

Remarks on Evidential Hierarchies

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It has been suggested in the literature that evidentials can be arranged in hierarchies that reflect that speakers prefer certain evidentials over others. This paper addresses the question of what properties an evidential hierarchy should have in order to be cross-linguistically applicable. It is argued that linear hierarchies of evidentials as proposed in previous studies do not adequately capture the pragmatic facts. Instead, a non-linear hierarchy of evidence types is proposed.

1 Introduction

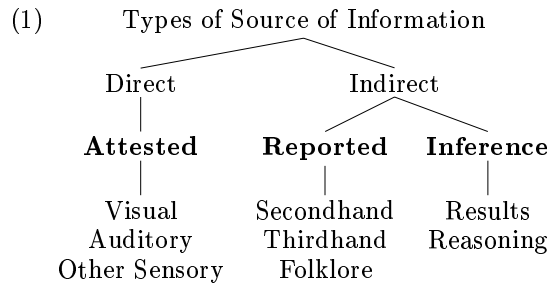
Cross-linguistic studies of evidentiality, the grammatical marking of source of information, have to date primarily been concerned with defining the phenomenon as a linguistic category, and in particular with the question of how evidentiality relates to (epistemic) modality in general and other categories such as tense, aspect and mirativity (e.g. Anderson (1986); Chafe (1986); DeLancey (to appear); Givón (1982); Palmer (1986); Wierzbicka (1994); Willett (1988)). Only a few studies have addressed the question of how the different evidential categories relate to each other, Willett (1988) and in particular de Haan (1998). De Haan's main proposal is that evidentials can cross-linguistically be arranged in a hierarchy, on the basis of which typological universals regarding the evidential inventories of languages can be formulated, and which at the same time captures certain pragmatic relations that cross-linguistically hold between evidentials.

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This paper builds on de Haan's insights and studies in more detail the pragmatic underpinnings of the hierarchy. In particular, I argue that the hierarchy should order evidence types, the cognitive concepts underlying evidentials, rather than evidentials, and that a linear hierarchy does not capture the empirical facts adequately. Instead, I propose a non-linear version. As other linguists, I use the term *evidential* to refer to grammatical markers of evidentiality only, not to lexical ones. While a comprehensive theory of evidentiality should ultimately be able to accommodate lexical evidentials also, this limitation aids us for the time being to better understand evidentiality as a linguistic concept. Furthermore, while some linguists use the term to refer to any kind of marker of speaker's attitude towards the proposition expressed, it is here used only for elements that have marking of source of information as at least part of their meaning.

Languages differ greatly as to what kinds of source of information they mark with evidentials, though of course all languages have means to express all evidential distinctions. Willett (1988) surveyed 38 languages and found the kinds of source of information in (1). to be marked grammatically across languages, with the types in bold face being the major types.¹



The types of evidence in (1) are organized in a *is-a*-hierarchy. For example, INFERENCE FROM RESULTS² is a type of INFERENCE which in turn is a type of INDIRECT information. Evidentials may refer to the leaves of this hierarchy, or to any of the supertypes. Thus, a language may have an evidential that is used exclusively for VISUAL, or it may have an evidential that refers to DIRECT, subsuming VISUAL under this broader type. Some languages make fine-grained distinctions in their

¹The terms Attested and Direct are used interchangeably by Willett. For the difference between INFERENCE FROM RESULTS and INFERENCE BY REASONING see footnote 5.

²In the following, evidentials will be written with a capital letter, and evidence types with small caps.

evidential system, others only mark the most basic contrast between DIRECT and INDIRECT grammatically. If speakers of such a language want to make more fine-grained distinctions, they have to use lexical means, just as a speaker of a language without any evidentials would.

Given this taxonomy of evidence types, it is quite natural to ask whether there are some universal principles that determine how languages structure their evidential system. First, of course, we have to ask whether the *is-a*-hierarchy in (1) is in fact cross-linguistically valid. It turns out that it is not quite correct, because some languages, for example Kashaya (see section 2.2 below), do not group OTHER SENSORY, which includes the subtypes SMELL and TOUCH, under DIRECT, but under INFERENCE.

But there might be other kinds of universal principles at work. For example principles that determine how a language that has less evidentials than there are evidence types - and most languages are of this kind - distributes its evidentials over the types. This is a typological issue. A second area has been studied from a universal point of view, is the question of whether evidentials or evidence types can be arranged in a pragmatically motivated hierarchy.

De Haan (1997) proposes that both the typological and the pragmatic universal aspects of evidential systems can be captured with the same hierarchy, thus suggesting that the restrictions on possible evidential inventories are pragmatically motivated.

While de Haan's is probably the most thorough cross-linguistic study of the evidential hierarchy, and the first to apply it to typology, the idea that evidentials can be arranged in a hierarchy is not new. Thus, Willett (1988), too, proposes a linear ordering in addition to the *is-a* hierarchy presented in (1), and there have been several proposals for language-specific hierarchies. As it is useful to review some language-specific evidential hierarchies before discussing cross-linguistic proposals, the following section presents the hierarchies for Tuyuca and Kashaya. Section 3 discusses Willett's (1988) and de Haan's (1998) cross-linguistic hierarchies, and argues that in order to capture the empirical pragmatic facts, one has to give up the linear form of the evidential hierarchy adopted by all previous proponents. Section 4 contains the conclusion and indicates some open areas for future research.

2 Language specific hierarchies

The language specific hierarchies discussed in this section were proposed by Barnes (1984) for Tuyuca, and by Oswalt (1986) for Kashaya. Both of these languages have rich sets of evidentials, which makes them

well suited for studying the relations between evidentials. The comparison of Tuyuca and Kashaya furthermore leads to interesting questions regarding the nature of an evidential hierarchy with cross-linguistic applicability.

