

The Languages of Amazonia*

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DRAFT - UNDER REVIEW

1. Introduction

Amazonia is a linguistic treasure-trove. In this region, defined roughly as the area of the Amazon and Orinoco basins, the diversity of languages is immense, with some 300 indigenous languages corresponding to over 50 distinct 'genealogical' units – language families or language isolates for which no relationship to any other has yet been conclusively demonstrated; as distinct, for example, as Japanese and Spanish, or German and Basque (see section 12 below). Yet our knowledge of these languages has long been minimal, so much so that the region was described only a decade ago as a "linguistic black box" (Grinevald 1998:127). Despite considerable strides made in recent years, just a fraction of the region's languages have been well described, and many are spoken today by only a handful of people.

* The present article began as an extended review of work on Amazonian languages in the ten years that followed the publication of Dixon and Aikhenvald's *The Amazonian languages*. While we believe that we have identified some of the major lines of theoretical research that have been shaping the field in the last decade, we do not claim to be comprehensive in our bibliography or in enumerating currently active researchers, nor do we attempt to provide an assessment of the current situation of the languages and their speakers, or of the extent to which they are documented and described. For such ends, the reader should consult Moore (2007) and the overviews cited in the last section. We wish to thank the numerous colleagues that have contributed bibliographical references and materials in pre-publication stage; these are cited in the bibliography. Epps' contribution was partially funded by NSF grant HSD-902114. The authors' names are in alphabetical order.

The value of these languages cannot be overestimated. To their speakers, of course, they represent part of a rich cultural heritage. For linguists, they contribute a wealth of information to shape our understanding of human language more generally. Many Amazonian languages reveal structures and categories that contradict assumptions about what is possible and impossible in language (see Dixon and Aikhenvald 1999:1, C. Everett 2010, Campbell forthcoming). A now classic example is that of basic (i.e. 'default') word order: It was assumed until a few decades ago that a basic object-before-subject order was impossible, until studies of Hixkaryana (Carib),¹ Urubu Ka'apor (Tupi-Guarani), and other Amazonian languages proved this to be false.

The study of Amazonian languages is of fundamental relevance to anthropologists. Not only is linguistic understanding a critical part of the participant-observer paradigm, but it informs our understanding of culture in profound ways, and vice versa, as captured in the Boasian model and in Hockett's dictum (1973:675) that "linguistics without anthropology is sterile, anthropology without linguistics is blind" (see also Evans and Dench 2006:16). The question of how culture, via discourse, may shape the emergence of grammatical structures over time is a fascinating one (e.g. Sapir 1949 [1933], Hill 2006, Evans 2003). Similarly, elements of grammar are the building blocks of discourse, which in turn maintain and create systems of communicative practice and verbal art. As Sherzer (1987:297-300) eloquently observes, "it is because grammatical categories are economical and efficient ways of expressing meaning... that they often have a poetic feel

¹ Scholars vary in the conventions preferred for representing language family names; e.g. Arawak(an), Tukano(an).

to them and seem to touch at the heart of the genius of a language and especially the language-culture-thought relationship". Elements of grammar are "a resource, a potential, a way of conceiving and perceiving the world which [a] language offers and which is made salient by entering into a web and network of associations actualized in discourse, especially artistic discourse... The resulting depth, thickness, and intricacy is what Clifford Geertz finds characteristic of culture" (1987:299-300).

Nevertheless, linguists and anthropologists have often had little to say to one another in the decades following Boas and Sapir. Approaches to the study of language have tended to focus on grammar, often to the explicit exclusion of cultural considerations, while many anthropologists have been content to leave language mostly to the linguists. Currently, however, as linguists refocus their attention on the world's linguistic diversity, a renewed appreciation for the cultural context in which these languages are spoken is emerging. In Amazonia and elsewhere, ethnographically grounded research is now seen as a prerequisite for rich and comprehensive linguistic documentation (e.g. Lehmann 2001, Franchetto 2006). Likewise, as many languages cease to be spoken, scholars and communities alike consider the implications of language shift for cultural and artistic practices (e.g. Hale 1992, Woodbury 1993).

There is much to be gained from a renewal of dialogue between scholars of language and scholars of culture, and this is nowhere truer than in Amazonia. We hope to contribute to this goal by presenting here a survey of some of the most intriguing topics in Amazonian linguistics, intended for a primary audience of anthropologists. We present as comprehensive a view of the Amazonian languages as possible by addressing a

broad range of topics, from sound systems and grammatical categories to discourse and language relationship. As we note in our conclusion, our discussion reflects the considerable advances that have been made in the field of Amazonian linguistics over the last decade.

2. Phonological features

The emergence of particular sounds and sound patterns in a language is grounded in the biomechanics of articulation and perception, directing language change along paths that are to some degree predictable and independent of cultural considerations (for a recent systematization of this idea, see Blevins 2004). However, the spread of such innovations throughout a speech community is a largely social process, informed by associations drawn between particular people and particular ways of speaking. While in most cases the *quality* of the sound(s) in question probably has little to do with this process, at least some phonological features appear to be more prone to adoption by speakers and thus relatively easily spread. This is particularly true of prosodic phenomena, or sound patterns that affect whole words or phrases, probably because these are associated with discourse-level qualities of speech (such as accent; see Matisoff 2001, Urban and Sherzer 1988). In this section, we focus on the prosodic features of nasality and tone, and examine a number of patterns that are strongly attested in the Amazon region, and are either less frequent or absent elsewhere.

Nasality. In many Amazonian languages, vowel inventories often include a contrast between plain and nasalized vowels. Contrary to vowel nasality in European languages,

which can be easily reconstructed as deriving from a following nasal consonant, vowel nasality in many Amazonian languages is inherent in the vowels themselves.² In fact, in many of these languages there is no contrast between oral and nasal consonants (e.g. *b* vs. *m*), and the realization of nasality in consonants depends on the adjacent vowels, rather than the other way around. An oft-discussed example of this phenomenon come from the Jê language Apinayé (Callow 1962; for a theoretical discussion see Anderson 1976), as illustrated in (1).

(1) *Behavior of voiced stops in Apinayé*

Before nasal vowels: *mõr* ‘go (pl.)’

Before oral vowels: *^mbor/bor* ‘cut down’

After nasal vowels: *kõm* ‘drink’

After oral vowels: *ob^m/ob* ‘dust, flakes’

Analogous examples abound in Tupi, East Tukano, Nadahup (Makú), Arawak, and other families. Various experimental studies have recently been conducted regarding the production of these contour consonants (cf. Demolin et al. 2006, Storto and Demolin 2009), and there is still room for a great amount of discussion regarding their proper representation. Where nasality is always associated with the entire morpheme or word (or occasionally syllable), rather than with particular segments, some analyses have

² This is not true across the board, however: in Pano languages, nasality works not unlike nasality in Romance languages, being present in vowels only when they are followed by an *n*. This nasal consonant has disappeared from syllable-final environments in certain languages, giving the impression of inherently nasal vowels, as in French or Portuguese.

proposed that nasal prosody may be best understood as a morpheme- or syllable-level feature, rather than as a property of either consonants or vowels specifically (e.g. Barnes 1999:211, Kaye 1971).

The manifestation of nasality in Amazonian languages has practical implications for the development of orthographies. Linguists and communities must negotiate the fact that orthographies derived from European languages – while already familiar to speakers literate in Spanish or Portuguese – represent nasality in consonants rather than vowels or syllables. A compromise must be sought between an accurate representation of the indigenous language's phonological system and the need to facilitate learning by maintaining some consistency across different orthographic conventions.

Another feature of Amazonian nasal prosody that has attracted linguists' attention is *nasal harmony*. Harmony in phonology refers to long-distance assimilation of a particular feature affecting a certain class of segments. The best-known examples of this are the vowel harmony processes found in Turkic and Uralic languages, where the back and/or rounded qualities of vowels in lexical roots are assimilated by vowels in associated morphemes (such as suffixes), and in many West African languages, where harmony involves vowel tenseness; a type of vowel harmony like that of West African languages has been identified in the Macro-Jê language Karajá (Ribeiro 2002). What is far more common in Amazonia (and quite rare elsewhere) is the phenomenon of nasal harmony, where nasality spreads to several segments within a certain domain, even at a considerable distance. We give an example from Paraguayan Guarani (from Gregores and Suárez 1968), which (though not actually spoken in Amazonia), properly typifies a

process found in its many Tupi relatives and in several unrelated Amazonian languages:

(2) *Guaraní nasal harmony*

nõ-rõ-nũpã-ĩ 'I don't beat you'

ⁿdo-ro-haihu-i 'I don't love you'

nõ-rõ-hẽⁿdu-i 'I don't hear you'

In these three forms, the same two prefixes and one suffix are attached to three different stems. If the stressed (final) vowel of the verb stem is nasal (as in *nupã* 'beat'), all the voiced segments in the word are also nasal. If the stressed vowel of the verb stem is oral (*haihú* 'love'), the voiced segments in the word will also be oral, with voiced stops having a small amount of pre-nasalization. Finally, where a prenasalized voiced segment is present in the stressed syllable, all preceding voiced segments within the word are also nasal, while those that follow are unaffected.

