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Inference vs. assumption in light of the Finnish evidential-modal adverbs *näköjään* and *varmaan*

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Abstract

Inference is usually defined as a speaker's personal but indirect evidence that is based on something that the speaker can directly witness (such as the result of an event), while assumption is based on something such as the speaker's general knowledge of the world. This paper is concerned with inference and assumption in light of the semantics of the Finnish inferential and assumptive adverbs *näköjään* (inference) and *varmaan* (assumption). These are examined by administering a questionnaire study. The discussed scenarios differ according to three factors: the presence or lack of visual or sensory evidence, the temporal relations between the evidence and the claim that is made, and the strength of the evidence. The results of the study clearly establish that inference and assumption are separate notions (coded by different adverbs) and that the (non-)observability of the evidence noted above explains only a part of the attested cases; in general, the use of the adverbs is determined by how reliable the speaker considers the

evidence to be. As a consequence, this paper proposes new definitions based on the speakers' selection of the appropriate inferential/assumptive adverb based on how strongly they are willing to vouch for the truth value of their statement.

Keywords: assumption, evidentiality, Finnish, inference, modality

1 INTRODUCTION¹

Numerous studies have analysed the different types of evidentiality within and across languages (for instance, see Chafe & Nicholls [1986]; Willett [1988]; Aikhenvald [2004]; Aikhenvald [2018] among others). For example, previous studies have focused on the evidentiality categories in different languages (see Faller [2002]; Gawne & Hill [2017]; Floyd et al. [2018] among many others), and the use of evidentials in interaction (Mushin [2001]; Evans et al. [2017]). Typically, the analytical focus of these studies has been on languages with some type of grammaticalised and/or obligatory evidentiality. The present analysis contributes to the list of evidentiality studies. The current focus is on a language with optional evidentiality, Finnish. The most typical means of referring to the information source in Finnish is through the use of evidential adverbs, as illustrated in (1)¹:

(1) a. *Kalle kuulemma tulee huomenna*

¹ All the examples in this study, unless otherwise indicated, are from Finnish and based on my personal knowledge and observations.

Kalle HEARSAY come.3SG.PRSⁱⁱ tomorrow

'(They say) Kalle will come tomorrow'

b. *Kalle varmaan tulee huomenna*

Kalle ASSUM come.3SG.PRS tomorrow

'Kalle will come tomorrow (I assume)'

c. *Kalle on näköjään kotona*

Kalle be.3SG.PRS INFER home

'Kalle is home (which I can infer from some unspecified evidence)'

Example (1a) illustrates the hearsay adverb of Finnish, (1b) exemplifies the use of the assumptive adverb and (1c) the inferential adverb². All three adverbs semantically resemble similar categories in other languages. For example, the inferential adverb (in Finnish) is used when speakers base their claims on inference (see also below). In addition to the evidential adverbs, Finnish can use verbs such as 'see', 'hear' and 'smell' to refer to the information source, but these are not taken into account in this study.

The present analysis is concerned with two of the adverbs illustrated in (1), namely *varmaan* and *näköjään*. The adverb *varmaan* is (typically) used to code prototypical assumption, and the adverb *näköjään* codes prototypical inference. In addition, there are numerous less clear cases whose coding provides us with interesting insights into the nature of inference and assumption. These differences and the basic semantics of these

² The elements analysed in this paper are called adverbs. This is in line with the terminology of the Finnish grammar tradition and previous studies (for example, see Hakulinen et al. 2004 and Jaakola 2021).

adverbs in Finnish are at least partly explained by their origin; *näköjään* has its origin in the word *näkö* ‘sight’, whereas the adverb *varmaan* is based on the epistemic adjective *varma* ‘sure, certain’ and it has the same origin as the adverb *varmasti* ‘definitely/certainly’. As a consequence, sensory evidence is rather strongly associated with *näköjään*, while *varmaan* is more versatile due to its more modal origin. The analytical objective is to determine the division of labour between these adverbs, and hence to explore the notions of inference and assumption from a more general perspective. My hypothesis is that the origin of the adverbs is visible in their use, and *näköjään* appears more frequently with concrete evidence (and therefore expresses inference), while *varmaan* is more flexible in this regard. My objective is also to determine whether the generally accepted definitions of inference and assumption (for instance, see de Haan 2001, Aikhenvald 2004 and Plungian 2010) are indeed capable of explaining the differences in the use of the adverbs selected for the current study. Even though the analytical focus is on Finnish only, it is my hope that the results will be relevant to cross-linguistic studies on inference and assumption as well (examples of other languages are only included to illustrate a specific point). Previous studies (for example, see Aikhenvald 2004 and Plungian 2010) have discussed inference and assumption as distinct evidence types that can be distinguished primarily based on the presence (inference) and lack (assumption) of sensory evidence, as in (2):

Tariana (Aikhenvald [2004: 2-3]):

- (2) a. *Juse irida di-manika-nihka*
 Jose football 3SG.NF-play- REC.P.INFER
 ‘Jose has played football (we infer it from visual evidence)’

- b. *Juse irida di-manika-sika*
 Jose football 3SG.NF-play- REC.P.ASSUM

‘Jose has played football (we assume this on the basis of what we already know)’

The speaker in (2a) makes a claim concerning some type of visual evidence without actually witnessing the state-of-affairs that the speaker refers to directly. By contrast, (2b), the speaker in (2b) assumes the denoted state-of-affairs to have occurred based on his/her general knowledge of the world. The inferential evidential is appropriate, for example, if Jose’s boots are missing, while assumptive evidential is used, for example, if we know that Jose regularly plays football on Sunday and it is Sunday as we speak. As for Finnish, in (2a), the inferential adverb *näköjään* would be more expected because it would clearly indicate that the speaker possesses some type of visual evidence for his/her claim, while the assumptive adverb *varmaan* would be appropriate in (2b) due to the lack of visual evidence. Most definitions for the inferential/assumptive adverbs are based on these types of typical cases (for instance, see de Haan [2001]; Aikhenvald [2004]). However, as will be demonstrated in this article, only some of the uses of the examined adverbs can be explained solely by the presence or absence of sensory evidence. Inference and assumption were selected as the topic of this study due to their intermediate nature between evidentiality and modality (see Sections 2 and 4 for a more detailed discussion), and because there are not detailed studies on these types of evidence (for example, however, see de Haan [2001]).

Evidentiality and the evidential-modal adverbs are not a particularly recurrent topic in the research on Finnish linguistics. One exception is the work by Minna Jaakola on the

verb+*kseni* and the derivatives of the verb *tietää* ‘know’ (Jaakola 2018; 2021). The adverbs that Jaakola analysed differ from the adverbs discussed in this paper in that the former code the mode of knowing than the speaker’s actual information source. For example, the adverb *tietääkseni* ‘as far as I know’ states that the speaker thinks s/he knows what s/he is referring to without in any way revealing the original information source. Even though the elements discussed in this study and the one by Jaakola are in principle rather different, they do share some features. For both inference/assumption and the verb+*kseni* –adverbs, we express something we think or know to be real rather than reporting a direct perception. Jaakola (2021: 277) asserts that inference is a key concept between epistemic modality and evidentiality, which is something that others have likewise observed, such as Nuyts (2017). Jaakola (2021: 277) also states (quoting Cornillie 2009: 46) that the most common evidence types expressed in languages are inference and hearsay, in which evidentiality is expressed by lexical means (including adverbs), which is also confirmed by Finnish (inference is involved in many of the examples analysed by Jaakola). To summarise, both the present analysis and the study by Jaakola examine the speaker’s attitude towards the expressed state of affairs with the highly relevant difference that the study by Jaakola is based on corpora, while the present analysis examines the studied adverbs by administering a questionnaire. The present study also challenges the previously proposed definitions of inference and assumption, which is not the primary goal of Jaakola’s studies.

Some methodological/terminological clarifications are in order before proceeding. The first is that this study is based on a questionnaire and examples from corpora are not included in the data (the reasons for this are explained in Section 3). The next clarification is that the studied adverbs have been selected for two basic reasons. Firstly, they

correspond, at least from my own perspective, best to cases that are usually considered as the prototypes of inference and assumption. This is especially evident for *näköjään*, which has its origin in the word *näkö* ('sight'), and as was noted above, generally recognised definitions of inference usually define inference based on the presence of directly observable evidence. The choice was not as clear for the assumptive particle, because *varmaan* and *vissiin* are rather close in meaning and both could have been selected. However, in the end, I decided on *varmaan* because my analytical objective was to study elements used by all speakers and some speakers do not use *vissiin* at all owing to its rather colloquial nature. Other candidates, such as *kai/ehkä* 'perhaps/maybe' and *ilmeisesti* 'obviously/apparently' do not express the notions analysed as clearly and for example, the use of *kai* usually implies some type of shared knowledge, which is not relevant here. My primary intention was to only compare the two adverbs.

Finnish was selected as the language of this study for three main reasons. Firstly, and most importantly, Finnish is well suited for this study because it has both inferential and assumptive adverbs that are used optionally. This means that speakers can always select these types of adverbs freely, grammar does not exert an influence. Secondly, Finnish is my native language, which enables me to evaluate the results better. Furthermore, it was rather easy to create scenes that render it possible to focus on exactly those features relevant to my study. Thirdly, closely related to the previous point, it was very easy to recruit informants to fill in the questionnaire. I am aware of the fact that this analysis is based exclusively on Finnish, but it is my opinion that the present analysis nevertheless has the potential to serve as a basis for similar studies in other languages. Whenever inference and assumption are mentioned, as in reference grammars, they are analysed only in light of prototypical cases such as those noted above. By focusing on a

single language, I had an opportunity to delve deeper into the features that may be relevant to distinguishing between inference and assumption. It would be especially interesting to study similar effects in other languages to obtain a more comprehensive picture of these two evidence types. This study can thus be considered as an important first step towards a better understanding of inference and assumption across languages and from a theoretical perspective as well. The analysis clearly reveals that the distinction between inference and assumption is not clear-cut.

