# Verbal synthesis in the Guaporé–Mamoré linguistic area: a contact feature?

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# Verbal Synthesis in the Guaporé-Mamoré Linguistic Area: a Contact Feature?

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*In their discussion of the linguistic area Guaporé-Mamoré (eastern Bolivia and Rondônia) Crevels & Van der Voort (2008) propose 'polysynthetic morphology' as one of the structural features shared by most languages in the area. In their approach the feature is regarded as binary (present versus absent) and it is not entirely clear what the basis for their categorization is. In this paper I try to come to a more precise understanding of the nature of the morphological similarities between the Guaporé-Mamoré languages by looking at a range of formal and semantic factors related to the verbal templates of these languages. In this way we can locate the cross-linguistic morphological similarities more precisely, setting the stage for a deeper understanding of the processes of contact-induced diffusion in the area.*

## 1. Introduction

Although (morphological) structure is often thought to be relatively impervious to borrowing (e.g. Weinreich 1953, Thomason & Kaufman 1988, Dunn et al. 2005) the geographical skewing of certain morphological parameters is, at least at first sight, suggestive of a sensitivity to contact (see van Gijn, this volume).[1] In this paper I examine the question of potential contact-induced diffusion of morphological structure by zooming in on a putative linguistic area in western South America, called the Guaporé-Mamoré (GM), proposed by Crevels & Van der Voort (2008). They argue that the languages of this area, which belong to a number of different families, share a number of structural traits due to a history of contact between the speakers of the languages. One of the shared features is the presence of polysynthetic morphology in many of the languages.

The goal of the present paper is to give a more precise account of the cross-linguistic morphological similarity in the GM, and to evaluate how consistent these similarities are with a contact-induced diffusion account. The paper is structured as follows: in section 2 I introduce the GM area in more detail. In section 3 I introduce the database that was developed for the purposes of this paper and which allows for the comparisons between the languages discussed in sections 4 and 5. Section 4 focuses on several formal parameters to answer the question how similar the verbal morphologies of the GM really are, going well beyond the binary approach taken in Crevels & Van der Voort (2008). In Section 5 I focus on the semantics of verbal morphologies of the languages under study, based on the idea that, if contact is responsible for morphological similarities in the area, this should go hand in hand with functional convergence in verbal morphology as well, since semantics and pragmatics are generally taken to be involved in some way or another in contact-induced diffusion. Section 6 presents a more detailed case study of a seemingly areal feature: prefixed valency-changing markers, in particular valency-increasing markers. Section 7 presents the conclusions.

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[1] I thank two anonymous reviewers for helpful comments. Remaining errors are mine.

## 2. The Guaporé-Mamoré Area

Crevels & Van der Voort (2008) propose to regard the area in east Bolivia and Rondônia in Brazil, delineated by the basins of the Guaporé and Mamoré Rivers as a linguistic area. Their claim partly follows up on ethnological studies (e.g. Lévi-Strauss 1948, Galvão 1960, Maldi 1991, see for a discussion and further references Crevels & Van der Voort 2008) that suggest that long-term contact between different ethnic groups has led to areal similarities. The cultural patterns found in the ethnological studies are consistent with two larger culture areas of quite different dynamics. The area (north)east of the Guaporé, on the Brazilian side is characterized by small, seminomadic, egalitarian groups that could form temporary alliances with other groups. Other features of this area include shamanism and the use of hallucinogenic substances, as well as the central place of chicha (fruit or vegetable-based beer). The Bolivian side, west of the Guaporé was dominated by the more complex, stratified societies associated with the Llanos de Mojos and, further away, the Chiquitanía. Features include raised fields and a jaguar cult. Crevels & van der Voort (2008:154) mention that archaeological evidence also suggests contacts across the Guaporé, thus justifying their proposal to consider the entire area as a linguistic area

Linguistically, the area displays a dazzling degree of genealogical diversity, but - crucially - there is considerable overlap in structural features. Crevels & Van der Voort mention 55 languages, representing 12 different language families, as well as 12 unclassified languages and one pidgin. There is also one unidentified language in the list. The claim that the languages are structurally similar is based on a review of 21 grammatical features for 24 languages, three of which (Southern Quechua, Central Aymara, and Uru) are spoken outside the area proper, and have been added as control languages. Table 1 displays the sample used in Crevels & Van der Voort (2008).
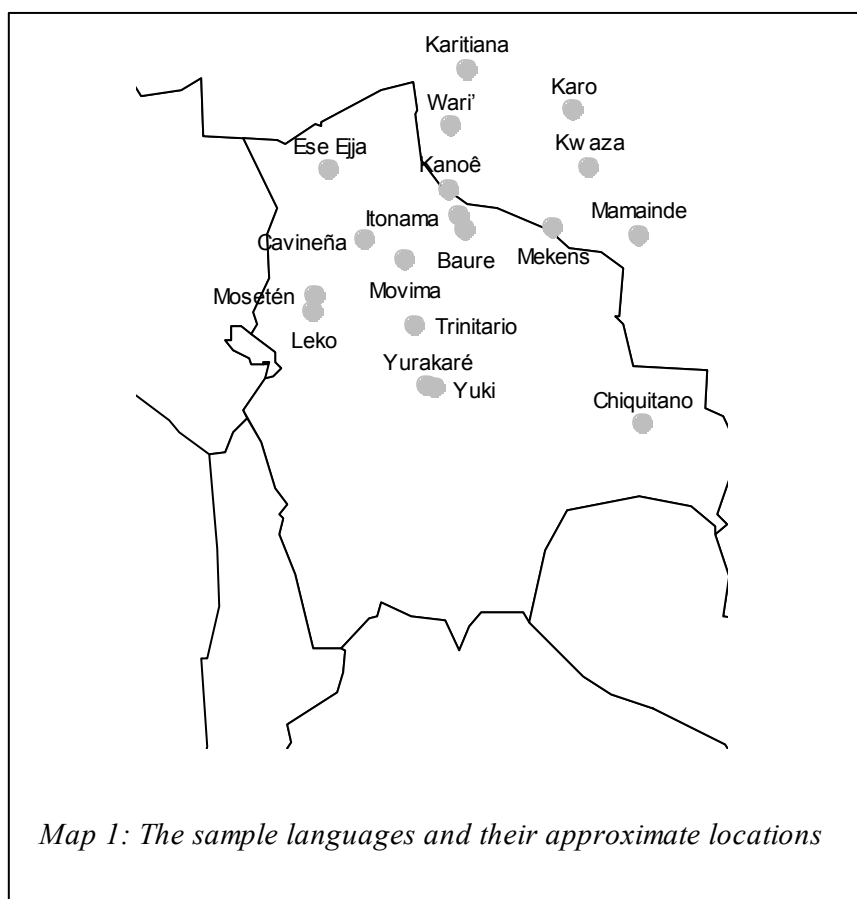
| Name | Family | Name | Family |
|------|--------|------|--------|
| Baure | ARAWAKAN | Mekens | TUPIAN (TUPARI) |
| Aymara | AYMARAN | Yuki | TUPIAN (TUPÍ-GUARANÍ) |
| Wari' | CHAPACURAN | Uru | URU-CHIPAYA |
| Arikapú | MACRO-JÊ (JABUTÍ) | Aikanã | ISOLATE |
| Mosetén | MOSETENAN | Cayubaba | ISOLATE |
| Lakonde | NAMBIKWARAN | Chiquitano | ISOLATE |
| Chácobo | PANOAN | Itonama | ISOLATE |
| Bol. Quechua | QUECHUAN | Kanoê | ISOLATE |
| Cavineña | TACANAN | Kwaza | ISOLATE |
| Karitiana | TUPIAN (ARIKÉM) | Leko | ISOLATE |
| Gavião | TUPIAN (MONDÊ) | Movima | ISOLATE |
| Karo | TUPIAN (RAMARAMA) | Yurakaré | ISOLATE |

*Table 1: Languages considered by Crevels and Van der Voort (2008)*

The present paper is not a review of Crevels & Van der Voort's linguistic area proposal as such, but rather a more in-depth look at one of their features, 'polysynthesis'. Although the feature is not defined in Crevels & Van der Voort (2008), it is paraphrased as 'a high degree of synthesis' (ibid.: 170) suggesting that the authors do not refer to a special type of morphological profile that includes noun incorporation, but rather highly morphologized languages. The fact that head-marking is another widely shared feature suggests that the morphological complexity is expected in particular on verbs. The authors concede that polysynthesis is a more widespread feature, well beyond the GM area, but they consider it nevertheless, since it does contribute to the picture that the GM languages look alike. Other features they mention are geographically more restricted. In any event, by taking up the

feature 'polysynthesis' in their list of areal features, they suggest that this feature has spread through contact. If this is indeed the case, one would expect that the languages of the GM area are polysynthetic in similar ways, i.e. that they have morphologized similar concepts.

The present paper zooms in on the verbal morphology of a subset of the GM languages to assess the question whether or not they look alike, so that an account in terms of diffusion through contact becomes probable. Since not all languages have been adequately described in the literature yet, I have had to narrow down the subset of 21 languages considered by Crevels and Van der Voort (without the control languages) to 18 languages, which still gives a good impression of the area. The languages of the sample of this study and their approximate locations are given in Map 1.



