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► **To cite this version:**

Pier Marco Bertinetto, Luca Ciucci. Reconstructing Proto-Zamucoan. Evidence (mostly) from verb inflection.. Paola Cotticelli Kurras; Sabine Ziegler. Tra semantica e sintassi: il ruolo della linguistica storica - Zwischen Semantik und Syntax: die Rolle der historischen Sprachwissenschaft., Il Calamo, 2019, 9788898640409. hal-04429078

HAL Id: hal-04429078

<https://hal.science/hal-04429078>

Submitted on 31 Jan 2024

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RECONSTRUCTING PROTO-ZAMUCOAN.
EVIDENCE (MOSTLY) FROM VERB INFLECTION

PIER MARCO BERTINETTO

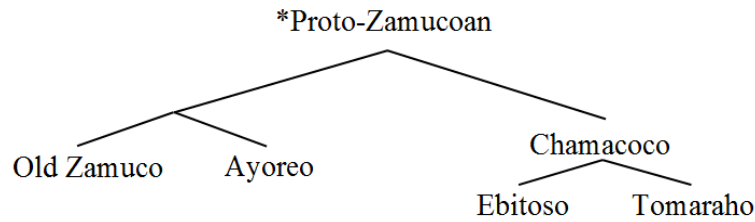
LUCA CIUCCI

1. INTRODUCTION¹

The Zamucoan family consists of two currently spoken languages, Ayoreo (= **AY**) and Chamacoco (= **CH**), plus a language spoken in the 18th century in the Jesuit missions of south-eastern Bolivia, Old Zamuco (= **OZ**), of which we have the relatively detailed documentation provided by Father Ignace Chomé (see Lussagnet 1958 [= ante 1745], Ciucci 2018, Ciucci *forthcoming a*). Although other Zamucoan dialects/languages have existed in the past according to historical data (Hervás y Panduro 1784: 32), very little is known about them except for a few word lists. However, the whole group must have been quite small at any time. Ayoreo and Chamacoco speakers presently number approximately 4,500 and 2,000, respectively. Their traditional settlement was in the Northern Chaco lowlands, between Bolivia and Paraguay, where they used to have a seminomadic life, still pursued up to the present by a tiny group of Ayoreo.

Ciucci & Bertinetto (2015, 2017) proposed a plausible reconstruction of the Proto-Zamucoan (= **P-Z**) person inflections in pronouns, verbs and possessable nouns (a paper on the reconstruction of nominal suffixes is in preparation). The following diagram assigns Old Zamuco and Ayoreo to the same branch of the family, as suggested by the large overlap of their lexicon. By contrast, Chamacoco (with its two dialects, Ebitoso and Tomaraho) shows no more than 30% of lexical similarity with the sister languages. The split of the two branches must therefore have occurred a long time ago, as also confirmed by the glottochronological computations of Wichmann *et al.* (2016). In terms of grammatical structure, however, there are several features selectively shared by Old Zamuco or Ayoreo on the one hand, and Chamacoco on the other hand. Hence, despite its tiny size, this linguistic family can be regarded as an ideal training field for reconstruction exercises. This is what this paper aims to show with specific focus on the verbal system.

¹ Questo contributo è dedicato a Cristina Vallini, accademica anticonformista. The authors wish to express their gratitude to Alexandra Y. Aikhenvald, R. M. W. Dixon and Brigitta Flick.



The data on Ayoreo and Chamacoco come from available lexical sources (Higham *et al.* 2000; Ulrich & Ulrich 2000) and from repeated fieldwork by the two authors for Ayoreo, and by Luca Ciucci for Chamacoco. Ciucci (2016) provides a thorough comparison of the morphological structure of the three Zamucoan languages, while Bertinetto (2014a) offers a grammatical sketch of Ayoreo.

2. THE STRUCTURE OF THE ZAMUCOAN WORD

What makes the Zamucoan languages special is their typological diversity when compared with the vast majority of languages spoken in the Americas. While the latter exploit agglutinating mechanisms, with little fusion, the Zamucoan languages are purely fusional. Verbs inflect for person, number, and mood (with neither tense nor aspect distinctions; Bertinetto 2014b), while nouns and adjectives inflect for gender, number, and ‘form’.² The fusional nature of the Zamucoan morphology is shown by the fact that all the mentioned features of nouns and adjectives are simultaneously conveyed by one and the same *portmanteau* suffix. By contrast, this is not the case with verbs, where person and number are often conveyed by separate affixes, except that number is in some cases jointly expressed by the person prefix and a plural-marking suffix. This can however be rationalized as a residue of agglutinating logic, and indeed various hints suggest that in the distant past – prior to the stage at which Proto-Zamucoan can be reconstructed – Zamucoan had this type of morphological structure (Bertinetto *forthcoming*).

Zamucoan adjectives have the very essential structure shown in (1a). Verbs and nouns share instead the template in (1b), except that: (i) the prefix is zero for non-possessable nouns; (ii) with verbs, the features gender and form do not apply, and number only applies in specific plural persons, depending on the language (see Tables 1-2).

² ‘Form’ refers to a threefold morphological distinction that in previous works by the present authors was dubbed as ‘base’, ‘full’ and ‘indeterminate’ form (Bertinetto 2014a, Ciucci 2016, Ciucci & Bertinetto 2019), and in later works renamed as ‘predicative’, ‘argument’ and ‘indeterminate’ form (Bertinetto *et al.* 2019). The quoted works, especially the last one, describe the morphosyntactic usage of these three forms.

- (1) a. ADJECTIVES
 root + suffix
number, gender, form

b. VERBS and NOUNS

_____ theme _____
 (prefix) + |(thematic vowel) + root| + (suffix)
 (*person*) (number [gender, form])

The thematic vowel (unless absent in so-called ‘radical’ nouns) could in most cases be analyzed as an essential part of the root, but deserves its special role because of the peculiar replacement mechanism it takes part in, as explained in §3. The prefix gives expression to the possessor in nouns, and to the subject (or subject-agreement marker) in verbs. However, while the prefix virtually has no allomorphy for speech-act participants, at most involving a binary choice (disregarding the oral/nasal harmony alternations shown within angled brackets in Tables 1-2), the 3rd person prefix of both nouns and verbs has a wider range of possible exponents. Tables 1-2, based on Ciucci & Bertinetto (2015), show this with respect to verb inflection, by separately listing the realis and irrealis mood (respectively glossed as RLS and IRLS) of the three Zamucoan languages, plus the reconstructed system of Proto-Zamucoan in the left column. A similar situation is described for possessive prefixes by Ciucci & Bertinetto (2017). Thus, while all other person exponents are normally predictable for most words (save for some exceptions), the 3rd person’s structure has to be learned on a word by word basis. It follows that the 3rd person morphology is crucial for classificatory purposes. One can distinguish three major types of verbs and possessable nouns, depending on whether the 3rd person has overt expression of:

- (i) both prefix and thematic vowel (PREFIXAL words);
- (ii) only the thematic vowel (THEMATIC words);
- (iii) neither one (RADICAL words).

