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Possessive inflection in Proto-Zamucoan

A reconstruction

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This paper presents a comparative analysis of possessive inflection in the three known Zamucoan languages: Ayoreo and Chamacoco – still spoken in the Chaco area between Bolivia and Paraguay – plus †Old Zamuco, described by the Jesuit father Ignace Chomé in the first half of the 18th century. The comparison allows us to build a plausible reconstruction of Proto-Zamucoan possessive inflection. Old Zamuco appears to be the most conservative language among the three, while Chamacoco appears to be the most innovative, although it exhibits relics of special importance for reconstructive purposes. Our analysis identifies in Zamucoan a series of features of general interest for the typology of person marking.

Keywords: person marking, diachronic reconstruction, possessive morphology, verb morphology, Zamucoan languages, kinship terms, syncretism in person/number marking, Chaco region

1.   Introduction[1]

This paper proposes a reconstruction of the possessive morphology of Zamucoan, an underdescribed language family spoken in the Chaco region, between Bolivia and Paraguay. The family consists of three documented languages: Ayoreo, Chamacoco

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1.   This paper is largely based on the comparative analysis of Ciucci (2016) [2013]. The authors share responsibility for any claims made. The Ayoreo and Chamacoco examples are offered in phonemic transcription (with no delimiting slashes) for ease of reading. The transcriptions of Old Zamuco are based on Chomé (1958 [ante 1745]) as reinterpreted according to our knowledge of Ayoreo and Chamacoco phonology (for a discussion, see Bertinetto 2014 [2009] and Ciucci 2016 [2013]). In the few cases of uncertain interpretation, we added Chomé's transcription between angled brackets. We would like to thank Willem Adelaar, Alexandra Y. Aikhenvald, Grev Corbett, Sonia Cristofaro, Wolfgang U. Dressler, Nicholas Evans, Gianguido Manzelli and Raoul Zamponi, plus the anonymous reviewers, for their suggestions.

and †Old Zamuco, a variety described in the first half of the 18th century. The present study concentrates on the possessive inflection of nouns and its intertwining with the person inflection of verbs, on which we only provide necesssary data (but see Ciucci & Bertinetto 2015). The analysis confirms the internal coherence of Zamucoan, justifying a plausible reconstruction of the Proto-Zamucoan possessive inflection. Our work thus shows the limits and possibilities of historical reconstruction of a small language family, in a situation where one language is documented earlier than the others.

The structure of the paper is as follows. After introducing Zamucoan and the sources used (§1.1), §1.2 provides an overview of the structure of Zamucoan possessive inflection and of the morphological relation between verbs and nouns, while introducing a number of terminological and notational conventions. The following sections describe the possessive morphology of Old Zamuco (§2), Ayoreo (§3) and Chamacoco (§4). §5 compares the three languages, while §6 proposes a reconstruction of Proto-Zamucoan possessive inflection. §7 concludes, highlighting aspects relevant for the typology of person marking and new perspectives for the study of language contact in the Chaco region.

1.1 Zamucoan

The Zamucoan family consists today of two living languages spoken in Northern Chaco: Ayoreo and Chamacoco. The term *Ayoreo* is based on *ajore* (F.SG), *ajorej* (M.SG) "real person (as opposed to outsiders)", semantically corresponding to the Chamacoco endonym *iȼir(o)* (M.PL; *iȼirȼ* M.SG, *iȼiɹɹa* F.SG).

The Ayoreo people (about 4,500 according to Fabre 2007a) traditionally lived a nomadic life in what is today the Santa Cruz Department of Bolivia and in the Alto Paraguay and Boquerón departments of Paraguay. Although some uncontacted Ayoreo groups still live a traditional nomadic life in the Paraguayan Chaco, most now live in rural settlements, excepting the community in Santa Cruz de la Sierra (Bolivia).

The Chamacoco people (approximately 2,000; see Ciucci 2016 [2013]: 33) mainly live in the Alto Paraguay Department (Paraguay) on the west bank of the Paraguay River, but some live in the suburbs of Asunción and in Brazil (Fabre 2007a). The language includes two dialects: Ebitoso (or Ɨbɨtoso) and Tomaraho. The data reported here refer to the Ebitoso dialect.[2]

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2. According to Tracey Carro Noya (p.c.), who investigated Tomaraho, the inflectional morphology of the two dialects is very similar.

The first stable contact with Zamucoan tribes was established by Jesuit missionaries. In the early 18th century, one Zamucoan language (here called Old Zamuco) was described by the Jesuit father Ignace Chomé (1958 [ante 1745]). Old Zamuco is lexically close to Ayoreo, although not a direct ancestor of the latter but rather a related extinct dialect (Ciucci 2016 [2013]). The Chamacoco already had peaceful relationships with Hispano-American culture at the turn of the 19th century, when they were first studied by the Italian explorer and artist Guido Boggiani (Boggiani 1894). By contrast, the Ayoreo only began to surrender at the end of the 1940s.[3]

Although Ayoreo and Chamacoco share no more than 30% of their basic vocabulary (200 word Swadesh list), they show noteworthy morphological similarities suggesting that, together with Old Zamuco, they stem from a common ancestor, Proto-Zamucoan (Bertinetto 2011; Ciucci 2016 [2013]). Glottochronological studies indicate that the split of Chamacoco from Old Zamuco and Ayoreo (lexically close to each other) occurred in the distant past (Wichmann et al. 2016). The two major branches of the family – disregarding other extinct languages of which very little is known – are shown in Figure 1.
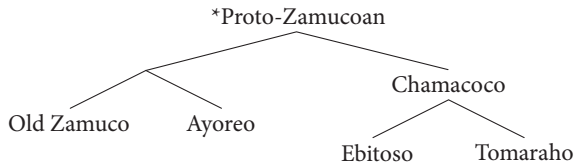

Figure 1. Internal classification of Zamucoan

The fusional Zamucoan languages show traces of contact with the surrounding agglutinating languages (Ciucci 2014), although they differ structurally and genealogically. Biological studies confirm the common origin of the Zamucoan populations, as well as their genetic distance from any other Native American population analyzed (see quotations in Ciucci 2016 [2013]: 39–40).

The current study is part of a documentation project aiming at producing comprehensive grammars of Ayoreo, Chamacoco and Old Zamuco. The Zamucoan inflectional morphology has been analyzed in detail by Ciucci (2010a, 2010b, 2016 [2013]). Two companion papers address verb inflection (Ciucci & Bertinetto 2015) and nominal suffixation (forthcoming). Ciucci (2013, 2016 [2013]) provides a survey of the linguistic work on Zamucoan. Besides the authors' fieldwork (2008–2014), the input of this study mainly stems from Higham et al. (2000) and Chomé (1958 [ante 1745]). Other bibliographical sources used were Kelm (1964), Morarie

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3.   For the history of the Zamucoan people, see Combès (2009).

(1980), Ulrich & Ulrich (2000) and Bertinetto (2014 [2009]). See also Fabre (2007a) for a linguistic and anthropological bibliography on the Zamucoan languages.

1.2 On Zamucoan noun and verb affixation

The present section describes the general morphological structure of Zamucoan nouns and introduces the conventions used throughout the paper.

According to Fabre (2007b), all languages of the Chaco region distinguish possessable vs. non-possessable nouns (not to be confused with alienable vs. non-alienable). The former have prefixes expressing agreement with their possessor or their genitival modifier. To refer to the possessor of non-possessable nouns, Chaco languages mostly make use of possessive classifiers (Fabre 2007b).[4] In particular Ayoreo makes pervasive usage of them: e.g., *j-a-tꞔidi tamoko* (1-THEMATIC_VOWEL-PET_CLASSIFIER dog) "my dog". However, since Zamucoan classifiers have the same inflectional prefixes as any noun, we do not discuss them further.

The distinction between possessable and non-possessable nouns varies from language to language. In Zamucoan, animal and plant nouns are generally non-possessable,[5] while body parts, kinship terms, most tools, physical objects, and even abstract nouns (such as "life") are possessable. For the remaining nouns, neither semantic nor morphological rules have been identified to explain their possessability status.[6]

The structure of the Zamucoan possessive inflection can be analyzed as in (1):

(1)   PREFIX + THEMATIC VOWEL + ROOT

         THEME

ROOT plus THEMATIC VOWEL form the THEME. The THEMATIC VOWEL can be any vowel (disregarding quantity and nasality), namely /i e a o u/, to which Chamacoco adds /ɨ/. Based on the 3rd person, the following tripartite structure arises, depending on how many structural slots are filled:

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4.   Fabre (2007b) does not cite †Lule, which (like Vilela) is an exception since it lacked the possessable ~ non-possessable distinction and expressed the possessor by means of suffixes (Raoul Zamponi p.c.).

5.   In Chaco cultures, animals are considered non-possessable entities (Comrie et al. 2010: 113).

6.   Actually, Chamacoco has an etymological criterion to the effect that Spanish loans are almost always non-possessable; this however is due to loss of productivity of the possessive inflection (§4.1).

(2) a. PREFIXAL nouns: prefix plus theme (e.g., CH *l-a-tahaįca*
"her/his/their stepmother")
b. THEMATIC nouns: theme (e.g., CH *Ø-e-įcit*
"her/his/their domestic animal")
c. RADICAL nouns: bare root (e.g., CH *Ø-Ø-nerpta*
"her/his/their shirt").

The above classification only applies to the 3rd person: the remaining persons generally fill all structural positions (i.e., they have a prefix and a thematic vowel). Whenever a noun is cited, the prefix, the thematic vowel and the root are indicated in the segmentation, with Ø marking the possible absence of the first two components, as in (2b–c). The identical tripartition (prefixal, thematic, radical) concerns the verb's 3.RLS[7] and is equally used for classificatory purposes (Ciucci & Bertinetto 2015). Further similarities between noun and verb morphology are noted below (§2.1, §3.1, §4.1 and §6.7). However, while the vast majority of Zamucoan nouns are thematic, most verbs are prefixal. The inflectional classes do not follow any semantic criteria in either nouns or verbs, with the partial exception of a subgroup of prefixal nouns (the so-called *d*-nouns, see below), mostly consisting of kinship terms.

The noun morphology of Zamucoan, unlike the other families of the Chaco region, characteristically distinguishes a plain 3rd person and a REFLEXIVE 3rd person (i.e., 3rd person coreferent with the subject; henceforth REFL). Neither the 3rd person nor the REFL distinguish between singular and plural. While the REFL is characterized by relatively high morphological predictability, the 3rd person may show subregularities or irregularities. Precisely because the 3rd person (just like the 3[.RLS] in verb inflection) is the least predictable of the whole paradigm, it is used as the citation form from which all the remaining forms may to a large extent be generated. For simplicity, whenever a noun or a verb is reported as a citation form, we avoid adding reference to 3rd person (thus, "house" should be implicitly understood as "her/his/their house"). All exceptions to the (largely regular) Zamucoan possessive inflection are described in Ciucci (2016 [2013]); the current paper only lists data relevant to linguistic reconstruction.

Another salient cross-Zamucoan feature is that the 2SG and the REFL normally share the same theme (in Ayoreo this also extends to the 2PL). In these persons the thematic vowel slot may be filled by a vowel (/a/ or /e/, depending on the language) diachronically belonging to the prefix and synchronically replacing the original

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7. The Zamucoan verb system displays the 'realis/irrealis' contrast (RLS/IRLS). However, as shown in Tables 2, 4 and 6, the three languages differ: Old Zamuco exhibits a systematic contrast in all persons, Ayoreo only in 1st and 2nd persons, Chamacoco only in the 3rd person. As a consequence, the labels RLS/IRLS apply vacuously when referring to the Ayoreo 3rd person and to the Chamacoco 1st and 2nd persons.

thematic vowel whenever the latter is [+high] (3a). As far as the 2SG/PL is concerned, this also applies to verbs (3b). This diachronic process of vowel replacement is indirectly supported by a few exceptions, whereby a thematic [+high] vowel is preserved after prefixal /a/ in both possessive and verb inflection (3c–d).[8] However, systematic replacement of the thematic vowel produced, in due course, the reinterpretation of the replacing vowel as part of the theme of 2SG(/PL) and REFL, alongside the [+high] vowel to be found in the rest of the paradigm. By contrast, with non-high thematic vowels the reverse process applied, namely deletion of prefixal /a/, with no alternation in the theme (3e–f).[9] Thus, at some point, /a/ must have ceased to be perceived as part of the prefix, to become the marker of 2SG(/PL) and REFL in words with [+high] thematic vowel:

(3)   a.   AY *j-i-bioj* (1SG), *b-a-bioj* (2SG), *Ø-i-bioj* (3), *d-a-bioj* (REFL),
         jok-i-bioj (1PL), *wak-a-bioj* (2PL) "light, lamp"
      b.   AY *j-i-go* (1SG), *b-a-go* (2SG), *tɕ-i-go* (3),
         j-i-go-go (1PL), *wak-a-go-jo* (2PL) "to tell, to show"
      c.   OZ *j-i-geda* (1SG), *a-i-geda* (2SG), *Ø-i-geda* (3), *da-i-geda* (REFL),
         aj-i-geda (1/2PL), *g-i-geda* (GF) "house"
      d.   OZ *a-i-se* (1SG.RLS), *da-i-se* (2SG.RLS), *tɕ-i-se* (3.RLS),
         a-i-ko (1PL.RLS), *da-i-so* (2PL.RLS) "to reach"[10]
      e.   OZ *tɕ-o-irak* (1SG), *Ø-o-irak* (2SG), *Ø-o-irak* (3),
         p-o-irak (GF) "what is added"
      f.   OZ *j-e-do* (1SG), *Ø-e-do* (2SG), *Ø-e-do* (3), *p-e-do* (GF) "eye"

Whenever we have reasons for not specifically referring to the thematic vowel proper, we shall use the term INFLECTIONAL VOWEL for any vowel occupying the thematic vowel slot. Similarly, we shall refer, when relevant, to 1SG vowel, 2SG vowel, 3rd vowel and so on. This is useful not only for the just described vowel replacement process but also for irregular words in which the inflectional vowel changes from person to person (see, e.g., §5.2). We use the label VOCALIC PATTERN to refer to the behavior of the inflectional vowel in the whole paradigm of a given noun.

    Many possessable nouns present an additional form indicating an unspecified possessor, here called GENERIC FORM (GF). The GF is morphologically idiosyncratic

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8.   Although /e/ is frequently observed as the replacing vowel in Chamacoco nouns and verbs, the diachronic reasoning is here restricted to /a/, since the Chamacoco widespread change /a/ → /e/ must have occurred at a later time, after the split from the Old Zamuco/Ayoreo branch of the family.

9.   As for words with thematic /a/, we hypothesize fusion of two identical vowels (prefixal and thematic /a/), rather than replacement of one of the two by the other.

