Kees Hengeveld* and Marize Mattos Dall'Aglio Hattnher

Four types of evidentiality in the native languages of Brazil

Abstract: In this paper we argue that the notions generally grouped together under the heading of evidentiality actually belong to four different evidential subcategories, which are different from one another in terms of their semantic scope. The hierarchical, scopal architecture of Functional Discourse Grammar is used to define these four categories. After giving our arguments for this new classification, we test a number of predictions that follow from it concerning the coexistence of evidential subcategories within a language and the co-occurrence of evidential markers in a single clause. We investigate our predictions in a sample of 64 native languages of Brazil. The data from these languages show that the presence of one or more of the four evidential subcategories can be systematically described in terms of an implicational hierarchy.

1 Introduction

In this paper we argue that the notions generally grouped together under the heading of evidentiality actually belong to four different evidential subcategories, differing from one another in terms of their scope. The hierarchical, layered architecture of Functional Discourse Grammar (Hengeveld and Mackenzie 2008) will be used to define these subcategories as applying to different hierarchical layers within the grammar and is explained in Section 2. The new and fourfold classification of evidential categories resulting from this approach is presented in

*Corresponding author: Kees Hengeveld: Amsterdam Center for Language and Communication, University of Amsterdam, Spuistraat 210, 1012 VT Amsterdam, The Netherlands. E-mail: p.c.hengeveld@uva.nl
Marize Mattos Dall'Aglio Hattnher: Departamento de Estudos Linguísticos e Literários, Universidade Estadual Paulista, Rua Cristóvão Colombo 2265, 15054-000 São José do Rio Preto, SP, Brazil. E-mail: marize@ibilce.unesp.br

Section 3. On the basis of the resulting classification we specify three typological predictions that follow from it in Section 4. These predictions concern the potential co-occurrence of evidential markers in a single clause and the implicational relations between the existence of evidential subcategories within a language. The latter general prediction is formulated from a qualitative perspective and from a quantitative perspective. Before putting these predictions to the test, we first go into a number of methodological issues in Section 5, which presents the sample of native languages of Brazil used in the current study and provides criteria for the identification of the four evidential subcategories. Sections 6–8 then give the results for the three predictions. In Section 9 we present our conclusions.

2 Functional Discourse Grammar

2.1 Layering

Since the eighties, a number of grammatical theories have incorporated the idea that grammatical categories are organized in scopal layers.[1] The basic idea may be illustrated with the following example from Hidatsa:

(1) Hidatsa
 wíra   i   ápáari   ki   stao   ski
 tree   it   grow   INGR   REM.PST   CERT
 'The tree must have begun to grow a long time ago.'
 (Matthews 1965)

In this example it is clear that the certainty that is being expressed through the particle *ski* does not only involve the lexical content of the utterance. It also involves the fact that the event expressed within the utterance took place in the remote past, as expressed through the particle *stao*, and that this event is viewed from its starting point, as expressed through the morpheme *ki*. Similarly, the re-

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1 This assumption is most prominently present in Role and Reference Grammar (Foley and Van Valin 1984), Usage-based Grammar (Bybee 1985), Functional (Discourse) Grammar (Hengeveld 1989; Hengeveld and Mackenzie 2008), and Generative Grammar (Pollock 1989; Cinque and Rizzi 2011). A major difference between these approaches is that in Usage-based Grammar and Functional (Discourse) Grammar layers are defined in semantic terms, while in Role and Reference Grammar and Generative Grammar they are defined in positional terms. For a detailed comparison between various approaches to layering see Narrog (2009).

mote past morpheme *stao* not only situates the event expressed lexically in the remote past, it also does so for the fact that this event is viewed from its starting point. The scope relations between the tense, mood, and aspect (TMA) markers in this sentence are thus as indicated in (2):

(2) certainty (remote past (ingressive (predicate + arguments)))[2]

2.2 Layers

In Functional Discourse Grammar scope relations are defined in terms of different pragmatic and semantic layers. Pragmatic layers together constitute the Interpersonal Level in this model, while semantic layers together constitute the Representational Level.

At the Interpersonal Level scope relations are defined in terms of different pragmatic layers. The ones that are relevant for our argumentation below are, working inside out, the *communicated content*, which represents the message transmitted in an utterance; the *illocution*, which specifies the communicative intention of the speaker; and the *discourse act*, which is the basic unit of communication.

At the Representational Level scope relations are defined in terms of different semantic layers. Working inside out again, the layers that are relevant for the argumentation below are the *situational concept*, which provides the basic characterization of a state-of-affairs; the *state-of-affairs*, which is the situated real or hypothesized situation the speaker has in mind; the *episode*, which is a thematically coherent combination of states-of-affairs that are characterized by unity or continuity of time, location, and participants; and the *proposition*, which is a mental construct entertained about an episode.

The layers within each level are hierarchically related and so are the levels among themselves. These hierarchical relations are indicated in Figure 1.

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2 Note that the correlation between scopal layers and the relative order of TMA (and E: evidentiality) markers present in Example (1) and its English translation only holds under restricted conditions, namely only to the extent that TMAE markers are expressed using the same morphological strategy (Boland 2006: 234–249). Thus the prediction holds for e.g., all affixal expressions among themselves, all particles among themselves, all auxiliaries among themselves, all clitics among themselves, but not for combinations of e.g., affixes, auxiliaries, and particles. Since the grammars available to us do not always allow us to strictly distinguish between affixes and clitics on the one hand, and particles and auxiliaries on the other, we will not take the linear order of evidential expressions into consideration.
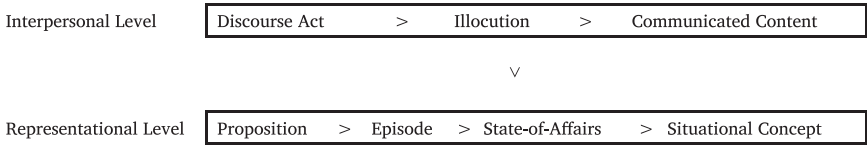
Interpersonal Level	Discourse Act	>	Illocution	>	Communicated Content

∨

Representational Level	Proposition	>	Episode	>	State-of-Affairs	>	Situational Concept

Fig. 1: Scope relations in FDG

Figure 1 shows the hierarchical relations between layers and levels, with the symbol ">" and "∨" showing the directions in which layers and levels have scope over one another. Thus, the Interpersonal Level has scope over the Representational Level, and within each level layers more to the left have scope over layers more to the right.

2.3 TMA categories

TMA categories are captured in FDG through operators applying at the different layers of the Interpersonal and Representational Level. The position of an operator thus reveals the scope of the corresponding TMA category. We follow here the classification of TMA categories offered in Hengeveld (2011) and Hattnher and Hengeveld (forthc.). Table 1 summarizes this classification.

Tense, mood, and aspect are not unified categories in their application to these layers of pragmatic and semantic organization, but fall into different subcategories according to their scope. Aspect is subdivided into two categories,

Table 1: TMA categories in Functional Discourse Grammar

Interpersonal Level	discourse act	illocution	communicated content	
Mood		basic illocution		
Representational Level	**propositional content**	**episode**	**state-of-affairs**	**situational concept**
Aspect			event quantification	phasal aspect (im)perfectivity
Tense		absolute tense	relative tense	
Mood	subjective epistemic modality	objective epistemic modality	event-oriented modality	participant-oriented modality

separating quantitative aspectual distinctions (such as habitual), which quantify over states-of-affairs as a whole, from qualitative aspectual distinctions (such as imperfective), which affect the internal temporal organization of a state-of-affairs. Tense is subdivided into absolute tense distinctions (such as past), which locate episodes, i.e., series of states-of-affairs, in time with respect to the moment of speaking, and relative tense distinctions (such as anterior), which locate a single state-of-affairs in time relative to another one. The widest range of sub-categories is found in the area of Mood, where we find basic illocutions (such as interrogative), which show the speaker's communicative intention; subjective epistemic modality distinctions (such as certainty), which indicate the speaker's attitude toward a propositional content; objective epistemic modality distinctions (such as possibility), which provide an assessment of the reality status of a series of states-of-affairs; event-oriented modality distinctions (such as moral obligation), which specify the existence of general facilitating conditions, desirabilities, and general obligations; and participant-oriented modality distinctions (such as ability), which express a relation between a participant in a state-of-affairs and the realization of that state-of-affairs.

In Section 3 Table 1 will be expanded so as to include evidentiality distinctions. The interaction of evidentiality with the illocutionary and tense categories specified in Table 1 will turn out to be of special importance in establishing evidential subcategories.

2.4 Grammaticalization

A further point that is relevant in relation to our argumentation below concerns the treatment of grammaticalization in FDG. The current hypothesis within FDG (Hengeveld 2011) and in other frameworks (see e.g., Roberts and Roussou 2003; Narrog 2009) is that generally operators start out as lexical elements and in a process of grammaticalization may acquire grammatical status at any layer of grammatical structure. Once they have acquired grammatical status, they may acquire further grammatical functions, but only in two directions: (i) by increasing their scope layer by layer within the same level, (ii) by moving up from the Representational to the Interpersonal Level. When applying generalization (i) to Figure 1 and Table 1, a TMA marker expressing, for instance, phasal aspect at the layer of the situational concept may develop into a marker of relative tense at the layer of the state-of-affairs, and subsequently become a marker of absolute tense at the layer of the episode. According to generalization (ii) a marker of, for instance, dubitative modality at the propositional layer of the representational level may develop into a marker of interrogative illocution at the interpersonal level.