This nasal harmony is not simply mechanical coarticulation, as some segments are explicitly skipped (i.e., *p* is not nasalized, as it is voiceless). In addition, nasal harmony is sensitive to morphological domains within the word in very subtle ways, as has been shown in particular for East Tukano languages (e.g. Kaye 1971, Peng 2000).

The suprasegmental aspect of nasality (i.e., that it seems to 'hover' over a large domain, rather than being tied to a particular segment) is a rather striking Amazonian phenomenon, which brings nasalization close to tonal phenomena. In fact, there are perceptual similarities between vowel nasalization and other prosodies, such as

glottalization (often a concomitant of low tone). Vowel nasality has been found to be triggered by adjoining glottal consonants in languages such as Pirahã (Sandaló 1989) and Paresi (Romling 2008); see also Matisoff (1975). Moreover, the language families that have long-distance nasal harmony are families where tone is also found. In the Tupi family, tone is found in several branches of the family (see references below), although it is prominently absent from Tupi-Guarani, where nasal harmony is most prominent. In other language families tone and nasal harmony are found side by side. An interesting perspective for research, therefore, is establishing whether there is a link between nasalization and tone or a glottal prosody in the history of particular Amazonian languages.

Tonal phenomena. Distinctive lexical tone, defined as a difference in pitch that may constitute the sole difference between two lexical items, is strongly represented in the languages of East Asia and sub-Saharan Africa, and is present in a number of other languages in the rest of the world. In Amazonia, tone has been described in the Tupi (Moore 1999, Picanço 2005), Tukano (e.g. Gómez-Imbert and Kenstowicz 2000, Gómez-Imbert 2001, Stenzel 2007), Záparo (Michael forthcoming), and Nambiquara (Eberhard 2007) families, as well as in a few languages in the Arawak language family, and in several smaller language families and isolates of western and southwestern Amazonia, such as Tikuna (Montes Rodrigues 1995, Soares 1996), Urarina (Olawsky 2006), Bora (Weber & Thiesen 2000, Seifart 2005), among others.

Tone is still an area where research is incipient, and we can say little of great generality. In a recent survey of Amazonian tone systems, Hyman (2010) argues that

most tonal Amazonian languages contrast high, low, and/or the absence of tone; contour tones (those where the pitch level rises or falls within a single vowel) and other tone values are largely a surface-level phenomenon, i.e. an effect of interactions between tones and the association of tones to particular tone-bearing units (syllables or moras); see also Yip (2000). In many Amazonian languages, tone is attracted to the stressed syllable, with tonal contrasts being absent in less prominent syllables; such systems are often referred to as 'pitch-accent', although Hyman (2009, 2010) argues that this terminology obscures the fact that these languages are indeed tonal.⁴ Hyman (2010) observes that a comparison between Amazonian tone systems and those found elsewhere in the world, as well as the correlations between tone and other features such as metrical stress, syllable structure, and laryngealization, "suggest a relatively recent development of tone in at least some language families in South America". Much work remains to be done to arrive at a better understanding of Amazonian tone systems and how they compare to tone systems elsewhere in the world.

⁴ Prominence (word stress, sometimes also called accent) and tone are logically independent notions. In many languages that do not have tonal contrasts, the stressed syllable is indicated by a rise in pitch (i.e., the same acoustic feature associated with high tone). For this reason, one might think of languages with stress contrasts (such as English, which has pairs such as *pérvert* vs. *pervért*) as being impoverished tone languages. A full tonal system would allow four different combinations of H and L tones in a bisyllable, as opposed to the two possibilities afforded in stress languages. In so-called 'pitch-accent' languages, a tonal contrast can be made only on the stressed syllable, resulting in two possibilities if the position of the stress is fixed. This simplified presentation of the typology does not address the possibility that prominence might play a role in tone languages, and that it might be expressed other than by a rise in pitch in stress languages. For an overview, see Yip (2000), Hyman (2001).

3. Nominal classification

We turn now to some of the morphosyntactic structures that have attracted particular interest in the study of Amazonian languages. One of these is nominal classification, the grammatical categorization of nouns. Classification systems are found in many Amazonian languages, including those of the Arawak, Tupi, Macro-Jê, Tukano, Nambiquara, Yanomami, Bora, and other families. Amazonian data have played a major role in typological studies of noun classification (Grinevald 2000, Grinevald and Seifart 2004, Aikhenvald 2000, etc.).

Amazonian languages display a range of classification systems. The more grammaticalized variants are the noun class or gender systems, of which European languages like Spanish and German provide familiar examples. Such systems tend to be obligatory and to involve a small number of classes by which nouns are distinguished, the assignment of nouns to classes has limited semantic motivation, and the system typically functions to register agreement (concord) between nouns and adjectives, numerals, and other elements (see Grinevald 2000:56-58, 62, Aikhenvald 2000, Corbett 2006). In Amazonian languages, noun class (gender) systems are encountered in a number of families, including Arawá (where all or most nouns are either masculine or feminine, Dixon 1999:298) and Chapacura, of which the Wari' language provides an excellent example of the complexity that may be apparent in a system where the assignment of nouns to classes is semantically only partly opaque: The 'feminine' category includes human females, collective nouns, and mixed groups of males and females; in the 'masculine' category we find human males, animals, and culturally

significant objects; and the 'neuter' set includes most inanimates, newly introduced objects/animals/plants, etc. (Everett and Kern 1977; see also Aikhenvald and Dixon 1999:360).

Noun classifiers, on the other hand, are typically more like words than grammatical elements. Classifier systems tend to have a relatively large number of classes, to which the assignment of nouns is semantically more or less transparent; classifiers usually function to derive new words, as opposed to marking agreement; and the occurrence of classifiers may be limited to only some nouns, or to only a few nominal contexts (Grinevald 2000:62, Aikhenvald 2000). The distinction between noun class and classifier may be considered a continuum, and noun class systems may in general derive historically from the more lexical classifiers (e.g. Grinevald 2000).

In Amazonia, the variety and complexity of classifier systems is mind-boggling. Some languages of the Bora family, for example, have as many as several hundred dedicated classifiers. Other languages, such as those of the East Tukano family, allow the noun itself to fill the classifier slot (as a 'repeater') when no classifier form is available (see Aikhenvald 2000, Barnes 1999:218). Semantic bases for classification vary widely; in Nambiquaran languages, for example, humans are classified by gender, inanimates by shape, function, etc., and animals are unclassified; in East Tukano and some Nadahup (Makú) languages, animates are classified by gender, inanimates by shape, etc.; and in some Arawak languages (e.g. Baniwa do Içana) humans are classified by gender, inanimates by shape, etc., and animals by both gender and shape. Shape-based and related categories in these languages include such basic notions as 'round things' and

'flat things', but can also include more esoteric concepts like that of loose bark on a tree, applied by extension to baggy pants and plywood (East Tukano; Barnes 1999:219).

One of the most intriguing features of noun classification systems is the fact that the membership of particular classes (as defined by the use of particular classifying morphemes) may seem at first glance to be arbitrary and hodge-podge, but is often informed by culturally significant associations among entities, as Lakoff (1987) and Dixon (1982) have famously argued for the Australian language Dyirbal. Entities may be assigned to sets – or, over time, reassigned – on the basis of culturally specific experience, including mythologically grounded belief systems. A remarkable example is given by Hill (1988), who describes the noun classes in Wakú (also known as the Curricaro dialect of Baniwa/Kurripako). These include such sets as 'large catfish species, machete fish, vines, snakes, fishing lines'. While some of these associations relate to physical qualities (e.g. vines, snakes, and fishing lines are all long, thin, and flexible), others are mythologically based; in this set, the large catfish is the namesake of a ceremonial trumpet that is bound with a vine rim, itself named 'two-snakes'. While the membership of noun classes is largely fixed for a given speaker (as is true of noun classification systems cross-linguistically), Hill shows that the same processes that are responsible for the organization of these classes over time are also observable in ritual *málikai* chants, where nouns are also grouped into classes (largely distinct from those in the everyday language), but are freely manipulated by specialists. For example, while a chant-owner may usually name the yellow curassow bird in the 'bird animal spirit' class defined by the Wakú *málikai* genre, he may choose to name it in the 'fish and aquatic

(Lowe 1999:281), and ‘my parrot’ as ‘I-DOMESTIC.ANIMAL parrot’ in Bahwana Arawak (Aikhenvald 1999a:84). Classifiers may also occur with verbs, as in Baniwa do Içana (Arawak) *wa-dzekata-kazu-pa* [we-make-PURPOSE-CL(BUNDLE)] ‘(We shall go and cut palm leaf) to make a bundle (of it)’ (Aikhenvald 2007:489). While classifiers in many languages appear in only one such context, in Amazonian languages they frequently appear in multiple contexts, referred to as ‘multiple classifier systems’ (Aikhenvald 2000, Grinevald and Seifart 2004:79); as such, they arguably serve an agreement function that is more commonly associated with noun classes rather than classifiers:

(4) *ha-dapana* *pa-dapana* *pani-si* *nu-ya-dapana*

DEM-CL:HOUSE one-CL:HOUSE house-NON.POSS 1sg-POSS-CL:HOUSE

hanu-dapana *heku na-ni-ni-dapana-mahka*

big-CL:HOUSE wood 3PL-make-TOPIC.ADV.VOICE-CL:HOUSE-REC.PAST.NON.VISUAL

‘This one big house of mine is made of wood.’ (Tariana, Arawak; Aikhenvald 1999a:83)

The characteristics of nominal classification systems are subject to change over time, sometimes motivated by contact with classification systems in other languages. An example of semantic change is found in Cubeo (East Tukano), which now classifies animals by both gender and shape (as opposed to gender only) due to influence from Baniwa (Arawak; Gomez-Imbert 1996). Morphosyntactic restructuring of a classifier system can be seen in Resigaró (Arawak), under influence from Bora (Aikhenvald 2000,

Seifart 2007:440). In Hup (Nadahup), a classifier system is newly emergent; its accommodation of culturally novel objects is illustrated by forms like *g'æt* 'leaf', which now classifies types of books and papers as well as kinds of leaves (Epps 2007a; see also Ospina Bozzi 2002 for Yuhup). Finally, it is noteworthy that many classifiers for inanimate objects in Amazonian languages are derived historically from plant-part terms, as is the case in Hup (Nadahup, Epps 2007a, 2008a), Apurinã (Arawak, Facundes 2000:183-201), and Yanomam (Yanomami, Goodwin-Gomez 2000:18-20, Perri Ferreira 2009), which can be attributed to the fact that plants in this region provide most of the raw materials for native manufactured items.

4. Numeral systems

The observation that Amazonian numeral systems tend to relatively low limits, when compared with numeral systems in many other parts of the world, has been a point of considerable recent interest (e.g. Everett 2005, Gordon 2005, Pica et al. 2004, Frank et al. 2008). In fact, a number of Amazonian languages arguably have no 'basic' numerals at all (i.e. terms whose primary or only use is to denote an exact quantity); for example, a term used to mean 'one' may also mean 'small quantity' (as in Pirahã, Mura family, the subject of much recent attention; see references above and section 10), 'two' may be equivalent to 'a few' (as reported for Nadëb, Nadahup family; Weir 1984:103), and quantities larger than two or three may simply be referred to as 'several' or 'many'. Such languages, and others whose numerals do not go above 'two', include Jarawara (Arawá; Dixon 2004:179-80), Krenak (Macro-Jê; Loukotka 1955:125), Jabuti (Macro-Jê;

Aikhenvald and Dixon 1999:358, cf. Ribeiro and Van der Voort to appear), Matsigenka (Pano; Fleck 2003:558), and Canela-Kraho (Macro-Jê; Green 1997:181).

Many other Amazonian languages have somewhat larger sets of fixed numeral expressions (commonly 1-3 or 1-5), but expressions for higher quantities are variable and transparent, typically involving terms for fingers and/or toes. In Hup (Nadahup; Epps 2006, 2008a), for example, 'six' may be expressed as 'another finger standing', 'one finger standing', 'another thumb', etc.; a similar situation is reported for languages like Emérillon (Tupi-Guarani; Rose 2003:195). Other systems display still less exact strategies, such as the tally system in Dâw (Nadahup; Martins 2004:265), in which quantities above 'three' are referred to only as 'even' (literally 'has a brother') and 'odd' (literally 'has no brother'), supplementing a gestural system involving paired fingers.

Even where the numeral systems of Amazonian languages include fixed, 'basic' forms, these are in many cases etymologically transparent. For example, in Mundurukú (Tupi; Pica et al. 2004:500), 'two' derives from 'arms', 'three' from 'two and one', and 'four' from 'two and one and one'. In Hup and several other members of the Nadahup (Makú) family, 'one' appears to derive from a demonstrative, 'two' from 'eyes', and 'three' from 'rubber-tree-seed' (which is distinctively three-lobed). A remarkable number of languages throughout Amazonia have terms for 'four' that involve that language's word for 'sibling', 'brother', or 'companion'; these include languages of the East Tukano, Arawak, Nadahup, Bora, Tupi-Guarani, Záparo, and other families (Epps 2006, Hansen and Epps forthcoming), suggesting that this expression may have spread widely via contact among speakers, perhaps facilitated by trade.

These features of Amazonian numeral systems are of considerable theoretical interest from several viewpoints. From the cognitive perspective of several recent studies (Gordon 2005, Pica et al. 2004, Frank et al. 2008), low numeral systems have been shown to correlate with a limited facility for exact calculation and enumeration of quantities, inviting questions of Whorfian causality. From a linguistic perspective, the low limits of many Amazonian systems and the etymological transparency of their low-level numerals are unusual relative to many other parts of the world, and Amazonian languages thus provide insights into how numeral systems may develop over time (Epps 2006, Hansen and Epps forthcoming). Moreover, the fact that numerals are not a universal property of human language suggests that, as Andersen (2005:22) observes, 'where numeral systems exist, they are a cultural attainment, that is, they have developed (or been borrowed from other languages) because they were culturally motivated'. Many authors have noted that the limits of numeral systems appear to correlate roughly with social structure and subsistence patterns, such that low-level systems are more typical of smaller, more egalitarian, and hunting/gathering-oriented groups (e.g. Winter 1999:43, Heine 1997:24); this correlation appears to hold across Amazonian groups as well (Epps and Hansen 2009). Finally, it is worth noting that many Amazonian languages have supplemented or replaced their indigenous numeral systems with borrowed Portuguese or Spanish terms. While such borrowing has undoubtedly been a part of numeracy for millennia, the result is that numeral systems are among the most endangered features of native languages in Amazonia and worldwide (Comrie 2005), and are thus a priority for documentation.

5. Tense and tenselessness

The importance of temporal notions in the comparative study of human languages and the universals of human cognition cannot be underestimated. It was a contrast between the organization of the tense systems of Hopi and English that led Whorf (1950) to advance his hypothesis of linguistic relativism. Tense systems are still among the most prominent domains of inquiry regarding the question of how much of linguistic structure is universal, and how much is language-specific.

Relatively little is known about tense systems in the Amazon region, as existing descriptions very seldom give details of the semantics of verbal inflectional categories. Dixon and Aikhenvald (1999:9) list as an areal trait the fact that verbal categories such as tense are expressed by *optional* suffixes. Though it is impossible to determine the pervasiveness of this trait from the available descriptions, it does indeed seem to be the case that many Amazonian languages are *weakly-tensed* languages, i.e., languages where tense may be left unexpressed, and the temporal anchoring of a particular proposition left to context or inference from properties of the event described by the predicate. This might contrast in a given language with the obligatoriness of evidentiality or aspectual marking.⁶

In what follows, we discuss how this is played out in Mebengokre, as described in Salanova (2007a,b) and subsequent work, which exhibits a number of features

⁶ One should note, however, that at least in the East Tukano languages tense is both obligatory and morphologically integrated to the verbal word.

commonly encountered in the verbal systems of Amazonian languages.

Měbengokre has the following properties: (a) verbs inflect for iterativity (see 'verbal number' in the next section) and for an aspectual distinction which we might call 'stativity'; these two categories are often expressed through suppletion of the verbal stem; (b) enclitics to the verb encode certain other aspectual distinctions ('be about to', 'finish', 'begin'); (c) optional 'particles' near the beginning of the clause encode future versus nonfuture tense, as well as other categories such as the hearsay evidential, the conditional or the hortative; tense in particular is normally omitted in non-future clauses. Though the majority of these elements are not explicitly temporal, they are associated by default with certain temporal interpretations. The following examples illustrate some of the mechanisms by which this occurs:

(5)a. *ba mỳja krẽn o nhỹ*

I something eat with sit

'I'm eating it (sitting down).' (lit., 'I'm sitting down with eating it.')

b. *ba mỳja krẽ*

I something eat

'I'm going to eat something.'

As can be seen, in (5a), a particular aspectual effect is achieved by 'borrowing' the inherent durative meaning of a positional verb. This in turn creates a present progressive meaning that contrasts with the imminent future meaning of the unmodified construction of (5b).

