

Case dependent agreement in an active-stative language

Guillaume Thomas, Akil Ismael and Germino Duarte

University of Toronto, UC Berkeley, Independent

1. Introduction

Guarani languages exhibit a well-known combination of active-inactive and hierarchical patterns of cross-reference marking, illustrated in (1) with Paraguayan Guarani examples. Intransitive verbs are split into active and inactive classes, glossed A and B in examples (1a) and (1b) respectively, which cross-reference their subject with different series of markers. Because 1st and 2nd person inactive markers are phonologically similar to free pronouns, they have been analyzed as clitic doubling (e.g., *che=*), in contradistinction to active agreement prefixes (e.g., *a-*). Cross-reference marking on transitive verbs follows a hierarchical pattern illustrated in (1c) and (1d). Verbs cross-reference their subject, unless the object is higher than the subject on the person hierarchy in (2), in which case the object is cross-referenced. Subjects are cross-referenced by active markers, cf. (1c), while objects are cross-referenced by inactive markers, cf. (1d). Combinations of a first person subject and a second person object are cross-referenced by a portmanteau prefix *ro-*¹ as illustrated in (1e).

(1) *Paraguayan Guarani* (Zubizarreta and Pancheva 2017a; our glosses)

- | | | | |
|----|-----------------------|---------|----------------------------|
| a. | (Che) a-jahu | | Active intransitive |
| | (I) A1SG-bathe | | |
| | 'I bathe.' | | |
| b. | (Che) che=r-asẽ | | Inactive intransitive (PG) |
| | (I) B1SG-LK-cry | | |
| | 'I cry.' | | |
| c. | (Che) a-mbo-jahu | Juan-pe | Transitive direct (PG) |
| | (I) A1SG-CAUS-bathe | Juan-PE | |
| | 'I bathe Juan.' | | |
| d. | (Nde) che=mbo-jahu | | Transitive inverse (PG) |
| | (you) B1SG=CAUS-bathe | | |
| | 'You bathe me.' | | |
| e. | (Che) ro-mbo-jahu | | Portmanteau agreement (PG) |
| | (I) PORT-CAUS-bathe | | |
| | 'I bathe you.' | | |

(2) Person hierarchy governing cross-reference marking:

1 > 2 > 3

¹ In Paraguayan Guarani, the prefix *po-* is used also used for 1st person plural subjects acting on second person objects. This is unattested in Mbya Guarani and therefore will not be relevant for this paper.

The most detailed generative account of Guarani cross-reference marking is due to Zubizarreta & Pancheva (2017a, b), whose analysis focuses on Paraguayan Guarani. In their analysis, cross-reference marking results from a formal agreement relation between functional heads and referential expressions, which is driven by functional heads probing for phi-features (person, gender and number) in their c-command domain. Two functional heads are involved in this process: Infl and little v. Zubizarreta & Pancheva's analysis stand in contrast to cyclic expansion accounts of hierarchical cross-reference marking (Bejar & Rezac 2009), which have been also applied to Tupi-Guarani languages (see notably Deal 2021 on Tupinamba). In a cyclic expansion analysis of the Guarani paradigm, a single functional head probes for phi-features in its c-command domain, which is expanded when no appropriate goal is found during the first probing cycle. Both Zubizarreta & Pancheva's (2017a, b) analysis and cyclic agree analyses of Guarani person indexing aim to account for the paradigm in (1a-e). However, this paradigm is incomplete, since it fails to include two relevant phenomena attested in some Guarani languages and more generally across the Tupi-Guarani family: object agreement using the prefix *i-* and absolutive agreement in converbs.

The first phenomenon of interest concerns a subset of transitive verbs where subject and object agreement cooccur, object agreement being marked by the segment *i-* (or its allomorphs) following subject agreement:

(3) *Mbya Guarani (Constructed)*

Xee a-i-nupã
 I A1SG-AGR-beat
 'I beat it/him/her/them.'

In the literature on Paraguayan Guarani, such occurrences of the segment *i-* are analyzed as part of an allomorph of the subject agreement prefix. By contrast, this segment has been analyzed as an object agreement prefix in the literature on Mbya Guarani and other Tupi-Guarani languages.²

The second phenomenon concerns a class of converbs that follow an absolutive cross-reference marking pattern: only objects and intransitive subjects are cross-referenced, as illustrated in (4a-c). (4c) in particular shows that transitive converbs cross-reference their object rather than their subject even when the latter outranks the object on the person hierarchy, as we will discuss in more detail in section 3:

(4) *Mbya Guarani (Dooley 1991)*

- | | | | | |
|----|--|----------|-------------------------|--------------------------|
| a. | A-pu'ã | | a-'a-my | |
| | A1SG-stand.up | | A1SG-stand-CONV | |
| | 'I stood up and remained on my feet.' | | | |
| b. | Xe=r-u | xe=jopy | xe=r-er-a-vy | |
| | B1SG=LK-father | B1SG-get | B1SG=COM-go-CONV | |
| | 'My father got me and took me with him.' | | | |
| c. | Xe=r-o | py=gua | kuery a-r-u | h-ero-kua-py |
| | B1SG=LK-house | LOC-NMLZ | COL A1SG-COM-come | B3-COM-be.PL-CONV |
| | 'I brought all of the inhabitants of my house as a group.' | | | |

² Deal (2021) does take object marking into consideration in her analysis of Tupinamba, although she does not discuss the distribution of the prefix in detail.

The present paper revisits the cross-reference marking system of Guarani, more specifically Mbya Guarani, in light of these two phenomena. We argue that agreement is sensitive to abstract Case in Mbya, active markers being the morphological realization of agreement of Infl heads with nominative DPs. We argue that both Infl and little *v* probe for person features but little *v* is underspecified and therefore never triggers cyclic expansion. In this model, active agreement prefixes and inactive clitic doubling compete for the morphological realization of phi-features on Infl, which probes for phi-features on both external and internal arguments. By contrast, object agreement markers that cooccur with subject agreement prefixes spell-out phi-features on little *v*, which only enter into agreement relations with internal arguments.

