or activities; rather, they should be understood as acting entities.[394]

Thus we can understand mechanisms as (1) entities that (2) are engaged in some activity (3) which is produced by the activities of its parts. The central idea is that mechanisms are composite systems that are always doing something.[395] In other words, they have a function and this function is how we identify mechanisms and their composite parts. The thing on my desk is a cell phone because it does something; it can perform many functions and these functions are produced by the activities of its parts. Furthermore, its parts are not simply identified by material/spatial containment, but rather on the basis of what they do. We cannot just list bits of material objects inside the phone and imagine to understand the organisation of the parts. Composite parts of a mechanism are specified by their activities and by their relationships to other parts and their activities (figure 9.). We identify the battery, for instance, as a composite part of the mechanism as it produces power.

Figure 9. Levels of mechanism (adapted from Craver 2007, 189)



[392] Craver 2007, 184-188. Consider my cell phone on my desk in front of me. Some of its properties, such as its colour or mass, are aggregates of the properties of its parts. If the relevant properties of the parts change, so do the properties of the whole. Further, in spatial/material containment, the identification of component parts is based on spatial boundaries. If we were to smash my cell phone to pieces, it is highly improbable that the pieces would correspond to the component parts of the cell phone. All those pieces are arguably inside the boundaries of my phone, but they are not its component parts.

[393] See, e.g., Bechtel 2006; Bechtel & Wright 2007; Glennan 2002; Machamer *et al.* 2000.

[394] Craver 2007, 189.

[395] This definition of a mechanism is outlined by Machamer *et al.* 2000 and subsequently reiterated in several places by Craver (2007) and others (Bechtel & Wright 2007).

Now, when Craver and others talk about levels of mechanism they are referring to levels of whole/part relationships specified in terms by mechanisms and their component parts that are related to each other by spatial, temporal and active relationships. Note how this understanding of levels differs significantly from the more traditional and popular uses of the level metaphor. Usually entities like molecules, societies or organisms are considered to be located in one single level instead of another. The mechanists, however, do not think that such entities can be categorically located in one level since societies, molecules or organisms are not doing anything – they are not performing any activity. There can be no neat hierarchy of such entities in terms of levels of mechanism at all. Component parts that are picked out by mechanistic decomposition are not mere objects but acting entities: identification of a mechanism as a whole and its composition is based on the activities (or functions) of that mechanism, not on its simple physical or material composition. In this sense, mechanisms are always "perspectival" or "local": acting entities and their parts do not map onto some "global" or metaphysical menu of levels in nature.[396] Therefore, the same entity can be situated in several different levels of mechanism depending on our point of view which depends on the compositional hierarchy of activities we are interested in at that moment.

This last point is very important. When Bechtel and Wright are discussing the differences between the reductionist account and mechanistic accounts they write that

> [p]erhaps the clearest difference is simply that mechanistic accounts do not start with separate theories at different levels that are subsequently related to each other with the formal apparatus of theory or reconstructed in their idealized forms. Mechanistic explanations at each level are partial and constructed piecemeal with a focus toward actual experimental investigation, without overarching concerns that they fit into grand, large-scale scientific theories; hence, there is no desideratum to provide a complete account of everything that happens.[397]

The point is that when discovering mechanisms there is no need for a general theory that lists the ontological furniture of the world. Nor is there any need for assuming a specific structure of scientific disciplines and theories. Interestingly, mechanistic explanation is a form of reductive explanation in the sense that it explains the activities of the whole as a result of the activities of its parts. This means that it is always the micro-level of mechanism that explains the macro-level of mechanism, but such reductionism is always "local reductionism" since levels of mechanism are not anchored to some global or universal level of nature. Finally, unlike micro-reductionism mechanistic explanation does not require the existence of some "basic" or "foundational" level which would then constitute "the ultimate explanation".

We can now see how mechanistic explanation is very closely related to other accounts of constitutive explanation, such as to Cummins' style functional analysis and to the idea of sub-personal explanation. Indeed, we can see the mechanist account as the most developed version of constitutive explanation currently available. It can also be combined with Woodward's interventionist theory of causal explanation. Note, however, that causal explanation differs from constitutive explanation. We already sketched an account of this

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[396] Craver 2007, 191-195. Craver's view (2007, 192) entails that "there can be no unique answer to the question of when two items are at the same level. I can provide only a partial answer: X and S are at the same level of mechanisms only if X and S are components in the same mechanism, S's Φ-ing is not a component in X's Φ-ing, and S's Φ-ing is not a component of X's Φ-ing." Similar points are made by, e.g., Bechtel & Wright 2007, 55-56.

[397] Bechtel & Wright 2007, 59.

difference by distinguishing "horizontal" and "vertical" explanation (section 4.3). Causal, or horizontal, explanations are etiological as they explain an occurrence of a single phenomenon and as such they do not necessarily require an account of the underlying mechanisms. Constitutive (mechanistic) explanations are not causal in this same sense since they explain how something works rather than why something took place. In short, causal explanations usually gives us "Why" and constitutive explanations "How" answers.

Finally, notice how the multi-level mechanism account reaches a very similar conclusion to McCauley. Craver highlights this point by the notion of "mosaic unity" when he writes that

> [t]he different fields that contribute to the mosaic unity of neuroscience are autonomous in that they have different central problems, use different techniques, have different theoretical vocabularies, and make different background assumptions; they are unified because each provides constraints on a mechanistic explanation. Individual fields do not surrender their autonomy through this form of unification; in fact, their ability to contribute novel constraints on a mechanism *requires* that they maintain their autonomy.[398]

In this passage, Craver clearly expresses similar sentiments to those that drive McCauley's explanatory pluralism. The emphasis on pragmatics of explanation, the independence of background assumptions and on the diversity of central problems fits well with explanatory pluralism.

4.7. Explanatory Scope Revisited: Asking Questions about Religion

We began in section 4.2 by clarifying the *explanandum* and the *explanans* of CSR explanations and concluded that CSR explanations

(1) explain general tendencies in the transmission of representations
(2) by invoking operations of particular cognitive systems that introduce selection pressures and
(3) that the mode of such explanations is functional.

The ultimate/proximate distinction was introduced in order to identify the aspects which selective explanations explain and how they explain them. It was argued that ultimate explanations can be understood as explaining changes in populations whereas proximate explanations explain individual traits. With respect to explaining cultural evolution, ultimate explanations can be understood as describing abstract selective pressures that lead to accumulation of certain types of representations in human populations whereas proximate explanations would explain why individuals have the representations that they have. We also identified several factors that reduce the explanatory power of such models. First of all, ultimate explanations of cultural evolution do not describe actual causal chains but rather they generate "how possibly" scenarios for cultural trends and yield general predictions about them. The abstractness of these models makes them vulnerable to counterexamples and suggests that more work is needed in the future to integrate such models into accounts of actual cultures and religious traditions. Secondly, we also established that ultimate explanations of cultural evolution do not reduce to proximate explanations of why some individuals have the representations that they have. In other words, we could have a fairly comprehensive explanation of why John believes in God but we would still have no ultimate

[398] Craver 2007, 231.

explanation of why belief in God is so common in John's population. Finally, we must remember that ultimate explanations of cultural evolution are not "ultimate" in the sense that they are more foundational or basic than other explanations. This also means that ultimate explanations do not claim to describe unconscious motivations or some "hidden" motivations of individuals.

In section 4.3, we looked at different accounts of psychological explanation and claimed that these accounts shape our understanding of the scope of CSR explanations. If we assume that sub-personal explanations of behaviour can explain the same things that personal explanations explain but in a more elegant way, then we might conclude that personal explanations of behaviour might be eliminated at some point. If this would be the case, then there could in principle be a sub-personal explanation for all religious actions. However, if we assume that personal explanations of behaviour do not map onto sub-personal and biological explanations, then it is difficult to see how CSR could explain those behaviours that would fall onto the side of personal explanation. Finally, we pointed out that there is no consensus about these questions and that we should be cautiously sceptical towards attempts to equate personal explanations with sub-personal explanations since it was suggested that sub-personal explanations explain psychological capacities by their internal structures.

Section 4.4 began by giving an overview of CSR writers' views about causal explanation. Then it proceeded to identify the assumptions of those views by looking at philosophical theories of causal explanation, especially the causal-mechanism model. It was then observed that the causal-mechanism model has certain problems – it leads to explanatory fundamentalism and it cannot distinguish explanatorily relevant causes from irrelevant causes – and that there might be better alternatives available. Finally, we looked at one alternative, the interventionist model of causal explanation, and noticed how it avoids the problems of the causal-mechanism model. We also noted how the contrastive analysis of *explanandum* might help us to specify our explanations and relate them to one another.

Finally, in sections 4.5 and 4.6 we looked at how CSR writers understand the way in which scientific disciplines and theories are related to one another. It was argued that the idea of vertical integration advocated by evolutionary psychologists had probably had an implicit influence. This model of integration was then criticised along with models related to it and it was suggested that we might adopt a more pluralistic view. Finally, we examined two models, McCauley's explanatory pluralism and the multi-level mechanism model, as viable anti-reductionist alternatives and concluded that we might understand CSR in terms of these models.

We can now see how our understanding of the scope and explanatory power of CSR theories depends on the philosophical assumptions we have been dealing with in previous sections. First of all, if we assume that explanations given in terms of cultural selection answer all our questions about religion, then CSR theories might go far in explaining religion. But if we assume that religion has something to do with individual level beliefs and practices and their content, then we might conclude that the scope of CSR theories is more modest. Second, if we assume that sub-personal explanations can be invoked to explain everything that personal explanations explain, then we might conclude that sub-personal explanations of religion might replace personal explanations. Finally, if we assume that all proper explanations are invariably given by describing physical causal chains, then it would be possible in principle to "explain religion away". Note that answers to these questions cannot be found simply by experiment; they are philosophical questions and need philosophical answers.

We can now return to Laidlaw's and Day's critical points and to the problem of scope. I hope that it has become clear by now that critics of CSR are both right and wrong. The critics are right in insisting that CSR explanations are not sufficient to explain why some

occurrences and characteristics of particular instances of religious thinking and behaviour differ from one another. Critics are also right in claiming that CSR explanations do not explain the "whole of religion" or every aspect of behaviour and thinking that we consider religious. Finally, they are right in saying that CSR explanations do not give a "final" or "ultimate" explanation of religion in the sense that everything would now have been said about religion or its metaphysical nature would now be resolved. Although the critics, in my view, are right about all these things they are wrong in insisting that these points make CSR explanations irrelevant or meaningless. There seems to be a more or less implicit assumption that there should be one approach that would answer all our questions about religion at work here. This assumption, as we have seen, does not seem very plausible. When the critics are chastising CSR explanations for not being very applicable to particular cases, they have in mind totally different contrasts and *explananda* than CSR writers. When Laidlaw is complaining that the cognitive approach excludes "everything that humans think and do in the reflective exercise of capacities [like] reason, imagination, and will", he is saying that these factors are extremely important in explaining why some individual instances of belief and action are different from some other instances of individual belief and action. However, CSR writers are claiming that when we explain why certain recurrent patterns arise at the level of populations, "reason, imagination and will" are not sufficient to explain these patterns. Simply put, the critics are interested in explaining individual differences whereas CSR writers are interested in explaining general tendencies across populations.

We can see the radical difference between these *explananda* if we take an example. Let us seek an answer to the question of why John believes in God rather than not believing God. Recall that when we are looking for an explanation we are looking for the factor that makes a difference in the case that we are explaining. We could answer the question by saying that John believes in God because he has a normal human brain (which includes all normal domain specific cognitive architecture). In one sense this is surely right because if John did not have a brain, he would certainly not believe in God. However, this answer seems somehow unsatisfactory because all humans have brains and not all humans believe in God. We are looking for the factor that makes the difference in John's case and having brains does not seem to be it. Suppose that John had a strong religious experience when he went to church two weeks ago. This experience would be an exceptionally good candidate for an explanation of John's belief in God because it would reveal the factor that made the difference in John's case. And as we have already seen in our discussions about micro-reduction (section 4.4) we need not reduce or transform this explanation to some micro-explanation based on cognitive mechanisms or biological functions.

When we disconnect explanation from physical causation as suggested, then in the case of John's belief in God, we can simply say that cognitive mechanisms do not give us what we want. Cognitive mechanisms surely are among the causes of John's belief in God but they are not explanatorily relevant for our question. But if we are interested in explaining why almost all human beings believe in gods and spirits in different environments, then cognitive mechanisms might be explanatorily relevant. A mechanistic, constitutive explanation that would explain how the psychological capacity for religion worked might be very relevant for such an explanation. Consider what would happen if our agency detection device suddenly stopped being hyperactive. I doubt that John's belief in God would be affected since the hyperactivity of his agency detection device was not responsible for his religious experience. On the other hand, if the hyperactivity of HADD were to be reduced in all human populations, then we might see a change in the overall amount of people believing in spirits. As it seems to be explanatorily relevant HADD might constitute at least part of the answer to our latter question. This method of imagining a counterfactual intervention and its results might be used to test other CSR explanations as well. This rethinking, however, I leave to CSR writers themselves.

I will now draw some concluding morals from the somewhat lengthy discussions of previous sections. We have established that there can be no final or ultimate scientific explanation of religion for several reasons. Explanations, at least if we adopt the theory of explanation that I was advocating, depend on our interests and questions and these can change over time. Furthermore, some writers have assumed that we can "explain religion" in some metaphysical way to reveal the "actual" causes behind it without examining our interests and questions at all. If explanations depend on our questions and interests, then this attitude will not do. I suggested that we construe the enterprise of explanation as answering different kinds of why-questions and we let our questions drive our explanatory efforts. It seems to me that we should not debate so much about whether we should "explain religion" or not, but rather we should be clarifying our explanation-begging questions and their implicit contrasts to identify what we are actually explaining, how we are explaining it and in relation to what. This last point is especially important since there is considerable loose talk about "explaining religious belief". We could be explaining a number of different things, such as the persistence or prevalence of religious belief, the content of individual religious beliefs, the similarity between contents of individual religious beliefs and so forth. It is highly unlikely that one approach – especially an approach that invokes underlying cognitive mechanisms – would be able to answer all our questions at all possible levels.