Further, since Měbengokre displays no morphological distinction between present and past, whether an event is complete or ongoing is often determined by the narrative context. By default, however, properties of the event described by the main predicate determine the temporal interpretation of the clause:

(6) a. *ba nē* *ba ku-by*

I NONFUTURE I it-grab

'I grabbed it'

b. *ba nē* *ba i-ngryk*

I NONFUTURE I I-angry

'I'm angry'

In both of these clauses, the tense indication is identical (nonfuture), yet whether the interpretation should be past or present depends on a characteristic of the main predicate. It is not always easy to determine, for a particular language, what this predicative property is that determines past or present interpretation. In Měbengokre we have claimed (Salanova 2007a) that the interpretation depends on stativity, that is, whether a predicate describes a relatively unchanging situation, or a dynamic and momentary event, which in turn is directly related to the morphological class of the

predicate: nominal predicates are stative, and are thus interpreted as present in constructions such as the above, while verbal ones are dynamic. The language employs the resource of nominalization to achieve particular aspectual effects with verbal predicates, as described in some detail in Salanova (2007b).

Systems of tense not unlike what we have described here for Mëbengokre are quite common in the Americas; they have been studied in greater detail in certain languages of North America, such as Mohawk (Baker 1997), Navajo (Smith 2007), Inuktitut (Bohnmeyer 2004), Yucatec Mayan (Bohnmeyer 2007), Blackfoot and Halkomelem (Ritter 2004, 2005), among others. We predict that this is an area of research where many interesting findings would be made if Amazonian languages were to be considered more closely.

A few Amazonian languages (to our knowledge, at least some members of the Arawak, Carib, Nambiquara, and Tupi-Guarani families; cf. Nordlinger and Sadler 2004) have morphological markers of temporality that occur on noun phrases. These are typically termed 'nominal tense' (although Tonhauser 2006 argues that they are primarily aspectual and modal), and they function to indicate that the referent exists in the future or in the past. Out of context, this typically seems to work much like English 'former' and 'future', as in this example from Guarani (Tupi-Guarani family; from Tonhauser 2006: 159):

(7) a. *che-roga-kue*

my-house-FORMER

'my former house'

b. *che-roga-rã*

my-house-FUTURE

'my future house'

In this case, *rã* and *kue* match their English translation equivalents, even with respect to the ambiguity as to whether they apply to the object itself or to the possessive relation (i.e., 'my former house' can mean one that used to belong to me, but it may also refer to a pile of smoldering embers that still belongs to me, and that used to be a house). They indicate a tense that is completely independent of the tense of the clause, as can be seen also in the following Guarani examples from Nordlinger and Sadler (2004:781):

(8) a. *o-va-ta* *che-róga-kue-pe*

3-move-FUT 1-house-FORMER-in

'He will move into my former house.'

b. *a-va-va'ekue* *hoga-rã-pe*

1-move-PAST 3.house-FUTURE-in

'I have moved into his future house.'

Nominal tense systems may also encode other categories. In Nambiquara languages, nominal tense is fused with evidentiality (see section 7), as illustrated in the following

examples (from Lowe 1999, apud Nordlinger and Sadler, op. cit.):

(9) a. *wa³lin³-su³-n³t²*

manioc-CL-TENSE+EVID

‘this manioc root that both you and I saw recently’

b. *wa³lin³-su³-nũ¹tã²*

manioc-CL-TENSE+EVID

‘the manioc root that must have been at some time past, as inferred by me (but not by you)’

While the translations of these examples are relative clauses, for lack of an equivalent resource in English, the Nambiquara utterances are in fact structurally simple noun phrases with markers that encode the evidence surrounding the epistemic status of the entity's existence.

It is likely that in languages where tense is not obligatorily marked in the clause, nominal tense marking would interact with the temporal anchoring of the whole predicate. Such an interaction would be analogous to the way that, in some languages of the Chaco (Manni 2007) and of the Pacific Northwest (Matthewson 1998), a distinction encoded in the determiners between visible and invisible or absent entities has consequences for the temporal interpretation of the clause (i.e., where participants are marked as ‘invisible’ or ‘absent’, the default interpretation is one of a past event). Some of the examples given for nominal tense hint at this possibility, but descriptions are still

too incomplete to allow a full account.

6. Verbal number

Number is relatively familiar as a nominal category, that is, as singular or plural (or sometimes also dual or paucal) marking on nouns. Less common cross-linguistically is the marking of number primarily or exclusively on verbs. Verbal number seems quite widespread in Amazonian languages, though it is not always easy to glean the details of how it functions in each language family from the available language descriptions. In the Jê family, in particular, some authors claim that verbal number constitutes agreement with the absolutive argument (Urban 1985), while others claim that it is exclusively a marker of repeated action (D'Angelis 2004). Queixalós (1998), describing a language from the Guahibo family, interprets what we would call verbal number as a category of its own, 'distensivité', which is fuzzily related to aspect, agentivity, effectiveness of the action, and so on. A particularly noteworthy example of verbal number is found in Itonama (a language isolate spoken in Bolivia; Crevels 2006), which stands out for the extremely intricate nature of the system, coupled with a lack of any number marking on the nominals themselves.

Much of the interest in verbal number resides in the multiple uses to which it may be put, even when its primary use is clearly to indicate the plurality of a participant of the clause. The following examples show how the meaning of number shifts to a primarily aspectual one when clauses are stativized by nominalization in Mëbengokre:

(10) a. *krwỳj jã nẽ môp krẽ*
parakeet this NFUT malanga eat.V.SG

‘This parakeet ate the malanga.’

b. *krwỳj jã nẽ môp ku*
parakeet this NFUT malanga eat.V.PL

‘This parakeet ate the malangas.’

(11) a. *krwỳj jã nẽ kute môp krẽn*
parakeet this NFUT 3ERG malanga eat.N.SG

‘This parakeet has eaten malanga (at least once in his life).’

b. *krwỳj jã nẽ kute môp kur*
parakeet this NFUT 3ERG malanga eat.N.PL

‘This parakeet eats malanga (often).’

The meaning shifts in another direction – from indicating a definite to an indefinite set of nominal entities – when a particular quantifier (which we have loosely glossed as ‘all’) is added:

(12) a. *arỳm nẽ ba i-nhõ pur kam môp kuni kaba*
already NFUT 1NOM 1-POSS garden in malanga all uproot.V.SG

‘I already uprooted all of the malanga from my garden.’

b. *arỳm nẽ ba i-nhõ pur kam môp kuni krwỳ*
already NFUT 1NOM 1-POSS garden in malanga all uproot.V.PL

'I already uprooted a lot of the malanga from my garden (but there might still be some left).'

Further intricacies exist, which make this topic an area for interesting comparative research. It should be noted that marking of plurality of action is a trait also found in certain language families of North America, notably Muskogean (Mithun 1999: 83ff) and Tsimshian (Dunn 1995), where its morphological expression is strikingly similar to that found in some Jê languages (cf. Cavalcante 1987).

7. Evidentiality

Another intriguing grammatical feature found in many Amazonian languages is evidentiality. Evidentiality is defined as the grammaticalized expression of information source: while languages such as English must rely on periphrastic forms such as 'I heard the boat go by', languages with evidentiality (as normally understood) instead use a suffix or particle which may be expected or even required in every utterance. Such grammaticalized evidentials are encountered in languages of the Arawak, Nambiquara, Tupi, Pano, and Nadahup (Makú) families, among many others.

Amazonian languages distinguish a variety of evidential categories. Some of the more common are nonvisual (for information that is heard, and sometimes tasted, felt, or otherwise nonvisually experienced), quotative (for a direct quotation), reported (for information repeated second-hand but not necessarily directly quoted), and inferred (often on the basis of tangible evidence; see Aikhenvald 2004). A visual information

source may also be marked directly, but in many cases this is the default interpretation of a lack of marking. Amazonian evidentiality is commonly a verbal category, realized as an affix, clitic, or associated particle.

Some of the most complex systems of evidentiality in the world are encountered in languages of the East Tukano family of the northwest Amazon. In these languages, paradigms of obligatory verbal suffixes fuse evidential distinctions with person, number, and tense. In Tuyuca, for example, the evidential categories are visual, nonvisual, apparent (inferred), secondhand (reported), and assumed (Barnes 1984, Malone 1988):

(15) *yai wede-gi tii-gi*

jaguar speak-MSG AUX-NONVISUAL:PRESENT:3MSG

'A jaguar is crying'. (Speaker hears but does not see the animal.) (Malone 1988:

130)

It is not uncommon for Amazonian languages to have evidentials that are grammaticalized (i.e. expressed morphologically), but not grammatically obligatory (cf. Dixon and Aikhenvald 1999:1). That is, an utterance that lacks an evidential may be judged pragmatically odd or inappropriate, but not grammatically incorrect (in the way that leaving off the past tense *-ed* would be incorrect in a typical English sentence beginning with 'yesterday'). In such languages, evidentiality may only be 'obligatory' in the sense that it must be marked somewhere in the preceding discourse and understood by the listeners (see Valenzuela 2003:57-58, Michael 2008:102); examples include Nanti

(Arawak), Shipibo-Konibo (Pano), Hup (Nadahup), and Karo (Tupi). Evidentiality is thus a particularly clear example of a linguistic category that straddles grammar and discourse.