2.1 Tuyuca

Tuyuca belongs to the Tucanoan language family, and was reported by Barnes in 1984 to be spoken in Colombia and Brazil by approximately 700 people. According to Barnes, Tuyuca has five sets of evidential verbal suffixes: Visual, Nonvisual, Apparent, Secondhand and Assumed. The evidentials are portmanteau morphemes. For each evidential category, there are subsets for present and past tense, the members of which are further distinguished for person (3 vs. other), gender (fem. vs. masc.) and number (sg. vs. pl).³

The following variations on the same sentence illustrate the basic meanings of the evidentials.⁴

- (2)a. *dúga apé-wi*. *-wi* = Visual
 ‘He played soccer’. (I saw him play.)
- b. *dúga apé-ti*. *-ti* = Nonvisual
 ‘He played soccer’. (I heard the game and him, but didn’t see it or him.)
- c. *dúga apé-yi*. *-yi* = Apparent ‘He played soccer’. (I have seen evidence that he played: his distinctive shoe print on the playing field. But I did not see him play.)
- d. *dúga apé-yigî*. *-yigî* = Secondhand
 ‘He played soccer’. (I obtained the information from someone else.)
- e. *dúga apé-hîyi*. *-yigî* = Assumed
 ‘He played soccer’. (It is reasonable to assume that he did.)
 (Barnes, 1984, 257f.)

³It might be possible to separate the evidential morpheme from the agreement morpheme, but Barnes herself leaves this area for further research. Furthermore, the paradigm has gaps: there is no first person present tense Apparent, and there are no present tense evidentials for Secondhand. See Barnes (1984) for an explanation of these gaps.

⁴All Tuyuca examples are directly taken from Barnes (1984, 257), including the explanatory contexts in parentheses. Unfortunately, no morpheme-by-morpheme glosses are available. However, the evidential is separated from the verb by a hyphen. All evidentials in (2) are past 3masc.sg.

The examples in (2) sufficiently illustrate how the evidentials Visual, Nonvisual and Secondhand are used, but this might not be so clear for Apparent and Assumed, especially how they differ from each other. Barnes (1984) describes their use as follows:

An apparent evidential is used when the speaker draws conclusions from direct evidence (Barnes, 1984, 260). An assumed evidential is used when the speaker has prior knowledge about the state of things or about habitually general behavior patterns (Barnes, 1984, 262).⁵

However, a closer look at the examples Barnes gives for Apparent and Assumed, shows that her definitions are not sufficient to predict when a speaker uses one or the other. (3)a.-b. are further examples Barnes gives for the use of Apparent, and (4)a.-c. for Assumed.

- (3)a. *pisánã mĩnĩmãkĩre nẽẽyahã-yi*
 ‘(Apparently) the cat caught and ate a bird.’ (Said while looking at feathers on the ground.)
- b. *bóahõã-yu*
 ‘(Apparently) it rotted.’ (Said of a plant after pulling it up to examine it.) Barnes (1984, 260)
- (4)a. *Bogotápi nĩ-ko*
 ‘She is in Bogotá.’ (She left last week and said that was where she would be.)
- b. *wĩmãra hò-a-hĩya*
 ‘The children drew those pictures.’ (It is apparent that someone drew them, but it is assumed that the children did it.)
- c. *diágo ti-kú*
 ‘You are sick.’ (The way you are groaning, you must be sick.) Barnes (1984, 262)

⁵ The Tuyuca Apparent and Assumed thus appear to refer to Willett’s (1988) INFERENCE FROM RESULTS and INFERENCE FROM REASONING, respectively.

Inference from results: the speaker infers the situation described from the **observable evidence** (i.e. from perception of the results of the causing event or action).

Inference from reasoning: the speaker infers the situation described on the basis of intuition, logic, a dream, previous experience, or some other **mental construct** (Willett, 1988, 96).

The examples for Assumed show that the “prior knowledge” Barnes requires for its use can be a report, (4)a., or direct information, (4)b. and c. Thus, one difference between Apparent and Assumed is in terms of evidentiality: Assumed can be used for conjectures based on reports, and Apparent cannot. However, the difference between (4)b. and c. on the one hand, and (3)a. and b. on the other, cannot be evidential, as in all cases the speaker makes an inference or conjecture on the basis of direct evidence.

A plausible hypothesis is that the difference is one of strength of the available direct evidence. When using an Apparent the speaker conveys that they found the direct evidence on which they base their inference completely convincing, whereas with an Assumed, they leave open the possibility that their conjecture might be wrong. The difference between Apparent and Assumed is therefore not purely evidential.

Let me now turn to the evidential hierarchy Barnes (1984) proposes for Tuyuca.

(5) Visual > Nonvisual > Apparent > Secondhand > Assumed

The ordering relation $x > y$ in (5) is a relation of speaker preference, such that evidential x will be preferred over evidential y where possible. Barnes does not explain, however, why a speaker prefers certain evidentials over others.

The effects of this hierarchy can most easily be seen, when a speaker has more than one source of information for the same event. In such a case s/he will use the evidential that is higher on the hierarchy. For example, a person watching a soccer game will usually have both visual and nonvisual information for an event such as described by the sentences in (2), but will choose (2)a. over (2)b.

But in Tuyuca the preference for certain evidentials, in particular the Visual, has, according to Barnes, more complicated effects: a speaker prefers a somewhat more indirect proposition if that allows her or him to use a Visual. In order to understand what I mean by “more indirect”, one has to know that a main verb can enter into a so-called compound construction with the auxiliary *nĩ*. In this construction the evidential - which, recall, is also a tense marker - is suffixed to the auxiliary, and the resultative morpheme *-ri* followed by a gender-number morpheme is suffixed to the main verb. This compound construction is used to describe the end result of an event, and is thus a more indirect way of giving information about an event than using the simple construction. An example is given in (6).⁶

⁶Given the description Barnes herself gives of this construction, which I have

- (6) *María diáhõãrigo nĩ~wo*
 ‘María died.’