The paper is structured as follows. In section 2, we review arguments that the segment *i-* that co-occurs with subject agreement prefixes is itself an object agreement marker in Mbya Guarani. In section 3, we discuss cross-reference marking with converbs in more detail. Section 4 presents our analysis of Mbya Guarani alignment. Section 5 compares our proposal to Zubizarreta & Pancheva's (2017a, b) and Deal's (2021) analyses. Section 6 concludes.

Unless stated otherwise, all examples in the following sections are from Mbya Guarani. Our primary source of data is Dooley's (1991) description of Mbya converbs and Dooley's (2015) discussion of cross-reference marking in Mbya. These examples referenced as [D91] and [D15] respectively, after the translation line. These were supplemented by examples constructed by the third author of the manuscript, who is a native speaker of the language. These examples are referenced as [C] after the translation.

2. Object marking

This paper focuses on the Mbya variant of Guarani. The basic cross-reference marking paradigm of Mbya is identical to that of Paraguayan Guarani (henceforth, PG), which was presented in the previous section. As in PG, with some transitive verbs, an additional prefix *i-* (or its allomorphs *j-* and *nh-*) attaches to the stem following a subject agreement prefix:

- (5) A-i-nupã ava
 A3-AGR-hit man
 'I hit the man.' [C]
- (6) A-j-apo xe=r-o-rã
 A3-AGR-build B1SG=LK-house-FUT
 'I am building my house.' [C]

In grammatical descriptions of PG, this segment has been analyzed as part of an allomorph of the subject prefix. Transitive verbs that are inflected with the additional segment are called *aireales*, while other verbs are called *areales* (see Estigarribia 2020: 133-135). We refer to this view as the *airal hypothesis*:

- (7) Paraguayan Guarani (Estigarribia 2020: 134; our glosses, preserving the author's segmentation)
 Ai-pytyvõ ichupe
 A1SG-help to.him/her
 'I help(ed) him/her.'

By contrast, grammatical descriptions of Mbya as well as comparative Tupi-Guarani (henceforth, TG) studies analyze the added segment and its cognates as object agreement prefixes (on Mbya, see Dooley

2015: §5.5 and Fileti Martins 2004: §2.4.1; on TG morphosyntax, see Jensen 1987 and Rose 2009, 2018). There are several pieces of evidence that support this analysis, which we review in this section.

Firstly, the additional segment is in complementary distribution with inactive markers that cross-reference the object. This follows straightforwardly if the segment is an object agreement prefix, under the assumption that it competes with inactive markers for object indexing on the verb. By contrast, the fact that only active markers are subject to allomorphy is not explained by the aireal hypothesis but merely stipulated.

- (8) Ava xe=nupã.
 man B1SG=hit
 'The man hit me.' [C]

Secondly, the additional segment is in complementary distribution with prefixes that bind the object, such as the reflexive prefix *je-/nhe-* and the reciprocal prefix *jo-/nho-*, as illustrated in (9). Likewise, the segment is in complementary distribution with valence increasing prefixes such as the causative prefix *mo-/mbo-* and the comitative prefix *guero-* and its allomorphs, as illustrated in (10). If the segment is an object agreement marker, this would follow from the hypothesis that valence changing prefixes and object agreement markers spell out the same functional head. In section 4, we will argue that this is because object agreement markers spell out a transitive little v_{TR} head and valency changing prefixes spell out a Voice head that is bundled with v_{TR} (cf. Pykkänen 2008), thereby competing for exponence. It is unclear how the aireal hypothesis can explain the incompatibility of *ai-* allomorphs with valence changing prefixes.

- (9) a. A-nhe-nupã.
 A1SG-REFL-hit
 'I hit myself.' [C]
 b. O-nho-nupã.
 A3-RECIP-hit
 'They hit one another.' [C]
- (10) a. A-mbo-'a ava
 A1SG-CAUS-fall man
 'I made the man fall.' [C]
 b. A-guero-'a ava
 A1SG-COM-fall man
 'I wrestled the man to the ground.' [C]

A potential objection to the analysis of the additional segment as an object marker is that it co-occurs with the portmanteau prefix *ro-*, which indexes a 1st person subject acting on a 2nd person object:

- (11) Xee ro-i-nupã.
 I PORT-AGR-hit
 'I hit you.' [C]

If *ro-* spells out agreement with both the subject and the object, the additional segment cannot be an object agreement marker and should instead be analyzed as part of the aereal allomorph of the portmanteau prefix. To rebuke this objection, we point out that the portmanteau analysis of *ro-* has been challenged in several publications. Rose (2015, 2018) observes that the prefix *ro-* is independently attested as a first person plural exclusive agreement marker and that the so-called portmanteau *ro-* may be analyzed as a 1st person agreement marker that signals that the subject does not include the addressee in its extension. Zubizarreta & Pancheva (2017a) on the other hand analyze portmanteau *ro-* as a contextual allomorph of the 1st person singular active agreement marker *a-* that is selected when the verb's object is second person.³ In any case, it appears that *ro-* does not need to be analyzed as a true portmanteau prefix, i.e., a prefix that spells out subject and object agreement. Rejecting the portmanteau analysis of *ro-* allows us to maintain the analysis of the additional segment *i-* as an object agreement prefix, which in turn allows us to explain its complementary distribution with inactive object markers and valence changing prefixes.

An interesting consequence of this analysis is that the object agreement marker *i-* is attested both with 3rd person objects, as illustrated in examples (5) and (6), and with 2nd person objects, as illustrated in example (11). Consequently, we must assume that *i-* is underspecified for person. Far from being a liability, we will argue in section 3 that this assumption allows us to make sense of the distribution of the prefix *i-* and its allomorphs in converbs.

