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Evidential subtypes and tense systems in Brazilian Native Languages

Subtipos evidenciais e sistemas temporais nas línguas nativas do Brasil

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ABSTRACT

The aim of this paper is to illustrate the possibility of interaction between Functional Discourse Grammar and typological studies by examining the relationship between evidentiality and tense in a sample of native languages of Brazil. More specifically, it shows that the nature of the mental process involved in the construction of evidential meaning determines its combination with different dimensions of past, present and future.

Key-words: *evidentiality; tense; Functional Discourse Grammar; typology.*

RESUMO

Este estudo ilustra a possibilidade de interação entre a Gramática Discursivo-Funcional e os estudos tipológicos, examinando a relação entre evidencialidade e tempo em um conjunto de línguas nativas do Brasil. Mais especificamente, mostra que a natureza do processo mental envolvido na construção do significado evidencial determina a sua combinação com diferentes dimensões do passado, presente e futuro.

Palavras-chave: *evidencialidade; tempo; Gramática Discursivo-Funcional; tipologia.*

1. Introduction[1]

This study discusses the relationship between evidentiality and tense in a sample of Brazilian native languages. In this sense, it builds on previous studies (Hengeveld; Hattnher, 2015, Dall'Aglio-Hattnher, 2012) that illustrate the possibilities of interaction between the theoretical framework of Functional Discourse Grammar (FDG; Hengeveld; Mackenzie, 2008) and typological studies.[2] In particular, it expands the study presented in Hattnher (2013) which deals exclusively with the relationship between tense and the expression of event perception and deduction evidentials.

In this study, the relationship between tense and evidentiality will be analyzed taking into account the four evidential subtypes identified

1. *Abbreviations*: 1 = first person, 1/2 = first + second person, 2 = second person, 3 = third person, / = constituency boundary, AFFECT = affected, AUG = augmentative, CERT = certainty, COMPL = completive, CONN = connective, DECL = declarative, DED = deduction, DIST = distant, DIR = directional, DS = different subject DU = dualis, DUR = durative, DYN = dynamic, EMPH = emphatic, ERG = ergative, EX = existential, EXCL = exclusive, EXT = extent of action, F = feminine, FNS = final nominal suffix, FOC = focus, FUT = future, HUM = human, imm = immediate, IMP = imperative, IMPF = imperfective, INCH = inchoative, IND = indicative, INFER = inferential, INGR = ingressive, INTNSF = intensifier, INTER = interrogative, LOC = locative, M = masculine, MU = moment of utterance, N = neuter, NCLF = noun classifier, NEG = negative, NF = non-feminine, NMZR = nominalizer, NON1 = non-first person, NON3 = non-third person, NONPST = non-past, NONVIS = non-visual, OBJ = object, PERC = event perception, PF = perfective, PL = plural, POSS = possessive, PRS =present, PROX = proximate, PST = past, PUNCT = punctual, REC = recent, REM = remote, REP = reportative, SBJ = subject, SG = singular, SPEC = specific, SS = same subject, TEL = telic, VIS = visual, VS = verbal suffix.
2. Cf. Hengeveld & Mackenzie (2010) for a general description of the FDG model in English or Hengeveld & Mackenzie (2012) for the same outline in Portuguese.

in Hengeveld and Hattnher (2015). More specifically, I intend to see to what extent the nature of the mental process involved in the construction of evidential meaning determines its combination with different dimensions of past, present and future.

In order to do this, a sample of native languages of Brazil with grammatical expression of the categories of evidentiality and tense will be analyzed. The criteria for composition of the sample will be described in Section 2. The classification of evidentiality proposed by Hengeveld and Hattnher (2015), which is the basis of the analysis proposed here, will be summarized in Section 3. A description of the tense systems of the languages from the sample, based on Hattnher (2013) will be provided in Section 4. Finally, an analysis of the relationship between tense and the expression of the four evidentiality subtypes is proposed in Section 5. The results will be discussed in Section 6 and Section 7 will provide some conclusions.

2. The sample

As can be seen in Aikhenvald (2004), which presents the analysis of more than 500 languages with a grammatical evidential system, multiple evidential systems are quite common among the indigenous languages of Brazil, which is why these languages were chosen to constitute the corpus of this research.

To discuss the interaction between time and evidentiality, I will analyze the same sample of native languages of Brazil used by Hengeveld and Hattnher (2015) to propose the identification of four types of evidentiality, and by Hattnher (2013) to analyze the interaction between tense, deduction and event perception.[3] As already highlighted in these studies, although there are a large number of native languages of Brazil, it is difficult to draw a sample that fulfills the valid typological criteria, since only few of these languages have been described. For this reason, all 64 languages with a full description to which I had access at the time of my research are included in the sample. Of these languages, 34 present at least one grammaticalized evidential subtype;

3. Cf. Kapp (2013) for a similar discussion on tense and evidentiality in languages in which these two categories are expressed by different morphemes.

in 14 of these languages tense marking is mandatory and, of these, 11 languages have a complex evidential system.