Barnes (1984, 262)

Example (6) was used by a man who had first heard that María, who lived in a different town, had died. He had then later gone to that town and visited her family, where he obtained VISUAL information about her death, including her grave. Now, when giving this information, he (theoretically) had a choice between using the simple verb construction with the Secondhand evidential, as he would have done before traveling to María’s town, and using the compound construction with the Visual. He could obviously not use the simple construction with the Visual, since he had not seen the event itself. According to Barnes, speakers in such a situation generally prefer the compound construction because that allows them to use the Visual. In fact, one might read Barnes to mean that a speaker has very little choice in such a situation: “[he] no longer could use a secondhand evidential, since he had finally obtained some firsthand information.” (Barnes, 1984, 263)

However, this preference of a more indirect proposition over a simpler one cannot be an effect of the hierarchy. If it were, we would expect that the speaker prefers a slightly different proposition in order to be able to use any evidential over others that are lower on the hierarchy. But this is not the case, as the sentences in (7) illustrate. (7)a. is a simple construction with an Apparent, and (7)b. is a compound construction with a Visual.

- (7)a. *wáahõã-ya*
 ‘(Apparently) they went away.’

- b. *wáahõãrira nĩ~ĩ-wa*
 ‘They went away.’

Barnes (1984, 264)

The context for both sentences are similar. The speaker saw a line of ants crossing a foot-path and shortly after that they were gone. In neither case did the speaker see the event of the ants going away. Here, the speaker has a free choice between the two, even though Visual is higher than Apparent. According to Barnes, the difference between the two sentences is that in (7)a., the speaker focuses on the event, whereas in (7)b. no attempt is made to describe the event itself, but only the end result.

A further example that illustrates this point is (4)a. The speaker uses an Assumed evidential in the present tense. However, s/he could summarized here, the gloss for (6) is somewhat surprising. I would have expected *María is dead*. This might indicate that the construction in Tuyuca is quite different from the English resultative construction.

(theoretically) also have said something like *She was going to go to Bogotá* using a Secondhand in the past.⁷ Unfortunately, Barnes does not say whether or not the speaker had a free choice in this case. But it is clear that if the hierarchy played a role in choosing one proposition over the other, we would expect that the speaker prefers the Secondhand evidential.

As the quote from Barnes above suggests, the important factor here is *firsthand* vs. *secondhand*, or in de Haan's (1998) terms, speaker involvement. Thus, we are in fact dealing with two different kinds of preference. One is captured by the hierarchy, the second, firsthand over secondhand, is not.⁸ Thus, it is important to state clearly, what the motivation behind the preference relation for the hierarchy is. This question will be further discussed in section 3.

2.2 Kashaya

Kashaya also has five evidentials: Performative, Factual-Visual, Auditory, Inferential and Quotative. These evidentials are suffixes with mostly no other meaning or function than the indication of source of information. The Performative evidentials in Kashaya are used when the speaker is performing an action, the Factual-Visual ones when the speaker saw the event, and for generally known facts such as *Birds sing*. The Inferential is in Kashaya not only used for inferences but also for direct nonvisual nonauditory evidence, i.e. TOUCH and SMELL (Oswalt, 1986).

The Kashaya hierarchy proposed by Oswalt (1986) in (8) is also based on speaker's preference.

- (8) Performative > Factual-Visual > Auditory > Inferential > Quotative

Oswalt (1986) only discusses preference of the simple kind: what evidential is chosen for the same proposition, when the speaker learned of the event through various sources of information. Like Barnes (1984), he treats the preference relation as a primitive, i.e. he does not state why a speaker prefers certain evidentials over others.

However, he explicitly excludes the possibility that different evidentials express different degrees of certainty, a claim that has been made for evidentials of other languages.

⁷Recall that Secondhand present tense evidentials do not exist in Tuyuca.

⁸If it were the case that (4)a. is actually preferred over the suggested alternative, then this preference would in fact go contrary to the hierarchy. But unfortunately we do not have enough data to make this strong a claim.

“It might be noted that, despite the hierarchy, all propositions with the Kashaya evidentials are presented by the speaker as certain and true. However, the evidentials themselves are at the top of a continuing hierarchy of modals expressing increasing uncertainty on part of the speaker. These include a Suppositional suffix (‘I suppose that ...’, a Speculative (‘I wonder if ...’), an Optative (‘I hope or wish that ...’) and others.” (Oswalt, 1986, 43)