The cross-referencing system of transitive verbs that we have arrived at is summarized in table 1. For the sake of conciseness, nasal allomorphs of cross-reference markers are not represented in the table.

| Subject/Object | 1SG | 1PL.EXCL | 1PL.INCL | 2SG | 2PL | 3 |
|----------------|------------|-------------|----------------|--------------|---------------|--------------|
| 1SG | — | — | — | <i>ro-i-</i> | <i>ro-i-</i> | <i>a-i-</i> |
| 1PL.EXCL | — | — | — | <i>ro-i-</i> | <i>ro-i-</i> | <i>ro-i-</i> |
| 1PL.INCL | — | — | — | — | — | <i>ja-i-</i> |
| 2SG | <i>xe=</i> | <i>ore=</i> | — | — | — | <i>re-i-</i> |
| 2PL | <i>xe=</i> | <i>ore=</i> | — | — | — | <i>pe-i-</i> |
| 3 | <i>xe=</i> | <i>ore=</i> | <i>nhande=</i> | <i>nde=</i> | <i>pende=</i> | <i>o-i-</i> |

Table 1 Transitive cross-reference marking (Dooley 2015: 20)

As we noted in the introduction, 1st and 2nd person inactive markers are largely homophonous with free form personal pronouns, which are listed in table 2. For this reason, inactive markers have been argued to be clitic doubling,⁴ while active markers have been analyzed as agreement prefixes (see notably Jensen 1998, Zubizarreta & Pancheva 2017a).

³ In Paraguayan Guarani, there would be an additional allomorph *po-* when the object is second person plural.

⁴ Since inactive markers can cooccur with overt arguments, one must assume that argument cliticization with inactive markers is a case of clitic doubling.

| | |
|----------|-------------------------------------|
| 1SG | <i>xee</i> |
| 2SG | <i>ndee</i> |
| 3SG | <i>ha'e</i> |
| 1PL.INCL | <i>nhande (kuery)</i> |
| 1PL.EXCL | <i>ore (kuery)</i> |
| 2PL | <i>peẽ (kuery) or pende (kuery)</i> |
| 3PL | <i>ha'e kuery</i> |

Table 2 Personal pronouns (Dooley 2015: 17)

Note that third person subjects of inactive intransitive verbs are cross-referenced either by the prefix *i-* and its allomorphs or by the prefix *h-*. However, neither of these prefixes is identical in form with the third person pronoun *ha'e*. This motivates their analysis as agreement prefixes rather than clitic doubling.

- (12) a. Kyringue i-kane'õ
 children B3-tired.
 'The children are tired.' [C]
- b. Yy h-aku
 water B3-warm
 'The water is warm.' [C]

Jensen (1987) argues that the prefix *h-* is itself descended from an allomorph **c* of the object marking prefix **i-* in Proto-Tupi-Guarani. This prefix is no longer attested as an object marking prefix in Mbya Guarani due to phonological change. Nevertheless, both *i-* and *h-* were attested as object marking prefixes in Old Guarani, a variant of Guarani that was spoken in the Jesuitic missions in the 17th and 18th centuries. Ruiz de Montoya (1724 [1996]) calls them *relacion* and discusses their distribution in great detail (see notably Ruiz de Montoya 1724 [1996]: Part 3, ch. 2, §1-5 and §9; ch. 3 §1), supporting Jensen's (1987) analysis.

In sum, there is evidence that the segment that is added to subject agreement markers in so-called *aireales* verbs is an object agreement prefix. This prefix is underspecified for person, since it can cross-reference either 2nd person or 3rd person objects. We now move to a discussion of the second phenomenon of interest in this study, namely converbs and their absolutive cross-reference marking pattern.

3. Absolutive cross-reference marking in converbs

Tupi-Guarani languages have a multi-verb construction that is referred to as a *gerund* (*gerundio*) in the Brazilian tradition of TG linguistics (Rodrigues 1953) and that has alternatively been characterized as a double-verb construction (Dooley 1991) or a serial-verb construction (Jensen 1990, Velázquez-Castillo 2004, Damaso Viera & Baranger 2021). In her description of Emerillon serialization, Rose (2009) notes that "from a cross-linguistics perspective, this construction may best be described as a converb." We follow Rose's suggestion in this paper and refer to said construction in Mbya as a converb construction.

Converbs have been defined as dependent verb forms specialized for functions that are neither argumental nor adnominal (Rapold 2007; cf. also Haspelmath 1995). Mbyá converbs are dependent verbs formed from a closed class of intransitive active roots by adding the suffix *-py* or one of its allomorphs (*-my/-ngy/-ny*), as illustrated in table 3. In addition, converbs can be transitivized with the causative prefix *mbo-* or the comitative causative prefix *guero-* and their allomorphs.

Case dependent agreement in an active-stative language

| Root | Converb | Meaning |
|---------|-------------|------------------------------|
| 'ã | 'ãmy | stand |
| ĩ | ĩny | sit, be located |
| iko/eko | ikovy/ekovy | exist, walk around |
| kua | kuapy | be (plural) |
| a/o | avy/ovy | go |
| (j)u | (j)uvy | come |
| (j)u | (j)upy | lie (be in a prone position) |

Table 3. converb roots

While converbs cross-reference their arguments using active and inactive markers, the subjects and objects of converbs are never expressed overtly and are obligatorily shared with the superordinate verb (Dooley 1991, Damaso Viera & Baranger 2021):

- (13) A-pu'ã a-'ã-my
 A1SG-stand.up A1SG-stand-CONV
 'I stood up and stayed on my feet.' [D91]

The main feature of interest of Mbya converbs for this study is that they only cross-reference their absolutive argument (Dooley 1991: §4.3).⁵ Intransitive converbs cross-reference their subjects with active agreement prefixes, as illustrated by example (13). Reflexive and reciprocal forms of transitive converbs are syntactically intransitive and also cross-reference their subject with active agreement prefixes:

- (14) Ja-guata ja-jo-guer-a-vy
 A1.INCL-travel A1.INCL-RECIP-COM-go-CONV
 'We accompanied each other as the travelled.' [D91]

By contrast, transitive converbs formed with the comitative prefix never cross-reference their subject and always cross-reference their object with inactive markers, regardless of the person of the subject:

⁵ In their discussion of Mbya converbs (which they analyze as serial verb constructions), Damaso Vieira & Baranger (2021: §5.3) write that "in relation to the personal morphology, supplementary and subordinate verbs follow the same rules of independent clause verbs, not the absolutive pattern found in the original gerundive forms, employed in other languages of the group." On a first, reading, this appears to contradict Dooley's (1991) description. Indeed, Dooley states very clearly that Mbya converbs, which he refers to as "V2s," have absolutive agreement: "V2s agree only with the absolutive argument" (Dooley 1991: p. 46). Dooley also provides a wealth of examples that support this conclusion, some of which are reproduced in section 3 of our manuscript. On a closer reading of Damaso Vieira & Baranger (2021), it appears that what these authors mean is that Mbya converbs do not use only inactive cross-reference markers but also make use of active markers. This contrasts with the cross-reference marking system of converbs in Proto-Tupi-Guarani and in some modern Tupi-Guarani languages, which only make use of inactive markers together with a special set of coreferential subject markers (see Jensen 1998: §6.3, Rose 2009: §3.1). What matters for the present discussion is that, in Mbya as in other Tupi-Guarani languages where this construction is still attested, converbs only cross-reference their absolutive argument, i.e., either their intransitive subject or their object. We find no contradiction between Dooley (1991) and Damaso Viera & Baranger (2021) in this respect.

prefixes on transitive verbs. This suggests that this prefix spells out the person features of a different functional head, which we take to be a transitive little *v* head.