What about the aspirations of some CSR writers and Evolutionary Psychologists to create an overarching framework that would unify the socio-cultural sciences with the natural and behavioural sciences? Our discussions about explanatory pluralism and multi-level explanations leave much room for scepticism on this issue. Many critics agree that Evolutionary Psychology has not been successful in replacing or assimilating more traditional approaches in the socio-cultural sciences and if we are to take McCauley's explanatory pluralism model seriously, such replacement should not be expected. Haines, for example, concludes that "current evolutionary theorizing in sociology and anthropology is a heterogeneous activity and is likely to remain a heterogeneous activity."[399] I think this point holds also in the case of CSR. We should not expect CSR to provide a general theoretical framework for the study of religion in general; nor should we expect it to replace existing approaches. This is because CSR operates, as we have seen, on certain levels and not on others, asks certain questions about religion and not others and conceptualises its target in a certain way. However, our emphasis on explanatory pluralism should not be taken to mean that we are left with radical incommensurability and pluralism – or anarchy even. Even if disciplines would proceed to develop theories without the prospect of reduction, they should look to other disciplines and theories for inspiration and possibilities of cooperation. For instance evolutionary and psychological theorising might inform and transform some of the assumptions behind traditional approaches to religion and produce more comprehensive approaches in the future. In fact, we might view CSR as not being in the business of producing theories at all, but informing theorising about religion by psychological results.

[399] Haines 2007, 294.

5. The Problem of Religious Relevance

Although the religious implications of CSR theories rarely interest CSR writers themselves, they implicitly (and sometimes explicitly) hold conflicting views about these issues. The situation is made more complicated by the fact that recent atheistic writers such as Richard Dawkins and Daniel Dennett have appropriated CSR theories into their arguments against all religious beliefs. Especially Dawkins seems to think that CSR theories explain why humans have widespread false beliefs in supernatural agents.[400] Furthermore, some critics of CSR have argued that CSR is inherently "anti-religious" or is motivated by an aggressive naturalistic agenda. The reason why I find these points interesting is that, if examined, they lead us to the philosophical assumptions that the advocates of these different positions hold. I am calling these assumptions philosophical in nature because it is always at least partly a philosophical question of how some scientific theory is related to some non-scientific piece of knowledge (or belief).

To anticipate, it seems to me that most CSR writers have fairly strong philosophical or worldview positions that enter in especially when they are interpreting their theories and the overall nature of the study of religion. Section 5.1 will lay out three possible views that are already present in CSR writers, namely, strict naturalism, broad naturalism and/or methodological naturalism and theism. The subsequent sections (5.2, 5.3 and 5.4) will then examine and elaborate each of these positions.

5.1. Three Views: False Belief, Agnosticism and Positive Relevance

The relevance of CSR theories to religious beliefs and other worldviews is far from clear as both insiders and outsiders have conflicting views. On the one hand, some writers (insiders and outsiders in some moods) are of the opinion that CSR theories severely undermine traditional religious – especially theistic – worldviews. On the other hand, some writers (again, insiders and outsiders in some moods) think that CSR theories are basically religiously irrelevant, namely, that they do not support or undermine religious views. Finally, there are writers who claim that CSR theories actually give support to some religious worldviews such as theism.[401]

We will begin by looking briefly at what CSR writers themselves have to say about this issue. It will become clear that their views are divided and that there is constant fluctuation between different views even in the case of single writers. The dominant view is that CSR enquiry does not assume anything about the truth or falsity of religious beliefs and its results are mostly religiously irrelevant. However, sometimes CSR writers seem to think that CSR enquiry begins from the assumption that religious beliefs are false or mistaken

[400] See Dawkins 2006; Dennett 2006.

[401] For contributions to the discussion so far, see Barrett 2007; Brelsford 2005; Bulkeley 2003; Clark & Barrett 2009; Day 2007; Dennett 2006; Gregersen 2006; Lawson 2005; Murray 2007, 2009; Näreaho 2008; Oviedo 2008; Peterson 2006; Van Till 2008 and Visala 2008. In the scattered debate, there is some disagreement about how relevant the findings of CSR are to religious matters. Furthermore, those who hold that they are relevant, disagree about the proper manner of engagement with CSR theories. Some writers (Bielfeldt 2004, Laidlaw 2007) have cast doubt on the ability of the cognitive sciences in general (and therefore the ability of CSR in particular) to contribute anything new to topics such as traditional religious views of the human being, nature, and God, whereas others have argued for the relevance of the findings of CSR and the importance of engagement (Oviedo 2008) but differ about what form the engagement should take. While some have supposed that the hypotheses and findings of CSR can be shown to be largely compatible with traditional religious claims, others (Peterson 2006, 857) suggest that CSR is inherently hostile to these claims and the appropriate religious response might be (at least partial) critique.

which would mean that if CSR theories acquire evidential support, the case against religious beliefs would be stronger.

In the preface of his *In Gods We Trust*, Atran briefly points out that the cognitive perspective is agnostic towards religious truth-claims. He then goes on to say that

> [r]eligious beliefs and practices involve the very same cognitive and affective structures as non-religious beliefs and practices – and no others – but in (more or less) systematically distinctive ways. From an evolutionary standpoint, these structures are, at least proximately, no different in origin and kind from the genetic instincts and mechanical processes that govern the life of other animals. Religious explanations of religion may or may not accept this account of proximate causes, but no faith-based account considers it to be the *whole* story. I do not intend to refute such nonscientific explanations of religion, nor do I pretend that they are morally worthless or intellectually unjustified. The chosen scientific perspective of this book is simply blind to them and can elucidate nothing about them – so far as I can see.[402]

Atran makes at least two important claims here: firstly, he claims that nonscientific, religious accounts of religion are also possible and secondly, that the scientific account that he himself professes is agnostic towards religious accounts of religion. The question of how to relate the scientific account and the religious accounts is left for the religious believers to decide, but the falsity of "religious accounts", that is, some set of religious beliefs, is not assumed. Therefore, by assuming that religious ideas (as well as all other ideas) are products of the human mind/brain, Atran does not want to claim that religious ideas are false.[403]

However, even though Atran in his introduction seems to opt for the religious irrelevance of CSR theories, he sometimes writes as if the falsity of religious claims had already been established. For example, he connects the counter-intuitiveness of religious ideas with "counterfactuality": when religious ideas violate our innate and modular expectations about ontological categories, they necessarily become counterfactual. The exact meaning of "counterfactuality" in Atran is unclear, but at least in philosophical language the property "counterfactual" is connected to non-actual states of affairs. Furthermore, in addition to being counterfactual, religious beliefs, according to Atran, do not include propositions at all, but rather some kind of quasi propositions that have no proper content. He writes that

> religious quasi propositions may have *truth value* (e.g., Baptists believe that "after you die you either go to Heaven or Hell" has truth value), but they are *not truth-valuable* in the sense of being liable to verification, falsification, or logical evaluation of the information. Truth is taken on faith and emotionally validated with little reasoning required for support.[404]

Atran seems to claim here that even though religious quasi propositions might have some content, that content cannot be evaluated as being true or false and as a result, religious quasi propositions are basically meaningless.[405] However, as believers usually consider their religious beliefs representing the world Atran at least radically challenges what the believers themselves think that they believe, so much so that we can conclude that this basically amounts to holding religious beliefs false.[406]

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[402] Atran 2002, ix.
[403] Atran 2002, viii-ix.
[404] Atran 2002. 95.
[405] Atran 2002, 93-95.
[406] Atran makes a brief reference to A. J. Ayer, who in his *Language, Truth and Logic* (1936) famously argued that

We also can see similar fluctuation in Boyer. He sometimes implies that it is the business of the CSR to explain why belief in imagined agents is so widespread in human cultures. "The question is", he writes, "why do some concepts of imagined entities and agents rather than others matter to people?"[407] In several different places in his writings he explicitly states that "[r]eligious notions are products of the supernatural imagination."[408] We could understand these statements as employing professional jargon where the term "imagination" is used without any implication to truth or falsity of religious ideas. Elsewhere, Boyer is describing his approach and writes that

> people who think that we have religion because religion is *true* (or their version of it is, or perhaps another, still-to-be-discovered version of it) will find little here to support their views and in fact no discussion of these views.[409]

Again, Boyer can be interpreted in two ways on this point. On the one hand, he seems to be saying that his approach to religion somehow entails, that religious truth-claims should be considered false. In this case, he would be saying that CSR theories explain why a set of false beliefs is so widespread in human populations. On the other hand, Boyer might mean that with regard to the explanations he is interested in giving, the truth or falsity of religious beliefs is irrelevant. In other words, his cognitive approach explains religious beliefs regardless of their truth or falsity. These points show that Boyer's actual view in this issue should be left relatively open. Finally, we might regard some of Boyer's and Atran's comments as a kind of "intrusion" of worldview assumptions into their popular presentations of the aims and findings of CSR. Such comments do not feature in their actual empirical work.

Whereas Boyer and Atran leave the question unanswered or to the level of implicit assumptions, others have tried to be more specific and show that the falsity of religious beliefs need not be assumed. Barrett, for instance, has argued that CSR enquiry is neutral and that its results are religiously irrelevant. In addition, he has also implied that CSR results might actually support some theistic beliefs. In his *Why Would Anyone Believe in God*, after pointing out that from a cognitive viewpoint religious beliefs are not that absurd or irrational, he makes the following response to his sceptical minded colleagues:

> I also hope that I have shown that religious belief may be comparable to other belief that many of these befuddled professors hold near and dear, such as belief in other people's minds, belief in the permanence of physical principles governing our world and belief in moral certitudes.[410]

Barrett's idea is here that what the cognitive study shows is that religious beliefs are psychologically comparable with many other beliefs that are held true. As in the case of these

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religious expressions, as well as other types of metaphysical, ethical and aesthetic expressions, are non-cognitive, namely, that they lack proper truth-conditions and are meaningless. Atran's position seems to be very close to Ayer's non-cognitivism which originally arose in the classical debate about falsification and religious language. Today, Ayer's criterion of meaningful language (the criterion of verification) has been very broadly rejected by philosophers.

[407] Boyer 2002, 68.

[408] Boyer 2003, 199. Boyer (2001, 342) also states that the evidence for gods and spirits is "shall we say, tenuous at best" and on the same page he points out that the "activation of a panoply of systems in the mind" explains "the very existence of religious concepts" and not just their appeal and spread. Elsewhere (2001, 343), he points out that "People who ask questions such as *How can one believe that?* are of course not among the believers".

[409] Boyer 2001, 48.

[410] Barrett 2004, 122.

ordinary beliefs, religious beliefs are products of cognitive systems that we normally hold to be reliable. He claims that we cannot take the facts that God's existence cannot be scientifically proven and that many phenomena that were explained by appeals to God can now be explained scientifically as proof prove that God does not exist. The reason is that such criteria would destroy most of our everyday beliefs as well. Although Barrett acknowledges that the naturalness of religion *seems* to seriously undermine the truthfulness of religious beliefs, in fact, he argues, this is not the case at all. In his view, the cognitive approach to religion is, therefore, compatible with some theologies and he concludes that "[t]hese observations should reveal that I find the cognitive science of religion independent of whether someone *should* or *should not* believe in God."[411] We will return to Barrett's arguments later in detail.

On the basis of this brief survey, we can conclude (1) that the writers in the CSR have not reached consensus on the subject of the religious implications of CSR theories, and (2) some CSR writers are not themselves consistent in their views on this matter. Some (e.g., Atran and Boyer, in some moods) seem to imply that in order to study religion scientifically, we need to start from the fact that religious beliefs are false and leave the religious implications to the religious people to decide. Others (e.g., Barrett - again, at least in some moods) deny both of these claims and argue that, first, scientific explanations of religion should not presume anything at all about the truth or falsity of religious beliefs, and second, the results of the CSR are mostly religiously irrelevant. The main differences between these positions is not that they disagree about the actual results or the core theories of the CSR, but rather that they interpret the function of science and the results of the CSR in different frameworks with different large-scale assumptions.

CSR theories have achieved a great level of public exposure through the writings of high-profile atheists, such as Richard Dawkins and Daniel Dennett, who make explicit references to CSR.[412] These writers are mainly interested in showing how religion could have developed even though religious beliefs are false and religious practices are irrational. It is unclear whether these writers think that CSR theories themselves show or prove that religious ideas are false or just undermine the plausibility of religious ideas when they claim that "religion is natural". We already pointed out (section 3.4) the ambiguities of the "religion as a natural phenomenon" claim. At least Dennett acknowledges the possibility that religion might be a natural phenomena and God could still exist. When he is examining the different meanings of the "religion as a natural phenomenon" claim he writes that

> I might mean that religion is natural as opposed to supernatural, that it is a human phenomenon composed of events, organisms, objects, structures, patterns, and the like that all obey the laws of physics or biology, and hence do not involve miracles. And this *is* what I mean. Notice that it could be true that God exists, that God is indeed the intelligent, conscious, loving creator of us all, and yet *still* religion itself, as a complex set of phenomena, is a perfectly natural phenomenon.[413]

However, for reasons that will become apparent later it is clear that both Dennett and Dawkins use CSR results as parts of their argument for atheism.

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[411] Barrett 2004, 123.

[412] See Dawkins' *God Delusion* (2006) and Dennett's *Breaking the Spell: Religion as a Natural Phenomena* (2006). Dennett uses Boyer's, Atran's and Barrett's theories extensively when he is examining the origins of religion. See, e.g., Dennett 2006, 104. Dawkins refers to Boyer and Atran (and to the work of psychologists Paul Bloom and Deborah Kelemen) when he argues that humans are psychologically primed for religion. See, e.g., Dawkins 2006, 177-190. See also Bloom 2004, 2007; Kelemen 2004.

[413] Dennett 2006, 25.