The proposal that the evidential hierarchy should be seen as forming the top part of a larger, modal hierarchy is very interesting. It brings us directly to the question of the relation between evidentiality. For Oswalt, evidentials are markers of high certainty. At the same time, modal statements (of low certainty) do not require evidential justification. This is reminiscent of Givón’s (1982) cross-linguistic classification of statements into three categories: (i) those that do not require evidential justification, because they are taken for granted and unchallengeable, (ii) those that require or admit evidential justification, because they are asserted with relative confidence and are open to challenge, and (iii) those that are beneath evidentiary justification, because they are asserted with doubt (Givón, 1982, 24). As the first group of statements is not marked morphosyntactically as such, they do not figure on Oswalt’s hierarchy of linguistic markers, and Oswalt’s and Givón’s proposals are still comparable. A detailed discussion of this issue is however beyond the scope of this paper. The reason to bring it up here, is to raise the question of what elements should be on the evidential hierarchy. Oswalt mentions in the above quote a suffix Suppositional, which he classifies as a non-evidential modal. Unfortunately, this mention is the only information we have at this moment about this suffix. Nevertheless, given the English gloss Oswalt provides, it is fairly safe to assume that the Kashaya Suppositional has roughly the same meaning as the Tuyuca Assumed. But, Barnes (1984) classifies Assumed as an evidential. Recall that I argued above that the Tuyuca Apparent and Assumed differ in terms of strength of the available evidence on which the speaker bases their inference. This notion appears to be inseparable from the notion of speaker certainty, i.e. a Tuyuca speaker using an Assumed will also convey that they are not convinced of the truth of their statement. Thus, if we adopt Oswalt’s criterion that all evidentials express high certainty, we have to classify Assumed also as a modal. However, if Oswalt is right that modals and evidentials occupy adjacent segments on the same hierarchy, then we actually expect to find borderline cases for which it is impossible to decide whether they belong to one or the

other category. The Tuyuca Assumed, the Kashaya Suppositional are prime candidates for such borderline cases.

Oswalt suggests that the hierarchy in (8) is universal. However, comparing the Tuyuca and Kashaya hierarchies, repeated in (9) for convenience, we notice some mismatches in addition to the question of whether Assumed belongs on the evidential (part of the) hierarchy: The meanings of the Kashaya Performative and Factual-Visual are combined in the meaning of the Tuyuca Visual, and the Kashaya Auditory and parts of its Inferential (Other Sensory) are combined in the Tuyuca Non-Visual.

(9) **Tuyuca**

Visual > Nonvisual > Apparent > Secondhand > Assumed

Kashaya

Performative > Factual-Visual > Auditory > Inferential > Quotative

If one wants to construct a hierarchy with cross-linguistic applicability these, and discrepancies arising with evidential systems of other languages, have to be accommodated. In the next section, I will argue that this can best be done by conceiving of the evidential hierarchy as defining an evidential space which languages can divide up in different ways. This in turn requires that the hierarchy order evidence types rather than evidentials.

3 Towards a universal hierarchy

Hierarchies have been proven useful tools in typology as well as in semantics and pragmatics. In typology, hierarchies are taken to be an ordering of implicational universals, and are used to predict possible and impossible language systems as well as directions of diachronic language change, among other things (Croft, 1990; Dik, 1997). In semantics and pragmatics, hierarchies, more often called linguistic scales, are taken to be an ordering of a set of linguistic expressions belonging to a single grammatical category, where the order is determined by degree of informativeness or semantic strength (Levinson, 1983). These scales are generally used to explain Gricean implicatures associated with the linguistic expressions it orders.

It is de Haan's (1998) goal to construct an evidential hierarchy which can be used both for making typological claims and for explaining certain Gricean implicatures associated with evidentials. It would be very desirable to have such a hierarchy, since in addition to having

explanatory power in each of the two areas, it would provide us with a pragmatic reason for the existence of the typological implicational universals.

In this section, I take a closer look at the pragmatic underpinnings of the evidential hierarchy, and discuss what features it should have in order to accommodate the observations made for Tuyuca and Kashaya in the previous section, the Quechua data presented below, and ultimately to have universal validity. In particular, I will address the following questions.

- (i) What kinds of items are ordered by the evidential hierarchy?
- (ii) What is the conceptual basis for the ordering relation?
- (iii) Is the hierarchy a linear or a non-linear ordering?

The hierarchies discussed in the previous section order evidentials, and so do the hierarchies de Haan (1998) proposes.⁹ However, the hierarchies of some researchers, for example Willett's (1988), order *evidence types*, the cognitive concepts underlying the meaning of evidentials. All hierarchies discussed in this paper take "preference" as their ordering criterion, but researchers disagree as to what concepts underlie preference. For Willett (1988) preference is based on directness and reliability, and for de Haan (1998) on directness and speaker involvement. Furthermore, all evidential hierarchies proposed in the literature take the form in (10). That is, the evidential hierarchy is generally conceived of as a *linear* ordering.

$$(10) \quad x_1 > x_2 > \dots > x_n \quad \begin{array}{l} x_i: \text{evidential or evidence type} \\ >: \text{ordering relation} \end{array}$$

In the following, I argue that the hierarchy is best conceived of as ordering evidence types rather than evidentials. Regarding the preference relation, I argue that its conceptual basis is directness, where however one has to recognize two kinds of directness, and that linearity is not a maintainable feature.

3.1 The items on an evidential hierarchy

That the evidential hierarchy cannot be taken to order evidentials can be seen already when trying to construct a hierarchy that accounts for

⁹While de Haan (1998) sometimes seems to conceive of the hierarchy as ordering evidence types, rather than evidentials, he clearly states in his definition of the abstract evidential hierarchy in (10 below), that x_i stands for an evidential marker.

both Tuyuca and Kashaya. As we have seen in section 2, Tuyuca and Kashaya have different kinds of evidentials. Thus, we would first have to determine which evidentials in these languages correspond to each other and then decide on a common label for those. This is roughly the approach de Haan (1998) takes. In his language sample there are 5 languages that make the same evidential distinctions as Tuyuca, and two of the Kashaya type (including Tuyuca and Kashaya respectively). (11)a. shows the ordering de Haan presents for the Tuyuca type, and (11)b. the one for the Kashaya type.