The Chamacoco examples in (2-3) demonstrate this for nouns and verbs, while Table 3 shows how verbs can be organized into different classes depending on the 3rd person inflection (more specifically, 3rd person realis, whenever available). It is worth observing that thematic words largely prevail among nouns, while the prefixal set is by far the largest one among verbs.

- (2) POSSESSABLE NOUNS³
- | | | | |
|-----------|---------|----------------------|---------|
| Prefixal: | e.g. CH | <i>d-i-rt</i> (3) | ‘leg’ |
| Thematic: | e.g. CH | <i>Ø-u:-t̪a</i> (3) | ‘cheek’ |
| Radical: | e.g. CH | <i>Ø-Ø-bahat</i> (3) | ‘price’ |

- (3) VERBS
- | | | | |
|-----------|---------|--------------------|---------------|
| Prefixal: | e.g. CH | <i>t̪-e-er</i> (3) | ‘to fish’ |
| Thematic: | e.g. CH | <i>Ø-i-jem</i> (3) | ‘to wait for’ |

³ All linguistic data are reported in IPA transcription.

Radical: e.g. CH Ø-Ø-*kañir* (3) ‘to appreciate’

The multifarious manifestation of 3rd person inflections invites the conclusion that, at a very early stage, the 3rd person of both nouns and verbs had a Ø-marker, so that the speakers had to explore different solutions in order to fill this paradigm gap. That this is more than a plausible speculation is shown by the personal pronouns paradigm (Table 4), which – except for the few Chamacoco pronouns not within square brackets – makes use of demonstratives in the 3rd person singular, precisely to overcome the lack of dedicated markers. By contrast, the 1st and 2nd persons, as well as the 3rd plural, have dedicated pronouns, which in most cases bear resemblance to the person affixes of Tables 1-2 (especially Table 1).

This suggests a significant consequence: since the original 3rd person marker was zero for both nouns and verbs, it follows that both might have had a predicative import. This is obvious in the case of verbs, while the reasoning can be extended to nouns only by assuming a generalized omnipredicative inclination of the language. Indeed, this is precisely what one can observe in Zamucoan, where the so-called ‘predicative’ form of nouns and adjectives (see fn. 2) – originally coinciding with the word’s root – has in and by itself a predicative meaning. In Ayoreo, for instance, just as *nihî* (a radical verb) means ‘s/he wakes up’, *joka* (predicative form) does not merely mean ‘turtle’, but rather ‘it is a turtle’, just as *wome* means ‘it is good’ rather than simply ‘good’. Bertinetto *et al.* (2019) elaborate on this topic.⁴

3. THE VOWEL REPLACEMENT MECHANISM

As anticipated above, the thematic vowel takes part in a peculiar replacement mechanism, which occurs in the 2nd persons of nouns and verbs when the given vowel is [+high], namely /i u/ for Old Zamuco and Ayoreo, and /i i u/ for innovative Chamacoco. This is shown with verb examples in (4-6), where the high thematic vowel is replaced by /a/ in Old Zamuco and Ayoreo, and with /a/ or /e/ in Chamacoco. The reader might observe that 2nd person /e/ also occurs in the Ayoreo example in (5c), but this is an almost unique exception in this language, stemming from fusion of prefix vowel /a/ and thematic vowel /i/; by contrast, the diachronic change /a/ → /e/ is a widespread context-free phenomenon in Chamacoco.

The vowel replacement process at stake was caused by reinterpretation of the original prefix vowel /a/ of the 2nd person as thematic vowel (Ciucci & Bertinetto 2015, 2017); by contrast, with non-high thematic vowels, the prefix vowel vanished (4d, 5d, 6d). In practice, at a past stage of development, the adjacency of these two vocoids (prefix vowel and thematic vowel) was no longer

⁴ Needless to say, possessable nouns would bear the required person prefix even when used in the predicative form: e.g. *j-igina* ‘it is my house’.

tolerated and this caused the deletion of one of them, according to the following strength hierarchy principle, with high vowels the weakest: o,e,a > u,i,(i).⁵

Significantly, however, some rare exceptions exist in all three languages, with preservation of both the prefix vowel /a/ and the original high thematic vowel (4c, 6c), or (even more rarely) with the already mentioned vowel fusion process (5c). Now, if such cases were confined within a single branch of the family, one might understand them as a branch-internal phenomenon, or maybe as idiosyncratic historical accidents. Since they can however be observed in both branches, one can safely interpret them as evidence of a Proto-Zamucoan state of affairs, preceding the major split of the family. This conclusively allows us to posit /a/ as the 2nd person prefix vowel in Proto-Zamucoan, as shown in Tables 1-2.

(4) Replacement of high 2nd person vowels

OZ: a. *a-i-misẽre* (1SG.RLS), *d-a-misẽre* (2SG.RLS), *te-i-misẽre* (3.RLS) ‘to love’

b. *a-u-gau* (1SG.RLS), *d-a-gau* (2SG.RLS), *te-u-gau* (3.RLS) ‘to thread’

c. ⇒ *a-i-se* (1SG.RLS), *da-i-se* (2SG.RLS), *te-i-se* (3.RLS) ‘to reach’

d. *a-e-kare* (1S.RLS), *d-e-kare* (2SG.RLS), *te-e-kare* (3.RLS) ‘to trail/track someone/something’

(5) AY: a. *j-u-ga* (1SG), *b-a-ga* (2SG), *te-u-ga* (3) ‘to sew’

b. *j-i-mata* (1SG), *m-a-mata* (2SG), *te-i-mata* (3) ‘to collect’

c. ⇒ *j-i-se* (1SG), *b-e-se* (2SG), *te-i-se* (3) ‘to find, to meet’

d. *j-e-kãre* (1SG), *m-e-kãre* (2SG), *te-e-kãre* (3) ‘to change, to replace’

(6) CH a. *t-i:-ta* (1SG), *Ø-a:-ta* (2SG), *te-i:-ta* (3.RLS) ‘to serve something to drink’

b. *tuk-u:-na* (1SG), *Ø-e:-na* (2SG), *te-u:-na* (3.RLS) ‘to feel’

c. ⇒ *t-i-behe* (1SG), *e-j-behe* (2SG), *te-i-behe* (3.RLS) ‘to change’

d. *t-o-ntew* (1SG), *Ø-o-ntew* (2SG), *ts-o-ntew* (3.RLS) ‘to hold, to block, to prevent’

4. IRREGULARITIES AND SUBREGULARITIES

4.1. *Radical verbs as a source of diachronic knowledge*

The system of verb classes shown in Table 3 is in itself a significant source of evidence. As claimed above, prefixal verbs form the largest set among verbs. The creation of different prefixal classes (especially so in Chamacoco) must have been the result of morphophonological processes caused by attrition between the root-initial phonemes and the newly introduced 3rd person prefix(es), although some evidence suggests that the *t*-class might have originated from language contact (Ciucci 2014). In the course of time, this innovation attracted an increasingly larger number of verbs into the new inflectional paradigms, thus turning the original prefixless verbs into a repository of residual exceptions. It is not easy to assess whether the primordial class consisted of thematic or radical verbs, since, presumably, both existed from very early on.