As Aikhenvald and Dixon (1988: 69) show, the interaction between evidentiality and tense may involve dependencies in two different directions: Evidentiality > {Tense and Aspect} or Tense > Evidentiality. In the first direction, the choices available in a combined tense/aspect system depend on the choice that is made in the evidentiality system. In the second direction, the choices available in the evidentiality system depend on the choice that is made in the tense system. In order to verify the interaction between tense and evidentiality, it is necessary to exclude languages with a facultative evidential or tense system from the sample. As Aikhenvald (2004: 79) says,

> In languages where evidentiality is fused with tense, or with tense-aspect, the option of omitting an evidential is dependent on whether the corresponding tense or tense-aspect is obligatory or not. In Jarawara evidentiality is obligatory within an optional tense system. If the speaker chooses not to mark tense, he automatically chooses not to express an evidential.

One methodological question still needs to be clarified. The descriptive material used to compose the sample is quite diverse, consisting of grammars with a high degree of detail, theses, dissertations and articles. Some of these materials do not (indeed cannot) cover every detail of the evidential systems of the languages in question. When the descriptive material available on one language did not address in detail the evidential category, it was not included in the sample, even if an evidential system has been identified in that language. In the end, out of 34 languages (representing 15 language families) characterized by at least one type of grammatically expressed evidentiality, it was possible to compose a sample of 11 languages with a complex evidentiality system (representing 6 language families). These languages are given in italics in Table 1:

Table 1 – Languages with evidential system included in the sample (in italics)

LANGUAGE FAMILY	SAMPLE LANGUAGES*
ARAUAN	*Jamamadí*, Jarawara
ARAWAKAN	*Tariana*
CARIB	Apalaí, Waiwai
GE-KAINGANG	Parkatêjê,
MAKU	Dâw, Hup, Yuhup
MURA	Pirahã
NAMBIQUARAN	*Lakondê*, *Mamaindê*, *Sabanê*, Nambikuára
PANOAN	Huariapano, *Matses*, Yaminahua
TRUMAÍ	Trumaí
TUCANOAN	*Carapana*, Cubeo, *Desano*, *Tuyuca*, Wanano, *Ye'pâ-masa*
ARIKEM	Karitiana
MONDE	Surui
RAMARAMA	Karo
TUPI-GUARANI	Guajá, Kamaiurá, Kokama-Kokamilla, Nheengatú, Urubu-Kaapor
YANOMAM	*Sanuma*, Yanomami
TOTAL	**34**

3. The evidential systems in the sample

The theory of Functional Discourse Grammar of Hengeveld and Mackenzie (2008) regards evidentiality as a linguistic category that operates at both the Interpersonal Level (which accounts for the pragmatic motivations of linguistic formulation) and the Representational Level (which accounts for the semantic motivations). At the Interpersonal Level Hengeveld & Mackenzie (2008) distinguish *Reportative modality* and at the Representational Level the authors distinguish *Inferential modality* and *Event perception.* These three categories are in a clear hierarchical relationship, since event perception, operating at the layer of the State-of-affairs, is within the scope of inferential modality, operating at the layer of the Propositional Content, which in turn is within the scope of reportative modality, operating at the layer of the Communicated Content (C).

Hengeveld and Hattnher (2015) extended the tripartite classification of evidentiality proposed by Hengeveld and Mackenzie (2008), identifying four types of evidentiality (on the basis of scope considerations). In this section I will summarize this classification,

*. The names of the languages are cited as they are used by the authors of the main reference grammars on which this research is based.

which forms the basis of the analysis of the relationship between evidentiality and tense provided below.

(i) **Event perception (PERC)**, which operates at the layer of the State-of-Affairs at the Representational Level, signals whether an event was witnessed directly by the speaker. In all languages of the sample we find evidentials to signal that the evidence perceived by the speaker is visual (1) or non-visual (2):

(1) TUYUCA (Barnes 1984: 257)
díiga apé-wi
soccer play-PERC.VIS.PST
'He played soccer.' (I saw him play.)

(2) YE'PÂ-MASA (Ramirez 1997: 130)
kãdêkẽ' uú-sa-bĩ
cock speak-PRS.PERC.NONVIS.3-FSG
(I hear that) the cock crows.

(ii) **Deduction (DED)**, which operates at the layer of the Episode, indicates that the information the speaker presents is deduced on the basis of current evidence; the speaker did not witness the Episode itself, but he/she is able to deduce its occurrence via the perception of some resulting evidence. This type of evidential is present in all languages of the sample. 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). In (3), the speaker obtained his/her knowledge through a deduction on the basis of visual evidence.

(3) TARIANA (Aikhenvald 2003: 288)
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).'

Although deduction is mostly based on visual evidence, the speaker may also base his/her deduction on any other kind of sensory evidence, as pointed out by Hengeveld and Hattnher (2015). The example in (4) shows a deduction based on olfactive evidence in Sabanê:

(4) SABANÊ (Araújo 2004: 143)
Kieylali-k kan-n-tika hala-n-dana
Peccary-OBJ to die-VS-PST.DED to stink-VS-PRS.PERC.NONVIS
'The peccary died; (because) it stinks.'