- (11)a. Visual > Nonvisual > Inferential > Quotative
 b. Visual > Auditory > Inferential > Quotative¹⁰

Both hierarchies contain an evidential called Inferential. However, in (11)a. it corresponds to the Tuyuca Apparent, and in (11)b. to the Kashaya Inferential. As we have seen in the discussion of Tuyuca and Kashaya, however, the Kashaya Inferential is also used for evidence obtained through the sensory modes TOUCH and SMELL, whereas in Tuyuca these are subsumed under Nonvisual, and Apparent is exclusively used for inference. Thus, the term Inferential refers to two different kinds of evidentials in the two hierarchies, which I will distinguish in the following as Inferential⁻ (not used for OTHER SENSORY), and Inferential⁺ (used for OTHER SENSORY). This shows for one that it is not always possible to find one-to-one correspondences between the evidentials of different languages. It also has a more theoretical implication: with the hierarchy in (11)a., we do not get a relative ranking of Auditory and Nonvisual/Nonauditory, in (11)b. we do. Conversely, with (11)a. we do get a ranking of Nonvisual/Nonauditory sensory and Inference, but with (11)b. we do not. Thus, neither of the two can be said to be universal, even if we ignore the fact that the same labels refer to slightly different things in different languages.

In fact, de Haan (1998) never presents a universal hierarchy, only specific hierarchies for language types such as (11). Instead of a universal hierarchy, he offers the different concept of a “prototypical” hierarchy, given in (12).¹¹

¹⁰Notice that the Kashaya Factual-Visual has been collapsed here into Visual, and that the Kashaya Performative has disappeared altogether, because de Haan does not consider the Performative to be an evidential. These decisions are not relevant for the purposes of this paper, but see Garrett (1999) for arguments in favor of analyzing the Performative as an evidential.

¹¹de Haan (1998) does not define the concept of a prototypical hierarchy. My interpretation of it is that, typically, languages with evidentials make the distinctions in (12), but for any language that makes these distinctions, the ordering is as in

(12) Visual > Nonvisual > Inferential > Quotative

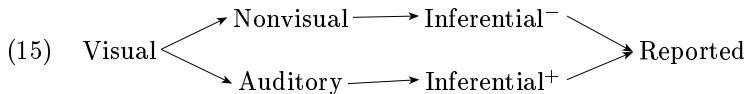
Nevertheless, as said at the outset, it is part of de Haan's enterprise to use the hierarchy to make universal typological predictions. The typological universal he proposes is given in (13):

(13) If a language possesses a certain evidential category, it will possess all evidential categories lower on the Evidential Hierarchy (de Haan, 1998).

In order for (13) to have any predictive power, however, it must be based on a universal ordering; it is not sufficient to base it on the prototypical hierarchy in (12). While de Haan does not present a universal hierarchy, the following implicational universals that determine a universal ordering of evidentials are implicit in his work.

- (14)a. If a language has a Visual, then it will be ordered above all other evidentials (see (11)a.,b.)
- b. If a language has a Nonvisual and an Inferential⁻, then Nonvisual will be ordered above the Inferential⁻ (see (11)a.)
- c. If a language has an Auditory and an Inferential⁺, then the Auditory will be ordered above the Inferential⁺ (see (11)b.)
- d. If a language has an Inferential^{+/-} and a Reportative, the Inferential^{+/-} will be ordered above the Reportative (see (11)a.,b.)¹²

Combining the universals in (14), we get the partial hierarchy in (15). The split in the hierarchy arises because it is not possible to order Nonvisual and Auditory, and Inferential⁻ and Inferential⁺ with respect to each other.



A universal hierarchy of the kind in (15) could get very complex, given that it is generally not possible to exactly identify two evidentials from different languages as having the same meaning, and this might be the reason for why de Haan does not attempt to construct a full universal hierarchy. The reason for this complexity, I believe, has to

(12). That is, the prototypicality does not refer to the ordering, but to the evidential inventory. Note that the Inferential in (12) is Inferential⁻.

¹²De Haan (1998) does not distinguish between Inferential⁻ and Inferential⁺, but it is clear that he would order both above Reported.

do with the fact that we have been trying to order *evidentials* cross-linguistically. We get a simpler picture, and a better understanding of how such a hierarchy determines the internal structure of language-specific evidential systems, if we take the view that the hierarchy orders *evidence types*.

In order to construct a hierarchy of evidence types, the set of universal evidential concepts has to be determined. On the basis of Willett's (1988) and de Haan's (1998) cross-linguistic studies, we can define the following preliminary universal set of evidence types: VISUAL, AUDITORY, OTHER SENSORY, SECONDHAND, THIRDHAND, INFERENCE, ASSUMED, where INFERENCE should be understood as the concept behind the Tuyuca Apparent, i.e. excluding TOUCH and SMELL.¹³ Let me for illustratory purposes use the preliminary ordering in (16), which is partially derived from the ordering suggested by de Haan (1998), though I will argue below that such a linear ordering can in fact not be maintained.

- (16) VISUAL > AUDITORY > OTHER SENSORY > INFERENCE > SECONDHAND > THIRDHAND > ASSUMED

A given evidence type may in some languages be encoded by a specific evidential, and in others be part of a broader evidential. For example, AUDITORY is in Kashaya encoded with a specific evidential, but in Tuyuca it is only part of the meaning of the broader evidential Nonvisual.