⁵ With thematic /a/, one might entertain the alternative hypothesis, namely deletion of the identical thematic vowel. This would however jeopardize the logic of the vowel strength hierarchy, based on the [±high] feature. Needless to say, fusion of the two identical vowels is another possibility, but this would be indistinguishable from the proposed deletion mechanism.

It is, at any rate, a solid fact that both prefixless classes, especially the radical one, contain the great majority of the irregular or subregular verbs. Hence, according to a well-known principle of historical linguistics, they are likely to preserve some of the most archaic features, whose significance emerges via comparison with the sister languages. Needless to say, the resistance of thematic and radical verbs to the ‘regularization’ induced by the prefixal model can be explained by the fact that they are frequently used verbs, thus good candidates for rote learning of their irregular paradigms.

This is confirmed by family-internal comparison of radical verbs, which provides interesting cues for reconstruction. The following examples are straightforward. Although independent evolution cannot be ruled out for the individual cases, it becomes unlikely as soon as one observes that the set of radical verbs (so defined by the 3rd person’s structure) is by and large the same in both branches. An identical reasoning can be put forth for radical nouns (Ciucci & Bertinetto 2017), as shown by (7d).

- (7) a. OZ: *a-i-rihi* (1SG.RLS), *d-a-rihi* (2SG.RLS), \emptyset - \emptyset -*dihi* (3.RLS/IRLS) ‘to wake up’
 AY: *j-i-rihi* (1SG), *m-a-rihi* (2SG), \emptyset - \emptyset -*nihi* (3) ‘to wake up’
 CH: *tik-i-r̄ihi* (1SG), \emptyset -*e-r̄ihi* (2SG), \emptyset - \emptyset -*nihi* (3.RLS/IRLS) ‘to get up’
- b. OZ: *a-i-todo* (1SG.RLS), *d-a-todo* (2SG.RLS), \emptyset - \emptyset -*todo* (3.RLS/IRLS) ‘to be intimidated, to be afraid of’
 AY: *j-i-todo* (1SG), *b-a-todo* (2S), \emptyset - \emptyset -*todo* (3) ‘to be afraid of’
 CH: *tik-i-tila* (1SG), \emptyset -*a-tila* (2SG), \emptyset - \emptyset -*tola* (3.RLS/IRLS) ‘to fear, to be afraid of’
- c. OZ: *a-i-juare* (1SG.RLS), *d-a-juare* (2SG.RLS), \emptyset - \emptyset -*juare* (3.RLS/IRLS) ‘to cry’
 AY: *j-u-juare* (1SG), *b-a-juare* (2SG), \emptyset - \emptyset -*juare* (3) ‘to wail, to grieve with mournful cries, to lament’
 CH: *tik-i-jeɽ* (1SG), \emptyset -*e-jeɽ* (2SG), \emptyset - \emptyset -*jeɽ* (3.RLS/IRLS) ‘to cry’
- d. OZ: *j-i-manai* (1SG), \emptyset -*a-manai* (2SG), \emptyset - \emptyset -*manai* (3) ‘hand’
 AY: *j-i-ṃanaɟ* (1SG), *b-a-ṃanaɟ* (2SG), \emptyset - \emptyset -*ṃanaɟ* (3) ‘hand’
 CH: *p-i-ṃita* / *p-o-ṃita* (1SG), \emptyset -*a-ṃita* (2SG), \emptyset - \emptyset -*mata* (3) ‘hand’

A particularly vivid example comes from the two highly irregular motion verbs reported in (8). As shown in Tables 1-2, Ayoreo and Chamacoco have a defective irrealis conjugation; besides, Chamacoco has introduced the clusivity split in the 1st person plural, as well as the 3rd plural inflection. This explains the dashes in (8).⁶ Assuming this as a premise, the verb forms in (8) are particularly revealing with respect to a number of important features, as detailed below (see also Ciucci & Bertinetto 2015: 64-66).

(8) a.	OZ ‘to go’	AY ‘to go, to leave’	CH ‘to go’
1SG.RLS	a-i-no	j-i-hi / ji	tak-a-ha
2SG.RLS	d-a-no	b-a-bo	bo / bu
3.RLS	no	ṃo	ṃo

⁶ For reasons of simplicity, in (8) we did not provide the Chamacoco 3PL.IRLS. The Old Zamuco data slightly differ from those reported in Ciucci & Bertinetto (2015), because they include some Old Zamuco forms found in Chomé’s dictionary. Note that, owing to the irregularity of these verbs, the proposed segmentation is tentative.

1PL.(INCL).RLS	a-i-no-go	j-i-ko	j-u-ko
1PL.EXCL	—	—	o-j-u-ko
2PL.RLS	d-a-no-ŋo	wak-a-bo-jo	buli-lo / boli-lo, bulu-lo, bul-lo / bollo ⁷
3PL.RLS	—	—	o-ŋo
1SG.IRLS	j-i-no	—	—
2SG.IRLS	bo	bo	—
3.IRLS	no	—	do
1PL.IRLS	j-i-no-go	—	—
2PL.IRLS	bo-jo	bo-jo	—
b.	OZ ‘to go’	AY ‘to bring, to get’	CH ‘to bring, to do, to get’
1SG.RLS	o-j	j-i-hi / ji	tak-a-hi [?]
2SG.RLS	do-j	b-a-be	b-e-j
3.RLS	i	do-j	i:
1PL.(INCL).RLS	o-ko-j	j-i-ko-j	j-u-kw-i [?] / j-u-k-i [?]
1PL.EXCL	—	—	o-j-u-kw-i [?] / o-j-u-k-i [?]
2PL.RLS	do-jo-j	wak-a-be-jo-j	b-e-j-lo / b-e-li-lo
3PL.RLS	—	—	o-j
1SG.IRLS	j-a-hi	—	—
2SG.IRLS	be	be	—
3.IRLS	do-j	—	do-j
1PL.IRLS	i-ko-j	be	—
2PL.IRLS	be-jo-j	be-jo-j	—

First, we have evidence that the *b(V)*- prefix of the 2nd person, still preserved in the singular in Ayoreo, has its roots in Proto-Zamucoan, as shown by its residual presence in Old Zamuco and Chamacoco. Its loss in the Ayoreo 2nd plural must therefore be a later development (see Table 1). Second, Chamacoco bears evidence that the 1st plural *-ko* suffix (both inclusive and exclusive), subsequently lost in this language, did exist in Proto-Zamucoan, otherwise we would not find it in both branches of the family. Note that the suffix *-ko/-kw* has been segmented for purely comparative purposes, but in the above examples it has become part of the root. It is also noteworthy that in (8a) the Old Zamuco 1PL suffix of both realis and irrealis is *-go* (*ainogo*, *jinogo*), whereas Ayoreo and Chamacoco preserve the original Proto-Zamucoan *-ko* (respectively *jiko* 1PL.RLS and *juko* 1P.INCL.RLS). Thus, in this particular case Old Zamuco has innovated, although it is generally the most conservative language of the family.