*Map 1: The sample languages and their approximate locations*

| Name | Family | Main source |
|---|---|---|
| Baure | ARAWAKAN | Danielsen 2007 |
| Trinitario | ARAWAKAN | Rose In press; p.c. |
| Wari' | CHAPACURAN | Everett & Kern 1997 |
| Mosetén | MOSETENAN | Sakel 2004 |
| Mamainde | NAMBIKWARAN | Eberhard 2009 |
| Cavineña | TACANAN | Guillaume 2008 |
| Ese Ejja | TACANAN | Vuillermet 2012 |
| Karitiana | TUPIAN (ARIKÉM ) | Storto 1999, Everett 2006 |
| Karo | TUPIAN (RAMARAMA) | Gabas Jr. 1999 |
| Mekens | TUPIAN (TUPARI) | Galucio 2001 |
| Yuki | TUPIAN (TUPÍ-GUARANÍ) | Villafañe 2004 |
| Chiquitano | ISOLATE | Galeote-Tormo 1993 |
| Itonama | ISOLATE | Crevels 2012 |
| Kanoê | ISOLATE | Bacelar 2004 |
| Kwaza | ISOLATE | van der Voort 2004 |
| Leko | ISOLATE | van de Kerke 2009 |
| Movima | ISOLATE | Haude 2006 |
| Yurakaré | ISOLATE | van Gijn 2006 |

*Table 2: The language sample of the present study.*

## 3. The Database

For each of the languages in the sample, I have classified the productive morphological expressions that are found on the verb in terms of their position with respect to the root, the type of morphological operation, and their semantics. This information is organized by template position. Three types of template position patterns are distinguished:

1. Simple
2. Mobile
3. Discontinuous

A simple position pattern occurs when a morpheme or group of morphemes has a fixed position in the morphological template, so that it can be associated for instance with position -3 or +5 relative to the root. Mobile position patterns occur when the position of certain morphemes relative to each other is determined by other principles than templatic position, such as scope relations. Also included in the group of "mobile" affixes are those markers for which there is not enough information available to determine a precise templatic position, and for which more than one position is theoretically possible. Both mobile affixes and markers with uncertain location in the template can be associated with various positions in the template with the operator 'OR', indicating that they must be in one of these positions. Discontinuous positions, finally, refer to morphemes that always occupy more than one position simultaneously. A classic example of this positional pattern is a circumfix. Discontinuous morphemes are also associated with more than one position, connected with the operator 'AND'. Combinations of 'AND' and 'OR' operators are also possible, but in practice irrelevant to this study.

In determining the positional patterns for the different morphological operations, I give preference to paradigmatic over syntagmatic structures in the sense that there needs to be

positive evidence for a syntagmatic position, and in the absence of such positive evidence, markers may be assumed to share the same positional pattern. The upshot of this is that there is a chance that paradigmatic oppositions are overestimated at the cost of syntagmatic oppositions, but they introduce the least number of postulations in the form of syntagmatic positions that are not there.

In this way, a templatic structure is built up for the verbs of the different language, on the basis of which several comparisons can be made. In what follows I first discuss briefly what the general restrictions are on the types of data structures that I have taken into account followed by a discussion of the variables that are tracked in the database.

For each positional pattern in the database, I kept track of the different types of morphological operations. The operations and their brief definition I distinguish are given in Table 3. More than one type of process can be associated with a single positional pattern.

| Prefixing | A morphological operation whereby an affix is attached to the left edge of a base (a root plus potential other markers). |
|---|---|
| Suffixing | Affix that attached to the right edge of a base. |
| Circumfixing | Discontinuous affix that attaches to both edges of a base. |
| Infixing | Affix that is inserted within a stem. |
| Vowel mutation | A morphological process whereby the quality of a vowel of a morpheme is changed |
| Consonant mutation | A morphological process whereby the quality of a consonant of a morpheme is changed. |
| Suppletion | Situation whereby regular semantic or grammatical oppositions are expressed by formal patterns that cannot be related to each other. |
| Tone (morphological) | The systematic use of tonal patterns to express form-meaning correspondences. |
| Reduplication | A morphological operation whereby (part of) the base is copied and attached to the base. |

*Table 3: Morphological processes and their definitions.*

Apart from these processes I kept track of the semantics associated with the different positional patterns. Like the processes, the semantics were built up from what the data suggested. However, for semantics there was another consideration. As is argued by e.g. Wiemer & Wälchli (2012) language contact may lead to functional convergence, but rarely, if ever, to complete isomorphism of functions. This means that, in order to evaluate the likelihood of contact playing a role in the shaping of the verbal morphologies of the GM languages, we need to allow for a certain amount of fuzziness in the semantic categories. For this reason I have coded the semantics of the different morphemes and morphological operations at two levels of generality. Table 4 gives the highest (most general) categories, and in their definition, the subcategories.

| Category | Description and subcategories |
|---|---|
| Illocution | Any morpheme that specifies the speech act of the proposition. Primary subtypes are interrogatives, declaratives, directives. |
| Voice & Valency | The voice and valency group includes those markers that determine "the number, formal encoding, and semantic role of verbal argument(s)" (Authier & Haude 2012: 4-5). Major subgroups: valency increasing, valency decreasing, valency rearranging, and role identity. |
| Space | Morphemes that locate an event in space. Major subtypes: location and movement. |
| Manner | Morphemes that indicate the way in which an event is executed. Subtypes: posture, speed, other. |
| Time | Morphemes that locate an event in time. Subtypes relative tense (past, present, future) and absolute time expressions (e.g. time of day). |
| Stance | Morphemes that indicate the way speakers position themselves with respect to the proposition. Major subdistinctions: evidential, epistemic, opinion/attitude |
| Evaluative | Morphemes that either hedge or augment the meaning expressed in the predicate, subtypes: diminution, augmentation/intensification. |
| Classification | Morphemes that classify verbs into different groups, without there being any clear semantic principle that can be handled by one of the other semantic categories. No subtypes. |
| Polarity | Morphemes that indicate whether or not the event expressed in the verb is a true statement about reality or not. Major subdivisions: negative and affirmative. |
| Aspectuals | Morphemes that mark the status of an event with respect to a certain period of time. Major subdistinctions: Viewpoint, Phasal, Quantificational, Situational, Dynamicity. |
| Agreement | Morphemes that mark referential features of some participant in the event described by the predicate. Main subdivisions: A agreement, P agreement, S agreement, S/A agreement, S/P agreement. |
| Interaction | Morphemes that mark some aspect of the speaker or hearer in the interactional situation. Major subdivisions: speaker-related, hearer-related. |
| Modality | Morphemes that mark the relation between an event and its potential realization. Major subtypes: Facultative, deontic, volition/intention, reality status |

*Table 4: Semantic categories and their subdivisions.*

Mostly for reasons of manageability I have focused on particular types of data, and excluded others. The basic restrictions on the type of data in the database are the following:

1. Maximum potential: Because for most of these languages there is no access to corpus data, I have focused on what is possible in the verbal template. This means that no frequency information was taken into account, and dependencies between morphemes (apart from those morphemes that fall into the discontinuous class mentioned above) have been ignored. Issues of obligatoriness and optionality are equally hard to assess without corpora, so they have not been taken into consideration either.[2]

2. Independent verbs only: I have not regarded any non-finite morphology, but restricted myself to looking at independent clauses. Moreover, I have focused on verbs; the database does not contain information about non-verbal predicates.

3. Category-preserving morphology only: Another major restriction I imposed upon the data is that I disregard any category-changing morphology, and focus on category-preserving derivational and inflectional morphology.

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[2] Languages may differ substantially between what they can do theoretically and what they will do in practice. This is a serious drawback of the maximum potential approach. On the other hand, contact-induced increase of morphological potential does not necessarily apply to frequently used or obligatory categories only (see e.g. Weinreich 1953, van Hout & Muysken 1994).

4. No compounding. Finally, I have considered structures that contain one root morpheme only. I will discuss the possibilities the GM languages have for noun incorporation in the next section, but those observations are not part of the database.

The types of structures in 1-4 are all interesting in their own right, and they should be explored, but they fall outside the scope of this paper.

## 4. Comparing Morphology: Formal Parameters

Based on the database principles described above, we can come to a characterization of the formal aspects of the verbal morphologies of the languages in the sample. The goal in this section is simply to get a more refined understanding of the morphological variation, which goes beyond a binary (yes/no) value for polysynthetic or not.

A first concern, although Crevels & Van der Voort (2008) do not regard it criterial for polysynthesis, is whether the languages of the sample allow for argument incorporation. Map 2 shows the results for the sample.

As can be seen on Map 2, quite a few languages have some form of incorporation, and languages without incorporation occur at the fringes in the south-west and south-east, and in the northeast (mostly Tupian languages). Nevertheless, the systems are quite diverse.

One of the more elaborate and productive systems is found in Kwazá. Kwazá allows for incorporation of classifiers which refer to or are associated with the absolutive argument. Multiple classifiers can be incorporated into the verb and cross-refer to its arguments. The verb *hay-* 'to cut' is normally limited to the cutting of wood, but it may form a relatively fixed combination with certain classifiers:[3]
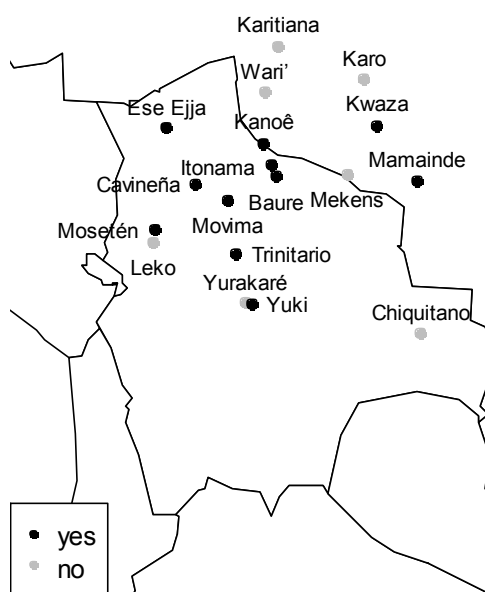


*Map 2: Incorporation*

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[3] Abbreviations: ANTIP antipassive; APPL applicative; ART article; ATTR attributive; AUX auxiliary; BEN benefactive; CAU causative; CERT certainty; CL classifier; COM comitative; CON adverb comparison; COP copula; DCL declarative; DES desiderative; DISTR distributive; DM 'uh' proform; DR downriver; HSY hearsay ; EV euphonic vowel; F feminine; GEN genitive; GNR generic; IC involuntary comitative; IN inessive; INC inclusive; INV inverse; INTR intransitive; IRR irrealis ; L linker; M masculine; MAL malefactive; OBJ object; PL plural; POSS possessor; PRS present; PST past ; REFL reflexive; RESM resumptive; RR reflexive and reciprocal marker; SA secondary action; SBJ subject; SG singular; SUP superessive; THEM thematic vowel; TOP topic; VC voluntary comitative; VOL volitive; VSM verbal stem marker

Kwazá [Isolate], Van der Voort 2004: 134
(1)  hay-xy-nũ-ko'ro-da-mỹ
     cut-CL:hair-CL:powder-CL:arm-1S-VOL
     'I'm going to cut hair off the arm'

In this example, the classifier -*xy* refers to the hair that is being cut off and -*koro*- to the arm from which it is cut. The classifier -*nũ*- is probably not an "incorporated" argument, but it further specifies hair as a powder-like substance and may as such specify the manner of hair-cutting.