10.   Chomé did not report the 2.IRLS.

and not all nouns have it (e.g., kinship terms). In the examples reported, it is only indicated when relevant, provided we have evidence about it. When the GF is missing, the 3rd person can be used to express an unspecified possessor. The use of an unspecified possessor marker for possessable nouns has been proposed as an areal trait for the languages of the Chaco region (Campbell & Grondona 2012: 646).[11]

Besides sharing their basic structure, verbs and nouns may also share, depending on the Zamucoan language considered, part of their person inflections, as illustrated in §2.1, §3.1 and §4.1. In addition, Old Zamuco and Ayoreo show a derivational mechanism of root convertibility between verbs and nouns, a feature mostly lost in Chamacoco. See the so called "verbal nouns" (Bertinetto 2014 [2009]: 395), with passive meaning, which share the same root as their verbal counterpart (4a) or are derived by means of a suffix (-*k* in 4b):

(4)   a.   AY *ṱc-i-mo* (3) "to see, to realize" → *Ø-i-mo* (3.M.SG.BF) "who/what is seen"
      b.   OZ/AY *ṱc-a-ka* (3) "to plant" → *Ø-a-ka-k* (3.M.SG.BF) "plant, what is planted"

The main structural difference between verbs and nouns is that verb suffixes simply mark person plurality, whereas noun suffixes express in a syncretic manner a range of grammatical functions: gender (masculine, feminine), number (singular, plural) and 'form'. The last feature is a peculiarity of the Zamucoan languages, where nouns and adjectives can appear in BASE FORM, FULL FORM or INDETERMINATE FORM. For practical reasons, and with only a few exceptions, Ayoreo and Chamacoco nouns are cited in full-form singular (the most frequently used one, which in Chamacoco has often replaced the base form), whereas Old Zamuco nouns are mostly provided in base form singular, which is the citation form used by Chomé. This might suggest that Old Zamuco words are shorter than Ayoreo and Chamacoco ones, but this impression vanishes as soon as one compares base and full forms of cognate words in the three languages (incidentally, this demonstrates the fusional nature of Zamucoan, owing to combined exponence of gender, number and form):

(5)   "young man"

	BASE FORM		FULL FORM	
	SINGULAR	PLURAL	SINGULAR	PLURAL
OZ	*nakar*	*naka-jo*	*nakar-itie*	*nakar-onoe*
AY	*ṇakar*	*ṇaka-ɲo*	*ṇakar-i*	*ṇakar-ode*
CH	*ṇakɨrbit-ak*	*ṇakɨrbit-o/-e*	*ṇakɨrbit-it*	*ṇakɨrbit-o/-e*

However, owing to scarcity of data, sometimes we have to alternate base and full form in different persons of one and the same Old Zamuco noun in order to fill

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11.   Campbell (2012: 297–298) notes that this feature is also present in some Mesoamerican languages, such as Nahuatl. Gianguido Manzelli (p.c.) adds Chiricaua Apache and Navajo. Two anonymous reviewers also suggest Algonquian and Arawak.

gaps in the person paradigm. In such cases, suffixes not belonging to the singular base form are indicated in parentheses.

2. Old Zamuco possessive inflection

This section describes the possessive inflection of Old Zamuco. The available data, stemming from Chomé, are incomplete; there are just three complete possessive paradigms (3c, 6a and 7a). §2.1 describes the person prefixes of Old Zamuco possessable nouns, as compared with their verbal counterparts. §2.2 focuses on the generic form (GF).

2.1 Person inflection

The morphology of Old Zamuco possessable nouns is reported in Table 1, where V stands for the thematic/inflectional vowel slot. The possessive prefixes can be compared with the verb prefixes and the free pronouns listed in Table 2, where all phonemes shared with the possessive prefixes are in bold. Interestingly, possessor marking overlaps more with verb prefixes (especially in the irrealis mood) than with free pronouns.

Table 1. Old Zamuco possessive inflection

1SG	2SG	3		REFL	1PL	2PL	GF
j-V-root	Ø-*a*/V-root	PREFIXAL NOUNS:	*d-a*/V-root		*aj*-V-root	*aj*-V-root	*p*-V-root
ɩc-V-root		*d*-V-root			*as*-V-root	*as*-V-root	*d*-V-root
s-V-root		*g*-V-root					*g*-V-root
		THEMATIC NOUNS:					Ø-Ø-root
		Ø-V-root					
		RADICAL NOUNS:					
		Ø-Ø-root					

Table 2. Old Zamuco verb inflection and free pronouns (Ciucci & Bertinetto 2015)

	Old Zamuco verb inflection		Old Zamuco free pronouns
	REALIS	IRREALIS	
1SG	*a*-V-ROOT (1SG)	*j*/*tɕ*-V-ROOT (1SG)	*(u)ju*
2SG	*d-a*/V-ROOT (2SG)	Ø-*a*/V-ROOT (2SG)	*(u)wa* <*(u)gua*>
3	*tɕ*/*t*/Ø-(V)-ROOT (3)	*d*/Ø-(V)-ROOT (3)	[*wite* <*güite*> / *ude* (M)] [*wate* <*guate*> / *uda* (F)][12]
1PL	*a*-V-ROOT-SUFF (1PL)	*j*/*tɕ*-V-ROOT-SUFF (1PL)	*(u)jok*
2PL	*d-a*/V-ROOT-SUFF (2PL)	Ø-*a*/V-ROOT-SUFF (2PL)	*(u)wak* <*(u)guac*>
3PL	–	–	*ore*

The 1SG exhibits three lexically conditioned allomorphs (in decreasing order of frequency): *j*-, *tɕ*- and *s*-. The possessive allomorphs *j*- and *tɕ*- coincide with the verb's 1.IRLS allomorphs (see fn. 7), where *tɕ*- marks the 1.IRLS of the most regular verb class (characterized by the identical 3.RLS *tɕ*-prefix), while the other verb classes have *j*- as 1.IRLS-prefix (Ciucci & Bertinetto 2015). A transparent relation with verb morphology is also found in deverbal nouns (§1.2), where *tɕ*- is mostly found in nouns derived from the most regular class (6a), while *j*- is typical of nouns derived from the other classes (6b). Thus, the 1SG possessive allomorph of a deverbal noun coincides with the 1.IRLS allomorph of the verb it derives from. The exceptions are a few verbs with the 3rd-prefix *t*-, whose deverbal nouns show the 1SG-prefix *tɕ*- rather than *j*- (6c):[13]

(6) a. *tɕ-i-mesērak* (1SG), Ø-*a-mesērak* (2SG), Ø-*i-mesērak* (3),
aj-i-mesērak (1PL/2PL), *p-i-mesērak* (GF) "what is loved"
cf. *tɕ-i-mesēre* (3.RLS/1SG.IRLS) "to love"

b. *j-i-jauk* (1SG), Ø-*a-jauk* (2SG), Ø-*i-jauk* (3), *p-i-jauk* (GF) "what is left"
cf. Ø-*i-jau* (3.RLS) "to quit; to stop"

c. *tɕ-a-gari* (1SG) "what is believed"
cf. *t-a-gari* (3.RLS/IRLS) "to believe"

The 2SG exponent is identical to that of the verb's 2.IRLS (see Table 2). In both cases, as anticipated in §1.2, the 2nd vowel /a/ (also found in the verb's REFL and 2.RLS) originally belonged to the prefix, before being reinterpreted – in the relevant words – as a thematic vowel alongside /i u/ in the rest of the paradigm. Since,

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12. In the Zamucoan languages, with the exception of Chamacoco *ir(e)* in Table 6, there are no true 3SG free pronouns; all other forms reported in Tables 2, 4 and 6 are demonstratives.

13. The word *tɕ-o-rotat* (1SG), *aj-o-rotat* (1PL), *aj-o-rotat* (2PL) "shoulder" is an exception; it appears not to be a deverbal noun, yet it shows the *tɕ*-prefix.

however, the non-high thematic vowels /e o/ had the reverse effect of deleting pre-fixal /a/, the consequence was that in thematic nouns with thematic /e o/ the 2sG and the 3rd person coincide, as shown in (3e–f) above (as for thematic /a/, see fn. 9).

As for the 3rd person, most Old Zamuco nouns are thematic, as is typical of Zamucoan. Prefixal nouns exhibit the lexically conditioned allomorphs *d-* (7a) – identical to the 3.IRLS prefix of the most regular verb class (Table 2) – or *g-* (7b). In radical nouns, the first consonant of the root can undergo word-initial fortition, as in (7c) where /b/ turns into /p/ in the radical 3rd person. The same occurs in verb inflection ((70) §5.5):

(7) a. *Ø-o-te* (1sG), *Ø-a-te*(*tae*) (2sG), *d-a-te* (3),
         as-o-te (1PL), *aj-a-te* (2PL) "mother"
     b. *j-a-nek* (1sG), *Ø-a-nek* (2sG), *g-a-nek* (3) "belonging"
     c. *j-i-bidit* (1sG), *Ø-a-bidit* (2sG), *Ø-Ø-pidit* (3) "who/what is called"
         (cf. *t-i-bidi* (3.RLS/IRLS) "to call")

In the plural, one finds the syncretism of 1PL and 2PL, both marked by *aj-* (8a–b).[14] However, if the 1sG-prefix is *s-*, the 1PL- and 2PL-allomorph is *as-* (8c). One might hypothesize that these plural persons are obtained by adding *a-* to the 1sG; how-ever, unless *ʨ-* is an innovation (§6.1), this does not explain why nouns with the 1sG-prefix *ʨ-* have 1PL/2PL *aj-*. "Mother" (7a) is the only exception, with 1PL and 2PL differing from each other (see §5.3, §6.1 and §6.5):

(8) a. *ʨ-a-kak* (1sG), *Ø-a-kak* (2sG/3), *aj-a-kak* (1PL), *aj-a-kak* (2PL), *p-a-kak* (GF) "what is planted"
     b. *j-i-geda* (1sG), *aj-i-geda* (1PL), *aj-i-geda* (2PL) "house" (for the full para-digm, see (3c) and (10b))
     c. *s-o-ritat* (1sG), *as-o-ritat* (1PL), *as-o-ritat* (2PL) "buckler (a type of shield)"

2.2   The generic form

Chomé reports that most nouns have a GF, usually obtained by means of one among several lexically determined allomorphs. The most frequent is *p-* (see (9)), while

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14. In a letter to Lorenzo Hervás y Panduro, the Jesuit Joaquín Camaño reports the possessive paradigm of "child", making a distinction between 1PL-person and 2PL-person: <ayab> (1PL) ~ <adab> (2PL) (Clark 1937: 127–128). Since these are second-hand data provided by other mis-sionaries who had left South America long before, they are not fully reliable. Here <y> stands for /j/ and it is possible that in the 2PL-person <d> stands for [ʤ], which in both Ayoreo and Chamacoco is a possible realization of /j/. If so, this would indicate that <ayab> and <adab> merely reflect two different pronunciations of the same form.

d- (10a) and *g-* (10b) are rare. The inflectional vowel always coincides with the thematic vowel:

(9) a. *tɕ-o-it* (1SG), *Ø-o-it* (2SG), *Ø-o-it* (3), *p-o-it* (GF) "who/what is brought
     b. *j-i-noriga* (1SG), *Ø-a-noriga* (2SG), *Ø-Ø-noriga* (3), *p-i-noriga* (GF) "way"
     c. *j-i-bidit* (1SG), *Ø-a-bidit* (2SG), *Ø-Ø-pidit* (3), *p-i-bidit* (GF) "who/what is called"

(10) a. *j-u-hos* (1SG), *Ø-a-hos* (2SG), *Ø-u-hos* (3), *d-u-kos* (GF) "disease"
      b. *j-i-geda* (1SG), *a-i-geda* (2SG), *Ø-i-geda* (3), *da-i-geda* (REFL), *aj-i-geda* (1/2PL), *g-i-geda* (GF) "house"

The GF occasionally coincides with the root, as in (11a–b). In such cases, one can surmise (also based on data in §3.5) that the theme of the possessive inflection is obtained by adding the high thematic vowels /i u/ to the GF. Note that in (11c–d) root-initial /r/ undergoes fortition into /d/ in the GF. The same occurs in the 3rd person of Ayoreo radical nouns (§3.4 and (74c), §5.6):

(11) a. OZ *j-i-gios* (1SG), *Ø-a-gios* (2SG), *Ø-i-gios* (3), *Ø-Ø-gios* (GF) "relative"
      b. OZ *j-i-poduo* (1SG), *Ø-a-poduo* (2SG), *Ø-i-poduo* (3), *Ø-Ø-poduo* (GF) "lungs"
      c. OZ *j-i-raogena* (1SG), *Ø-a-raogena* (2SG), *Ø-i-raogena* (3), *Ø-Ø-daogena* (GF) "mortar"
      d. OZ *j-u-rahek* (1SG), *Ø-a-rahek* (2SG), *Ø-u-rahek* (3), *Ø-Ø-dahek* (GF) "path"

3. Ayoreo possessive inflection

This section deals with Ayoreo. After introducing the person prefixes (§3.1), the inflectional classes are described: thematic (§3.2), prefixal (§3.3) and radical nouns (§3.4). §3.5 addresses the morphology of the GF and the productivity of Ayoreo possessive inflection.

3.1 Person inflection

Table 3 illustrates the morphology of Ayoreo possessive inflection, with a typical example in (12a), and can be used as a recapitulation. In nasal-harmony contexts, the prefixes 1SG *j-*, 2SG *b-* and REFL *d-* can respectively nasalize into *ɲ-*, *m-* and *n-* (12b–c), although this behavior varies across speakers.[15] When discussing the issue

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15. The data in all examples mirror the respective sources with respect to prefix nasalization.

in general terms, rather than with respect to individual words, only the oral allo-morphs are reported. The thematic vowel remains in the whole paradigm, except that in the 2SG/PL and in the REFL high thematic vowels are replaced by /a/ (12a, c), originally part of the prefix (§1.2, §5.1). As far as 2SG and REFL are concerned, this replacement is a shared Zamucoan feature, but in Ayoreo it also extends to the 2PL. The 3rd person is discussed while analyzing the individual inflectional classes; just like the GF – see §3.5 – it exhibits remarkable polymorphy.

Table 3. Ayoreo possessive inflection

1SG	2SG	3	REFL	1PL	2PL	GF
j-V-root	*b-a*/V-root	PREFIXAL NOUNS: *d*-V-root, *g*-V-root, *j*-V-root, *k*-V-root, *p*-V-root THEMATIC NOUNS: Ø-V-root RADICAL NOUNS: Ø-Ø-root	*d-a*/V-root	*jok*-V-root	*wak-a*/V-root	*dVk*-V-root *g*-V-root *k*-V-root *p*-V-root Ø-Ø-root

(12)   a.   *j-i-go* (1SG), *b-a-go* (2SG), *Ø-i-go* (3), *d-a-go* (REFL), *jok-i-go* (1PL), *wak-a-go* (2PL), *Ø-Ø-ko* (GF) "jar, earthenware"

 b.   *ɲ-e-ņaj* (1SG), *m-e-ņaj* (2SG), *g-e-ņaj* (3), *n-e-ņaj* (REFL), *jok-e-ņaj* (1PL), *wak-e-ņaj* (2PL) "farm, vegetable garden"

 c.   *ɲ-u-ņakari* (1SG), *m-a-ņakari* (2SG), *Ø-u-ņakari* (3), *n-a-ņakari* (REFL), *jok-u-ņakari* (1PL), *wak-a-ņakari* (2PL), *Ø-Ø-ņakari* (GF) "grown son"

Ayoreo possessive morphology can be compared with verb inflection and free pronouns, as reported in Table 4, where phonemic segments shared by the corresponding possessive markers are in bold. The 1SG, 2SG and 2PL possessive markers respectively coincide with the 1SG.IRLS, 2SG.RLS and 2PL.RLS of the verb. The 1PL and 2PL possessive prefixes stem from the corresponding pronouns. Similarities between possessive prefixation and free pronouns are also found in the singular persons.

Table 4. Ayoreo verb inflection and free pronouns[16]

	Ayoreo verb inflection		Ayoreo free pronouns
	REALIS	IRREALIS	
1SG	[Ø-V-ROOT]	*j*-V-ROOT	(*u*)*ju*
2SG	*b-a*/V-ROOT	Ø-*a*/V-ROOT	(*u*)*wa*
3	*tɕ/t/*Ø-(V)-ROOT	–	[*ude* ("this" M)]
			[*udak* ("this" F)]
			[*ute* ("that" M)]
			[*wate* ("that" F)]
1PL	[Ø-V-ROOT-*ko/go*]	*j*-V-ROOT-*ko/go*	(*u*)*jok*
2PL	*wak-a*/V-ROOT-*tɕo/jo*	Ø-*a*/V-ROOT-*tɕo/jo*	(*u*)*wak*
3PL	–	–	*ore*

3.2   Thematic nouns (Ø – THEMATIC VOWEL – ROOT)

Thematic nouns, as in (12a, c), are the most frequent ones. They are usually regular and form a productive class. There are only a few exceptions relating to the shape of the 2nd person in words with a high thematic vowel: a few nouns have 2nd vowel /e/ (13a), while a single exception ((50) in §5.1) exhibits 2nd vowel /o/. In (13b) the 2nd and REFL vowel /e/ is due to merging of the prefix vowel with the first vowel of the root:

(13)   a.   *j-i-daj* (1SG), *b-e-daj* (2SG), Ø-*i-daj* (3), *d-e-daj* (REFL),
             jok-i-daj (1PL), *wak-e-edaj* (2PL) "village, town"
       b.   *j-u-etɕaj* (1SG), *b-e-tɕaj* (2SG), Ø-*u-etɕaj* (3), *d-e-tɕaj* (REFL),
             jok-u-etɕaj (1PL), *wak-e-tɕaj* (2PL) "beyond, opposite side of"[17]

3.3   Prefixal nouns (PREFIX – THEMATIC VOWEL – ROOT)

The 3rd person of prefixal nouns is characterized by one of the lexically determined allomorphs: *d-* (14a), *g-* (14b), *j-* (14c), *k-* (14d) and *p-* (14e). The *d*-nouns are by far the most frequent (considering the relative rarity of prefixal nouns), while *k-* and *p*-nouns are exceedingly rare. Since the latter is the most frequent GF prefix, forms such as *pibiṇaj* (14e) must be former GFs:

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16. The 1.RLS is shown between square brackets, because it is normally replaced by the 1.IRLS in currently spoken Ayoreo.