In many cases, evidentials – particularly those that are not so grammatically entrenched – show traces of earlier, more periphrastic origins. For example, Nanti (Arawak) evidentials are the clitics *-ka* (quotative) and *-ke* (reportive), and *ka* (inferential); of these, only inferential *ka* can be reconstructed in Proto-Kampa (an Arawak subgroup), whereas the quotative and reportive are related to the verb roots *kaNt* ‘say’ and *kem* ‘hear’, respectively (Michael 2008). Similarly, in Hup (Nadahup), *mah* (reported) reconstructs to Proto-Nadahup, but *hõ* (nonvisual) and *cud* (inferred) derive historically from the verbs ‘make noise’ and ‘be inside’ (Epps 2005).

Evidentials may form a paradigm unto themselves (i.e. exhibit identical morphosyntactic behavior), and may combine with a variety of other markers, such as markers of tense (e.g. East Tukano languages), mood (e.g. Karo, Tupi; Gabas 1999) or even negation (M̃ky, isolate; Montserrat and Dixon 2003). Evidentials may also be ‘scattered’, filling multiple morphosyntactic slots and thus not forming a single paradigm; this is the case in Hup (Nadahup), for example, where different morphosyntactic behaviors stem from the different historical origins of the evidential markers.

Evidentiality has at least two major discursive functions. It allows speakers to convey their commitment to the facticity of an utterance, i.e. their responsibility for its accuracy (e.g. Hill and Irvine 1993, Aikhenvald 2004; see Michael 2008). In addition, as argued by Michael (2008), evidentials may also help to mitigate the speaker’s responsibility for an

event; that is, the speaker can use an evidential to indicate whether he/she was present when the event occurred. These functions underscore the close link between evidentiality in grammar and the cultural expectations and conventions relating to communicative competence. The strong discursive relevance of evidentiality makes languages particularly prone to adopt it in situations of contact, and the fact that evidentials are so widespread in Amazonia (e.g. Aikhenvald and Dixon 1998, Epps 2005) may also indicate that "a prominent concern with epistemological matters is an areal cultural feature" in the region (Beier et al. 2002:133).

8. Alignment

Alignment refers to the strategies language use to mark clausal participants to distinguish them from each other. In English, two different pronominal forms (*they* and *them*) are used to distinguish among three core grammatical functions, i.e., subject of an intransitive verb, subject of a transitive verb, and direct object.

For reasons of economy (given that subjects or objects of transitive verbs and subjects of intransitives never occur in the same clause, so need not be distinguished), languages having a different form for each grammatical function are relatively rare. English illustrates the most commonly found pattern, the 'nominative-accusative' (or simply 'accusative') pattern, according to which subjects of both transitive and intransitive verbs are treated identically, and objects are morphologically distinct.

Conversely, one often finds systems in which there is a morphological identity between objects of transitive verbs and subjects of intransitive verbs, as in the following

Kuikuro example (from Franchetto 2008):

(14) a. *u-te-lü*

1-go-PUNCT

'I go.'

b. *u-api-lü i-heke*

1-hit-PUNCT 3-ERG

'He hit me.'

It can be observed here that the first person pronoun maintains the same form in the two utterances, even though it is the (intransitive) subject in the first sentence, and the object in the second. The subject of the transitive sentence, on the other hand, takes a special mark (*-heke*) to distinguish it from the other participants. This is a typical 'ergative-absolutive' (or 'ergative') system. Ergative alignment is found in many Amazonian families and language isolates, including Carib, Arawak, Tupi, Macro-Jê, Nadahup, Pano, Záparo, Yagua, Yanomami, Trumai, Tacana, and Guahibo.

In addition, several Amazonian languages (notably, though certainly not exclusively, in the Tupi-Guarani family) exhibit a special mixed type of ergativity often considered an alignment system of its own, commonly termed 'active-stative' alignment (also 'split intransitive' or 'split/fluid-S'; e.g. Klimov 1974, Dixon 1994; for Tupi-Guarani, see Seki 1976, 1990, 2000; Leite 1990, 1991). This means that the subjects of intransitive verbs are marked like direct objects when the verb has 'stative' semantics, and like subjects of

transitive verbs when the verb has ‘active’ semantics (see definitions above). In some instances, as in the following Guaraní data from Velázquez-Castillo (1996), particular verbs can be construed with both stative and active interpretations. As statives, these take pronominal prefixes identical to those occurring on direct objects (e.g. first person singular *che-*); as actives, they take prefixes that correspond to those found with the subjects of transitive verbs (e.g. first person singular *a-*):

(15)

Stative		Active	
che-yta	‘I can swim’	a-yta	‘I swim’
che-monda	‘I’m a thief’	a-monda	‘I steal’
che-karu	‘I’m a big eater’	a-karu	‘I eat’
che-ka’u	‘I’m a drunkard’	a-ka’u	‘I get drunk’
che-guata	‘I’m a fast walker’	a-guata	‘I walk’
che-kirirĩ	‘I’m a quiet person’	a-kirirĩ	‘I stop talking’

Whether a particular predicate is treated as ‘stative’ varies from one language to the next (cf. Mithun 1991 for discussion and some North American examples), and often reveals something about how certain events are conceptualized in particular languages. For instance, subjects of particular verbs of perception might be marked as stative, as in *it occurred to me*, or as active, as in *I imagined*, possibly revealing a volitional or non-volitional etymology.

Ergativity is by no means exclusive to the South American lowlands, being found in at least a fifth of the languages of the world (see Comrie 2005a, 2005b, Siewierska 2005), in all continents. Consideration of alignment systems here is worthwhile, however, in view of the statement made in the introduction to Dixon (1994), and echoed in Dixon and Alkhenvald (1999:1), that the patterns of ergativity found in Amazonian languages contradict many of the generalizations previously upheld by the first author. In what follows, we will outline some of the cross-linguistic tendencies that have been observed in connection with ergativity, and point out some places where Amazonian languages display patterns that run counter to those tendencies. For a very detailed treatment of this question, see Gildea (2004).

In languages with ergative alignment, the ergative constructions are typically associated with certain grammatical or discourse traits of the clauses in which they occur. While considerable cross-linguistic variation exists, the following robust tendencies (among others) are in evidence:

	<i>Ergative</i>	<i>Accusative</i>
Tense/aspect	past/perfective	nonpast/imperfective
Person/nominal reference	less topical/definite; third person	more topical/definite; first and second person

A language might use ergative alignment for past tense clauses and accusative for nonpast tenses, or it might use ergative or accusative alignment across the board, but

one would not expect to find a language where past tense employs the accusative and nonpast the ergative. In the domain of nominal reference, noun phrases that are more “topical,” such as first or second person pronouns, definite noun phrases, or noun phrases denoting human participants would be the ones to follow an accusative alignment if a particular language had this type of split (see Dixon 1994).

Amazonian languages present several prima-facie exceptions to these tendencies. In the examples offered below, from Santos (1997), Suyá-Kĩsêdjê pronouns follow the ergative alignment, while non-pronominal noun phrases follow the nominative-accusative alignment, contradicting the generalization about person/nominal reference:

(16) a. *rotxi ra mĩtxi pĩĩ kere*

anaconda NOMINATIVE alligator kill no

‘The anaconda didn’t kill the alligator.’

b. *mẽ ra ngere mã*

people NOMINATIVE dance about.to

‘The people are about to dance.’

c. *i-ngere mã*

I-dance about.to

‘I’m about to dance.’

d. *i-re a-kaken kere*

I-ERGATIVE you-scratch no

‘I didn’t scratch you.’

Likewise exceptionally, ergative alignment is used for generic or habitual clauses in Mëbengokre, which are normally interpreted as present, while simple past clauses display nominative-accusative alignment:

- (17) a. *ba nẽ* *ba kruwa* *nhimrô*
 I NONFUTURE I arrow sharpen.VPUNCTUAL
 ‘I sharpened the arrow.’
- b. *i-je* *kruwa* *nhimrônh*
 I-ERGATIVE arrow sharpen.GENERIC
 ‘I sharpen arrows.’

However, the Mëbengokre case, at least, has a transparent source. In this language, as in many other Amazonian languages, nominalization is among the most frequently used strategies for clause subordination.⁷ The range of constructions that require subordination is also much larger than would be expected; negation, certain aspectual values, and some manner modifiers often function syntactically as subordinating main

⁷ Action nominalizations are nouns related to verbs that ‘name the action’ expressed by the related verb, as in *growth* (from *grow*). Action nominalizations are used in lieu of finite relative, complement, or adverbial clauses in many Amazonian languages, which include at least those of the Carib, Arawak, Tupi, Macro-Jê, Tukano, Nambiquara, and several smaller language families and isolates. As will be seen in this section, the uses of nominalization often go beyond these types of subordination in many Amazonian languages.

predicates in bi-clausal constructions (cf. the literal translation of example (a) below).⁸ In addition to this, it is widely recognized that nominalizations frequently display some type of ergative alignment cross-linguistically (Koptjevskaja-Tamm 1993). This combination of factors leads to ergativity in unusual contexts, such as in the following examples:

(18) a. *ije tep krēn kêt*

I-ERGATIVE fish eat no

'I didn't eat fish' (lit., 'there wasn't (any) eating of fish by me')

b. *a-djujarēnh mex*

you-speak good

'You spoke well' (lit., 'your speaking was good')

Whether the literal translations are valid as synchronic analyses is insubstantial.⁹ The result, regardless of this, is that ergativity is found in very diverse contexts, many of which are unexpected given the traditionally assumed discourse conditions mentioned above.