Finally, as has been discussed by many scholars (for example, see Cornillie 2009 and Boye 2012), modality and evidentiality are closely related notions. This is especially evident for inference and assumption (for instance, also see van der Auwera and Plungian 1998 and Nuyts 2017). The questionnaire could thus also have been used for a study on modal adverbs and for example, the focus could have been solely on the speaker's subjective certainty. However, the focus this study is on the effects of the type of evidence on the use of the examined adverbs, and for this reason, the adverbs *näköjään* and *varmaan* were selected. It is also easier to separate the examined features from each other for specific features of evidence, while certainty is rather a continuum-like notion that is difficult to divide into different parts.

The organisation of the paper is as follows: in Section 2, I define the notions of inference and assumption, as they have been previously understood, and how they are defined for the current analysis. Section 3 discusses the design of the questionnaire. Section 4 presents the results, while Section 5 presents the theoretical implications of the study for our understanding of inference, assumption, and evidentiality more generally. Section 6 consists of a brief summary.

2 DEFINING INFERENCE AND ASSUMPTION

Regardless of the exact wording, the basis for differentiating between inference and assumption is usually the presence or lack of visible evidence/tangible results. Inference is based on some concrete observable evidence (which does not concern the denoted state-of-affairs directly), while assumption is described as reasoning based, for example, on common knowledge (for example, see Aikhenvald [2004: 64, 174]; Barnes [1984: 262]; Miller [1999: 67-8]). Let us consider the following example:

Tsafiki (Dickinson [2000], as cited in [Aikhenvald 2004: 54])

- (3) a. *Manuel ano fi-nu-e*
 Manuel food eat-INFER-DECL
 ‘Manuel ate’ (the speaker sees the dirty dishes)
- b. *Manuel ano fi-n-ki-e*
 Manuel food eat-NOMN-VCLASS:do-DECL
 ‘Manuel ate’ (he always eats at eight o’clock and it’s now nine o’clock)

The speaker in (3a) has visible evidence for his/her claim, whereas in (3b), the claim is based on his/her general knowledge about the world (see also (2)). These examples are excellent illustrations of the prototypical instances of inference and assumption as they are usually defined. Furthermore, the Finnish adverb *näköjään* would be most naturally used in (3a) to emphasise the fact that we have visual evidence for our inference, while

varmaan would appear in (3b) due to a lack of visual evidence. In other words, these adverbs code what is typically defined as inference or assumption.

The starting point for this study is provided by the definitions of Plungian (2010) and de Haan (2001). Plungian (2010: 37) defines inference and assumption as [+PER][-DIR] evidence. This means that inference and assumption are the speaker's personal information based on his/her own sensory perception, or his/her personal knowledge of the world [+PER], which do not, however, concern the denoted state-of-affairs directly, making the evidence indirect [-DIR]. As de Haan (2001: 193-194) observes, inference and assumption thus display features of both direct and indirect evidence. For example, in (3), the speaker has not seen Manuel eat ([-DIR]) but may infer/assume this based on (contextually available or unavailable) personal information ([+PER]). The two definitions noted above differ in that Plungian makes a distinction between the two types of evidence (even though on the level of the two defining features they are identical), while de Haan (2001: 201) envisions the two information sources as slightly different manifestations of the same evidence type. For example, de Haan (2001: 202) considers the differences between the Kashaya inferential I and Inferential II as exceedingly minimal at best (see also Oswalt [1961: 243]). It is also interesting to note that for both Plungian and de Haan, inference and assumption represent the only "mixed" categories. This means that they are the only categories that cannot be defined by either [+/-PER/1st] or [+/-DIR] alone, while directness and/or personality alone suffice for defining all other evidence types. Furthermore, direct evidence could be defined sufficiently only as [+PER/1st] or [+DIR] and reported evidence as [-PER] or [-DIR], but both [+PER] and [-DIR] are needed to capture the essence of inference and assumption.

Inference and assumption are also rather directly related to epistemic modality (see, for example, Nuyts 1997, Cornillie 2009 and Jaakola 2021). Scholars who work on modality and evidentiality hold vastly different opinions on whether modality and evidentiality should be regarded either as one notion (with subtypes) or as separate notions. For example, Boye (2012) regards modality and evidentiality as one notion, while others, such as Cornillie (2009) and Narrog (2005), consider them as separate categories but do include evidentiality among the modal categories. Some other scholars exclude evidentials from the modal categories (for example, see Bybee et al. 1994; Aikhenvald 2004). Finally, some studies distinguish between different evidence types based on how closely they relate to modality. What is most relevant for the present analysis is that studies such as Palmer (2001) and van der Auwera and Plungian (1998) consider inferentiality to be a part of epistemic modality, while other categories, such as hearsay and experienced, are excluded from modality. Nuyts (2017: 70) has observed that inferentiality is a scalar notion and that the category is central to the speaker's deliberation process, which makes it essentially remarkably similar to epistemic modality; in both cases, the speaker considers the facts and draws conclusions from them. Nuyts (2017) also considers both epistemic modality and inferentials to be attitudinal categories. I fully agree with Nuyts (2017) as well as Jaakola (2021) concerning their observations that inferentials/assumptives are closer to epistemic modality than direct evidentials and hearsay. One of my objectives is to provide additional evidence for the subjective and scalar nature of the inferentials/assumptives such that they are in contrast to other evidential categories (see Section 4 for further discussion).

The results of the present study are based on a questionnaire administered in 2015 to the students in my university course titled ‘Introduction to general linguistics’. Their participation in responding to the questionnaire was completely voluntary (that is, it was not a part of the course requirements). A total of 94 students completed the questionnaire. All of them were native speakers of Finnish (seven people were bilingual). The students were granted 20 minutes to complete the task. The students had learnt what evidentiality is prior to the test, and we may, of course, speculate as to whether prior exposure to the notion of evidentiality affected the results. I would seriously doubt this for two main reasons. The first is that evidentiality is one of the notions that only a few students actually remember on the exam (questions concerning evidentiality are answered correctly only by approximately 10–15% of the students). The other reason I doubt that the students’ prior exposure to evidentiality affected their responses is that I do not think that knowing something about the notion of evidentiality on a general level affects the use of the adverbs in practice, particularly because the semantics/pragmatics of the studied adverbs was not discussed in any manner during the course. Some of the responses may have been less spontaneous, but my guess is that the overall effect is minimal. The questionnaire consisted of 32 slots to fill in (see the appendix), and the participants had the following choices (not in any specific order; the test itself did not have numbering)

1. *Näköjään* (INFER)
2. *Varmaan* (ASSUM)
3. Both (in which case the student could explain his/her choice)
4. Mark the choice with a question mark if you are not sure

When calculating the exact numbers of the occurrences for adverbs, the uncertain cases have been counted as instances of the adverb the participant has selected, even when this has been marked with a question mark. The few instances of ‘both’ have not been taken into account and the equally few empty slots have not been added to the overall numbers (see the appendix for exact numbers). One of the completed questionnaires was not considered because the student stated explicitly that s/he always uses *varmaan*, which means that the distinction studied was not relevant for that student. Hence, the final number of answers is 93 for each slot.

I decided to conduct this study by administering questionnaires because this enabled me to focus on exactly those features whose relevance I was analysing and which I expected to be relevant for the use of the discussed adverbs. This cannot be as clearly determined by corpora, and we cannot be sure of the exact function of the adverbs in corpora (for example, *varmaan* also has clear modal uses and *näköjään* can also express mirativity). Moreover, the described evidence forces the participants to make their choice based on it, and it can therefore be claimed that the choice is determined by the discussed features (even though all participants make the choice based on their personal preferences). The choice is, of course, also personal for the spontaneous uses of the adverbs that could be analysed from corpora, but in these cases, we can usually only speculate what the speaker’s motivation has been and what type of evidence the speaker has had. In other words, corpora reveal the use (and frequencies), but not the motivation. In questionnaires, we can more reliably guess as to why the speakers have used the adverb they have. Questionnaires also present problems. For example, the participants may merely want to complete the questionnaire as quickly as possible, which may adversely

affect the results. Another drawback is that some of the respondents may not read the instructions carefully. In general, however, the benefits of adopting questionnaires as an analytical method outnumber the drawbacks. This article thus examines the semantic factors that motivate the use of the analysed adverbs in Finnish, and the objectives of the analysis are more theoretical in nature. The question of how the evidentials are actually used in conversation would require a completely different type of research design (see Jaakola 2021 for a study of this type). An example of how the different cases have been analysed is illustrated below³:

1. *Kävelet Villen talon ohitse ja huomaat, että hänen ikkunassaan palaa valo. Kerrot tästä mukana olevalle kaverillesi:*

Ville on _____ kotona

1. *You walk pass Bill's house and you notice that his lights are on. You say to a friend who is walking with you:*

³ Both the original version in Finnish as well as an English translation are provided here and this practice is implemented in all the examples that are illustrated later in the article. The Finnish names (both of people and groups of people, such as sports teams) have been replaced by more appropriate English names in the translations. The numbers preceding the different cases indicate the number of the assigned task on the questionnaire.