3 Evidentiality in Functional Discourse Grammar

3.1 Introduction

Using the framework sketched in Section 2, we now turn to the classification of evidential distinctions based on scope considerations.[3] These considerations lead us to posit four evidential subcategories: reportativity, inference, deduction, and event perception. We first give a general characterization of these subcategories in Sections 3.2–3.5. Only after this first presentation we will provide proof for their distinct nature by discussing some grammatical features that crucially distinguish them in Section 3.6. After an intermediate summary in Section 3.7, we discuss further subdistinctions within each subcategory of evidentiality in Section 3.8, and compare our classification with existing ones in Section 3.9.

3.2 Reportativity

The first subcategory of evidentiality is reportativity. Reportativity distinctions indicate that the source of the information that the speaker is passing on is another speaker. In terms of the distinctions made above, this means that reportativity operates at the layer of the communicated content at the Interpersonal Level: the message content contained in a discourse act is characterized as transmitted rather than originally produced. The high scope of the reportativity operator is reflected in the fact that the report it introduces may contain all kinds of material related to the original rather than the current speaker. Consider Example (3):

(3) *I was told that Sheila will probably come.*

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3 By taking scope as a crucial classificatory property of evidential distinctions we take a position that is diametrically opposed to Boye (2010), a paper which "rejects the idea that different types of evidential meanings have different scope properties" and "argues that evidential meanings share scope properties in the sense that they are all conceptually dependent on a "proposition" – i.e., a meaning unit which can be said to have a truth value." We do not agree with the arguments presented in Boye (2010), but discussing these would lead us too far away from the main objectives of the current paper. On an empirical basis this paper will show that, when one *does* take scope properties into account in defining evidential distinctions, important typological generalizations can be arrived at.

In this sentence the propositional attitude expressed by *probably* can only be interpreted as expressing the subjective evaluation of the original speaker, not the current one.

In Example (4), from Lakondê, the suffix -*setaw* is used in this reportative function:

(4) Lakondê
     *ta'wẹn   'teh-'naw   ta-'ạjh-wi-***setaw***-'tãn'*
     woods   path-LOC   DIR-walk-1.DU-**REP**-IMPF
     'Let's walk to the path in the woods, someone told me.'
     (Telles and Wetzels 2006: 240)

3.3 Inference

The second subcategory of evidentiality is inference. We use this term exclusively for evidential expressions that the speaker uses to indicate that he infers a certain piece of information on the basis of his/her own existing knowledge. An utterance characterized by an inferential operator thus elaborates on that existing and stored knowledge rather than reacts to external perceptual stimuli. In terms of the distinctions made above it operates at the layer of the propositional content at the Representational Level. This layer deals with mental constructs as represented in the speaker's brain. Inference is different from the expression of epistemic (un)certainty as in the latter case the proposition brought forward is presented as (un)certain not as a result of an active inferential process, but because the relevant knowledge is already stored as (un)certain in the mind of the speaker. In cases in which languages use the same marker for inference and epistemic modality, we include the marker in our data analysis.

In Karo, the evidential particle *memã* is used when the information conveyed is an inference based on a known pattern of behavior of the subject of the sentence:

(5) Karo
     *aʔ=ket-t   **memã***
     3.SG=sleep-IND   **INFER**
     'I suppose he is sleeping.'
     (Gabas 2004: 269)

In the following example from Desano the speaker likewise bases an inference on his/her knowledge of the habits of the subject of the sentence, not on any perceived evidence:

(6) Desano

*suʔri   koe-go   ii-**kũ**-bõ   pera-ge*
clothes   wash-F.SG   do-**INFER**-3.F.SG   port-LOC
'I guess she is washing clothes at the river landing.'
(Miller 1999: 67)

3.4 Deduction

The third category of evidentiality is deduction. We use this term for the evidential distinctions that are used to indicate that the information the speaker presents is deduced on the basis of perceptual evidence. In terms of the distinctions made above deduction operates at the layer of the episode. This conclusion is warranted by the fact that deduction necessarily involves at least two related states-of-affairs: the perceived one and the deduced one. The speaker deduces the occurrence of one state-of-affairs, the deduced one, on the basis of another state-of-affairs, the perceived one. Note that the output of the deductive process is propositional in nature, and in that sense deduction resembles inference, but for the localization of an operator the input it takes is decisive. Further support for this analysis will be provided in Section 3.6.

In Tariana, the evidential suffix *-nihka* is used "to refer to something one has not seen, but which is based on obvious evidence which can be seen" (Aikhenvald 2003: 287–288). Thus, in (7) the speaker obtained his/her knowledge through a deduction on the basis of visual evidence.

(7) Tariana

*tʃinu   niwhã-**nihka**   di-na*
dog   3.SG.NF.bite-REC.PST.**DED**   3.SG.NF-OBJ
'The dog bit him (I can see obvious signs).'
(Aikhenvald 2003: 288)

Deduction is frequently based on visual evidence, but not exclusively. In (8) and (9), the speaker bases his/her deduction on sounds and smells, respectively:

(8) Yuhup

*‿jìdə̆h   ˜jáb^má   ˜**hó***
3PL   dance   DED
'They are dancing.' (as I deduce from the noise).
(Ospina Bozzi 2002: 183)

(9) Sabanê

    kieylali-k   *kan-n-**tika***   *hala-n-dana*

    peccary-OBJ   die-VS-PST.**DED**   stink-VS-PRES.PERC.NONVIS

    'The peccary died; (because) it stinks.'

    (Araújo 2004: 143)

The fact that deduction is always based on perceptual evidence is easily seen in Sabanê, in which the marker of deduction appears in sentences that are obligatorily accompanied by another sentence which contains a sensory evidential, as in (9).

3.5 Event perception

The fourth category of evidentiality is event perception. By means of evidential expressions of this type the speaker indicates whether or not he witnessed the event described in his utterance directly. With "directly" we mean that the speaker was at the scene and through one of the senses perceived the occurrence of a state-of-affairs. Perception is thus involved in both deduction and event perception. The crucial difference is that in the case of deduction the state-of-affairs that the utterance is about is not perceived through one of the senses (though another one is, the one that forms the basis for the deduction), while in the case of event perception the state-of-affairs that the utterance is about is perceived through one of the senses. In terms of the distinctions made above event perception operates at the layer of the state-of-affairs, as it is this state-of-affairs that is directly perceived.

    The following examples from Tuyuca illustrate visual event perception and non-visual event perception respectively:

(10) Tuyuca

    dïiga   *apé-wi*

    soccer   play-VIS.PST

    'He played soccer.' (I saw him play.)

    (Barnes 1984: 257)

(11) Tuyuca

    mũtúru   *bisí-tɨ*

    motor   roar-NONVIS.PST

    'The motor roared.'

    (Barnes 1984: 260)

Event perception also includes elements that express that an event was not perceived directly. An example of such an element, in contrast with an element expressing direct perception, is given in (12):

(12) Jarawara
  Wero   *kisa-me-no*
  name(M)   get.down-DIR-IMM.PST.NONWITN.M
  ka-me-hiri-ka
  in.motion-DIR-REC.PST.WITN.M-DECL.M
  'Wero got down from his hammock (which I didn't see), and went out (which I did see).'
  (Dixon 2004: 204)

Note that, in contrast with e.g., Willett (1988) and Aikhenvald (2004) we consider the non-witnessed category to be an instantiation of event perception, not an expression of indirect evidentiality. Deduction, inference and reportativity all imply the absence of perception, but these evidential interpretations can all be derived from the basic meaning of the non-witnessed category of event perception.

3.6 Distinguishing features of the four evidential subcategories

In the preceding sections the arguments for distinguishing between the four subcategories of evidentiality and their association with certain layers within the FDG model are primarily based on the semantics of evidentials in combination with the semantics of layers. Evidence for the relevance and separate status of these subcategories is, however, also supported by further grammatical evidence. This evidence has to do with the combinability of the four evidential subcategories with basic illocutions and with tense.