In the next subsection, we present a detailed analysis of the agreement relation between these functional heads and the verb's core arguments. This analysis should account not only for the basic paradigm of active-inactive and hierarchical cross-reference marking of Guaraní languages but also for the distribution of object markers and the absolutive pattern of cross-reference marking in converbs.

4.2 Modeling agreement in independent clauses

We adopt Deal's (2021) theory of Agree with Interaction and Satisfaction features. Syntactic probes are characterized by two conditions: Interaction specifies the features α that a probe will copy when it finds them on a goal in its search domain. Satisfaction specifies the features β that will halt the search once the probe finds them. We can represent these two conditions as follows: [INT: α , SAT: β]. The search domain of a probe is (simplifying somewhat) its c-command domain, subject to relativized minimality, i.e., a probe will always interact with the closest goals in its c-command domain before interacting with more distant goals. Following Preminger (2014), it is assumed that Agree is an obligatory operation but its failure does not trigger ungrammaticality.

In Mbya, Infl and transitive little *v* heads probe for person and number features.⁶ Following Harley & Ritter (2002) and Bejar & Rezac (2009) among others, we assume that such features have a hierarchical, privative structure. In Mbya, person is structured as follow, and all person and number features are furthermore subsumed under a [Φ] root feature:

- | | | |
|------|-------------------------------------|---|
| (24) | 1P = [speaker, participant, person] | (for conciseness: [SPK, PRT, PER] or [1]) |
| | 2P = [participant, person] | (for conciseness: [PRT, PER] or [2]) |
| | 3P = [person] | (for conciseness: [PER] or [3]) |

According to this representation, 3rd person is the least specific feature combination in the person feature geometry, followed by 2nd person and then 1st person.

Hierarchical cross-reference marking in Mbya follows from the assumption that Infl interacts with [Φ] but is satisfied by [speaker], together with the observation that subjects are generated in the specifier of VoiceP and objects are generated inside little *v*P: (i) If Infl finds a 1st person goal in the specifier of VoiceP, it will agree with it and no other goal will be probed. This results in cross-referencing the 1st person subject. (ii) If Infl finds a 2nd person goal in the specifier of VoiceP, it will continue its search. If the object is 1st person, Infl will agree with the more specific object. This results in cross-referencing the 1st person object. Otherwise, the object is 3rd person.⁷ In that case, all person features on the object are also present on the 2nd person subject, therefore Infl does not copy any new person features from the object. This results in cross-referencing the 2nd person subject. (iii) If Infl finds a 3rd person goal in the specifier of VoiceP, it will probe the object and copy its [participant] and [speaker] features, if any are present, which results in cross-referencing the object. If both the subject and the object are 3rd person, Infl will probe both the subject and the object but will not copy any person features from the object that was not already copied from the subject. This results in cross-referencing the subject.

⁶ We will focus on person features, which are the most relevant for our account, and only discuss number feature when relevant.

⁷ Reflexive and reciprocal predication is realized through valency reduction prefixes in Mbya. Therefore, if the subject of a transitive verb is 1st or 2nd person, its object will never have the same person specification.

One complication is that the source of person features on Infl affects their morphological realization: while person features that are copied from subjects are spelled out as agreement prefixes, person features that are copied from objects are spelled out through clitic doubling. To explain this, we hypothesize that the morphological realization of person feature on Infl is sensitive to Case. While this assumption may seem stipulative, we will see in section 4.4 that it supports a unified analysis of hierarchical cross-reference marking in independent clauses and absolutive cross-reference marking in converbs.

We adopt Legate's (2008) theory of Case assignment. For nominative-accusative systems, Legate simply argues that Infl assigns nominative Case to subjects while little *v* assigns accusative Case to objects:

- (25) Nominative-accusative Case assignment:
- Infl assigns nominative Case to subjects
 - Little *v* assigns accusative Case to objects

Coming back to Mbya, under the assumption that Case assignment follows a nominative-accusative pattern in independent clauses, the fact that person features on Infl are spelled out as agreement prefixes only if they were copied from a subject can be captured as a constraint that ties morphological realization to Case assignment:⁸

- (26) Case dependence of agreement in Mbya:

Φ-features on Infl can only be spelled-out as agreement prefixes if a nominative DP with matching Φ-features is present in the specifier of InflP.

(26) can be implemented through contextual allomorphy in Distributed Morphology (Halle & Marantz 1993), by requiring that person features on Infl be spelled out only if a nominative DP with matching features is present in the specifier of InflP. This is illustrated in (27) with Vocabulary Insertion rules for a subset of agreement prefixes:⁹

- (27) a. 1st SG agreement prefix insertion (preliminary version):
- a- ↔ Infl_[1,SG] / [_{InflP} DP_[1,SG,NOM] ___ [...]]
- b. 2st SG agreement prefix insertion
- re- ↔ Infl_[2,SG] / [_{InflP} DP_[2,SG,NOM] ___ [...]]
- c. 3rd agreement prefix insertion
- o- ↔ Infl_[3] / [_{InflP} DP_[3,NOM] ___ [...]]

Object cross-reference marking, on the other hand, is realized by clitic doubling. Following Preminger (2019), we assume that clitic doubling is licensed by agreement. More precisely, clitic doubling in Mbya is non-local head-movement of an object D to Infl, which is licensed by interaction between Infl

⁸ Note that this is different from the situation where agreement itself is mediated by case (cf. Bobaljik 2008). In Mbya, Infl can agree with accusative DPs, but the person feature copied from an accusative DP will not be spelled out as agreement prefixes.