Bill is _____ home.

After the participants gave their responses, the questionnaires were collected, and I manually counted the numbers of occurrences of each adverb and marked them for each slot. I did not apply statistical methods to analyse the results but in Section 4, where the results are discussed, only the numbers of both adverbs are provided for each feature discussed. As such, calculating and interpreting the results is straightforward because this only concerns the raw numbers and conclusions are drawn from them.

As noted above, the 32 slots in the questionnaire were based on different scenarios comprising different types of evidence. The different scenarios basically described different types of evidence that the participants had at their disposal when making a decision on which of the adverbs to use. The 32 slots varied according to the four features listed below (see Section 4 for a more detailed discussion):

1. Visual evidence (or the lack of it)
2. Other sensory evidence (or the lack of it)
3. Temporal relations between the evidence and the claim made
4. Evidence strength

The first of these refers to the speaker's claim being based on some directly observable evidence that is not directly related to the speaker's claim, while the second feature relates to whether the speaker has some other type of other sensory evidence available (without witnessing the coded event directly). The third feature means whether the speaker is making an inference based on prior, simultaneous or subsequent states-of-affairs. In other

words, the claim concerns something that the speaker thinks has happened (PRIOR), something that is occurring at the speech moment (SIMULTANEOUS) or something that is yet to happen (SUBSEQUENT). Finally, feature 4 concerns how strongly the described evidence (given after the number of the example) supports the claim that is made. The evidence strength is here considered as being strong when the claim that is made (on the reaction line) rather clearly follows from the evidence provided (if we act rationally). In contrast, the evidence strength is weak when the claim is only one of the potential explanations for the evidence that is described. This feature is clearly more subjective than the three previous features, but this feature is highly relevant and it is therefore included in the current study. All these features are defined more thoroughly in Section 4 where the results of the study are illustrated. The following is one example of how the data is interpreted:

29. Huomaat, että uusimman Satu Rannerenkaiden Rouvasta –elokuvan ikäraja onkin 16 vuotta odottamasi 12 vuoden sijaan. Juttelet tästä kaverisi kanssa:

Elokuvassa on _____ enemmän väkivaltaa kuin ennen.

Näköjään 14

Varmaan 79

29. You notice that the latest Tale of the Lady of the Bracelets is R-rated instead of PG13 that you expected. You talk about this with a friend:

The film _____ includes more violence than the previous films.

Näköjään 14

Varmaan 79

The features:

Visual Evidence: yes

Sensory evidence: yes

Temporal relations: simultaneous

Evidence strength: weak

The speaker's claim in (29) is based on visual evidence because the speaker sees that the film is R-rated (thus: visual evidence: yes). This also means that the speaker has sensory evidence for that claim (Sensory evidence: yes). The available evidence and the claim overlap temporally because the speaker makes a claim about a present state-of-affairs based on evidence s/he witnesses at the moment of speaking, and the example is thus viewed as 'simultaneous' for temporal relations.⁴ Lastly, the claim illustrated on the reaction line is considered here as one of the possible reasons for the higher age limit, whereas other possible reasons include some aspects of the film, such as foul language or sex. Another could be that the policy has in general become stricter, which makes the

⁴ One of the referees for the paper remarks that we cannot be certain whether the informant treats these simultaneously. This is, of course, merely a point, but three matters are relevant here. The first is that this is my judgement/evaluation that is used to make possible a more systematic comparison of different cases. The second is that I attempted to clarify this by using the present tense form of the verb. And finally, in this particular case, this is less relevant than in many other cases because we are dealing with a general truth that applies equally whenever it is referred to, which also means that in (29), it is currently present.

evidence strength weak (we cannot vouch strongly for the truth value of the claim made). All the 32 slots were analysed in the same manner as (29), for ‘yes’ and ‘no’ for features 1 and 2, strong versus weak for feature 4 and for the values, ‘prior’, ‘simultaneous’ and ‘subsequent’ for feature 3. The occurrences were calculated separately in Section 4; no correlations between them were taken into account.

The features were selected because they are all relevant to the differences between inference and assumption. The two first features are in line with the usual definitions of inference and assumption, and the two others were added to enable the analysis to evaluate the differences from a wider perspective. The three first features are rather objective in nature and can be easily determined, while feature 4 clearly involves subjectivity and can also be envisioned as a continuum. The present analysis considers only two values, strong and weak.

4 THE RESULTS

This section presents a detailed discussion of the semantics of the studied adverbs. The term ‘use’ below refers to the use of the adverbs in the questionnaire, that is, the semantic/pragmatic features that determine the use of the adverbs in the scenarios created for this study, not to the use of the adverbs in normal discourse. The four features below are discussed in the order that they appear below:

1. Visual evidence (or the lack of it)
2. Sensory evidence (or the lack of it)

3. Temporal relations between the evidence and the claim made

4. Evidence strength

All of the features are explained in more detail below in terms of concrete examples. The central theoretical implications of the study are discussed in Section 5. Below, I discuss only some of the 32 cases in more detail, but all analyses are found in the appendix. It is also important to note that the features are discussed independently of each other, even though there are correlations between them (for example, the presence of visual evidence often, yet not necessarily, correlates with strong evidence strength). In each sub-section, one of the features is discussed individually, the values for other features are not provided. All the numerical values to be discussed in the following sections are listed in Table 1:

	<i>Näköjään</i>	<i>Varmaan</i>
+Visual evidence	803 (45.4%)	964 (54.6%)
-Visual evidence	191 (15.8%)	1018 (84.2%)
+Sensory evidence	953 (41.0%)	1369 (59.0%)
-Sensory evidence	37 (5.7%)	614 (94.3%)
Prior	476 (56.9%)	361 (43.1%)
Simultaneous	388 (26.1%)	1100 (73.9%)
Subsequent	126 (19.4%)	525 (80.6%)
High evidence strength	450 (53.9%)	385 (46.1%)
Low evidence strength	540 (25.3%)	1594 (74.7%)

Table 1: Numerical values and percentages for the discussed features

4.1 *Visual evidence*

For purposes of this analysis, visual evidence means that the speaker is inferring/assuming a state-of-affairs to be valid based on something s/he has witnessed/witnesses visually without actually witnessing the event referred to itself. Visual and sensory evidence could be regarded as one evidence type but for the present analysis, these two evidence types are explicitly distinguished. Firstly, we gather much of our information concerning our surrounding world through visual evidence (provided naturally that we are not visually impaired), and visual evidence has become the unmarked/default value of evidentiality in many languages. Secondly, visual evidence is usually the most direct and reliable evidence we can have for a state-of-affairs; for example, seeing flames is better evidence of a fire than only smelling smoke. It is also exceedingly difficult to deny something we have witnessed visually. In addition, the special status of visual evidence is also manifested linguistically in that many languages have a dedicated visual evidential (for example, see Aikhenvald [2004: 2] for Tariana), while only a handful of languages have a specific marker for auditory evidence (for instance, see Jalava [2017] for Tundra Nenets), and no languages have a dedicated marker for evidence that is olfactory, gustatory, or tactile. Finally, we need to bear in mind, as observed above, that the adverb *näköjään* stems from an item referring to visual perception (*näkö* ‘sight’), and we may expect this to be manifested in the use of the adverb.

Examples of how visual evidence is defined in this paper are provided below (example 5 is used as an instance of a case that lacks visual evidence):

9. Olet ollut USA:ssa lomalla ja saat matkan jälkeen luottokorttilaskun. Summa on hiukan korkeampi kuin luulit, vaikka olet pitänyt hyvin tarkkaan kirjaa siitä, mitä olet luottokortilla maksanut. Toteat:

Dollarin kurssi on _____ vahvistunut jonkun verran.

9. You have been on holiday in the U.S., and you receive your credit card bill. The total amount is a bit higher than you expected, even though you have kept a good record of all your credit card purchases. You think:

The exchange rate of USD _____ has gone up a bit.

Näköjään 67

Varmaan 26

5. Odostat kaveriesi kanssa Liisaa saapuvaksi luoksesi, mutta hän on hiukan myöhässä. Pian kuulet ääntä rappukäytävästä. Kerrot tästä muille:

Nyt Liisa on _____ tulossa.

5. You and your friends are waiting for Lisa to arrive at your place, but she is late. Soon you hear some noise from the corridor. You tell about this to the others:

Now Lisa is _____ coming

Näköjään 18

Varmaan 75

In (9), the speaker bases his/her claim on seeing the credit card bill, that is, the speaker has visual evidence to infer that the exchange rate of the USD has risen. In (5), the speaker has auditory evidence without visual evidence. For these particular cases, the presence of visual evidence clearly increases the frequency of *näköjään*, while the lack of that evidence strongly favours the use of *varmaan*.

Based on the two examples above, we may claim that the use of the inferential and assumptive adverbs is predominantly determined by the presence of visual evidence versus the lack of it. In particular, the lack of visual evidence makes the assumptive adverb considerably more frequent; *varmaan* appeared 1,018 times when the visual evidence was lacking, while *näköjään* was used 191 in these cases, which means that *varmaan* was approximately 5 times more frequent. Moreover, the presence of visual evidence does not automatically trigger the use of *näköjään*; the two adverbs were rather equal in frequency when the speaker had visual evidence to support his/her claim. However, in this context, *varmaan* remained slightly more frequent; *näköjään* appeared 803 times and *varmaan* 964 times in these cases (cf. Aikhenvald [2004: 305, 307] who notes that in Tariana, the inferential is used whenever the speaker has visual evidence for his/her statement). This suggests that visual evidence is not automatically highly reliable. We may also note that events differ from each other in the type of evidence that is most reliable for them. For example, we can feel heat better than we can see it and smell gas

better than we see it. This aspect is not taken into account in this study as the main focus is solely on the presence versus absence of indirect visual (or other sensory) evidence.