Finally, some critics of CSR have argued that CSR theories seek to replace the religious understanding of religion with cognitive scientific explanations. Kelly Bulkeley, for instance, writes in his very hostile book review of Boyer's *Religion Explained* that

> [t]his is the essence of Boyer's argument in *Religion Explained*. He presents research on the adaptive values of various cognitive functions, and then uses that research to show how religion has developed as a parasitic growth on those inherent mental processes. His analysis sweeps through history and across religious traditions all over the world ... In every case Boyer finds cause to dismiss religious understandings and replace them with cognitive scientific ones. He expresses no interest in counterclaims that religion is more complex, subtle, or multidimensional than his theory suggests.[414]

Bulkeley's point here seems to be that rather than explaining religion Boyer ends up explaining religion away. Pyysiäinen answers this critique by pointing out that scientific explanations of religion should not be given in religious terms. Furthermore, he insists that the goal of explanations of religion is not to take the place of religion in people's lives: arguing for a more rigorous approach to the study of religion is not the same as arguing that religious ideas should be replaced by scientific theories about religion.[415] Pyysiäinen is surely right in his claim that scientific explanations of religion need not be given in religious terms. Further, he is right in insisting that bringing rigour to the study of religion does not imply that scientific results should supplant religious ideas. However, we can understand Bulkeley's critique as pointing out that Boyer seems to constantly imply that although scientific explanations do not supplant religious or theological understanding of religion, they severely question their truth.

There is also a more general question here about whether the mere existence of a naturalistic explanation of some religious phenomena would seriously undermine religion. The problem is determined by our intuitive pre-understanding of what explanations of religion are about. Many people seem to think that if religious beliefs were true, they would not require an explanation at all, and as a result, all attempts to "explain" religion should be considered anti-religious or instances of evil "reductionism".[416] This claim, as we have already seen, is plainly false, because we can have many different kinds of scientific explanations of religion that have different *explananda*. And further, scientific explanations do not explain religion as a whole or provide an "ultimate" explanation. So "explaining religion" is not inherently anti-religious any more than "explaining science" is anti-scientific.[417]

We have now briefly outlined two different positions. According to the first, CSR enquiry and results are mostly religiously irrelevant and worldview neutral. This would mean that CSR theories are compatible with different kinds of secular or religious worldview positions. According to the second position, CSR enquiry almost inevitably leads us to refute religious truth-claims and CSR theories lead to rejection of religious belief. Finally, there is a third position that was mentioned in the beginning of this section, but was not developed further. This position claims that some CSR theories can offer support to some theistic claims. In order to clarify these positions, we must look beyond CSR writers' explicit claims in their philosophical assumptions which are mostly implicit. First, however, we must clarify the ideas of religious relevance and worldview neutrality.

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414 Bulkeley 2003, 672-673.

415 Pyysiäinen 2005b, 60-63; Pyysiäinen 2009.

416 Some defenders of "religionist" or anti-reductionist approaches to religion argue in this fashion (chapter 2.1.).

417 Pyysiäinen makes similar points in his article *Reduction and Explanatory Pluralism in the Cognitive Science of Religion* (2009).

By introducing the distinction between worldview neutrality and religious relevance that originates from the philosopher Mikael Stenmark, we can bring some measure of clarity to these debates. According to Stenmark, we must first distinguish between worldview[418] neutral and worldview partisan science. If science or some part of it is worldview neutral, then it does not intentionally align with or support a particular ideology, worldview or religion over another. Conversely, science, or some part of it, is worldview partisan, if it aligns with or supports a particular ideology, religion or worldview over another.[419] Notice that these claims deal with methodological commitments. In addition to worldview neutrality or partiality, we must distinguish biased science from unbiased or wrong science. Science, or a part of it, is biased, if it represents how things are unfairly or in an unjustified way. Unbiased (objective) science, however, would represent how things are in a fair and justified manner. Science is in error if it misrepresents how things really are. Finally, Stenmark introduces the difference between religiously relevant and irrelevant science. Science is religiously relevant, if its results or practices can either support or undermine religions or world-views. Further, science is religiously irrelevant, if its results or practices cannot support or undermine religions or world-views.[420] Notice that the distinction between religiously relevant and irrelevant science is based on scientific results, rather than methodology.

Stenmark concludes that

> we should grant that science could be worldview-relevant in respect to religions or ideologies x, y or z, while at the same time being worldview-neutral in respect to them. Worldview-relevance does not imply worldview-partisanship.[421]

Stenmark's point is that we should not infer from negative religious relevance to worldview partisanship which is a quite common mistake in science/religion discussions. Alvin Plantinga, for instance, seems to assume that if some scientific theory undermines theistic beliefs, this theory is *de facto* worldview partisan.[422] In Stenmark's mind, this inference is not valid because there can be a worldview neutral theory, that is, a theory that does not favour materialism over theism, for instance, which has negative (or positive) religious relevance.[423] In the case of CSR theories, it could be that they are worldview neutral in the sense that they

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[418] Stenmark (2004, 172) defines "worldview" as a "constellation of beliefs and values that (consciously or unconsciously) guides people in their attempts to deal with their existential concerns." Such existential concerns include such questions as who they are, why they exist, what the meaning of their life is and so on. Notice that according to this usage, it does not make sense to talk about a "scientific worldview" or a "religious worldview" as such.

[419] Pyysiäinen (2005) also highlights another idea of neutrality according to which neutrality equals scientific objectivity. By this he means that enquiry and theorising in some discipline or a field of research are conducted according to general scientific norms. This neutrality would be what Stenmark calls unbiased (or objective) science.

[420] Stenmark 2004, 174-183. Notice that neutrality, relevance or bias can be implicit or explicit in some given science. For example, it could very well be the case that writers in some discipline explicitly declare worldview neutrality but at the same time practice worldview partisanship. We can also distinguish normative and descriptive claims of worldview neutrality. The question of whether some discipline is in its present form world-view neutral and the question of whether some discipline should in its ideal form be world-view neutral are crucially different. The former is basically a question that can be solved by looking into how scientists actually go about doing science whereas the latter is a more conceptual question. Finally, Stenmark points out that neutrality and partiality are matters of degree rather than "on-off" properties of some scientific enquiry. In this sense, science is always worldview partisan in some sense although total objectivity (unbiased science) functions as a regulative ideal. He (2004, 192) writes that "[e]ven if science always was partisan and never fully unbiased, the goal of scientists could still be to strive to be as objective as they could, given their partisanship, abilities, and social context, and they could succeed in this to a larger or smaller degree."

[421] Stenmark 2004, 181.

[422] See, e.g., Plantinga 2006, 2009.

[423] Stenmark 2004, 180.

do not presume the truth of one single worldview, and yet they might have strong negative religious relevance.[424]

Another important conclusion we should draw from these distinctions is that religious relevance is worldview relative in the sense that there can be no "general" account of the religious or worldview relevance of some scientific theory. Religious or worldview relevance is always relative to the religious or worldview position we are currently looking at. In the case of CSR for instance, its religious (or worldview) relevance would be relative to the set of beliefs and practices we choose to take as our focus. These positions could be religious positions - different forms of theism, for example - or ideological or political positions such as Marxism.

By applying the aforementioned conceptual resources, we can now break the question of the religious implications of CSR theories into sub-questions:

(1) Are CSR theories worldview neutral or worldview partisan?
(2) Are CSR theories religiously relevant or irrelevant for some set religious ideas and practices?
(3) If CSR theories are religiously relevant for some set of religious ideas and practices, is this relevance negative or positive?
(4) Are CSR theories biased or unbiased?

We have already provided a preliminary answer to the question (1) when we pointed out that some CSR writers seem to assume that most religious beliefs are false whereas others remain agnostic. The former position would be a case of worldview partisanship[425] whereas the latter position would be closer to a worldview neutral position. As to questions (2) and (3), we also have preliminary answers. Some writers consider CSR theories to undermine almost all religious beliefs whereas others hold that CSR theories are religiously irrelevant. I will skip question (4) because I simply assume that CSR experiments and their results are products of sound scientific reasoning and practice insofar as CSR researchers employ the same norms of scientific rationality and justification as their peers. Moreover, the answer to this question is mostly scientific (or empirical), rather than philosophical. What I mean by this is that conceptual *a priori* considerations are unlikely to resolve the issue.

The relevant positions I will be looking at in the following sections are

(1) CSR theories are worldview partisan in the sense that they assume the truth of strict naturalism (that is, they are methodologically atheist) and religiously relevant for theistic beliefs in the sense that they have negative religious relevance for them.
(2) CSR theories are worldview neutral in the sense that they allow different worldview positions and religiously irrelevant for theistic beliefs in the sense that they do not have consequences for their truth or falsity.
(3) CSR theories are worldview neutral in the sense that they allow different worldview positions and religiously relevant for theistic beliefs in the sense that they have some positive consequences for some of them.

[424] Stenmark (2004, 180) writes that "science has the potential to undermine (or support, for that matter) *any* religious or ideological idea that has *empirical content*. Here lies also the key to understanding why we cannot expect that science is (or should be) worldview-neutral in this sense, because investigating empirical claims and developing theories about empirical states of affairs is what science is all about; it is its proper domain."
[425] We can call this feature "methodological atheism".

5.2. Strict Naturalism and Methodological Atheism

In this section, we will be looking at position (1) outlined in the previous section and its philosophical background. I have already connected this interpretation of CSR to some remarks made by Atran and Boyer as well as some atheistically oriented writers outside the field itself. As these writers do not explicitly reveal their assumptions, I will use other writers that have explicitly defended strict naturalism in the study of religion to flesh out a possible set of philosophical background assumptions. These background assumptions have their roots in a certain form of philosophical naturalism.

The notion of "naturalism" is tricky because it is used in different forums and discussions in different branches of philosophy with different meanings. And as basically everyone in modern analytic philosophy wants to be a naturalist the term itself tends to lose any robust meaning and its power as an analytic tool. Given the scope of the present work, it is futile to attempt to give an overview of all discussions where the term is applied or even the history of the term.[426] Nevertheless, I must point out that my considerations should be kept separate from the uses of the term "naturalism" as it comes up in methodological discussions in the study of religion. I am referring to the insider/outsider problem that was outlined in section 2.1.[427] We will simply start from philosophy of science where different forms of naturalism are now the philosophies of choice for many contemporary philosophers. These philosophers usually share most of the following four assumptions:

(1) Rejection of "first philosophy" (no philosophical foundations for science)
(2) Scientism (sciences as guides to epistemology and metaphysics)
(3) Darwinism as a framework for scientific and philosophical enquiry
(4) Progress in science.[428]

These four assumptions come up in the discussion later in this section: we will see how they are appropriated by those who seek to "naturalise" the humanities and socio-cultural sciences (and the study of religion).

For the present purposes, we can take anti-supernaturalism as the common core of the forms of naturalism that we are interested in. The naturalist emphasises "natural" processes, events and explanations rather than supernatural ones. In this sense, "naturalism" only makes sense when it is contrasted with supernaturalism. Philosopher Owen Flanagan takes supernaturalism to claim that

> (i) there exists a 'supernatural being or beings' or 'power(s)' outside the natural world; (ii) this 'being' or 'power' has causal commerce with this world; (iii) the grounds for belief in *both* the 'supernatural being' *and* its causal commerce cannot be seen, discovered, or inferred by way of any known and reliable epistemic methods.[429]

The problem here of course is that "nature" itself defies definition. Philosopher Paul Draper defines nature as "the spatiotemporal universe of physical entities together with any entities that are ontologically or causally reducible to those entities."[430] However, this definition

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[426] It is commonly used on such diverse fields of philosophy as epistemology, philosophy of mind, philosophy of science, ethics and philosophy of religion. For a useful overview, see Flanagan 2006. See also Kitcher 1992 and Rosenberg 1996.

[427] See, e.g., McCutcheon 2005, Gothoni 2005.

[428] These four claims are formulated in Alexander Rosenberg's article *A Field Guide to Recent Species of Naturalism* (1996). Rosenberg also traces the roots of contemporary philosophical naturalism to Ernest Nagel's *The Structure of Science* (1961).

[429] Flanagan 2006, 433.

[430] Draper 2005, 278. Draper's definition of supernatural is basically a simpler version of Flanagan's definition: x is supernatural if x is not a part of nature and x can affect nature.

simply pushes the problem even deeper: what is physical? Usually philosophers define nature in a somewhat circular way by saying that nature consists of those events and processes that the natural sciences study or eventually disclose.

Philosophers Charles Taliaferro and Stewarth Goetz in their succinctly named book *Naturalism* (2008) distinguish "strict naturalism"[431] from "broad naturalism"[432]. According to strict naturalism, "nature is all that exists and nature itself is whatever will be disclosed by the 'ideal' natural sciences, especially physics."[433] This definition of "nature" is open and pragmatic because it acknowledges the fact that natural sciences are in a state of constant change. Furthermore, it highlights the point that sciences not only study actual entities, but they postulate unseen entities and processes that are used to explain empirical results. Thus "natural" entities, such as sub-atomic particles, can be said to be "physical" even though they are not "material" in any traditional sense of the world.

Several philosophically oriented writers have argued for a "naturalisation" of the study of religion and in so doing they have endorsed strict naturalist assumptions. In what follows, I will take a brief look at two such writers – Edward Slingerland and Donald Wiebe – in order to get a hold on assumptions that some interpreters of CSR seem to share. I have chosen these two writers because they both regard CSR as an example of properly naturalised study of religion.[434]

In his recent article *Who Is Afraid of Reductionism?: the Study of Religion in the Age of Cognitive Science* (2008a), Slingerland claims that the study of religion should adopt a more naturalistic attitude than before because social-constructivism, with which the contemporary study of religion has been associated, has made the study of religion parochial and uninteresting to scientists.[435] Social-constructivism is mistaken, Slingerland argues, because it implies that social and mental realms are causally independent of natural realms, such as physics and biology. Slingerland's antidote is the idea that human beings are physically constituted: human thoughts and mental life are physical events in the brain and as such susceptible to the causal explanations of biology and psychology. For Slingerland, Darwinism is the key for providing a proper foundation for the study of religion: because our bodies and minds are products of evolution, the products of our minds, that is, ideas and cultural artefacts, are products of evolution as well. Slingerland, thus, calls for the "embodiment" of the humanities and a rejection of the implicit dualism between mind and body:

> What I am going to be referring to as the "embodied" approach to the study of culture involves a loose collection of scholars who see the human mind and its products as parts of the physical world, not hovering somewhere above it, and who are therefore committed to breaching the *cordon sanitaire* that has traditionally divided the humanities and natural sciences.[436]

Slingerland's "embodied approach" entails that all thoughts, mental states and products of these states can be ultimately explained by the deterministic laws of physical processes:

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[431] Strict naturalism is sometimes called ontological naturalism, reductive (or eliminative) physicalism, reductive naturalism or hard naturalism.