The combinability of evidential subcategories with various basic illocutions allows us to separate reportativity from the other three types of evidentiality. In most cases evidentiality is limited to declarative and, with certain restrictions, interrogative sentences. Declaratives and interrogatives are related in the sense that both are concerned with the transmission of information. They contrast with basic illocutions that are concerned with influencing behaviour, such as imperatives and hortatives. Reportativity allows the combination with both of these types of basic illocution. This is a result of the fact that in principle any type of

sentence can be reported, as is also evident from the existence of, for example, relayed imperatives in certain languages. The following examples are from Hup (Epps 2008: 654):

(13) Hup
ʔɔ́m-ɔ́y=**mah**
fear-DYN=**REP**
'(He's) scared, he says.'
(Epps 2008: 655)

(14) Hup
hɨ̃-nʼɨ̃h=**mah?**
Q-NMZR=**REP**
'What did he say?'
(Epps 2008: 655)

(15) Hup
nǽn=**mah!**
come=**REP**
'Come here, he said!'
(Epps 2008: 656)

The reportative combines with a declarative in (13), with an interrogative in (14), and with an imperative in (15). The reportative is the only evidential in Hup that may combine with the imperative (Epps 2008: 656). This is also true of the reportative in Tariana, as observed by Aikhenvald (2003: 322). An example of this combination is given in (16):

(16) Tariana
*pi-a   pi-ñha-**pida***
2.SG-go   2.SG-eat-PRS.**REP**
'Go and eat.' (on the order of someone else)
(Aikhenvald 2003: 376)

Similarly, in the reportative examples from Lakondê given above in (4) the reportative is used in a hortative sentence, again showing the compatibility of reportativity with illocutions of the behavioural type.

　　The other three subtypes of evidentiality can be distinguished from one another in terms of their interaction with the categories of absolute and relative tense. Since in our sample languages in many cases evidentiality and tense are

expressed in portmanteau morphemes, we cannot use examples from these languages to illustrate the interaction between evidentiality and tense. Instead, we will use examples in which lexical complement-taking verbs express the various evidential values so that we can show the interaction between the various meaning components. By applying this strategy we by no means want to suggest that grammaticalized evidentiality and the lexical expression of evidential values should be taken as forming a single system. It does, however, allow us to tease the various evidential and temporal meanings apart. Compare the following examples:

(17) Inference
   I infer that he is cooking.

(18) Deduction[4]
   I smell that he is cooking.

(19) Event perception
   I see him cooking.

These examples are similar in that the temporal specification of the main clause is identical to that of the subordinate clause in all three cases.

A first difference between the three evidential scenarios illustrated in (17)–(19) shows up in (20)–(22):

(20) Inference
   I infer that he has been cooking.

(21) Deduction
   I smell that he has been cooking.

(22) Event perception
   *I see him having been cooking.

A difference between inference and deduction on the one hand and event perception on the other is that relative tense modifications are allowed within the scope of the former but disallowed within the scope of the latter. The ungrammat-

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4 This is a case of deduction, as from the smell one cannot identify who is doing the cooking.

icality of (22) is a consequence of the fact that direct perception necessarily implies simultaneity. This sets off event perception from the remaining two evidential categories.

A difference between inference and deduction shows up in (23)–(24):

(23) Inference
     I infer that he had been cooking.

(24) Deduction
     **I smell that he had been cooking.*

A difference between inference on the one hand and deduction on the other is that absolute tense modifications are allowed within the scope of the former but disallowed within the scope of the latter. The ungrammaticality of (24) follows from the fact that in order for one state-of-affairs to provide evidence for the occurrence of another, there has to be a temporal connection between the temporal reference point of the state-of-affairs providing the evidence and that of the deduced state-of-affairs. This does not mean that the deduced state-of-affairs has to have occurred before the state-of-affairs providing evidence: the inverse temporal order is possible too. Suppose someone is expecting someone else in a hallway where elevators are situated and he/she is aware of the fact that this person has to come from the second floor to where he/she is. The lights indicating where the elevator is may then provide evidence for him/her to predict that the person he/she is expecting is on his way, as in:

(25) *I can see that he is going to arrive.*

The four subcategories of evidentiality are thus different in their behaviour as regards their co-occurrence with basic illocution and absolute and relative tense, as indicated in Table 2.

Table 2: Distinctive features of evidential subcategories

Evidential Criterion Subcategory	Combines with behavioural illocutions	Takes absolute tense within its scope	Takes relative tense within its scope
Reportativity	+	+	+
Inference	−	+	+
Deduction	−	−	+
Event Perception	−	−	−

Table 3: TMA and evidential categories in Functional Discourse Grammar

Interpersonal Level	discourse act	illocution	communicated content	
Mood		basic illocution		
Evidentiality			reportativity	
Representational Level	**propositional content**	**episode**	**state-of-affairs**	**situational concept**
Aspect			event quantification	phasal aspect (im)perfectivity
Tense		absolute tense	relative tense	
Evidentiality	Inference	deduction	event perception	
Mood	subjective epistemic modality	objective epistemic modality	event-oriented modality	participant-oriented modality

3.7 Intermediate summary

Table 1 may now be expanded to include evidential subcategories as in Table 3.

Table 3 shows how evidential subcategories are situated in relation to other TMA categories. It specifically shows that only reportativity operates at the Interpersonal Level, where it interacts with basic illocution, and that inference and deduction are situated at layers where they dominate tense categories at lower layers. Inference dominates absolute and relative tense, deduction only dominates relative tense, and event perception dominates neither. The classification arrived at thus correctly reflects the interactions between evidentiality on the one hand, and basic illocution and tense on the other, as argued in Section 3.6.

3.8 Evidential sub-subcategories

The fact that we can identify four subcategories of evidentiality in a language does not necessarily mean that this language may only have four evidential markers. Within each subcategory further distinctions are possible. In Mamaindê, for instance, there are two markers of event perception: one to indicate that the speaker perceived the occurrence of a state-of-affairs through the visual sense (26) and another one to indicate that the speaker perceived the state-of-affairs through one of the non-visual senses (27):

(26) Mamaindê
    ta-tukwinʔni-tu   *na-ʔaik-tu*
    POSS.1.SG-father.in.law-FNS   POSS.3.SG-field-FNS
    *tau-**latʰa**-ø-wa*
    chop-SBJ.3.**PERC.VIS**-PRS-DECL
    'My father-in-law is clearing his field.' (and I know this because I just came
    from his field and I saw him working)
    (Eberhard 2009: 474)

(27) Mamaindê
    ta-tukwinʔni-tu   *ʔaik-tu*
    POSS.1.SG-father.in.law-FNS   POSS.3.SG-field-FNS
    *tau-ø-**nha**-wa*
    chop-SBJ.3-PRS.**PERC.NONVIS**-DECL
    'My father-in-law is clearing his field.' (and I know this because I just passed
    near his field and heard him chopping)
    (Eberhard 2009: 475)

In both cases, the evidential concerns the direct perception of a state-of-affairs by
the speaker.

    In Mamaindê there are two different reportative suffixes too, one expressing
that the original utterance was produced by a second hand source (-*satau*), the
other that it was produced by a third hand source (-*sĩn*):

(28) Mamaindê
    waʔnĩn-soʔka   *janãn-tu*
    shaman-NCL.HUM   jaguar-FNS
    *sun-**satau**-le-ø-hĩn-wa*
    kill-**REP**-IMM.PST-SBJ.3-PST.PERC.NONVIS-DECL
    'The shaman killed a jaguar (yesterday).' (and I know this because someone
    told me)
    (Eberhard 2009: 478)

(29) Mamaindê
    ta-tukwinʔni-tu   *ʔaik-tu*   *tau-**sĩn**-ø-nha-wa*
    PS1-father.in.law-FNS   field-FNS   chop-**REP**-SBJ.3-PRS.PERC.NONVIS-DECL
    'My father-in-law is clearing his field.' (and I know this because someone
    said they were told that it was so)
    (Eberhard 2009: 480)

In both cases, the evidential concerns the report of a communicated content.

An overview of the subdistinctions made in the languages of our sample within each of the four evidential subcategories is provided in Section 7.

3.9 Comparison with other classifications

The four evidential subcategories we discuss above have been recognized under different names in the literature on evidentiality, and we do not claim any originality in this sense. What is different in our approach is that we claim that these four subcategories are all primary subcategories of evidentiality, as each has scope over a different layer of grammatical structure. Other authors make different subgroupings, and we will review these briefly in this section. Table 4 provides a systematic comparison.

Willett (1988) makes a primary distinction between direct and indirect evidence. Within the category of indirect evidence he further distinguishes between reported evidence (the speaker received the information from another speaker) and inferred evidence (the speaker inferred the situation from its results or through logical reasoning). Within the category of inferred evidence Willett thus distinguishes between our Deduction category (inference from results) and our Inference category (inference through reasoning).

De Haan (1998) too argues that, although evidential systems may differ from language to language, the opposition between direct and indirect evidence is the basis of all of them. He makes further subdistinctions, though not between our Deduction and Inference.

The six semantic values attested by Aikhenvald (2004) in her crosslinguistic analysis of grammatical evidentiality are visual, non-visual sensory, inference, assumption, hearsay, and quotative, which combine in different ways in evidential systems. Her categories can be directly mapped onto ours, but Aikhenvald does not posit a priori further groupings, as we do.

Although Plungian (2010: 29–30) considers the opposition between direct and indirect access to information the hierarchically and typologically most important one, he also suggests that the opposition between personal and non-personal access to information may play an important role in the identification of evidential subtypes. Besides the predictable combination of direct and personal access or indirect and non-personal access, the combination of indirect and personal access to a situation is possible too: "In this case the speakers obtained knowledge of a situation themselves, without other persons being involved, but the knowledge of this situation has not been obtained in a direct way since the speakers did not observe the situation directly." The two evidential subtypes identified as characterized by indirect and personal

access are inferential (the speaker draws a logical conclusion on the basis of observed results, our Deduction) and presumptive (the speaker draws a conclusion based on his/her knowledge of the world, our Inference). Plungian furthermore within the direct group adds the category of participatory evidentiality, which refers to evidence obtained through participation in a state of affairs.