⁹ Third person agreement prefixes and pronouns are unmarked for number. Recall that [1] stands for [SPK, PRT, PER], [2] for [PRT, PER] and [3] for [PER].

and the phrase headed by D. Crucially, this movement occurs before spell-out. Consequently, the morphological realization of clitic doubling is subject to Vocabulary Insertion rules that reference Infl as shown in (28):

- (28) a. 1st SG clitic doubling insertion:
 xe= ↔ [Infl D_[1,SG] Infl_[1,SG]]
 b. 2st SG clitic doubling insertion:
 nde= ↔ [Infl D_[2,SG] Infl_[2,SG]]

Because clitic doubling and agreement prefixes compete for the morphological realization of Infl, exponent selection will be subject to the Subset Principle, and speakers will choose the most specific candidate.

We are now in a position to provide a detailed account of hierarchical cross-reference marking in independent clauses. Consider first the case where the subject outranks the object. In (29), Infl agrees with a 1st person subject base generated in the specifier of VoiceP, copying its [1, SG] features, i.e., [SPK, PRT, PER, SG]. This satisfies Infl and no further probing takes place. After movement of the subject to the specifier of InfIP, the [1, SG] features on Infl are in a configuration that licenses their spelling out as an agreement prefix, in accordance with rule (27). Since Infl does not agree with the object, clitic doubling cannot take place:

- (29) a. Xee a-mbo-jau
 I A1SG-CAUS-bathe
 'I bathe her/him/it/them.' [C]
 b. [DP_[1,SG] Infl_[1,SG] [Voice ~~DP_[1,SG]~~ Voice_{CAUS} [VP V_{TR} [VP V DP_[3]]]]]

Next, consider the case where the object outranks the subject. In (30), Infl agrees with the 3rd person subject, copying its [3] feature, i.e. [PER]. Since the Satisfaction condition on Infl is not met, Infl further agrees with the object, copying its [1, SG] features. That is to say, [SPK, PRT, SG] are added to the [PER] feature already present on Infl. At spell out, the 3rd person nominative DP in the specifier of InfIP matches the features present on Infl. Consequently, the Φ -features on Infl could be realized by the 3rd person agreement prefix *o-* per rule (27c). However, rule (28a) also applies and is more specific, which results in spelling out Φ -features on Infl through clitic doubling:

- (30) a. Ha'e xe=mbo-jau
 3 B1SG=CAUS-bathe
 'She/he/they bathe me.' [C]
 b. [DP_[3] [Infl D_[1SG] Infl_[1,SG]] [Voice ~~DP_[3]~~ Voice_{CAUS} [VP V_{TR} [VP V DP_[1,SG]]]]]

4.3 Object marking with underspecified agreement prefixes

In section 4.2. we offered an account of active and inactive cross-reference marking in transitive verbs that focuses on subject agreement and clitic doubling. This account does not explain why an underspecified object agreement marker cooccurs with subject agreement prefixes on some transitive verbs, as described in section 2.

We propose that underspecified object agreement prefixes spell out a transitive little v_{TR} head. Unlike Infl, little v_{TR} interacts with and is satisfied by [person], i.e., it is specified as [INT: person, SAT: person]. Consequently, little v_{TR} will always agree with the object and will never trigger cyclic expansion. The derivation is straightforward when the subject outranks the object on the person hierarchy, as in example (31). In this case, Infl agrees with the subject and is spelled out as an agreement prefix as outlined in section 4.2. Little v_{TR} agrees with the 3rd person object:

- (31) a. Ava o-i-nupã xe=akã
 man A3-AGR-hit B1SG-head
 ‘The man hit my head.’ [C]
- b. [DP_[1,SG] Infl_[1,SG] [Voice ~~DP_[1,SG]~~ Voice [vP v_{TR}[3] [VP V DP_[3]]]]]

The fact that not all transitive verbs bear object agreement prefixes can be captured as a lexical constraint, implemented as a contextual restriction on Vocabulary Insertion:

- (32) a. -i ↔ v_{TR}[person] / [___ [NUPã, etc]]
 b. ∅ ↔ v_{TR}[person] (elsewhere case)

This analysis faces a complication when the object outranks the subject on the person hierarchy. In that case, both Infl and v_{TR} agree with the object. Therefore, one might expect that clitic doubling should cooccur with an object agreement prefix. This prediction is not borne out since in that case the object is only cross-referenced by clitic doubling. This configuration is illustrated in (32).¹⁰

- (33) a. Nde che=nupã
 You B1SG-hit
 ‘You hit me.’ [C]
- b. [DP_[1,SG] [InflD_[2,SG] Infl_[2,SG] [Voice ~~DP_[1,SG]~~ Voice [vP v_{TR}[3] [VP V DP_[2SG]]]]]

We suggest that in such configurations, the morphological realization of Φ -features on v_{TR} is blocked by a morphological filter that bans the exponence of multiple sets of person features that were valued from the same goal. In such cases, the most informative exponent is preserved, which corresponds to clitic doubling on Infl. We can also implement this filter through contextual allomorphy:

- (34) Double exponence filter:
 ∅ ↔ v_{TR}[person] / [[InflD_[person] Infl_[person]] [Voice [_ [...]]]]

Note that the double exponence filter does not block cooccurrence of the so-called portmanteau prefix with an object agreement marker, under the assumption that this prefix really is an allomorph of the first person subject agreement prefix. A relevant example is provided in (35), where the prefix *ro-* marks agreement with a first person subject in the context of a second person object:

¹⁰ Remember that ‘[3]’ is short for ‘[person].’ In this example, little v_{TR} only probes for [person], which is copied onto the probe following establishment of an agreement relation with the 2nd person object, hence the notation ‘v_{TR,[3]}’.