[432] Broad naturalism is sometimes called non-reductive materialism, non-reductive physicalism or soft naturalism.

[433] Taliaferro & Goetz 2008, 7.

[434] There are many other writers as well who have defended similar forms of naturalism in the study of religion. See, e.g., 1992 and McCutcheon 1997, 2001.

[435] Slingerland presents his arguments in more detail in his recent book *What Science Offers the Humanities: Integrating Body and Culture* (2008b).

[436] Slingerland 2008a, 378.

> This means that our thoughts and behaviour are, at least in principle, as predetermined and predictable as any other physical process. It also means that the self as we ordinarily understand it – as a disembodied something, soul or spirit or mind, caused by nothing other than itself – is nothing more than an illusion created by the workings of our embodied brain.[437]

This approach has several consequences for the study of religion. First of all, the study of religion should work towards "vertical integration", namely, unifying scientific knowledge under a single causal and mechanistic scheme. This unification would also entail that our "ideal science" ought not contain any intentional or socio-cultural causes at all. All things can be explained by physical processes or processes that are reducible to physical processes.[438] Secondly, such an approach would leave little room for religious truth-claims: "at least as long as physicalism remains our current best explanation of the world – any religious or philosophical belief based on dualism is going to be in this sort of conflict."[439] In short, we know, Slingerland claims, that physicalism is true, so religious claims that refer to non-physical realities must be false.[440]

Donald Wiebe argues for similar "disenchantment" of the social and cultural realm: social and cultural sciences are still enchanted because they posit entities that are more than mere physical objects.[441] Different socio-cultural sciences postulate all sorts of entities and processes that contradict assumptions made by other socio-cultural sciences as well as the natural sciences.[442] Wiebe calls for a unification of all scientific inquiry and the expulsion of what he considers to be non-naturalistic approaches to religion, namely, religiously, politically or ethically motivated inquiries, from the study of religion. In concert with Slingerland, Wiebe emphasises the explanatory and unificatory power of Darwinism. The reason for Wiebe's emphasis on Darwinism and naturalism is that he sees the study of religion as severely corrupted by extra-scientific, that is, theological, religious and political interests:

> Thus, conceptually integrated with the natural and behavioural sciences, the study of religion can clarify its referential field and clearly place its subject matter into naturalistic register, thereby assisting it in managing the massive amount of

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437 Slingerland 2008a, 383.

438 The idea of bringing all knowledge together in a naturalistic scheme has a long history. As we have already seen, Cosmides' and Tooby's "vertical integration" is one recent attempt to reformulate this idea. Another influential account is given by Edward O. Wilson in his *Consilience: The Unity of Knowledge* (1998).

439 Slingerland 2008a, 401.

440 In their answer to Slingerland's article, Francisca Cho and Richard Squier (2008a, 2008b) point out that the rhetorical strategy of the naturalists relies on an idealised image of what science is, and subsequently sets the standards of reasonable science too high. The naturalist critique of current theorising in the study of religion is, as we have already seen, based on three claims: (1) the study of religion posits ontologically vague entities (beliefs, religions, cultures, etc.), (2) explanations in the study of religion are insufficient and (3) there is a plurality of incompatible methodological assumptions in the study of religion. Cho and Squier point out that the naturalist assumes that "religion" as a category has to refer to some empirically self-evident quality in order to function as a scientific category. Contrary to this view, Cho and Squier argue that the function of social categories is precisely the opposite: they are useful because they do not pick out a single phenomenon, but rather function as guides into human thought. Finally, the naturalist sets up the demarcation problem too simply: either we adopt some kind of theological view of religion or a completely physicalistic view of religion. This dichotomy is not only problematic because it relies heavily on a metaphysically contested position but it also hinders the progress in the study of religion because it restricts the space of possible explanation-begging questions.

441 See Wiebe 1991, 1999, 2005.

442 The object of Wiebe's criticism is the image of a social scientist as a "virtuoso" who creates imaginative theories of cultural phenomena that cannot be empirically tested. Wiebe claims that virtuoso theorists like Levi-Strauss or Geertz base their theories on their own intuitions rather than empirical evidence that is accessible to all. See, e.g., Wiebe 2005, 70-71.

> information involved. ... The conceptual integration of the study of religion with the natural and behavioural sciences, moreover, reinforces the demarcation of the academic study of religion from the religio-theological approaches to the meaning of religion that preceded it.[443]

If the study of religion were to be based properly on the sciences, then it could be clearly separated from ideological and religious interests.

Both Slingerland and Wiebe make explicit references to Daniel Dennett's *Darwin's Dangerous Idea: Evolution and the Meaning of Life* (1995) in which Dennett claims that Darwinism gives a firm foundation for the natural sciences, humanities and philosophy. Indeed, the theory of evolution by natural selection is a "universal acid" that eats through all traditional ideas of the world, nature and humans and provides the basis of all philosophy.[444] Dennett claims that natural selection imposes constraints on all life: the human body as well as the human mind and its products exist in "a design space" generated by natural selection. The fact that natural selection occurs in some form or another on both the cultural and the biological level explains why certain biological and cultural forms arise. In this way, the study of human societies, cultures, religions and psychology can all be subsumed under one single scheme. In his *Breaking the Spell: Religion as a Natural Phenomenon* (2006), Dennett applies this approach to religion. Drawing heavily from CSR writers he claims that religious behaviours and ideas are natural by-products of evolved cognitive capacities. Similarly to other naturalist, he dismisses religious truth-claims by pointing out that they have no scientific support. He also points out that a proper science of religion is needed in order to know what religion is really about.[445]

The strict naturalism of both Wiebe and Slingerland is similar to that of naturalists like Edward O. Wilson and Owen Flanagan to name just a few. As we have seen, strict naturalism includes several different claims about various ontological, epistemological and methodological issues. Wiebe's and Slingerland's strict naturalism involves at least three core claims:

(1) Scientism: scientific enquiry has priority over all other enquiries.
(2) Physicalism: all entities and processes are physical processes or reducible to physical processes.
(3) Micro-reductionism: all "higher-level" states can be explained by their micro-states which in turn can be ultimately reduced to physical states.[446]

The claim (1) is methodological and epistemological in nature: only science can provide us knowledge about reality and, therefore, scientific knowledge has priority over all other ways of producing knowledge. This claim is sometimes formulated in the following way: "all that exists can be described and explained in terms of the natural sciences". Such claims have several methodological consequences. First of all, such claims allow no essential difference between sciences and humanities: explaining human action and products of that action, such as societies, languages and cultural artefacts, is similar than explaining natural phenomena

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[443] Wiebe 2005, 80.

[444] Dennett is not alone in emphasising Darwinism as a foundation for all our enquiries. See, e.g., Ruse 1986, 1995.

[445] For Dennett's dismissal of religious truth-claims, see Dennett 2006, 240-246. Furthermore, Dennett points out (2006, 308-339) that we just cannot take beliefs about religion on faith. Instead we must use the best scientific tools that we have at our disposal to determine what we should think about religion. The preliminary results, in his view, show that religious truth-claims are problematic at best.

[446] Stenmark adds two claims: (1) science is essential in dealing with our ethical concerns and (2) science can tell us what the meaning of life is and deal with our existential concerns. Stenmark claims that at least Edward O. Wilson and Richard Dawkins accept all these claims. See Stenmark 2001, 123-128.

that the sciences study. In short, naturalists usually reject methodological dualism or pluralism. Secondly, the claim is usually interpreted to mean that naturalistic methodology and ontology should be accepted in humanities and social sciences more wholeheartedly than before. The advocates of such approaches usually emphasise the role of Darwinism as a general framework for social, cultural and behavioural sciences.

The claim (2) is ontological and it states that only "matter in motion" is real. Thus the strict naturalist is usually committed to some form of physicalism which claims that all entities consist of parts that are ultimately material or at least in the scope of physics. Physicalism can be construed in different ways, but usually it includes at least one of the following claims:

(a) The generality of physics.
(b) The causal completeness (or causal closure) of physics.
(c) The explanatory completeness of physics.

Claim (a) states that physics aims to describe all entities with spatio-temporal properties. Thus, the laws of physics represent the most general laws that apply to spatio-temporal entities and no entity can be outside of the scope of these laws. Claim (b) means that all spatio-temporal processes have a physical cause that can be deducted from a more general physical law. The basic idea of the causal closure of physics is that there can be no spatio-temporal processes without physical causes. Usually the causal completeness of physics is taken as the central claim in physicalism: even if it is not currently possible to show how everything that happens has a physical cause, the "ideal science" or "complete science" includes nothing more than physical causes.[447] Claim (c) states that explanation based on the laws of physics can explain all possible phenomena.

If the claim (a) is accepted and (b) and (c) refuted, then we have a kind of minimal physicalism that is compatible (or identical) with positions such as non-reductive materialism (or emergent materialism). If we accept (a) and (b), then our physicalism gets considerably stronger: usually the positions that accept the causal completeness of physics are said to endorse reductive physicalism (or reductive materialism). In reductive materialism, non-physical looking properties are considered to be reducible to physics. Finally, the acceptance of all three claims produces a position called eliminative physicalism (or eliminative materialism) according to which all phenomena outside of physics are simply illusions.[448]

Physicalism leads to claim (3), namely, that there can be no "higher-level" states that are not reducible or causally dependent of physical states. This claim includes a strong rejection of dualism and the possibility of independent intentional explanation: mental states can be ultimately explained by non-mental, physical states. This claim, in effect, eliminates all possible teleological and intentional explanations as well as first-person explanations: consciousness and the products of consciousness are to be explained by non-conscious causes. The target of strict naturalism is dualism which takes mental states as "something more" than physical states in the sense that they can cause physical events without being dependent on physical states. The central point here, the physicalists claims, is that mental states cannot have physical effects without being physical themselves; but if they are indeed physical states and the causal completeness of physics is true, then physical causes are

[447] The causal completeness claim has produced a massive discussion spanning from its original context in philosophy of mind to philosophy of science and other fields. Jaegwon Kim, for example, defends reductive materialism and physicalism against non-reductive materialism. See, e.g., Kim 1998, 2005. Kim is also known as a vigorous defender of the causal closure thesis. Paul Churchland defends a form of eliminative materialism. See Churchland 1988, 1995.
[448] These claims are neatly summed up by Tim Crane (2001, 43-48).

sufficient to explain all effects. Thus conscious mental states do not cause anything at all: mental states are epiphenomenal.

Strict naturalism seems to have destructive consequences for our everyday views of how the world is: although our phenomenology includes entities like beliefs, desires, reasons, cultures and religions, they are not "real" in any sense even if they can be used in everyday language as useful abstractions. If this is the case, we are, as Slingerland succinctly puts it, "robots designed not to believe that we are robots". Furthermore, strict naturalism also eliminates the explanatory independence of cultural, social and behavioural sciences: social and cultural phenomena are nothing more than mental states which in turn are physical states of human brains and as physical states they can be explained as results of material causes. Finally, strict naturalism also makes it impossible to hold that religious beliefs that refer to gods, spirits or other supernatural powers or entities were true.

We have already argued against some of the elements of the strict naturalistic position in previous chapters. We pointed out that the clear-cut notions of causal explanation, micro-reduction and vertical integration have severe problems and should be replaced by more pragmatic understandings of these issues. If these arguments are right, they will undermine the justification of strict naturalism as the only possible "scientific" background philosophy for naturalistic sciences of religion.

In sum, strict naturalism is a broad conceptual framework in which the knowledge produced by different sciences is unified under a single scheme that would constrain our scientific efforts. Note that this position is mainly a philosophical one, not a scientific one: there can be no experiments that would verify these views directly. On a strict naturalist reading, CSR enquiry is worldview partisan because it begins from the acknowledgement that religious beliefs must be false (methodological atheism). Further, it takes one philosophical view as a guide for all scientific enquiries. Finally, this reading would also have negative religious relevance for most religious ideas: if the plausibility of supernatural agent concepts is based on our everyday experience and that experience can be explained in a naturalistic way, then we have no reason to believe that supernatural agents exist. This seems to be what Boyer had in mind when he wrote that "[p]eople who ask questions such as *How can one believe that?* are of course not among the believers".[449]

This kind of view about the scientific study of religion is analogous to Dennett's position concerning the explanation of consciousness.[450] In his *Consciousness Explained* (1991), he claims that the *explanantia* of a science of consciousness are the qualities and entities in our everyday phenomenology. Beliefs, desires, intentions, qualities of conscious experiences and the like are parts of our phenomenology but such entities can have no place in our scientific understanding of the world. To explain consciousness is to explain it terms that do not refer to intentional processes or phenomenal entities: to explain consciousness is to explain how these phenomenal entities and processes come about. If we take strict naturalism as the background philosophy for CSR (or the study of religion in general), we might think about religion in a similar way. Our everyday experience (or at least the everyday experience of some people) involves non-physical (or non-ordinary) beings, entities and phenomena that cannot be located in our scientific understanding of the world. The function of a properly naturalistic science of religion would be to explain why these strange things inhabit our everyday world and experience in terms that are natural and understandable – that is, not religious.[451] We can reformulate the point in terms of "folk religion" and "folk theology". On

[449] Boyer 2001, 343.