Finally, San Roque and Loughnane (2012) basically take over Willett's (1988) classification, but add Plungian's (2010) category of participatory evidentiality.

A systematic comparison between the evidential subcategories proposed by these authors and the ones resulting from our approach is shown in Table 4. Table 4 shows that the major difference between our approach and the other ones discussed here is that the main split in our approach is between reportativity and all other types of evidentiality, following from the major division between

Table 4: Comparison of classifications of evidential categories

Source	Classification of evidential categories						
This article	Representational					Interpersonal	
	Event Perception			Deduction	Inference	Reportativity	
Willett (1988)	Direct			Indirect			
	Attested			Inferring		Reported	
	Visual	Audi-tory	Other	Results	Reasoning	Second-hand	Third-hand
de Haan (1998)	Direct			Indirect			
	Visual	Audi-tory	Other	Inferential		Quotative	
Plungian (2010)	Direct Access			Indirect Access			
	Personal			Personal		Non-personal	
	Partici-patory	Visual	Non-visual	Inferential	Presump-tive	Reportative	
San Roque and Loughnane (2012)	Direct			Indirect			
	Partici-patory	Visual	Sensory	Inferring		Reported	
				Results	Reasoning		
Aikhenvald (2004)	Visual		Sensory	Inference	Assump-tion	Hearsay	Quota-tive

interpersonal and representational categories in FDG. As we show in Sections 6 and 7, our separation of reportativity from other evidential subcategories allows us to formulate an evidential hierarchy, presented in the next section, in a straightforward manner.

4 Predictions

On the basis of the theory outlined above, we now come to a number of predictions as regards the distribution and expression of evidential operators.

– *The co-occurrence of evidential subcategories*: A first and rather straightforward prediction that follows from our approach to evidentiality, in which the four evidential subcategories proposed are located at four different layers of underlying pragmatic and semantic structure, is that markers of these four different subcategories will be allowed to co-occur in a single clause.
– *The existence of evidential subcategories (qualitative)*: Our second prediction is that there will be an implicational relationship between evidential meanings present in a language according to the following evidentiality hierarchy:

(30) event perception ⊂ deduction ⊂ inference

As explained in Section 2.4, according to FDG theory grammatical elements may acquire new meanings (i) by increasing their scope layer by layer within the same level, (ii) by moving up from the Representational to the Interpersonal Level. According to (i) an evidential expressing, for instance, visual event perception at the layer of the state-of-affairs may come to express deduction on the basis of visual evidence at the layer of the episode. Only after that may it acquire the function of expressing inference at the layer of the proposition. According to (ii) any evidential from the Representational Level may come to express reportativity. On the basis of (i) one may expect that evidentiality at higher layers can only exist by virtue of its existence at lower layers, hence the hierarchy in (30). On the basis of (ii) one expects that reportativity does not play a role in this implicational relationship, hence its absence from (30). Note with respect to (30) that in principle grammatical elements at higher layers might also develop directly out of lexical elements. However, we expect that this will only occur when the more basic categories at lower layers are present in a language. Furthermore, in principle a lower layer element may disappear when it develops into a higher layer one. Again,

we expect this will only happen when an alternative expression for the more basic lower category is available.

- *The existence of evidential subcategories (quantitative)*: Following the same type of reasoning we predict that the implicational hierarchy in (30) will also manifest itself in a quantitative sense, such that the number of distinctions made within each of the subcategories of evidentiality within a single language will decrease from left to right in (30). This prediction follows from the expectation that new distinctions typically arise at the lowest evidential layer, are closer to their lexical origin, and will only in some cases make it to higher layers. Note that for methodological reasons we only count overt grammatical markers and not the potential zero marking of an evidential subcategory, as in many of the languages of the sample evidentiality is an optional category.

In Sections 6–8 these three predictions are tested against data from a sample consisting of native languages of Brazil. In Section 5 we first present this sample and explain how the data from this sample was processed.

5 Methodological issues

5.1 The sample

This study forms part of a larger research enterprise that aims to establish a comprehensive typology of the native languages of Brazil.[5] Brazil is home to a large variety of languages, virtually all of which are in danger of extinction. Lewis (2009) lists 226 extant and extinct spoken native languages in 21 major groups for Brazil.[6] Though many new descriptions have become available over the last ten years, the majority of these languages have hardly been documented, which makes it difficult to draw up a representative sample. For this reason, all relevant languages for which we had access to a grammatical description at the time of the research are included in the sample. It is important to mention that our classification of the sample languages is based on the descriptions we have access to and that these may not cover all details of the evidential systems of the languages

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5 For some earlier results see Hengeveld et al. (2007) and Hengeveld et al. (2012).

6 Lewis (2009) also lists 2 sign languages, 2 creole languages, 1 mixed language, and 5 Indo-European languages for Brazil, all off which are excluded from the present research. Unclassified languages are treated as one group in Table 5.

Table 5: Sample languages

Language family	# Lgs	Sample languages
ARAUAN	5	Jamamadí, Jarawara
ARAWAKAN	22	Baré, Palikur, Parecis, Tariana, Terena, Wapixana
ARUTANI-SAPE	1	–
CARIB	19	Apalaí, Kuikuro, Macushi, Tiriyó, Waiwai
CHAPAKURA-WANHAM	4	Moré
KATUKINAN	3	Katukina-Kanamari
MACRO-GE	31	
BORORO	3	–
BOTOCUDO	1	–
FULNIÔ	1	Fulniô
GE-KAINGANG	16	Apinayé, Parkatêjê, Pykobje, Xavante
GUATÓ	1	Guató
KAMAKAN	1	–
KARAJA	1	–
MAXAKALI	1	Maxacalí
OPAYE	1	–
OTI	1	–
PURI	1	–
RIKBATSA	1	Rikbáktsa
YABUTI	2	–
MAKU	4	Dâw, Hup, Nadëb, Yuhup[7]
MATACO-GUAICURU	1	Kadiwéu
MURA	1	Pirahã
NAMBIQUARAN	7	Lakondê, Mamaindê, Sabanê, Nambikuára
PANKARARÚ	1	–
PANOAN	16	Amahuaca, Huariapano, Katukina, Kaxinawá, Matses, Shanenawa, Yaminahua
TICUNA	1	–
TRUMAÍ	1	Trumaí
TUCANOAN	14	Carapana, Cubeo, Desano, Tuyuca, Wanano, Ye'pâ-masa
TUPI	64	
ARIKEM	2	Karitiana
AWETI	1	Aweti
MAWE-SATERE	1	
MONDE	5	Surui
MUNDURUKU	2	Munduruku
PURUBORA	1	
RAMARAMA	2	Karo

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7 Yuhup is spoken in both Brazil and Colombia. The grammar we use (Ospina Bozzi 2002) describes the Colombian variety.

Table 5 (cont.)

Language family	# Lgs	Sample languages
TUPARI	5	
TUPI-GUARANI	42	Guajá, <u>Guajajara</u>, <u>Guarani-Mbyá</u>, Kamaiurá, Kokama-Kokamilla, Nheengatú, <u>Parintintín</u>, Urubu-Kaapor
YURÚNA	3	
TUXÁ	1	
UNCLASSIFIED	25	<u>Kanoê</u>, <u>Kwaza</u>
WITOTOAN	1	
YANOMAM	4	Sanuma, Yanomamɨ

concerned. The total number of these languages is 64, which gives a coverage of 28% of the native languages of Brazil. The languages distribute across the aforementioned groups in the way indicated in Table 5, in which the first column gives the name of the language family concerned, the second column the number of languages in this family spoken in Brazil, and the third one the sample languages from this family. Only languages with at least one grammaticalized evidential category, 34 out of the 63 languages investigated, are relevant to the predictions investigated in the present article.[8] Languages without such a category are underlined in Table 5 and will not figure in some of the overviews presented later in this paper. Note that we give the languages names as they are used by the authors of the principal reference grammars on which our research is based. For an overview of the language descriptions that were consulted for this study see Appendix B.

5.2 The identification of evidential subcategories

The information about evidential systems of the sample languages was collected from existing reference grammars. An overview of these sources is given in Appendix B. The grammars differ not only in extension and depth but also in the descriptive labels that are used for evidential subcategories. In order to compare these languages, all evidential subcategories described in the grammars are reclassified in terms of the labels presented above in the context of the FDG

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8 In establishing the sample the inventory presented in Torres Sánchez (2013) has been very useful to us.

approach to evidentiality. In the case of the 34 languages with evidentiality retained for the present research, the semantic information offered by the grammars is sufficient to carry out such a re-classification with a reasonable degree of confidence.