4.2 *(Other) sensory evidence*

(Other) sensory evidence means whether the speaker who is making an inference/assumption has any type of sensory evidence other than visual (comprising auditory, olfactory, gustatory and tactile) at his/her disposal. Let us consider the following two examples:

20. *Ystäväsi on tehnyt sinulle hienon aterian. Maistat ruokaa ja huomaat, että se polttaa suussa melkoisesti. Kerrot tästä ystävällesi:*

Tässä ruoassa on _____ aika paljon chiliä.

20. *Your friend has prepared a nice meal for you. You taste the food, and you notice a strong burning sensation in your mouth. You say to your friend:*

This food _____ has quite a bit of chili in it.

Näköjään 62

Varmaan 31

2. Tiedät, että Liisan työpäivä alkaa aina kello 8.30 ja hän on aina ajoissa. Kaverisi soittaa sinulle kello 8.56 ja kysyy, tiedätkö, missä Liisa on. Vastat:

Liisa on _____ töissä

2. You know that Lisa's working day always starts at 8.30 and that she is always on time in her office. Your friend calls you at 8.56 asking about the whereabouts of Lisa. You respond:

Lisa is _____ at work

Näköjään 2

Varmaan 91

The speaker in (20) has sensory (that is, gustatory) evidence for his/her claim because s/he tastes the chili in the food. By contrast, the speaker in (2) bases his/her answer on his/her general knowledge of the world. The speaker does not, for example, witness Lisa's coat missing from a hanger or see Lisa's car parked in front of her office. In other words, for the speaker in (2), sensory evidence is lacking. Example (2) could perhaps be regarded as the paradigm case of assumption, which is also manifested in the highly frequent use of the assumptive adverb.

The presence versus lack of sensory evidence has been included in the discussion here because many previous accounts (Aikhenvald [2004: 3]; Plungian [2010: 37]) distinguish between inference and assumption based on (the presence or lack of) sensory

evidence. As the two examples above confirm, indeed this feature makes a vitally important contribution, which is especially evident in the latter case⁵. This is not confined to this example only, but in general, a lack of sensory evidence strongly favoured the use of *varmaan* and the adverb was used 614 times when other sensory evidence was lacking, while *näköjään* appeared only 37 times.

As mentioned above, the prototype of inference is usually defined according to where the speaker makes a claim based on some type of concrete sensory evidence, such as the result of an event. We could thus predict that the availability of sensory evidence strongly favours the use of *näköjään*. Yet according to the questionnaire results, this prediction does not hold, as *näköjään* appeared 953 times when sensory evidence was available, while *varmaan* was used 1,369 times. The difference between the adverbs is clearly less evident than for the lack of sensory evidence, but the assumptive adverb nevertheless also remains more frequent in cases that could be regarded as the prototype of inference. Thus, the presence of sensory evidence does not automatically motivate the use of the inferential adverb, but the lack of sensory evidence strongly favours the use of the assumptive adverb.

4.3 *Temporal relations between the evidence and the claim made*

In addition to the evidence itself, the temporal relations vary between the evidence and the claim made. This analysis distinguishes three different types based on whether the claim made (what is stated on the reaction line) temporally precedes, follows, or

⁵ One of the anonymous referees for an earlier submission stated that *näköjään* would be possible when the speaker takes a look at his/her watch and notices that it would be time for Lisa to be at work, and I agree with this.

temporally overlaps the evidence (described after the number and before the reaction line). The types are labelled here as prior, simultaneous and subsequent. The following are examples of each type:

Simultaneous:

17. *Ystäväsi Liisa ei ole tullut töihin, eikä ole ilmoittanut sinulle tästä mitään. Liisa on luotettava työntekijä eikä jäisi kotiin muuten vaan. Juttelette tästä kollegoiden kanssa:*

Liisa on _____ kipeä

17. *Your friend Lisa has not arrived at work and has not informed you of this. Lisa is a dependable employee and would not stay home without a good reason. You talk about this with colleagues:*

Lisa is _____ sick

Näköjään 12

Varmaan 81

Prior:

18. *Kämppekaverisi on jättänyt illalla tietokoneensa asuntonne keittiön pöydälle illalla. Aamulla huomaat koneen puuttuvan. Mietit itseksesi:*

Ville on _____ lähtenyt jo yliopistolle.

18. *Your roommate has left his laptop on the kitchen table of your flat in the evening. In the morning you notice that the laptop is missing. You think to yourself:*

Bill has _____ already gone to the university.

Näköjään 56

Varmaan 37

Subsequent:

30. *Luet netistä, että seuraava ALT:n konferenssi järjestetään Australiassa joulukuussa 2017. Tiedät, että kollegasi Jaakko haluaa mennä konferenssiin, koska käy siellä joka kerta, mutta tiedät myös, että hän kärsii aina todella pahasta jet lagista. Mietitte tätä toisen kollegan kanssa:*

Jaakko on _____ seuraavassa ALT:ssa ihan väsynyt koko konferenssin ajan.

30. *You read on the Internet that the next ALT meeting will be held in Australia in December 2017. You know that your colleague Jake wants to go the conference because he has attended each meeting. You also know that he always suffers from severe jetlag. You discuss this with another colleague*

Jake will _____ be totally tired during the next ALT

Näköjään 4

Varmaan 89

In (17), we make a statement regarding something that temporally overlaps our evidence. In other words, we think Lisa is sick at the moment of speech, which explains her absence from work. In the next example, (18), the state-of-affairs we are referring to (Bill's leaving for the university) has occurred prior to the speech event and the time when we witness the computer missing. Finally, in (30), we make a prediction concerning the future based on the currently available evidence that we have just learnt. In this case, the state-of-affairs we are referring to temporally follows the evidence, and the value for (30) is thus 'subsequent'. The notions selected here display some similarities with the notion of speech time and evidence acquisition time (EAT) presented by Smirnova (2013). For Smirnova, the speech time refers to the time when the speaker refers to the given state-of-affairs, while EAT refers to the moment when the speaker learnt about the event. Koev (2017) uses the term learning time for EAT. Smirnova and Koev are both more concerned with how the acquisition of evidence relates to the speech time, while the focus of this analysis is on how the evidence temporally relates to the claim that is being made. Speech time is constant in this study, as is the availability of the evidence, and these notions are thus not relevant.

The tripartite division illustrated briefly above is clearly relevant to the use of the adverbs being investigated. Overall, the inferential adverb occurred 388 times for 'simultaneous', while the assumptive *varmaan* was used 1,100 times. The frequencies changed radically for 'prior', where *näköjään* was used 476 times, and *varmaan* 361

times. Finally, *varmaan* was approximately 4 times more frequent for ‘subsequent’; *näköjään* appeared 126 times and *varmaan* 525 times in these cases.

Of the three types, ‘prior’ can perhaps be regarded as the prototype of inference; we witness a state-of-affairs and we try to guess/infer the reason for this. This is the only instance in which *näköjään* is more frequent than *varmaan*, even though the differences are not very significant. ‘Subsequent’, in turn, clearly favours *varmaan*, which results in having been used about four times more frequently than *näköjään*. This is perhaps also expected because for future events, we do not have sensory evidence and our claims cannot be based on any type of result for future events, which makes general knowledge the only way to assume what may occur. For ‘subsequent’, we attempt to guess what may follow, while in the two other cases, we try to find a reason for what has happened or is happening. Finally, for ‘simultaneous’, *varmaan* was approximately three times more frequent than *näköjään*. This is perhaps the least expected ratio of the three cases discussed here. As such, ‘simultaneous’ and ‘prior’ resemble each other in that we witness something (a result, or something that is currently happening), and we make an inference/assumption based on this. In principle, making an inference/assumption based on the present or the past are rather similar processes, but what might be relevant is that with ‘prior’, we have a result for our inference/assumption, which may better exclude some possible explanations. On the other hand, when a state-of-affairs is on-going, we cannot be certain of its outcome, which may render multiple explanations possible. This is directly related to evidence strength that is discussed in the following section.

4.4 *Evidence strength*

The last feature discussed in this paper is evidence strength (this term has been adopted from Matthewson 2020; this term is also what Waldie (2012) referred to as perspectival status). For purposes of the present analysis, this feature means how strongly the evidence available supports the claim made on the reaction line. In more concrete terms, this refers to whether the claim is (clearly) the most logical explanation for the presented evidence, or whether it is only one of the possible explanations, and we cannot rationally exclude other possible explanations. In the first case, the evidence strength is strong, while in the latter case, it is weak. This is, of course, a highly subjective notion because we all evaluate the strength of evidence differently. There are rather clear examples of both strong and weak evidence strength, but many cases cannot to be classified as easily. It is likewise in order to note that evidence strength is best envisioned as a continuum ranging from very strong to very weak, but in this paper, only two values are distinguished, weak and strong.

