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How to restructure a grammatical category: the innovative person system of Chamacoco (Zamucoan, northern Paraguay)

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Abstract: Chamacoco is a Zamucoan language of northern Paraguay that has considerably restructured its person reference system. Starting from the existing reconstruction of Proto-Zamucoan, I will analyze the evolution of person marking in free pronouns, verbs and possessable nouns. The verb lost the realis/irrealis distinction in speech act participants, while the third person underwent some allomorphic changes and introduced a distinction between third singular and plural, dependent on an innovative animacy hierarchy. The first person proved overall particularly unstable. In possessable nouns, it was replaced by a form for unspecified possessor, while a new exponent was created for the latter. In free pronouns, the first plural shifted to the first singular and then grammaticalized to the new verb prefix for the first singular. The most significant changes concern the introduction of clusivity in verbs and free pronouns, which was combined with an unusual number term: the greater plural. Besides, the verbal first-person exclusive is typologically unexpected, since it derives from the inclusive. I will discuss the reasons for these and other minor changes, which involve internal factors and language contact. Finally, I will show how recent contact with Spanish has affected the Chamacoco person system.

Keywords: clusivity, inflectional morphology, person, possessive markers, South American Indigenous languages

1 Introduction

This paper analyzes the evolution of person marking in Chamacoco (a.k.a. *Ishir ahwoso*), an endangered Zamucoan language spoken by about 2,000 people who traditionally inhabit the department of Alto Paraguay, in northern Paraguay.

The Zamucoan family consists of two other languages, Old Zamuco and Ayoreo. Old Zamuco was spoken in the 18th century in the Jesuit Mission of *San Ignacio de Samucos*, in the Boreal Chaco of South America and became extinct in the 19th century. The available data for Old Zamuco are due to the Jesuit missionary Ignace Chomé (1958 [before 1745]). An Old Zamuco dictionary by Chomé was recently rediscovered (Ciucci 2018, Forthcoming), and this has considerably increased the amount of available information on the language and its inflectional morphology. Ayoreo has about 4,500 speakers in the Chaco area of southeastern Bolivia and northern Paraguay. In the rest of the paper, an abbreviation is used for the three Zamucoan languages: **AY** = Ayoreo, **CH** = Chamacoco, **OZ** = Old Zamuco[†].¹

¹ Unless stated otherwise, the data for Chamacoco come from several periods of fieldwork, undertaken between 2009 and 2019, and refer to the Ebitoso (or Ibitoso) dialect, spoken by the vast majority of the Chamacoco. Since each Zamucoan language has its own orthographic transcription, for reasons of simplicity, data are reported in IPA. The following abbreviations are used: 1, 2, 3 = first, second, third person; A = subject of transitive verb; AUGM = augmentative; AY = Ayoreo; CH = Chamacoco; EMPH = emphatic; EPENTH = epenthesis; EXCL = exclusive; F = feminine; GF = generic form; GPL = greater plural; INCL = inclusive; INDEF =

OZ and AY are lexically very close to each other and form one branch of the family, while CH has lost about 70% of the lexicon retained from the proto-language. The main sound correspondences between Zamucoan languages are reported in the Appendix. The Chamacoco had a prolonged contact with neighboring indigenous populations, from whom they introduced lexical and grammatical borrowings. For instance, in CH one can recognize loanwords from Kadiwéu (Guaycuruan, Brazil) (Ciucci 2014: 37–40), and the latter is also the donor of the CH serial verb constructions (Aikhenvald 2018c: 211–212). Two CH innovations discussed in this paper, clusivity and the greater plural, are due to contact with Tupí-Guaraní languages and with Nivaê (Mataguayan). Language change also went hand in hand with cultural change: according to Cordeu (1989–1992), the CH cosmovision sharply differs from the AY one, because the Chamacoco underwent the influence of other peoples, such as the Jê, the Bororo (Macro-Jê, Brazil), the Chiquitano (unclassified, Bolivia) and the Kadiwéu, among others. Some cultural differences between the Ayoreo and the Chamacoco, concerning origin myths, the presence of spirit masters and the role of woman in society, are discussed in Ciucci (Forthcoming 2021b). In 1885, the first contact with Bolivian and Paraguayan society (Boggiani 1894: 27) implied the gradual beginning of CH-Spanish bilingualism, which has profoundly affected the language: Spanish loanwords are now ubiquitous and include many function words; new clause combining strategies have replaced older syntactic structures.