　　At the other end of the spectrum is Yuki. Yuki allows for the incorporation of classifier-like elements, before the root. This is so general that one might actually argue that it is a type of agreement. There are three markers (they appear before the person prefixes): *aba*- 'generic, human', *ba*- generic, non-human, *nema*- also 'generic non-human'. However since these markers can have a detransitivizing effect (Villafañe 2004: 122), an analysis as incorporated classifiers is more appropriate. Moreover, the generic object marker comes from the root *maʔe* 'thing'.

Yuki [Tupí-Guaraní], Villafañe 2004: 121
(2)  ba-a-u
     GNR.OBJ-1SG-eat
     'I eat (something).'

The system in Mosetén is also not very prototypical of incorporation systems. In Mosetén, there are a number of structures which are similar to incorporation, like constructions with the verb -*tii*- 'to bring' which can be attached to a noun that functions as the object of the verb. It seems to be very limited and perhaps tending more towards derivation than incorporation. Nevertheless, since some of these 'incorporation markers' also function as independent verbs, they are taken up here for completeness' sake.

Mosetén [Mosetenan], Sakel 2004: 253
(3)  raej  katyi'  pamin-si'  öjñĭ-tii  ka-ki  shara  sara'i-khan
     all   HSY    morning-L.F  water-bring.M.SBJ  bring-ANTIP.M.SBJ  gourd  mari-IN
      'All mornings he went to bring back water in gourds in his *mari*-bag (traditional hand-made bag).'

A summary of the different systems is given in Table 5, on the basis of the following parameters:
　　1. Position (are incorporated elements prefixed or suffixed),
　　2. The type of unit that is incorporated: full nouns (FN), partial nouns (PN), classifiers (CL),
　　3. The semantics of the incorporated elements
　　4. The argument role of the incorporated element: intransitive subject (S), transitive subject (A) transitive object (P), oblique (Obl)
　　5. Productivity according to the estimate of the author of the grammar.

|          | pos. | unit      | semantics                  | arg type            | productivity                           | Source                  |
|----------|------|-----------|----------------------------|---------------------|----------------------------------------|-------------------------|
| Ese ejja | pre  | FN        | possessed Ns, esp. body parts | S/P              | productive but infrequent              | Vuillermet 2012: 514-519 |
| Kanoê    | post | CL/PN/FN  | body parts, locations      | S/P/Obl             | limited (?)                            | Bacelar 2004: 205-6, 214 |
| Kwaza    | post | CL        | any                        | S/P                 | productive                             | Van der Voort 2004: 133-4 |
| Cavineña | pre  | FN        | body parts, abstract nouns | P                   | not productive                         | Guillaume 2008: 144-8    |
| Baure    | post | CL/FN     | body parts, locations      | P                   | productive                             | Danielsen 2007: 98-100   |
| Itonama  | pre  | CL/FN     | body parts, locations      | P/Obl               | productive                             | Crevels 2012: 247-8      |
| Trinitario | post | CL/FN   | Inherently possessed       | S/P/Obl             | ?                                      | Rose in press, p.c.      |
| Yuki     | pre  | CL        | any                        | P                   | productive                             | Villafañe 2004: 121-3    |
| Mamainde | pre  | FN/PN     | body parts                 | P/Obl (S)           | productive, partially grammaticalized  | Eberhard 2009: 379-385.  |
| Movima   | post | FN/PN     | any                        | P (also modifying)  | productive                             | Haude 2006: 367-76       |
| Mosetén  | pre  | FN        | any                        | P                   | very limited                           | Sakel 2004: 249-58       |

*Table 5: Characteristics of argument incorporation in the sample languages*

The presence of prefixed full incorporation in Cavineña and Ese Ejja seems to be a feature of the Tacanan language family, also found in Maropa (Guillaume 2012: 203) and Araona (Emkow 2006: 106-7). The same is true for the presence of suffixed incorporated classifiers in Arawakan, represented by Baure and Trinitario in the sample (see e.g. Aikhenvald 1999: 83-4). Although object incorporation is a feature of some of the Tupian branches like Tupí-Guaraní languages (Jensen 1999: 159), but also sister branches Mawé, Awetí and the more distantly related Mundurukú, it is not found in the other branches, in particular in none of the 'western' branches (Rodrigues & Cabral 2012: 539), suggesting an innovation or loss at some point in history after the initial splits of the Tupian family worth investigating in more detail (unfortunately this falls outside the scope of this paper).

*Map 3: Number of morphologized values*          *Diagram 1: Number of morphologized values*
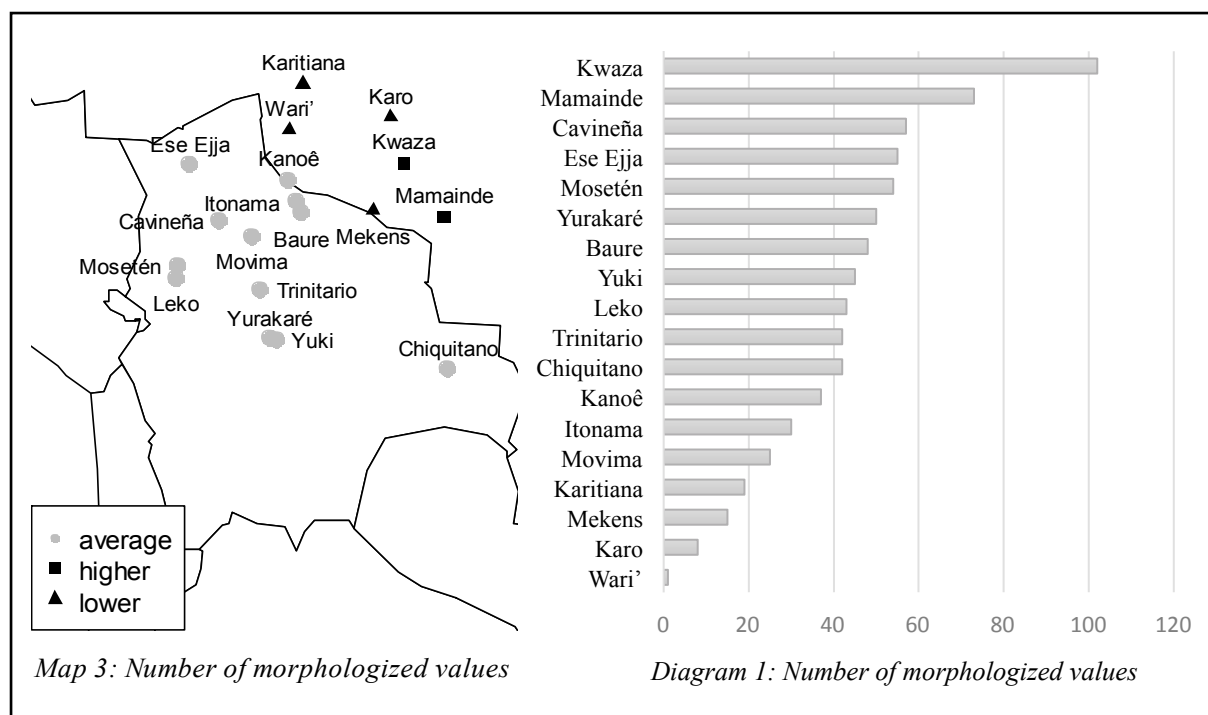
Apart from incorporated arguments, most languages of the Guaporé-Mamoré have several other non-compositional morphological structures. As a first step to comparing languages in terms of morphological structure, I have simply counted all category values that are expressed morphologically for each language, so that a picture of morphological complexity emerges that takes into account syntagmatic structure and paradigmatic structure. The average number of morphologized category values is 41.44 and the average deviation from this number is 17.23.

    Map 3 in indicates the languages that fall outside the range of average deviations in black, those with a higher number of morphologized values in squares, and those with a lower number in triangles. In terms of overall morphological complexity, then, there seems to be a basic east-west difference, where both extremes are found (north)east of the Guaporé. The languages with lower morphological values include 3 of the 4 Tupian languages. This is consistent with the ethnological accounts of the two sides of the Guaporé River, where the inter-ethnic interaction on the Brazilian side has a more local nature (see section 2) so that geographically more confined patterns are expected on the Brazilian side.