[450] Philosopher Charles Taliaferro also makes this point in his paper *Explaining Religious Experience* (2009).

[451] As a matter of fact, this seems to be what Dennett has in mind in his *Breaking the Spell* (2006, 17) when he claims that we need "scientific, no-holds-barred investigation of religion as one natural phenomenon among many" to know whether religious ideas are true and whether religious practices are rational and meaningful. In the case of consciousness, we need science to determine whether the entities that inhabit our phenomenology

this reading, everyday assumptions about supernatural agents and our religious practices are parts of folk religion. On top of this folk religion cultures build their own folk theologies, that is, reflective systems that "explain" folk religion. Unfortunately for folk theology (and fortunately for scientists), the argument concludes that we now have a properly scientific (naturalistic) account of folk religion which eliminates the need for folk theology.

5.3. Broad Naturalism and Methodological Naturalism

In the previous section, we looked at one possible philosophical construal that could be used as a background for CSR. This section will look at another possible construal (already stated at the end of section 5.1) according to which

(2) CSR theories are worldview neutral in the sense that they allow different worldview positions and religiously irrelevant for theistic beliefs in the sense that they do not have consequences for their truth or falsity.

We will begin with a brief look at a position which may be called "broad naturalism" (sometimes also known as "non-reductive naturalism" or "non-reductive materialism") which has been seen as an alternative to the view presented in the previous section. We will then proceed by looking at arguments put forward by those (mainly Barrett) who endorse such a position. As we will see, thte broad naturalist position involves a denial (or at least rephrasing) of the main claims of strict naturalism – that is, physicalism, scientism and micro-reductionism – as it argues for some forms of non-reductive materialism and/or multiple realisation.

Before we proceed any further, we should distinguish strict naturalism and broad naturalism from "methodological naturalism". Methodological naturalism is usually taken as a norm according to which scientists should not invoke supernatural entities to explain natural phenomena. In other words, when scientists are postulating theoretical entities to explain observed regularities or events, they should not postulate supernatural agents unless absolutely necessary. Virtually all scientists, irrespective of their religious views, accept this claim.[452] As a methodological norm, the claim does not include ontological assumptions, such as physicalism, or epistemological assumptions related to the priority of scientific knowledge over other types of knowledge.

The term "broad naturalism" comes from Taliaferro and Goetz (2008) who use it to refer to naturalists who do not subscribe to the causal closure of the physical and micro-reduction.[453] The preferred ontological doctrine of broad naturalists is some form of non-reductive or emergent materialism. According to emergent materialism, the natural world is physically constituted but includes complex entities and processes that cannot be explained by physical causes alone or reduced to physics. Thus, the advocates of non-reductive materialism usually deny or at least reformulate the claims for causal closure and the explanatory completeness of physics. In this scheme, mental states, for instance, can be seen relatively independent of the physical states that realise them in the sense that they can have

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actually exist. The same goes in the case of religion. But in both cases we already know that such entities cannot exist because they do not feature in our current theories of physics. In this view, religious and scientific "explanations" of religion are seen as competitors much in the same way as everyday explanations of consciousness (e.g. dualism) and scientific accounts of consciousness are seen as competitors. If a proper scientific explanation of religion can be constructed, then the religious or theological (non-scientific) interpretation loses its plausibility. This seems to be the position of Paul Bloom as well. See, e.g., Bloom 2009.

[452] This definition of methodological naturalism is given in Draper 2005. Draper points out that this definition does not exclude the postulation of non-natural entities, such as ideas (numbers, propositions, etc.), in general, but only supernatural agents.

[453] Taliaferro & Goetz (2008) consider John Searle and Jerry Fodor as prime examples of broad naturalism.

true "causal power". By the same token, the products of intentional states need not be explained by causes susceptible to physical description. Methodologically, non-reductive materialism allows more independence to the special sciences than physicalism. Fodor, the champion of this view, argues that special sciences study phenomena that are multiply realised functional states of physical systems. Fodor remains a materialist when in claiming that nature is completely materially constituted but he also claims that mental states are "multiply realised" in the sense that they can be explained by theories or laws that cannot be reduced to the theories and laws of physics. What is true of mental states is also true of phenomena that are studied in other special sciences: societies, for example, can be described as having true empirical generalisations without the possibility of such generalisations being reduced or even related to psychological, biological or physical theories.[454]

Some of Barrett's aforementioned comments (section 5.1) can be understood in the light of broad naturalism and worldview neutrality. In his article *Is the Spell Really Broken?: Bio-psychological explanations of religion and theistic belief* (2007c), Barrett defends the worldview neutrality of CSR theories on the grounds that the "truth-question" is outside CSR theories. He also ends up endorsing views that are close to broad naturalism as previously described. Barrett's basic approach is to draw a distinction between psychological and biological mechanisms that underlie religious thinking and behaviour and the justification of religious beliefs and the rationality of religious practices. In his article, Barrett deals with five implicit and explicit arguments for the fact that biological and psychological explanations of religious beliefs and practices undermine the rationality of religion. Of these five arguments, the following three are relevant for our subject:[455]

(1) The argument from religion as a by-product of non-religious cognition
(2) The argument from inherited belief
(3) The argument from the fallibility of cognition

We will also examine one argument discussed by philosopher Michael Murray as he defends a position similar to Barrett's:

(4) The argument from the lack of causal connectedness.

Murray's discussion can be found in his article *Four Arguments That the Cognitive Psychology of Religion Undermines the Justification of Religious Belief* (2007).[456]

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[454] See, e.g., Fodor 1974, 1997. Hilary Putnam (1975) has also argued strongly for multiple realisation. For a short overview, see Niiniluoto 1999, 21-25. The position outlined here is also the position of some writers introduced in chapter 4. Recall Garfinker's argument against micro-reduction and for multiple realisation: in his view, macro-states can be constituted by several different micro-states. If macro-states are relatively independent from the micro-states that realise them, then the autonomy of the special sciences would be secured: there could be genuine explanatory generalisations that could not be described in terms of psychology, neuroscience, biology or physics. The relationship between higher-level states and lower-level states in non-reductive materialism is usually identified as some form of supervenience relation or emergence. The exact nature of supervenience, emergence and multiple realisation has been debated hotly. For discussion, see, e.g., Clayton & Davies 2006; Craver & Wilson 2007; Craver & Bechtel 2007; Hohwy & Kallestrup 2008; Kistler 2006; McCauley 2007; Murphy & Stoeger 2007; Zahle 2007. Classic articles can be found in Beckerman *et al.* 1992.

[455] I will not deal with Barrett's two remaining arguments that concern (1) neurotheology and (2) adaptationism. In the former case, Barrett argues that the fact that some areas of the brain are activated in religious context does not constitute an explanation of anything. Furthermore, it does not make the objects of our ordinary experience false. In the latter case,

[456] Murray's arguments are recapitulated in an updated form in his *Scientific Explanations of Religion and the Justification of Religious Belief* (2009).

First, consider the idea that religious beliefs and practices are a by-product of cognitive mechanisms produced by natural selection. It might seem that *prima facie* such a claim would severely undermine religious beliefs. However, if we look at this reasoning more carefully, Barrett argues, we realise that we have no reason to claim that beliefs that are evolutionary by-products or "accidents" produced by cognitive systems geared for other functions must be false.[457] The argument can be formulated as follows:

> (1) Natural selection has created selection pressures which have led to the emergence of various dispositions in the human mind that accidentally give rise to religious beliefs.
> (2) Religious beliefs are accidents or by-products of evolution.
> (3)Therefore, religious beliefs cannot be trusted.

Barrett points out that claim (1) is an interesting empirical claim and may even be true. Claim (2) might also be true: it seems that natural selection did not favour or work against individuals who had religious beliefs, but rather natural selection favoured some behaviours and cognitive systems that made religious beliefs and practices possible. Although the premises look fine, the conclusion does not follow: the two premises do not give us reasons not to trust accidents or by-products of natural selection. Barrett points out that most of our beliefs, including scientific beliefs, are evolutionary by-products: natural selection did not select individuals who could do calculus or had beliefs about quantum mechanics. We are able to form beliefs about quantum mechanics and calculus – as well as many other things – because our cognitive mechanisms, that originally evolved to do something else, are flexible enough to process different inputs. So the fact that evolved cognitive mechanisms are involved in producing religious beliefs does not entail that those beliefs are mistaken or even suspicious.[458]

It seems to me that the reason why the argument from religion as a by-product seems convincing is that it confuses the following claims:

(a) Some features of religious thinking and behaviour can be explained by invoking cognitive mechanisms that were designed by natural selection to serve a non-religious purpose in our ancestral environment.
(b) Religion is nothing more than a by-product of non-religious cognitive mechanisms.

The latter claim does not follow from the former. To show that the latter is the case, one would need to do much more than to show that some features of religious traditions can be explained by the features of our non-religious cognition. Another reason why we might jump from an available naturalistic explanation of the origins of religion to its falsity is our intuition that in order for a belief that p be justified (that is, be a proper candidate for being true), the belief that p must be causally connected to the reality which it represents. So if religious beliefs are not caused by actual states of affairs in reality but merely by cognitive mechanisms themselves, then they do not seem to be proper candidates for being true.

Murray has formulated this argument in the following way:

(1) The origin of religious beliefs can be explained without any reference to or without any causal connection to supernatural reality.

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[457] Both Dawkins and Dennett, for example, opt for this construal of the by-product view. See, e.g., Dennett 2006, 309 and Dawkins 2006, 179.
[458] Barrett 2007c, 62-63, 65. Barrett points out that it seems difficult to understand how any belief could be encouraged by natural selection. This is because natural selection does not select beliefs or attitudes but behaviours. Natural selection does not care about truth, only survival. See Barrett 2007c, 64-65.

(2) Religious beliefs are not causally connected to their targets.
(3) A belief in general is not justified if it is not causally connected to its target in certain ways.
(4) Therefore, religious beliefs are unjustified.

The argument has two basic problems. The first problem is that although causal analysis of knowledge and justification are quite popular among philosophers, they are by no means the only possible theories available.[459] Not all theories of justification require a causal connection between the object of a belief and the belief itself. Broadly speaking, theories of justification can be either internalist or externalist. Internalist theories of justification ground the justification of a belief in factors "inside the head" or factors knowable to the epistemic subject herself. In most cases, other beliefs possessed by the epistemic subject function as such factors. Evidentialist theories of rationality are prototypes of internalism: beliefs are justified by other beliefs. Contrary to internalists, externalists argue that a belief can be justifiably held if it is connected to the world in a proper way. Thus externalism allows that the justification of a belief can be out of the reach of the epistemic subject. One way to construe this relationship is to say that a belief should be produced by a reliable source.[460]

The second problem is that, even if we grant for the sake of the argument, that religious beliefs must be causally connected to a supernatural realm, the argument would still fail. The reason is that we can construct a causal connection between a religious belief and its target in a way that satisfies the requirements. Consider the following ways in which a belief about supernatural reality can be causally connected to its target:

(a) Supernatural reality can directly affect our cognitive systems (brains).
(b) Supernatural reality can be directly perceived or experienced.
(c) Supernatural reality can cause a natural event which in turn functions as grounds for the belief in a supernatural reality.
(d) Supernatural reality can set up our cognitive systems in such a way that they produce religious beliefs in certain environments.

Murray points out that alternative (d) is always open to the theist. God can be understood as setting up our cognitive machinery and its environment in such a way that they together produce true beliefs about him. This move would make it unnecessary for God to directly reveal himself in one's experience or cause some natural events which would in turn cause a religious belief.[461] Other alternatives are also possible. Take option (b) for instance. In his *Perceiving God: The Epistemology of Religious Experience* (1991), philosopher William Alston has argued that religious experiences can be understood as a form of perception.[462] According to this view, the causal connection between some religious beliefs and religious experience is similar to the causal connection between perceptual beliefs and their targets. In both cases, the experience (religious or perceptual) constitutes a reliable process of belief formation.

Now, we can consider Barrett's second argument – the argument from inherited belief. The argument begins from CSR's claim that religion comes naturally to human beings as religious beliefs and practices "fit" quite well in our cognitive architecture. Barrett construes the argument as follows:

(1) People are credulous recipients of religious beliefs.

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[459] For discussion, see, e.g., BonJour & Sosa 2003.
[460] A classical exposition of both reliabilism and externalism is Goldman 1992. Internalism is defended by, e.g., Roderick Chisholm (1989).
[461] Murray 2007, 368-369.
[462] Alston is also a defender of a certain kind of reliabilism in epistemology. See, e.g., Alston 1989.

(2) Natural selection provided us with the cognitive faculties that make us credulous recipients.
(3) We know now why people believe in God so easily.
(4)Therefore, continuing to believe in God is irrational.

Again Barrett points out that claim (1) is an interesting empirical claim: not only can the CSR show that the claim is plausible but it can even explain why it is so. Claim (2) is a plausible claim as well: Barrett refers to evidence from developmental psychology that suggests that children, for instance, are quite credulous especially towards everything their parents tell them. Finally, claim (3) is inferred from the two previous claims. The problem with this argument, however, that there is again a considerable gap between the premises and the conclusion. What is missing is the following premise: if humans have cognitive faculties that make some beliefs more plausible than others, we should not hold these beliefs true. This premise is clearly false: why should we think that the plausibility of a belief is evidence for its falsity? Finally, Barrett makes the most crucial point: if we hold that we can offer a psychological explanation of why certain beliefs are plausible and take this as evidence against these beliefs, then we are assuming that the plausibility of those beliefs is based solely on the cognitive mechanisms that psychologists study. If this were the case, we would commit ourselves to the claim that conscious deliberations would not come in at any point in the process of acquiring beliefs. This cannot be true, Barrett claims, because humans are also capable of grounding their beliefs in consciously reflected arguments and evidence, so there is at least a possibility that the plausibility of religious beliefs is produced by conscious reflection.[463]

At this point, Barrett's defence hinges on a certain conception of what cognitive mechanisms are and how they are related to conscious reasoning and to the outside world. In his view, what individuals believe is always a result of interplay between many different factors: unconscious biases created by cognitive systems, conscious reasoning and available information all contribute to produce a belief in an individual. This brings us back to the more general and mainly philosophical question concerning the nature of consciousness and its role in naturalistic world views.