- (35) a. Chee ro-i-nupã
 I PORT-AGR-bathe
 'I hit you.' [C]
- b. [DP_[1,SG] Infl_[1,SG] [~~DP_[1,SG]~~ Voice_{[VP v_{TR} [3]} [VP V DP_[2,SG]]]]]

A revised Vocabulary Insertion rule for 1st person features in Infl that captures the relevant allomorphy is given in (35). Under this analysis, *ro-* spells out 1st person features on the Infl head in the context of a second person object in its scope. Since in that case the features on Infl and little *v_{TR}* are valued by different DP, the double filter exponence does not apply and the person feature on *v_{TR}* may be spelled out as an object agreement prefix:

- (36) 1st SG agreement prefix insertion (final version):
- ro- ↔ Infl_[1,SG] / [_{InflP} DP_[1,SG,NOM] ___ [Voice/v_{TR} DP_[1,SG,NOM] Voice/v_{TR} [VP V DP_[2,SG]]]]
- a- ↔ Infl_[1,SG] / [_{InflP} DP_[1,SG,NOM] ___ [...]]

As discussed in section 2, the proposed analysis of object marking explains the complementary distribution of object markers with valency increasing and decreasing prefixes, which we take to spell out Voice heads. Indeed, since Voice is bundled with little *v_{TR}*, valency changing prefixes compete with object agreement prefixes for the morphological realization of the bundled head. The analysis of Mbya as a Voice bundling language is supported mainly by the observation that verbalizing and causativizing heads are spelled out jointly (cf. Harley 2017). Indeed, *mbo-* can be prefixed to nominal roots, which verbalizes the root and causativizes it in the same process. This is illustrated by examples (37a) and (37b), where *mbo-* verbalizes the nominal phrase *kupe arygua* ('saddle') and causativizes it at the same time:

- (37) a. kupe ary-gua
 rib on.top-NMLZ
 'saddle' (lit. 'thing that comes on top of the ribs') [D15]
- b. Ava o-mbo-kupe ary-gua kavaju.
 man A3-CAUS-rib on.top-gua horse
 'The man saddled the horse.' [D15]

4.4 Cross-reference marking in converbs

In section 3, we established that cross-reference marking in converbs follows an absolutive pattern, whereby only intransitive subjects or objects may be cross-referenced. We propose that the source of this variation is a split in the grammar of case assignment in the language, which we locate in the grammar of little *v_{TR}*, following Legate (2008). More specifically, we propose that converbs follow an 'absolutive as default' patterns in Mbya, as spelled out in (38):

- (38) Matrix clauses (nominative-accusative):
- Infl assigns nominative Case to subjects
 - Little *v_{TR}* assigns accusative Case to objects

Converbs (absolutive as default):

- Infl assigns nominative Case to intransitive subjects
- Little v_{TR} assigns inherent ergative Case to subjects and accusative Case to objects

This proposal is supported by diachronic studies of alignment in Tupi-Guarani languages, which have argued that Proto-Tupi-Guarani made use of a nominative-accusative alignment in matrix clauses and ergative-absolutive alignment in subordinate clauses (Jensen 1990, 1998). In modern Tupi-Guarani languages, various types of subordinate constructions would have preserved ergative-absolutive features, including converbs (Rose 2009, 2013).

Under this analysis, subjects of intransitive converbs are nominative, hence they may be cross-referenced with agreement prefixes even if the Case dependence of agreement is active in converbs. This is indeed the case, as shown by example (39):

- (39) a. A-pu'ã **a-'ã-my**
 A1SG-stand.up **A1SG-stand-CONV**
 'I stood up and remained on my feet.' [D91]
- b. [_{IP} DP_[1,SG] Infl_[1,SG] [_{VoiceP} DP_[1,SG] Voice [_{VP} v [_{VP} V]]]]

By contrast, because subjects of transitive converbs¹¹ are ergative, they cannot be cross-referenced by agreement prefixes. If the object is higher than the subject on the person hierarchy, this gap doesn't manifest itself morphologically, since in that case the object is cross-referenced by clitic-doubling, just as in matrix clauses. This is illustrated by example (40):

- (40) 3 → 1, *object cross-referenced on converb*:
- Xe=r-u xe-jopy xe=r-er-a-vy
 B1SG=LK-father B1SG-get B1SG=COM-go-CONV
 'My father got me and took me with him.' [D91]

If on the other hand the subject outranks the object, Infl copies its Φ -features from the subject, but these features cannot be spelled out as agreement prefixes, since the subject is ergative. In that case, we may expect either absence of agreement morphology or resort to an underspecified agreement marker. It is the second option that is attested in Mbya: whenever the subject of a transitive converb outranks its object, the subject is cross-referenced using the underspecified agreement prefix *i-* or its allomorph *h-*¹² regardless of the person of the subject. This is shown in (41) and (42), where the subject of the converb is 1st person and its subject is third person:

- (41) Mboka a-jopy h-er-a-vy.
 Rifle A1SG-take **B3-COM-go-CONV**
 'I took my rifle and went off uninterruptedly.' [D91]

¹¹ Recall from section 3 that all converb roots are intransitive, and transitive converbs are derived either by simple causativization or by comitative transitivization.

¹² See example (12) and its discussion in section 2 for a discussion of *h-* and its relation to the object marking use of the prefix *i-*.

- (42) Xe=r-a'y a-mo-pu'ã i-mo-'ã-my.
 B1SG=LK-father A1SG-CAUS-rise **B3-CAUS-stand-CONV**
 'I made my son stand up.' [D91]

4.5 Defective cross-reference marking with simple causative converbs

In section 2, we observed that object cross-referencing with clitic doubling is unattested with simple causative converbs, unlike with comitative causative converbs. This was illustrated by the contrast between (15) and (17), which we repeat here as (43) and (44):

- (43) 3 → 1, *object cross-referenced on comitative converb*:

Xe=r-u xe-jopy xe=r-er-a-vy
 B1SG=LK-father B1SG-get B1SG=COM-go-CONV
 'My father got me and took me with him.' [D91]

- (44) 3 → 1, *inactive i- marker prefixed to causative converb*:

Xe=r-u xe=mo-pu'ã i-mo-'ã-my
 B1SG=LK-father B1SG-CAUS-rise AGR-CAUS-stand-CONV
 'My father made me rise and stand up.' [D91]

In order to explain the absence of clitic doubling with simple causative converbs, we hypothesize that ergative little v_{TR} is a strong phase head. Since the object is generated in the complement of v_{TR} (either as a specifier of a lower vP for causative of unergatives, or as a complement of V for causative of unaccusatives), Infl cannot probe person features on the object through the strong phase boundary. This is illustrated in (45), which shows the proposed syntactic structure of the converb in example (44).¹³ Since the object is inaccessible to Infl, Infl cannot agree with it and clitic doubling is not licensed.