Third, the *-j* morpheme at the end of some forms in (8b) stems from the cliticization of the locative adposition *=ihi*, a lexical expansion mechanism frequently observed in Old Zamuco and Ayoreo. In modern Chamacoco, the cognate clitic *=ihi* is instead seldom used for this purpose and, unlike in the sister languages, it never reduced to a vocoid. Further evidence for the decline of this derivational mechanism in Chamacoco stems from the very position of *-i[?]/j*. In Old Zamuco and Ayoreo, it follows the suffixes *-ko* (1PL) and *-jo* (2PL) like a true clitic, as regularly observed in all such cases. In Chamacoco, by contrast, this vocoid has an ambiguous behavior: it follows *-kw-*

⁷ The consonantal sequence *-ll-* in *bullo* and *bollo* is the result of two abutting consonants due to vowel loss.

(1PL), the relic of Proto-Zamucoan **-ko*, but it precedes *-lo* (2PL). This indicates that *-iʔ/-j* had already been reinterpreted as part of the root before the introduction of *-lo*, the Chamacoco innovative allomorph of the 2nd person plural.

Finally, (8) shows prefix correspondences, in both singular and plural, between Old Zamuco 1.IRLS and Ayoreo 1.RLS, and between Old Zamuco 2.IRLS and Chamacoco 2nd person. This is clear evidence that, in some cases, the irrealis has replaced the realis, according to the well-known principle of the marked feature replacing the unmarked one (we return to this in §4.2). The Chamacoco situation indicates, in particular, that this replacement was conducive to the decline, in that language, of the 1st and 2nd persons of the irrealis paradigm.

Radical verbs are again at stake as far as the feeding of some Chamacoco conjugation classes is concerned (see Table 3). Inspection of cross-linguistic lexical correspondences sheds light on instances of unetymological segmentation by Chamacoco speakers, whereby the root-initial consonant of the 3rd person was reinterpreted as a prefix. This was accompanied by concomitant reinterpretation of the first vowel of the root as thematic vowel, as shown by comparison with the 1st and 2nd persons. Note that in almost all examples in (9) – with the only exception of the metaplasmatic Ayoreo verb in (9a) – there is a high thematic vowel, which justifies the application of the vowel replacement process described in §1.3. Example (9d) highlights another instance of the irrealis replacing the realis (compare Old Zamuco *kana* 3.IRLS and Ayoreo *kana* 3.RLS). Here again, we have to acknowledge that this occurred before the decline of the 3rd person in the Ayoreo irrealis paradigm. Therefore, both Chamacoco and Ayoreo provide strong evidence that the attraction exerted by the irrealis over the realis is a very old phenomenon.

As for Chamacoco *jana* 3.RLS in (9d), this is not the only case of the, admittedly rare, Ayoreo /k/ ~ Chamacoco /j/ correspondence; a phonetic change also documented in other languages (see, e.g., Latin *faktu(m)* → Piedmontese *fajt*). However, new data in Chomé’s dictionary (Ciucci, forthcoming b) suggest another possibility. One has to consider that: (i) this verb was originally thematic, as shown by Old Zamuco; (ii) /g/ in Old Zamuco/Ayoreo regularly drops out in Chamacoco. Therefore, deletion of /g/ in Chamacoco might have led to consonantization of thematic /i/, and to its reinterpretation as a prefix: **Ø-i-gana* → **Ø-i-ana* → *j-a-na*. The root in the rest of the paradigm was restructured accordingly, but the irregular vowel /i/ in the first person is a relic of the original thematic /i/.

- (9) a. OZ: *a-i-tata* (1SG.RLS), *d-a-tata* (2SG.RLS), *Ø-Ø-tata* (3.RLS/IRLS), ‘to say, to tell’
 AY: *j-a-tata* (1SG), *b-a-tata* (2SG), *te-a-tata* (3) ‘to tell’
 CH: *t-i-ta* (1SG), *Ø-a-ta* (2SG), *t-a-ta* (3.RLS/IRLS) ‘to say, to report’
 b. OZ: *a-i-tiboha* (1SG.RLS), *d-a-tiboha* (2SG.RLS), *Ø-Ø-tiboha* (3.RLS/IRLS) ‘to yawn, to open the mouth’
 AY: *j-i-tiboha* (1SG), *b-a-tiboha* (2SG), *Ø-Ø-tiboha* (3) ‘to yawn’

- CH: *tik-i-buhu* (1SG), *Ø-e-buhu* (2SG), *t-i-buhu* (3.RLS/IRLS) ‘to yawn; to lick’
 c. OZ: *a-i-rik* (1SG.RLS), *d-a-rik* (2SG.RLS), *Ø-Ø-dik* (3.RLS/IRLS) ‘to walk’
 AY: *j-i-rik* (1SG), *b-a-rik* (2SG), *Ø-Ø-dik* (3) ‘to walk’
 CH: *tik-i-rk* (1SG), *Ø-e-rk* (2SG), *d-i-rk* (3.RLS/IRLS) ‘to walk’
 d. OZ: *a-i-gana* (1SG), *d-a-gana* (2SG), *Ø-i-gana* (3.RLS), *Ø-Ø-kana* (3.IRLS)
 AY: *j-i-ηana* (1SG), *m-a-ηana* (2SG), *Ø-Ø-kana* (3) ‘to laugh’
 CH: *tik-i-na* (1SG), *Ø-a-na* (2SG), *j-a-na* (3.RLS/IRLS) ‘to laugh’

Unetymological segmentation can also be identified in the creation of some Chamacoco prefixal nouns in the possessive inflection. The noun in (10a) is radical in Old Zamuco and thematic in Ayoreo, owing to attraction by the dominant noun class via the default vowel /i/. In Chamacoco, by contrast, this word-initial /k/ of Old Zamuco was re-analysed as a 3rd person prefix, with the following vowel turned into a thematic vowel (recall that */a/ often becomes /e/ in Chamacoco, §3). Similar considerations apply to (10b), where the Chamacoco prefix *w-* is a re-analysis of the root-initial velar consonant (/g/ in Ayoreo).