The easiest subtype to be identified is Reportativity, as language descriptions refer to this category in a consistent way. The names used to identify this category vary, but their definitions are the same, as can be seen in the following descriptions:

> The mediative evidential particle indicates that the content was attested by someone else or by hearsay. (*Guajá*, Magalhães 2007: 84 [our translation])

> The reportative suffix *-kia* indicates that the information is second-hand. It can be translated by *it is said that* ... or *they say that* ... (*Yaminahua*, Faust 2002: 30 [our translation])

> [The hearsay particle *tsile*] is used when the speaker wants to report a fact that s/he did not observe and for which there is no direct evidence. The speaker knows the fact because somebody else told it to her/him. The particle is found very often in mythical narratives and it is translated by the consultants as 'they say, people say that ...' (*Trumaí*, Guirardello 1999: 225)

Evidentials of Event Perception are also consistently described and their identification generally does not offer any special difficulty. Some languages have different ways to indicate that the speaker had direct access to the information he/she conveys, expressing whether the event was perceived through the visual or a nonvisual sense, as in Tuyuca:

> [...] visual evidentials are used to describe states or events that the speaker saw or is seeing, including those in which he himself is the actor [...] nonvisual evidentials are used to report how someone, something or some event smelled, sounded, tasted, or felt (smells, sounds, tastes, or feels). (*Tuyuca*, Barnes, 1984: 259)

Other languages only express that the event was directly perceived by the speaker, without distinguishing between senses. Evidentials with this meaning receive labels such as 'observation' (Pirahã), 'attested' (Jamamadi), 'witness' (Sanuma) or 'experiential' (Matses):

> The term 'Experiential' should be defined carefully here to distinguish it from 'Inferential' (next section). The essential condition is that the speaker witnesses the event (using any of the five senses) *as the event happens*. A definition could be as follows: *experiential* refers to a situation where the speaker detects the occurrence of an event at the time that it transpires (or a state at the time that it holds true). The primary (i.e., optimal or most direct) way of detecting most events is by visual contact, but not always. (*Matses*, Fleck 2003: 402)

The identification of Deduction and Inference is harder for different reasons. First, due to the similarities in the meanings of the words *inference* and *deduction*, one and the same evidential meaning is sometimes identified with either of these labels. This is for instance the case in the descriptions of Wanano and Ye'pâ-masa. These two languages have grammatical ways to indicate that the information the speaker conveys is deduced by him/her based on perceived evidence, but still these evidentials are classified with different names:

> *Inference* markers are used in utterances in which the speaker is presenting a conclusion about an event or state based on directly perceived results, inferring what happened based on the current evidence (*Wanano*, Stenzel 2004: 357)

> The *deductive* modality forms are used when the speaker did not see or perceive the verbal situation but has proof (traces) that this situation happened. (*Ye'pâ-masa*, Ramírez 1997: 137 [our translation])

In both of these cases we classify the evidential as expressing Deduction, since in both cases the speaker deduces the occurrence of an event through the perception of existing evidence. We classify an evidential as expressing Inference only in those cases in which the speaker comes to his/her conclusion on the basis of his/her existing store of knowledge. Examples of definitions of inference markers under various labels are the following:

> *Assertion* suffixes are used to code statements in which the speaker's assessment of a situation is based not on any specific currently accessible *outside* evidence, but on *internal* or *internalized* evidence. This evidence can be founded either on the speaker's own previous experience, upon which s/he can make reasoned suppositions, or on his/her cultural, historical, or physical knowledge of the world, upon which s/he can make assertions of fact. (*Wanano*, Stenzel 2004: 359)

> The *assumed* evidential tells the hearer that the speaker has not seen or is not seeing the event, but supposes that an event has occurred or is occurring based on his knowledge of the habits of the persons involved, what they indicated they were going to do, or on his general knowledge of how things work. (*Desano*, Miller 1999: 66)

> A strong *supposition* is indicated by the marker *kite*. This supposition usually refers to future time, but can refer to the present, both present and future at once, and the past. (*Sanuma*, Borgman 1990: 172)

On the basis of these and other definitions, the re-classification is possible. In Table 6 we provide an overview of the correspondences between our

Table 6: Terminology used in reference grammars in relation to our terminology

	Representational			Interpersonal
	Event Perception	**Deduction**	**Inference**	**Reportative**
Apalaí	Eyewitness evaluation	Deduction or assumption	Evidently	
Carapana	Definido	Evidente		Reportativo
Cubeo	Witnessed	Assumed		Reportative
Dâw				Reportativo
Desano	Visual	Inferred	Assumed	Hearsay
Guajá	Atestada			Mediativa
Huariapano	Evidencial direto			Reportativo
Hup	Nonvisual	Inferred	Inferred 2	Reportative
Jamamadí	Testemunha ocular	Verificada	Suposição	Relatada por testemunha ocular, Relatada por testemunha não-ocular
Jarawara	Eyewitness, Non-eyewitness			Reported
Kamaiurá	Evidência direta visual, Evidência direta prévia	Inferencial/ dubitativa	Opinativa	Reportativa
Karitiana				Hearsay
Karo	Visual	Inference from evidence	Inference from expectation	Hearsay
Kokama-Kokamilla				Reported
Lakondê	Visual, Non-visual	Sensory evidence		Hearsay, Quotative
Mamaindê	Visual, Non-visual	Inferred	General knowledge	Reported Secondhand, Reported Third hand
Matses	Direct experience	Inferential	Conjecture	
Nambikwara	Observação individual, Obsevação coletiva	Dedução individual, Dedução coletiva		Narrativa individual, Narrative coletiva

Table 6: (cont.)

	Representational			Interpersonal
	Event Perception	**Deduction**	**Inference**	**Reportative**
Nheengatú				Reportativo
Parkatêjê	Validacional	Inferencial		Reportativo
Pirahã	Observation	Deduction		Hearsay
Sabanê	Sensory evidentiality	Inferred	Inferred neutral	Hearsay
Sanuma	Witnessed	Verified	Supposition	Verified
Surui				Hearsay
Tariana	Visual, Nonvisual	Inferred specific	Inferred generic	Reported
Trumai				Hearsay
Tuyuca	Visual, Nonvisual	Apparent	Assumed	Secondhand
Urubu-Kaapor				Hearsay
Waiwai	First person responsability	Evidently		Third person responsability
Wanano	Visual, Non-visual	Inference	Assertion	Hearsay quotative, Hearsay diffuse
Yaminahua	Testimonial			Reportativo
Yanomamɨ	Testimonial, Non-testimonial	Déductif		Citatif
Ye-pâ-masa	Vista, Sentida	Dedutiva		Reportativa
Yuhup	Inferentiel 1	Inferentiel 1, Inferentiel 2		Rapportatif

re-classification and the original terms used by the authors of the grammars that formed the basis of our research.

In glosses, the four evidential subcategories appear as PERC/NON.PERC for markers of Event Perception and the absence thereof, DED for markers of Deduction, INFER for markers of Inference, and REP for markers of Reportativity. Further subdistinctions are made where relevant.

6 Co-occurrence of evidential markers

The first prediction we formulated in Section 4 concerns the co-occurrence of evidential subcategories.[9] If it is true that evidentiality is not one category but actually covers four different subcategories applying at different layers of grammatical structure, we expect it to be possible for two or more evidential expressions from different subcategories, i.e., different in terms of their scope properties, to co-occur in a single expression. Before going to the actual data, let us first consider the logical possibilities of combining evidential meanings. Note again that in the following examples we paraphrase the meaning of evidentials using English lexical verbs. By doing so we by no means want to suggest that grammatical and lexical expressions of evidentiality form a single system. Our only purpose is to explicitly separate the different evidential meanings, something we can not do in the same systematic way using the data available to us from the sample languages.

The maximal combination of four different evidential expressions, one from each evidential subcategory, is paraphrased in (31):

(31) *I hear (from A) that A inferred on the basis of his existing knowledge that B deduced from visual evidence that C had been smoking, something that B did not witness directly*.

Of course, such a sentence overloaded with evidentiality distinctions is unnatural for various reasons. The point here is that it is semantically possible. In order to show this we will look at the combinations of evidentiality distinctions in all possible pairs of two.

Reportativity + Inference
(32) *I hear (from A) that A inferred on the basis of his existing knowledge that C had been smoking.*

Reportativity + Deduction
(33) *I hear (from A) that A deduced from visual evidence that C had been smoking.*

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9 Note that the co-occurrences we list may have either a scoped reading or a concord (see e.g., Geurts and Huitink 2006) reading. Our material does not always allow us to tell these two apart. However, combinations of grammatical evidential markers in a concord relations are just as indicative of the relevance of the different evidential subcategories as the scoped combination are: in both cases the relevant slots for the evidential markers should be available.

Reportativity + Event Perception

(34) *I hear that from A that C has been smoking, something that A did not witness directly.*

The combinations that involve reportativity are straightforward: everything that has been communicated can be reported, which means that if an original utterance may contain an evidential marker, the reported utterance will contain that same marker. Note that in these cases the evidential markers that are within the scope of the reportativity marker are attributed to the original source. When an utterance containing a marker of reportativity is reported a special situation arises. As shown above, Mamainde has a special marker for such a third hand report, next to its marker for second hand reports.