After addressing the category of person in Zamucoan and its reconstruction in Proto-Zamucoan (Section 2), the innovations that have taken place in CH are discussed in chronological order. The development of the paradigm shows several connections between the persons, particularly between the 1st person, the 3rd person and (in nouns) the indefinite possessor. Verbs initially lost the realis/irrealis distinction in the 1st and 2nd person (Section 3), while the 3rd person of verbs and possessable nouns underwent some allomorphic changes (Section 4). Then, verbs introduced a distinction between 3SG and 3PL, conditioned by animacy hierarchy. The most conspicuous innovations concern the 1st person. In possessable nouns, the 1SG prefix was replaced by an allomorph for indefinite possessor, and a new form was created for the latter (Section 5). Verbs and free pronouns developed clusivity (that is the distinction between 1st person inclusive and exclusive),² which was subsequently combined with an unusual number term: the greater plural (Section 6). Finally, the 1PL and 2PL of possessive inflection have disappeared, while recent language contact with Spanish has caused the loss of productivity of verbal and possessive inflection (Section 7).

2 Person marking in Zamucoan

Before addressing the changes undergone by person marking in CH, it is necessary to consider the category of person in the Zamucoan languages. Some utterances from CH

indefinite; INT = interrogative; IRR = irrealis; M = masculine; NEG = negation; OZ = Old Zamuco; PL = plural; QUOT = quotative; REAL = realis; RECP = reciprocal; REFL = reflexive; REL = relativizer; RETR = retrospective; SAP = speech act participant; S = subject of intransitive verb; SG = singular; SUB = subordinator; V = thematic vowel; VOL = volitional. **Acknowledgments.** I would like to express my gratitude to Alexandra Y. Aikhenvald, Pier Marco Bertinetto, R. M. W. Dixon, Borja Herce, Linda Konnerth, Jolene Overall, Andrea Sansò and two anonymous reviewers.

² The term ‘clusivity’ was first used by Michailovsky (2001).

spontaneous speech are reported in (1–2): as one can see, the category of person is expressed by free pronouns, on verbs and possessable nouns.

- (1) Chamacoco
 diḷ-ak ḥ t-ikēra p-uru-wo, p-aṇim-ita,
 night-M.SG and 1SG-dream 1SG-dream-M.PL 1SG-granddaughter-F.SG
 t-itim owa
 1SG-tell 2SG
 ‘At night I dreamed some (lit. my) dreams, my granddaughter, I tell you (my dreams).’

- (2) Chamacoco
 ese:=ke ite t-ata, “p-aṇim-o watsi-lo, jok
 then=RETR and 3-narrate 1SG-grandchild-M.PL dear-M.PL 1SG
 ite t-erz=iḱe, ich t-erz u: a:nṱt”
 EMPH 1SG-win=RETR EMPH 1SG-win the.M.SG evil.spirit-M.SG
 ‘Then, he narrated, “My dear grandchildren, I won, I won the evil spirit.”’

Table 1 displays free pronouns in the three Zamucoan languages, along with their reconstruction in Proto-Zamucoan. Here and in the rest of the paper, free forms separated by a slash are variants. Zamucoan languages have a 3PL free pronoun, but use demonstratives for 3SG (in square brackets in Table 1). CH is the only language that has dedicated 3SG free pronouns; in addition, CH distinguishes between 1PL.INCL vs. 1PL.EXCL and some of its pronouns have a greater plural, which indicates a larger than usual amount or the totality of possible referents. These features of CH will be discussed later on.

	OLD ZAMUCO	AYOREO	CHAMACOCO	PROTO-ZAMUCOAN
1SG	ju uju	ju uju	jok	*jV _{back} *V _{back} jV _{back}
1PL	jok ujok	jok ujok	1PL.INCL ejok 1GPL.INCL ejoklo 1PL.EXCL òrjok	*jV _{back} k *V _{back} jV _{back} k
2SG	wa uwa	wa uwa	owa	*wa *V _{back} wa
2PL	wak uwak	wak uwak	PL olak GPL olaklo	*wak *V _{back} wak
3SG	[ude (M)] [uda (F)] [wite (M)] [wate (F)]	[ude (‘this’ M)] [udak (‘this’ F)] [ute (‘that’ M)] [wate (‘that’ F)]	ir(e) witei (M) wate (F)	[*wite (M)] [*wate (F)]
3PL	ore	ore	õr wir	*ore

Table 1: Zamucoan free pronouns.