- (10) a. OZ *j-i-gatade* (1SG), *Ø-a-gatade* (2SG), *Ø-Ø-katade* (3) ‘knee’
 AY *j-i-gatade* (1SG), *b-a-gatade* (2SG), *Ø-i-gatade* (3) ‘knee’
 CH *p-i-tita* (1SG), *Ø-e-tita* (2SG), *k-e-tita* (3) ‘knee’
 b. AY *j-o-goro* (1SG), *b-o-goro* (2SG), *Ø-o-goro* (3) ‘hip’
 CH *p-o-ɬɬa* (1SG), *Ø-o-ɬɬa* (2SG), *w-o-ɬɬa* (3) ‘hip’

In Table 3, *t-* and *d-*verbs are listed as the two Chamacoco subclasses of the second class of prefixal verbs. While the *t-*class can be traced back to Proto-Zamucoan (see below for further details), the *d-*class is a Chamacoco innovation with a rather restricted number of members. Segmentation errors such as those in (9) have certainly contributed to its enlargement. The latter subclass also includes *n-*, *l-* and *j-*verbs; apart from the last (for all we know) isolated single case, the previous ones may be regarded as one and the same set, since /n/ is the nasal counterpart of /d/, and /l/ (another Chamacoco phonemic innovation) is in free variation with /d/ word-initially.

4.2. *The attraction by marked features*

As Tables 1-2 show, Old Zamuco had a fully-fledged irrealis conjugation, which contrasts with the defective paradigms that are found in Ayoreo and Chamacoco, whose complementarity is a curious historical accident. Such complementary arrangement would in and by itself suffice to suggest that the irrealis mood did exist in the proto-language, but of course the full paradigm of Old Zamuco conclusively proves the matter.

Of special interest for diachronic reasoning is the already mentioned attraction exerted by the irrealis over the realis mood: a clear example of the fascination of marked features over the unmarked ones. This emerges with special evidence in three cases.

The first one concerns the fact that, in currently spoken Ayoreo, the marker of 1st singular realis tends to be replaced by the corresponding marker of the irrealis; that is the reason why this inflection is shown between square brackets in Table 1. We saw an example of this in the highly irregular verbs in (8). The same phenomenon can be observed in Chamacoco; the allomorph *t-* of 1st person singular most likely stems from deaffrication of Proto-Zamucoan **tɕ-*, a 1st irrealis allomorph preserved in Old Zamuco. Similarly, in the Chamacoco 1st person plural (both inclusive and exclusive) one can see the same prefix *j-* that characterizes the irrealis in Old Zamuco and Ayoreo.

The second case is the 2nd person in Chamacoco: although the realis vs irrealis contrast was lost, the present-day 2nd person inflection is diachronically a 2nd person irrealis, with zero prefix as in the irrealis of Old Zamuco and Ayoreo (Table 2).

The third kind of evidence has to do with the creation of the *t-* and *d-* classes, with radical verbs once more in focus, although the issue at stake is wider. As shown in Table 2, the morphological exponent of the 3rd irrealis are (excluding Ayoreo) {*d-/n-(l)-*}/*t-/∅-*, with *l-* only present in Chamacoco and *d-/n-* as oral/nasal allomorphs. Since *d-/n-* are the most frequent and salient markers in this set, it is not surprising that the *d-* class exhibits systematic 3rd person identity in the two moods, as shown by the Chamacoco verb in (11). The logical explanation is that in this class the 3rd person irrealis has replaced the original 3rd person realis:

- (11) a. AY: *j-o-ru* (1SG), *b-o-ru* (2SG), *tɕ-o-ru* (3) ‘to climb, to ride’
 CH: *tok-o-hir* (1SG), *∅-o-hir* (2SG), *d-o-hir* (3.RLS/IRLS) ‘to go up’
 b. CH: *tak-a-buhu* (1SG), *∅-e-buhu* (2SG), *d-e-buhu* (3.RLS/IRLS) ‘to live’

The just described phenomenon also sheds light on a conspicuous diachronic change: the disappearance of the 3rd person from the Ayoreo irrealis paradigm. This occurred via attraction by the (subsequently lost) 3rd irrealis, as shown in (12), where *tɕage* clearly corresponds to the identical Old Zamuco form and to Chamacoco *tsehet*. Another such example is (12b), where the Old Zamuco and Chamacoco paradigms show that this verb must have been thematic in Proto-Zamucoan (as proven by the 3rd realis). Here again, the original Ayoreo 3rd person realis was replaced by the irrealis *nona*, identical to the corresponding Old Zamuco form (see also Chamacoco *noja*). In addition, the 3rd person irrealis prefix *n-* of *nona* was reinterpreted in Ayoreo as part of the root along with the thematic vowel /o/, which in Old Zamuco and Chamacoco alternated with /i/ (an irregular inflectional paradigm). Later on, however, Ayoreo added the new regular 3rd person *tɕiɲina*, via assimilation to the class of *tɕ-* verbs, by far the largest one. Note also that, although the Old Zamuco verb in (12b) has a different meaning with respect to Ayoreo and Chamacoco, there is

evidence that it originally meant ‘to accompany’, because the 3rd person realis *ina* generated a homophonous adposition, not documented in the sister languages, meaning ‘together with’.

- (12) a. OZ: *a-i-jage* (1SG.RLS), *d-a-jage* (2SG.RLS), *Ø-i-jage* (3.RLS), *Ø-Ø-~~t~~age* (3.IRLS) ‘to stand up’
 AY: *j-i-jage* (1SG), *b-a-jage* (2SG), *Ø-Ø-~~t~~age* (3) ‘to stand up’
 CH: *tik-i-jehet* (1SG), *Ø-a-lehet* (2SG), *Ø-i-jehet* (3.RLS), *Ø-Ø-tsehet* (3.IRLS) ‘to stand up’
 b. OZ: *Ø-o-na* (1SG.RLS), *d-o-na* (2S.RLS), *Ø-i-na* (3.RLS), *n-o-na* (3.IRLS) ‘to roll/to go round’
 AY: *j-i-~~n~~ina* (1SG), *b-a-~~n~~ina* (2SG), *Ø-Ø-nona* / *t~~i~~-i-~~n~~ina* (3) ‘to accompany, to go with’
 CH *tok-~~o~~-ja* (1SG), *m-e-ja* (2SG), *Ø-~~i~~-ja* (3.RLS), *n-o-ja* (3.IRLS) ‘to accompany’

It is worth emphasizing that cases such as those in (12) provide the only recognizable traces of the 3rd irrealis in Ayoreo. Once again, comparison between the two branches of the Zamucoan family provides crucial information.