    I will briefly survey two further parameters of the morphological profiles of the GM languages. First, there is a general tendency in most languages of the area to have a single meaning per morpheme. Diagram 2 shows the average number of values that can be maximally expressed per morpheme. The average is 1.39 with an average deviation of 0.22. Map 4 shows those languages that fall outside the range of average deviations, with the same legend as Map 3.
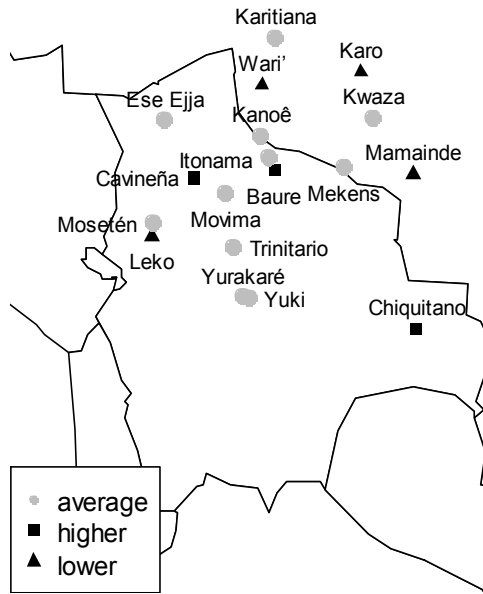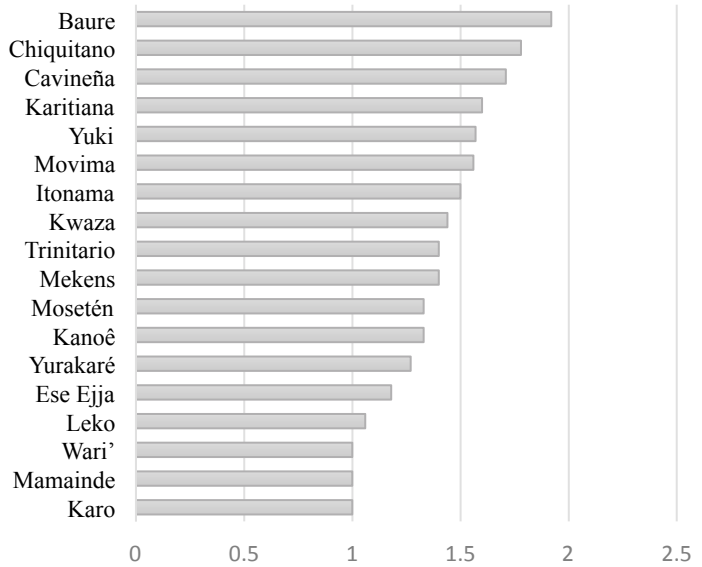
*Map 4: Average values per morpheme*



*Diagram 2: Average values per morpheme*

Rather than an east-west divide, there may be a center-periphery pattern here, where especially the languages with a lower degree of cumulative exponence tend to be spoken at the fringes of the area.

A last parameter concerns the position of the affixes. Almost all languages of the GM area (the only exceptions are Wari' and Kwaza) have prefixes or at least circumfixes (including prefix positions). This is all the more interesting, given the fact that, according to Payne (1990) languages in western South America have a preference for suffixing, whereas eastern languages tend to have more prefixes. Map 5 and diagram 3 indicate the ratio of prefixed values in the total number of morphologized category values (average is 0.28, with an average deviation of 0.22).
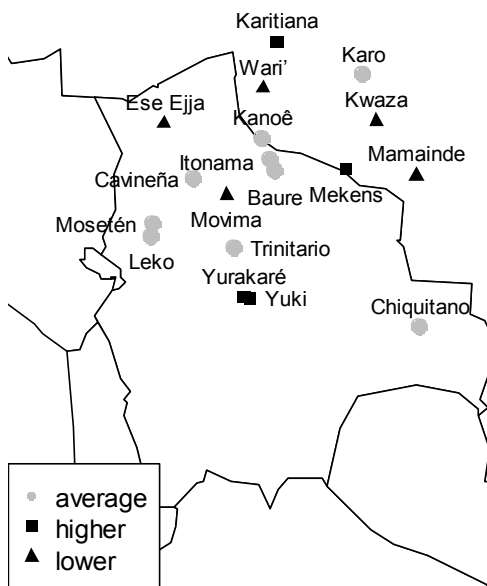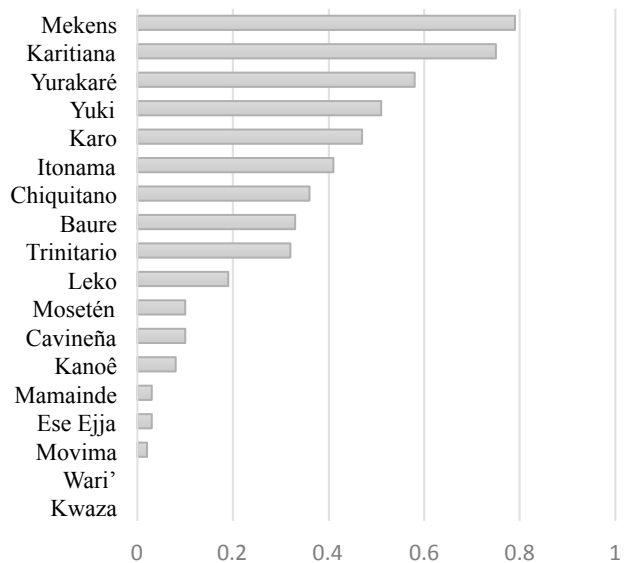


*Map 5: Prefix:suffix ratio*



*Diagram 3: Prefix:suffix ratio*

Like with cumulative exponence, there seems to be a general center-periphery pattern with the languages with a lower share of prefixed values especially in the north and north-east. Movima is deviant from the central languages in that is has a very clear preference for suffixes.

Overall, there are a number of indications that the morphologies of at least some of the GM languages have characteristics in common. A typical GM morphological profile of verbs has incorporation, a high number of morphologized features, a tendency to have few meanings per morpheme, and a substantial amount of the morphological material is prefixed. The languages in the north-east (where Tupian languages dominate) are rather deviant from some of these characteristics, as they represent languages that are morphologically relatively poor and have no incorporation. The languages at the south-western and south-eastern fringes are deviant to a lesser extent, in that they are morphologically rich, but have no or marginal incorporation.

From this brief formal survey it appears that there may be reason to suspect contact-induced diffusion effects especially on the Bolivian side of the area, and more local patterns on the Brazilian side. In the next section I go into the functional profiles of the verbal templates of the languages in the sample in order to highlight potential spheres of contact-induced influence.

## 5. Comparing Morphology: Semantic Categories

Most contact theorists agree that contact-induced change involves some kind of identification between two elements from the languages in contact (see Van Gijn, introduction to this special issue). Perhaps with the exception of contact-induced phonological and phonetic change, this identification involves semantics or pragmatics. It is therefore useful to additionally look at the semantic categories that are expressed in the different languages of the sample and, in a second step, where in the verbal template corresponding functions are expressed.

As explained above, the semantic functions associated with morphemes are classified at two levels of generality. The higher, more abstract level was presented in Table 4; Table 6 lists these categories in order of frequency in terms of the percentage of languages that have morphologized the category in question.

| Category | Proportion of languages with category |
|---|---|
| Aspectuals | 0.94 |
| Voice & Valency | 0.94 |
| Agreement | 0.89 |
| Modality | 0.78 |
| Illocution | 0.72 |
| Evaluative | 0.67 |
| Time | 0.67 |
| Polarity | 0.61 |
| Space | 0.61 |
| Stance | 0.50 |
| Manner | 0.33 |
| Classification | 0.22 |
| Interaction | 0.06 |

*Table 6: distribution of morphologized semantic macro categories*

As can be seen, three macro categories, aspectuals, voice & valency, and agreement are almost universally present in the sample languages. Modality, illocution, evaluation, time, polarity, and space occur in the morphological template of the verb in more than half the languages of the sample. Although no direct comparison can be made, it is useful to look at the results obtained by Bybee (1985: 31) on the basis of a 50-language sample, so that we can compare the GM data to data from a global sample.

| Category | Proportion of languages with category |
|---|---|
| Valence | 0.90 |
| Aspect | 0.74 |
| Mood | 0.68 |
| Number (agr) | 0.66 |
| Person (agr) | 0.56 |
| Voice | 0.56 |
| Tense | 0.50 |
| Person (obj agr) | 0.28 |
| Gender (agr) | 0.16 |

*Table 7: Relative frequency of the most common derivational and inflectional verbal categories in Bybee (1985)*

Bybee (1985) divides the categories differently, but it is still clear that the high proportion of languages with voice & valency and aspectual markers in the sample of the present paper are consistent with the global patterns found on the basis of Bybee's sample. Agreement is a little harder to compare, since it is divided into several subcategories in Bybee's approach, but at least 66% of the languages in Bybee's sample has some form of agreement, based on the highest agreement category 'number'. Tense in half of the languages in the sample also corresponds to the findings in this paper, as does the high frequency of 'mood' in Bybee's categorization, which corresponds to 'modality', 'stance', 'illocution', and 'polarity' in my categorization. Given the low frequency of 'manner' (which is moreover semantically disparate), 'verb classification', and 'interaction', it is hard to say anything about these categories. It is unclear how 'evaluation' (including intensity, augmentatives, diminutives) and 'space' (associated motion, location) relate to Bybee's findings.