Furthermore, on the basis of such a hierarchy we can make certain predictions about possible evidentials of a language. For example, an evidential may cover only a contiguous range of (16), but not two or more evidence types that are separated by another type. Thus, the Tuyuca evidential Nonvisual covers the concepts AUDITORY and OTHER SENSORY, and the Kashaya Inferential covers the concepts OTHER SENSORY and INFERENCE, but we expect that no language can have an evidential that can be used for AUDITORY and INFERENCE evidence, but not for OTHER SENSORY.¹⁴

While the hierarchy of evidentials and that of evidence types superficially look very similar, the move from the former to the latter is

¹³Following de Haan (1998), I exclude the concept behind the Kashaya Performative from the set, I also leave out FOLKLORE, as it appears to be in a different class than the other types of evidence. The cognitive reality of the evidence types in this set should be confirmed by independent cognitive studies

¹⁴This prediction accords with Croft's "*Semantic Map Connectivity Hypothesis*: any relevant language-specific and construction-specific category should map onto a CONNECTED REGION in conceptual space." (Croft, in press)

theoretically motivated. This can most clearly be seen with the concept OTHER SENSORY. No language in the samples of Willett and de Haan has an evidential that encodes specifically and exclusively OTHER SENSORY. In Tuyuca it is grouped together with AUDITORY in the evidential Nonvisual, and in Kashaya it is grouped together with the concept INFERENCE. Thus, OTHER SENSORY features in none of de Haan's language-specific or prototypical hierarchies, and it will therefore also never feature in an implicational universal of the kind in (14). There is therefore no explicit way in his system to state that OTHER SENSORY is ordered above INFERENCE, though of course we might be able to derive that from language-specific hierarchies such as the Tuyuca hierarchy.¹⁵ A further advantage of the hierarchy in (16) is that one-to-one correspondences between the evidentials of distinct languages are not expected to be found. It is perfectly acceptable that the evidential called Inferential in Kashaya and the Tuyuca Apparent mean slightly different things. A hierarchy of evidence types is therefore simpler than a hierarchy that tries to order evidentials cross-linguistically.¹⁶

In the previous paragraphs, I have argued that a universal evidential hierarchy should be taken to order evidence types rather than evidentials. The next section discusses the question of what underlies the preference relation that Barnes (1984) and Oswalt (1986) appeal to in constructing their hierarchies, and how this affects the form of the hierarchy.

3.2 The ordering relation

As mentioned, the pragmatic function of the evidential hierarchy is primarily to capture why speakers prefer certain kinds of evidentials over others, or rather why they prefer to base their statement on one type of evidence rather than another when they have different types of evidence for the same event. Another way, in which one can observe the speaker's preference of evidence types, and which has not been brought into the discussion so far, is the speaker's choice of proposition (plus indication of source of information) in a case where s/he has

¹⁵One might of course argue now, that it is a good thing that we cannot make any explicit statements about the position of OTHER SENSORY, if indeed no language has a specific evidential for it. To that I would respond that we cannot be sure that there is no such language, and with (16) we can predict where such a specialized evidential would go on the hierarchy.

¹⁶The hierarchy in (16) is also more versatile than one that orders evidentials. While de Haan restricts himself explicitly to languages with grammatical evidentials, and for this paper I do, too, (16) can potentially also be used to explain linguistic differences between lexical items that encode evidential concepts. This area is left for future research.

conflicting information from different sources of information. We will see an example for such a case shortly. However, as the discussion of Tuyuca in section 2.1 shows, the hierarchy does not play a role in all cases in which the speaker prefers one evidential over another, and it is therefore necessary to state clearly, what the reason underlying speaker's preference is that is supposed to be captured by the hierarchy.

Speaker preference is not a concept usually taken to form the basis of the ordering relation of a linguistic scale. In semantics and pragmatics, it is commonly taken to encode the degree of informativeness and semantic strength (Levinson, 1983). This means that given a scale of the form $x_1 > x_2 > \dots > x_n$ a sentence containing x_i is more informative or semantically stronger than the same sentence containing $x_{j>i}$ instead of x_i . Furthermore, from such a scale Gricean quantity implicatures can be derived: by asserting a sentence containing x_i , $S(x_i)$, the speaker implicates that they cannot assert $S(x_{j<i})$, that is they are indirectly negating $S(x_{j<i})$. This kind of implicature can also be observed with certain evidentials (de Haan, 1998): by using an evidential lower on the hierarchy, the speaker implicates that they could not have used a higher evidential, and thus indirectly negates the existence of higher evidence. For example, Quechua has three evidential enclitics, *-mi*, *-si*, and *-chá*, which are usually analyzed as Direct, Reportative and Conjectural respectively. By using the Reportative in (17)a., the speaker implicates that they could not have used (17)b. which contains the Direct. This implicature is captured by the ordering DIRECT > REPORTATIVE.

(17)a. María-qa Lima-ta-s ri-sqa.

María-TOP Lima-ACC-**si** go-PST2

‘(It is said that) María went to Lima.’

b. María-qa Lima-ta-**n** ri-rqa-n.

María-TOP Lima-ACC-**mi** go-PST1-3

‘(I have direct evidence that) María went to Lima.’¹⁷

The fact that the hierarchy induces such implicatures can in turn be used to test whether a given ordering is correct. For example, the ordering in (16), predicts that the Reportative triggers the implicature that the speaker does not have inferential evidence. I will show below that this is in fact not the case.

¹⁷ Abbreviations used in the Quechua glosses: TOP: topic, REP: reportative, NEG: negative 2P: second person possessive, 3: third person ACC: accusative, PST1: the so-called direct past tense, PST2: the so-called indirect past tense

While all hierarchies shown so far order INFERENCE above REPORTATIVE, there have also been proposals for the reverse ordering. For example, Willett (1988) proposes the hierarchy in (18),

(18) ATTESTED > REPORTED > INFERRING

which he explains as follows:

On a scale from most to least direct, Attested evidence is ranked as the most reliable source, Inferring evidence as the least reliable, and Reported evidence somewhere in the middle. (Willett, 1988, 86)

Thus, for Willett the speaker's preference of certain evidence types over others is based on two criteria: directness and reliability. He goes on to say that "a speaker using an Inferring evidential denies having reported or direct evidence", i.e. for him the indirect negation between INFERENCE and REPORTATIVE goes in the opposite direction. We have already seen that de Haan (1998) orders Inferential above Quotative, but on what criterion does he base this order? He, too, uses two ordering criteria, the first of which is also directness. However, since he, like Oswalt (1986), denies that evidentials encode speaker certainty, his second criterion cannot be reliability. With respect to the relative ordering of Inference and Quotative, de Haan (1998) states:

Within the area of indirect evidence, Inference is closer to direct evidence than Hearsay because by using a Quotative, the speaker relies wholly on evidence that comes from another source. The Inferential is used when the speaker is involved him- or herself with the evidence to a certain degree. The speaker makes deductions on the basis of evidence. This evidence has been collected by the speaker, which makes him or her more of an active partner than in the passive act of receiving information from another source.