4.3. Phonetic changes

The Old Zamuco and Ayoreo *t~~e~~*-class split into the two Chamacoco subclasses of *t~~e~~*- and *ts*-verbs (Table 3). The likely cause was depalatalization, although we do not know why this only affected a subset of *t~~e~~*-verbs (13). By contrast, the remarkable rarity of Ayoreo thematic verbs is explained by the fact that many of them turned into radical verbs, or else were attracted into the *t~~e~~*-class. Example (12b) above provides an exceptional illustration of both developments; (14) illustrates instead the second kind of change, which can be understood in terms of a well-known principle of historical linguistics, the so-called ‘gang effect’, i.e. the tendency to regularize the exceptions or at least to attract them into an analogically salient paradigm. More sporadically, the attraction exerted by prefixal verbs can also be observed in Chamacoco, as shown by the 3rd singular in (15a-b).

Interestingly, the subclass of *t*-verbs, present in all three languages and thus to be postulated for Proto-Zamucoan, includes comparatively more verbs in Chamacoco. This can be due to unetymological reinterpretation of the root initial /t/ as a prefix, as shown in (9a-b), but in part also to deaffrication (16).

- (13) a. ‘to reach’
 OZ: *t~~e~~-i-se* (3.RLS)
 AY: *t~~e~~-i-se* (3)
 CH: *t~~e~~-i-~~ε~~* (3.RLS)
 b. ‘to help’ (*t~~e~~*- > *ts*-)
 OZ: *t~~e~~-i-asore* (3.RLS)
 AY: *t~~e~~-o-s~~o~~re* (3)
 CH: *ts-o-sir* (3.RLS)
- (14) a. OZ: *Ø-o-si* (1SG.RLS), *Ø-a-si* (2SG.IRLS), *Ø-i-si* (3.RLS), *d-o-si* (3.IRLS) ‘to give’
 AY: *j-i-si* (1SG), *b-a-si* (2SG), *t~~e~~-i-si* (3) ‘to give’
 CH: *tok-o-~~ε~~i* (1SG), *Ø-e-~~ε~~i* (2SG), *Ø-i-~~ε~~i* (3.RLS), *d-o-~~ε~~i* (3.IRLS) ‘to pay; to give; to contaminate; to deliver’
 b. OZ: *Ø-o-hi* (1SG.RLS), *Ø-i-hi* (3.RLS) ‘to drink’
 AY: *j-o-hi* (1SG), *b-o-hi* (2SG), *t~~e~~-o-hi* (3) ‘to drink’
 CH: *tok-o-ho* (1SG), *Ø-e-he* (2SG), *Ø-i-hi* (3.RLS), *d-o-ho* (3.IRLS) ‘to drink’
- (15) a. OZ *a-i-rahā* (1SG.RLS), *d-a-rahā* (2SG.RLS), *Ø-Ø-dahā* / *Ø-Ø-nahā* (3.RLS/IRLS) ‘to put’

AY: *j-i-rã* (1SG), *m-a-ra* (2SG), *Ø-Ø-naha* (3) ‘to put into’

CH: *t-i-rãha* (1SG), *Ø-e-rãha* (2SG), *Ø-Ø-naha* (3.RLS/IRLS, archaic) / *t̥-i-rãha* (3.RLS, regularized) ‘to load up’

b. AY: *j-u-kutame* (1SG), *b-a-kutame* (2SG), *Ø-Ø-kutame* (3) ‘tired of (to be)’

CH: *t-u-kutim* (1SG), *Ø-e-kutim* (2SG), *t̥-u-kutim* (3.RLS) ‘to refuse to work’

(16) OZ: *t̥-u-sekãru* (3.RLS) ‘to count, to number’

AY: *t̥-i-sekãru* (3) ‘to count, to number’

CH: *t-i-skir* (3.RLS) ‘to count, to number’

Finally, family-internal comparison reveals a number of cases of root allomorphy, such as, e.g., the consonant alternations in (15a). Of special importance are, however, the phonologically-governed consonant-root alternations to be found in Chamacoco. As shown in (17-20), this phenomenon concerns both verb and noun, and goes both ways: palatalization and depalatalization. In (17-18), the [+front] feature of the thematic vowel in the 1st and 3rd person caused palatalization of the following consonant, which instead remained unchanged (as in the sister languages) in the 2nd person, owing to the protective effect of the [–front] feature of the preceding /a/. Evidently, this palatalization process must have applied after the implementation of the vowel replacement mechanism described in §3, which explains the non-palatal consonants in the 2nd person of these examples; moreover, such process must have been still active when the Chamacoco context-free /a/ → /e/ change took place, as proved by the innovative 2nd person form *ejok* (alternating with the older form *ahok*) in (18a).⁸ The opposite effect, depalatalization, essentially originated, *mutatis mutandis*, for the same reasons in some Chamacoco verbs and nouns. We have already seen an example of word-initial depalatalization of /t̥/ into /ts/ in (13b), as contributing to the birth of a new subclass of verbs. Here, examples (19-20) show that preservation of */a/ in the 2nd person caused depalatalization of the following consonant, once again contrasting with the situation in the other persons. In other words: in Chamacoco, /a/ stopped palatalization of following /s/ and /h/, and caused depalatalization of following /t̥/ and /j/.

(17) a. OZ: *a-i-saw* (1SG.RLS), *d-a-saw* (2SG.RLS), *t̥-i-saw* (3.RLS) ‘to take’

AY: *j-i-sa* (1SG), *b-a-sa* (2SG), *t̥-i-sa* (3) ‘to touch, to pick up, to grab, to accept’

⁸ The formulation of the palatalization rule should take into account that it also applied after the high central vowel /i/, a Chamacoco phonemic innovation, as in:

(i) AY: *j-i-siome* (1SG.RLS), *b-a-siome* (2SG.RLS), *t̥-i-siome* (3) ‘to give to’

CH: *tok-o-sim* (1SG.RLS), *Ø-a-sim* (2SG.RLS), *Ø-i-çim* (3.RLS) ‘to give to’.

This Chamacoco item has an irregular pattern, also found in some Old Zamuco verbs, featuring the alternation /o/ ~ /i/ in the thematic vowel slot of 1st and 3rd person. This was ostensibly the situation in Proto-Zamucoan, since we find this pattern in both branches of the family. By contrast, Ayoreo (with /i/ in both persons) has regularized this paradigm. One might wonder whether the original thematic vowel (at the pre-Proto-Zamucoan stage) was /o/ or /i/. The answer is straightforward: it clearly must have been /i/, for otherwise one would not find /a/ as thematic vowel in the 2nd person of both languages. Given this state of affairs, since /i/ was the antecedent of Chamacoco /i/ in the 2nd and 3rd person, it is possible that palatalization was already in place prior to this vowel innovation. One cannot however exclude that, in other instances, /i/ was the actual trigger of the process, considering its genuinely palatal nature. As a matter of fact, Chamacoco /i/ can have other antecedents, including the low vowel /a/. Further research is needed to shed light on the possible effect of /i/ on palatalization.