   Diagram 4 shows the relative positions in the morphological template with respect to the root of the different semantic macro-categories. Markers were classified either as suffixes, prefixes, circumfixed, root operations (non-linear morphology and infixing) or mixed (for combinations of linear and non-linear morphology). As can be seen, most semantic categories are suffix-oriented, and relatively homogeneous in that respect. Less homogeneous categories are agreement, illocution, and voice & valency, which have a considerable amount of prefixed markers. I come back to this issue in the next section.
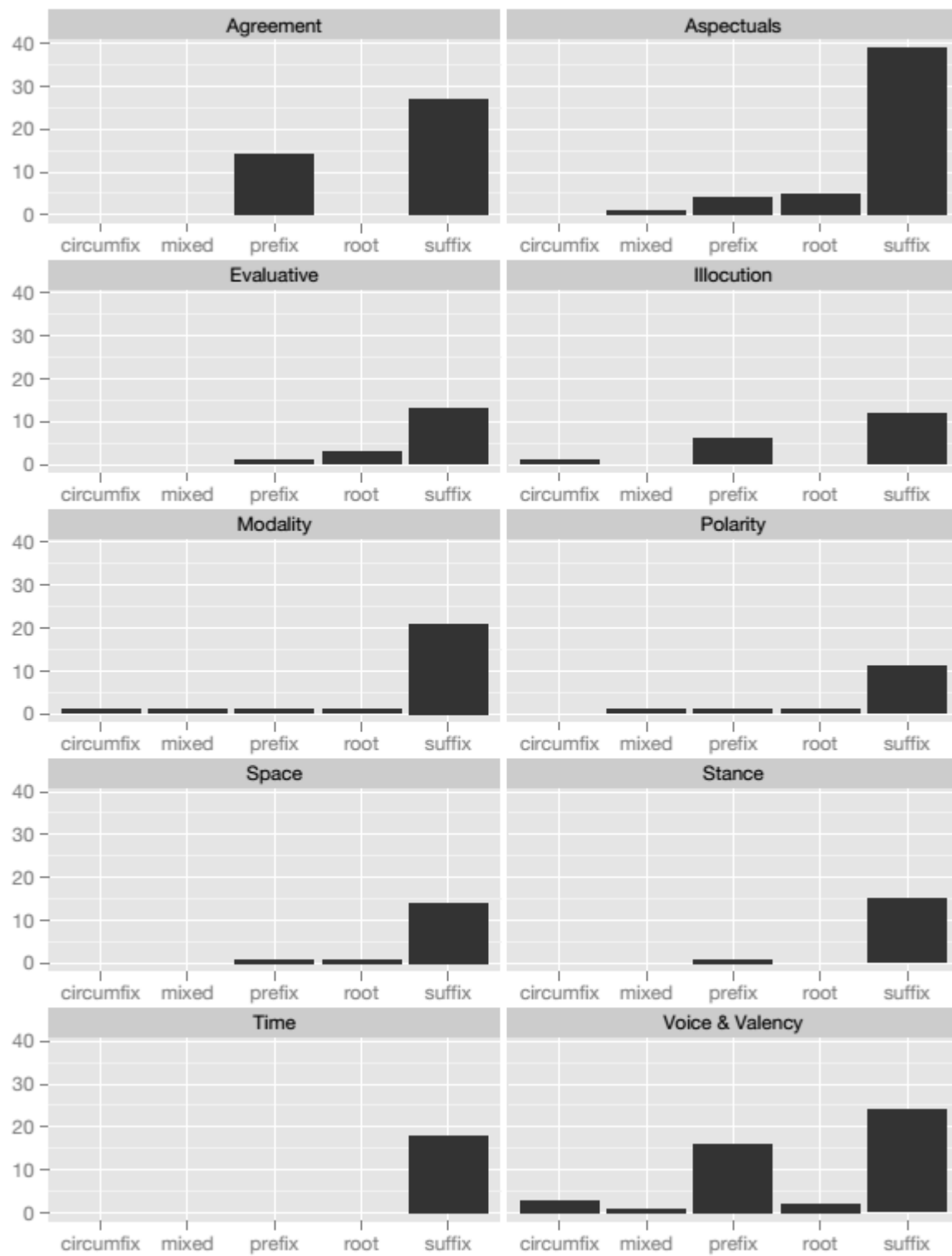
*Diagram 4 - Position relative to the root of markers of specific semantic fields.*

Table 8 shows the distribution of the 15 most widespread morphologically marked semantic subcategories.

|    | Category | macrocategory | description | p |
|----|----------|---------------|-------------|---|
| 1 | Valency increase | Voice & valency | Morphemes that indicate that a participant is added to the basic valence of the verb root. | 0.89 |
| 2 | Quantificational aspect | Aspectuals | Morphemes that divide a complex event over time and/or space. | 0.78 |
| 3 | Argument identity (R) | Voice & valency | Morphemes that indicate that the arguments of a transitive verb are identical (reflexive and reciprocal) | 0.72 |
| 4 | Directives | Illocution | Morphemes that indicate that the proposition expressed in the clause is to be interpreted as an assignment or order. | 0.67 |
| 5 | Phasal aspect | Aspectuals | Morphemes that indicate the phase in the development of an event | 0.67 |
| 6 | Tense | Time | Morpheme that locates the event at a point in time relative to a deictic center. | 0.67 |
| 7 | Augmentative | Evaluation | Morphemes that intensify or increase the meaning expressed in the verb. | 0.61 |
| 8 | Motion | Space | Morphemes that connect the event expressed in the verb to a motion. | 0.61 |
| 9 | Negation | Polarity | Morphemes that explicitly assert that something is not the case. | 0.61 |
| 10 | P agreement | Agreement | Morphemes that indicate referential features of the P (and/or R) argument of transitive verbs. | 0.61 |
| 11 | S/A agreement | Agreement | Morphemes that indicate referential features of the subject of a transitive event and of the sole participant in an intransitive event. | 0.61 |
| 12 | Reality status | Modality | Morphemes that indicate whether or not something has happened and/or is likely to happen. | 0.56 |
| 13 | Situational aspect | Aspectuals | Morphemes that indicate the status in the development of an event with respect to time periods before and after it. | 0.56 |
| 14 | Volition/Intention | Modality | Morphemes that indicate a desire or intentionality on the part of the controlling participant to realize a certain state of affairs. | 0.56 |
| 15 | Valency decrease | Voice & valency | Morphemes that indicate that the basic valence of the verb root is decreased. | 0.50 |

*Table 8 - Distributions of the most widespread subdivisions of the major categories*

From Table 8 it appears that, apart from formal homogeneity, there seems to be some degree of semantic homogeneity as well. Moreover, for most of the morphologized major semantic categories (and therefore their subdivisions as well) we can additionally say that they are homogeneous with respect to their position relative to their base (see Diagram 4). Diagram 5 shows a MDS (Multi-Dimensional Scaling) plot on the basis of a distance matrix of the semantic subdivisions. Distances between languages were based on the number of categories they had in common.

   Although cluster analysis did not yield any significant groups[4] it is clear that there are a few outliers, which partly correspond to the same outliers we found in the formal section,

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[4] We would not necessarily expect there to be very clear clusters, because the languages, apart from sharing certain features would also still contain a lot of non-matching elements, creating noise. The best clusters have

again suggesting that the languages in the north-east of the area are not part of the GM as far as verbal morphology is concerned. Karo, Mekens, Wari', and Karitiana clearly have less verbal morphology than the other languages and generally lack the more common categories in their verbal templates. Interestingly, (distantly) related Karitiana, Mekens, and Karo do not seem to be similar to each other either. Movima is slightly different from most other sample languages in that although it is morphologically more complex than the other outliers, it marks deviant semantic categories on the verb. For instance, it operates, unlike the typical GM language, with a direct-inverse voice system on an ergative basis.[5]

Summarizing, many of the languages of the GM share a good amount of morphologically marked semantics: there are 15 features (allowing for some flexibility) that are shared by at least half of the languages in the sample. One question one might ask on the basis of this result is whether we can say anything about the relative time depth of these shared features. Historical linguistics has developed a set of lexical concepts whose word forms are said to be more time-stable than others (see e.g. Swadesh 1971 and McMahon & McMahon 2005 for a more modern version). No such list exists for language structure, but recent exploration of the data provided in Dryer & Haspelmath (2013) suggest that there are features that show an intrinsic, areally and genealogically independent propensity to persist in time, as well as a group of features that shows inherent instability (see Dediu & Levinson 2012, Dediu & Cysouw 2013).

WALS categories that can be connected to some of the categories are given in Table 9, with their original reference number, as well as their approximate correspondence to the categories used in this study and their relative rank[6] in Dediu & Levinson (2012). [7]

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average silhouette width of under 0.1 and should therefore not be considered to have any structure (Kaufman & Rousseeuw 1990). I thank Taras Zakharko for help with the statistical analyses.

[5] With regard to its arrangement of arguments in direct constructions (as opposed to inverse), Movima can be argued to operate on an ergative.

[6] The higher the rank, the less stable an item is.