(iii) **Inference (INF)**, which operates at the layer of the Propositional Content at the Representational Level, indicates that the speaker infers a certain piece of information based on his/her existing knowledge. In Sanuma (5), the evidential particle *kite* is used when the information conveyed comes from inference, which is based on a known pattern of behavior of the subject of the sentence:

(5) SANUMA (Borgman 1990: 172)
töpö hu-lali kite
3.PL come-PRES.LOC INF
'(I suppose) they are coming (from upstream).

This is the only subtype of evidentiality that does not occur in all languages of the sample. In the evidential system of Carapanã, Lakondê and Ye'pâ-masa, there is no marker to express that an information is not an attested or deduced one. In all other languages of the sample, if the speaker does not have any evidence to the information he/she is conveying but he/she infers it based on his/her personal knowledge or in general knowledge, the inferential evidential is used.

(iv) Reportativity (REP), which operates at the layer of the communicated content at the Interpersonal Level, indicates that the speaker is not expressing his/her own cognitive material, but is passing on the opinions of others. This is the most frequent evidential subtype, Matses being the only language in the sample without a reportative marker.[4] In Lakondê (Telles & Wetzels, 2006: 240) the suffix *–setaw* ('someone (identifiable) told me') is used in this reportative function:

(6) LAKONDÊ (Telles & Wetzels 2006: 240)
ta'wę̣n 'teh-'naw ta-'ą̨jh-wi-setaw-'tãn'
woods path-LOC DIR-walk-1.DU-REP-IMPF
'Let's walk to the path in the woods, someone (identifiable) told me.'

4. Fleck (2003: 419) claims that "when one wishes to report an event that he has learned about by word of mouth, the honest way to relate it is through direct quotation using one of two quotative verbs, -que 'say (intransitive)' and ca (tell, say to (transitive).'

When the original source of the information is diffuse or unidentifiable, the reportative suffix -'*seʔ* ('I have heard' or 'somebody said to me') is used:

(7) LAKONDÊ (Telles & Wetzels 2006: 240)
ã-'pat-ho'te-'ten-'seʔ-ø-'tãn-hi
SBJ-leave-for.sb-DES-REP-3S-IMPF-N
'She is going to leave it for me, I heard'

Similar subdivisions of reportative evidential are present in other languages of the sample. Mamaindê and Wanano have different markers to secondhand and third hand sources; Jamamadí is particularly interesting in that it allows one to mark whether the information is reported by an eyewitness or a non-eyewitness. In the other languages of the sample, the reportative evidential indicates that the source of information comes from a quotation or some other second-hand source, as in Sabanê:

(8) SABANÊ (Araújo 2004: 154)
m-ilup-i-tiaka-datinan
2OBJ-vomit-VS-REP-PST
'You vomited, they said'

The subcategories of evidentiality proposed by Hengeveld and Hattnher (2015) are primarily based on the semantics of evidential in the combination with the semantics of the layers within the FDG model. In the 11 languages of the corpus in which the tense mark is mandatory and the evidential system is complex, the four evidential subtypes proposed by the authors are identified in the way summarized in Table 2:

Table 2 – Evidential subcategories in the languages of the sample

LEVEL	**REPRESENTATIONAL**			**INTERPERSONAL**
EVIDENTIAL	PERC.EV	DED	INF	REP
Desano, Sabanê, Tuyuca, Jamamadí, Tariana, Mamaindê, Sanuma	+	+	+	+
Matses	+	+	+	
Lakondê, Ye'pâ-masa, Carapanã	+	+		+

These four subtypes are in a clear hierarchical relationship: *perception event*, operating at the State-of-Affairs layer (e), is within the scope of *deduction*, which operates at the Episode layer (p), which, in turn, is within the scope of *inference*, which operates at the Propositional Content layer (p), which, final, is within the scope of *reportative* evidential, which operates at layer the communicated content (C).

The acceptance of this hierarchical relationship implies the assumption that the evidential subtypes behave differently with respect to the scope relation they establish with other grammatical categories such as tense. This prediction will be tested against data from a sample of native languages of Brazil in Section 5. First, I will present the tense systems of these languages.

4. The tense systems in the sample

The languages in the sample exhibit a great variety of time concepts, reflected in different tense systems. Some languages make a distinction between two groups, according to different criteria: past vs non-past; present vs past; future vs non-future or past vs future. Most of them organize the tense in three groups, present, past and future, with or without subdivisions as recent, remote or very remote, as it is shown in Table 3:

Table 3 – Relevant tense distinctions in the languages of the sample

LANGUAGES	RELEVANT TENSE DISTINCTIONS
Sabanê, Sanuma, Jamamadí, Tariana, Carapanã, Desano	present vs past vs future
Tuyuca, Ye'pâ-masa	present vs past
Matses	past vs non-past
Mamaindê, Lakondê	past vs future

But even if the divisions of the tense systems are the same, it is possible that they do not correspond to the same period of time for at least two important reasons: differences in the semantic values considered in each grammatical tense; and differences in the reference point used to localize the timespan related to the tense. I will discuss these topics separately.