⁸ For a discussion of this, see Salanova (2007a, 2010).

⁹ Gildea (1992, 1998) discusses main clause ergativity in Carib languages as a historical development from biclausal constructions involving a nominalized subordinate clause, whereas Reis Silva and Salanova (2000), Reis Silva (2001) and Salanova (2008) consider that these structures are synchronically biclausal in Mébengokre and possibly other Jê languages.

There is a further sense in which we might look for correlates to ergativity: not in universal correlations between certain pragmatic or semantic values and ergative constructions, but between ergativity in general within a given language and cultural parameters. This putative relationship was the subject of a long-standing yet now largely outdated debate, summarized in Dixon (1994), to which we have very little to add. Despite an uneven geographical distribution, ergativity and accusativity are present in languages spoken by widely different societies, and it is often the case that languages where ergativity is dominant are spoken side by side with accusative languages.

9. The Pirahã debate

A considerable amount of popular attention has recently been focused on Amazonian languages – or, more precisely, one Amazonian language, Pirahã – particularly as represented in the work of Daniel Everett.

In a widely cited article published in *Current Anthropology* (2005), Everett argues that the Pirahã language lacks, among a variety of other features common to most languages, any recursive structures.¹¹ We believe that the facts on which this claim is based have parallels in many languages of the region, and we will discuss them in the next section as the basis for an areal trait. In this section we address some of the

¹¹ Recursion in linguistics refers to the ability to indefinitely embed constituents within others of the same type (i.e., a clause within a clause, or a noun phrase within a noun phrase). It is this feature which would be primarily responsible for the fact that human language makes "infinite use of finite means" (Chomsky 1995: 14, where the quote is attributed to Wilhelm von Humboldt), there being a priori no limits to the amount of times this embedding can be done in a single utterance: *The newspaper claims that the senator said that...*

implications that Everett and other authors have drawn from this phenomenon.

Everett (2005, 2009) claims that the Pirahã facts challenge the hypothesis made by Chomsky et al. (2002), that the ability for recursion is the one (innate) feature that characterizes the human language faculty defined narrowly.¹² Everett furthermore links the ability to embed propositions recursively to the property of *displacement*, which refers to the possibility, apparently absent in animal systems of communication, to relativize truths to situations other than the here/now and the point of view of the speaker.¹³ That is, we can relativize the truth of *there are good fish upriver* to some other individual's point of view because we can say *John thinks that there are good fish upriver*, and so on as many times as desired. Interpreting Everett's claim literally, a culturally determined lack of interest in anything but the here and now would have led to Pirahã speakers' not developing (or losing) any construction involving embedding in their language; conversely, due to this lack of embedding in its grammar, the Pirahã language would lack the means to assert any proposition about anything but the present moment, the place in which the speaker is standing, and the speaker's own point of view. We will address the relationship between displacement and embedding in the following section.

The extensive discussion in Nevins et al. (2009), a reply to Everett (2009), points out

¹² It might seem surprising that, after all that has been argued in the chomskyan camp to justify innate structures, our genetic endowment for language is reduced to just a recursive engine in Chomsky et al.'s article. It would take us too far afield to go into this issue here, but the contentions of that article are consistent with the drive of Chomsky's (1995) minimalist program, where many of the design features of language are attributed to 'interface conditions' (i.e., functional motivations) rather than innate design. We return to this question briefly when we talk about form and function below.

¹³ For a discussion of this notion, see Hockett (1960).

that Everett's (2005, 2009) argument is flawed in many respects, and that many of his claims are unverifiable. Claims to the effect that the Pirahã facts represent a serious challenge to chomskyan thinking about language are overstated, since, as Nevins et al. have pointed out, recursivity is a feature of linguistic competence that might make it to performance relatively seldom.

To give an example of what is meant by competence in this context, consider the following:¹⁴ all Germanic languages create noun-noun compounds recursively; German words such as Rindfleischetiketierungsüberwachungsaufgabenübertragungsgesetz (animal meat labelling monitoring function transfer law), though they might seem somewhat comical, are easily created and understood. Essentially the same mechanism for compound formation exists in English,¹⁵ though it is far less likely to be used to the extent that it is in German. The reasons for this might be purely historical: by borrowing terminology *en masse* from Latin and French in the early Modern era, the need for many of those compounds never existed; English speakers are used to the fact that most of the technical or cultured lexicon is opaque (zoo, television, linguistics, etc.), whereas a higher proportion of it, though idiomatic, can be broken down into constituent parts in German (Tiergarten, Fernseher, Sprachwissenschaft, ...)

¹⁴ We limit ourselves to discussing one construction for ease of argumentation; we are not claiming here that German resorts to recursion more naturally than English globally. In fact, Nevins et al. discuss a construction where recursion is claimed to be limited in German but not in English (in prenominal possessors, such as *father's mother's brother's husband*).

¹⁵ In English it is usual to separate elements from each other by spaces, but this is simply a spelling convention. Compounds of this sort are always formed from unmodified nouns (*water lily*), and are thus distinct from possessed nouns such as *The queen's English*, which have phrasal subconstituents.

Despite this difference between German and English, it is quite likely that embedding in this construction is part of an English speaker's competence. To show the contrary, it is insufficient to argue that it is rare or that speakers reject it as unnatural, as this might happen for purely pragmatic or historical reasons.

Of course, if we find that all adult speakers in a particular linguistic community, though otherwise normal in their cognitive abilities (i.e., without any mental handicap due to a shared genetic trait), lack even the ability to *learn* a certain linguistic construction that was previously believed to be universal, there would be reason to doubt whether it were actually a part of a universal linguistic capability. Since generative theoreticians are talking about competence, however, much more than lack of attestation is required to show that some linguistic trait is not universal. Both the methodology of introspection used by generative grammarians and the monolingual fieldwork advocated by Everett (2001) are inadequate approaches here.¹⁶ The experiments carried out among the Pirahã and other Amazonian communities in recent times (e.g. testing whether the presence of numerals in a language correlates with the ability to perform basic mathematical operations; cf. Frank et al. 2008) are a step in the right direction, though initial reports suggest that there are difficult issues to solve regarding experimental design, and in any case the issue of recursivity is not addressed.

¹⁶ Direct and long-term exposure to a language, even with linguistic training, is of course insufficient for abstracting accurate grammatical descriptions, as can be quickly ascertained by observing the difficulty that native speakers have in coming up with the right generalizations, e.g., to answer something like 'are there any contexts in which I sent *John a package* is not synonymous with *I sent a package to John?*'.

10. On the scarcity of embedding

Having put aside the more controversial points surrounding Pirahã, we return to the possibly valid empirical generalization that clausal embedding is rare in many languages of Amazonia.

It is certainly true that many Amazonian languages do not use embedding as frequently as other languages as a means of expressing displacement, as can be seen in many of the traits discussed above. For example, instead of embedding under verbs of perception, a language might choose to use an evidential marker indicating in which way the information of the proposition was obtained. In addition, as Beier et al. (2002:134) note, Amazonian languages tend to express others' mental states by quoting what people say rather than by embedding a proposition under an attitude verb (such as 'think' or 'believe'). Finally, many languages express such common bi-clausal constructions as *X wants to do Y* by means of bound verbal morphology (e.g., in this case, a 'desiderative' affixed to the verb '*do*'), rather than via a subordinate clause.

As can be seen, one cannot conclude from the scarcity of embedding that displacement will be scarce.¹⁷ In fact, it often means that the displacement is obligatorily coded in a sentence, as we argued for the case of evidentiality, much in the same way that temporal information is obligatorily encoded in the sentences of most European languages. However, it is true that the usual means employed by the language to

¹⁷ The converse, i.e., that lack of temporal, spatial or modal displacement would imply lack of embedding, is equally unwarranted, since embedding occurs in many structures that refer to the here and now, such as *I see you look at the river* or *You are my mother's brother's son*.

displace may fail when one tries to displace inside an already displaced proposition (i.e., keeping to the evidentiality theme, ‘John infers that Bill heard that a jaguar is crying’). What happens in such circumstances has not been actively researched, to the extent of our knowledge. We presume that Everett would argue that the Pirahã would be at a loss if attempting to express such an idea in a single sentence. However, we should not conclude that because a particular construction does not exhibit syntactic embedding, a multiply displaced meaning cannot arise. Consider the following:

- a. In our mind, Everett would say it.
- b. Everett says: ‘The Pirahã are at a loss. They try to say this and they are at a loss.’