17. In Colonia Peralta (Paraguay) we have also documented the irregular 2PL form *wakuetɕaj* alternating with *waketɕaj*.

(14)   a.   *j-u-kari* (1sg), *b-a-kari* (2sg), *d-u-kari* (3), *d-a-kari* (REFL) "thread"
     b.   *j-i-pej* (1sg), *b-e-pej* (2sg), *g-i-pej* (3), *d-e-pej* (REFL) "man's rectangular bag"
     c.   *j-i-minori* (1sg), *b-e-minori* (2sg), *j-u-minori* (3), *d-e-minori* (REFL), *jok-i-minori* (1pl), *wak-e-minori* (2pl) "who/what is in the direction of"
     d.   *j-a-kadi* (1sg), *b-a-kadi* (2sg), *k-a-kadi* (3), *d-a-kadi* (REFL), *jok-a-kadi* (1pl), *wak-a-kadi* (2pl) "entrance"
     e.   *j-i-biṇaj* (1sg), *b-a-biṇaj* (2sg), *p-i-biṇaj* (3), *d-a-biṇaj* (REFL), *jok-i-biṇaj* (1pl), *wak-a-biṇaj* (2pl) "call, shout"

The 3rd-prefix *j-* always co-occurs with the irregular vocalic pattern /i/ (1st person) ~ /e/ (2nd person) ~ /u/ (3rd person) and is only found in nouns derived from the highly irregular noun *juj* (15):[18]

(15)   *j-i* (1sg), *b-ej* (2sg), *j-uj* (3), *d-ej* (REFL),
     jok-i (1pl), *wak-ej* (2pl) "bodily presence; killed body"

The small *g*-nouns subset, with thematic vowel /i/, also shows 2nd vowel /e/ rather than /a/ (16). Some *g*-nouns (whatever the thematic vowel) may alternate a prefixal and a thematic 3rd person (see again 16), suggesting that they tend to converge towards the largest inflectional class (i.e., thematic):

(16)   *j-i-jasōri* (1sg), *b-e-jasōri* (2sg), *g-i-jasōri* / *Ø-i-jasōri* (3), *d-e-jasōri* (REFL), *jok-i-jasōri* (1pl), *wak-e-jasōri* (2sg) "one who finds something"

The small set of *d*-nouns (17) exhibits three properties: (i) they mostly consist of kinship terms (although not all kinship terms are *d*-nouns); (ii) their 3rd vowel is idiosyncratically /a/ or /e/; (iii) the 3rd person coincides with the REFL (the only exception is *dukari* "thread" in (14a)). If one assumes that in *d*-nouns with 1st vowel /i/, such as those in (17b) and (18), this was the original thematic vowel, we surmise that the REFL has colonized the 3rd person (see §5.4). The *d*-prefix can turn into *n-* owing to nasal harmony (17b) and (18b). Some *d*-nouns have an irregular prefixless 1sg form (18), occasionally alternating with the regular one as in (18a):

(17)   a.   *j-a-haj* (1sg), *b-a-haj* (2sg), *d-a-haj* (3/REFL) "brother"
     b.   *j/ɲ-ī-saraj* (1sg), *b/m-ā-saraj* (2sg), *n-ā-saraj* (3/REFL), *jok-ī-saraj* (1pl), *wak-ā-saraj* (2pl) "son-in-law"

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18. Since *juj* has a reduced phonological root, the thematic vowel is not indicated.

(18)　a.　*Ø-i-tigate / j-i-tigate* (1SG), *b-a-tigate* (2SG), *d-a-tigate* (3/REFL),
　　　　　jok-i-tigate (1PL), *wak-a-tigate* (2PL) "older brother"
　　b.　*Ø-i-na* (1SG), *b-e-na* (2SG), *n-e-na* (3/REFL) "sister"[19]

3.4　Radical nouns (ø – ø – ROOT)

The vocalic pattern of the singular persons of radical nouns is /i/ ~ /a/ ~ Ø, as in
(19a). The only exceptions are nouns with 1st vowel /u/, owing to vowel harmony
triggered by the identical first root vowel (19b):

(19)　a.　*j-i-betigaj* (1SG), *b-a-betigaj* (2SG), *Ø-Ø-betigaj* (3), *d-a-betigaj* (REFL),
　　　　　jok-i-betigaj (1PL), *wak-a-betigaj* (2PL) "multitude"
　　b.　*j-u-hurugaipidi* (1SG), *b-a-hurugaipidi* (2SG), *Ø-Ø-hurugaipidi* (3),
　　　　　d-a-hurugaipidi (REFL), *jok-u-hurugaipidi* (1PL), *wak-a-hurugaipidi* (2PL)
　　　　　"prison"

In word-initial position, i.e., precisely in the 3rd person, the consonant can undergo
fortition, a phenomenon also observed in radical verbs ((70) and (90)). Thus, /b/
and /g/ can devoice into /p/ (20a) and /k/ (20b), and /m/ and /ŋ/ can denasalize
into /p/ (20c) and /k/ (20d):[20]

(20)　a.　*j-i-boti* (1SG), *b-a-boti* (2SG), *Ø-Ø-poti* (3) "food"
　　b.　*j-u-gutɕabuṇaj* (1SG), *b-a-gutɕabuṇaj* (2SG), *Ø-Ø-kutɕabuṇaj* (3) "great
　　　　　amount of things"
　　c.　*ɲ-i-mataraj* (1SG), *m-a-mataraj* (2SG), *Ø-Ø-pãtaraj* (3) "tooth"
　　d.　*j-i-ŋaraj* (1SG), *b-a-ŋaraj* (2SG), *Ø-Ø-kãraj* (3) "who/what is kept apart"

Similarly, root-initial /r/ can de-rhotacize into /d/ (21a) or into /n/ in nasal-har-
mony words (21b):

(21)　a.　*j-i-rosadi* (1SG), *b-a-rosadi* (2SG), *Ø-Ø-dosadi* (3) "side; wall"
　　b.　*j-i-rarane* (1SG), *b-a-rarane* (2SG), *Ø-Ø-narane* (3) "shoulder blade"

In some radical nouns there is an alternation between root-initial /tɕ/ in the 3rd
person and /j/ elsewhere (see (22)). For a possible explanation, see §5.5:

(22)　*j-i-jaripi* (1SG), *b-a-jaripi* (2SG), *Ø-Ø-tɕaripi* (3) "chair; saddle"

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19. According to Higham et al. (2000), this term for "sister" is only used in the singular.

20. The alternative hypothesis (lenition in intervocalic contexts) is discarded because of the
regular preservation of unvoiced intervocalic stops, as confirmed by several examples reported
here. This is further confirmed by cases such as *pamoj* (25a), where the unvoiced root-initial
consonant undergoes no lenition in the whole possessive paradigm.

3.5   The generic form

The GF is mostly obtained by means of lexically conditioned prefixes. In order of frequency, the allomorphs are *p-* (23a), *dVk-* (where *-V-* is a copy of the thematic vowel) (23b), *g-* (23c) and *k-* (23d), with *p-* overwhelmingly frequent and *k-* extremely rare. For simplicity, in GF-related examples the latter is mostly contrasted with the 3rd person only:

(23)   a.   *Ø-a-kadisõri* (3), *p-a-kadisõri* (GF) "teacher"
       b.   *g-a-ņej* (3), *dak-a-ņej* (GF) "possession; gift"
       c.   *Ø-i-giņaj* (3), *g-i-giņaj* (GF) "house"
       d.   *Ø-õ-ratɕaj* (3), *k-õ-ratɕaj* (GF) "weapon"

In the case of *d*-nouns with different 1st and 3rd vowels (§3.3), the GF displays the same vowel as the 1st person (24). This is further evidence that the 3rd person of *d*-nouns has been replaced by the REFL (§3.3 and §5.4):

(24)   *j-i-karia* (1SG), *b-a-karia* (2SG), *d-a-karia* (3/REFL),
       jok-i-karia (1PL), *p-i-karia* (GF) "daughter-in-law"

In some cases, the GF coincides with the root. This occurs with thematic nouns in /i/ or /u/ (25), where /u/ is mostly due to harmonization with the first root vowel (25b). This constraint might suggest that in these words the possessive inflection was obtained by adding the default thematic vowel /i/ to the radical GF.[21] This has indeed occurred with many relatively recent Spanish loanwords, which unsurprisingly entered the Ayoreo lexicon as GFs, with subsequent creation of the possessive inflection (26). This shows that the class of thematic nouns is still productive. The alternative consists in claiming that the autochthonous bare-root GFs are due to phonetic erosion, which is indeed likely to have occurred with high frequency words like the ones in (25). This is the only viable hypothesis in (25c), where thematic /u/ (with nasalization) has no harmonic motivation and the fortition of /r/ into /d/ follows the same pattern as (21a):

(25)   a.   *Ø-i-pamoj* (3), *Ø-Ø-pamoj* (GF) "woven belt"
       b.   *Ø-u-hubej* (3), *Ø-Ø-hubej* (GF) "woman's large bag"
       c.   *Ø-ṹ-rahej* (3), *Ø-Ø-dahej* (GF) "path"
(26)   a.   *Ø-i-karpaj* (3), *Ø-Ø-karpaj* (GF) "tent", cf. Spanish *carpa* "tent"
       b.   *Ø-i-plata* (3), *Ø-Ø-plata* (GF) "money", cf. Spanish *plata* "silver; money"

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21. Space restrictions prevent showing that thematic /i/ can be assumed as the Ayoreo default vowel, whereas /u/ is often the result of a harmonization process.

Indeed, when the GF coincides with the root, the initial consonant can undergo fortition, just as the 3rd person of radical nouns (see also (12a), §3.1).

(27) a. *Ø-i-gatibej* (3), *Ø-Ø-katibej* (GF) "spoon"
      b. *Ø-u-burudi* (3), *Ø-Ø-purudi* (GF) "shade"
      c. *Ø-i-reŋuj* (3), *Ø-Ø-deguj* (GF) "camp, village"

4. Chamacoco possessive inflection

The present section describes the morphology of Chamacoco possessive inflection. We first introduce the person markers (§4.1); next we address the peculiarities of thematic (§4.2), prefixal (§4.3) and radical nouns (§4.4). Although the GFs are rarely attested in Chamacoco, they show remarkable morphological variability (§4.5).

4.1 Person inflection

Table 5 illustrates the Chamacoco possessive inflection, with (28) as an example. It is useful to compare Table 5 with the data on verb inflection and free pronouns listed in Table 6, where the phonemes shared with the corresponding noun prefixes are in bold:[22]

Table 5. Chamacoco possessive inflection

1SG	2SG	3		REFL	1PL.INCL/ 1PL.EXCL	2PL	GF
p-V-root	*Ø-a/e/* V-root	PREFIXAL NOUNS: *d*-V-root *w*-V-root *k*-V-root *j*-V-root THEMATIC NOUNS: Ø-V-root RADICAL NOUNS: Ø-Ø-root		*d-a/e/* V-root	– (free pronoun + 3rd person)	– (free pronoun + 3rd person)	*dVk*-V-root *d*-V-root *k*-V-root Ø-Ø-root o-[3rd person]

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22. When discussing data in general terms, only the oral allomorphs are reported, and only /d/ is mentioned in relation to the word-initial free alternation /d/ ~ /l/. With individual examples, the form(s) most frequently found in fieldwork is cited. Table 6 shows that Chamacoco has lost the IRLS inflection in the 1st and 2nd persons; interestingly, Ayoreo presents the complementary distribution (see Table 4 and Ciucci & Bertinetto 2015).

(28)   *p-a-lokot* (1SG), *Ø-a-lokot* (2SG), *Ø-a-lokot* (3), *d-a-lokot* (REFL),
       ejok Ø-a-lokot (1PL.INCL), *õrjok Ø-a-lokot* (1PL.EXCL), *olak Ø-a-lokot* (2PL), *õr Ø-a-lokot* (3PL) "nickname"

Table 6. Chamacoco verb inflection and free pronouns

	Chamacoco verb inflection		Chamacoco free pronouns
	REALIS	IRREALIS	
1SG	*t*/*tVk*-V-ROOT	–	*jok*
2SG	*Ø-a*/*e*/V-ROOT	–	*owa*
3	*tɕ*/*ts*/*t*/*d*/*j*/*Ø*-(V)-ROOT	*d*/*t*/*Ø*-(V)-ROOT	*ir(e)*, [*witɕi* (M), *wate* (F)]
1PL.INCL	*j*-V-ROOT(-*lo* = GP)	–	*ejok* (1PL.INCL), *ejoklo* (1GP.INCL)
1PL.EXCL	*o-j*-V-ROOT	–	*õrjok*
2PL	*Ø*-V-ROOT-*lo*	–	*olak* (PL), *olaklo* (GP)
3PL	*o*-3.RLS	*o*-3.IRLS	*õr*, [*wir*]

The 1SG possessive *p*-prefix does not share any similarities with either verb in-flection or free pronouns. This is a Chamacoco innovation (see §6.1). The 2SG is prefixless (with exceptions to be discussed in §4.2). As already described for Old Zamuco and Ayoreo (see §1.2, §2.1 and §3.1), nouns with high thematic vowels (in Chamacoco including /ɨ/ alongside /u/) exhibit the 2SG vowel /a/ or – as a Chamacoco innovation – /e/, originally a prefix vowel (29). Here again, this the-matic vowel replacement is also found in verb inflection (30):

(29)   a.   *p-i-tɨlta* (1SG), *Ø-e-tɨlta* (2SG), *Ø-i-tɨlta* (3), *d-e-tɨlta* (REFL) "stick"
       b.   *p-u-kuta* (1SG), *Ø-a-kɨta* (2SG), *Ø-u-kuta* (3), *d-a-kɨta* (REFL) "branch"

(30)   *t-i-juhu* (1SG), *Ø-e-juhu* (2SG), *tɕ-i-juhu* (3.RLS), *j-i-juhu* (1PL.INCL),
       o-j-i-juhu (1PL.EXCL), *Ø-e-juhu-lo* (2PL), *o-tɕ-i-juhu* (3PL.RLS) //
       d-i-juhu (3.IRLS), *o-d-i-juhu* (3PL.IRLS) "to remove, to extract"

The morphology of the 3rd person will be described while analyzing the individ-ual inflectional classes. The REFL has the same *d*-allomorphs as the 3.IRLS of most Chamacoco verbs, and it can turn into *n*- in nasal-harmony contexts (see fn. 22). As noted in §1.2, the theme of the REFL always coincides with that of the 2SG (see, e.g., Examples (32a) and (34)).

The 1PL.INCL, the 1PL.EXCL and 2PL do not have a dedicated affix in noun in-flection.[23] In these persons, the relevant free pronoun precedes the citation form, which in turn coincides with the 3rd person. This underlines the pivotal role of the 3rd person in the possessive inflection. For simplicity, the Chamacoco plural

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23. As shown in Ciucci & Bertinetto (2015), clusivity is a Chamacoco innovation.

persons are only reported in (28) to provide a generally valid example (note that the 3PL pronoun is optional).

The GF is discussed in §4.5. Since possessive inflection is no longer productive in Chamacoco, recent loanwords are treated as non-possessable. This suggests that *ixit* "son" (33), from Spanish *hijo*, probably entered the Chamacoco lexicon at an early stage of contact.