The main differences related to the semantic value of the tenses in the languages of the sample may be summarized as follows:

PRESENT is the tense with the least variation. Usually, the present covers the moment of utterance, as in Desano (9), but it may also be used to refer to an event that took place immediately before the time of utterance, as in Mamaindê (10), or to a general truth, as in Ye'pâ-masa (11):

(9) Desano (Miller 1999: 65)
deko bẽrẽ-ro ii-a
water fall-N do-NON3.PRES
'It is raining.'

(10) Mamaindê (Eberhard 2009: 456)
ta-tukwinʔni-tu na-ʔaik-tu tau-lat^{h}a-Ø-wa
PS1-father.in.law-FNS PS3-field-FNS chop-S3- PRS.VIS-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)

(11) Ye'pâ-masa (Ramirez 1997: 127)
bũhî-pũu opâ + s~~ɨtɨ~~ dĩî-bĩ
Sun autotroph +circular be-PRS.VIS.3-FSG
'The sun is round.'

FUTURE usually means any moment after the moment of utterance, as in Sanuma:

(12) SANUMA (Borgman 1990: 21)
Kaikana te ku-ki kite
headman 3:SG be-FOC INF.FUT
'He will be a headman.'

In Sanuma, as in several other languages of the sample, the *future* tense also expresses modality, since it indicates, with different levels of certainty, that an event will occur. According to Campbell (1977), this is also the case in Jamamadí, language in which the different levels of certainty are expressed in two types of future: next future (nothing important will happen before) and remote future (another important event will happen before).

PAST is a tense with more variation. Desano distinguishes between recent and remote past. According to Miller (1999), *recent past* refers to events that have just occurred or which occurred in the past two weeks; *remote past* refers to an event that happened any time before recent past; present tense refers to an event that is taking place at the moment of utterance.

Another interesting difference is attested in Jamamadí (Campbel 1977), which has a more elaborated system for expressing past tense, with three subdivisions. *Recent past* refers to events that took place in the last two years or even more recently, while *remote past* refers to a period of time several years before the moment of utterance including the more distant memory of the speaker. But, as the author points out, the *remote past* tense does not refer to the first infancy because, although the speaker is physically present at the time reported, he/she cannot retain this period in his/her memory. *Very remote past* refers exclusively to legends, indicating that somebody (X) says something a long time ago and the speaker (Y) was not present at that moment. A similar system is found in Matses (Fleck 2003), with four types of past tense: recent past (around a month ago), distant past (from one month to fifty months ago), remote past (from fifty to one hundred years) and narrative past, used to refer to myths and histories that took place before the birth of the speaker.

Another very important aspect to be considered in the analysis of the relation between tense and evidentiality is the type of reference point used to localize the timespan related to each tense. In the languages of the sample it is possible to identify differences related to the organization of temporal reference: the time associated with the evidentiality may refer only to the moment of occurrence of the described event, only to the moment of acquiring information, or to the moment of occurrence of the event as well as to the moment in which the speaker has access to the evidence related to the event. As Aikhenvald (2003: 292) points out,

> the tense specifications of visual, non-visual and inferred evidentiality in Tariana combine reference to the time of the action and to the time when the information was acquired. The reported evidential differs from other evidentials in that tense specification refers exclusively to the time of the report. The time of the actual happening is irrelevant.

According to Rempel (2011) the languages of the sample are organized according to these two types of temporal reference in the following way: in Matses, Tariana and Tuyuca the temporal reference is mixed (tense refers to the moment of occurrence of the event and also to the moment in which the speaker has access to the evidence); in all the other languages of the sample, the temporal reference is only to the time of occurrence of the event.

Another aspect that may affect the interpretation of the tense systems is the fact that it is very common to find other semantic values expressed together with tense in a portmanteau morpheme. In the languages of the sample, tense is co-expressed with the habitual notions of mood and aspect and also with the notions of localization and person. In Sanuma, for instance, tense is co-expressed with evidentiality and location:

(13) SANUMA (Borgman 1990: 22) – *kule* = PRES + near the speaker
töpö ma apa kule
3:PL be.not INTNSF PRES:E.PERC.VIS:LOC
'There are no people at all (near the speaker).'

(14) SANUMA (Borgman 1990: 167) – *kulati* = PRES + far from the speaker
há Sanŏma tŏpŏ hila kulati
LOC Sanuma 3:PL be.on.ground PRES: E.PERC.VIS:LOC
'In that place (far from the speaker) the Sanumas are (seated) on the ground '

In Desano and Tuyuca, the evidential also expresses tense and person. In Ye'pâ-masa and Lakondê, not only evidentiality, tense and person, but also mood and aspect are expressed in a single morpheme. In Lakondê there is an interesting correlation between mandatory expression of evidentiality and polysemy: if the morpheme only expresses evidentiality, it is optional; if it simultaneously expresses evidentiality, tense and mood, then it is obligatory. This leads us to another feature that illustrates the complexity involved in a comparison between the tense systems of the languages of the sample: the obligatory or facultative character of the grammatical tense markers. In order to have a basic idea of the complexity of the relationship between tense

and evidentiality, it is necessary to take into consideration all these semantic variables. Section 5 presents the results reached so far.