Though this translation of one of the sentences in the preceding paragraph has no syntactic subordination, it eloquently expresses the same thought. We also paraphrased a conditional construction involving embedding with a coordinating construction, with no appreciable loss of meaning, given a particular context. The point to take from this is that a particular proposition may on some conceptual level involve embedding, but might nonetheless be grammaticalized as a coordinated structure. In fact, this may be systematic for particular constructions in particular languages. Mëbengokre, for instance, possesses a ‘twin clause’ construction that, even though it seems coordinated on the surface, necessarily encodes a relation of purpose:

(19) [*Kajti imã kàx ngã*] [*ba o kruwa nhimrõ*]

Kajti to-me knife gave I with arrow sharpen

'Kajti gave me a knife to sharpen arrows with' (literally, 'Kajti gave me a knife, I sharpen arrows with it')

It is, of course, a question for further research whether such constructions map systematically to particular subordinated meanings across languages.

11. On grammar, discourse, and culture

As Sherzer (1987) observes, discourse is the nexus of language and culture, the locus of both their continuity and creation. Grammar 'provides a set of potentials... actualized in discourse,' which is in turn 'an embodiment, a filter, a creator and recreator, and a transmitter of culture' (Sherzer 1987:306; see also Urban 1991). At the same time, the set of cultural practices that constitute discourse guides both the transmission of grammatical structures and the emergence of new ones over time.

Beier et al. (2002) list a number of discursive practices that are widely shared among Amazonian peoples, including the extensive use of dialog (ranging from highly routinized dialogic performance to more backgrounded 'echo speech'), ritual wailing, and special or ritual forms of language. Many of these practices draw cultural meaning and artistic effect from specific lexical, grammatical, and discursive resources of the languages in which they occur.

Ideophones are one example of a linguistic resource that is frequently encountered in Amazonian narratives. In most cases, these sound-symbolic forms make up a distinct lexical category within the language; they differ from other word types in that they

typically do not take bound morphology, involve phonologically distinct sounds and syllable structures, and may vary in their degree of conventionalization. Ideophones commonly represent sounds, but may also refer to motions or sensations. As “the closest linguistic substitute for a non-verbal, physical act” (Kunene 2001:183), ideophones contribute an emotive, experiential tangibility to a narrative, as in this Hup (Nadahup) example:

- (20) *wídídídí, pótʔah-an, kək-d'əh-hám-ãp, wídídídí*
 IDEO upriver-DIR pull-send-go-DEP IDEO
 ‘*Wídídídí*, upriver, (he) pulled them along, *wídídídí*...’

Some Amazonian discursive practices rely crucially on deviations from other or everyday forms of speech. This is a particularly noteworthy feature of many ritual and shamanic language varieties. In addition to differences in channel, such as singing, chanting, or blowing, and in discursive resources, such as the heavy use of metaphor and parallelism, ritual and shamanic speech often involves lexical and even morphosyntactic deviations. Lexical differences include the use of archaisms, words borrowed from other languages, or metaphorical substitutions; in Yagua ritual speech, for example, ‘tapir’ is substituted for ‘drum’ (based on the sound of the tapir’s footsteps) and ‘peccary’ for ‘palm species’ (because the peccary eats this palm’s fruit; see Chaumeil 1993). Morphological deviations can involve simplification, such as the dropping of otherwise obligatory verbal inflection in Bribri (Chibchan, Cervantes 2003),

and elaboration, such as the insertion of semantically empty affixes and non-semantic vocables in Warao (isolate, Briggs 1996). Examples of syntactic changes include changes in word order (Warao) and the omission of a copula or postpositions (Bribri; see Finley 2008 for further discussion). A fine-grained understanding of ritual speech and other discourse practices must take into account the linguistic features that make them special.

Linguistic structures are the building blocks of discourse, and are thus integral to the transmission and creation of culture. Yet, on the other hand, the idea that culture may be directly implicated in the development of linguistic structure has received little serious attention. This is undoubtedly due in part to the difficulty of proving that an apparent correlation between the two is more than chance, as the debates surrounding Pirahã attest. Yet there are at least two mechanisms of language change by which culturally specific patterns may influence grammar, as discussed by Evans (2003). The first involves frequency: patterns that are more frequently repeated may become conventionalized, leading in turn to routinization and reduction of form; as Du Bois (1987) puts it, “grammars do best what speakers do most” (see also Bybee 2000). The second involves pragmatic inferencing: particular uses of ellipsis (leaving parts of a message unsaid) and figurative language are guided by shared understanding, which may be culturally specific; these inferences may lead to the reinterpretation of expressions and their extension to new contexts.

A number of the features encountered in Amazonian languages appear to have arisen in conjunction with culturally specific patterns of discourse. As noted above,

with any of the four ontological operators, producing the following meanings: *úi-tyumã* ‘snake-spirits’ (*-tyumã/kumã* ‘supernatural, hyper-, exaggerated’), *úi-rúru* ‘true/venomous snakes’ (*-rúru* ‘true, genuine, best’), *úi-mína* ‘animals similar to snakes’ (*-mína* ‘similar to, having the properties of’), *úi-malú* ‘failed/non-venomous snakes’ (*-malú* ‘bad, worthless, unsatisfying’; Viveiros de Castro 2002:28-29). Again, the recurrence of similar systems of ontological operators across a variety of Amazonian languages and language families cannot be accidental, but is undoubtedly associated with the sharing of discourse norms and cultural perspectives.

12. Language relationship and language history

Languages change and diversify over time, such that a single language will split into dialects, which in turn will gradually develop into mutually unintelligible languages. On the model of biological organisms, languages are classified into families descended from a common ‘ancestor’ (a proto-language) – just as French, Spanish, and Portuguese are descended from Latin. Amazonia is remarkable for the enormous diversity of its languages, and the task of working out the relationships among these is still far from complete.

Historical linguists rely on a carefully defined methodology, known as the Comparative Method, to establish the ‘genealogical’ (or ‘genetic’) relationships among languages, and to identify the changes in words, sounds, meanings, and grammatical structures that have occurred over time (see, for example, Campbell 2002, Hock 1991).

This methodology focuses on identifying regular correspondences, particularly of sounds

(such as English *d* and German *t* in *deep* and *tief*, *deer* and *Tier*, etc.); these make it possible to establish cognates, or words that derive from a common parent language. The most likely candidates for true cognates are pronouns, bound morphology, and 'basic vocabulary' – words that represent concepts common to speakers regardless of their history or time period, and thus tend to be less prone to borrowing across languages (e.g. body parts, natural entities like 'sun' and 'rain', etc.). Because changes accumulate over time, these eventually obscure regularities across cognates, such that reliable evidence of relationship tends to fade out beyond approximately 8,000 years of time-depth. While new methodologies for discerning deeper relationships among languages have been attempted, none of these have yet proved reliable. The best known of these efforts is that of Greenberg (1987), who proposed a single macro-family ('Amerind') for the languages of South, Central, and most of North America, itself composed of various large-scale subgroups. Few linguists today accept Greenberg's proposal; although there is little doubt that some or perhaps all of Amazonia's language families are themselves distantly related, we can only guess at these relationships in the absence of solid evidence.

One of the greatest challenges in understanding the classification of the Amazonian languages has been the widespread lack of reliable descriptive data. As the number of quality studies of these languages builds, however, our knowledge of their relationships does as well. In some cases, previously unclassified or supposedly isolate languages can be assigned to larger families, such as Harakmbut (a language of Peru) to the small Katukina family in western Brazil (Adelaar 2000). In other cases, however, new data

leads instead to the splitting of ‘families’ whose membership was based on spurious classifications. For example, the ‘Makú’ or ‘Makú-Puinave’ family lumped together six to seven languages of the northwest Amazon: Hup, Yuhup, Dâw, Nadëb, Kakua, Nukak, and (according to some classifications) Puinave (e.g. Martins and Martins 1999, Loukotka 1968, Campbell 1997). These classifications relied primarily on a few sketchy word lists noted down by early visitors to the region (Koch-Grünberg 1904, Rivet and Tastevin 1920), and were methodologically unsound (based on impressionistic judgments of similarities among words, with no attempt to focus on ‘basic’ vocabulary or to identify regular sound correspondences). Work on the four ‘Nadahup’ languages (Hup, Yuhup, Dâw, and Nadëb), most of which has emerged within the past ten years, has clearly established their relationship (see Martins 2005, Epps 2008), but recent investigation into Kakua and Nukak indicates that these two languages – while related to each other – bear no demonstrable relationship to the Nadahup family (although they have acquired structural similarities via language contact; see Bolaños and Epps 2009). The relationship of Puinave to Kakua and Nukak is currently under investigation.