Zamucoan languages are fusional. Verbs mark subject (S/A) and mood (realis vs. irrealis), but the two moods are often syncretic, depending on the language and the verb paradigm: in such

cases, the mood is not indicated, as in the CH verbs in examples (1–2). Across the language family, the irrealis occurs after negation, in commands, or when the state or event is potential, hypothetical or uncertain. Some of these uses are exemplified in (3–5).

- (3) Chamacoco
 je d-oho aw-it=pe, je d-oho
 NEG 3.IRR-drink water-M.SG=NEG NEG 3.IRR-drink
 juk-ĩr=pe
 alcohol-M.PL.INDEF =NEG
 ‘He does not drink water, he does not drink alcohol.’
- (4) Chamacoco
 tsēhe d-iraha ejok Ø-aʷos-o piɛ-o
 VOL 3.IRR-know 1PL.INCL 3-word-M.PL AUGM-M.PL
 ‘He wants to know our real language (lit. words).’
- (5) Chamacoco
 xe dihip_kinehe-t d-osim kute-ẽ:k=ni uxe
 INT foreigner-M.SG 3.IRR-give thing-M.SG.INDEF=RETR REL
 t-ew par totiḷa?
 3-eat SUB mad
 ‘Did the foreigner give him something that he ate, so that (he is) mad?’

Many nouns inflect for possessor, which is expressed by a possessive prefix; these nouns are termed ‘possessable nouns’. All other nouns have no possessor marking and are not dealt with in the present study. Some possessable nouns are in examples (1), (2) and (4). Apart from the lack of mood, the category of person in Zamucoan possessable nouns has some values that differ from those of verbs. Possessable nouns distinguish a plain 3rd person (glossed as ‘3’ and referred to as 3rd person for simplicity) and a reflexive 3rd person (REFL), which is co-referent with the subject. The noun ‘child, son’ is in the 3rd person in (6), in the REFL in (7).

- (6) Chamacoco
 u: dihip_kinehe-t ir Ø-ixi-t o-te-ikēra
 the.M.SG foreigner-M.SG 3SG 3-son-M.SG PL-3.REAL-name
 o-tsi: B.
 PL-3.QUOT B.
 ‘They call the son of the foreigner B.’
- (7) Chamacoco
 d-a-ta ts-eta d-ejx-it ixa:b-it
 3-mother.F.SG 3.REAL-hug REFL-child-M.SG small-M.SG
 ‘The mother_j hugs her_j small child.’

Possessable nouns also have a form for indefinite or unspecified possessor, here called ‘generic form’ (GF); this covers cases in which the possessor does not exist, is unknown or simply unexpressed. In (8), the possessor of the trousers is co-referent with the subject, while in (9) the possessor is not indicated.

- (8) Chamacoco
 tɛ-icew d-eterpi-ta
 3.REAL-grab REFL-trousers-F.SG
 ‘He_j grabbed his_j trousers.’
- (9) Chamacoco
 o-Ø-ɛim ðrjok o-terp-e sejs
 PL-3.REAL-give 1PL.EXCL GF-trousers-F.PL six
 ‘They gave us six pairs of trousers.’ [the possessor is left unspecified] (Balbuena 1991: 12)

The use of a marker for unspecified possessor (for which different labels are used in literature) is a possible areal trait of Chaco languages (Campbell and Grondona 2012: 646). An affix for indefinite possessor is also found in Arawak, Cariban and Tupí-Guaraní languages (Aikhenvald 2012: 170–172).

Figure 1 displays the general structure of verbal and possessive inflection. The root is preceded by a thematic vowel in order to form the theme or stem. (Root and thematic vowel are not separated in examples of utterances, such as 1–9, but they are indicated when a paradigm is reported, as in 10–11.) Verbs and possessable nouns make use of a prefix, to which another prefix is added in innovative Chamacoco forms such as the verbal 3PL (Section 4.3), the verbal 1PL.EXCL (Section 6.2) and some GFs with prefix *o-* (Section 5). In verbs, a suffix marks person number, while the suffixation of nouns has nothing to do with the possessor: it expresses the gender and number of the noun, its syntactic function and its determinacy. For simplicity reasons, the noun’s suffixation is only indicated in examples of utterances (1–9), in which only gender and number are glossed.