5. Tense and evidentiality: a complex relationship

In previous work, the relationship between tense and two subtypes of evidentiality, event perception and deduction, was described in the same sample analyzed here. In this section, after summarizing the main results achieved in Hattnher (2013), I will expand that analysis to the four types of evidentiality.

The fact that there are portmanteau morphemes to express evidentiality and tense in all languages of the sample with obligatory evidential systems is strong evidence of the close relationship between these two categories. In order to describe all the possible combinations in the languages of the sample, I reanalyzed the different uses described in the grammars and descriptive materials consulted according to four timespans: present, recent past, remote past and future. This classification is only related to the conceptual-semantic value of the period of time expressed with the evidential marker; it doesn't mean that the languages express these values by specific morphemes although this may be the case in languages with a very specific tense system.

The results are presented below following the hierarchical order of evidentials proposed by FDG, from event perception to reportative evidential (see Section 3).

5.1. Tense contrast in event perception

As Fleck (2007: 595) points out, "experiential [event perception in FDG - Hengeveld & Mackenzie (2008) terms] refers to a situation where the speaker detects the occurrence of an event (or state), using any of the five senses, at the time that it transpires", which means that the occurrence of the perceived event and its detection have to be simultaneous. This meaning of the event perception evidential is mentioned in the grammars and descriptive material of several languages of the sample:

SABANÊ: "the present tense evidential suffix *–dana* assumes factuality of the sentence and implies the availability of sensory evidence" (Araújo 2004: 145).

MATSES: "The essential condition is that the speaker witnesses the event (using any of the five senses) *as the event happens*." (Fleck 2003: 402).

MAMAINDÊ: "The visual evidential indicates that the speaker witnessed the event firsthand." (Eberhard 2009: 455)

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." (Barnes 1984: 259)

As theses definitions show, the nature of the process involved in the construction of the evidential meaning restricts its combination with tenses to the timespan that includes the life experience of the speaker: the perceived event cannot be situated in the future or in a very remote past, before the lifetime of the speaker. This is the case in all languages of the sample. Examples of Mamaindê illustrate all the possible combinations of event perception evidential with present and past tenses:

(15) MAMAINDÊ (Eberhard 2009: 456) – Event perception + present tense
ta-tukwinʔni-tu na-ʔaik-tu tau-lat^{h}a-Ø-wa
POSS1-father.in.law-FNS POSS3-field-FNS chop-S3/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)

(16) MAMAINDÊ (Eberhard 2009: 456) – Event perception + recent past
wetwainʔ-tu na-waʔjona-t^{h}ã siha
girl-FNS PS3-menstruate-NCL.THING house
tai-hĩʔ hain-Ø-nan-wa
take.out-CONN.THEN.DS sing-S3-PERC.VIS.REC.PST-DECL
After taking the girl out of her puberty hut, they sang (earlier today) (and I know this because I was there early this morning and witnessed it)

(17) MAMAINDÊ (Eberhard 2009: 456) – Event perception + remote past
jahon ʔaik-tu tanik-taʔ n ãn-Ø-hĩnʔ-wa
old.man field-FNS bury-CONN.AND.SS cry-S3-REM.PST.PERC.VIS-DECL
They buried the old man in the field and cried (many years ago)
(and I know this because I was there as a youngster and witnessed it.)

Besides the differences related to the moment at which the event occurred, which is necessarily the moment of the perception of the event, present and past tenses add some interesting values to the semantics of the evidential that derive from the fact that the event is directly experienced by the speaker. The **present tense evidential** in Sabanê (Araújo 2004) assumes factuality of the sentence; in Sanuma (Borgman 1990), it also implies a spatial proximity to the speaker; in Matses (Fleck 2003), it indicates that the event being reported is presently being witnessed directly:

(18) SABANÊ (Araújo 2004: 145)
kolopanun-k wola silu-n-dana
meal-OBJ a lot to be tasty-VIS-PRS.PERC
'The meal is too salty.'

(19) SANUMA (Borgman 1990: 166)
hi ai kutiata pö kalol(o)–a kulai
this another canoe 3.PL float-DUR PRS.VIS.PERC.LOC
'There are other canoes floating here (beyond the trees)'

(20) MATSES (Fleck 2003: 427)
is-Ø a-bi cho-**e**-c
see-IMP there-EMPH come-NONPST.VIS.PERC-IND
'Look! Here, he comes now.'
Lit. 'Look! There he is coming.'

As already pointed out in Hattnher (2013: 53), "the number of forms to express the combination of **event perception + past** varies a lot, but they are all related to specific meanings that 'past' acquires in each language". In spite of this variation, it is possible to combine event perception with any past tense included in the lifetime of the speaker.