Inference + Deduction

(35) *I infer on the basis of my existing knowledge that B deduced from visual evidence that C had been smoking.*

The combination of inferentiality and deduction is less straightforward. But imagine I know B very well and that nothing irritates him more than the fact that C is smoking now and then. I also know that C was just smoking a cigarette and left the cigarette butt in the ashtray that was empty when B left the house. When I see B getting mad at C on his return I could say (35). It is clear that one has to set up complex scenarios to get an appropriate context for this combination of evidential meanings.

Inference + Event Perception

(36) *I infer on the basis of my existing knowledge that C has been smoking, something that I did not witness directly.*

The combination of inferentiality and event-perception is straightforward again. When I infer something about a certain state-of-affairs, it follows that I did not witness that state-of-affairs directly, or I would not use an inferential marker. Inferentiality thus necessarily implies the absence of visual evidence.

Our prediction thus is that in languages that have markers for more than one evidential subcategory, members of these subcategories may co-occur in a single clause. Given the unlikeliness of a speaker of a language wanting to combine many different evidential markers in a single clause, as in the improbable yet grammatical Example (31), we have only found combinations of evidential markers in the five pairs illustrated in (32)–(36). Table 7 shows all the attested co-occurrences.

Table 7: Co-occurrence of evidentials

Evidentiality / Language	Event Perception	Deduction	Inference	Reportativity
Hup			▓	▓
Hup		▓		▓
Huariapano, Hup, Jarawara, Mamaindê, Sabanê	▓			▓
Karo		▓	▓	
Wanano	▓		▓	
Hup, Sabanê, Wanano	▓	▓		

As expected, Reportativity co-occurs with all other evidentials, since they pertain to different levels. The following examples illustrate the three possible combinations.

Reportative + Inference
(37) Hup

    yúp   *hɔ́tʔah=**mah***   *hɨd*   *ye-**ní**-ip=b'ay-áh*

    that   other.side=REP   3.PL   enter-INFER-DEP=AGAIN-DECL

    'There on the other side of it (someone said) they apparently got in again.'

    (Epps 2008: 660)

The marker *-ní* in Hup tends to be used, in contrast with the marker =*cud* illustrated in (38) below, when the emphasis is on the actual act of inferring, and is preferred when there is no actual evidence available.

Reportative + Deduction
(38) Hup

    hup   *pã̌=**cud**=**mah***

    person   NEG.EX=DED=REP

    'There was apparently nobody there, it's said.'

    (Epps 2008: 658)

In Hup, the evidential *cud* is used to designate a deduction based on tangible proof. This proof is often, although not necessarily, visual evidence, as in (38). This deduction is part of the original message that is being reported in (38).

Reportative + Event Perception

(39) Sabanê

    wayulupi.maysili-k   *kan-n-**tiaka**-**dana***
    cat.younglings-OBJ   die-VS-**REP**-**PERC**
    'Somebody said that the kitten died.'
    (Araújo 2004: 154)

In (39), the message being reported concerns a state-of-affairs perceived by the original speaker.

As shown above, the combination of Inference and Deduction requires very specific scenarios. We have found only one example of this combination.

Inference + Deduction

(40) Karo

    péŋ   *aʔ=wĩ-n*   ***aket***   ***memã***
    White.man   3.SG=kill-IND   **DED**   **INFER**
    'The white man must have supposedly killed it/him.'
    (Gabas 1999: 277)

It should be noted, however, that Gabas (1999: 277) remarks the following about this and other combinations: "In the interview, the consultant said the sequences were utterly possible. But I do not have actual examples of their occurrences in natural texts/conversations. I am also not certain about their precise translations."

Inference + Event Perception

The following example illustrates the combination of inference and event perception.

(41) Wanano

    bora-~sɨ-ka   *wa'a-ro*   ***koa**-ta-**a***
    fall.down-COMPL-AFFEC   go-NMZR   **PERC.NONVIS**-come-**INFER**.PF
    'He fell right down.'
    (Stenzel 2004: 103)

Deduction + Event Perception

The deduction of an event is always based on some evidence available to the speaker and its expression may be affected by the way he/she accessed this

evidence. In the following example from Wanano, the deduction is based on visual evidence. As Stenzel (2004: 358) affirms, in (42) the speaker is examining a set of baskets that had been stored for a long period of time. One of the baskets is deformed, pushed in on one side, prompting her to comment:

(42) Wanano
    a'yoo   *tipa-wa'a-**ri***   *hi-**ra***
    Oh!   be.flat-become-NMZR.**DED**   COP-**PERC.VIS**.IMPF.NON1
    'Oh! This one's (been) flattened.'
    (Stenzel 2004: 358)

In Sabanê, as already shown in Section 3.4, the co-occurrence of deduction and event perception is indeed a rule, since the deduction evidential appears only in sentences preceding another evidential sentence which specifies the perceived evidence, as in (43):

(43) Sabanê
    kieylali-k   *kan-n-**tika***   *hala-n-**danal***
    Peccary-OBJ   die-VS-PST.**DED**   stink-VS-PRES.**PERC.NONVIS**
    'The peccary died; (because) it stinks.'
    (Araújo 2004: 143)

The examples presented here show that indeed every possible pair of evidential subcategories is attested in languages of the sample. We should note that the combinability of evidentials is hardly ever discussed explicitly in the grammars that form the basis for this study, so that a systematic comparison of the possibilities is impossible.

7 Implicational relations between evidential meanings (qualitative)

7.1 Introduction

In this section we present the results for our second prediction (Section 7.2), discuss the consequences of these results for the classification of evidential systems (Section 7.3), and comment on the areal and genealogical distribution of these systems (Section 7.4).

7.2 The existence of evidential subcategories

The second prediction we make in Section 4, based on considerations having to do with possible grammaticalization paths, is that there will be an implicational relationship between evidential meanings present in a language according to the hierarchy in (30), repeated here:

(30) event perception ⊂ deduction ⊂ inference

We also predict that languages may or may not combine any of the resulting systems with a reportative evidential. The data needed to test this prediction are given in Table 8.

Table 8 shows that our prediction is fully confirmed. There are no languages with an evidential subcategory of Inference that do not also have the evidential subcategories of Deduction and Event Perception; and there are no languages with an evidential subcategory of Deduction that do not also have the evidential subcategory of Event Perception. And if a language has only one evidential marker from the three in (30), it is one expressing Event Perception. These three possibilities may or may not be combined with an evidential marker of Reportativity, which is almost omnipresent, but lacks in one language otherwise rich in evidentiality. Reportativity may also be the only evidential marker of a language. Its high frequency is in accordance with the results of Aikhenvald's (2003: 31) typological study.

The systems of Parkatêjê, Yuhup, and Sanuma deserve special attention. In Parkatêjê the evidential particle *mӗr* may be used to indicate that the speaker has arrived at a certain conclusion through Deduction on the basis of sensory evidence, or through Inference based on existing knowledge. These two meanings are located at two contiguous layers of evidential marking, so that the overlap in meaning is in accordance with our prediction, which is based on contiguity.

A variant of this situation manifests itself in Yuhup: in this language the marker *hó* indicates that an event is perceived directly through the auditive channel, or that its occurrence is deduced on the basis of auditive information. Again, these two meanings are contiguous on the evidential hierarchy presented in (30).

A last case of contiguity is exemplified by Sanuma. In this language the marker *noa/no* may be used both for Deduction and for Reportativity. Though these two meanings, due to the restrictions of a two-dimensional medium, are not represented contiguously in Table 8, they are contiguous in the theoretical framework we are using here. As indicated in Section 2.4, in the course of a

Table 8: Evidential subcategories in the languages of the sample (* = same marker)

Level	Representational			Interpersonal
Evidential	Event perception	Deduction	Inference	Reportative
Desano	+	+	+	+
Hup	+	+	+	+
Jamamadí	+	+	+	+
Kamaiurá	+	+	+	+
Karo	+	+	+	+
Mamaindê	+	+	+	+
Parkatêjê	+	+*	+*	+
Sabanê	+	+	+	+
Sanuma	+	+*	+	+*
Tariana	+	+	+	+
Tuyuca	+	+	+	+
Wanano	+	+	+	+
Apalaí	+	+	+	
Matses	+	+	+	
Carapana	+	+		+
Cubeo	+	+		+
Lakondê	+	+		+
Nambikwara	+	+		+
Pirahã	+	+		+
Waiwai	+	+		+
Yanomamɨ	+	+		+
Ye-pâ-masa	+	+		+
Yuhup	+*	+*[10]		+
Guajá	+			+
Huariapano	+			+
Jarawara	+			+
Yaminahua	+			+
Dâw				+
Karitiana (Panoan)				+
Kokama-Kokamilla				+
Nheengatú				+
Surui				+
Trumai				+
Urubu-Kaapor				+

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10 There is a further dedicated marker of deduction.

grammaticalization process grammatical markers may step over from a representational to an interpersonal function. For this step to occur, it is not necessary for a marker to first complete the entire representational chain given in (30); crossover may occur at any point in this hierarchy. The combination of the representational function of Deduction with the interpersonal function of Reportativity falls therefore within the scope of our prediction.