4.2   Thematic nouns (ø – THEMATIC VOWEL – ROOT)

Thematic nouns form the largest and most regular class. The 2SG has no prefix, and the 2SG vowel is replaced by /a/ (as in Old Zamuco and Ayoreo) or /e/ in nouns with a high thematic vowel. By contrast, in thematic nouns with a non-high thematic vowel, where no replacement occurs, the 2SG and the 3rd person coincide (31; see also (3c–d), §1.2):

(31)   a.   *p-e-rtɕ* (1SG), *Ø-e-rtɕ* (2SG), *Ø-e-rtɕ* (3), *d-e-rtɕ* (REFL) "nape"
        b.   *p-o-bitɕ* (1SG), *Ø-o-bitɕ* (2SG), *Ø-o-bitɕ* (3), *d-o-bitɕ* (REFL) "wound, injury"

Some nouns with thematic /o/ followed by a bilabial consonant, where /a/ replaces the thematic vowel in the 2SG and in the REFL (32a), are an exception. This is also found in the 2nd persons of a few verbs (32b):

(32)   a.   *p-o-mtsit* (1SG), *Ø-a-mtsit* (2SG), *Ø-o-mtsit* (3), *n-a-mtsit* (REFL) "bed"
        b.   *t-o-mtis* (1SG), *Ø-a-mtis* (2SG), *ts-o-mtis* (3.RLS), *j-o-mtis* (1PL.INCL),
             o-j-omtis (1PL.INCL), *Ø-a-mtis-lo* (2PL), *o-ts-omtis* (3PL) //
             n-o-mtis (3.IRLS) "to turn"

Another exception is found in several nouns which preserve the thematic vowel /i/ in the 2SG, turned into /j/ after /e/ (33). This confirms the prefixal origin of 2SG /e a/ (see again §1.2, (3c–d)):

(33)   *p-i-xit* (1SG), *e-j-xit* (2SG), *Ø-i-xit* (3), *de-j-xit* (REFL) "son"

In some nouns with thematic /i/ or /ɨ/, the 2SG and the REFL vowel /a/ is accompanied by root alternations, such that the root-initial consonant contrasts with that of the 1SG- and 3rd person. The following alternations occur: /tɕ/ (1SG/3) ~ /ts/ (2SG) (34a–b), /j/ (1SG/3) ~ /l/ (2SG) (34c), /j/ (1SG/3) ~ /h/ (2SG) (34d–e) and /ɕ/ (1SG/3) ~ /s/ (2SG) (34f). By contrast, when the 2SG vowel is /e/, the 2SG root-initial consonant is the same as in the 3rd person (34d). The first root vowel can reduce to /ɨ/ after root-initial /h/ when the latter alternates with /j/, as in (34e). These idiosyncrasies will be discussed in §5.2:

(34)   a.   *p-i-ʨukut* (1sɢ), *Ø-a-tsukut* (2sɢ), *Ø-i-ʨukut* (3), *d-a-tsukut* (ʀᴇꜰʟ) "navel"
       b.   *p-i-ʨɨta* (1sɢ), *Ø-a-tsɨta* (2sɢ), *Ø-ɨ-ʨɨta* (3), *d-a-tsɨta* (ʀᴇꜰʟ) "mosquito net"
       c.   *p-i-jerʨ* (1sɢ), *Ø-a-lerʨ* (2sɢ), *Ø-i-jerʨ* (3), *d-a-lerʨ* (ʀᴇꜰʟ) "place"
       d.   *p-i-juʨ* (1sɢ), *Ø-a-huʨ* / *Ø-e-juʨ* (2sɢ), *Ø-i-juʨ* (3), *d-ahuʨ* (ʀᴇꜰʟ) "house"
       e.   *p-i-jõrta* (1sɢ), *Ø-a-hɨ̃rta* (2sɢ), *Ø-i-jõrta* (3), *n-a-hɨ̃rta* (ʀᴇꜰʟ) "plant"
       f.   *p-ɨ-ɕuwo* (1sɢ), *Ø-a-suwo* (2sɢ), *Ø-ɨ-ɕuwo* (3), *d-a-suwo* (ʀᴇꜰʟ) "possessed thing, clothing"

4.3   Prefixal nouns (ᴘʀᴇꜰɪx – ᴛʜᴇᴍᴀᴛɪᴄ ᴠᴏᴡᴇʟ – ʀᴏᴏᴛ)

The most common prefixal nouns are characterized by the 3rd-prefix *d-* (35a), in free alternation with *l-* and normally alternating with *n-* in nasal-harmony contexts (35b). As in the other Zamucoan languages, most *d-*nouns in Chamacoco are kinship terms and mostly show the 3rd vowel /a/ or /e/, so that the 3rd person and the ʀᴇꜰʟ overlap. The other lexically determined allomorphs – *j-* (35c), *k-* (35d) and *w-* (35e) – are less common; *d-* and *j-* are the only ones that coincide with some of the 3.ʀʟs prefixes of verb inflection (Table 6):

(35)   a.   *p-a-tahaʨa* (1sɢ), *Ø-a-tahaʨa* (2sɢ), *d/l-a-tahaʨa* (3/ʀᴇꜰʟ) "stepmother"
       b.   *jama* / *p-e-rmiʨ* (1sɢ), *Ø-e-rmiʨ* (2sɢ), *n-e-rmiʨ* (3/ʀᴇꜰʟ) "uncle"
       c.   *p-o-nĩːt* (1sɢ), *Ø-o-nĩːt* (2sɢ), *j-o-nĩːt* (3), *n-o-nĩːt* (ʀᴇꜰʟ) "ghost, evil spirit"
       d.   *p-iː-lak* (1sɢ), *Ø-aː-lak* (2sɢ), *k-aː-lak* (3), *d-aː-lak* (ʀᴇꜰʟ) "food, meal"
       e.   *p-o-lt* (1sɢ), *Ø-o-lt* (2sɢ), *w-o-lt* (3), *d-o-lt* (ʀᴇꜰʟ) "cap"

The 1sɢ vowel of prefixal nouns (and of *d-*nouns in particular) is often different from the 3rd vowel, so that 1sɢ /i ɨ/ can alternate with 3rd person /a e/ (36a–b). We discuss this in §5.1 and §5.4. In a few nouns, /ɨ/ can alternate with /o/ in the 1sɢ (36b):

(36)   a.   *p-i-tɨbitʨa* (1sɢ), *Ø-a-tɨbitʨa* (2sɢ), *d-a-tɨbitʨa* (3/ʀᴇꜰʟ) "older sister (of a woman) / niece (of a woman)"
       b.   *p-i-sɨbitʨa* / *p-o-sɨbitʨa* (1sɢ), *Ø-a-sɨbitʨa* (2sɢ), *l-a-sɨbitʨa* (3/ʀᴇꜰʟ) "niece (of a man)"

4.4   Radical nouns (ø – ø – ʀᴏᴏᴛ)

Radical nouns form the smallest class, with interesting irregularities to be used for reconstructive purposes. The 1sɢ vowel is mostly high and the 2nd vowel is either /a/ or /e/, but the vocalic pattern is often idiosyncratic and accompanied by

pervasive root allomorphy. The possibly original first root vowel is often only found in the 3rd person, for it deletes (37a) or reduces to /ɨ/ (37b) elsewhere (§5.5). This finds a parallel in radical verbs such as (37c). The inflectional vowel and the first root vowel occasionally give rise to harmonic processes as in (37d), with /u/ in the 1sG and /e/ in the 2sG (supposing that /u/ was the original thematic vowel, the actual rule-breaking phenomenon is the harmonization in the 2sG).

Root-allomorphy can also concern the root-initial consonant, as in (37e) where /j/ in the 1sG alternates with /n/ elsewhere. Since /n/ is the nasalized counterpart of /l/ (§4.3), this corresponds to the alternation /j/ ~ /l/ (see (34c)), where /j/ is normally found in 1sG and 3rd person while /l n/ occurs in 2sG and REFL. As argued in §5.4, the contrast of 1sG /j/ with 3rd-person /l n/ (as in (66c)) suggests that the latter person assimilated to the REFL. Finally, the root-initial consonant can undergo word-initial fortition in the 3rd person, as in (37f):

(37) a. *p-i-ktsɨrbɨt* (1sG), *Ø-a-ktsɨrbɨt* (2sG), *Ø-Ø-kotsɨrbɨt* (3), *l-a-ktsɨrbɨt* (REFL) "bag"

b. *p-i-tɨrī:t* (1sG), *Ø-e-tɨrī:t* (2sG), *Ø-Ø-torī:t* (3), *d-e-tɨrī:t* (REFL) "faint"

c. *tɨk-i-tɨla* (1sG), *Ø-a-tɨla* (2sG), *Ø-Ø-tola* (3), *j-i-tɨla* (1PL.INCL), *o-j-i-tɨla* (1PL.EXCL), *Ø-a-tɨlɨ-lo* (2PL), *o-tola* (3PL) "to be afraid of"

d. *p-u-huta / p-u:-ta* (1sG), *Ø-e-heta / Ø-e:-ta* (2sG), *Ø-Ø-huta* (3), *d-e-heta / d-e:-ta* (REFL) "head"

e. *p-i-jẽr* (1sG), *Ø-a-ner* (2sG), *Ø-Ø-ner* (3), *n-a-ner* (REFL) "behind"

f. *p-o-bɨtɨta* (1sG), *Ø-a-bɨtɨta* (2sG), *Ø-Ø-potɨta* (3), *l-a-bɨtɨta* (REFL) "edible fruit"

4.5 The generic form

The Chamacoco GF, unlike that of the sister languages, has almost completely disappeared (§1.2). In addition, some of the surviving GFs have partly lost the original function and can optionally and counterintuitively be used together with a possessor (see Ciucci 2016 [2013]). Despite their low number, GFs exhibit remarkable idiosyncratic variability: they can coincide with the root (38a) or be obtained via a prefix or a pre-prefix added to the 3rd person. Apart from the last mentioned allomorph (see below), the possible prefixes are: *d-* (38b), *k-* (38c) and *dVk-* (38d), where -*V*- is a copy of the thematic vowel. As seen above, *d-* and *k-* are also possible prefixes of the 3rd person. Since /d l/ are in free alternation word-initially, *d-* and *dVK-* can be realized as *l-* and *lVk-*:

(38)   a.   *Ø-i-xõrta* (3), *Ø-Ø-xõrta* (GF) "plant"
       b.   *Ø-i-kɨrmɨsta* (3), *d-i-kɨrmɨsta* (GF) "blood"
       c.   *Ø-iː-bitɕ* (3), *k-iː-bitɕ* (GF) "smoke"
       d.   *Ø-i-tɕibitɕ* (3), *dik-i-tɕibitɕ* (GF) "spirit, image"

The most common Chamacoco GF marker is the pre-prefix *o-* as added to the 3rd person. This applies to words of all classes: radical (39a), thematic (39b) and prefixal (39c–d). In thematic nouns with high thematic vowel, the latter is directly replaced by /o/ in the GF (39b), a mechanism identical to the one concerning /a/ or /e/ in 2SG and REFL (§4.1, see also §1.2). This gives some of these GFs the appearance of thematic nouns (39a–b). The pre-prefix *e-* in (39d) may be regarded as a variant of the last type, possibly caused by assimilation to the contiguous prefix /j/ and the following thematic vowel /ɨ/, which deletes in the GF:

(39)   a.   *Ø-Ø-m̥artɨta* (3), *o-m̥artɨta* (GF) "ring"
       b.   *Ø-ɨ-terpɨta* (3), *o-terpɨta* (GF) "pants"
       c.   *j-o-niːt* (3), *o-j-o-niːt* (GF) "ghost, spirit"
       d.   *j-ɨ-nsɨ̃rtɕ* (3), *e-j-Ø-nsɨ̃rtɕ* (GF) "boss, owner"

The pre-prefix *o-* is also found in verb morphology, where it is a pluralizer used to form the 3PL out of the 3rd person, and is also used to express an impersonal subject. As suggested by Ciucci & Bertinetto (2015), the 3rd-person verbal pluralizer *o-* probably derives from the 3PL pronoun *õr*, as shown in Table 6. As the same table indicates, an identical pre-prefix *o-* marks the 1PL.EXCL of Chamacoco verbs, but its origin is less obvious: it may be a morphomic reuse (in the sense of Aronoff 1994) of the 3rd-person pluralizer, or it may stem from the noun *os* (reduced form of *oso* "people") via the typologically not uncommon shift from collective unspecified plurality to 1PL reference (Chafe 1990).[24] Indeed, words analogous to Chamacoco *os* are used as indefinite reference pronouns in other American Indian languages (Mithun 1991, 1993). Interestingly, as far as nouns are concerned, 3PL reference can be expressed by the anteposed 3PL pronoun *õr*, while generic possession is either expressed by the 3PL pronoun or by the noun *os*: cf. *Ø-Ø-huta* "his/her/their head", *õr Ø-Ø-huta* "their head / head (in general)", *os Ø-Ø-huta* "head (in general)". The construction with *os* may be considered a suppletive strategy to counteract the massive loss of GFs exponents.

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24. Further hypotheses are discussed in Ciucci & Bertinetto (2015).

5.   Comparison

This section compares possessive inflection within the family, pointing out innovative vs. conservative features and paving the way for the reconstruction of Proto-Zamucoan in §6. Of special importance are common exceptions or peculiar divergences. In (40), for instance, Ayoreo has an irregular GF also present in Old Zamuco and this could hardly be a mere matter of chance; in (41), by contrast, the Chamacoco noun exhibits irregular root-allomorphy, opposing 2SG and REFL to the rest of the paradigm, but the Ayoreo cognate shows that the root-consonant /n̥/ found in the two mentioned persons is original:

(40)   OZ *j-i-terepek* (1SG), *Ø-a-terepek* (2SG), *Ø-i-terepek* (3), *Ø-Ø-pepek* (GF) "fabric, cloth"
AY *j-i-tarãpej* (1SG), *b-a-tarãpej* (2SG), *Ø-i-tarãpej* (3), *Ø-Ø-pepej* (GF) "what is used to cover"[25]

(41)   AY *j-i-n̥a* (1SG), *b-a-n̥a* (3), *Ø-i-n̥a* (3), *d-a-n̥a* (REFL) "woman's breast"
CH *p-ĩ:-ta* (1SG), *Ø-ã-n̥ta* (2SG), *Ø-ĩ:-ta* (3), *n-ã-n̥ta* (REFL) "udder"

The Zamucoan languages have the same inflectional classes (prefixal, thematic, radical), and they exhibit general class correspondence between cognate words, indicating substantial diachronic stability, with thematic nouns forming the largest and most regular class. §5.1 compares the thematic vowel correspondences within this class. The presence of /a/ instead of /e/ in the Chamacoco 2SG (§4.2) is often accompanied by root-allomorphy (§5.2). Prefixal nouns present shared irregularities (§5.3), some of which stem from assimilation of the 3rd person to the REFL (§5.4). §5.5 compares radical nouns, while §5.6 deals with loss of possessive inflection, which mainly occurred in Chamacoco.