[7] It should be borne in mind that the structure of the WALS data is different from the one used in this paper in terms of the variables and their values. The closest similarities are mostly based on a binary (re)coding of the WALS data used in Dediu & Levinson (2012), except for Applicative Constructions (109), which was not recoded by Dediu and Levinson. Instead, the original design by Polinsky (2013) was used, containing information on the semantics of the applicative markers and the type of base they attach to. Her results suggest clear areal patterns, also for the presence versus absence of applicative constructions in general. The list of poly-coded features in Dediu & Levinson (2012) is shorter than the binary features (68 versus 86), hence the different total number for feature 109.
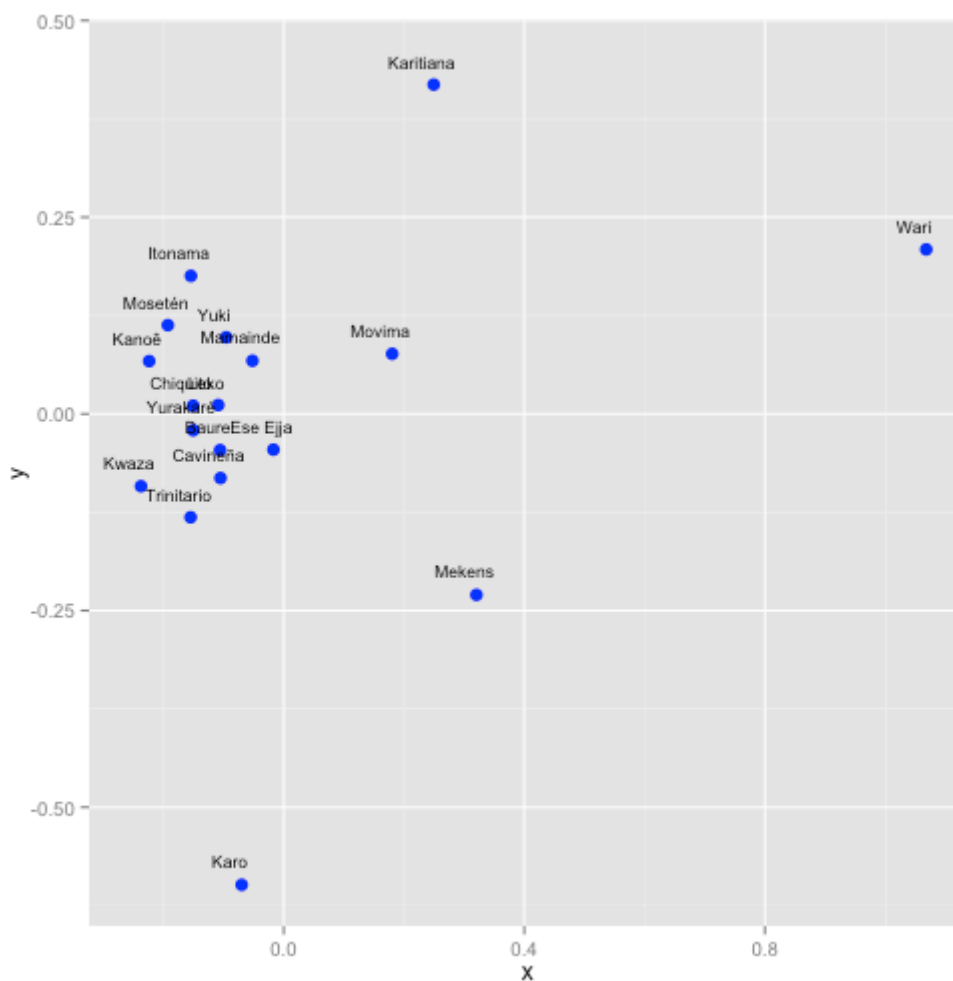
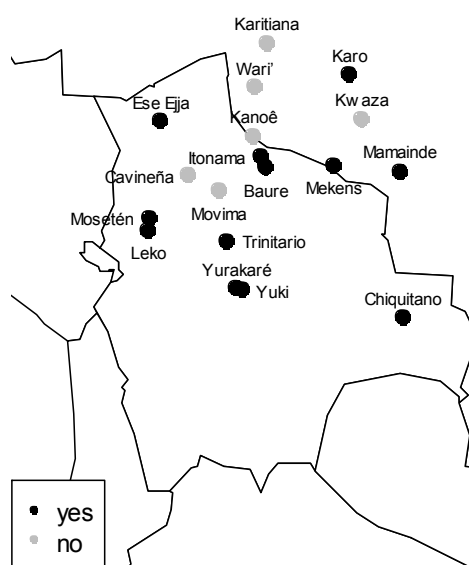*Diagram 5 - MDS plot of similarities in morphologized meanings*

| WALS ID | Name [author] (values) | Presence of corresponding category present study (% of sample languages) | Rank D&L /total |
|---|---|---|---|
| 65 | perfective-imperfective aspect [Dahl & Velupillai 2013a] (Y/N) | viewpoint aspect (38.9%) | 66/86 |
| 66 | The past tense [Dahl & Velupillai 2013b] (Y/N) | tense (66.7%) | 50/86 |
| 67 | The Future tense [Dahl & Velupillai 2013c] (Y/N) | tense (66.7%) | 69/86 |
| 70 | The morphological imperative [van der Auwera & Lejeune 2013] (Y/N) | directives (66.7%) | 26/86 |
| 77 | Semantic distinctions evidentiality [de Haan 2013] (Y/N) | evidentiality (27.8%) | 72/86 |
| 102 | Verbal person marking [Siewierska 2013a] (Y/N) | agreement (88.9%) | 34/86 |
| 107 | Passive constructions [Siewierska 2013b] (Y/N) | val. decreasing (50%) | 79/86 |
| 109 | Applicative constructions [Polinsky 2013] (poly) | val. increasing (88.9%) | 57/68 |

*Table 9: Stability of WALS features (Dediu & Levinson 2102) and their approximate corresponding features in the present study.*

Most features rank relatively low on stability across families, which tentatively suggests for the GM area that the semantic similarities between the verbal morphologies is not likely to be due to deep time retention from some common ancestor, but rather the result of contact-

induced convergence, in line with Crevels & Van der Voort (2008). It should be kept in mind, however, that the correspondences between the WALS categories and the categories of the present paper are not perfect, and that stability values for feature are generally considered controversial. The features should be regarded as potential areal morphological features, and as such as suggestions for further research. In the next section I zoom in on prefixed valency-changing markers as a potential areal feature.

## 6. Form and Function: Prefixed Valency-Changing Markers

A prime candidate for an areal GM (and possibly beyond) feature is prefixed valency markers. Map 6 shows the languages with a prefixed valency marker.[8] As can be seen, the majority of GM languages have a prefixed valency marker. This is surprising from a typological viewpoint, since in the majority of languages that have morphological valency markers they are suffixes (Hawkins & Gilligan 1988, Song 1996). However, "valency marker" is still a cover term for a potentially heterogeneous group of functions, so it is good to look into the similarities and differences between the languages with prefixed valency markers in more detail. A first distinction that we can make is between those valency markers that increase valency and those that decrease valency, indicated on Maps 7 and 8 (the languages without prefixed valency markers are left out).[9]



*Map 6: Prefixed valency-changing markers*

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[8] Also included are languages with a circumfixed valency marker, since that includes a prefix position
[9] Reflexives and reciprocals are not taken into account here, nor are direct/inverse markers. The focus is on increase and decrease.
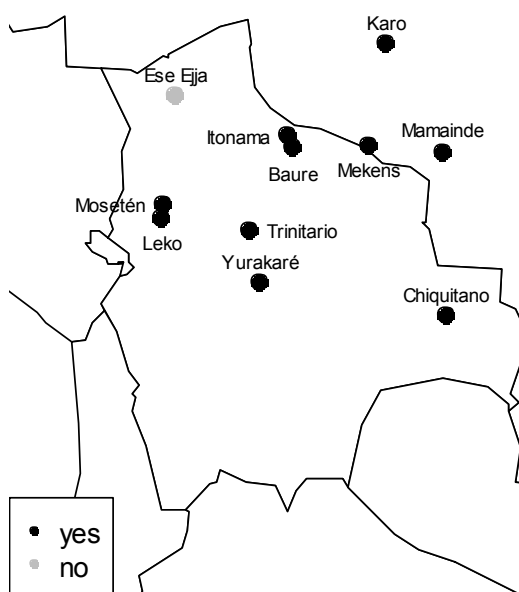
*Map 7: Prefixed valency-increasing markers*
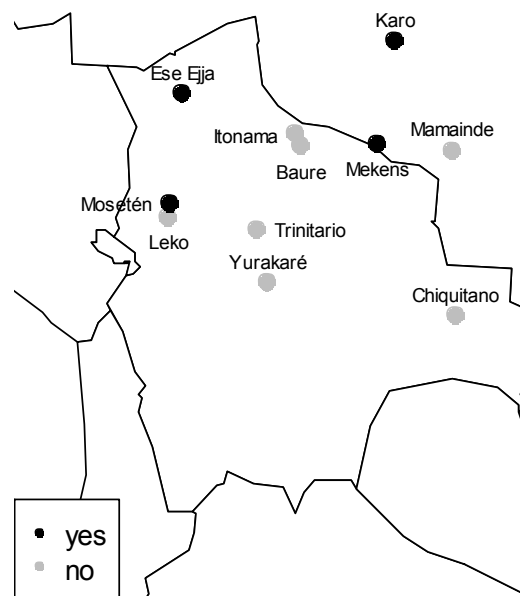


*Map 8: Prefixed valency-decreasing markers*

As can be seen, valency-increasing prefixes are much more common than valency-decreasing prefixes. With respect to the decreasing prefixes, prefixed passives are rare in the GM languages, and in fact only found in Karo and Mosetén (in combination with reflexive suffix). Mekens has an intransitivizing prefix *e-* that comes close to a passive functionally, and Ese Ejja has a middle voice circumfix. There are no prefixed antipassives (and very few suffixed ones).

More promising from an areal point of view are the valency increasing prefixes. Map 9



*Map 9: Prefixed causatives*



*Map 10: Prefixed applicatives*

and 10 show languages with causative and applicative prefixes, respectively. Causative prefixes are very common among the GM languages; applicative prefixes are more restricted, mainly found in the western languages. Among the languages with prefixed causatives are

three Tupian languages: Karo, Mekens, and Yuki.[10] All three distinguish between simple causatives (*ma-* in Karo, *(m)õ-* in Mekens, *m(e)-/b(e)-* in Yuki) and comitative causatives (*ta-* in Karo, *ese-* in Mekens, *gui-* in Yuki). The former applies to either intransitive or transitive verbs; the latter indicates that the causer, apart from making the causee perform an event, is performing the event himself as well, and it applies to intransitive verbs only, deriving transitives. These semantics give the comitative causative (exemplified in Mekens in example 4) a somewhat applicative-like character in some cases.

Mekens [TUPIAN, TUPARI], Galucio 2001: 98
(4)      s-ese-pɨbor-a-ra                        õt
         3SG-COM-arrive-THEM-RESM      I
         'I arrived again, bringing it/I arrived again with it.'

    The three Tupian languages are only distantly related, but make similar distinctions in their prefixed causative system, and the simple causative forms are also related to each other, indicative of a shared pattern, going back to proto-Tupian (Rodrigues & Cabral 2012: 530-533).
    The two Arawak languages in the sample, Baure and Trinitario, also both have formally and functionally related prefixed causatives: *ko-/ka-* and *i(mo)-*in Baure and *ko-* and *im-* in Trinitario. The prefix *ko-/ka-* in Baure, glossed 'attributive' is mainly found as a verbalizer on nouns, but on verbal bases it marks causative.[11]

Baure [ARAWAK], Danielsen 2007: 239
(5)      ni=ko-aparoko-wo                     to       hopi
         1SG=ATTR-break(INTR)-COP    ART    jar
         'I broke the jar.'