- (45) Causative converb structure, 3 → 1:

[_{IP} DP_[3] Infl_[3] [_{Voice} ~~DP_[3]~~ Voice_{CAUS} [_{VP} v_{TR} [_{VoiceP} DP_[1,SG] Voice [_{VP} v VP]]]]]

An obvious issue with this analysis is that it also appears to block clitic doubling with comitative causatives, contrary to facts. We must therefore explain why the object of comitative causatives remains accessible to the Infl probe. We believe that the answer to this question lies in the semantics of comitatives. In comitative causatives, the subject causes the object to participate in an event along with them (Dooley 2015: §13.2.6). To illustrate, the comitative causative form (*gue*)*ru* ('bring') derived from the root *u* ('come') conveys that the subject causes the object to come to a place along with them. There is however evidence that the object is not generated as the internal or external argument of the verb stem, but rather as an applicative argument. This is most evident with comitative causatives of psych-verbs, whose object denote stimulus arguments that would be realized by prepositional phrases in the non-comitative form of the verb, as illustrated in (46):

¹³ In this example, since the verb stem that combines with the causative prefix is agentive, we assume that the causative Voice head bundled with v_{TR} combines with a fully fledged Voice Phrase that introduces the agent of the caused event in its specifier. In other words, we assume that Mbya Guarani causatives are phase-embedding causatives in the sense of Pylkkänen (2008). Support for this analysis comes from the fact that Mbya Guarani causatives can be recursively embedded, and more generally can embed stems derived by other valency changing operation, see Damaso Vieira (2018).

- (46) a. Xee a-vy'a kyxe re
 B1SG A1SG-rejoice knife at
 'I rejoiced at the knife.' [D15: §13.2.6]
- b. Xee a-ro-vy'a kyxe
 B1SG A1SG-COM-rejoice knife
 'I enjoyed the knife.' [D15: §13.2.6]

The point of this example is that *vy'a* is an intransitive verb that selects an experiencer argument. Clearly, *kyxe* in (46b) cannot be understood as a causee argument of *vy'a*, since it cannot be understood as an experiencer. We conclude that *kyxe* is instead introduced by the comitative prefix *ro-* as an applicative object. Such syncretism between causative and applicative is frequent cross-linguistically and is commonly analyzed as the result of comitative extensions of causative forms (Shibatani & Pardeshi 2002). South-American languages stand out in this typology because many of these languages possess markers dedicated to the expression of comitative causatives, rather than causative morphemes that include comitative causation as one of their functions (Guillaume & Rose 2010). This includes the Mbya Guarani prefix *ero-* and its cognates in Tupi Guarani languages (*ibid.* p. 386).

Coming back to the topic of cross-reference marking in converbs, the applicative status of objects of comitative causatives explains why they remain accessible to the Infl probe despite the presence of a strong phase boundary created by v_{TR} . Indeed, if the comitative prefix introduces the applicative object and well as the subject, both arguments are introduced at least as high as the specifier of v_{TR} , and are therefore accessible for probing by Infl. More precisely, we propose that the comitative causative prefix spells out a sequence of two Voice heads, the lower of which introduces the applicative object, while the higher head introduces the subject. This is illustrated in (47), which presents the structure of the comitative converb from example (43):

- (47) Comitative converb structure, 3 → 1:

[_{IP} DP_[3] Infl_[1,SG] [_{Voice} DP_[3] Voice_{COM} [_{Voice} DP_[1,SG] Voice_{APPL} [_{V_{TR}} [_{VP} v VP]]]]]

In this structure, the lower vP denotes the event described by the bare verb stem (in example (43), an event of going), and does not introduce any argument. Little v_{TR} introduces the causing event and Voice_{APPL} introduces the applicative object of the comitative construction. Voice_{COM} introduces the subject of the comitative construction and marks it both as the causer argument and as the proto-agent of the caused event. Crucially, after Infl probes the phi-feature on the specifier of Voice_{COM}, the specifier of Voice_{APPL} remains accessible for further probing. When the object outranks the subject on the person hierarchy, as in this example, Infl can agree with the object and its person features can be spelled out by clitic doubling.

5 Comparison to previous analyzes

We now compare our proposal to two recent analyses of the cross-referencing system of languages closely related to Mbya Guaraní: Paraguayan Guaraní (Zubizarreta & Pancheva 2017a) and Tupinamba (Deal 2021).

5.1 Zubizarreta & Pancheva (2017a)

One of the main goals of Zubizarreta & Pancheva (2017a) is to present a semantically substantive theory of agreement phenomena in Paraguayan Guaraní (PG). Zubizarreta and Pancheva argue that both Infl and little *v* probe for person features in their c-command domain, and little *v* acts as a strong phrase head that blocks probing by Infl inside little *v*P, except at its edge. Furthermore, taking inspiration from Ritter & Wiltschko's (2014) work, they propose that Infl has interpretable person features in PG, which departs from standard assumptions about AGREE. Another important aspect of Zubizarreta and Pancheva's proposal is the P-constraint on phases, which applies to phases that contain a D specified for 1st or 2nd person features ([+participant] in the authors' feature geometry). The effect of the constraint is to move a 1st or 2nd person D to the edge of the phase that contains it. In PG, priority is given to 1st person. In effect, this guarantees that if a verb has a 1st or 2nd person object, this object will be moved to the edge of little *v*P and therefore accessible for probing by Infl.

Given these assumptions, Zubizarreta and Pancheva explain the hierarchical cross-referencing system of PG as follows. When the object does not outrank the subject, Infl probes for person features on the subject in the specifier of little *v*P. The subject meets the P-constraint requirement for both the *v*-phase and the Infl-phase¹⁴ and the person features on Infl are spelled out as agreement prefixes. If the object outranks the subject, the object is promoted to the edge of the *v*-phase and accessible for probing by Infl. Consequently, the object is also promoted to the edge of the Infl-phase where it cliticizes onto Infl.