Consider the argument from the fallibility of cognition. It is a well-known fact that human cognition makes systematic mistakes. Barrett points out that our perceptual systems, for instance, are prone to illusions and our inference systems do not always perform their tasks according to the rules of formal reasoning. If this reasoning is extended to our cognitive mechanisms that provide the plausibility for our believing in God, it would seem to undermine belief in God. The argument can be formulated as follows:

(1) Our cognitive capacities provide the plausibility for our believing in God
(2) Our cognitive capacities are prone to errors so they cannot be trusted to give us truth.
(3) If we cannot trust our cognitive capacities, we should not hold belief in God plausible.
(4) Therefore, the untrustworthiness of our cognition weakens the belief in God.

Barrett notes that the goal of this argument is to present our cognitive faculties in a dubious light. The basic idea of the argument is that if a belief arises from a source that is not reliable and there is no other means of justifying it, then it is not rational to hold it true. Although the argument looks convincing, Barrett points out that two implausible assumptions are made: firstly, it assumes that the multitude of cognitive systems that support religious beliefs

[463] Barrett 2007c, 65-67.

are all prone to errors, and secondly, it assumes that we do not have any other sources that might justify religious beliefs.[464]

The argument suffers from the same problems as the inherited belief argument, Barrett claims: it presupposes that the automatic cognitive systems which psychologists study are the only reasons that religious beliefs are plausible. Furthermore, in the case of perceptual illusions for example, we have other sources of knowledge that can be used to verify and rectify the distorted products of our cognitive systems. However, CSR writers claim that religious beliefs are supported by the same cognitive machinery that supports our other everyday beliefs as well. If all of our ordinary cognitive systems are seriously error-prone, then we fall into general scepticism for we cannot trust our belief-forming mechanisms at all. Thus, the argument produces too much "collateral damage": if the argument is correct, we should not trust religious beliefs because their source is not reliable; but by the same token, almost all other beliefs would have to go as well because they are products of the same machinery.[465]

Finally, Barrett concludes that naturalistic explanations – psychological, biological or whatever – cannot remove the justification of religious beliefs by themselves:

> For the moment, it appears that theists have nothing to fear from the bio-psychological explanations of religion. Although these scientific endeavours may grant new insights into mechanisms that play a role in shaping religious thought and action, whether or not belief in gods is rationally justified remains a question outside science.[466]

Murray also reaches a similar conclusion. His answer to the question of whether cognitive explanations of religious beliefs show that religion is nothing more than evolutionary by-product is that

> [o]ur first reaction to such a question should be: well, if they do, it is not clear how. These models, if correct, show *not one thing more* than we have certain mental tools (perhaps selected, perhaps spandrels) which under certain conditions give rise to beliefs in the existence of entities which tend to rally religious commitments. But pointing out does nothing to tell us about whether those beliefs are *justified* or not.[467]

The previous discussion supports a certain reading of CSR theories according to which CSR theories are worldview neutral in the sense that they allow different worldview positions and religiously irrelevant for theistic beliefs in the sense that they do not have major consequences for their truth or falsity. The latter conclusion may be a bit too strong as it depends on a given set of religious ideas; however the conclusion at least shows that CSR theories should not be construed as negatively religious relevant *in principle* without further enquiry. Moreover, Barrett's arguments reveal philosophical assumptions that contradict the strict naturalist reading. First, Barrett argues that conscious (reflective) reasoning can be involved in justifying religious beliefs. His argument implies that conscious processes and reflective reasoning cannot be completely explained by mechanistic factors. In other words, he acknowledges the possibility of non-mechanistic or "non-causal" explanations of some events thus contradicting the explanatory completeness of physics. Second, both Murray and Barrett assume that the issue of whether religious beliefs are true or not is outside science,

[464] Barrett 2007c, 67-68.
[465] Barrett 2007c, 69-70.
[466] Barrett 2007c, 70.
[467] Murray 2007, 365.

because science deals with empirically measurable reality. This, in turn, implies a certain view of the nature of scientific knowledge: there are aspects of reality that are not accessible to natural sciences and as a consequence there is genuine knowledge that is not scientific. As we have already seen, under the conditions imposed by strict naturalism these claims would not be possible. For if everything is considered as physical or reducible to the physical and the domain of physical states is completely exhausted by the natural sciences, then there is nothing left outside the sciences. Thus if the sciences can explain religious beliefs and no scientific evidence for their truth is available, then religious beliefs must be false. Advocates of the broad naturalist reading of CSR do not regard this line of reasoning as plausible. Finally, Barrett presents a certain type of defence of theistic beliefs by grounding them in the reliability of our cognitive systems. This is a topic, however, that we leave to the next section where we will look at some theological interpretations of CSR theories.

5.4. Positive Relevance: Rationality of Religious Belief

The previous sections have shown how implicit philosophical assumptions about the nature of scientific knowledge, the nature of religion, the ontological constitution of world and the like come in when CSR writers (and others) interpret CSR theories and their aims. The result was that – at least in principle – cognitive explanations of the origins of religious beliefs do by themselves have little bearing on the truth or falsity of religious beliefs. In order to get to the truth or falsity of religious beliefs, we must enter into the aforementioned philosophical issues. We examined two different interpretations – strict naturalism and broad naturalism and/or methodological naturalism. This section examines two possible points of positive religious relevance to theistic truth-claims, namely, the rationality of theistic belief and "cognitive fine-tuning".[468]

One possible way to understand CSR theories in a theological context is given by theologian Niels-Henrik Gregersen in his article *What Theology Might Learn (and Not Learn) from Evolutionary Psychology: A Postfoundationalist Theologian in Discussion with Pascal Boyer* (2006). He conducts his discussion of Boyer in the light of J. Wentzel van Huyssteen's theology and especially his model of rationality.[469] Gregersen and van Huyssteen see no particular religious or theological problem in the claim that religious beliefs are evolutionary by-products. The fact that human cognition has evolutionary roots means that all beliefs have evolutionary roots, even religious ones. However, in a similar way to Barrett, Gregersen concludes that rationality and the truth of religious beliefs should not be evaluated in terms of their biological origin. Gregersen refers to van Huyssteen's treatment of evolutionary epistemology and points out that van Huyssteen's ideas can be easily transferred over to evolutionary psychology and CSR.[470]

Van Huyssteen's motivation for appreciating evolutionary considerations is his attempting to find grounding for common human rationality in human evolutionary roots. He writes that

> [e]volutionary epistemology thus reveals the process of evolution as a belief-gaining process, a process that in humans, too, is shaped pre-consciously. All our beliefs, and

[468] In the current literature, claims for positive religious relevance are rare. In addition to Gregersen 2006 and some remarks by Barrett, only Clark & Barrett 2009 comes to mind. Some articles in a recent book *The Believing Primate: Scientific, Philosophical, and Theological Reflections about the Origins of Religion* (Murray & Schloss 2009) point to this direction also.

[469] For an overview of van Huyssteen's postfoundationalist model of theology, see van Huyssteen 1998, 1999. van Huyssteen's take on the evolution of human cognition can be found in van Huyssteen 2006. van Huyssteen's account of Boyer's theory is congruent with Gregersen. See van Huyssteen 2006, 261-270.

[470] For an overview, see Pinxten & Callebaut 1987.

> I would argue, also our religious beliefs, thus have evolutionary origins and were established by mechanisms working reliably in the world of our ancestors. This still does not mean, however, that natural selection can offer an adequate explanation for beliefs that far transcend their biological origins. But this again underlines the fact that cognition is a general characteristic of all living beings, and that human rationality, therefore, can only be fully understood if its biological roots are understood.[471]

Thus van Huyssteen sees no problem in treating religious beliefs and religious imagination equally with all other sorts of human thinking and reflection.[472] Furthermore, both Gregersen and van Huyssteen also accept, although not without criticism, the main claims of evolutionary psychology: first, that the human brain houses a number of functionally distinct systems that have evolutionary origins and, secondly, that these systems create cross cultural cognitive strategies that in turn have effects on how cultural information is processed. As postfoundationalists, Gregersen and van Huyssteen assume that the Christian community has *prima facie* justification for their truth-claims, so they are not looking to justify Christian claims through science. However, they are interested in the way scientific findings about the development of religious ideas and religious thinking might inform theological work. Both Gregersen and van Huyssteen are mainly interested about the origins and functions of rationalities in different domains of life. If religious rationality has cognitive and evolutionary roots in the sense that it is not its own distinct domain of rationality, all the better for religion, they claim. [473]

Gregersen makes several critical points about Boyer's claims. First of all, he point out that no straightforward causal connection exists between mental modules and processes in the brain. Thus Boyer's account is ultimately incomplete. In the future it might be that the neurosciences will validate assumptions concerning psychological theory, but they also might not. Secondly, Boyer's "supra-rationalistic" idea of religion neglects the practical dimension of religion as well as the fact that religious ideas also represent natural rather than supernatural realms. Thirdly, the generality of Boyer's theory, the fact that it deals with the "cultural fitness" of religious ideas, makes the explanatory scope of the theory quite limited: in particular, religions and behaviours are not explained. Finally, he criticises Boyer's claims to have "explained religion" as if his theory were equipped to evaluate the rationality of religious beliefs. Gregersen writes that

> Boyer concerns himself with cultural adaptation, with "cultural fitness", and not with the conceivability or rationality of particular religious imaginations. He is thus well aware that he cannot *qua* evolutionary psychologist evaluate the internal rationality of religious belief. The self-affirmative rhetoric of "explaining religion" disguises this fact, as Boyer's many Feuerbachian side-remarks do. For a theory about the emergence of religious concepts and imaginations does not answer the philosophical question about the validity of religious beliefs, nor the issue as to whether and how religious imagination may refer to extra-linguistic realities. The *reasons* that may undergird *the unreasonable effectiveness of religious thought* (to reuse John Wheeler's famous phrase about the unreasonable effectiveness of mathematics) simply transcends the scope of evolutionary psychology.[474]

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[471] Van Huyssteen 1998, 151-152.
[472] Van Huyssteen 2006, 264.
[473] Gregersen 2006, 312-314; van Huysteen 2006.
[474] Gregersen 2006, 320.

Despite the shortcomings of the cognitive approach, Gregersen claims that theologians should wholeheartedly accept the idea of naturalness of religious ideas. First of all, the fact that religious concepts are easy to understand and process coincides with the Judeo-Christian idea that humans are created in the image of God and thus endowed with abilities to be in communication with him. This "cognitively fine-tuned" ability to understand God is common to all humans irrespective of their religious views. Secondly, the fact that the ability to form religious ideas is part of human nature makes religion as real and natural as any physical phenomena. Finally, and most importantly, Gregersen points out that

> what evolutionary psychology shows us is that religions consistently produce mental representations with similar contents as a result of the ordinary workings of the human mind, including its imaginative capacities. This suggests that *religious imaginations and concepts are to be treated on a par with all other sorts of human thinking.* ... The human ability to form pictures and create metaphors is simply a fact of life that does not need justification. The philosopher of theologian is therefore freed from burden of giving evidence of rationality of religious concepts in general. Religious imaginations cannot be treated as a generic unity, but flow in many directions. According, their rational or irrational nature has to be evaluated on a case-by-case basis.[475]

Gregersen takes CRS theories to show that religious thinking and rationality are not that different from other types of human thinking. In a similar fashion to Barrett, he connects the rationality of religious beliefs to the cognitive systems that produced them and concludes that the naturalness of religious ideas actually supports religious claims rather than undermines them.

Recall the previous section where it was pointed out that Barrett's arguments against the anti-religious interpretations of CSR theories were partly based on the reliability of our cognitive systems to produce true beliefs. He makes a strong connection between the justification of religious beliefs and the truth-preserving nature of our cognitive systems: if religious beliefs are largely produced by normal human cognitive systems and if we generally trust these systems, then we should not suspect them in the case of religious beliefs. In a brief chapter of *Why Would Anyone Believe in God?* (2004), Barrett compares belief in God and belief in other minds and argues that they are psychologically speaking in the same level.[476] Both types of beliefs – belief in gods and belief in other minds – (1) lack empirical support, (2) are believed both reflectively and intuitively and (3) are mostly universal. Barrett writes that

> [p]erhaps surprisingly, no scientific evidence exists that proves people have minds. Indeed, such direct evidence of minds falls beyond the realm of science because minds (as believed in) are experiential and not material. ... Ultimately, what psychologists study is human behaviour, including the behaviour of brains and nervous systems. Psychologists and cognitive scientists interpret behaviors in terms of mental states and the functions of minds. However, minds are not accessible to direct investigation and have not even been proven to exist.[477]

Barrett points out that it is not scientific evidence that makes people believe in minds but the outputs of their cognitive systems: "believing in minds is a natural and nearly inevitable

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[475] Gregersen 2006, 322.
[476] Barrett 2004, 95-105. Barrett's argument draws from Plantinga's book *God and Other Minds: A Study of the Rational Justification of Belief in God* (1990).
[477] Barrett 2004, 96.

consequence of the sort of biology we have, by virtue of being humans and living in the general sort of world in which we live."[478] The gist of Barrett's argument is that belief in minds and belief in God or gods should be held as foundational or basic, that is, they are not based on empirical evidence or logical proof. Foundational beliefs need no outside justification. Further, as they are both basic beliefs, if we doubt the one on the basis of lack of empirical evidence or logical proof we should also doubt the other.[479]

Gregersen's and Barrett's picture fits quite well with what CSR writers say about belief acquisition. We already covered this in section 3.1 when we talked about intuitive and reflective beliefs so I just make some clarifications. Boyer contrasts two models of belief acquisition: the first model is based on our everyday (and sometimes philosophical) understanding whereas the second is suggested by psychological evidence. Consider belief acquisition as sort of judicial process. First the epistemic subject receives or collects information and forms a belief or a system of beliefs about something. Then this belief system is brought before a "belief-judge" and a "belief-attorney" presents all available evidence for and against it. Finally, the judge presents his verdict: either the belief system is accepted or discarded. The purpose of describing this model is to highlight the idea that acquiring new beliefs is based on analysis of evidence and coherence as well as exercise of reflective reasoning and inference. Further, the model supposes that we basically choose our beliefs as if our consciousness were like a guard standing at the gate of our mind. Only beliefs that are accompanied with sufficient evidence and coherence are let in.[480]

The second model – model suggested by cognitive psychology – is more complicated. The basic idea is that

> people do not have beliefs because they somehow made their minds receptive to belief and then acquired the material for belief. They have some beliefs because, among all the material they acquired, some of it triggered these particular effects.[481]

What Boyer is trying to say here is that the epistemic subject does not somehow open his mind to new information and assess it, but rather the epistemic subject acquires and processes information all the time and the information acquired triggers certain beliefs. There is no judge or jury in the mind, only a large number of independent systems that process information and send their processed information to other systems as facts.[482]

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[478] Barrett 2004, 95-99. Barrett acknowledges the fact that although most people believe that other people have minds there are philosophers and psychologists who believe that humans do not have minds (i.e. having conscious experiences) at all.