Apart from confirming our prediction, Table 8 also shows that it is not uncommon for all four different evidential subcategories that we propose to occur side by side within the same language. This is the case in 12 sample languages from 8 different major families. An example of a language with all four subcategories is Desano:

(44) Desano
    Bãdu   *yɨ*   *tĩgi-re*   *paa-**pɨ***   Reportativity
    Manuel   1.SG   brother-SPEC   hit-REP.3.M.SG
    'Manuel hit my older brother.' (hearsay)
    (Miller 1999: 66)

(45) Desano
    bɨ̃ʔɨ̃   *yoaro-ge*   *aʔhra-y-a*   Inference
    2.SG   far-LOC   come-INFER-NON3
    'You must have come a long way.' (based on what I know of your habits.)
    (Miller 1999: 67)

(46) Desano
    pisadã   *wai-re*   *ba-di-gɨ*   *árĩ-**bɨ̃***   Deduction
    cat   fish-SPEC   eat-PST-M.SG   be-DED.3.M.SG
    'The cat must have eaten the fish.' (you can see his paw marks on the ground where he ate it).
    (Miller 1999: 68)

(47) Desano
    gɨa   *õ-ge-re*   *era-**bɨ***   Event Perception
    1.PL.EXCL   here-LOC-SPEC   arrive-NON3.PERC.PST
    'We arrived here.'
    (Miller 1999: 65)

The data presented in this section lend strong support for the evidentiality hierarchy in (30). Other such hierarchies have been presented in the literature and we will briefly compare them with ours here.

Willett (1988) presents the hierarchy in (48):

(48) attested ⊂ reported ⊂ inferring

In this hierarchy the category *reported* is in the wrong position. As Table 7 shows, there are languages which have event perception (Willett's attested subcategory), deduction, and possibly inference (the latter two falling within Willett's inferring subcategory), but no reportedness (Willett's reported category). Cases in point are Apalaí and Matses.

de Haan (1998) presents the hierarchy in (49):

(49) visual ⊂ non-visual ⊂ inferential ⊂ quotative

The first three subcategories mentioned here seem to have a position compatible with our hierarchy, as de Haan's visual and non-visual subcategories fall within our subcategory of event perception, while de Haan's inferential subcategory covers our deduction and inference subcategories. His quotative subcategory, however, which corresponds to our subcategory of reportativity, is in the wrong position if checked against our data. Our sample contains many languages with just reportativity within their evidential system, and others that do have event perception and reportativity but no deduction or inference.

A hierarchy proposed in the literature that comes close to ours is the one presented in Faller (2002). It is given in (50):

(50) visual ⟨ second ⟶ third
auditory → other sensory → inf-result → inf-reason → assumption
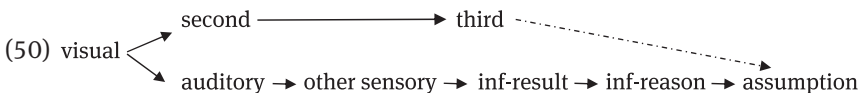
Faller (2002) argues that there should be two implicational pathways, both from visual to assumption, one passing through the area of reportativity, and another through the remaining categories. The second pathway is compatible to a high extent with our hierarchy, as Faller's first three subcategories (visual, auditory, other sensory) fall within our subcategory of event perception, her subcategory of inference on the basis of resulting evidence (inf-result) corresponds with our subcategory of deduction, and her subcategory of inference on the basis of reasoning (inf-reason) corresponds to our subcategory of inference. Faller herself raises the question whether assumption properly belongs in an evidential hierarchy or should rather be placed in a modal hierarchy. Faller's first pathway runs from her subcategory visual to second hand reportative (second) and third hand reportative (third). She tentatively poses a further possible

connection between reportatives and assumption. This implicational relation is contradicted by our data. As in the case of Willett's and de Haan's hierarchies, counterexamples are those in which a language has reportativity but no event-perception in its evidential system. Nevertheless, it is interesting to see that Faller creates a separate pathway for reportativity thus attempting to solve the difficulty of integrating it in an evidential hierarchy. We take one step further and claim it does not belong in the hierarchy at all, as it originates at a different level of the grammar.

7.3 Evidential systems

The restrictions on the co-existence of evidential subcategories also restrict the number of possible evidential systems. On the basis of the generalizations that can be derived from the data presented in Section 7.2 we may conclude that Table 9 provides a complete overview of possible evidential systems in terms of the four subcategories that we distinguish, ignoring possible further subdistinctions within each category. Systems are presented in pairs in Table 9, such that in each case variants of systems with and without reportativity are juxtaposed. For the sake of completeness we also include the system characterized by the absence of evidentiality markers.

Aikhenvald (2004) is the first publication in which a systematic classification of evidential systems is attempted. It is therefore interesting to compare our classification with hers. The result of this comparison is given in Table 10. Aikhenvald

Table 9: Classification of evidential systems and their manifestation in the sample

Level	Representational			Interpersonal	# lgs in sample
Evidential system	Event perception	Deduction	Inference	Reportativity	
1a	+	+	+	+	12
1b	+	+	+	−	2
2a	+	+	−	+	9
2b	+	+	−	−	0
3a	+	−	−	+	4
3b	+	−	−	−	0
4a	−	−	−	+	7
4b	−	−	−	−	30
Total					64

Table 10: Comparison of our classification of evidential systems with that of Aikhenvald (2004)

Level	Representational			Interpersonal	Aikhenvald
Evidential system	Event perception	Deduction	Inference	Reportativity	(2004)
1a	+	+	+	+	C2, D1
1b	+	+	+	−	
2a	+	+	−	+	B1, B4, C1, C3
2b	+	+	−	−	B2
3a	+	−	−	+	A4, B3
3b	+	−	−	−	A1, A2, A5
4a	−	−	−	+	A3, B5
4b	−	−	−	−	

(2004) uses the number of evidential choices in a language as the point of departure, A corresponding to a language with two evidential choices, B to one with three choices, C to one with four and D to one with five. Since our classification is based on the subcategories represented and not on the number of actual choices within each of these, various categories from Aikhenvald's classification may correspond to one of ours. For instance, corresponding to our evidential system 2a we find Aikhenvald's systems B1 (direct, inferred, reported), B4 (non-visual, inferred, reported), C1 (visual, non-visual, inferred, reported), and C3 (direct, inferred, reported, quotative). Note that the terms used here are the ones Aikhenvald applies as explained in Table 4. To give just one example of how these relate to our subcategories: in Aikhenvald's system C1 visual and non-visual are instances of event perception, inferred corresponds to our deduction, and reported to our reportativity. Overall, all Aikkenvald's systems fit into our more generalized classification.

It is interesting to note that there are no instances of our type 1b in Aikhenvald's sample, which has to do with the overall predominance of reportativity. Yet there are two languages in our sample that, on the basis of the existing documentation, do not seem to have reportativity as an evidential category: Matses and Apalaí. These two languages do not form part of Aikhenvald's sample.

Given the virtual omnipresence of reportativity in evidential systems, our classification of evidential systems or the absence thereof could be reduced to the one presented in Table 11.

We will use this classification in the following section, which explores the areal and genealogical distribution of these systems.

Table 11: Generalized classification of evidential systems and their manifestation in the sample

Level	Representational			Interpersonal	# lgs in sample
Evidential system	Event perception	Deduction	Inference	Reportativity	
1	+	+	+	(+)	14
2	+	+	−	(+)	9
3	+	−	−	(+)	4
4	−	−	−	(+)	37
Total					64

7.4 Areal and genealogical distribution

On the basis of the generalized classification of evidential systems in Table 11 the following preliminary observations can be made with respect to the distribution of these systems across the native languages of Brazil.

A clear genealogical pattern can be distinguished in the case of three families. All Nambiquaran languages in the sample (Lakondê, Mamaindê, Sabanê, Nambikuára) exhibit either system 1 or system 2. The same is true of the Tucanoan languages (Carapana, Cubeo, Desano, Tuyuca, Wanano, Yepâ-masa) and the Yanomam languages (Sanuma, Yanomami) in the sample.

In the case of other language families there is a mixed pattern. For instance, in Panoan we find systems 1 (Matses), 2 (Huariapano, Yaminahua), and 4 (Amahuaca, Katukina, Kaxinawá, and Shanenawa); in Tupi-Guarani systems 1 (Kamaiurá), 3 (Guajá), and 4 (Guajajara, Guarani-Mbyá, Kokama-Kokamilla, Nheengatú, Parintintín, Urubu-Kaapor); in Macro-Gê systems 1 (Parkatêjê) and 4 (all other Macro-Gê languages in the sample); in Maku systems 1 (Hup), 2 (Yuhup), and 4 (Dâw, Nadëb); in Arawakan systems 1 (Tariana) and 4 (all other Arawakan languages in the sample).