In cases where the subject is 1st person and the object is 2nd person, the authors assume that Infl agrees with the 1st person subject, which is spelled out as a portmanteau prefix using a rule of contextual allomorphy.

Our analysis takes inspiration from Zubizarreta and Pancheva in having both Infl and little *v* as probes, and in exploiting the mechanism of strong phases to constrain agreement in converbs. However, we depart from them in using a theory of agreement that eschews the assumption that person features are interpretable on Infl. More importantly, Zubizarreta & Pancheva (2017a) do not discuss object marking prefixes and assume that these prefixes are actually part of allomorphs of active agreement prefixes, following the aereal hypothesis that is dominant in the literature on Paraguayan Guaraní. We consider it an open question whether *i-* should also be analyzed as an object agreement prefix in Paraguayan Guaraní. Another major difference between our proposal and Zubizarreta & Pancheva's (2017a) analysis is that these authors do not discuss converb constructions. While there is a cognate construction with the suffix *-vo* in Paraguayan Guaraní, this construction does not appear to have absolutive agreement (see Velázquez-Castillo 2004: section 3.1 and footnote 6). Therefore, our analysis presumably does not extend to Paraguayan Guaraní in this respect.

¹⁴ It is not clear to us how the P-requirement is satisfied when both the subject and the object are 3rd person.

5.2 Deal (2021)

Deal (2021) introduces the theory of Interaction and Satisfaction that we used in our analysis, and sketches an analysis of agreement Tupinambá, another Tupi-Guarani language whose cross-reference system is similar to that of Mbya. It should be noted that Tupinambá is one of many languages discussed in Deal's (2021) paper and the author doesn't intend to give an exhaustive account of cross-reference marking in this language.

Deal proposes that subject and object cross-reference marking in Tupinambá spell out person features on a single little *v* head. This contrast both with Zubizarreta & Pancheva's (2017a) analysis and with ours. Deal's analysis is illustrated with examples (48) to (50) below. In (48), the subject is 3rd person and therefore only specified for Φ -features, while the object is 1st person and therefore also specified for participant (PART) and speaker (SPKR) feature. Little *v* is specified for Φ as its Interaction feature and SPKR as its satisfaction features. Consequently, upon agreeing the 1st person object, little *v* stops its probing and is subsequently spelled out as 1st person.

- (48) a. syé=repyák (Deal 2021)
 1SG=see
 'He/She/It/They/You saw me.'
- b. [vP S_[Φ] [v [V O_[Φ ,PART,SPKR]]]]

In (49) by contrast, the object is 3rd person and the subject is 1st person. Little *v* agrees with the object but fails to be satisfied, following which the probe reprojects and extends its probing cycle upwards in the syntactic structure, where it probes the 1st person subject which satisfies it and stops the probing. Each projection of the probe is spelled out according to the person feature specification of the argument it agreed with: 3rd person for the object and 1st person with the subject.

- (49) a. a-i-kutúk (Deal 2021)
 1SG-3-pierce
 'I pierced him/her/it/them.'
- b. [vP S_[Φ ,PART,SPKR] [v [V O_[Φ]]]]

(50) illustrates an ungrammatical example in which little *v* would continue to probe for Φ -features after agreeing with a first person object. This is ruled out by the satisfaction mechanism in Deal's theory:

- (50) a. *syé=i-(r)epyák (Deal 2021)
 1SG=see
 Intended: 'He/She/It/They/You saw me.'
- b. [vP S_[Φ] [v [V O_[Φ ,PART,SPKR]]]]

Deal's analysis accounts elegantly for the Tupinambá data she discusses. However, we believe that using a single probe is insufficient to account for the distribution of object marking prefixes. Indeed, it is unclear how to account for the complementary distribution of object agreement prefixes with valency

changing prefixes under this assumption. In our analysis, this complementary distribution is explained by the competition between valency changing prefixes and object agreement prefixes for the realization of little *v*, but this explanation is only possible under the assumption that subject agreement prefixes and object clitic doubling spell out another functional head, namely Infl. In this respect, we side with Zubizarreta & Pancheva (2017a).

Using a single probe is also incompatible with our analysis of absolutive cross-reference marking in converbs. Our analysis relies on the assumption that the morphological realization of person features on Infl is only possible when these features are copied from a DP with nominative Case. We assume that subjects of intransitive converbs are assigned Nominative Case by Infl while subjects of transitive converbs are assigned ergative Case by v_{TR} , which explains why converbs agree with the former but not with the latter. It is unclear to us whether this analysis could be maintained under the assumption that only little *v* probes for person features on subjects and objects.

Nevertheless, while we depart from Deal's (2021) analysis in positing that not only little *v* but also Infl probe for phi-features, we believe that our account of cross-reference marking in Mbya is largely compatible with her general theory of agreement.

6 Conclusion

This paper has revisited the cross-reference marking system of Mbya Guarani, focusing on two phenomena: double agreement using the object agreement prefix *i-* and absolutive cross-reference marking in converbs. Our analysis has demonstrated that cross-reference marking is sensitive to abstract Case in Mbya, building on a view of agreement as an obligatory operation whose failure does not result in ungrammaticality.

We demonstrated that the segment *i-* is an object agreement prefix rather than part of a series of allomorphs of active subject agreement prefixes. This marker is underspecified for person, allowing it to cross-reference both 2nd and 3rd person objects. Additionally, we showed that converbs in Mbya Guarani follow an absolutive cross-reference marking pattern, where only intransitive subjects or objects are cross-referenced. This pattern aligns with historical and cross-linguistic data from the Tupi-Guarani family.

Our contributions include the proposal that agreement in Mbya is sensitive to Case, with active agreement prefixes realizing agreement with nominative DPs only. We also emphasized the different roles of Infl and little *v* as probes for person features, with little *v* being underspecified and not triggering cyclic expansion. Furthermore, we provided a unified framework that accounts for both hierarchical cross-reference marking in independent clauses and absolutive marking in converbs, supported by the assumption of Case dependence of agreement.

This study enhances our understanding of the complex agreement mechanisms in Mbya Guarani and contributes to broader discussions on cross-reference marking in Tupi-Guarani languages.

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