(PREFIX)	PREFIX +	THEMATIC VOWEL (-V-)	+ ROOT	+ SUFFIX
THEME / STEM				

Figure 1: Structure of Zamucoan verbal and possessive inflection.

One can see the elements of Figure 1 in the three CH verbs reported in (10).

(10)	CH	CH	CH
	‘to know, to understand’	‘to give, to pay’	‘to cry’
1SG	t-i-raha	tok-o-ɛi	tik-i-jeɾ
1PL.INCL	j-i-raha	j-o-ɛi	j-i-jeɾ
1GPL.INCL	j-i-raha-lo	j-o-ɛi-lo	j-i-jeɾ-lo
1PL.EXCL	o-j-i-raha	o-j-o-ɛi	o-j-i-jeɾ
2SG	Ø-e-raha	Ø-e-ɛi	Ø-e-jeɾ
2PL	Ø-e-raha-lo	Ø-e-ɛi-lo	Ø-e-jeɾ-lo
3.REAL	tɛ-i-raha	Ø-i-ɛi	Ø-Ø-jeɾ
3.IRR	d-i-raha	d-o-ɛi	Ø-Ø-jeɾ
3PL.REAL	o-tɛ-i-raha	o-Ø-Ø-ɛi	o-Ø-Ø-jeɾ
3PL.IRR	o-d-i-raha	o-d-o-ɛi	o-Ø-Ø-jeɾ

The thematic vowel is lexically idiosyncratic. Its role is analogous to the thematic vowel in Latin verbs, which is added to the root to form the stem. In Zamucoan languages, the thematic vowel might often be considered a part of the root. However, it is useful to distinguish it in all paradigms for descriptive reasons: in some forms of verbs and nouns, the thematic vowel is absent, in others it undergoes a change or is replaced, as one can see in (10) and (11). The latter example features a possessable noun in the three Zamucoan languages. The paradigms in (10–11) are complete, while for the sake of brevity some forms are omitted in the following examples of verbs and nouns.

(11)	OZ	AY	CH
	‘hand’	‘hand’	‘hand’
1SG	j-i-manaj	j-i-ṃanaj	p-i-ṃita / p-o-ṃita
1PL	aj-i-manaj	jok-i-ṃanaj	–
2SG	Ø-a-manaj	b-a-ṃanaj	Ø-a-ṃita
2PL	j-i-manaj	wak-a-ṃanaj	–
3	Ø-Ø-manaj	Ø-Ø-ṃanaj	Ø-Ø-ṃata
REFL	d-a-manaj	d-a-ṃanaj	n-a-ṃita
GF	p-i-manaj	p-i-manaj	–

Tables 2–4 offer a synoptic view of verbs and possessable nouns in OZ, AY and CH, along with Proto-Zamucoan. In Tables 2–4, I omit some details that are not relevant for the present analysis. For instance, Zamucoan languages have nasal harmony, which can involve affixes. For reasons of simplicity, I only indicate oral allomorphs. The AY 1.REAL is in square brackets, because it is disappearing: for this reason, it is not reported in the AY examples below, where I also omit the 2.IRR (which has Ø-prefix). Bound elements separated by a slash occupy the same structural slot and are lexically conditioned.

	OLD ZAMUCO		AYOREO	
	REALIS	IRREALIS	REALIS	IRREALIS
1SG	a-V-ROOT	ṭe/j/s-V-ROOT	[Ø-V-ROOT]	j-V-ROOT
1PL	a-V-ROOT-ko/go/ho	ṭe/j/s-V-ROOT-ko/go/ho	[Ø-V-ROOT-ko/go/ho]	j-V-ROOT-ko/go/ho
2SG	d-a/V-ROOT	Ø-a/V-ROOT	b-a/V-ROOT	Ø-a/V-ROOT
2PL	d-a/V-ROOT-o/jo/ṭeo	Ø-a/V-ROOT-o/jo/ṭeo	wak-a/V-ROOT-j/ṭeo	Ø-a/V-ROOT-j/ṭeo
3	ṭe/t/s/j/Ø-(V-)ROOT	d/t/n/b/Ø-(V-)ROOT	ṭe/t/Ø-(V-)ROOT	
3PL				

Table 2: The verb inflection of Old Zamuco and Ayoreo.