- CH: *t-i-εew* (1SG), *Ø-a-sew* (2SG), *te-i-εew* (3.RLS) ‘to hold, to take, to grab’
- b. AY: *j-i-kasisōri* (1SG), *b-a-kasisōri* (2SG), *Ø-i-kasisōri* (3) ‘opponent who is not afraid’
 CH: *p-i-εipsīrte* (1SG), *Ø-a-sipsīrte* (2SG), *Ø-a-sipsīrte* (3) ‘opponent in combat’⁹
- c. CH: *p-i-εuwo* (1SG), *Ø-a-suwo* (2SG), *Ø-i-εuwo* (3) ‘possessed thing; clothing’
- (18) a. OZ: *a-u-hokāre* (1SG.RLS), *d-a-hokāre* (2SG.RLS), *te-u-hokāre* (3.RLS) ‘to frighten off’
 AY: *j-i-ṅokāre* (1SG), *m-a-ṅokāre* (2SG), *te-i-ṅokāre* (3) ‘to frighten’
 CH: *t-i-jok* (1SG), *Ø-a-hok / Ø-e-jok* (2SG), *te-i-jok* (3.RLS) ‘to frighten’
- b. OZ: *j-i-horā* (1SG), *Ø-a-horā* (2SG), *Ø-Ø-horā* (3) ‘companion’
 AY: *j-i-hōra* (1SG), *b-a-hōra* (2SG), *Ø-Ø-hōra* (3) ‘friend, companion’
 CH: *p-i-jēra* (1SG), *Ø-a-hīra* (2SG), *Ø-i-jēra* (3) ‘friend, companion’
- (19) a. OZ: *a-i-teagu* (1SG.RLS), *d-a-teagu* (2SG.RLS), *te-i-teagu* (3.RLS) ‘to goad; to sting; to open an abscess’
 AY: *j-i-teagu* (1SG), *b-a-teagu* (2SG), *te-i-teagu* (3) ‘to pierce; to stab; to give an injection’
 CH: *t-i-tew* (1SG), *Ø-a-tew* (2SG), *te-i-tew* (3.RLS) ‘to pierce; to dig; to write’
- b. OZ: *j-u-teak* (1SG), *Ø-a-teak* (2SG), *Ø-u-teak* (3) ‘dung; intestine, gut’
 AY: *j-u-teaj* (1SG), *b-a-teaj* (2SG), *Ø-u-teaj* (3) ‘excrement, feces, dung’
 CH: *p-i-tēit* (1SG), *Ø-a-tsit* (2SG), *Ø-i-tēit* (3) ‘excrement, feces, dung’
- (20) a. OZ: *a-i-jage* (1SG.RLS), *d-a-jage* (2SG.RLS), *Ø-i-jage* (3.RLS) ‘to stand up’
 AY: *j-i-jage* (1SG), *b-a-jage* (2SG), *Ø-Ø-teage* (3) ‘to stand up’
 CH: *tik-i-jehet* (1SG), *Ø-a-lehet* (2SG), *Ø-i-jehet* (3.RLS) ‘to stand, to stand up’
- b. AY: *j-i-jarit* (1SG), *b-a-jarit* (2SG), *Ø-Ø-tearit* (3) ‘stopping place’
 CH: *p-i-jertε* (1SG), *Ø-a-lertε* (2SG), *Ø-i-jertε* (3), ‘place’

5. CONCLUSION

The preceding pages pointed out a number of historical processes that can be observed in the small Zamucoan family. Although we mostly concentrated on the verbal system, we also illustrated comparable examples from the possessive inflection system. This proves that the mechanisms involved are an inherent component of these languages, rather than a domain-specific tendency. Altogether, the described phenomena highlight a number of well-known principles of historical linguistics, as here briefly summarized.

First, in several instances we illustrated meaningful parallels between the two branches of the family, i.e. between Old Zamuco or Ayoreo on the one side, and Chamacoco on the other side. Since all the cited facts are not single cases but can be found in other similar examples (all reported in Ciucci 2016), mostly including both verbs and nouns, one can reasonably discard the null hypothesis of accidental convergence.

Second, we found confirmation that irregular words are an important repository of old features. This emerged, in particular, in the discussion of example (8), but in fact most phenomena described in §4 support this conclusion. Needless to say, if such features were only exhibited by the

⁹ The identical shape of 2nd and 3rd person in this Chamacoco word is ostensibly due to replacement of the neuter 3rd person by means of the ‘reflexive’ person. See §5 for further indications.

irregular items, one might doubt their relevance. If, however, they are backed by other evidence in the given language, and even more evidence spread across the two family branches, they stand out as compelling evidence.

Third, we described the effect of natural phonological rules, such as (de)palatalization induced by [\pm front] vowels on adjacent consonants. See examples (17-20). This process occurred at an old stage of development of Chamacoco, but after the implementation of the 2nd person vowel replacement process described in §3, and was still active after the instauration of the context-free /a/ \rightarrow /e/ change.

Another important factor of linguistic change is analogical attraction. This often takes the form of regularization, whereby the numerically larger and morphotactically more transparent classes act as magnets with respect to items belonging to minority sets. Some of the above examples, such as (14), witness this tendency. Somehow opposite, yet similar in the underlying mechanism, is the principle of marked features attraction. In this case, the magnet consists in the stronger salience of features that, for whatever reason (phonological, morphological, syntactic, semantic...), are perceived as the system's marked elements. We illustrated this, in particular, with respect to the replacement of realis mood person-inflections by the corresponding irrealis ones; see examples (11, 12).

Interestingly, the Zamucoan possessive morphology bears evidence of a similar phenomenon, consisting in the attraction of the reflexive 3rd person over the neuter 3rd person, as shown in (21). The reflexive is a peculiar Zamucoan feature, not to be found in the surrounding languages, which expresses coreference with a 3rd person subject; it is thus a marked feature, as compared with the neuter 3rd person, similar to the irrealis as compared with the realis.

- (21) a. AY: *j-i-ñoḡamia* (1SG), *b-a-ñoḡamia* (2SG), *d-a-ñoḡamia* (3/REFL) 'aunt, father's sister'
 CH: *p-i-ḡemṭea* / *p-e-ḡemṭea* (1SG), \emptyset -*a-ḡemṭea* (2SG), *n-a-ḡemṭea* (3/REFL) 'aunt'
- b. AY: *j-a-buhi* (1SG), *b-a-buhi* (2SG), \emptyset -*a-buhi* (3), *d-a-buhi* (REFL) 'nephew, woman's brother'
 CH: *p-e-bihit* (1SG), \emptyset -*e-bihit* (2SG), *d-e-bihit* (3/REFL) 'nephew, woman's brother'
- c. AY: *j-u-suguruj* (1SG), *b-a-suguruj* (2SG), \emptyset -*u-suguruj* (3), *d-a-suguruj* (REFL) 'fingernail, claw, hoof'
 CH: *p-u-εurtε* (1SG), \emptyset -*e-εurtε* (2SG), *d-u-εurtε* (3), *d-e-εurtε* (REFL) 'fingernail, toenail'

As in the verb system, the attraction by the reflexive was most probably enhanced by concomitant factors of various nature, such as non-productivity of the (relatively marginal) inflectional class at stake, or specific phonological reasons. But the very fact that the winning form bears the marked feature can only be understood in terms of the sort of fascination of the more salient, i.e. marked features against the unmarked, and thus uneventive ones. In the case of the irrealis, one might surmise that this attraction mechanism had a role in the partial decline of this mood in Ayoreo and Chamacoco; however, similar cases can be observed in Old Zamuco, where

the irrealis is fully preserved. Moreover, the reflexive is a robust feature in all Zamucoan languages, yet it exerted a strong attraction on the neuter 3rd person. One can thus safely conclude that the attraction by the marked features presupposes their full resilience. The reduction of the irrealis paradigm in Ayoreo and Chamacoco must have occurred after the described attraction mechanism had produced its effects.