5.1   Thematic vowel

The thematic vowels are lexically idiosyncratic (recall the assignment of Latin verbs to different conjugations). Similar to the verbal conjugations in Romance, thematic vowels are diachronically rather stable, as confirmed by the frequently found intrafamily correspondences. As in Romance, however, there are exceptions, even independently of the fact that the Chamacoco vocalic inventory is richer, owing to the innovative presence of /ɨ/. This vowel corresponds to a high vowel in the other

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25. In the Ayoreo variety of Colonia Peralta, *itarãpej* and *pepej* underwent slight semantic differentiation, with *pepej* giving rise to a different inflectional paradigm.

languages (42) or derives from reduction of a non-high thematic vowel (see (43), with AY /e/ → CH /ɨ/ in the 1st and 3rd person):

(42)   AY *j-u-mahoto* (1SG), *b-a-mahoto* (2SG), *Ø-u-mahoto* (3), *d-a-mahoto* (REFL)
       "enemy" (F)
       CH *p-i-mahata* (1SG), *Ø-a-mahata* (2SG), *Ø-ɨ-mahata* (3), *n-a-mahata* (REFL)
       "enemy" (F)

(43)   AY *j-e-rubi* (1SG), *Ø-e-rubi* (2SG), *Ø-e-rubi* (3), *d-e-rubi* (REFL) "urine"
       CH *p-i-hɨrbitɕ* (1SG), *Ø-e-hɨrbitɕ / Ø-e-herbitɕ* (2SG), *Ø-ɨ-hɨrbitɕ* (3), *d-e-hɨrbitɕ*
       (REFL) "urine"

The Chamacoco counterpart of Old Zamuco/Ayoreo inflectional /a/ can be /a/ or /e/, owing to massive (although not systematic) /a/ → /e/ change. This can be observed in the vocalic pattern of many nouns (44) and verbs (45). As illustrated with Old Zamuco examples in §1.2 (see (3c–d)), the Proto-Zamucoan 2SG vowel */a/ used to be part of the prefix, and indeed Chamacoco too presents a few nouns, as shown in (46) (see also (33), §4.2) that maintain thematic /i/ (turned into /j/) together with the preceding original prefix vowel /e/ (< */a/). Example (47) repeats Example (3c), where the same phenomenon is observed for Old Zamuco; comparison with the Ayoreo lexical cognate shows the idiosyncratic nature of this conservative feature:

(44)   AY *j-a-hej* (1SG), *b-a-hej* (2SG), *a-hej* (3), *d-a-hej* (REFL) "inside of, in the midst
       of"
       CH *p-e-het* (1SG), *Ø-e-het* (2SG), *Ø-e-het* (3), *d-e-het* (REFL) "inside of, in the
       midst of"

(45)   AY *j-a-huke* (1SG), *b-a-huke* (2SG), *tɕ-a-huke* (3),
       j-a-hu-ho (1PL), *wak-a-hu-tɕo* (2PL) "to split, to chop"
       CH *t-e-hek* (1SG), *Ø-e-hek* (2SG), *ts-e-hek* (3.RLS), *j-e-hek* (1PL.INCL),
       o-j-e-hek (1PL.EXCL), *Ø-e-hek-lo* (2PL), *o-ts-e-hek* (3PL.RLS) //
       d-e-hek (3.IRLS) "to divide, to split"

(46)   OZ *j-i-gios* (1SG), *Ø-a-gios* (2SG), *Ø-i-gios* (3), *Ø-Ø-gios* (GF) "relative"
       AY *j-i-giosi* (1SG), *b-a-giosi* (2SG), *Ø-i-giosi* (3), *d-a-giosi* (REFL) "relative"
       CH *p-iː-sɨt* (1SG), *e-j-sɨt* (2SG), *Ø-iː-sɨt* (3), *de-j-sɨt* (REFL) "relative"

(47)   OZ *j-i-geda* (1SG), *a-i-geda* (2SG), *Ø-i-geda* (3), *da-i-geda* (REFL),
       aj-i-geda (1/2PL) "house"
       AY *j-i-giṇaj* (1SG), *b-a-giṇaj* (2SG), *Ø-i-giṇaj* (3), *d-a-giṇaj* (REFL) "house"

Some Ayoreo exceptions likewise show the 2SG vowel /e/, probably due to raising assimilation induced by adjacent /i u/, as in (48) (see also (13b), §3.2) or to /ai/ → /e/ vowel fusion, as in (13a), §3.2, and in (49), with the latter example illustrating the same phenomenon in verb morphology:

(48) AY *j-i* (1SG), *b-e-j* (2SG), *i* (3), *d-e-j* (REFL) "name"

    CH *p-iː-tɕ* (1SG), *eː-j-tɕ* (2SG), *Ø-iː-tɕ* (3), *deː-j-tɕ* (REFL) "name"

(49) OZ (RLS): *a-i-se* (1SG), *da-i-se* (2SG), *tɕ-i-se* (3), *a-i-ko* (1PL),
        da-i-so (2PL) "to reach"

    AY *j-i-se* (1SG), *b-e-se* (2SG), *tɕ-i-se* (3), *j-i-ko* (1PL),
        wak-e-so (2PL) "to find, to meet, to reach"

    CH *t-i-ç* (1SG), *Ø-e-ç* (2SG), *tɕ-i-ç* (3.RLS), *j-i-ç* (1PL.INCL), *o-j-i-ç* (1PL.EXCL),
        Ø-e-ç-lo / Ø-e-çi-lo (2PL), *o-tɕ-i-ç* (3PL.RLS) // *d-i-ç* (3.IRLS) "to meet, to
        reach"

Finally, (50) illustrates an exceptional paradigm shared by Ayoreo and Chamacoco, with a back 2nd and REFL vowel in a noun with high thematic vowel, which should normally have 2nd and REFL vowel /a/ or /e/ (cf. §1.2).

(50) AY *j-u-hoj* (1SG), *b-o-hoj* (2SG), *Ø-u-hoj* (3), *d-o-hoj* (REFL), *jok-u-hoj* (1PL),
        wak-o-hoj (2PL) "fellow"[26]

    CH *p-u-hut* (1SG), *Ø-u-hut* (2SG), *Ø-u-hut* (3), *d-u-hut* (REFL) (classifier for
        "fellow")

5.2 Root allomorphy

Some Chamacoco nouns exhibit root allomorphy in the root-initial consonant when the 2SG vowel is /a/ instead of /e/ (see (34), §4.2). The same sort of root alternations occurs in Chamacoco verb inflection (51), unlike in the sister languages (Ciucci & Bertinetto 2015):

(51) OZ RLS: *a-i-saw* <aizau> (1SG), *d-a-saw* <dazau> (2SG), *tɕ-i-saw* <chizau> (3)
        "to take"

    AY *j-i-sa* (1SG), *b-a-sa* (2SG), *tɕ-i-sa* (3), *j-i-sa-go* (1PL), *wak-a-sa-jo* (2PL) "to
        touch, to pick up, to grab, to accept"

    CH *t-i-çew* (1SG), *Ø-a-sew* (2SG), *tɕ-i-çew* (3.RLS), *j-i-çew* (1PL.INCL),
        o-j-i-çew (1PL.EXCL), *Ø-a-sew-lo / Ø-a-sɨ-lo* (2PL), *o-tɕ-i-çew* (3PL.RLS) //
        d-i-çew (3.IRLS) "to hold, to take, to grab"

Family-internal comparison allows one to reconstruct the original root-initial consonant. We report here the 2SG and 3rd person, since (as shown in 51) their roots are, respectively, identical to those of the REFL and 1SG. With the root-initial alternations /ts/ (2SG) ~ /tɕ/ (3rd person) as in (52), and /l/ (2SG) ~ /j/ (3rd person)

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26. In some Ayoreo varieties, the tendency to regularize the inflectional vowel /o/ into /a/ emerges (Gabriella Erica Pia p.c.).

as in (53), the 2sɢ root is innovative. Conversely, the 2sɢ preserves the original root-initial consonant when Chamacoco /h/ (2sɢ) alternates with /j/ (3rd person) as in (54). Chamacoco verb inflection sheds light on the alternation /s/ (2sɢ) ~ /ɕ/ (3rd person), for which comparative data in the nominal domain are scanty. In the only nominal pair that allows comparison (55), disregarding the Ayoreo root-initial syllable /ka/ which is lacking in the Chamacoco cognate, there is an irregular distribution of Chamacoco /ɕ/ and /s/, with /ɕ/ only present in the 1sɢ. However, verbs such as the one in (51) suggest that /s/, as exhibited by Old Zamuco and Ayoreo and preserved in the Chamacoco 2sɢ, turned into /ɕ/ in the Chamacoco 1sɢ and 3rd person:

(52)   AY *j-u-tɕaj* (1sɢ), *b-a-tɕaj* (2sɢ), *Ø-u-tɕaj* (3), *d-a-tɕaj* (ʀᴇꜰʟ) "excrement, feces, dung"
       CH *p-i-tɕit* (1sɢ), *Ø-a-tsit* (2sɢ), *Ø-i-tɕit* (3), *d-a-tsit* (ʀᴇꜰʟ) "excrement, feces, dung"

(53)   AY *j-i-jarit* (1sɢ), *b-a-jarit* (2sɢ), *Ø-Ø-tɕarit* (3), *d-a-jarit* (ʀᴇꜰʟ) "stopping place"[27]
       CH *p-i-jertɕ* (1sɢ), *Ø-a-lertɕ* (2sɢ), *Ø-i-jertɕ* (3), *d-a-lertɕ* (ʀᴇꜰʟ) "place"

(54)   AY *j-i-hõra* (1sɢ), *b-a-hõra* (2sɢ), *Ø-Ø-hõra* (3), *d-a-hõra* (3) "friend, companion" (ꜰ)
       CH *p-i-jẽra* (1sɢ), *Ø-a-hĩra* (2sɢ), *Ø-i-jẽra* (3), *n-a-hĩra* (ʀᴇꜰʟ) "friend, companion" (ꜰ)

(55)   AY *j-i-kasisõri* (1sɢ), *b-a-kasisõri* (2sɢ), *Ø-i-kasisõri* (3), *d-a-kasisõri* (ʀᴇꜰʟ) "opponent who is not afraid"
       CH *p-i-ɕipsĩrtɕ* (1sɢ), *Ø-a-sipsĩrtɕ* (2sɢ), *Ø-a-sipsĩrtɕ* (3), *l-a-sipsĩrtɕ* (ʀᴇꜰʟ) "opponent in combat"

Table 7 summarizes the evolution of Chamacoco noun and verb root allomorphy. We surmise that the 3rd-person root-initial palatal consonants /ɕ/ (</s/, (51), (55)) and /j/ (</h/, (54)) were innovatively brought about by the high thematic vowel /i/ or /ɨ/, while the 2sɢ inflectional vowel /a/ prevented palatalization. By contrast, 2sɢ /a/ innovatively caused the depalatalization of /tɕ/ into /ts/ (52) and of /j/ into /l/ (53). Evidence that /ɕ/, /j/, /ts/ and /l/ are Chamacoco innovations comes from the absence of these consonants from the phonological inventory of Old Zamuco and Ayoreo.

As shown in §5.4, the consonantal alternations discussed here with respect to Chamacoco shed light on some assimilation processes occurring in Zamucoan.

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27. The 3rd person of this Ayoreo noun shows an irregularity to be addressed in §5.5 (72).

Table 7. Root-initial consonant alternation

ORIGINAL CONSONANT		INNOVATIVE CONSONANT	EXAMPLES
/tɕ/ (1sG/3)	>	/ts/ (2/REFL)	(34a–b), (52)
/j/ (1sG/3)	>	/l/ (2/REFL)	(34c), (53)
/h/ (2/REFL)	>	/j/ (1sG/3)	(34d–e), (54)
/s/ (2/REFL)	>	/ɕ/ (1sG/3)	(34f), (51), (55)

5.3   Prefixal nouns (PREFIX – THEMATIC VOWEL – ROOT)

The family-internal correspondences among kinship terms, most of which are *d*-nouns, suggest the hypothesis that this irregular set traces back to Proto-Zamucoan. Here only irregularities allowing diachronic inferences are focused upon.

In some *d*-nouns, an irregular 1sG alternates with the regular one (56)–(58). The Ayoreo and Chamacoco 1sG of "father" (56) and the Chamacoco 1sG of "mother" (57) also exhibit suppletive loanwords from Spanish: *japade*, *papa*, *mama*, respectively. The 1sG of "mother" (57) has an irregular prefixless form in Zamucoan; in Old Zamuco, the irregularity of this noun extends to 1PL and 2PL (§2.1). The coincidence between Old Zamuco and Chamacoco suggests that 1sG *ote presumably was a Proto-Zamucoan form, while Ayoreo *jate* and Chamacoco *patɨ* are regularized forms (with final /ɨ/ of *patɨ* stemming from vowel reduction, see §5.1). Another irregularity to be assigned to Proto-Zamucoan is the Ayoreo and Chamacoco 1sG of "grandmother" (58), consisting of the bare root:

(56) OZ *j-a-itie* (1sG), *Ø-a-itie* (2sG), *d-a-itie* (3/REFL) "father"
  AY *j-a-j / j-a-pade* (1sG), *b-a-j / b-a-je* (2sG), *d-a-j / d-a-je* (3/REFL) "father"
  CH *diː / p-e-jtɕ / papa* (1sG), *Ø-e-jtɕ* (2sG), *l-/d-e-jtɕ* (3/REFL) "father"

(57) OZ *Ø-o-te* (1sG), *Ø-a-te(tae)* (2sG), *d-a-te* (3), *as-o-te* (1PL), *aj-a-te* (2PL) "mother"
  AY *Ø-i-te / j-a-te* (1sG), *b-a-te* (2sG), *d-a-te* (3/REFL) "mother"
  CH *Ø-o-te / p-a-tɨ / mama* (1sG), *Ø-a-ta* (2sG), *d-a-ta* (3/REFL) "mother"

(58) AY *Ø-Ø-kode / j-i-kode* (1sG), *b-a-kode* (2sG), *d-a-kode* (3/REFL) "grandmother"
  CH *Ø-Ø-kole / Ø-Ø-kolɨ / p-e-kɨta* (1sG), *Ø-e-kɨta* (2sG), *l-/d-e-kɨta* (3/REFL) "grandmother"

A group of Ayoreo and Chamacoco *d*-nouns exhibit the 1sG vowel /i/ or (in Chamacoco) /ɨ/, contrasting with the 3rd vowel /a/ or /e/, as in the Ayoreo 1sG *jikode* "grandmother" (58), where 3rd person and REFL coincide. The anomaly here is that 1sG- and 3rd vowel do not coincide. Since this anomaly is often shared by cognates in both languages (as shown in (59); see also (63), §5.4), this can be regarded as

a very old feature. Although 3rd-person high inflectional vowels are rare among *d*-nouns, one may surmise that in this small set of nouns */i/ was the original thematic vowel, while 3rd-person /a e/ comes from assimilation to the REFL. The same process was pointed out above to explain some exceptional Chamacoco thematic nouns (see §4.1 as well as §5.4), but in *d*-nouns this is particularly striking. The strong attraction by the REFL might be understood, in the case of kinship terms, with the relative frequency of reflexive reference for pragmatic reasons; however, cases such as the Chamacoco noun in (60), where 3rd person and REFL do not coincide, might suggest that the *d*-prefix also existed as an independent 3rd-person marker. The Chamacoco nouns in (60)–(61), compared with their thematic cognates in Ayoreo, are exceptions to the normal correspondence of prefixal nouns within Zamucoan. Since the general tendency should be for nouns to belong to the largest inflectional class (thematic nouns), the Ayoreo thematic forms might be regarded as innovative. Finally, (62) shows that not all kinship terms were *d*-nouns in Proto-Zamucoan:

(59)   AY   *j-i-ŋoŋamia* (1SG), *b-a-ŋoŋamia* (2SG), *d-a-ŋoŋamia* (3/REFL) "aunt, father's sister"
　　　　CH   *p-i-n̥emtɕa / p-e-n̥emtɕa* (1SG), *Ø-a-n̥emtɕa* (2SG), *n-a-n̥emtɕa* (3/REFL) "aunt" (also: *naneːmtɕa*)

(60)   AY   *j-u-suguruj* (1SG), *b-a-suguruj* (2SG), *Ø-u-suguruj* (3), *d-a-suguruj* (REFL) "fingernail, claw, hoof"
　　　　CH   *p-u-ɕurtɕ* (1SG), *Ø-e-ɕurtɕ* (2SG), *d-u-ɕurtɕ* (3), *d-e-ɕurtɕ* (REFL) "fingernail, toenail"

(61)   AY   *j-a-buhi* (1SG), *b-a-buhi* (2SG), *Ø-a-buhi* (3), *d-a-buhi* (REFL) "nephew, woman's brother"
　　　　CH   *p-e-bihit* (1SG), *Ø-e-bihit* (2SG), *d-e-bihit* (3/REFL) "nephew, woman's brother"

(62)   AY   *ɲ-a-ŋami* (1SG), *m-a-ŋami* (2SG), *Ø-a-ŋami* (3), *n-a-ŋami* (REFL) "grandson"
　　　　CH   *p-a-ŋimitɕ* (1SG), *Ø-a-ŋimitɕ* (2SG), *Ø-a-ŋimitɕ* (3), *n-a-ŋimitɕ* (REFL) "grandson"

5.4   On the attraction of the 3rd person by the reflexive

This subsection provides evidence that some irregularities or subregularities found in the Zamucoan languages can be explained by Proto-Zamucoan assimilation of the 3rd person to the REFL.