Thus, de Haan's second criterion is speaker involvement. Willett and de Haan therefore agree on the relative orderings derived from directness, namely that all kinds of DIRECT evidence should be ordered above all kinds of INDIRECT evidence, but their different second criteria lead them to postulate different relative orderings of INFERENCE and REPORTATIVE.

Which order is right? I'd like to argue that neither is correct, and that it is in fact impossible to fix the relative ordering of INFERENCE

and REPORTATIVE for the general case. Using Quechua data from my own fieldwork, I will show that by using a Reportative, a speaker does not necessarily deny having INFERENCE evidence, and vice versa, and that speakers do not prefer to base their statements on either on INFERENCE or REPORTATIVE evidence. The data were elicited by asking consultants to imagine scenarios similar to some of the Tuyuca examples cited above, and imagine what they would say in the given situation.

The first situation is one in which a farmer, say Pedro, notices that one of his hens is missing, and at the same time sees a trail of feathers on the ground leading away from the house. Knowing that foxes frequently steal hens, he might with fairly high certainty infer (19), using the conjectural enclitic *-chá*.

(19) Atuq-**chá** wallpa-yki-ta apa-rqa-n.
fox-**chá** hen-2P-ACC take-PST1-3

‘A fox must have taken the hen.’

If he were later to meet his neighbor who tells him that she actually saw a fox leave Pedro’s yard with a hen, he would use (20) to report the event to other people.

(20) Atuq-si wallpa-ta apa-sqa.
fox-si hen-ACC take-PST2-3

‘(It is said) A fox took the hen.’

The speaker of (20) prefers the eyewitness report over their own inference. Now consider the same situation to begin with, i.e. Pedro infers (19). But he then later meets a different neighbor who is known to be a drunk. He tells Pedro that he saw a Puma leaving his yard with his hen. In this case, Pedro has conflicting information from two different sources. Let’s assume that Puma’s are rarely seen in Pedro’s village, and that it is much more likely that it was indeed a fox. Then, given that the source of the report is not trustworthy, Pedro will probably simply disregard the drunk’s report, and continue to use (19) to tell other people about the event. A more complicated situation is one in which the source of the report is a trustworthy person, say the first neighbor. Then, Pedro will have to seriously consider that it was in fact a Puma, even though they are rare. He might in fact not be able to resolve this conflict, and choose to inform his hearers of both possibilities, marking each one with the respective evidential, as in (21).

- (21) Atuq-**chá** wallpa-ta apa-rqa-n. Ichaqa wasi masi-y
fox-**chá** hen-ACC take-PST-3. But house friend-POSS
rikhu-sqa, puma-s wallpa-ta apa-n-man ka-rqa-n.
see-sqa, puma-**si** hen-ACC take-3-COND be-PST-3

‘A fox must have taken the hen. But my neighbor saw it, (and it is said) a puma took it.

In the case of the drunk, the speaker prefers their own inference over a report.¹⁸ In the case, where the conflict cannot be resolved, neither Inferential nor Reportative is preferred over the other.

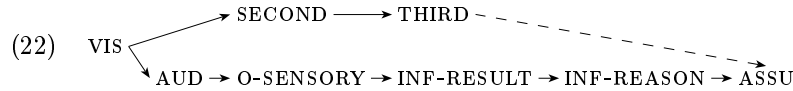
Thus, a speaker may sometimes prefer to base a statement on INFERENTIAL evidence, sometimes on REPORTATIVE and sometimes might not give preference to either. Furthermore, in none of the cases described above, can the speaker be said to implicate that they do not have the other type of evidence. Neither of the orderings INFERENCE > REPORTATIVE or REPORTATIVE > INFERENCE can therefore be said to be the correct in the abstract.

Rather, the speaker evaluates all evidence available to them, decides which proposition to believe in the case of conflicting information, and then chooses to mark the type of evidence that they consider to be the strongest. The details of this evaluation process are of course very complex, and require further study, though probably not within the field of linguistics. Two things that do seem to play a decisive role are the trustworthiness of the source in the case of REPORTATIVE evidence, and strength of evidence in the case of INFERENTIAL evidence, both of which might be said to be subsumed under Willett’s criterion of reliability, and secondly, the subjective likelihood that the proposition is true.

However, the fact that INFERENCE and REPORTATIVE cannot be ordered with respect to each other, does not mean that we have to give up the idea of a universal evidential hierarchy. It is clear, for example, that DIRECT evidence is always preferred over INFERENCE and REPORTATIVE evidence. Likewise, INFERENCE FROM RESULTS will always be preferred over INFERENCE BY REASONING (as defined in footnote 5), and SECONDHAND over THIRDHAND. What we do have to give up is the

¹⁸One might object that in order to be able to determine whether a speaker prefers to make his or her own inference or to report someone else’s observation, it is necessary to assume that the source of the report is a reliable and trustworthy person. But even so, it is not possible for the general case to fix the ordering. As we have seen in the discussion of Tuyuca, a speaker prefers their own inference over the report from someone else, if their inference is based on visual evidence, as example (6) shows. There is no indication that the speaker of (6) had reasons to doubt the reliability of the persons who reported María’s death to him.

idea that it is possible to order all types of evidence with respect to each other. I propose the preliminary non-linear hierarchy in (22).