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*PROTO-ZAMUCOAN	PERSON	OLD ZAMUCO	AYOREO	CHAMACOCO
* <i>a</i> -V-ROOT	1SG	<i>a</i> -V-ROOT	[\emptyset -V-ROOT]	<i>t-tV\bar{k}</i> -V-ROOT
{ <i>ba-/ma</i> }-V-ROOT (<i>da-/na</i> -V-ROOT)	2SG	<i>d</i> -V $\hat{\text{~}}$ -ROOT	{ <i>b-/m-</i> }-V $\hat{\text{~}}$ -ROOT	\emptyset -V $\hat{\text{~}}$ -ROOT
* <i>te-/t-/\emptyset</i> -V-ROOT	3	(<i>te-/t-/\emptyset</i>)-(V-) ROOT	(<i>te-/t-/\emptyset</i>)-(V-) ROOT	(<i>te-/ts-/t-/</i> { <i>d-/l-/n-</i> }/ <i>j-/\emptyset</i>)-(V-) ROOT
	RFL			
* <i>a</i> -V-ROOT- <i>ko</i>	1PL	<i>a</i> -V-ROOT- <i>ko/-go</i>	[\emptyset -V-ROOT- <i>ko/-go</i>]	INCL <i>j</i> -V-ROOT EXCL <i>o-j</i> -V-ROOT
{ <i>ba-/ma</i> }-V-ROOT-(<i>j</i>) <i>o</i> (<i>da-/na</i> -V-ROOT-(<i>j</i>) <i>o</i>)	2PL	<i>d</i> -V $\hat{\text{~}}$ -ROOT- <i>o</i>	<i>wak</i> -V $\hat{\text{~}}$ -ROOT- <i>teo/-jo</i>	\emptyset -V $\hat{\text{~}}$ -ROOT- <i>lo</i>
–	3PL	–	–	<i>o-</i> + 3 rd PERSON

Table 1. Zamucoan verb: person inflection of the Realis mood.¹⁰

*PROTO-ZAMUCOAN	PERSON	OLD ZAMUCO	AYOREO	CHAMACOCO
* <i>j-/te</i> -V-ROOT	1SG	<i>te-/j</i> -V-ROOT	<i>j</i> -V-ROOT	–
* <i>a</i> -V-ROOT	2SG	\emptyset -V $\hat{\text{~}}$ -ROOT	\emptyset -V $\hat{\text{~}}$ -ROOT	–
*{ <i>d-/n-</i> }/ <i>t-/\emptyset</i> -V-ROOT	3	({ <i>d-/n-</i> }/ <i>t-/\emptyset</i>)-(V-) ROOT	–	({ <i>d-/n-/l-</i> }/ <i>t-/\emptyset</i>)-(V-) ROOT
	RFL			
* <i>j-/te</i> -V-ROOT- <i>ko</i>	1PL	<i>te-/j</i> -V-ROOT- <i>ko/-go</i>	<i>j</i> -V-ROOT- <i>ko/-go</i>	–
* <i>a</i> -V-ROOT-(<i>j</i>) <i>o</i>	2PL	\emptyset -V $\hat{\text{~}}$ -ROOT- <i>o</i>	\emptyset -V $\hat{\text{~}}$ -ROOT- <i>teo/-jo</i>	–
–	3PL	–	–	<i>o-</i> + 3 rd PERSON

Table 2. Zamucoan verb: person inflection of the Irrealis mood.

	FIRST MACRO-CLASS PREFIXAL VERBS				SECOND MACRO-CLASS NON-PREFIXAL VERBS	
	FIRST CLASS		SECOND CLASS		THIRD CLASS	FOURTH CLASS
P-Z	* <i>te</i> -verbs		* <i>t</i> -verbs		*Thematic verbs	*Radical verbs
OZ	<i>te</i> -verbs		<i>t</i> -verbs	<i>s</i> -verbs ¹¹	Thematic verbs	Radical verbs
AY	<i>te</i> -verbs		<i>t</i> -verbs		Thematic verbs	Radical verbs
CH	First subclass: <i>te</i> -verbs	Second subclass: <i>ts</i> -verbs	Third subclass: <i>t</i> -verbs	Third subclass: <i>d</i> -verbs	Thematic verbs	Radical verbs

Table 3. Zamucoan verbal classes, based on the 3rd person inflection (Ciucci & Bertinetto 2015).

¹⁰ In Tables 1-2, V $\hat{\text{~}}$ in the 2nd persons of the three modern Zamucoan languages warns about the vowel replacement mechanism described in §3.

¹¹ This subclass is based on data stemming from Chomé's dictionary (Ciucci, *forthcoming* b).

*PROTO-ZAMUCO	PERSON	OLD ZAMUCO	AYOREO	CHAMACOCO
* <i>(u)jV</i> _[back]	1SG	<i>(u)ju</i>	<i>(u)ju</i>	<i>jok</i>
* <i>(u)wa</i>	2SG	<i>(u)wa</i>	<i>(u)wa</i>	<i>owa</i>
[* <i>wite</i> (M)] [* <i>wate</i> (F)]	3SG	[<i>wite / ude</i> (M)] [<i>wate / uda</i> (F)]	[<i>ude</i> (M PROX)] [<i>udak</i> (F PROX)] [<i>ute</i> (M DIST)] [<i>wate</i> (F DIST)]	<i>ir(e)</i> [<i>witei</i> (M)] [<i>wate</i> (F)]
* <i>(u)jV</i> _[back] - <i>k</i>	1PL	<i>(u)jo-k</i>	<i>(u)jo-k</i>	INCL <i>ejo-k</i> EXCL <i>õrjo-k</i>
* <i>(u)wa-k</i>	2PL	<i>(u)wa-k</i>	<i>(u)wa-k</i>	<i>ola-k</i>
* <i>ore</i>	3PL	<i>ore</i>	<i>ore</i>	<i>õr</i> , [<i>wir</i>]

Table 4. Zamucoan personal pronouns.