The prefix *i(mo)-* in Baure can derive transitive verbs from intransitives as well as ditransitives from transitives. In Trinitario, the two causative prefixes have similar distributions (Rose, in press). Transitivity-based distributions of causatives are a genealogical feature of Arawak, and similar forms are found throughout the family (Aikhenvald 1999: 90-91)
    Mamainde has a set of markers *ta(l)-* and *ã(l)-* whose distribution is determined by whether the cause is external (*ta(l)-*) or internal (reflexive)/unknown (*ã(l)-*). In the latter case the valency does not seem to change.

Mamainde [NAMBIKWARAN], Eberhard 2009: 378
(6a)      ta-sanĩnʔ-ta-nuʔ-Ø-wa
          CAU-happy-1OBJ-2SBJ-PRS-DCL
          'You caused me to be happy.'
(6b)      ã-sanĩnʔ-ka-naʔ-Ø-wa
          CAU-happy-OBL-1SBJ-PRS-DCL
          'I am happy (unknown cause).'
(6c)      ãl-enkũn-ten-aʔ-Ø-wa
          CAU-heal-DES-1SBJ-PRS-DCL
          'I intend to heal by myself.'

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[10] The fourth Tupian language in the sample, Karitiana has a system of prefixes that can be analyzed as voice systems (Everett 2006) but not with valency changing character.
[11] Baure has a negative counterpart *mo-* but this does not seem to have the same causativizing qualities as *ko-*.

The internal/agentless vs. external causative is slightly reminiscent of the situation in Chiquitano, where verb forms containing a prefix that includes the form *iñ-* in combination with a suffix *-naca* and a specific suffixed subject agreement paradigm express what Galeote-Tormo (1993) calls verbs of secondary action (i.e. provoked by some other event). Whether the controller of the provoking event is external or internal depends on the person marking (my provisional glosses, it is not entirely clear which element contributes which function).

Chiquitano [MACRO-JÊ], Galeote-Tormo 1993: 241
(7a)    iñ-ansü-naca-natiyü
        SA-have.diarrhea-SA-3SGM.REFL
        'He caused himself to have diarrhea (e.g. by taking bad food).'
(7b)    iñ-ansü-naca-nati-ñũ
        SA-have.diarrhea-SA-3SGM-1SG
        'He caused me to have diarrhea (e.g. by giving me bad food).'

Itonama and Mosetén are the only languages of the sample that have both prefixed causatives and applicatives. Crevels mentions the causative prefix *yu-* in Itonama, appearing directly before the root, and which competes with more common periphrastic expression means (Crevels 2012: 259). Mosetén distinguishes between general and stative causatives. The former applies to both intransitive and transitive stems and is semantically rather flexible, as it can have e.g. desiderative and permissive interpretations as well. Example (8a) shows a more straightforward causative use, (8b) exemplifies the stative causative, which is used with stative verbs.

Mosetén [MOSETENAN], Sakel 2004: 316-7
(8a)    Jike-ra'    aj    me'    ji'-we-ban-',              we-baj-te
        PST-IRR     yet   so     CAU-carry-VSM.again-F.OBJ  carry-VSM.again-3M.OBJ
        'And so he makes her carry again, she carries him again.'
(8b)    Jike    bajna-tii-'-in              fekoj-ñe-'-in
        PST     cotton.seed-bring-F.SBJ-PL  smoke-put-VSM.3F.OBJ-PL
        dyiph-dyërä'     je-shi'-ke-'-in.
        then-CERT        CAU-drunk-VSM-3F.OBJ-PL
        'They fry the seed of the cotton, put them in the fire and then they make her drunk (by making her breathe the smoke).'

In addition, Mosetén has a so-called 'restricted dynamic passive' construction which combines the causative prefix and the reflexive suffix, reminiscent of the Chiquitano and Mamainde reflexive causative constructions mentioned above.

Mosetén [MOSETENAN], Sakel 2004: 302
(9)     (...)    foto    jäe'mä    ji-keph-ti-'                mö'-chhë'
        (...)    photo   DM        CAUS-make-VSM.IRR-F.SBJ     3F-SUP
        '(...) in there she made herself be taken a picture of (or a picture was taken of her).'

The applicative *k'i-* in Itonama, which is homophonous with the inverse marker, appears directly before the verbal root, and adds a recipient.

Itonama [ISOLATE], Crevels 2012: 260
(10)   ohk'o'tyo   dahne   dih-k'i-ma-k'i-we-he                    u-papa
        who         maybe   1PL.INC-INV-hand-APPL-sell-DISTR   EV-potato
        'Who would sell us potatoes?'

Mosetén has two prefixed applicatives. The prefix *ti-/tï-* predominantly appears with intransitive verbs expressing an emotional state, and adds a condition or reason that provoked the emotional state.

Mosetén [MOSETENAN], Sakel 2004: 322
(11)   Yäe   tï-fäk-e-'                        mö'      nanasi'
        1SG   APPL-angry-VSM-3F.OBJ   3F.SG   girl
        'I was angry because of the girl.'

There is also an unproductive marker *jaj-/jäj-* that marks a comitative applicative, not entirely unlike the Tupian comitative causative, though without a causative element it seems.

Mosetén [MOSETENAN], Sakel 2004: 323
(12)   khin'-dye-ra'   mi'-we-ra'   jemoñ-e-'                   jäj-khösh-te.
        now-CON-IR      3M-DR-IRR    must-VSM-3F.OBJ      APPL-sleep-VSM.3M.OBJ
        'Now we will have to accompany it (the rice), sleeping (in the plantation).'

Leko applicatives contrast a benefactive/dative (*in-*) and malefactive (*ih-*) participant, the vowels fuse with the underspecified vowel of the object person prefix.

Leko [ISOLATE], Van de Kerke 2009: [16]
(13a)  ya-ache-ki         yo-moki   aycha   yin-k'o-a-ka-te
        1SG-father-GEN   1SG-GEN   meat    1.BEN-eat-PF-AUX-DCL
        'My father ate my meat for me (I couldn't eat more).'
(13b)  on     kuchi-ne   yo-moki   aycha   yih-k'o-a-ka-te
        that   dog-TOP    1SG-GEN   meat    1.MAL-eat-PF-AUX-DCL
        'That dog ate my meat (to my detriment).'

Yurakaré has the richest prefixed applicative system, with five types, marked in different ways, as shown in Table 10.

|      | involuntary comitative | voluntary comitative | goal | benefactive | malefactive |
|------|------------------------|----------------------|---------|-------------|-------------|
| 1sg  | ti-   | të-  | të-y-  | ti-n-  | ti-la-  |
| 2sg  | mi-   | më-  | më-y-  | mi-n-  | mi-la-  |
| 3sg  | ka-   | ku-  | ka-y-  | ka-n-  | ka-la-  |
| 1pl  | ta-   | tu-  | ta-y-  | ta-n-  | ta-la-  |
| 2pl  | pa-   | pu-  | pa-y   | pa-n-  | pa-la-  |
| 3pl  | ma-   | mu-  | ma-y-  | ma-n-  | ma-la-  |

*Table 10: Person marking + applicative paradigms in Yurakaré*

The benefactive-malefactive distinction is reminiscent of Leko, including the form of the marker for benefactive. The examples in (14) are directly comparable to the ones in (13) from Leko.

Yurakaré [Isolate], Van Gijn 2006: 155 & 157
(14a)    ti-n-dula-ø              ti-sibë
         1SG-BEN-make-3.SBJ       1SG-house
         'He made me my house.'
(14b)    ti-la-che-m              ti-chata
         1SG-MAL-eat-2SG.SBJ      1SG-food
         'You ate my food (to my detriment).'

The comitatives are functionally related to the prefixed comitative causatives and accompaniment found in the Tupian languages and Mosetén.

Yurakaré [Isolate], Van Gijn 2006: 149 & 151
(15a)    ka-mala-Ø
         3SG.IC-go.SG-3.SBJ
         'He takes him. (lit. goes with him)'
(15b)    ku-mala-ø
         3SG.VC-go.SG-3.SBJ
         'He follows him, goes with him (voluntarily).'

Interestingly, Leko and Yurakaré are the only languages in the sample that reserve prefix positions for P arguments and do not have S or A arguments there. All other languages that have prefixed person markers allow those markers at least to refer to the S argument (see Maps 11-13, indicated only for the subset of sample languages with valency-increasing prefixes). Itonama has prefixed S/A arguments, but in combination with an inverse system, allowing prefixes to refer to P participants. This situation makes it perhaps more natural for Leko and Yurakaré to have prefixed applicatives and suffixed causatives (Itonama has both prefixed and suffixed applicatives), and for other languages with a prefixed S to have the causative at the same side of the base. The idea behind this naturalness argument would be to have the marker that indicates the valency change close to the marker that indicates the participant that is directly affected in its interpretation by the valency-changing operations (P for applicatives and S and/or A for causatives).
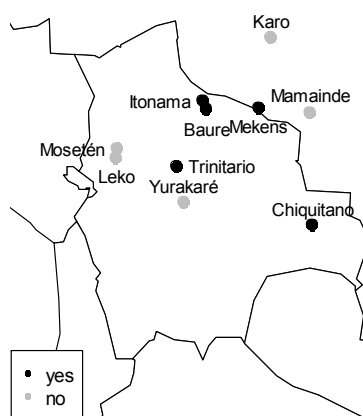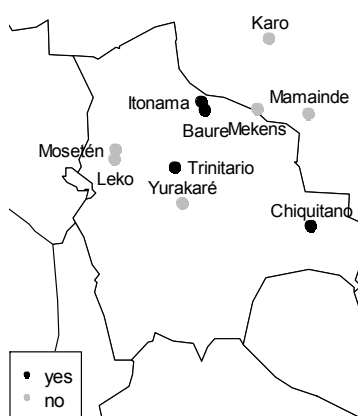


*Map 11: Prefixed S*          *Map 12: Prefixed A*          *Map 13: Prefixed P*
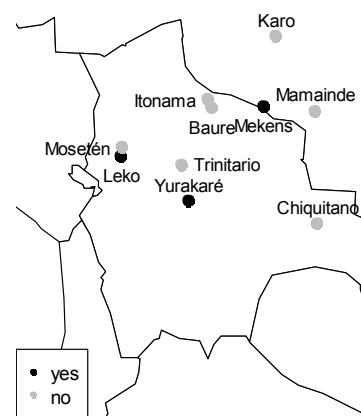
The picture that emerges for the prefixed valency-increasing markers then is a mix of genealogical factors (Tupian, Arawakan), possibly areal diffusion (comitative

causatives/applicatives, benefactive/ malefactive in Leko and Yurakaré), and naturalness effects (positional correlation of person prefixes and the type of valency-increasing markers).