[479] Barrett 2004, 98.

[480] Boyer 2001, 302-303. Boyer writes that "we have two quite different pictures of how a mind reaches a verdict. On the one hand, we sometimes weight the evidence and decide on its merit. On the other hand, there seems to be a great deal of underground belief making going on that is simply not reported. When we discuss religious concepts and beliefs, we tend to assume that these are processes in the mind along the lines of the first model, a kind of Judge and Attorney system in the mind. We assume that notions of supernatural agents, what they do, what they are like, etc. are presented to the mind and that some decision-making process accepts these notions as valid or rejects them. But this may be a rather distorted view of how such concepts are acquired and represented." Boyer 2001, 304.

[481] Boyer 2001, 30-31.

[482] Boyer 2001, 304. Psychologists and philosophers have pointed out that our standard philosophical picture of belief-formation is somewhat misguided: human beings are not ideally rational agents that assess the truth of beliefs according to the rules of normative rationality, but rather they are agents with limited cognitive powers who apply fast heuristics procedures and fuzzy logic in everyday situations. For a summary of this "rationality debate", see Stein 1996. For more discussion, see Evans & Over 1996. Arguments from the both sides are presented in Stainton 2006, 113-144. The most famous psychological test which shows that humans make systematic mistakes in tasks that require formal reasoning is the Wason selection task described by, e.g., Botterill & Carruthers (1999, 105-130).

If the latter model of belief acquisition is more accurate than the former, what are we to think of religious beliefs? First we must note that the "direction of justification" is different in the former model than in the latter. According to the latter model, it is a mistake to assume that the epistemic subject first decides to adopt some fairly general religious belief (like "our forefathers are present now" or "God exists") and then interprets everyday situations in the light of this belief. On the contrary, the human mind is built in such a way that it produces intuitions in different situations that are easily compatible with reflective religious beliefs such as "God exists". If there are practices of interaction, such as rituals and prayers, then intuitions, which increase the plausibility of a reflective religious belief are automatically produced. In this sense, the cognitive model suggests that the plausibility of very general and reflective religious beliefs is grounded on interplay of religious practices and cognition rather than the other way around.[483] This result corresponds to our everyday observations as well: religious people do not usually come to believe in the existence of God through metaphysical reflection, but rather hold the belief that God exists true, because it is compatible with what they do and experience. Moreover, if formation and justification of religious beliefs (and other everyday beliefs) are based on intuitive conceptual schemas, then we should not expect the process acquisition to proceed according to the abstract norms of philosophical rationality.

The moral of this story, in Barrett's and Gregersen's terms, is that the demands of normative rationality are simply too high for humans in most cases to achieve. The "standard model of rationality" suggests that religious thinking is irrational compared to other domains of thinking. However, what CSR theories and other theories in cognitive psychology seem to suggest is that religious thinking is on a par with other forms of everyday thinking. This result, according to Barrett and Gregersen, supports the idea that religious beliefs should be held as *prima facie* plausible because they are mostly produced by ordinary cognitive mechanisms – mechanisms that are normally thought to be reliable sources of beliefs.[484]

Finally, Barrett and some others have argued that CSR results support the Christian claim that humans are naturally endowed to know God – an idea that Gregersen mentions only in passing. Barrett writes that

> God created people with the capacity to know and love him but with the free will to reject him. Consequently, our God-endowed nature leads us to believe, but human endeavours apart from God's design may result in disbelief. ... God may have fine-tuned the cosmos to allow for life and for evolution and then orchestrated mutations and selection to produce the sort of organisms we are – evolution through 'supernatural selection.'[485]

In this sense, cognitive theories have ended up revealing a certain form of *sensus divinitatis*, that is, our God-given capacity to know God.[486] Barrett's claim rests on an idea of what we

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[483] Boyer 2001, 315. Boyer presents some results from cognitive psychology that show that human reasoning has the tendency to make mistakes: for example, people generally have the tendency to adjust their beliefs according to beliefs of other people (consensus effect) and to detect and recall positive evidence for their hypotheses better than negative evidence (confirmation bias). See Boyer 2001, 300-301.

[484] If we were to develop the idea further, we could argue that most of our everyday beliefs, such as beliefs about time passing, the solidity of material objects, the existence of other minds and God or gods (perhaps) are basic or foundational in the aforementioned sense. Notice that we are talking about the rationality of religious belief here, not its truth. It might be rational for a person to believe something that will turn out to be not true. Thus, the fact that a person has rational warrant (justification) to believe in God, for instance, does not guarantee that her belief is true.

[485] Barrett 2004, 123.

[486] Barrett also highlights this point in his recent article *Cognitive Science, Religion and Theology* (2009, 98) where he writes that "[w]hatever the reasons for these cognitive biases to serve as imperfect guides to God, a Christian version of the cognitive science of religion remains possible. The Christian may argue that through some means

might call "cognitive fine-tuning" which is related to a more general account of fine-tuning of the cosmos.[487] According to claims based on cognitive fine-tuning, God has set up our cognitive system in such a way that given a normal human environment our cognitive systems produce correct beliefs and intuitions about him.[488]

5.5. Religious Relevance Revisited: Causes and Reasons of Religion

In the preceding sections we were dealing with the problem of religious relevance. In section 5.1 we outlined the problem and briefly described three alternative readings of the aims and religious implications of CSR theories. In subsequent chapters, I attempted to reconstruct these alternative readings and their background theories. According to the strict naturalist reading (section 5.2), CSR theories have clear negative religious relevance as they explain why humans postulate such unnatural entities as supernatural agents even though such entities are at odds with current scientific theories. We also pointed out how strict naturalism is driven by a set of philosophical assumptions connected to scientific explanation (micro-reduction and the unity of science), physicalism, and to a certain view of the nature of scientific knowledge (scientism). Writers who advocate the second reading described in section 5.3 reject strict naturalist background assumptions in favour of broad naturalism. These writers claim that treating religion as a by-product of ordinary cognition and as natural for humans is mostly religiously irrelevant. Further, they distance themselves from physicalism, scientism and wholesale micro-reductionism. Finally, we looked at some writers who have argued that CSR theories provide support for some theistic claims. The naturalness of religion was seen by these authors to relieve the religious person of responsibility for providing a general justification for religious beliefs.

My point was to show that the religious implications of CSR are for the most part a matter of interpretation. The advocates of all three views mostly accept the core CSR theories (albeit not without some criticism) and auxiliary theories, but they differ on how they interpret their relationship to religious ideas. If CSR theories and auxiliary theories are put in different philosophical frameworks, then its religious implications are also different. This point implies that there need not be a single set of philosophical assumptions that must be shared in order to engage in CSR enquiry. The point also highlights the extent to which philosophical background assumptions can and will have effects on scientific work and especially on the interpretation of its results. Finally, we also noted that we cannot have an *a priori* account of what is religiously relevant and what is not, because religious relevance depends on what religious ideas we are talking about and how we are interpreting those religious ideas. Religious ideas are simply so diverse and so flexible in their interpretations that we cannot deal with them as a single set of ideas.

In the course of my treatment, I have mostly avoided favouring one of the three aforementioned positions over the other two. All three proposals have their advantages and disadvantages which for the reasons of space cannot be addressed here. However, I would like to highlight one question that is, in my view, the most important one regarding the

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(perhaps including evolution) God has equipped people with the prerequisite cognitive equipment to have an appropriate relationship with God."

[487] The term "cognitive fine tuning" originates from philosopher Del Ratzsch (2009). For an overview of biological and cosmological fine-tuning arguments and other types of arguments from design, see Manson 2003.

[488] Barrett goes on to (2009, 97-98) suggest that the perceived plurality of god-concepts today is due to the "sinful, fallen world" in which we live: in the ideal condition, he speculates, humans might develop a unified theistic concept of God automatically. In his joint article *Reidian Religious Epistemology and the Cognitive Science of Religion* (2009) with philosopher Kelly James Clark, Barrett develops this theme further. The article explores the claim that CSR results support a certain notion of rationality exemplified historically by Thomas Reid and some contemporary philosophers such as Nicholas Wolterstorff.

religious relevance of CSR theories. This is the question of the relationship between reasons and causes of religion. The broad naturalist position of Barrett and others is based on the idea that causes and reasons are quite distinct. Barrett and Murray seem to be saying that it does not matter what the causes of theistic belief are. By definition, explanations of religious beliefs describe causes of religious beliefs rather than their reasons. However, the matter might not be as simple as this, because in order to be justified, that is, to be a proper candidate for being true, a belief must be caused in some appropriate manner. The fact that sometimes reasons and causes overlap (but not always and not necessarily), suggests that we cannot *a priori* decide that the causes of religion that science reveals are irrelevant for the justification of theistic beliefs.

To determine the religious relevance of cognitive accounts of theistic beliefs one should answer the following questions:

(1) What do cognitive accounts of religious beliefs explain?
(2) What kinds of causes do these explanations involve?
(3) What kinds of causes of their own beliefs are the adherents of theism committed to?

Notice that the third question is a theological one: as most religions and theologies seldom come with elaborate accounts of the causes of their beliefs, theological work is needed to assess whether the causes invoked in scientific explanations, in our case by cognitive explanations, are compatible with a particular theology.

Philosopher Peter van Inwagen (2009) highlights this point when he claims that all naturalistic explanations can be in principle – that is, without logical contradiction – assimilated into a supernaturalist framework. However, some naturalistic explanations "resist" assimilation more than others and this resistance has to do with how the causes of supernatural beliefs and their referents are understood. Some natural causes just simply seem to undercut some beliefs about the nature of supernatural realities more than others. He illustrates his point with the following example.

> Suppose that a statue of the Virgin in an Italian Church is observed to weep; or, at any rate, that is how it looks. It is eventually discovered, however, that the apparent tears are bat urine (it seems that some bats have made their home in the dim recesses of the church ceiling). This account of the tears is of course logically consistent with their having a partly supernaturalistic explanation (maybe God wanted the statue to appear to be weeping and He so guided the bats that they took up residence in just the right spot). Still, it *resists* being incorporated into a larger supernaturalistic explanation – it strongly suggests that there's "nothing more to it" than ordinary causes and change.[489]

In this case, it somehow seems "unreasonable, contrived, artificial, or desperate"[490] to say that bat urine was "God's way of doing it".

Now, if we leave bat's urine behind and move our focus back to CSR explanations, then the question is whether the causes that CSR writers invoke to explain the prevalence of religious ideas are causes that resist theistic interpretation. Barrett, Murray and Gregersen do not seem to think so. Neither does van Inwagen who writes that

> [s]uppose that God exists and wants supernaturalistic belief to be a human universal, and sees (he would see this, if it were true) that certain features that it would be useful for human beings to have – useful from evolutionary point of view: conducive

[489] van Inwagen 2009, 135.
[490] van Inwagen 2009, 136.

> to survival and reproduction – would naturally have the consequence that supernaturalistic belief would in due course become a human universal. Why shouldn't he allow those features to be the cause of the things he wants? – rather as the human designer of a vehicle might use the waste heat from its engine to keep its passengers warm.[491]

Finally, van Inwagen suggests, in a similar vein to Gregersen, that the reason why some CSR writers and their associates consider CSR as anti-theistic is that they implicitly slide from the claim that there are natural factors that contribute to the origin and pervasiveness of religious beliefs to the claim that religious beliefs are completely caused by natural factors and do not point to supernatural realities. The former claim is a simple scientific claim whereas the latter requires a commitment to a metaphysical position.

This position could be challenged by claiming that neither Barrett, Murray, Gregersen or van Inwagen are interested in giving a more positive – that is, more theologically constructive – case for the compatibility of cognitive (and evolutionary) causes of religious belief and the theistic account. They seem to be satisfied in giving, like in van Inwagen's case, a brief analogy that shows how cognitive causes are compatible with theism *in principle* and leave it at that. Maybe this is as far as philosophers can go, but for theologians it might be important to examine this theme further and try to formulate a more integrated account. In other words, all those who seek to assimilate the results of CSR into a theistic scheme must show that the causes of religious belief are compatible with theistic accounts of the causes of such beliefs. And such accounts must be actual theologies rather than merely making relevant points "in principle".

[491] van Inwagen 2009, 136.

6. Conclusion: Prospects and Boundaries

In this work, I examined the main theories and methodological assumptions of three writers normally associated with the cognitive science of religion. In addition to looking at these three writers – that is, Scott Atran, Justin Barrett and Pascal Boyer – I also brought in Dan Sperber who, although not a CSR writer himself, has formulated some of the most important auxiliary theories of CSR. My perspective was philosophical in the sense that I attempted to give a philosophically informed account of their methodological principles and their main theories as well as to point out problems and possible solutions for them.