Although evidence strength cannot be objectively measured, there are rather unarguable examples of both strong and weak evidence. For example, if we see someone coming in soaking wet, we have strong evidence for the fact that it is raining (also see Matthewson 2020: 99 and von Fintel and Gilles 2010: 372 for a similar remark). Other explanations can usually be ruled out on rational grounds, such as involving someone having just gone for a swim fully clothed, or an explanation that a passer-by poured a bucket of water on the person entering, etc. That said, if we see John buying ice-cream, we only have weak evidence for him possibly celebrating some aspect of his life, such as his favourite team having won the Stanley cup, or that John has just bought a new car (which would be possible explanations if John often buys ice-cream to celebrate something, but we have no real evidence to vouch strongly for either of the proposed explanations). Between these two extremes, there are numerous cases where evidence

strength is far more difficult to determine. For this analysis, the evaluation of evidence strength is based on my own subjective evaluations, but I think they at least closely resemble judgements made by anyone else. The notion of evidence strength (as understood here) also displays similarities with Nedjalkov's (1988: 500, as cited in Nikolaeva 1999) division of trivial versus non-trivial results; a trivial result is predictable from the situation, while a non-trivial is not and it may have multiple explanations. As regards the speaker's choice of evidentials, evidence strength is manifested in how strongly the speaker can vouch for the truth value of his/her claims; the stronger the evidence, the more strongly the speaker can vouch for its truth value and exclude other possible explanations. Three different examples of evidence strength are presented below:

26. Olet toimistossasi, josta ei näe ulos, etkä ole ollut ulkona kahteen tuntiin. Kollegasi tulee viereiseen huoneeseen hiukset ja takki märkinä. Sanot hänelle:

Siellä_____sataa

26. You are in your office without a view to the outside world, and you haven't been out for two hours. Your colleague arrives at the next office all wet. You say to him/her

It's_____raining outside.

Näköjään 89

Varmaan 4

25. Ystäväsi tulee töihin aina raitiovaunulla. Huomaat, kuinka hän kaartaakin yhtäkkiä työpaikkanne pihaan autolla. Puhutte tästä toisen työkaverin kanssa:

Raitiovaununkuljettajat ovat _____ lakossa.

25. Your friend always comes to work by tram. One day, however, you notice that s/he arrives by car. You talk about this with another colleague:

The tram drivers are _____ on strike

Näköjään 20

Varmaan 73

15. Olet kaveriesi kanssa pubissa ja huomaat, että Kalle on iloisella päällä ja juo olutta ripeästi. Toteat:

Kallella on _____ aamulla vaikeuksia päästä töihin.

15. You are in a pub with some friends and you notice that Carl is happy and is drinking beer after beer. You think:

Carl will _____ have problems getting in time to work in the morning

Näköjään 6

Varmaan 87

The evidence in (26) is strong and it is highly likely that our friend is wet because it has rained outside (also see above). This is also manifested in the use of the adverbs. Example (25), in turn, is in many respects the opposite of (26), and the friend's arrival by car is only one potential, and not by any means the most logical explanation, let alone the only possible one. For example, the friend may be on his/her way to the countryside or s/he will take the car to the annual maintenance after work, etc. *Näköjään* appeared 20 times in this case, while there were 73 occurrences of *varmaan*. Finally, in (15), a very logical assumption is that Carl will encounter problems getting to work because he has consumed too much beer, but it is equally possible that he is never hungover afterwards, he has a day off, he intends to stop drinking soon, which would all invalidate our claim. Furthermore, in this case, the distribution of the adverbs provides support for the weak strength of the evidence.

The strength of evidence can be motivated in basically two ways. Firstly, the available evidence itself may allow multiple explanations. An example is illustrated by a scenario where a co-worker has not come to work (which is the evidence). This may have an array of different reasons, such as the person being sick or working at home today, or s/he is stuck in a traffic jam, etc. All of these are, in principle, equally likely scenarios, and we therefore rather avoid vouching too strongly for any of them. Nonetheless, in (25), it is highly likely that the reason for our colleague being wet is that it has rained outside. The second reason for motivating the strength of evidence is the cause-effect relation between the evidence and the statement made may be more complicated and, for example, involve activity by other people, which we cannot assume responsibility for (as

Matthewson (2020) puts it ‘how many reasoning steps are involved’). An example is provided by a scenario involving a colleague who has promised to shave his beard if his dissertation is awarded the grade ‘with distinction’. His receiving this grade depends on the PhD committee and furthermore, we cannot be certain as to whether the colleague actually delivers what he has promised. In contrast, the cause-effect relation is very direct for the scenario of the colleague being wet, and we can infer this to follow from rain.

As the illustration of the examples above shows, evidence strength does have consequences for the use of the examined adverbs. Overall, *näköjään* was used 450 times and *varmaan* 385 in those cases, where evidence strength is strong. By comparison, *näköjään* was used 540 times and *varmaan* 1594 times for weak evidence strength. We may thus conclude that evidence strength affects the use of inferential and assumptive adverbs most evidently for weak evidence strength, which is interestingly in line with the more frequent use of *varmaan* in cases where we do not have sensory evidence for our claim. On the other hand, the use of both adverbs is more or less equally frequent (with minor differences) for strong evidence strength. Consequently, the effects of evidence strength are less drastic than those of the other three features. It is important to note that on a more general level, the effects may be considerably more significant, but the likelihood is evaluated as a part of the other features. For instance, we can exclude additional explanations based on a visible result than by making a prediction about the future.

5 DISCUSSION

This section presents a discussion of the results of this study and their relevance to our understanding of inference and assumption as well as evidentiality in more general terms. I begin with a brief summary of the results presented in the previous section, which will be followed by a discussion of how the findings of this study affect our understanding of inference and assumption. Lastly, the central theoretical implications of this study are examined for our understanding of evidentiality.

As the discussion above has shown, the most important single feature that determines the use of the discussed adverbs is the lack of sensory evidence that made the assumptive adverb approximately 16 times more frequent than the inferential adverb. The lack of visual evidence also made a similar contribution, albeit not as drastic. These findings are in line with the typical definitions suggested for inference and assumption (such as Aikenvald (2004) and Plungian (2010) noted above), even though the use of the assumptive adverb was not 100% in these cases, either. It is also important to mention that this applied only to the *lack* of sensory/visual evidence. The mere presence of sensory/visual evidence did not affect the frequency of the inferential adverb, which suggests that the proposed definitions do not manage to capture the essence of inference and assumption. In particular, these definitions are not sufficient to define inference. In this context, it is important to bear in mind that, as noted above, the inferential adverb *näköjään* has its origin in the word *näkö* ‘sight’, which is clearly reflected in how the adverb is used, although it is important to state that the presence of visual evidence does not automatically trigger the use of this adverb.

Sensory evidence is not the only feature that affects the use of adverbs. In addition, temporal relations are relevant between the evidence and the claim being made. Here, the effects are most visible when the claim concerns the future, that is, when we predict what may happen based on the available evidence. In these contexts, *varmaan* was clearly more frequent than *näköjään*. We cannot obtain any type of sensory evidence for future events, which is probably relevant here. Finally, the speaker's choice is influenced by the evidence strength; the higher the number of possible explanations for our evidence (and the weaker the evidence strength), the more frequent the assumptive adverb becomes. This feature is not directly related to sensory evidence because in many cases, something we have sensory evidence for, particularly when we do not have visual evidence for our claim, may have multiple explanations (for example, see [25] above). This feature is also considerably more subjective than the other features, and an explanation that is the most likely one for one speaker may not be valid for someone else, even though in (26), most of us would probably consider rain to be a highly plausible reason for someone being wet. It is interesting that strong evidence strength appears to favour *näköjään* to a greater extent than the mere presence of sensory evidence.

The brief discussion above suggests that the typical definitions of inference and assumption do not accurately capture the nature of these evidence types, at least not for Finnish. The availability of sensory evidence does not cause the inferential adverb to be more frequent, let alone automatically trigger its use, whereas the assumptive adverb also remains more frequent in these cases. On the other hand, the lack of sensory evidence strongly correlates with the use of the assumptive adverb. What is common to all of the examined features is that the use of evidentials correlates with the reliability/certainty of evidence. We may thus say that the less reliable the available evidence is, based on any

of the examined features, the more probable/frequent the use of *varmaan* becomes, and only with highly reliable (indirect) evidence (based on any of the examined features) do the speakers use *näköjään*. The availability of sensory evidence is thus only one of the features that contribute to this (see Matthewson 2020: 109). In light of this, it is understandable that, for example, de Haan (2001) has grouped these evidence types together. A similar position is adopted by Nuyts (2017), and Willett (1988), while, Aikhenvald (2004) makes an explicit distinction between these two evidence types. The data presented in this study attest to an explicit distinction, yet with some modifications. Consequently, the following definitions of inference and assumption are proposed here (bearing in mind that these are only based on Finnish data):

Inference

1. A observes X
2. A believes (based on his/her previous experiences of the world) that X is related to Y (and not non-Y, V, W)
3. A informs B of Y

Assumption

1. A observes X
2. A thinks (based on his/her previous experiences of the world) that it is possible that X is related to Y (but cannot exclude non-Y, V or W)
3. A informs B of Y

The two definitions above are identical for features 1 and 3 but they can be differentiated based on feature 2. For inference, the speaker adamantly believes that his/her reasoning is correct, and the speaker can vouch for the truth value of his/her claim more strongly (see also Matthewson 2020: 101). The speaker can exclude other possible explanations based on the nature of evidence and his/her evaluation of it. By comparison, in the case of assumption, the speaker thinks that his/her reasoning best captures the reason for the observed state-of-affairs but cannot exclude other possible explanations and cannot vouch for the truth value of his/her claim very strongly. In the definitions provided above, the nature of the indirect evidence is intentionally not specified in any more detail. This follows because the point of the proposed definitions is to apply generally to the differences between inference and assumption. As the discussion above has shown, the main difference between the two evidentiality types is found in the less reliable nature of the evidence for assumption regardless of its motivation. Moreover, the choice is always subjective and different speakers evaluate reliability in different ways, because of which words *believe* and *think* are used in the definitions.