It seems reasonable in these cases to look for an areal explanation of the different patterns within a single family. Such an explanation offers itself, for instance, for the Maku family. The languages Hup and Yuhup are spoken in the vicinity of Tucanoan languages, while Dâw and Nadëb are not. Indeed Epps (2008: 30) and Ospina Bozzi (2002: 65) comment on a high degree of language contact between Hup and Yuhup respectively on the one hand, and Tucanoan languages on the other. Vicinity to Tucanoan languages probably also explains the exceptionally rich evidential system of Tariana as compared to the other Arawakan languages in the sample (Aikhenvald 2003: 7). Similar explanations are not

immediately evident in other cases, or seem to be rather unlikely, as for instance in the case of Kamaiurá (Seki 2000: 38–39).

8 Implicational relations between evidential meanings (quantitative)

A third prediction we formulated in Section 4 is that the hierarchy in (30) will have a quantitative correlate, such that the categories at the lower end of the hierarchy will have more subdistinctions within them than the ones at the higher end. This prediction follows from the expectation that new distinctions typically arise at the lowest evidential layer, are closer to their lexical origin, and will only in some cases make it to higher layers. Table 12 contains the data necessary to check this prediction. The data underlying Table 12 are given in Table 6.

The actual numbers involved do not allow firm conclusions here, but the data as far as available do confirm the general prediction. Along the hierarchy in (30) the number of languages with subdistinctions decreases, and reportativity behaves independently of this.

The common subdivision within the subcategory of event-perception establishes an opposition between visual and non-visual perception, as illustrated in the Mamaindê Examples (26) and (27) in Section 3.8. This is also the case of Wanano, Tuyuca, Kamaiurá, Tariana, Ye'pâ-masa, Lakondê and Jarawara. In all these languages, the non-visual concerns evidence perceived by all the senses excluding vision. An interesting different division occurs in Nambikuara. In this language, it is possible to express whether an event was perceived by the speaker alone or by the speaker and the hearer:

(51) Nambikuara
      *wa³kon³-ø-**na²hõ³**-la²*
      work-3.SG-**PERC.VIS.1**-PF
      'He worked yesterday.' (I tell you what I have seen.)
      (Kroeker 2003: 87)

Table 12: Semantic distinctions within the subcategories of evidentiality

Level	Representational			Interpersonal
Evidential	Event Perception	Deduction	Inference	Reportativity
Languages with subtypes	10	3	0	5

(52) Nambikuara
  *wa³ko³n-a¹-**tai¹ti²tu³**-wa²*
  work-1.SG-**PERC.VIS.1/2**-IMPF
  'I worked yesterday.' (You and I saw it)
  (Kroeker 2003: 88)

The distinction between individual (53) and collective (54) also applies to Deduction in Nambikuara:

(53) Nambikwara
  *wa³kon³-ø-**nũ²hõ³**-la²*
  work-3.SG-**DED.1**-PF
  'He must have worked yesterday.' (The deduction of the event is based on something that the speaker saw.)
  (Kroeker 2003: 87)

(54) Nambikwara
  *wa³kon³-ø-**te³nait¹ti²tu³**-wa²*
  work-3.SG-**DED.1/2**-IMPF
  'He must have worked yesterday.' (The event is deduced by the speaker and the hearer based on evidence available to both.)
  (Kroeker 2003: 89)

The reportative has interesting subtypes too. Apart from the Mamaindê Examples (28) and (29) discussed above, reportative evidentiality is also split into two subtypes in Jamamadí, which has a similar system as Mamaindê. In Nambikwara the split is determined by the question whether the communicated content was reported to just the speaker or to the speaker as well as the hearer, and in Lakondê and Wanano the decisive factor is whether the communicated content was reported by an identifiable or non-identifiable source.

9 Conclusion

In this paper we presented a new classification of evidential subcategories based on the treatment of grammatical categories in Functional Discourse Grammar. The resulting classification draws a sharp line between reportativity on the one hand, and event perception, deduction, and inference on the other. The latter three subcategories enter into an implicational hierarchy, while reportativity forms a subcategory in its own right. We found confirmation for our

classification and hierarchy in the co-existence and co-occurrence of evidential subcategories in the languages of a broad sample of native languages of Brazil. We furthermore showed that our hierarchy makes better predictions than existing ones, mainly as a result of the separation of reportativity from all other subcategories of evidentiality.

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Appendix A: Abbreviations

1 = first person, 1/2 = first + second person, 2 = second person, 3 = third person, AFFECT = affected, CERT = certainty, COMPL = completive, DECL = declarative, DED = deduction, DEP = dependent, DIR = directional, DU = dualis, DYN = dynamic, EX = existential, EXCL = exclusive, F = feminine, FNS = final nominal suffix, IMM = immediate, IMPF = imperfective, IND = indicative, INFER = inferential, INGR = ingressive, LOC = locative, M = masculine, NEG = negative, NF = non-feminine, NMZR = nominalizer, NON1 = non-first person, NON3 = non-third person, NONVIS = non-visual, NONWITN = non-witnessed, OBJ = object, PERC = event perception, PF = perfective, PL = plural, POSS = possessive, PRES =present, PST = past, REC = recent, REM = remote, REP = reportative, SBJ = subject, SG = singular, SPEC = specific, VIS = visual, VS = verbal suffix, WITN = witnessed.

Appendix B: Descriptions of sample languages

Amahuaca
Russel, Robert L. 1965. *A transformational grammar of Amahuaca* (Pano). Columbus, OH: Ohio
State University MA thesis.
Apalaí
Koehn, Edward H. & Sally S. Koehn. 1986. Apalaí. In Desmond C. Derbyshire & Geoffrey K.
Pullum (eds.), *Handbook of Amazonian languages*, vol. 1, 33–127. Berlin & New York:
Mouton de Gruyter.
Apinayé
Callow, John C. 1962. *The Apinayé language: Phonology and grammar*. London: School
of Oriental and African Studies dissertation.
Ham, Patrícia. 1961. *Apinayé grammar*. Brasília: Summer Institute of Linguistics.
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of the Apinayé language]. Cuiabá, MT: Sociedade Internacional de Lingüística.
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Apinajé language]. *Série lingüística* 5. 301–330.
Aweti
Borella, Cristina Cássia. 2000. *Aspectos morfossintáticos da língua Aweti* [Morphosyntactic
aspects of the Aweti language]. Campinas: Universidade Estadual de Campinas MA thesis.
Baré
Aikhenvald, Alexandra Y. 1995. *Bare*. Munich: Lincom Europa.
Carapana
Metzger, Ronald G. 1981. *Gramática popular del Carapana*. Bogotá: Ministerio de Gobierno.
Cubeo
Morse, Nancy L. & Michael B. Maxwell. 1999. *Cubeo grammar*. Arlington, TX: Summer Institute
of Linguistics and the University of Texas at Arlington.
Dâw
Martins, Silvana Andrade. 2004. *Fonologia e gramática Dâw* [Phonology and grammar of Dâw].
Amsterdam: Vrije Universiteit Amsterdam dissertation.
Desano
Miller, Marion. 1999. *Desano grammar*. Arlington, TX: Summer Institute of Linguistics and the
University of Texas at Arlington.
Fulniô
Meland, Douglas. 1968. *Fulniô grammar*. Brasilia*:* Summer Institute of Linguistics.
Guajá
Magalhães, Marina Maria Silva. 2007. *Sobre a morfologia e a sintaxe da lingua Guajá (Família
Tupí-Guaraní)* [About the morphology and syntax of the Guajá language (Tupi-Guaraní
family)]. Brasilia: Universidade de Brasília dissertation.
Guajajara
Bendor-Samuel, David. 1972. *Hierarchical structures in Guajajara*. Norman, OK: Summer
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Guarani-Mbyá
Martins, Marci Fileti. 2003. *Descrição e análise de aspectos da gramática do Guarani Mbyá*
[Description and analysis of aspects of the grammar of Mbyá Guarani]. Campinas:
Universidade Estadual de Campinas dissertation.

Guató

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Huariapano

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Hup

Epps, Patience. 2008. *A grammar of Hup.* Berlin & New York: Mouton de Gruyter.

Jamamadí

Campbell, Robert. 1977. Marcadores de fonte de informação na língua Jamamadí [Markers of information source in the Jamamadí langauge]. *Série lingüística* 7. 117–126.

Jarawara

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Kadiwéu

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Kanoê

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Karitiana

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Karo

Gabas Jr., Nilson. 1999. *A Grammar of Karo, Tupi, Brazil.* Santa Barbara, CA: University of California Santa Barbara dissertation.

Katukina (Panoan)

Aguiar, Maria Sueli. 1994. *Análise descritiva da língua Katukina-Pano* [A descriptive analysis of the Katukina-Pano language]. Campinas: Universidade Estadual de Campinas dissertation.

Katukina-Kanamari

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Kaxinawá

Montag, Susan. 2004. *Lições para a aprendizagem da língua Kaxinawá* [Materials for the study of the Kaxinawá language]. Lima: Ministerio de Educación.

Kokama-Kokamilla

Yopán, Rosa V. 2010. *A Grammar of Kokama-Kokamilla*. Eugene, OR: University of Oregon dissertation.

Kuikuro

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Kwaza

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Lakondê

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Macushi

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Mamaindê

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Matses

Fleck, David. 2003. *A grammar of Matses*. Houston, TX: Rice University dissertation.

Maxacalí

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Rikbáktsa
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Sabanê
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