The ordering relation in (22) is based on directness. However, we are dealing with two different kinds of directness. In the upper part, directness is measured in numbers of intervening speakers. In the lower part, directness is measured in terms of amount of inference involved in reaching the conclusion conveyed by the utterance. Thus, even when a speaker has VISUAL evidence, there will be a minimal amount of inference involved, with AUDITORY evidence, this amount is greater, and even more so for OTHER SENSORY evidence, and obviously for INFERENCE. For both clines, directness translates directly into preference such that speakers prefer to base their statements on the most direct type available to them. Furthermore, the hierarchy predicts quantity implicatures to be associated with the corresponding evidentials, i.e. a speaker using an evidential for a type lower on the hierarchy implicates that they do not have a higher type.

For those types between which no relation of directness can be established, a relation of preference is not defined either, and quantity implicatures are not expected. Thus, there is no measure of directness, on the basis of which one can compare for example SECONDHAND with INFERENCE FROM RESULTS, i.e. it is meaningless to say that one is more or less direct than the other, and we therefore do not expect that the use of a Secondhand evidential implicates that the speaker does not have INFERENCE evidence, and vice versa.

The hierarchy in (22) raises a number of questions, two of which I will mention here. First, as was discussed in section 2 it is not clear whether ASSUMED belongs on an evidential or modal hierarchy. The hierarchy in (22) assumes that it is part of the evidential hierarchy, though perhaps a borderline case, and orders it below INFERENCE BY REASONING. The question now is whether there should be an arrow from THIRDHAND to ASSUMED. Given the way the ordering relation is defined, we cannot measure relative directness from THIRDHAND to ASSUMED. However, if we adopt Oswald's (1986) proposal that the evidential hierarchy occupies the top part of a larger modal hierarchy then we would want to establish a connection between both the upper and the lower cline of the evidential part and the modal part of the hierarchy. The dashed arrow in (22) is meant to represent this relation.

Second, it is an open research question whether the split in the hierarchy should occur immediately below VISUAL as diagrammed or further below, after the other DIRECT types. In order to answer this question, one has to investigate whether the use of a Reportative implicates that the speaker does not have AUDITORY or OTHER SENSORY evidence. If it does, then the split has to occur further below. However, the following example suggests that this is not the case. Imagine that a person hears a shot during deer hunting season, and they are later told that someone shot a deer. In this situation it is not unreasonable to assume that some speakers will report this using a Reportative.

More cross-linguistic research will be necessary to establish the exact ordering of the evidence types in (22).

4 Conclusion and Future Work

The main purpose of the paper was to critically examine existing evidential hierarchies, and to establish the basic characteristics a potentially universal hierarchy must have in order to capture the observed pragmatic facts. It was argued that such a hierarchy necessarily has to order evidence types, not evidentials, and that it is not possible to define a linear order of evidence types, if the ordering is meant to capture speaker preference. As an alternative to existing evidential hierarchies, the hierarchy of evidence types in (22) was proposed, which captures the observation that the order of INFERENCE and REPORTATIVE cannot be fixed. When faced with a choice, speakers evaluate for each situation whether the INFERENCE or REPORTATIVE evidence is more convincing. In doing so, other factors besides evidence type such as trustworthiness, strength of evidence, and subjective likelihood of the proposition's truth are taken into account. The split in the hierarchy also makes clear that the two subtypes of INDIRECT evidence are indirect relative to DIRECT evidence in quite different ways.

Two open research questions that arise in relation with (22) were already pointed out. One concerns the exact ordering of the evidence types, and requires more extensive cross-linguistic research. The second question is whether or not the evidential hierarchy is part of a larger epistemic modal hierarchy. In order to resolve this issue, more research on the relation between evidentiality and modality in general is needed.

Another area that requires further investigation are the formal properties of the evidential hierarchy. It was shown that we can observe quantity implicatures with certain evidentials, which suggests that we might be dealing with a Horn scale. However, other properties that Horn scales typically have cannot be established for the evidential hi-

erarchy. Given a Horn scale of the form $x_1 > x_2 > \dots > x_n$, a sentence S containing an element x_i , $S(x_i)$, usually entails $S(x_{j>i})$. It is however not the case, for example, that a sentence containing a Direct evidential entails a sentence that contains a Reportative.

Furthermore, a sentence $S(x_i)$ is usually more informative or stronger than a sentence $S(x_{j>i})$. But it is not clear in what sense a sentence containing a Direct is more informative or stronger than the same sentence containing a Reportative. One might try to argue that a sentence with a Direct evidential is stronger in terms of the speaker's certainty that the statement is true. This relates to the question raised above of how evidentiality relates to epistemic modality in general.

Lastly, de Haan (1998) postulates the typological universal in (13). With respect to the evidentials Inference and Reportative, it predicts that any language that has an evidential Inference will also have an evidential Reportative. This prediction is indeed confirmed by the language sample de Haan surveys. From (22) this implicational universal and others cannot be read off. We therefore lose one of the most interesting features of de Haan's hierarchy.

In his system the typological distribution of evidentials is motivated by their pragmatic behavior. On the basis of (22), however, no such direct link between pragmatics and typology can be established. If (22) is indeed more adequate from a pragmatic point of view, as it has been argued in the present paper, then this suggests perhaps that the pragmatic factor that motivates typological distribution is not directness. One therefore has to investigate whether de Haan's second criterion of speaker involvement is sufficient to derive the typological distribution of evidentials.

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