A brief comparison to other languages is intriguing in this respect. Smirnova (2021: 558) observes that in Bulgarian, the directness of evidence is not sufficient to select between evidential and non-evidential forms (which at least correspond to some extent to Finnish inferential and assumptive adverbs), which is line with the findings of the current study. However, Smirnova (2021: 539) states that in its inferential use, the evidential suffix is confined to cases in which the inference is based on observable results, which deviates from the results of my study. An interesting observation is made by Friedman (1986: 185-186) who states: ‘it is the speaker’s attitude toward the reliability of the truth-value of information, and not the evidence on which it is based, that is crucial in

determining the choice of the form.’. This provides strong support for the claim made in the present study if we consider that this applies only to inferential and assumptive adverbs in Finnish. It is also interesting that Faller (2002: 70) observes for Cuzco Quechua that ‘inference from results will always be preferred over inference by reasoning’. For Finnish, in turn, the results of the present study suggest that the speakers rather select the less direct evidential for weak evidence strength; the use of the assumptive adverb is twice as frequent than the use of the inferential adverb overall.⁶ However, we should, however, mention that Faller was not analysing the use of similar adverbs, but rather studied evidentiality from a wider perspective. Nevertheless, the differences between Finnish, Bulgarian and Cuzco Quechua suggest that additional research is needed to determine the characteristic features of inference and assumption across languages. It is my hope that my study paves the way for these studies.

The discussion in this article is relevant to our understanding of indirect evidence more generally. It appears that when we have only indirect evidence for our claim, we often select a less direct evidential. There may be many reasons for this. One reason may be that we wish to avoid assuming excessive responsibility for our claims whenever we lack direct evidence and thus harbour doubts concerning our interpretation of the available evidence (As Matthewson 2020: 101 states, it is possible that evidentials may code speaker certainty). In addition, this minimises the risk of violating the co-operative principle (see also de Haan [2001: 218]), and may explain why *varmaan* was two times more frequent than *näköjään*. Downplaying the reliability of our evidence seems like a

⁶ A quick Google search yields approximately 45 million hits for *varmaan*, and around 8 million hits for *näköjään* (including *näemmä* and *nähtävästi*, which are the practically full synonyms of *näköjään*). This serves as additional support for this claim, even though these numbers need to be checked more carefully before making any actual claims.

less severe violation of Grice's maxims than giving the impression that our evidence is more reliable than it actually is (however, see Smirnova 2021: 536 for a somewhat different remark on this). This may be another explanation as to why it is easier to make generalisations for the use of the assumptive adverb than to predict when the inferential adverb is used; whenever reliable evidence is lacking, the speakers appear to select the assumptive adverb. This may relate to Faller's (2002) notion of the best possible evidence; in case we lack any type of reliable evidence, the assumption is the best evidence available to us and *varmaan* is used. Smirnova (2021: 546) refers to a relation between the perceived strength of the argument and the choice of (non-)evidential forms in Bulgarian; the evidential (corresponding rather closely to the Finnish assumptive adverb) is used when the conclusions based on the available evidence are weaker.

The present study is relevant to the discussion of differences/similarities between evidentiality and modality (see also, for example, Squartini 2008 and Cornillie 2009). The definitions of these two notions are usually based on how the information source is used as the basis for the speaker's utterance; evidentials code the information source, while modals code the speaker's subjective evaluation of the likelihood of the denoted state-of-affairs. However, as the discussion above has shown, this type of dichotomous distinction between evidentiality and modality is not plausible if we consider inference and assumption. Firstly, as has also been noted by, for example, Nuyts (2017) and van der Auwera and Plungian (1998), evidentiality is not a homogeneous notion but especially inference (and assumption) are close to epistemic modality (see also Nuyts 2017: 80). The findings of this analysis are clearly in line with this because the responses to the questionnaire reveal that speakers do not select the appropriate adverbs automatically based on the available evidence, but their interpretation of the available evidence is highly

relevant to this (see also Nuyts 2017: 69). Furthermore, Jaakola (2021: 261, 277) notes for the Finnish verb+*kseni* adverbs that the choice is determined by the speaker's subjective choice. In this respect, inferentials (and assumptives) are clearly distinct from hearsay and experienced evidentials (see also Palmer 2001), and, for example, van der Auwera and Plungian (1998) include inferentiality into epistemic modality, but exclude all other evidential categories. The findings of this paper lend more support to the highly modal/subjective nature of inference and assumption. Secondly, closely related to the previous point, evidentiality can be viewed as a scalar phenomenon, which has also been reported by Nuyts (2017: 69) who states: 'In other words, it involves degrees of confidence with which the speaker infers the hypothetical state of affairs from the evidence'. The results of this questionnaire study lend more support to this position: the presented scenarios display evident differences according to which of the adverbs is selected. This is determined by how strongly speakers can vouch for the truth value of their statements in light of the facts/evidence at his/her disposal (see also Nuyts 2017: 70, and Smirnova 2021: 534 for a similar remark on Bulgarian). According to Nuyts' terminology, inferentiality and epistemic modality constitute attitudinal categories.

In this context, we may further note that the use of *varmaan* is also possible when the speaker makes a claim without any specific evidence (that s/he could name), while the use of *näköjään* always implies that the speaker has some evidence for his/her claim (see also Barnes [1984] for a similar claim on Tuyuca). For example, we may say *huomenna varmaan sataa* ('it is probably going to rain tomorrow') as a general statement, which is based completely on our subjective evaluation. In comparison, if we say *huomenna näköjään sataa* ('I infer it is going to rain tomorrow'), this implies that we base our claim on some type of more specific evidence, such as we may see dark clouds

approaching, or we just watched a weather forecast. Speakers can therefore name the source of information for their statements with *näköjään* but not necessarily with *varmaan*. We may thus conclude that *näköjään* is the more evidential of the two adverbs because its use is possible only if we have some type of evidence available, while *varmaan* is more modal in nature. This is relevant to our understanding of these adverbs in Finnish, and it would be interesting to study whether similar cases are also attested in other languages that make a clear distinction between inference and assumption (see also Hakulinen 2004: §667, 1000, 1601 where the adverbs *näköjään* and *varmaan* are considered as not only evidential but also as modal adverbs).

The present discussion is also relevant to the pragmatics of evidentiality. Firstly, the effects of pragmatics are visible in the fact that neither adverb received a 100% ratio, but the best quota was 97.8% (91/93), that is, the choice is never determined directly and solely by the type of evidence. With direct evidentials, similar massive variation seems less likely, and this is due to the natural reason that languages usually only have one direct evidential, but also because direct evidence is more objective in nature. Secondly, pragmatics contributes to the use of the adverbs in that by selecting the appropriate evidential, we may vouch more strongly or weakly for the truth value of our statements. And thirdly, closely related to the previous point, the nature of the available evidence determines the use of the adverbs in different situations, and different people interpret the available evidence in different ways, which is more visible for indirect evidence.

Finally, the results of this study provide further evidence for the fact that evidentiality does not only concern a speaker's source of information, but other aspects also contribute to the choice of appropriate evidentials. For example, Evans et al. (2017) have demonstrated that in languages such as Andoke and Kogi, the differences between

shared and private knowledge contribute to the use of evidentials. As regards inference and assumption, the subjective evaluation of the speaker is central, and aspects such as intersubjectivity play a less important role. The more possible explanations allowed by a given piece of evidence, the more important is the speaker's evaluation. This is also manifested in the proposed definitions (see above) for which the words *believe* and *think* were selected on purpose. In other words, the speaker can rather freely select which of the two adverbs that speaker wishes to use, while with other evidence types, this is determined more directly by the nature of the evidence. For example, the speaker uses visual evidentials for visual evidence and hearsay evidentials for hearsay evidence, but for inference and assumption, the speaker may more freely select the evidential s/he finds more appropriate without, for example, violating any of Grice's maxims (see also Smirnova [2021: 536] for a remark on evidentials and Grice's maxims). Consequently, inference and assumption also display modal traits, as discussed in length above, and the speakers base their selection of one or the other on how reliable they find the given evidence.

6 SUMMARY

The notions of inference and assumption presented in this study were discussed in light of four features which were all demonstrated to have consequences for the use of two adverbs examined. The lack of sensory and/or visual evidence most clearly favours the use of the assumptive adverb, but the mere presence of sensory/visual evidence does not automatically trigger the use of the inferential adverb, or even make it more frequent in

all cases. The temporal relations determine the use of the adverbs most clearly when the claim follows the available evidence, that is, when we make an assumption about the future. Finally, weak evidence strength renders the assumptive adverb more frequent.

A brief summary of the main results of this study is that it is easier to present generalisations for the use of the assumptive adverb than for the inferential adverb. One reason for this may be that we rather avoid responsibility than take it, and [+PER][-DIR] is always somewhat uncertain and as a consequence, we opt for the less certain adverb. It is also interesting that although the described scenarios include cases that correspond directly to the prototypes of inference and assumption, the use of either adverb is never 100%. This underlines the different, subjective nature of the two evidence types; the speaker's personal choice always contributes to which adverb is used, while in other contexts, the choice is more directly determined by the type of evidence.