	CHAMACOCO		PROTO-ZAMUCOAN	
	REALIS	IRREALIS	REALIS	IRREALIS
1SG	t/tV _k -V-ROOT		*a-V-ROOT	*tɛ/j/s-V-ROOT
1PL	1PL.INCL j-V-ROOT 1GPL.INCL j-V-ROOT-lo 1PL.EXCL o-j-V-ROOT		*a-V-ROOT-ko	*tɛ/j/s-V-ROOT-ko
2SG	Ø-a/e/V-ROOT		*ba/da-V-ROOT	*a-V-ROOT
2PL	Ø-a/e/V-ROOT-lo		*ba/da-V-ROOT-o/jo	*a-V-ROOT-o/jo
3	tɛ/ts/t/d/Ø-(V-)ROOT	d/t/Ø-(V-)ROOT	*tɛ/t/s/Ø-(V-)ROOT	*d/t/n/Ø-(V-)ROOT
3PL	o- + 3.REAL	o- + 3.IRR		

Table 3: The verbs inflection of Chamacoco and Proto-Zamucoan.

	OLD ZAMUCO	AYOREO	CHAMACOCO	PROTO-ZAMUCOAN
1SG	j/tɛ/s-V-ROOT	j-V-ROOT	p-V-ROOT	*j-V-ROOT
1PL	aj/as/ag-V-ROOT	jok-V-ROOT	(expressed syntactically: free pronoun + 3 rd person)	*aj/as-V-ROOT
2SG	Ø-a/V-ROOT	b-a/V-ROOT	Ø-a/e/V-ROOT	*a-V-ROOT
2PL	aj/as/ag-V-ROOT	wak-a/V-ROOT	(expressed syntactically: free pronoun + 3 rd person)	?
3	d/g/k/Ø-(V-)ROOT	d/g/k/j/p/Ø-(V-)ROOT	d/j/w/k/Ø-(V-)ROOT	*d/g/j/Ø-(V-)ROOT
REFL	d-a/V-ROOT	d-a/V-ROOT	d-a/e/V-ROOT	*da-V-ROOT
GF	p/d/g/k/dV _k /Ø-(V-)ROOT	p/g/k/dV _k /Ø-(V-)ROOT	d/k/dV _k /Ø-(V-)ROOT o- + 3 rd PERSON	*p/d/k/dV _k /Ø-(V-)ROOT

Table 4: The Zamucoan possessive inflection.

Proto-Zamucoan is the starting point for the present analysis. Its paradigmatic structure is the same as OZ and AY. In these languages, the person system distinguishes 1SG, 2SG, 1PL, 2PL and 3rd person. In verbs, the 1st and 2nd person are usually marked by a prefix, the number by a suffix. Although Proto-Zamucoan possessable nouns had very likely a 2PL, it is not possible to reconstruct it.

The thematic vowel is represented as -V- in Tables 2–4, and is in parentheses when some nouns or verbs do not have it depending on their class; V also stands for a copy of the thematic vowel in prefixes such as tV_k- (for the CH verbal 1SG) and dV_k-, which marks the GF in all Zamucoan languages. Example (12) illustrates this mechanism, which may occasionally be irregular: for instance, the 1SG of ‘to cry’, *tik-i-jeɾ* (ex. 10) has thematic vowel /i/, but the prefix *tik-*, instead of **tik-*.

(12)	OZ	AY	CH
	‘bow’	‘bow’	‘spirit, image’
3	Ø-i-ohik	Ø-o-hik	Ø-i-tɛibite
GF	dik-i-ohik	dok-o-hik	dik-i-tɛibite

In the 2nd person of verbs and possessable nouns, */a/, formerly belonging to the prefix, has replaced high thematic vowels (there are however exceptions). This change probably began at a late stage of Proto-Zamucoan and continued in both branches (note that Proto-Zamucoan */a/ corresponds to /a/ or /e/ in CH, cf. Appendix); this detail will not be further discussed here, but one can see this vowel replacement in (11).