　　The Chamacoco nouns in (63)–(64) show the root-initial consonant alternation /ɕ/ ~ /s/ (the former a Chamacoco innovation). When such alternation occurs, /s/ is

always preceded by /a/, and /ç/ by a high vowel. Thus, as pointed out in §5.2, the irregularity of this consonant alternation is enhanced by the irregular vocalic pattern, whereby the 1SG- and 3rd vowel do not coincide. The interpretation of this pattern is however straightforward: /ç/ normally occurs in the 1SG – as well as (in regular cases) in the 3rd person – owing to palatal assimilation induced by a preceding high vowel, while /s/ in the 2SG was immune from this phonological process owing to the preceding /a/. This suggests the following sequence of changes in the nouns in (63)–(65): first there was partial or total assimilation of the 3rd person to the REFL, next 1SG palatalization took place. This combined vowel and consonant change occurred not only in *d*-nouns (63) but also in some thematic nouns (64)–(65). The alternative hypothesis, such that the vowel change took place in 1SG rather than in the 3rd person, is contradicted by examples like (64), where the Ayoreo noun maintains thematic /i/ in the 3rd person, while Chamacoco shows the innovative 3rd vowel /a/ under REFL influence:

(63) AY *j-/ɲ-ī-sarai* (1SG), *b-/m-ā-sarai* (2SG), *n-a-sarai* (3/REFL) "son-in-law"
      CH *p-i-çẽ:t* (1SG), *Ø-a-sẽ:t* (2SG), *l-a-sẽ:t* (3/REFL) "son-in-law"

(64) AY *j-i-kasisōri* (1SG), *b-a-kasisōri* (2SG), *Ø-i-kasisōri* (3), *d-a-kasisōri* (REFL)
      "opponent who is not afraid"
      CH *p-i-çipsīrtç* (1SG), *Ø-a-sipsīrtç* (2SG), *Ø-a-sipsīrtç* (3), *l-a-sipsīrtç* (REFL)
      "opponent in combat"

(65) CH *p-o-matç* (1SG), *Ø-a-matç* (2SG), *Ø-a-matç* (3), *d-a-matç* (REFL) "anus;
      bottom of a boat"

Another type of CH root-initial consonant alternation is /j/ ~ /n/ (where the latter consonant is the nasalized counterpart of the CH innovative phoneme /l/). In §5.2 we showed that /j/ – to be found in 1SG and 3rd person – is conservative, while /l n/ is an innovation brought about by the non-palatal 2SG vowel /a/. This occurs in both nouns (66a) and verbs (66b). However, in (66c) root-initial /n/, rather than /j/, is unexpectedly found in the 3rd person (see also (37e), §4.4). Since root-initial consonant alternation is normally conditioned by vowel quality, one might claim that the radical form *nerpta* underwent attraction by REFL *nanerpta*:

(66) a. CH *p-i-jermitç* (1SG), *Ø-a-nermitç* (2SG), *Ø-Ø-jermitç* / *Ø-Ø-jïrmitç* (3),
          n-a-nermitç (REFL) "back" (anatomy)
      b. CH *t-i-jem* (1SG), *Ø-a-nem* (2SG), *Ø-i-jem* (3), *j-i-jem* (1PL.INCL), *o-j-i-jem*
          (1PL.EXCL), *Ø-a-nem-lo* (2PL), *o-jem* (3PL) "to wait"
      c. CH *p-i-jẽrpta* (1SG), *Ø-a-nerpta* (2SG), *Ø-Ø-nerpta* (3), *n-a-nerpta* (REFL)
          "shirt, dress"

To sum up, Ayoreo and Chamacoco nouns may have an irregular vocalic pattern, as mostly observed in *d*-nouns, whereby the 1SG and the 3rd vowel differ. Some of these irregularities must derive from Proto-Zamucoan. Furthermore, the Chamacoco root allomorphy, besides indicating sensitivity to the thematic vowel quality, suggests that the REFL must have exerted an attraction on the 3rd person.

5.5   Radical nouns (ø – ø – ROOT)

The radical lexemes form the most irregular class in both nouns and verbs. In §4.4 (37) we claimed that the original first root vowel of Chamacoco radical nouns (/a/ in (67), /o/ in (68)–(69)) is only preserved in the 3rd person and reduces to /ɨ/ (or deletes) elsewhere. This is confirmed by comparison with the sister languages, in which one and the same first root vowel shows up in the whole paradigm. Thus, while the 3rd person of Zamucoan radical nouns can be innovative in the root-initial consonant, in Chamacoco this person may be the most conservative as far as the first root vowel is concerned. As for the 1SG vowel of radical nouns, it is generally high in Zamucoan, so that its occasional change into /o/ in Chamacoco (68)–(69) must be due to attraction by the original first root vowel (§4.4). In addition, in Zamucoan word-initial voiced bilabial stops can undergo fortition in the 3rd person of both nouns and verbs (68)–(70); see (7c) for a similar example of root-initial fortition in Old Zamuco):

(67)   OZ *j-i-manai(tie)* (1SG), *Ø-Ø-manai* (3) "hand"
     AY *j-i-m̥anaj* (1SG), *b-a-m̥anaj* (2SG), *Ø-Ø-m̥anaj* (3), *d-a-m̥anaj* (REFL)
       "hand"
     CH *p-i-m̥ita / p-o-m̥ita* (1SG), *Ø-a-m̥ita* (2SG), *Ø-Ø-m̥ata* (3), *n-a-m̥ita* (REFL)
       "hand"

(68)   OZ *j-i-bosodoe* (1SG) "food"
     AY *j-i-boti* (1SG), *b-a-boti* (2SG), *Ø-Ø-poti* (3), *d-a-poti* (REFL) "food"
     CH *p-o-bi̢çt* (1SG), *Ø-a-bi̢çt* (2SG), *Ø-Ø-po̢çt* (3), *d-a-bi̢çt* (REFL) "food"

(69)   AY *j-i-mataraj* (1SG), *b-a-mataraj* (2SG), *Ø-Ø-pātaraj* (3), *d-a-mataraj* (REFL)
       "tooth"
     CH *p-o-bitēt* (1SG), *Ø-a-bitēt* (2SG), *Ø-Ø-potēt* (3), *l-/d-a-bitēt* (REFL) "tooth"
       (plural: *Ø-Ø-potēre*)

(70)   AY *j-i-bo* (1SG), *b-a-bo* (2SG), *Ø-Ø-po* (3), *j-i-bo-go* (1PL), *wak-a-bo-jo* (2PL)
       "to cry"
     CH *t-o-bɨta* (1SG), *Ø-a-bɨta* (2SG), *Ø-Ø-pota* (3), *j-o-bɨta* (1PL.INCL), *o-j-o-bɨta*
       (1PL.EXCL), *a-bɨti-lo* (2PL), *o-pota* (3PL) "to envy, to lust after"

Chamacoco has comparatively fewer radical nouns than the sister languages, possibly owing to change of inflectional class. A case in point is (71), where the Ayoreo first root vowel /o/ is identical to the Chamacoco thematic vowel, suggesting shift from radical to thematic inflectional class (see fn. 31 for the phonetic correspondence):

(71) AY *j-i-hogat* (1sg), *b-a-hogat* (2sg), *Ø-Ø-hogat* (3), *d-a-hogat* (REFL) "place"
   CH *p-o-witɕ* (1sg), *Ø-o-witɕ / Ø-a-witɕ* (2sg), *Ø-o-witɕ* (3), *d-o-witɕ / d-a-witɕ* (REFL) "place"

A counterexample is (72), presenting an Ayoreo radical noun paired with a Chamacoco thematic one, with the original root-initial consonant /j/ of both languages turned into /tɕ/ in the Ayoreo 3rd person. The same can be observed in (53), §5.2. In the verb inflection of Zamucoan (see (73)), we find the same root-initial alternation /j/ ~ /tɕ/ (or /ts/ in Chamacoco), with the latter restricted to the 3rd person (more precisely, 3.IRLS in Old Zamuco and Chamacoco). This alternation in the verb morphology of the whole family must be an archaic feature. In Ciucci & Bertinetto (2015) two hypotheses were formulated: (i) /j/ turns into /tɕ/ owing to word-initial fortition; (ii) the 3(.IRLS) person of such verbs originally consisted of the *d*-prefix followed by thematic /i/ and root-initial /j/, with /tɕ/ stemming from spontaneous affrication of the sequence /dij/. The latter hypothesis provides a more economical explanation in verb inflection, but its application to possessive inflection presupposes that Ayoreo *tɕagueo* in (72) originally had the *d*-prefix (due to attraction by the REFL) and the 3rd vowel /i/. Its Chamacoco cognate *ijuwo* confirms that the 3rd vowel was indeed /i/ but, being thematic, offers no clue as to the possible existence of a prefix:

(72) AY *j-i-jagueo* (1sg), *b-a-jagueo* (2sg), *Ø-Ø-tɕagueo* (3), *d-a-jagueo* (REFL) "hunger"
   CH *p-i-juwo* (1sg), *Ø-a-luwo* (2sg), *Ø-i-juwo* (3), *d-a-luwo* (REFL) "hunger"

(73) OZ RLS: *a-i-jage* (1sg), *d-a-jage* (2sg), *Ø-i-jage* (3), *a-i-jage-go* (1pl), *d-a-jage-o* (2pl); IRLS: *j-i-jage* (1sg), *Ø-Ø-tɕage* (3), *j-i-jage-go* (1pl), *Ø-a-jage-o* (2pl) "to stand up"
   AY *j-i-jage* (1sg), *b-a-jage* (2sg), *Ø-Ø-tɕage* (3), *j-i-jage-go* (1pl), *wak-a-jage-jo* (2pl) "to stand up"
   CH *t-i-jehet / tɨk-i-jehet / tik-i-jehet* (1sg), *Ø-a-lehet* (2sg), *Ø-i-jehet* (3.RLS), *j-i-jehet* (1pl.INCL), *o-j-i-jehet* (1pl.EXCL), *Ø-a-lehet(i)-lo* (2pl), *o-jehet* (3pl.IRLS) // *Ø-Ø-tsehet* (3.IRLS) "to stand, to stand up"

5.6   Loss of possessive inflection

As noted in §4.1, possessive inflection is no longer productive in Chamacoco, as shown by the fact that the Chamacoco counterparts of many Old Zamuco/Ayoreo possessable nouns have no possessive inflection. In some cases, the surviving form is a relic of what used to be the GF, and this in turn contributes to the scarcity of GFs. We distinguish a number of situations.

First, a Chamacoco non-possessable noun can correspond to an Old Zamuco/Ayoreo GF, either expressed by the bare root as in (74) or by the *dVk*-prefix (§4.5) as in (75):

(74)   a.   AY *Ø-u-gutɕaj* (3), *Ø-Ø-kutɕaj* (GF) "thing" ~ CH *kutɕit* "thing (NPS)"
       b.   AY *Ø-i-bora* (3), *Ø-Ø-bora* (GF) "article of clothing" ~ CH *bortiɕt* "clothing (NPS)"
       c.   OZ *Ø-u-rahec* (3), *Ø-Ø*-dahec (GF) "path" ~ AY *Ø-ū-rahej* (3), *Ø-Ø-dahej* (GF) "path" ~
            CH *dehet* "path (NPS)"
       d.   AY *Ø-u-burut* (3), *Ø-Ø-purut* (GF) "shade" ~ CH *puːrtɕ* "shade, shadow (NPS)"

(75)   AY *Ø-o-de* (3), *duk-o-de* (GF) "tomb, grave" ~ CH *dukuta* "cemetery (NPS)"

Second and third, the Chamacoco non-possessable noun can correspond to the Ayoreo root, as distinguished from the GF (76), or can derive from the original 3rd person, as in (77); see also (84), §6.3. In the fourth and last situation, we detect traces of prefixation in the Chamacoco non-possessable noun, such as a relic of the prefix *d-* in (78), or /j/ in (80, §6.1):

(76)   AY *Ø-i-daj* (3), *g-i-daj* (GF) "village" ~ CH *dit* / *dut* (NPS) "village"

(77)   a.   AY *j-u-ŋori* (3) "killer; winner in a game" ~ CH *juwɨrtɕ* (NPS) "killer"
       b.   AY *Ø-a-sōre* (3) "lance" ~ CH *asõ̃ɭɭa* (NPS) "lance"

(78)   AY *Ø-u-tɕakepie* (3), *d-a-tɕakepie* (REFL) "outhouse, toilet" ~ CH *ditɕipita* (NPS) "outhouse, bathroom, toilet"

The noun in (79) is the only case so far observed in which an Ayoreo non-possessable noun corresponds to a Chamacoco possessable one:

(79)   AY *bisit* (NPS) "medicine" ~ CH *Ø-i-miɕt* (3) "medicine"

6.   Reconstructing the Proto-Zamucoan possessive inflection

We now propose a reconstruction of Proto-Zamucoan possessive inflection. Table 8 offers a synoptic view, anticipating a plausible reconstruction of Proto-Zamucoan whose forms are justified in the following subsections, respectively devoted to: 1SG (§6.1), 2SG (§6.2), 3rd person (§6.3), REFL (§6.4), 1PL and 2PL (§6.5) and GF (§6.6). Subsequently, the Proto-Zamucoan verb and possessive inflections are compared (§6.7).

Table 8. Possessive inflection in Old Zamuco, Ayoreo, Chamacoco and Proto-Zamucoan

	Old Zamuco	Ayoreo	Chamacoco	Proto-Zamucoan
1SG	*j*-V-root	*j*-V-root	–	**j*-V-root (§6.1)
	tɕ-V-root	–	–	–
	s-V-root	–	–	–
	–	–	*p*-V-root	–
2SG	Ø-*a*/V-root	*b*-*a*/V-root	Ø-*a*/*e*/V-root	**a*-V-root (§6.2)
3	*d*-V-root	*d*-V-root	*d*-V-root	**d*-V-root
	g-V-root	*g*-V-root	*j*-V-root, *w*-V-root	**g*-V-root (§6.3)
	–	*k*-V-root	*k*-V-root	–
	–	*j*-V-root	*j*-V-root	(**j*-V-root ?)
	–	*p*-V-root	–	–
	Ø-V-root	Ø-V-root	Ø-V-root	**Ø*-V-root
	Ø-Ø-root	Ø-Ø-root	Ø-Ø-root	**Ø*-Ø-root
REFL	*d*-*a*/V-root	*d*-*a*/V-root	*d*-*a*/*e*/V-root	**da*-V-root (§6.4)
1PL	*aj*-V-root	–	–	**aj*-V-root
	as-V-root	–	(see §6.5)	**as*-V-root [rare] (§6.5)
	–	*jok*-V-root	–	–
2PL	*aj*-V-root	–	–	? (§6.5)
	as-V-root	–	–	
	–	*wak*-*a*/V-root	–	
GF	*p*-V-root	*p*-V-root	–	**p*-V-root
	d-V-root	–	*d*-V-root	**d*-V-root (§6.6)
	–	*dVk*-V-root	*dVk*-V-root	**dVk*-V-root
	–	*k*-V-root	*k*-V-root	**k*-V-root
	–	*g*-V-root	–	–
	Ø-Ø-root	Ø-Ø-root	Ø-Ø-root	**Ø*-Ø-root
	–	–	*o*-[3rd person]	–

6.1   First singular

The 1SG-prefix *j-* is a possessive marker in both Old Zamuco and Ayoreo, where it is also a 1.IRLS-prefix in verb morphology (see Tables 2 and 4). By contrast, in Chamacoco it is restricted to the function of verbal 1PL.INCL-prefix (Table 6), although it presumably used to act as a 1st-person marker for both singular and plural before the Chamacoco clusivity split occurred (see Ciucci & Bertinetto 2015: 76–80). The *j*-prefix is also present in the 1SG free pronoun of Zamucoan: Old Zamuco/Ayoreo *(u)ju* and Chamacoco *jok* (Tables 2, 4, 6). This convergence of possessive inflection with pronominal and verbal morphology suggests that Proto-Zamucoan nouns must have had the 1SG possessive prefix **j-*. In Chamacoco this was subsequently replaced by *p-*, the most frequent GF marker of Old Zamuco and Ayoreo. This explains the rarity of GFs in Chamacoco.