This article has demonstrated that certain generalisations can be drawn, but this study is merely the initial step towards a better understanding of these notions. It is therefore my hope that there will be additional studies on similar markers in different languages that may code inference and assumption in somewhat different ways. It would be especially interesting to examine more closely the languages with obligatory/grammaticalised evidentiality and with distinct markers for assumption and inference to determine whether or not optional versus obligatory marking somehow affects the coding of assumption and inference. Moreover, it would be interesting to analyse the correlations between the examined features in more detail, and one means would be to observe whether the presence of visual evidence (or in other respect, strong evidence) is more important where these two would favour different adverbs. An illustration of this is provided by example (25), where the speaker has visual evidence,

but it appears that the choice is nevertheless determined primarily by the weak evidence strength.

Appendix: the original questionnaire with translations into English.

The numbers indicate the occurrences of each adverb given by the participants. The acronyms are as follows, and + indicate the presence of the feature in question, while - indicates the lack of it:

VE+ = Visual evidence

VE- = No visual evidence (but sensory evidence)

SE+ = sensory evidence

SE- = no sensory evidence

PRIOR = the speaker makes a claim about something that has happened prior to the moment of speech.

SIM(ultaneous) = the claim made and the evidence temporally overlap, the speaker is making a claim on something happening as we speak

SUBS(sequent) = the speaker is making a claim based on present evidence about what is going to happen

Strong = Strong evidence strength

Weak = Weak evidence strength

1. *Kävelet Villen talon ohitse ja huomaat, että hänen ikkunassaan palaa valo. Kerrot tästä mukana olevalle kaverillesi:*

Ville on _____ kotona

1. You walk past Bill's house and you notice that the lights are on. You say to your another friend:

Bill is _____ home

Näköjään 68

Varmaan 25

VE+; SE+; SIM; Strong

2. Tiedät, että Liisan työpäivä alkaa aina kello 8.30 ja hän on aina ajoissa. Kaverisi soittaa sinulle kello 8.56 ja kysyy, tiedätkö, missä Liisa on. Vastaat:

Liisa on _____ töissä

2. You know that Lisa's working day always starts at 8.30 and that she is always on time in her office. Your friend calls you at 8.56 asking about the whereabouts of Lisa. You respond:

Lisa is _____ at work

Näköjään 2

Varmaan 91

VE-; SE-; SIM; Weak

3. Olet järjestämässä juhlia ja kaikki muut paitsi Kalle ovat saapuneet jo. Kalle on usein töissä pitkään ja siksi soitat Kallen työpuhelimeen, mutta hän ei vastaa. Kerrot tästä muille:

Kalle on _____ matkalla tänne jo.

3. You are organizing a party and all except Carl have arrived already. Carl usually works late and therefore you call him in his office, but he does not pick up. You tell the others:

Carl is _____ on his way here already.

Näköjään 4 Varmaan 89

VE-; SE+; SIM; Weak

4. Haluat lämmittää itsellesi ja kaverillesi lounaaksi kaksi päivää sitten tekemääsi makaronilaatikkaa. Otat laatikon jääkaapista ja huomaat, että se haisee hiukan erikoiselta. Kerrot tästä kaverillesi:

Ei syödäkään tätä, tämä on _____ pilaantunutta.

4. You want to warm up some macaroni casserole that you made two days ago for yourself and your friend. You take the casserole out of the fridge and you notice that it smells a bit funny. You say to your friend:

Let's not eat this, this is _____ not good anymore

Näköjään 44 Varmaan 48 Both 1

VE-; SE+; SIM; Strong

5. Odotat kaveriesi kanssa Liisaa saapuvaksi luoksesi, mutta hän on hiukan myöhässä.

Pian kuulet ääntä rappukäytävästä. Kerrot tästä muille:

Nyt Liisa on _____ tulossa.

5. You and your friends are waiting for Lisa to arrive at your place, but she is late. Soon you hear some noise from the corridor. You tell about this to the others:

Now Lisa is _____ coming

Näköjään 18 Varmaan 74 Empty 1

VE-; SE+; SIM; Weak

6. Kävelet ulkona koirasi ja ystäväsi kanssa kauniina kesäiltana ja haistat sytytysnesteen hajun. Toteat:

Joku _____ grillaa jossain.

6. You are walking your dog with your friend on a nice summer evening and you smell charcoal lighter fluid. You say:

Someone is _____ having a barbecue.

Näköjään 15 Varmaan 77 Empty 1

VE-; SE+; SIM; Weak

7. Olet juhlissa Kallen kanssa ja huomaat, että Kallen kengät eivät olekaan eteisessä, mietit:

Kalle on _____ lähtenyt kotiin jo.

7. You are at a party with Carl and you notice that his shoes are missing from the hallway, you think to yourself:

Carl has _____ gone home already

Näköjään 56

Varmaan 37

VE+; SE+; PRIOR; Weak

8. Olet menossa kaverisi kanssa uimarannalle yhtenä kevään ensimmäisistä lämpimistä päivistä. Kerrot tästä toiselle kaverillesi ja mietit, voitko mennä uimaan vielä:

Vesi on siellä _____ aika kylmää vielä.

8. You are on your way to the beach with your friend on one of the first warm days of the spring. You tell about this to another friend and think whether you can go swimming:

The water there is _____ still pretty cold.

Näköjään 2

Varmaan 91

VE-; SE-; SIM; Strong

9. Olet ollut USA:ssa lomalla ja saat matkan jälkeen luottokorttilaskun. Summa on hiukan korkeampi kuin luulit, vaikka olet pitänyt hyvin tarkkaan kirjaa siitä, mitä olet luottokortilla maksanut.

Dollarin kurssi on _____ vahvistunut jonkun verran.

9. *You have been on holidays in the U.S., and you receive your credit card bill. The total amount is a bit higher than you expected, even though you have kept good record of all your credit card purchases. You think:*

The exchange rate of USD_____ has gone up a bit.

Näköjään 67

Varmaan 26

VE+; SE+; PRIOR; Weak

10. *Yksi kollegoistasi on luvannut tarjota kaikille kakkua ja kahvia, kunhan saa pitkään tekeillä olleen kirjansa valmiiksi. Huomaat kopiohuoneessa käydessäsi, että tuo kirja odottaa kollegasi postilaatikossa. Kerrot tästä toiselle kollegalle:*

Me saadaan _____ tänään kakkukahvit.

10. *One of your colleagues has promised to give everyone coffee and cake, when his/her latest book is finished. In the copy room, you spot a copy of the book in your colleague's mailbox. You say to another colleague:*

We will _____ have coffee and cake today.

Näköjään 48

Varmaan 45

VE+; SE+;; SUBS; Weak

13. Olet ollut kaverisi luona illallisella ja huomaat aamulla, että sinulla on ihottumaa. Tiedät, että sitä tulee, jos syöt yhtään tomaattia. Et kuitenkaan muista syöneesi tomaattia.

Soitat kaverillesi:

Mä olen _____ syönyt illalla tomaattia.

13. You had dinner at a friend's, and in the morning you notice that you have a rash, which you get if you eat any tomato. However, you don't remember eating any tomato.

You call a friend:

I have _____ eaten some tomato yesterday.

Näköjään 35

Varmaan 58

VE+; SE+; PRIOR; Weak

14. Saavut kaverisi juhliin ja huomaat, että tarjolla on kauhea määrä suklaata, jota et vain pysty vastustamaan ja tiedät, että syöt sitä niin kauan, että sinulla on paha olo.

Toteat tämän kaverillesi:

Mä olen _____ pian ihan ähkyssä.

14. You arrive at a party and you notice that they are serving lots of chocolate, which you simply cannot resist, and you will eat it until you get nauseous. You say to your friend:

I will _____ be totally stuffed soon.

Näköjään 14

Varmaan 79

VE-; SE-; SUBS; Weak

15. Olet kaveriesi kanssa pubissa ja huomaat, että Kalle on iloisella päällä ja juo olutta ripeästi. Toteat:

Kallella on _____ aamulla vaikeuksia päästä töihin.

15. You are in a pub with some friends and you notice that Carl is happy and is drinking beer after beer. You think:

Carl will _____ have some problems getting in time to work in the morning

Näköjään 6

Varmaan 87

VE+; SE+; SUBS; Weak

16. Katsot pihalle ja huomaat, että kadut ovat märät. Pohdiskelet:

Ulkona on _____ satanut.

16. You look out and notice that the streets are wet. You think:

It has _____ rained outside

Näköjään 36

Varmaan 57

VE+; SE+; PRIOR; Strong

17. Ystäväsi Liisa ei ole tullut töihin, eikä ole ilmoittanut sinulle tästä mitään. Liisa on luotettava työntekijä eikä jäisi kotiin muuten vaan. Juttelette tästä kollegoiden kanssa:

Liisa on _____ kipeä

17. *Your friend Lisa has not arrived at work and has not informed you of this. Lisa is a dependable employee and would not stay home without a good reason. You talk about this with colleagues:*

Lisa is _____ sick

Näköjään 12 Varmaan 81

VE+; SE+; SIM; Weak

18. *Kämpäkaverisi on jättänyt illalla tietokoneensa asuntonne keittiön pöydälle. Aamulla huomaat koneen puuttuvan. Mietit itseksesi:*

Ville on _____ lähtenyt jo yliopistolle.