## 7. Conclusion

In this paper I tried to achieve a more precise picture of the morphological systems of the languages of the putative Guaporé-Mamoré linguistic area. It seems that, in formal terms, most languages, except the ones in the northeast, which are morphologically poorer, there is a common 'GM'-type of profile for verbal morphology, which can be described as allowing for incorporation, having a high number of morphologized features, a tendency to have few meanings per morpheme, and a substantial amount of the morphological material is prefixed. In terms of the semantics of verbal morphemes, I have identified 15 potential areal morphologized meanings (those that are present in more than half of the sample languages) which require further scrutiny.

Although this paper was not intended as an evaluation of Crevels & Van der Voort's (2008) linguistic area proposal, it does offer support for it with respect to verbal morphology, both in terms of formal and functional parameters. The formal parameters mostly suggest a convergence area on the Bolivian side of the area, and geographically more confined contact effects in Rondônia. The functional parameters show substantial agreement between the languages of the area, mostly with respect to what has been regarded by Dediu & Levinson (2012) as unstable features, tentatively suggesting a not very deep history of contact. The survey of valency-increasing prefixes, finally, identified a few more specific (geographically confined) areal patterns, but also that other forces, like naturalness and genealogy, play a role.

## References

Aikhenvald, Alexandra Y. 1999. The Arawak language family. The Amazonian languages, ed. by R.M.W. Dixon & Alexandra Y. Aikhenvald, 65-106. Cambridge: Cambridge University Press.

Authier, Gilles & Katharina Haude. 2012. Introduction. Ergativity, valency and voice, ed. by Gilles Authier & Katharina Haude, 1-14. Berlin: De Gruyter Mouton.

Auwera, Johan van der, Ludo Lejeune (with Umarani Pappuswamy, Valentin Goussev). 2013. The Morphological Imperative. The World Atlas of Language Structures Online, ed. by Matthew Dryer & Martin Haspelmath (available online at http://wals.info/chapter/70, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Bacelar, Laércio. 2004. Gramática da língua Kanoê. PhD dissertation Radboud University Nijmegen.

Bybee, Joan. 1985. Morphology: A study of the relation between meaning and form. Amsterdam: John Benjamins.

Crevels, Mily. 2012. Itonama. Las lenguas de Bolivia. Tomo II: Amazonía, ed. by Mily Crevels & Pieter Muysken, 233-294. La Paz: Plural.

Crevels, Mily & Hein van der Voort. 2008. The Guaporé-Mamoré region as a linguistic area. From linguistic areas to areal linguistics, ed. by Pieter Muysken, 151-180. Amsterdam: John Benjamins.

Dahl, Östen, Viveka Velupillai. 2013a. Perfective/Imperfective Aspect. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/65, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Dahl, Östen, Viveka Velupillai. 2013b The Past Tense. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/66, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Dahl, Östen & Viveka Veluillai 2013c The future tense. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/67, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Danielsen, Swintha 2007. Baure: an Arawak language of Bolivia. Leiden: CNWS Publications.

Dediu, Dan & Michael Cysouw. 2013. Some structural aspects of language are more stable than others: a comparison of seven methods. PLoS ONE 8(1): e55009.

Dediu, Dan & Stephen C. Levinson. 2012. Abstract profiles of structural stability point to universal tendencies, family-specific factors, and ancient connections between languages. PLoS one 7(9): e45198.

Dryer, Matthew S. & Haspelmath, Martin (eds.) The World Atlas of Language Structures Online. Leipzig: Max Planck Institute for Evolutionary Anthropology.

Dunn Michael, Angela Terrill, Ger Reesink, Robert A Foley & Stephen C. Levinson. 2005. Structural phylogenetics and the reconstruction of ancient language history. Science 309: 2072–2075

Eberhard, David. (2009) Mamaindê grammar: A northern Nambikwara language and its cultural context. Utrecht: LOT Publications.

Emkow, Carola. 2006. A grammar of Araona. Unpublished PhD Thesis LaTrobe University.

Everett, Caleb. 2006. Gestural, perceptual, and conceptual patterns in Karitiana. PhD dissertation Rice University. Houston, Texas.

Everett, Dan & Barbara Kern. 1997. Wari': the Pacaas Novos Language of Western Brazil. London: Routledge.

Gabas Jr. Jr, Nilson,. 1999. A Grammar of Karo, Tupi (Brazil). PhD dissertation University of California at Santa Barbara.

Galeote-Tormo, Jesús. 1993. Manityana auki besiro. Gramática moderna de la lengua Chiquitana y vocabulario básico, Santa Cruz de la Sierra: Los Huérfanos.

Galucio, Ana Vilacy. 2001. The morphosyntax of Mekens. PhD. dissertation University of Chicago.

Galvão, E. 1960. Áreas culturais indígenas do Brasil; 1900–1959. Boletim do Museu Paraense Emílio Goeldi, n.s., Antropologia 8.

Gijn, Rik van. 2006. A grammar of Yurakaré. PhD dissertation Radboud University Nijmegen.

Gijn, Rik van. This volume. The stability of complex verbal morphology.

Guillaume, Antoine. 2008. A grammar of Cavineña. Berlin: Mouton de Gruyter.

Haan, Ferdinand de. 2013. Semantic Distinctions of Evidentiality. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/77, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Haude, Katharina. 2006. A grammar of Movima. PhD dissertation Radboud University Nijmegen.

Hawkins, John A. & Gary Gilligan. 1988. Prefixing and suffixing universals in relation to basic word order. Lingua 74: 219-259.

Hout, Roeland van & Pieter Muysken. 1994. Modelling lexical borrowability. Language variation and change 6(1): 39-62

Jensen, Cheryl. 1999. Tupí-Guaraní. The Amazonian languages, ed. by R.M.W. Dixon & Alexandra Y. Aikhenvald, 125-164. Cambridge: Cambridge University Press.

Kaufman, Leonard & Peter. J. Rousseeuw. 1990. Finding Groups in Data: an introduction to cluster analysis. New York: John Wiley & Sons.

Kerke, Simon van de 2009. Leko. Las lenguas de Bolivia. Tomo I: Ámbito andino, ed. by Mily Crevels & Pieter Muysken, 287-332. La Paz: Plural.

Lévi-Strauss, Claude. 1948. Tribes of the right bank of the Guaporé river. Handbook of South American Indians 3, ed. by J.H. Steward, 370-379. Washington DC: Smithsonian Institution.

Maldi, Denise. 1991. O Complexo Cultural do Marico: Sociedades Indígenas dos Rios Branco, Colorado e Mequens, Afluentes do Médio Guaporé. Boletim do Museu Paraense Emílio Goeldi, Antropologia 7(2): 209–269.

McMahon, April & Robert McMahon. 2005. Language classification by numbers. Oxford: Oxford University Press.

Payne, Doris. 1990. Morphological characteristics of Amazonian languages. Amazonian Linguistics: Studies in Lowland South American Languages, ed. by Doris Payne, 213-241. Austin: University of Texas Press.

Polinsky, Maria. 2013. Applicative Constructions. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/109, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Rodrigues, Aryon D. & Ana Suelly Cabral. 2012. Tupían. The indigenous languages of South America: A comprehensive guide, ed. by Lyle Campbell & Verónica Grondona, 495-574 Berlin: Walter de Gruyter.

Rose, Françoise. In press. Trinitario. To appear in Las lenguas de Bolivia: tomo III: oriente, ed. by.Mily Crevels & Pieter Muysken. La Paz: Plural.

Sakel, Jeanette. 2004. A grammar of Mosetén. Berlin & New York: Mouton de Gruyter

Siewierska, Anna. 2013a. Verbal Person Marking. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/102, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Siewierska. 2013b. Passive Constructions. The World Atlas of Language Structures Online, ed. by Dryer, Matthew S. & Haspelmath, Martin (available online at http://wals.info/chapter/107, Accessed on 2015-03-09). Leipzig: Max Planck Institute for Evolutionary Anthropology.

Song, Jae Jung. 1996. Causatives and causation: a universal-typological perspective. London: Longman.

Storto, Luciana R. 1999. Aspects of a Karitiana Grammar. University of Cambridge. Cambridge, Mass.: MIT Libraries.

Swadesh, Morris. 1971. The origin and diversification of language (edited post-mortem by Joel Sherzer). Chicago: Aldine.

Thomason, Sarah G. & Terrence Kaufman (1988). Language contact, creolization, and genetic linguistics. Berkeley: University of California Press.

Villafañe, Lucrecia. 2004. Gramática Yuki. Nijmegen: PhD dissertation Radboud University Nijmegen.

Voort, Hein van der. 2004. A grammar of Kwaza. Berlin & New York: Mouton de Gruyter.

Vuillermet, Marine. 2012. A grammar of Ese Ejja, a Takanan language of the Bolvian Amazon. PhD dissertation Université Lumière Lyon 2.

Weinreich, Uriel. 1953. Languages in Contact: Findings and Problems. New York: Linguistic Circle of New York.

Wiemer, Björn & Bernhard Wälchli. 2012. Contact-induced grammatical change: diverse phenomena, diverse perspectives. Grammatical replication and borrowability in language contact, ed. by Björn Wiemer, Bernhard Wälchli & Björn Hansen, 3-64. Berlin: De Gruyter Mouton.