Table 4 summarizes this result:

Table 4 – Tense contrasts in the event perception evidential

EVENT PERCEPTION	Present	Recent Past	Remote Past	Future
Tuyuca, Mamaindê, Sanuma, Desano, Tariana, Sabanê, Jamamadí, Matses, Lakondê Ye'pâ-masa, Carapanã	+	+	+	-

5.2. Tense contrast in deduction

The semantic meaning of deduction also imposes some restrictions on its combination with tense. In the grammars and descriptive materials of all languages of the sample the notion of deduction is used to describe situations in which the speaker did not witness the event itself, but is able to deduce its occurrence from the perception of some resulting evidence. The definitions below illustrate this meaning:

> DESANO: "The speaker using the inferred evidential [deduction in FDG terms] does not see the event happening but makes an inference about it based on some evidence that he sees." (Miller 1999: 67)

> MAMAINDÊ: "The inferred evidential [deduction in FDG terms] indicates that the speaker deduced the information through circumstantial evidence." (Eberhard 2009: 458)

> TARIANA: "The 'specific inferred' evidential [deduction in FDG terms] 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)

> TUYUCA: "An apparent evidential [deduction in FDG terms] is used when the speaker draws conclusions from direct evidence". (Barnes 1984: 260)

> CARAPANÃ: "The speaker uses the evident past tense to give an information about an action that, although he/she did not witnessed it, he/she witnessed the result or results of such action. (Metzger 1981: 28)

As pointed out by Hengeveld and Hattnher (2015: 486), "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."

As mentioned in Hattnher (2013), the fact that there are two events involved in the semantics of deduction has very specific consequences for its combinability with tense. First, it is possible that only the deduced event is expressed, leaving the evidence perceived by the speaker implicit. In this case, the perception of one event in the present is the basis for the speaker to affirm that the deduced event occurred in the past. This combination with past, in which deduced events are always seen as completed, occurs in all languages of the sample. Examples (22) and (23) illustrate the possible combinations:

(21) SANUMA (Borgman 1990: 171)
a ko-ta-põ-ma thai
3:SG return-EXT-FOC-CMPL DED.REC.PST
'She returned home.' (The speaker did not see her when she returned, but saw the girl afterward at home.)

(22) TARIANA (Aikhenvald 2003: 288)
tʃinu niwhã-nihka di-na
dog 3.SG.F+bite-REC.PST.DED 3.SG.NF-OBJ
'The dog bit him (I can see unmistakable signs of a dog's teeth on his hand).'

Second, in languages in which the tense refers to the moment when the speaker perceives the resultant evidence, the combination of deduction with present tense is natural. This is the case in three languages of the sample: Sanuma, Mamaindê and Tuyuca. Barnes (1984: 261) reports that, in Tuyuca, this combination of deduction and present tense is rare and it does not exist for first person. Examples from the other two languages are:

(23) SANUMA (Borgman 1999: 170)
makö lope -o opa noa
2:PL fast -PUNCT INTENS DED.PRS
'It is evident that you were really fast.'

(24) MAMAINDÊ (Eberhard 2009: 459)
ta-tukwinʔni-tu ʔaik-tu tau-Ø-sihna-wa
PS1-father.in.law-FNS field- FNS chop-S3-DED.PRS-DECL
My father in law is clearing the field (and I know this because he and his axe disappeared)

There are also some restrictions on the combination of deduction and present tense. These restrictions, as well as those on the combination of deduction and past tense are determined by two factors: (i) the present involves spatial separation and concomitance between the detection of evidence and the event; (ii) the past does not necessarily involve spatial separation, but it always presupposes a temporal distance - that is, in languages which do not present deduction in the present, the deducted events are always seen as concluded. Some examples of these two cases of perception are:

(25) Mamaindê (Eberhard 2009: 459)
ta-tukwinʔni-tu ʔaik-tu tau-Ø-sihna-wa
PS1-father.in.law-FNS field-FNS chop-S3-PRS/DED-DECL
My fafther in law is plowing the field (and I know this because he and his axe disappeared)

(26) Desano (Miller 1999: 68)
pisadã wai-re ba-di-gɨ árĩ-bĩ̃
cat fish-SPEC eat-PST-M.SG be-DED.3.M.SG
'The cat must have eaten the fish (I can see his pawprints where it ate)

Although it is logically possible to deduce that an event took place at a moment before the speaker was born, the combination of deduction and very remote past was not found. In languages with a specific marker for this tense, this marker can only be used with the reportative evidential.

The possibilities of deduction combining with the present or past tense can be explained as follows (see Hattnher 2013):

– the present tense necessarily involves spatial distance and concomitance between the detection of evidence and the reported event. In (26) above, the speaker is not in the same

space as his father-in-law clearing the field, otherwise he/she would have used an event perception evidential;

– the past necessarily involves a temporal distance, since deduced events are always seen as concluded in languages which do not present deduction in the present

Table 5 summarizes all possible combinations of deduction evidential and tense:

Table 5 – Tense contrasts in the deduction evidential

DEDUCTION	Present	Recent Past	Remote Past	Future
Desano, Tariana, Sabanê, Jamamadí, Matses, Lakondê, Ye'pâ-masa, Carapanã	-	+	+	-
Tuyuca, Mamaindê, Sanuma	+	+	+	-

5.3. Tense contrast in Inference

Inferences are based solely on the knowledge of the speaker, which means that they do not involve the availability of direct sensorial evidence, or on the speaker receiving information from some other source, as shown in the definitions below:

DESANO: "The assumed evidential [inference in FDG terms] 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." (Miller 1999: 66)

MATSES: "What is meant by 'conjecture' [inference in FDG terms] here is that the speaker wishes to report the occurrence of an event or state that he did not witness, did not hear about from somebody else, and for which there is no resulting evidence." (Fleck 2003: 417)

TUYUCA: "Assumed [inference in FDG terms] is used when the speaker has prior knowledge about the state of things or about habitual or general behavior patterns." (Barnes 1984: 262)

Since the general knowledge on which the speaker bases his/her inference is always available to him/her at the moment of utterance, the time of inference is strictly related to the moment of utterance; the time of the occurrence of the event reported as inferred, however, may be any moment in the present, past or even the future, as in Sanuma:

(27) DESANO (Miller 1999: 67)
suʔri koe-go ii-kū-bō pera-ge
clothe wash-F.SG to make-INFER.PRS-3.F.SG port-LOC
'I guess she is washing the clothes at the river port'

(28) SANUMA (Borgman 1990: 28)
ulu te ohi ipö kite
kid 3:SG hungry AUG INFER.PRES/FUT
'I suppose the kid is/is going to be hungry'

(29) Desano (Miller 1999: 67)
b ɨʔɲɨ yoaro-ge aʔhra-y-a
2s far-LOC come-INFER.REC.PST-NON3
You have come a long way (it appears).

(30) Jamamadi (Campbell 1977: 3)[5]
awi ama siratokanameteke
'The blood of the tapir was spread' (mete = INFER)

(31) Tuyuca (Barnes 1984: 262)[6]
universidádpɨ̃ bũé-hĩyo
She attended a college (the speaker infers that the did since she is a teacher)

As Aikhenvald (2004: 277) points out,

> a future tipically includes an element of prediction concerning something unwitnessed and of subsequent lack of certainty. It can easily come to be associated with a description of events which the speaker has not witnessed personally, and of which they can only talk on the basis of an educated guess, an inference, as well as assumption or hearsay.

5. Glosses are not available in the reference material.
6. Glosses are not available in the reference material.

Despite this logical possibility, Sanuma is the only language in the sample with the combination of inference and future tense.

There are languages that distinguish between deduction and inference through time. In Desano, for example, it is possible to have inference + present - which is absent in the deduction - and this combination is possible because there is no relation between the detection of an evidence and a later conclusion. On the other hand, the deduction and inference match the same tenses in various languages

Some differences between inference and deduction may be related to the mental process involved in these types of evidentiality: inference is triggered by an internalized knowledge that is available for the speaker, while deduction is triggered by detection of a sensory evidence, which means that the time of the inference may include any point in the past, as time of deduction must be accessible to the speaker. This is why, in Desano (Miller 1999), it is possible combine inference with present tense, but not deduction and present tense, since the deduction evidence results from a completed event.

Table 6 summarizes all those possibilities of combination between the inference evidential and tense:

Table 6 – Tense contrasts in the inference evidential

INFERENCE	Present	Recent Past	Remote Past	Future
Sanuma	+	+	+	+
Tuyuca, Desano	+	+	+	-
Mamaindê, Tariana, Sabanê, Jamamadí, Matses	-	+	+	-

5.4. Tense contrast in reportative evidentials

Reportativity is intrinsically related to past tense, as is clear from the description of this type of evidential in several languages of the sample:

> MAMAINDÊ: "The reported second hand evidential /-satau/ is used to report what one has learned from others, typically without citing the original source". (Eberhard 2009: 460)

TARIANA: "The use of reported evidentials is restricted to information that was learned from someone else". (Aikhenvald 2003: 302)

TUYUCA: "A secondhand evidential [reportative evidential in FDG terms] is used whenever the speaker is reporting information that was relayed to him about a state or event of which he has no firsthand knowledge whatsoever. In general, secondhand evidentials are clearly past and are used for legends as well as for recent reports". (Barnes 1984: 261)

In all languages of the sample with reportative, this evidential marker also expresses at least one subtype of past tense. According to the type of temporal reference, the past tense indicates that the speaker acquired the information at a moment previous to the moment of utterance (33) or indicates that the reported event took place in the past (34):

(33) YE'PÂ-MASA (Ramirez 1997: 142)
uti-a-po'
to cry-REC.PST.REP.3+FSG
(I heard that) she cried.

(34) DESANO (Miller 1999: 66)
bɨ̃ʔɨ̃ miercoles árĩ-kɨ̃ bõʔbẽ-a -yo-ro
2s wednesday be-SR work-REC.PST.REP-NON3
You worked on Wednesday (I heard that from your wife)

In languages in which the temporal reference is the moment at which the reported information is acquired it is also possible to have the combination of reportative evidencial and present. This is the case in Tariana, Mamaindê, Sanuma and Lakondê. The occurrences (35) and (36) illustrate the combination of reportative evidential with present and past tenses:

(35) TARIANA (Aikhenvald 2003: 292)
Tiago di-ñami-pida
Tiago 3.SG.NF-to die-PRES.REP
'Tiago died' (the speaker hás just received this information)

(36) TARIANA (Aikhenvald 2003: 292)
Tiago di-ñami-pidaka
Tiago 3.SG.NF-to die-REC.PST.REP
'Tiago died (the speaker received this information in the past few days)

In languages in which the temporal reference is the moment of the event, the past tense may be extended indefinitely and is often used to refer to myths or legends. This is the case in Ye'pâ-masa:

(37) Ye'pâ-masa (Ramirez 1997: 142)
dɨpódo-pɨ ûhudi wekɨ̂-de wẽhé-kã'-pɨ'
Once-FOC box turtle tapir-REF to kill-ASS-REM.PST.REP.3-FSG
'It is said that once the box turtle killed the tapir".