18. *Your roommate has left his laptop on the kitchen table of your flat in the evening. In the morning you notice that the laptop is missing. You think to yourself:*

Bill has _____ already gone to the university.

Näköjään 56 Varmaan 37

VE+; SE+; PRIOR; Strong

19. *Olet menossa kaverisi kanssa ulos ja katsot ulos ikkunasta ja huomaat, kuinka taivaalle on kerääntynyt tummia pilviä, vaikka vielä ei sadakaan yhtään. Sanot kaverillesi:*

Otetaan sateenvarjo mukaan, siellä _____ sataa pian.

19. *You are going out with a friend and you look out of the window and you notice how dark clouds gather in the sky, but it is not raining yet. You say to your friend:*

Let's take umbrellas with us, it's _____ going to rain soon.

Näköjään 7

Varmaan 86

VE+; SE+; SUBS; Weak

20. *Ystäväsi on tehnyt sinulle hienon aterian. Maistat ruokaa ja huomaat, että se polttaa suussa melkoisesti. Kerrot tästä ystäväillesi:*

Tässä ruoassa on _____ aika paljon chiliä.

20. *Your friend has prepared a nice meal for you. You taste the food and you notice a strong burning sense in your mouth. You say to your friend:*

This food _____ has pretty much chili in it.

Näköjään 62

Varmaan 31

VE-; SE+; SIM; Strong

21. *Ystäväsi Kalle on Saksan jalkapallomaajoukkueen suuri fani. Itseäsi ei jalkapallo kiinnosta yhtään, mutta huomaat sattumalta 14.7.2014, että Saksa on voittanut jalkapallon maailmanmestaruuden edellisenä yönä. Kalle uhosi ennen kisoja, että ottaisi mestaruuden kunniaksi mestaruustatuoinnin heti seuraavana päivänä. Juttelet tästä toisen kaverisi kanssa:*

Kallella on _____ nyt mestaruustatuointi.

21. Your friend Carl is a big fan of Germany's national soccer team. You have no interest whatsoever in soccer, but you notice on July 14, 2014 that Germany has won the world championship in soccer the night before. Carl said before the tournament that he will have a championship tattoo the very next day if this happens. You say to another friend: Carl _____ has a championship tattoo now.

Näköjään 7

Varmaan 86

VE-; SE-; SIM; Weak

22. Ystäväsi on suuri Kärpät-fani ja hän on yleensä aina huonolla tuulella, jos Kärpät on hävinnyt edellisen illan pelin. Itse et seuraa jääkiekkoa yhtään. Huomaat, että ystäväsi on aamulla luennolla melko hiljainen ja selvästi huonolla tuulella. Kuiskuttelet tästä vieruskaverisi kanssa:

Kärpät on _____ hävinnyt eilen.

22. Your friend is a huge fan of the Pittsburgh Penguins and s/he is usually in a bad mood if the Pens have lost the last night's game. You don't know anything about hockey yourself. You notice that your friend is quiet and obviously in a bad mood during the morning class. You whisper about this with another friend:

The Pens have _____ lost last night

Näköjään 51 Varmaan 41 Both 1

VE+; SE+; PRIOR; Weak

23. *Katsot aamulla kesälomasi alussa ulos ikkunasta ja huomaat, että aurinko paistaa kirkkaasti. Innoissasi kerrot tästä lapsillesi:*

Tänään mennään uimaan, tänään tulee _____ lämmin päivä.

23. *Your summer holidays have just begun. You look out of the window and notice that the sun is shining brightly. You say to your children:*

We are going swimming, it's _____ going to be a warm day.

Näköjään 44 Varmaan 48 Both 1

VE+; SE+; SUBS; Weak

24. *Katselet ihmisiä uimarannalla kuumana päivänä ja huomaat, että kukaan ei ole uimassa. Mietiskelet:*

Vesi on _____ aika kylmää.

24. *You look at people on the beach on a hot day and you notice that no-one is swimming.*

You think to yourself:

The water is _____ pretty cold.

Näköjään 19 Varmaan 74

VE+; SE+; SIM; Weak

25. Ystäväsi tulee töihin aina raitiovaunulla. Huomaat, kuinka hän kaartaakin yhtäkkiä työpaikkanne pihaan autolla. Puhutte tästä toisen työkaverin kanssa:

Raitiovaununkuljettajat ovat _____ lakossa.

25. Your friend always comes to work by tram. One day you, however, notice that s/he arrives by car. You talk about this with another colleague:

The tram drivers are _____ on strike

Näköjään 20

Varmaan 73

VE+; SE+; SIM; Weak

26. Olet toimistossasi, josta ei näe ulos, etkä ole ollut ulkona kahteen tuntiin. Kollegasi tulee viereiseen huoneeseen hiukset ja takki märkinä. Sanot hänelle:

Siellä _____ sataa

26. You are in your office without a view to the outside world, and you haven't been out in two hours. Your colleague arrives at the next office all wet. You say to him/her

It's _____ raining outside.

Näköjään 89

Varmaan 4

VE+; SE+; SIM; Strong

27. Ystäväsi Liisa on pitkään pohtinut ja järjestänyt väitöspäiväänsä ja lopulta saat häneltä sähköpostin, jossa todetaan, että väitös on 30.10.2015. Tunnet Liisan erittäin pahana hermoilijana ja kerrot tästä toiselle ystävällesi:

Liisa on _____ ihan paniikissa 30.10.2015.

27. Your friend Lisa has been thinking about and organizing her doctoral defence for a long time. You get an e-mail from her stating that the defence will take place on October 30, 2015. You know that Lisa is always very nervous about these kinds of thing and you say to another friend:

Lisa will _____ be in total panic on October 30, 2015.

Näköjään 3 Varmaan 90

VE-; SE-; SUBS; Weak

28. Olet menossa elokuviin ja juttelet kaverisi kanssa lippua ostaessasi, etkä siksi keskity ostotilanteeseen kunnolla. Muistelet, että lippu maksoi viimeksi 12 euroa ja maksat 20 euron setelillä. Ostettuasi lipun huomaat, että olet saanut takaisin vain 6 euroa. Mietit tätä kaverisi kanssa:

Lipun hinta on _____ noussut vähän.

28. You are going to the movies and while buying the ticket you talk with your friend and you are therefore somewhat distracted. You recall that that ticket cost 12 Euro the last time and you pay with a 20 Euro bill, and you get 6 Euro in return. You ponder this with your friend:

The price of the ticket has _____ gone up a bit.

Näköjään 76 Varmaan 17

VE+; SE+; PRIOR; Weak

29. Huomaat, että uusimman Satu Rannerenkaiden Rouvasta –elokuvan ikäraja onkin 16 vuotta odottamasi 12 vuoden sijaan. Juttelet tästä kaverisi kanssa:

Elokuvassa on _____ enemmän väkivaltaa kuin ennen.

29. You notice that the latest Tale of the Lady of the Bracelets movie is R-rated instead of PG13 that you expected. You talk about this with a friend:

The movie _____ has more violence than the previous movies.

Näköjään 14 Varmaan 79

VE+; SE+; SIM; Weak

30. Luet netistä, että seuraava ALT:n konferenssi järjestetään Australiassa joulukuussa 2017. Tiedät, että kollegasi Jaakko haluaa mennä konferenssiin, koska käy siellä joka kerta, mutta tiedät myös, että hän kärsii aina todella pahasta jet lagista. Mietitte tätä toisen kollegan kanssa:

Jaakko on _____ seuraavassa ALT:ssa ihan väsynyt koko konferenssin ajan.

30. *You read in the Internet that the next ALT meeting will be held in Australia in December 2017. You know that your colleague Jake wants to go the conference, because he has attended each meeting. You also know that he always suffers from a severe jetlag. You discuss this with another colleague:*

Jake will _____ be totally tired during the next ALT

Näköjään 4

Varmaan 89

VE-; SE-; SUBS; Weak

31. *Työkaverillasi on tapaaminen pomonne kanssa, mutta et tiedä tälle mitään tarkkaa syytä. Huomaat pian, kun kaverisi tulee pomonne huoneesta ja kävelee suoraan ulos sanomatta sanaakaan. Sanot:*

Ville on _____ saanut potkut.

31. *Your colleague has a meeting with your boss, but you don't know any reason for this. You see that your colleague rushes out of your boss's room and walks out without saying a word. You say:*

Bill has _____ been fired.

Näköjään 13

Varmaan 79

Empty 1

VE+; SE+; PRIOR; Weak

32. Olet odottanut pitkään Pasilan uusinta tuotantokautta ja istut television ääreen katsomaan sitä. Huomaat kuitenkin, että nyt tuleva jakso onkin osa 2, eikä 1, kuten oletit.

Harmittelet tätä:

Uudet jaksot ovatkin _____ alkaneet jo viime viikolla.

32. You have been waiting a long time for the new season of Family guy and are sitting in on your couch waiting for it to start. You notice that the episode that starts is episode 2 and not 1, as you expected. You think to yourself:

The new season has _____ started already last week.

Näköjään 86

Varmaan 7

VE+; SE+; PRIOR; Strong

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ⁱⁱ The following abbreviations are used in this paper (in accordance with the Leipzig Glossing Rules: ASSUM Assumptive; DECL Declarative; HEARSAY Hearsay evidential; INFER Inferential; NF Non-feminine; NOMN Nominalization; PRS Present tense; REC.P Recent past; SG Singular; VCLASS Verb class