For the majority of Amazonian language families, the overall membership is still less mysterious than are the internal relationships among the languages (see Campbell 1997, Epps 2009). Here again we find methodological challenges and pitfalls. In particular, many proposals for subgrouping are based on percentages of shared vocabulary (purportedly cognates, retained from the proto-language; e.g. Martins and Martins 1999 for Nadahup/Makú), such that languages with less common vocabulary are assumed to be less closely related. However, historical linguistic methodology accepts

only shared *innovations* as reliable evidence for subgrouping, since there is no guarantee that languages lose vocabulary at a constant rate. Subgrouping proposals based on cognate percentages, as well as on geographic proximity and other indicators, should be viewed as constituting no more than a first guess. Yet because the identification of shared innovations requires a careful reconstruction of the proto-language, such guesswork is still the only option available for the majority of Amazonian language families. Most of the existing proposals for their subgrouping should therefore be understood as highly tentative. For example, the classification of Macro-Jê by Rodrigues (1999:167-168) is informed principally by the languages' geographic distribution (see Ribeiro and van der Voort 2010). Similarly, Facundes (2002:83-84) points out the considerable differences between Aikhenvald's (1999a:67-71) and Payne's (1991) classifications of Arawak languages; there is as yet no consensus as to which (if either) is more accurate (compare also a third, even more different classification by Ramirez 2001; cf. Michael 2009). Given the lack of data on many of the languages in question, and the tremendous diversity of the Amazon region, it may be some time before solid internal classifications for most of these families are available.

As languages diverge, they become more distinct. Sound changes accumulate and meanings shift, obscuring similarities among related words; grammatical distinctions like evidentiality and tense emerge or are abandoned. However, languages may also converge: interaction among speakers may lead to the borrowing of words and morphemes, and even to the adoption of new grammatical structures and categories. Long-term, pervasive multilingualism, in particular, may lead to the restructuring of one

language's grammar to fit the model presented by the other, even while each maintains much of its original vocabulary.

Because similarities among languages may derive from either contact or shared inheritance, determining which type of relationship pertains among languages may be a challenge. Nevertheless, the methodological tools of comparative historical linguistics are usually adequate for distinguishing between these, except in the case of truly 'mixed' languages or at very great time-depth (see, e.g., Campbell and Poser 2008; cf. Dixon 1997). Whereas regular sound correspondences within basic vocabulary are indicative of descent from a common linguistic ancestor, similarities that are confined to non-basic vocabulary (e.g. culturally or environmentally specific terms) and to grammatical categories and structures are more likely the result of language contact.

The possibility that the Amazon region might generally constitute a linguistic area, a region where similarities among languages may be attributed to contact among their speakers, has received some attention; for example, Dixon and Aikhenvald (1999:8-9) list a number of widely encountered features (see also Derbyshire and Pullum 1986, Klein 1992). However, a great deal more work is needed to determine whether these or other features are in fact indicative of some kind of relationship among these languages (contact or otherwise), and whether their distribution is contiguous with the Amazon basin (see Constenla Umaña 1991:135, Doris Payne 1990:3, Campbell 1997:348-351, Epps 2009 for further discussion).

Language contact is more easily demonstrated within narrowly defined regions of Amazonia. A well established case is that of the Vaupés region, a highly multilingual

area in the northwest Amazon, where the practice of linguistic exogamy – marriage across language groups (see Jackson 1983, Sorensen 1967, *inter alia*) – has led to an avoidance of lexical borrowing (as speakers resist language mixing), but has fostered profound changes in grammatical structures and categories. Among the contact-induced changes in this region, East Tukano languages have influenced Tariana (Arawak; e.g. Aikhenvald 1999b, 2002), Hup and Yuhup (Nadahup; e.g. Epps 2007b, 2008b), and Kakua (Bolaños and Epps 2009); and Baniwa (Arawak) has influenced Cubeo (East Tukano; Gomez-Imbert 1996). Another area of Amazonia in which contact has probably led to significant grammatical restructuring of the languages spoken there is the Guaporé-Mamoré region of Bolivia and Brazil (Crevels and van der Voort 2008). On the other hand, Seki (1999) shows that contact-driven changes in the languages of the Xingu region appear to be relatively few, apparently because multilingualism among speakers has been of relatively low intensity and short duration. In multilingual zones like the Vaupés and the Xingu, the linguistic outcome of contact among speakers of different languages owes much to particular socio-cultural norms – such as linguistic exogamy – and to the discursive practices that enable the diffusion of grammatical structures (see Beier et al. 2002).

Studies of language contact and change can tell us much about indigenous pasts, particularly in places like Amazonia where the textual and archaeological records are relatively limited (see Epps 2009). Relationships among languages entail past relationships among groups (but note that, despite terminology, 'genealogical' or 'genetic' linguistic relationships most certainly do *not* entail corresponding genetic

relationships among peoples, as evidenced by Portuguese-speaking Brazilians of indigenous descent, for example). Patterns of linguistic similarity and diversity raise numerous questions: Why is linguistic diversity highest along the Amazonian periphery? Might these patterns hold clues to the peopling of the New World (Dahl 2006), the spread of innovations such as agriculture (Clement et al. 2005), or the origins of widespread language families (e.g. Aikhenvald 1999a:75)? Additionally, the histories of particular words can reveal clues about the histories of the concepts they correspond to. For example, Payne's (1991) reconstruction of Proto-Arawak suggests that early Arawak speakers cultivated manioc and other crops, made hammocks and ceramics, and observed particular ritual practices (see Heckenberger 2002:106-115). Linguistic evidence indicates that the Tupi-Guaraní-speaking Guajá people are former agriculturalists who took up a hunting and gathering lifestyle in the relatively recent past, probably due to pressures of the European conquest (Balée 1999); in contrast, comparison of the Nadahup languages suggests that these speakers' current hunting/gathering focus is representative of a past in which agriculture has never played a primary role (Epps forthcoming).

13. Conclusion

The last ten years have seen enormous strides in our understanding of Amazonian languages. One important development has been the publication of several comprehensive overviews of these languages, including Dixon and Aikhenvald (1999), Queixalós and Renault-Lescure (2000), Solís Fonseca (2003) for Peru, González and

Rodríguez (2000) for Colombia; see also Rodrigues (1986, 2006) for Brazil. Many new quality studies of particular Amazonian languages have also emerged, a large number authored by Latin American scholars. Among the many examples, we cite the following: Aikhenvald (2003), Barbosa (2005), Bruno (2003), Cabral and Rodrigues (2002, 2007), Cândido (2004), Crevels et al. (2002), Cruz (2005), Dixon (2004), Epps (2008a), Facundes (2000), Fleck (2003), Galucio (2001), Girón (2008), Guillaume (2008), Haude (2006), Martins (2004), Meira (forthcoming), Olawsky (2006), de Oliveira (2005), de Oliveira (2007), Ospina Bozzi (2002), Picanço (2005), Rodrigues and Cabral (2007), Rose (2003), Sakel (2004), dos Santos and Pontes (2002), dos Santos (2006), dos Santos (2007), Seifart (2005), Stenzel (forthcoming), Valenzuela (2003), van der Voort (2004), van der Voort and van de Kerke (2000), and Wetzels (2007). In addition, the number and regularity of academic forums devoted to Amazonian linguistics have grown exponentially, ranging from major international conferences to online discussion groups (www.etnolinguistica.org) to new periodicals (such as LIAMES [South American Indigenous Languages]), suggesting that the field has begun to come of age. As we point out in Salanova (2007c), documentation of the most endangered languages of the region proceeded slowly in the past because, on the one hand, carrying out fieldwork in the more remote parts of the Amazon was too costly for linguists working from within South America, and, on the other hand, linguistic work carried out by missionaries has generally targeted the more widely or vigorously spoken languages, as these offer access to more souls. The first factor has been partly reversed by new international sources of funding that, in relative terms at least, have been more accessible to the

scholarly community outside the more developed countries. It is nevertheless important to note that many of the region's languages are even more critically endangered now than they were a decade ago.¹⁸ Documentation work on many of these languages is still insufficient, and, as we hope to have made clear above, our knowledge of even some of the better-documented languages is still not complete enough to answer some of the theoretical questions that have arisen in the analysis of the better-known North American languages, among others. We can only hope that the current pace of the documentation of Amazonian languages will continue.

Contemporary advances in the study of Amazonian languages reflect a maturation of the field of language documentation more generally. This process has seen a developing methodological emphasis on naturally occurring discourse from a variety of genres and settings, informed by a rich and nuanced ethnographic context. As we point out here, elements of grammar can both shape and be shaped by discursive practices. Likewise, a linguistic perspective can contribute critical insights into speakers' cultures and histories. As our knowledge of Amazonian languages continues to advance, we hope that the dialogue between linguists and anthropologists working in this region will grow as well.

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¹⁸ For a recent appraisal of the situation, see Moore (2007).

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