I began by outlining the development of the "cognitive science approach" in very general terms and pointed out how CSR theorising is done in the intersection of several different disciplines, namely, cognitive sciences, anthropology and evolutionary psychology. In addition, the multidisciplinary nature of CSR theorising also makes it a fertile ground for different kinds of philosophical considerations coming from philosophy of psychology, philosophy of mind and philosophy of social science. Finally, to bring some conceptual rigour to our analysis a distinction between three levels of CSR theorising was introduced: (1) core theoretical contributions (MCI hypothesis, HADD hypothesis, etc.), (2) auxiliary theories (epidemiology, modularity, etc.) and (3) philosophical assumptions (causal explanation, materialism, etc.). My goal was to examine both core theoretical contributions and auxiliary theories in order to reveal their philosophical assumptions.

Chapter 2 focussed on spelling out the methodological assumptions and auxiliary theories of CSR writers by situating these theories and assumptions into the nexus of existing approaches to religion. First it was pointed out how CSR writers like to contrast their approach with those who advocate a special method of "understanding" in the study of religion and anthropology in general. Their basic argument was that contemporary cognitive sciences can inform anthropological theorising about the human mind and offer tools for producing causal explanations. They insisted that since cognitive science examines thinking in terms of causal and physical processes of the brain, they can link thinking and its socio-cultural products to the natural world of brains, bodies and physical things. They also insisted that as non-religious factors can be invoked to explain some religious phenomena we should conclude that religion is not a *sui generis* phenomenon, but rather part of the natural world and susceptible to naturalistic explanations. Second, we drew attention to the way in which CSR writers connected cognition and culture. They claimed that rather than being extra-individual "cultural systems", cultures (and religions) should be viewed as special configurations of cognitive processes. Since cultures and religions can be seen as widespread ideas, they can be explained by invoking cognitive constraints that make some ideas easier to learn and transmit than others. Thus, the goal of CSR explanations is to explain the prevalence and persistence of religious ideas by invoking cognitive systems. This suggested that the explanatory factors come from the cognitive and behavioural sciences rather than from the socio-cultural sciences. It is the domain-specific and modular architecture of human cognition that provides the cross-cultural constraints for this explanatory scheme: cognitive systems create recurrent patterns in human thinking and behaviour by constraining and informing the ways we act and think. Finally, CSR writers distinguished their "spandrelist" approach to religion from those who emphasise the adaptive role of religion. The spandrelist (or religion as by-product) approach emphasises the flexibility of cognitive modules: modules that were originally selected to perform other functions create a cultural domain of knowledge around them. In this sense, all aspects of culture (and religion) are evolutionary by-products of our cognitive processes.

In chapter 3, we provided an overview of the core contributions of CSR focussing mainly on the MCI hypothesis and on the different ways in which supernatural agent representations activate our cognitive systems. Generally speaking, CSR writers explain the fact that religious ideas and practices are widespread and pervasive by the fact that human cognition operates in such a way that religious ideas are easy to acquire and transmit. According to the MCI hypothesis, representations that are minimally counterintuitive – that is, representations that include a single violation of intuitions created by our pre-existing domains of intuitive knowledge – have a selective advantage over purely intuitive and highly counterintuitive representations. Further, CSR writers argued that most successful religious ideas, such as those of gods and spirits, are minimally counterintuitive in this sense. It was also pointed out that the MCI hypothesis requires the existence of cross-cultural domains of intuitive knowledge that provide the backdrop for counter-intuitive representations. The fact that most religious ideas include references to supernatural agents can be explained by the "inferential potential" of agent representations. The (hypersensitive) agent detection device creates a general bias towards agent-driven representations, and the systems of social cognition – mainly those dealing with mental states and social interactions of other humans – inform inferences about supernatural agents. The relevance of supernatural agent representations is increased by the fact that they can be easily linked to moral intuitions, events of misfortune, death and ritual. As the origin of our moral intuitions is outside our conscious awareness supernatural agent representations can be invoked as sources of our moral norms. Further, the fact that human cognitive systems are geared to find explanations to salient and life-threatening events and biased towards agent-driven representations makes supernatural agent representations plausible candidates for causes of fortune and misfortune. CSR accounts of rituals are quite diverse for some writers emphasise the way in which rituals promote intra-group cooperation whereas others highlight the intuitive sense of urgency. Finally, CSR writers are keen to emphasise the difference between theological systems and actual religious beliefs: abstract and universal religious systems are not very relevant for the everyday life of believers and thus they are constantly being countered by the more local and particular religious beliefs of believers. In sum, supernatural agent representations have a very high probability of distribution because humans have a large number of cognitive systems that are specialised for identifying agents, making predictions about their behaviour and figuring out their interrelationship.

In chapter 4, we examined the scope of CSR explanations. The "problem of scope" was created by the fact that some writers claim that CSR explanations are mostly irrelevant for explaining religion whereas others claim that they can answer most of our questions about religion. We began by looking at how selective explanations work in general and concluded that CSR explanations are mainly ultimate explanations of cultural evolution. In this sense, they explain population-level tendencies rather than particular cases of religious thought and behaviour. This conclusion also led us to reframe the problem of scope: ultimate explanations of cultural evolution provide us with abstract models of selection pressures – namely, models of "cultural fitness" of representations. Next, we examined the nature of psychological explanation and the relationship of personal and sub-personal explanations and concluded that sub-personal explanations explain regularities in thinking and behaviour (psychological effects) by the structure of psychological capacities. Furthermore, it was argued that the explanatory scope of CSR depends (to some extent) on how the relationship of personal to sub-personal explanation is understood. Since the live options are varied it was concluded that instead of a strong *a priori* position, we should proceed by putting forward hypotheses at different levels of psychological explanation. After considering psychological explanation, we turned to causal explanation in general. After arguing that CSR writers views coincide quite well with causal-mechanism model of causal explanation I proceeded to describe some of the critique that has been directed towards the

causal-mechanism model. It was suggested that the emphasis on "material causes" is too strong and leads to unnecessary elimination of "higher-level" explanations. Finally, I presented an alternative to the causal-mechanism model, the interventionist model of causal explanation that can clarify what our explanations actually explain and highlight the usefulness of "higher-level" explanations.

After examining causal explanations I pointed out how CSR writers are committed to a certain view about the integration of scientific disciplines that was connected to their notion of causal explanation. CSR writers seem to endorse a certain type of "vertical integration" advocated by some Evolutionary Psychologists which seeks to make the socio-cultural sciences mutually compatible and also compatible with the behavioural and natural sciences. We also compared vertical integration to traditional and classical models of inter-theoretic reduction and pointed out several similarities. Finally, I pointed out some problems in the previous models (mainly their physicalist commitments) and offered an explanatorily pluralistic account as an alternative. McCauley's explanatory pluralism is based on the idea that disciplines and theories in different analytic levels can have different assumptions and poor inter-level mapping without the need for reduction or elimination. We also looked at Craver's multi-level mechanism according to which we can explain acting wholes by the actions performed by their component parts. We concluded that both aforementioned models work towards the same idea, namely, scientific explanation as a multi-level and pragmatic enterprise.

My conclusion was that the problem of scope is created by the fact that the critics are interested in explaining different things than CSR writers. The critics are looking for causes that make the difference between particular products of "reason, imagination, and will" whereas CSR writers are looking for causes that explain similarities between large groups of ideas, practices and actions. I also proposed that we should not stick too rigidly to one set of methodological assumptions, but acknowledge that different assumptions might help us to answer different questions about religion. It seems that we might adopt explanatory pluralism which would allow allows different kinds of methodological presupposition in the study of religion provided that they attempt to answer different kinds of why-questions. It seems that religion is a multi-faceted phenomenon that spans over a variety of fields of special sciences. It seems, therefore, that we should not restrict the study exclusively to the socio-cultural "level of analysis". Nor should we claim that religion is "merely" a by-product of cognitive processes, "merely" a device for social cohesion or "merely" an existential stance towards the uncertainties of the world around us. The moral is that we should refrain from drawing sharp juxtapositions between seemingly different approaches in the study of religion without proper analysis of their *explananda* and *explanantia*. Many CSR writers, for instance, want to distance themselves from adaptationist approaches, but it might very well turn out that those who advocate the adaptationist approach are actually explaining different things than those explaining religious cognition. It might also turn out that some aspects of religion are adaptations and others are not. This same point holds when we consider hermeneutically oriented approaches. Rather than explaining general tendencies, hermeneutical approaches are concerned with particulars and individuals.

In the final chapter, I examined the religious relevance of CSR theories. I argued that this is interesting for two reasons. First, there seems to be a lot of confusion about this issue: some writers have claimed that CSR theories show that religious beliefs are false, whereas others invoke CSR theories to defend some religious ideas. Secondly, different interpretations of the religious relevance of CSR theories reveal the more general philosophical assumptions of those who make these interpretations. I began by sketching three different positions: strict naturalism, broad naturalism and positive religious relevance. Given a set of philosophical assumptions that we called strict naturalism, CSR theories lead to the rejection of most religious truth-claims. If we assume that all causes can be accessed

by the natural sciences and that the natural sciences can give an adequate account of religion based on such causes, there seems to be no reason to believe that there is something "more" to religion than those causes. However, those who advocate broad naturalism of some sort usually reject the physicalist assumptions behind strict naturalism and claim that causes invoked by CSR theories (and other naturalistic theories) are mostly irrelevant for religious truth-claims. CSR theories, they claim, have little positive or negative relevance for religious believers or the truth or falsity of their beliefs. Finally, I examined those (few) writers that have argued for the positive religious relevance of some CSR theories. The argument is, very roughly, that CSR theories show how religious beliefs are produced by cognitive machinery we ordinarily hold reliable and thus we should hold religious ideas *prima facie* plausible candidates of being true.

My conclusion was that CSR theories can be interpreted inside different philosophical frameworks without doing violence to the core theories or their auxiliary theories and that these frameworks give different kinds of results regarding the religious relevance of CSR theories. Furthermore, I pointed out that the religious relevance of CSR theories depends on how we understand the relationship of causes and reasons for religion. If the atheist assumes that a scientific account of religion removes the plausibility of religious ideas and the rationality of its practices, he cannot do so simply on the basis of the fact that he has a naturalistic explanation. A specific case must be made that the natural causes revealed by a given naturalistic explanation are incompatible with those given by a religious account – a case that is philosophical in nature, rather than scientific.

In conclusion, I will highlight some philosophical points about naturalistic explanations of religion that have come up in this work. The main point was that, contrary to the materialist and "scientific" insistence of CSR writers, we should not commit ourselves methodologically to some general "metaphysical" theory or a general account of what causes of religion ("material" versus "non-material" or supernatural) qualify as "proper causes" in the study of religion. Our enquiry into religious phenomena can proceed in piecemeal fashion, more "locally" than "globally", and it can be based on the usefulness of different kinds of explanations rather than *a priori* commitment to a possible set of causes ("material causes"). Recall Boyer's point that "the shift to 'physicalist' or materialist interpretation of cognition is made possible, because cognitive science has at least a minimal 'causal story' to explain how thought processes can be actualised in material processes". Recall also Slingerland's point that "our thoughts and behaviour are, at least in principle, as predetermined and predictable as any other physical process." The problem with such comments is their "in principle" nature: they are statements about philosophical positions rather than claims about actual explanations or theories.

The fact is that there is no theory in the cognitive or behavioural sciences that makes behaviour "as predetermined and predictable as any other physical process" and we do not even have an idea of what such a theory might look like. The question is not what cognitive (purportedly physical) approaches can explain "in principle" but what they can explain in real life – now rather than in some ideal, future science. Further, we should ask what regularities cognitive approaches can explain and what minimal causal stories they can actually give. My point is that appeals to "future science" where all "non-physical" explanations are eliminated are not very plausible because we do not have this "future science" but actual science. And in actual science we do not have "material explanations" that would do the same work as socio-cultural explanations. If we understand explanations in the way that I suggested in chapters 4.5 and 4.6, we need not worry so much about whether or not our explanations "posit no special phenomena, ontologies, causes, or laws beyond those of ordinary material objects and their inter-relationships". Rather, we can ask whether or not "non-material" explanations really work or not (and many have suggested that they do work). The moral is that we should not mix our philosophical views about ultimate ontology with our empirical research and our

interpretations of such research. That being said, however, we should acknowledge that we have no *a priori* reason to deny the explanatory relevance of cognitive and/or biological factors in explaining some features of religious ideas and practices. But we should not assume that cognitive and/or biological explanation will do all the work as if only they revealed the "actual, material causes" of religion. How deep these explanations go and what they actually explain is a matter for future empirical research rather than *a priori* commitment to some strictly naturalistic philosophical position.

I also pointed out that we should not expect CSR or any other "naturalistic" approach to religion to automatically provide us with an account of the "ultimate" or fundamental nature of religion for several reasons. First of all, scientific explanations are complete only in the sense that they give a satisfactory answer to the question we are asking at a given moment. Our interests can change and, as a consequence, our questions and contrasts can change. Second, as we have seen, the concept of religion is quite flexible: one's religion is another's superstition. In this sense, an explanation of religion is always an explanation of some conceptualisation of religion. Finally, if we endorse some form of explanatory pluralism, we can then conclude that we can have many "explanations of religion" at different levels at the same time that need not be reducible or even compatible. The question of which of these explanations is the "ultimate" one lacks definite meaning. Incidentally, this is also the reason why we should not expect the CSR to provide an overarching theoretical framework for all approaches to religion.

As for the theological or religious implications of these considerations, religious beliefs and practices would be (at least to some extent) parts of the natural world even in the case that gods, spirits or some transcendental reality existed. Further, if religious beliefs are processed with the same cognitive machinery as all other beliefs (which seems reasonable), then we should not be surprised by the fact that this cognitive machinery influences religious beliefs in some way. The fact that all our beliefs and practices have to do with our cognitive machinery, which is implemented in our brains and part of our bodies as a biological organism, should make inquiry into our psychological and biological mechanisms a reasonable enterprise for even the most supranaturalist (and/or dualist) of thinkers.

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