Reportative evidentiality does not accept future tense in any language of the sample since it involves evidence of a past or ongoing event.

The combinations of tense and reportative evidential are summarized in Table 7:

Table 7 – Tense contrasts in reportative evidentials

REPORTATIVE	Present	Recent Past	Remote Past	Future
Mamaindê, Tariana	+	+	+	-
Sanuma, Lakondê	+	+	-	-
Tuyuca, Sabanê, Desano, Jamamadí, Ye'pâ-masa, Carapanã	-	+	+	-

6. Discussion

The results show that, although the temporal systems of the languages in the corpus vary widely, it is possible to detect some regularities. In order to highlight these regularities, this section compares the constraints on some of the subtypes of evidentiality involved.

6.1. Event perception x deduction[7]

– The event perception evidential does not accept very remote past and future

– Deduction occurs with all tenses, except for the future

Since in the event perception the state-of-affairs that is perceived through one of the senses has to be accessible to the speaker, it is natural that the combination of event perception with tense is restricted to the lifetime of the speaker. In FDG terms, event perception operates at the layer of the state-of-affairs, as it is the state-of-affairs that is directly perceived.

Since in deduction the perception of one event in the present is the basis for the speaker to affirm that the deduced event occurred in the past, deduced events are always seen as completed. Its combination with present is allowed in languages in which the tense value combined with the evidential refers to the moment when the speaker perceives the resultant evidence (present) rather than the moment of the deduced event (past). In FDG terms, the perceived event (e_i) is always established in relation to the deduced event (e_j), which confirms the relative temporal location as the basic characteristic of deduction.[8]

6.2. Deduction x inference

– Deduction occurs with all tenses, except for the future.

– Inference occurs with all tenses even in the future.

Although it was possible to identify several languages in the corpus with clear expressions of deduction and inference, the results did not show a systematic difference in their relationship with tense. The restriction to the combination with future is related to the mental process involved in evidentiality: inference is triggered by an internalized knowledge that is available to the speaker, while deduction is triggered

7. Cf Hattnher (2013) for a more detailed discussion on event perception and deduction.
8. Cf. Hattnher (2013) for the arguments to support this claim.

by the detection of sensory evidence, which means that the inference may include future events, while deduction can only relate to events in the past or the present. As Hengeveld and Hattnher (2015: 485) explain, inference indicates that the speaker "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 FDG terms, this means that inference operates at the layer of the Propositional Content at the Representational Level, the layer that deals with mental constructs as represented in the speakers' mind.

6.3. Reportative x all the other three evidentials

– Reportative evidentials do not accept future tense because they involve evidence of a past or ongoing event.

Since the reportative necessarily involves information that the speaker obtained from someone else, its combination with future tense seems to be logically impossible. But, as Hengeveld and Hattnher (2015: 484) claim, "the message content contained in a discourse act is characterized as transmitted rather than originally produced." In FDG terms, this means that reportativity operates at the layer of the Communicated Content at the Interpersonal Level, which means that it is in a higher position in the hierarchical organization of layers and levels. Its higher scope is reflected in the fact that the report introduced by this evidential may contain all kinds of material related to the original speaker, which means that the speaker may provide information that he/she received about an event in the future. In languages in which the reference point is not the time of acquiring the information, but of the actual event, it is possible to have a combination of reportative evidential and future. Although this combination does not occur in the languages of the sample, it is attested in Tucano (West 1980), another native language of Brazil. Aikhenvald (2003) also refers to evidential systems in which reportative is combined with all tenses, future tense included. The author describes systems in which the reportative evidential is not restricted to any tense and systems in which "the reportative evidential may have more tense distinctions than others"

(Aikhenvald 2003:264), which is in accordance with the hierarchy proposed by FDG.

7. Conclusion

The data shows that there are few absolute restrictions on the combination of evidentiality with specific tenses. The differences in the reference point used to localize the timespan related to each tense add complexity to the relationship between evidentiality and tense. Most combinations that seem to be deviant are easily explained if these differences in the organization of the temporal reference are taken into account, since the time associated with the evidentiality may refer only to the moment of occurrence of the described event or may refer to the moment in which the speaker accesses the evidence related to the event he/she describes. Nevertheless, despite the variation in the tense systems of the languages in the corpus, the FDG approach to evidentiality allows us to establish some regularities and it can be said that, in the languages of the sample, it is the semantics of evidentiality that determines the tense options.

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