Some fossilized *j*-forms can be detected in Chamacoco, e.g., in some non-possessable nouns stemming from inflected forms, such as *josɨ̄rsɨ̄rtç* in (80), where initial /j/ corresponds to the Ayoreo (and Proto-Zamucoan) 1SG-prefix:

(80)   AY *j-o-sõrasõri* (1SG), *Ø-o-sõrasõri* (3) "one who is merciful, compassionate"
       CH *josɨ̄rsɨ̄rtç* "liberator, merciful person (NPS)"

Another example – Chamacoco <ioté> "mother" – was reported in the first half of the 19th century by the Austrian explorer Johann Natterer (Willem Adelaar p.c.; see also Adelaar & Brijnen 2014). This word is unknown to present-day Chamacoco speakers and does not appear in the data collected at the end of the 19th century by Boggiani (1894: 101). We interpret this form as *j-o-te*, with the irregular inflectional vowel /o/ documented in the 1SG of the same Old Zamuco and Chamacoco word (cf. *Ø-o-te* "mother.1SG"; (57), §5.3), while *j-* is a remnant of the original prefix.[28]

A motivation of the Chamacoco substitution of 1SG *j-* by the GF prefix *p-* might lie in the process described by Mithun (1991) and Chafe (1990), whereby indefinite/defocusing person markers can evolve into 1PL-markers.[29] This has also occurred in French and Italian with, respectively, *on* and "impersonal *si*" as used for 1PL reference (cf. *on mange* / *si mangia* as a colloquial equivalent of "we eat").

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28. The existence of an old 1SG marker in *jote* does not contradict the fact that *ote* (found in both Old Zamuco and Chamacoco) can be traced back to Proto-Zamucoan, because other kinship terms equally present the alternation between a prefixed and a non-prefixed 1SG form (see (57)–(58), §5.3).

29. As Mithun (1993) observes, indefinite pronouns can also turn into third person pronouns (see §6.6). See also Cristofaro (2013) and Aikhenvald (forthcoming), who shows that in some Arawak languages the impersonal marker **pa-* developed into a marker for the first person plural (inclusive) or the third person.

The Chamacoco situation, though, presents a further step, namely transfer of the innovative 1ᴘʟ-marker (as derived from the ɢꜰ) to the 1sɢ. This finds, however, a parallel in free pronouns, where the original 1ᴘʟ free pronoun *jok* replaced the 1sɢ pronoun (see Tables 6 and 10). The same transfer from 1ᴘʟ to 1sɢ occurred in verbal morphology, although the prefix *tVk-* apparently differs from the pronoun *jok* (see Table 6). Ciucci & Bertinetto (2015) provide supporting evidence for this particular change. Thus, Chamacoco shows in both nominal and verbal morphology the replacement of the 1sɢ-prefix **j-*.

Old Zamuco also exhibits the 1sɢ-prefixes *tɕ-* and *s-*, not found in the nominal morphology of the sister languages. These may be archaic, considering that Old Zamuco is the morphologically most conservative language (Ciucci 2016 [2013]), but we prefer to exclude them from reconstruction, although *tɕ-* is also found in Old Zamuco verb morphology (see Table 2), where it can indeed be traced back to Proto-Zamucoan (Ciucci & Bertinetto 2015). As for *s-*, it might possibly stem from contact with Chiquitano (a.k.a. Bésɨro), the dominant language in the Jesuit missions where the Zamuco speakers – whose language was also described by Chomé – were present. Chiquitano was a contact language for the Northern Zamucoan tribes much before the Jesuit period, and the data from the Jesuit grammars indicate that some possessable nouns and some verbs belonging, respectively, to the Chiquitano fifth declension and fifth conjugation, marked the 1sɢ by means of the *ts-*prefix (Adam & Henry 1880: 11, 34; Falkinger & Tomichá 2012: 22, 32–33). Since /ts/ is not part of the phonological inventory of Old Zamuco, it might plausibly have turned into /s/ by deaffrication.

6.2   Second singular

Zamucoan shows the 2sɢ vowel /a/ replacing the high thematic vowels. In Chamacoco this vowel often turned into /e/, obeying a frequent phonological change (§4.1). As shown in §5.1, there are clear hints that **/a/* used to be (part of) the 2sɢ-prefix in all three languages, as indicated by nouns where /a/ (or /e/) is preserved before a high thematic vowel, instead of replacing it (47)–(48). This suggests **/a/* should be assigned to Proto-Zamucoan. The same phenomenon is found in verb inflection, where **/a/* used to be the Proto-Zamucoan 2(.ɪʀʟs) prefix (§6.7, Table 10). By contrast, with non-high thematic vowels the opposite occurred, namely 2sɢ **/a/* was itself replaced, leaving no relics (see also fn. 9).

The Ayoreo 2sɢ prefix *b-* is innovative and either derives from the labial feature of the 2sɢ pronoun *(u)wa* or, most likely, is a copy of the 2sɢ.ʀʟs prefix of the verb conjugation (see Table 4), stemming from Proto-Zamucoan **ba-* (see Table 10).

6.3   The third person

The examples above show frequent interlinguistic correspondences between thematic (the most conspicuous class), prefixal and radical nouns, indicating substantial diachronic stability despite occasional inflectional class shifts (§5.3 and §5.5). In this subsection, the class of prefixal nouns is dealt with.

The 3rd-prefix *d-* is found in all three languages and most probably existed in Proto-Zamucoan. As noted (see §3.3, §4.3, §5.3), most *d*-nouns are kinship terms and share a number of irregularities, partly caused by assimilation of the 3rd person to the REFL, which probably already occurred in Proto-Zamucoan.

The Ayoreo 3rd-prefix *g-* is absent in Chamacoco, and indeed this phoneme is lacking in the Chamacoco phonological inventory. The Chamacoco counterpart of this prefix is Ø as in (81) or /j/ as in (82):[30]

(81)   AY *j-a-ʨit* (1SG), *b-a-ʨit* (2SG), *g-a-ʨit* (3), *d-a-ʨit* (REFL) "pet, domesticated animal, vehicle"[31]
       CH *p-e-ʨit* (1SG), *Ø-e-ʨit* (2SG), *Ø-e-ʨit* (3), *d-e-ʨit* (REFL) "pet, domesticated animal"

(82)   AY *j-a-ṇesõri* (1SG), *b-a-ṇesõri* (2SG), *g-a-ṇesõri* (3), *d-a-ṇesõri* (REFL) "owner, master, possessor"
       CH *p-i-nsɨrtɕ* (1SG), *Ø-e-nsɨrtɕ* (2SG), *j-i-nsɨrtɕ* (3), *n-e-nsɨrtɕ* (REFL) "master, owner, employer"[32]

The latter case might indicate that a */g/-like prefix might have existed in Proto-Zamucoan. However, Chamacoco /j/ does not necessarily derive from */g/. Consider, for instance, the rare Ayoreo 3rd-prefix *j-* in (83)–(84), where the two cognate words are obtained in a parallel way in both languages via two pairs of mutually equivalent derivational suffixes: Ayoreo *-sõri* ~ CH *-sɨrtɕ* in (83), and AY *-ŋori* ~ CH *-wɨrtɕ* in (84). The AY nouns, characterized by irregular vocalic pattern, share the 3rd prefix *j-* (§3.2); by contrast, the CH counterpart in (83) is a thematic noun, while the word in (84), although turned into a non-possessable noun, preserves a trace of the /j/ prefix. The latter conclusion is enhanced by the presence of /u/ in

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30. The same applies to the nasalized counterpart of Ayoreo /g/, i.e., /ŋ/, which corresponds to Ø in Chamacoco (see (59)).

31. The phonological change in (81) is found elsewhere, as in Chamacoco *Ø-i-titɕ* "pillow" corresponding to Ayoreo *Ø-u-gutat*, with deletion of the root-initial syllable. By contrast, in Chamacoco *Ø-o-witɕ* "place", corresponding to Ayoreo *Ø-Ø-hogat* (see (71), §5.5), /g/ turned into /w/, with reinterpretation of the first root vowel as a thematic vowel.

32. As noted in §5.1, the thematic vowel /i/ in this noun results from vowel reduction.

CH *juwĭrtç* (84), to be compared with AY *juŋori*: this is an unmistakable sign of an original 3rd person, despite subsequent loss of the possessive inflection.[33] It is thus possible that the small group of AY nouns with 3rd-person *j-* may have been present in Proto-Zamucoan:

(83) AY *j-i-sõri* (1sg), *b-e-sõri* (2sg), *j-u-sõri* (3), *d-e-sõri* (refl) "killer; winner in a game"
CH *p-i-rsĭrtç* (1sg), *Ø-e-rsĭrtç* (2sg), *Ø-i-rsĭrtç* (3), *d-e-rsĭrtç* (refl) "winner"

(84) AY *j-i-ŋori* (1sg), *b-e-ŋori* (2sg), *j-u-ŋori* (3), *d-e-ŋori* (refl) "killer; winner in a game"
CH *juwĭrtç* (nps) "killer"

The 3rd-person prefix *k-* is absent in Old Zamuco and is rarely found in both Ayoreo and Chamacoco (where this prefix never shows up in cognate pairs), hence it might be an independent innovation in both languages. For instance, the Chamacoco 3rd-prefix *k-* in (85) probably derives from reinterpretation of the root-initial velar, as shown by the Ayoreo/Chamacoco cognates (*igatade ~ k-e-tita*; recall that in Chamacoco the velar stop has no voicing contrast). The same process occurred in some Chamacoco prefixal verbs which used to be radical (Ciucci & Bertinetto 2015):

(85) AY *j-i-gatade* (1sg), *b-a-gatade* (2sg), *Ø-i-gatade* (3), *d-a-gatade* (refl), *Ø-Ø-katade* (gf) "knee"
CH *p-i-tita* (1sg), *Ø-e-tita* (2sg), *k-e-tita* (3), *d-e-tita* (refl) "knee"

Another problematic 3rd-prefix is *w-*, only found in Chamacoco. Since we observe phonological correspondences between Ayoreo /g/ and Chamacoco /w/ (see (71) and fn. 31), one might hypothesize that Chamacoco *w-* stems from the *g-prefix (§6.3). However, no Ayoreo and Chamacoco cognates showing the prefix correspondence *g- ~ w-* have been found. Chamacoco *w-* in (86), just like *k-* in (85), seems to derive from root erosion plus reanalysis of the first root-consonant (Ayoreo *goro* ~ Chamacoco *w-o-ʎʎa*):

(86) AY *j-o-goro* (1sg), *b-o-goro* (2sg), *Ø-o-goro* (3), *d-o-goro* (refl) "hip"
CH *p-o-ʎʎa* (1sg), *Ø-o-ʎʎa* (2sg), *w-o-ʎʎa* (3), *l-o-ʎʎa* (refl) "hip"

Ayoreo also exhibits the rare 3rd-person marker *p-* (14e), to be explained as a former gf.

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33. The irregular vocalic pattern of the Ayoreo word is the same as in *juj* "bodily presence; killed body" (15), which is in fact the base on which the derivative *juŋori* is built.

6.4   The reflexive person

The REFL *d*-prefix is attested in the whole family, where 2SG and REFL share the same theme, even when this differs from the rest of the paradigm (§1.2). This occurs not just when the 2SG and REFL vowel is /a/ (or, in Chamacoco, /e/) owing to thematic vowel replacement but even with root allomorphy (§5.2). The presence vs. absence of /a/ in the REFL prefix depends, just as with the 2nd person, on the thematic vowel of the individual noun. Having shown evidence that */a/ was the original 2SG-prefix (§1.2, §5.1), the same observation extends to Proto-Zamucoan REFL *da-.

6.5   First and second plural persons

The Old Zamuco 1PL and 2PL share the same prefix *aj-*, while Chamacoco has lost the 1PL and 2PL inflection, and Ayoreo has turned the independent pronouns into new possessive markers. At first sight, Chamacoco seems to have adopted the same solution as Ayoreo, as shown by Tables 3 and 5, but in fact the difference emerges as soon as one considers that: (i) the use of the independent plural pronouns is not compulsory in Chamacoco, whereas they have been turned into obligatory affixes in Ayoreo; (ii) the Ayoreo 1PL- and 2PL-prefixes are directly attached to the theme even in the case of radical nouns (where the 3rd person, namely the citation form, presents no thematic vowel). The adoption of the independent pronouns as plural person prefixes in Ayoreo (in both nouns and verbs) must have occurred after the systematic application of the vowel replacement/deletion process in the 2SG/PL and REFL persons (§1.2), because the inflectional vowel that follows these innovative plural affixes is the expected one in both 1PL and 2PL.

   The convergence of Ayoreo and Chamacoco might suggest that the use of plural pronouns as possessive markers was a Proto-Zamucoan feature. However, on top of the non-obligatory use of such pronouns in Chamacoco, some old studies provide hints that this language must have had a true 1PL-prefix. Since the relevant historical sources do not provide evidence of clusivity – which, as shown in Ciucci & Bertinetto (2015) is a Chamacoco innovation – this feature is neglected here. Baldus (1932: 393) reports the forms *aset* "mother.1PL" and *al(d)e* "father.1PL". Sušnik (1972: 22), in turn, reports *asɨt* "mother.1PL". *Aset* corresponds to the irregular Old Zamuco *asote* "mother.1PL", characterized by the irregular 1PL-prefix *as-* (see §2.1 and (57), §5.3). This suggests that in Proto-Zamucoan the 1PL of "mother" displayed the prefix *as-. The most frequent 1PL-prefix in Old Zamuco is, however, *aj-*, whose Chamacoco counterpart is *al-* in *al(d)e* "father.1PL". The correspondence Old Zamuco /j/ ~ Chamacoco /l/ is easy to explain, owing to the Chamacoco alternation /j/ ~ /l/ (§4.2), where /j/ turns into /l/ when preceded by /a/ (§5.2). A related Chamacoco form reported by Baldus (1932: 392) is <áirum-me> "hands.1PL", to be

interpreted as *aj-r-u-m̥e*,[34] with the original 1PL-prefix *aj-*, the inflectional vowel /u/ and the linking consonant /r/ to avoid the formation of a triphthong.

To sum up, the marginally attested Chamacoco 1PL-prefixes *al-* and *aj-* suggest that the 1PL-prefix *aj- – also found in Old Zamuco – can be traced back to Proto-Zamucoan. As for *as-*, it seems to be an Old Zamuco allomorph of the 1PL in nouns exhibiting the 1SG-marker *s-* (§6.1), but since it can also be detected in Chamacoco, we argue that it too might have existed in Proto-Zamucoan. On the other hand, the absence of Ayoreo relics relating to these plural affixes indicates that their loss must have occurred at a fairly early stage.[35]

Finally, the coincidence of 1PL and 2PL, as found in Old Zamuco, is typologically quite puzzling and one has to hesitate to project this feature back onto Proto-Zamucoan. Chomé reports one noun ("mother"; §5.3, (57)) where 1PL and 2PL diverge (*asote* vs. *ajate*), but this is a highly irregular word, since these two forms also show an unpredictable inflectional vowel contrast, with 1SG/PL /o/ ~ 2SG/PL /a/. It is thus impossible to draw any solid conclusion for the possible existence of an early stage at which 1PL and 2PL had a different marker (see also fn. 14).[36] As Mithun (1991) observes, in North American languages exhibiting person affixes the 1 and 2 persons generally morphologized before the 3, and number grammaticized later than person. This can help explain, on the one hand, why the Old Zamuco/ Ayoreo possessive inflection has 1PL/2PL but no 3PL, and suggests, on the other hand, that the disappearance of the original 1PL/2PL in Ayoreo and Chamacoco could reflect a possible instability of these affixes in Proto-Zamucoan, due to later grammaticization of number. Support for a later creation of the 3rd-person affix,

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34. In Zamucoan, /i/ before or after a vowel is often ambiguous between vowel and semivowel. Here the root *-m̥e* differs from that of (67) because Baldus provides the plural rather than the singular, which is the form regularly reported in this paper.

35. Ayoreo presents a possible relic of the Proto-Zamucoan prefix *as-* in the word *asute* "chief", very similar to *asote*/*aset*, the archaic Old Zamuco and Chamacoco form of "mother.1PL". If so, we surmise that a 1PL form was reinterpreted as the word's theme. Ayoreo *asute*, quite exceptionally, is morphologically feminine even though it only refers to males, and as a matter of fact it is not related to any Old Zamuco word for "chief/leader". One might thus cautiously propose that, in a possibly matriarchal ancient society, the word for "mother" was also used with this nuance.

36. According to Sušnik (1957: 101), in the Chamacoco variety spoken in Puerto Leda there was a 1PL.INCL prefix *j-*. Although the reliablility of this author is doubtful when it comes to grammatical observations, we surmise that *j-* could be due to the influence of the verbal 1SG.INCL prefix *j-*, or else to extension of the original possessive 1SG-prefix *j-* to the plural (interestingly, in Chamacoco verb inflection *j-* originally marked both 1SG and 1PL, before specializing as 1PL. INCL marker; see Ciucci & Bertinetto 2015). A reviewer suggests that it might be connected with Old Zamuco 1/2PL possessive marker *aj-*.

as opposed to the deictic persons, derives from the relatively small number of prefixal nouns.

6.6   The generic form

The 3rd-person and GF allomorphs are summed up in the following table, with the proposed Proto-Zamucoan reconstruction:

Table 9. Expression of 3rd person and GF in Zamucoan

	Old Zamuco		Ayoreo		Chamacoco		Proto-Zamucoan	
	3rd person	GF	3rd person	GF	3rd person	GF	3rd person	GF
p-		√	√	√				√
dVk-				√		√		√
d-	√	√	√		√	√	√	√
g-	√	√	√	√			√	
k-			√	√	√	√		√
j-			√		√			
w-					√			
thematic form	√		√		√		√	
bare root	√	√	√	√	√	√	√	√
o- (pre-prefix)					√			

The GF allomorphs are lexically idiosyncratic. The *p*-prefix is by far the most common in Old Zamuco and Ayoreo, while it underwent reinterpretation in Chamacoco, where it turned into the 1SG-prefix (§6.1). Considering that the GF is now exceedingly rare in Chamacoco, one can claim that the reinterpretation of the *p*-prefix caused the decay of this inflection, while *p- can be proposed as the predominant GF marker in Proto-Zamucoan. Some other allomorphs are also found as 3rd-person prefixes, and it is thus likely that one form expanded at the expense of the other, as observed for Ayoreo *p-* in §3.5. As Mithun (1993: 344) notes: "cross-linguistically, it is not unusual for indefinite pronouns to be used for specific reference, and even to evolve into general referential pronouns, particularly in languages originally lacking third person pronominal forms" (see also Mithun 1991). Nevertheless, since (precisely excepting *p*-) the frequency of these prefixes is far from overwhelming as either a 3rd-person or GF marker, it is difficult to establish the direction of change.

The *dVk*-prefix is found in both Ayoreo (§3.5) and Chamacoco (§4.5). Since these two languages split long ago (§1.1), this marker can be reconstructed for Proto-Zamucoan despite its absence in Old Zamuco.

Similarly, the *d*-prefix is found in Old Zamuco (§2.2) and Chamacoco (§4.5). The only trace of it in Ayoreo is found in (87), where one observes a small phonological difference in the root, opposing the GF to the possessed forms.[37]

The *g*-allomorph, by contrast, is only found in the Old Zamuco/Ayoreo branch (88) and one can doubt whether it stems from Proto-Zamucoan. Indeed, as mentioned in §6.3, /g/ is not part of the Chamacoco phonemic inventory. Chamacoco exhibits instead the GF *k*-allomorph, but this is probably unrelated to *g*-, since Ayoreo /g/ mostly corresponds to Chamacoco /j w/ or deletes (§6.3). Nevertheless, the correspondence Ayoreo /g/ ~ Chamacoco Ø-morpheme (81) might justify including *g- among the Proto-Zamucoan GF allomorphs. The *k*-allomorph, by contrast, is a weak candidate for reconstruction, because it is only found once in Ayoreo (23d), in a word with no corresponding GF in Chamacoco (similar considerations apply to the Chamacoco 3rd-prefix *k*-; (85), §6.3):

(87) OZ *Ø-u-hos* (3) ~ *d-u-kos* (GF) "disease"
    AY *Ø-u-hosi* (3) "wound; sore, sickness" ~ *d-u-kosi* (GF) "fever; sickness; wound"

(88) OZ *Ø-i-geda* (3) ~ *g-i-geda* (GF) "house"
    AY *Ø-i-giṇaj* (3) ~ *g-i-giṇaj* (GF) "house"

Zamucoan languages show radical GFs, i.e., forms coinciding with the bare root (89). In §3.5 we noted that these occurrences are either due to phonetic erosion deleting the prefix and the thematic vowel, or to lexical borrowing, i.e., bare-root items interpreted as generic forms. In the latter case, a thematic 3rd person can be formed by adding the default vowel /i/. Although this process is still productive in Ayoreo with Spanish loanwords (26), in (89) the presence of thematic /u/ and the fortition /r/ → /d/ support the phonetic erosion hypothesis for reasons detailed in §3.5 (the same kind of fortition is also found in verb inflection; see (90)):

(89) OZ *Ø-u-rahek* (3) ~ *Ø-Ø-dahek* (GF) "path"
    AY *Ø-ŭ-rahej* (3) ~ *Ø-Ø-dahej* (GF) "path"
    CH *dehet* (NPS) "path"

(90) AY *ɲ-i-rĩ* (1SG), *m-a-rĩ* (2SG), *Ø-Ø-di* (3), *ɲ-i-rĩ-ŋo* (1PL), *wak-a-rĩ-ɲo* (2PL) "to arrive"

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37. Although, according to Higham et al. (2000), Ayoreo *uhosi* and *dukosi* in (87) present a slight meaning contrast, they must nevertheless be part of the same inflectional paradigm. This semantic difference is not reported by Kelm (1964: 495); the translation takes into account data from Barrios et al. (1995).

Finally, the Chamacoco GF pre-prefix *o-* is an idiosyncratic innovation presupposing the following steps: (i) reinterpretation of the most frequent GF allomorph (*p*-prefix) as 1SG, leaving a gap in the system (§6.1); (ii) introduction of a new construction, consisting of the 3PL free pronoun *õr* (or possibly *os*, reduced form of *oso* "people"), as preceding the 3rd person, to replace the GF function (§4.5); (iii) inclusion of *õr/os* into the noun, creating a new inflected form in analogy with the 3PL of verb inflection, another Chamacoco innovation stemming from the analogous inclusion of *õr/os* into the 3rd person (see Table 6).

6.7   Verbal and possessive inflection in Proto-Zamucoan

We have repeatedly mentioned structural and morphological similarities between the Zamucoan verb and possessive inflection. Table 10 presents a Proto-Zamucoan synoptic comparison, drawing on Ciucci & Bertinetto (2015). The expression of the possessor tends to converge with the person markers of the irrealis mood, with special regard to the 1SG-prefix *j-*, the 2SG morphology and the 3rd-person prefix *d-*. The latter phoneme is also to be found in the REFL prefix *da-*; indeed, the possessive *d-* and *da*-prefixes might have the same origin (Ciucci 2014: 22–23). By contrast, there is no significant overlap between the possessive and realis mood inflection (ignoring the prefixless thematic and radical 3rd person). Although nouns and verbs have the same types of inflectional class (prefixal, thematic, radical), in Zamucoan verb morphology is more complex than nominal morphology, as illustrated in Table 11. Besides, the most frequent verbal 3(.RLS) prefixes (*ʨ-*, *ts-* and *t-*) are not used as 3rd-person possessive markers. This ensures a sharp division of labor between the verbal 3(.RLS) and the nominal 3rd person.

As for the overlap between the prefixal system and free pronouns, Table 10 highlights 1SG/PL /j/ and 2SG/PL /a/. The 3rd person does not matter here, since the 3SG pronouns are (with the single exception of Chamacoco *ir(e)*) mere demonstratives filling a hole in the system, and the 3PL-person is missing in the verbal and possessive inflection of Proto-Zamucoan. The later formation of the 3rd-person morphology explains the multifarious nature of its allomorphs.

Table 10. Reconstructed Proto-Zamucoan verbal and possessive inflection, as compared to free pronouns

	Proto-Zamucoan verb inflection		Proto-Zamucoan possessive inflection	Proto-Zamucoan free pronouns
	REALIS	IRREALIS		
1SG	*a-V-ROOT	*j-V-ROOT *tɕ-V-ROOT	*j-V-root	*(u)jV$_{back}$
2SG	*ba-V-ROOT (*da-V-ROOT)	*a-V-ROOT	*a-V-root	*(u)wa
3	*tɕ-V-ROOT *t-V-ROOT *Ø-V-ROOT *Ø-Ø-ROOT	*d-V-ROOT *t-V-ROOT – *Ø-Ø-ROOT	*d-V-root *g-V-root, (*j-V-root ?) *Ø-V-root *Ø-Ø-root	[*wite (M)] [*wate (F)] –
REFL	–	–	*da-V-root	–
1PL	*a-V-ROOT-ko –	*j-V-ROOT-ko *tɕ-V-ROOT-ko	*aj-V-root *as-V-root [rare] (§6.5)	*(u)jV$_{back}$k –
2PL	*ba-V-ROOT-(j)o (*da-V-ROOT-(j)o)	*a-V-ROOT-(j)o	?	*(u)wak
3PL	–	–	–	*ore

Table 11. Verb classes in the Zamucoan languages, according to 3rd-person inflections

	First macro-class Prefixal verbs				Second macro-class Non-prefixal	
	First class		Second class		Third class	Fourth class
Old Zamuco	tɕ-verbs		t-verbs		Thematic verbs	Radical verbs
Ayoreo	tɕ-verbs		t-verbs		Thematic verbs	Radical verbs
Chamacoco	1st subclass: tɕ-verbs	2nd subclass: ts-verbs	3rd subclass: t-verbs	4th subclass: d-verbs	Thematic verbs (i-, u-, i-)	Radical verbs
Proto-Zamucoan	*tɕ-verbs		*t-verbs		*Thematic verbs	*Radical verbs

7.   Conclusions

We have proposed a reconstruction of Proto-Zamucoan possessive morphology with data from the only three documented languages: †Old Zamuco, Ayoreo and Chamacoco. Old Zamuco emerged as the most conservative language, while both Ayoreo and Chamacoco showed innovative tendencies, some in complementary distribution. The similarities and differences may be summed up as follows:

i.   The Zamucoan languages show some degree of stability in the 3rd person and the REFL (§§6.3–6.4). The presence of the latter, as contrasted with the other Chaco languages, is a distinctive Zamucoan feature, although we have reason to surmise that the split between 3rd person and REFL was due to language contact (Ciucci 2014).

ii. In 1SG and 2SG, Ayoreo and Chamacoco show complementary distribution of conservative features: Chamacoco has innovated the former (§6.1), Ayoreo the latter (§6.2). The Chamacoco 1SG stems from reinterpretation of the GF, only marginally replaced by the new GF pre-prefix *o-* (§6.6).

iii. In 1PL and 2PL, both Ayoreo and Chamacoco are innovative, since they make use of the corresponding independent pronouns, except that Ayoreo has turned them into obligatory prefixes (§6.5). However, some Chamacoco 1PL relics suggest that the Old Zamuco 1PL-prefixes may be projected back onto Proto-Zamucoan (§6.5). As for the 2PL, one can only count on the Old Zamuco testimony. This preempts any solid reconstruction of this person in Proto-Zamucoan, although some hints suggest that these persons might have had distinct markers in the distant past (§6.5).

Our analysis is a contribution to the typology of person marking by highlighting features of general interest, namely:

a.   Diachronic interactions of the unspecified possessor (GF) with 1st and 3rd person. These are observed in other families (§6.1, §6.6), but large-scale diachronic studies are still missing.

b.   The special behavior of kinship terms, which tend to form a separate group involving peculiar exceptions, like suppletion in the 1SG-person. As noted by Baerman (2014: 414) with examples from New Guinea languages, "suppletion for properties of the possessor largely remains unexplored territory".

c.   Neutralizations among person affixes. See the Old Zamuco homophony in 1PL/2PL and (disregarding the REFL-person) 3SG/3PL, which in some cases extends to the 2SG-person. Existing cross-linguistic studies on person marking (Cysouw 2003) and syncretism (Baerman et al. 2005) do not consider pronominal possession. However, 1PL/2PL homophony is well documented in pronominal systems, whereas its co-occurrence with another case of homophony (here 3SG/3PL) is classified as rare (Cysouw 2003: 126). Furthermore, 1PL/2PL neutralization implies dependency of person on number, while 3SG/3PL neutralization implies dependency of number on person (Aikhenvald & Dixon 2011: 170–204). The unusual presence of two opposite dependencies in the same paradigm deserves attention.

d. The convergence of personal markers for nouns and verb. This underlines a widespread feature among indigenous South American languages. Significantly, in both Zamucoan and neighboring Mataguayan this characteristically involves the contribution of the irrealis mood (§6.7), whose pervasiveness in the Mataguayan family is a recent discovery (Ciucci 2014).

This last observation naturally brings us to the issue of interfamily language contact in the Chaco area. Well beyond possessive morphology, we find substantial evidence of transfer of morphological features among Zamucoan and Mataguayan/ Guaycuruan. What makes this case especially interesting is that it highlights a rarely described yet not uncommon situation among South American languages, whereby a limited number of lexical borrowings goes hand in hand with substantial transfer of grammatical markers, as claimed by Aikhenvald (2002), Evans (2005: 232–233), Seifart (2011) and Epps (forthcoming). We intend to address this issue elsewhere, exploiting data from different domains of grammar, well beyond possessive morphology. These include, according to Ciucci (2014): (i) person prefixes used for realis and irrealis mood in verb inflection; (ii) possessive classifiers; (iii) nominal plural suffixes; (iii) adpositions; (iv) negation markers; (v) conjunctions; to this one can add (vi) typologically rare para-hypotactical structures (Bertinetto & Ciucci 2012).

Abbreviations

1, 2, 3	first, second, third person	INCL	inclusive
AY	Ayoreo	IRLS	irrealis
OZ	Old Zamuco	M	masculine
BF	base form	NPS	non-possessable
CH	Chamacoco	PL	plural
EXCL	exclusive	REFL	reflexive person
GF	generic form	RLS	realis
GP	greater plural	SG	singular
F	feminine	SUFF	suffix
		V	(thematic/inflectional vowel)

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Résumé

Cet article présente une analyse comparative de la flexion possessive dans les trois langues Zamuco qui nous sont connues: l'Ayoreo et le Chamacoco – toujours parlés dans la région du Chaco entre la Bolivie et le Paraguay – ainsi que †l'Ancien Zamuco, décrit par le jésuite Ignace Chomé au début du 18ᵉ siècle. Les données permettent une reconstruction plausible de la flexion possessive du Proto-Zamuco: l'Ancien Zamuco serait la plus conservatrice des trois langues, tandis que le Chamacoco serait comme la plus innovatrice, bien qu'on y trouve des restes très probants du point de vue historique. L'analyse signale en particulier une série de traits d'intérêt général pour la typologie des marques de personne.

Zusammenfassung

Dieser Artikel unternimmt eine vergleichende Analyse der Possessivflexion in den drei dokumentierten Zamuco-Sprachen: Ayoreo und Chamacoco – im Chaco-Gebiet von Bolivien und Paraguay immer noch gesprochen – und †Alt-Zamuco, das in der ersten Hälfte des 18. Jahrhunderts vom Jesuiten Ignace Chomé beschrieben wurde. Der Vergleich erlaubt eine plausible Rekonstruktion der Possessivflexion des Proto-Zamuco. Alt-Zamuco scheint unter den drei Sprachen die konservativste zu sein, Chamacoco dagegen die innovativste, auch wenn es für die Rekonstruktion besonders relevante Relikte aufweist. Die Untersuchung identifiziert in den Zamuco-Sprachen außerdem einige Charakteristika, die von allgemeinem Interesse für die Typologie der Personenmarkierung sind.

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