For subject and possessor, there is no distinction between 3SG and 3PL, with CH being the only exception (cf. Section 4.3). Typologically, this is the most common neutralization involving person and number (Cysouw 2003: 161), and also characterizes Tupí-Guaraní. (Section 6.2 shows possible traces of contact between Zamucoan and the Tupí-Guaraní languages spoken in the Chaco).

The base of the inflection is the 3.REAL for verbs (or simply the 3rd person when 3.REAL and 3.IRR coincide) and the plain 3rd person for possessable nouns. Both nouns and verbs can be divided into ‘prefixal’, ‘thematic’ and ‘radical’ depending on the structural slots that are filled in their 3rd person, as shown in (13) with verbs whose complete paradigm is in (10).

- (13) PREFIXAL prefix + thematic vowel + root e.g. CH *tɛ-i-raha* ‘to know, to understand’
 THEMATIC Ø + thematic vowel + root e.g. CH *Ø-i-ɛi* ‘to give, to pay’
 RADICAL Ø + Ø + root e.g. CH *Ø-Ø-jeɾ* ‘to cry’

The 3rd person also determines the inflectional class, whose membership finds no explanation in terms of phonological, syntactic or semantic properties. Nouns have just three classes in all Zamucoan languages: prefixal, thematic and radical nouns. All Zamucoan languages also have a class of thematic and radical verbs, but prefixal verbs are divided into several classes, depending on their 3.REAL allomorph. The classes of prefixal verbs are named after the allomorph that characterizes their 3.REAL: for instance, the CH verbs with 3.REAL prefix *tɛ-*, such as *tɛ-i-raha* (10), are called ‘*tɛ*-verbs’. The situation of verb classes in Zamucoan languages is summarized in Table 5.

	PREFIXAL VERBS				THEMATIC VERBS	RADICAL VERBS
OLD ZAMUCO	<i>tɛ</i> -verbs	<i>s</i> -verbs	<i>j</i> -verbs	<i>t</i> -verbs	Thematic verbs	Radical verbs
AYOREO	<i>tɛ</i> -verbs		<i>t</i> -verbs		Thematic verbs (rare)	Radical verbs
CHAMACOCO	<i>tɛ</i> -verbs	<i>ts</i> -verbs (<i>ɛ-</i> , Section 3)	<i>t</i> -verbs	<i>d</i> -verbs	Thematic verbs	Radical verbs
PROTO-ZAMUCOAN	* <i>tɛ</i> -verbs	* <i>s</i> -verbs	* <i>t</i> -verbs		*Thematic verbs	*Radical verbs

Table 5. Verb classes in the Zamucoan languages.

The inflectional class mainly determines the selection of prefixes (excepted the noun’s GF), which in Tables 2–4 are ordered according to their frequency. Except for the above-mentioned 3rd person markers and the GF, there is a one-to-many relationship between the

prefixes in Tables 2–4 and their inflectional classes: for instance, the CH verbs with the 3.REAL prefix *tɛ-* (*tɛ*-verbs) take the 3.IRR allomorph *d-*, as well as thematic verbs. The *tɛ*-verb *d-i-raha* ‘to know, to understand’ has the 3.IRR form *d-i-raha* (ex. 10) and the thematic verb *Ø-i-ɛi* the 3.IRR *d-o-ɛi* (ex. 10). By contrast, the choice of the verbal suffix is usually phonologically-conditioned, but this does not affect CH, which only has the suffix *-lo* (Table 3). This paper does not specifically address inflectional classes, but only mentions them when a class-related change occurs.

2.1 Proto-Zamucoan reconstruction and CH innovations

As one can see from Tables 1–4, the paradigmatic structure of CH person marking underwent remarkable changes as compared with the sister languages. They are summarized in Table 6 and will be described in the rest of this paper.

Change	Took place in	Discussed in
Neutralization of realis and irrealis in the 1 st and 2 nd person	verbs	Section 3
Partial neutralization of the 3.REAL and 3.IRR	verbs	Section 3
Reorganization of some inflectional classes	verbs	Section 3
Development of 3 rd person prefixes via reinterpretation of the root-initial consonant	verbs	Section 4.1
Development of new 3 rd person free pronouns from reflexive and demonstrative pronouns	free pronouns	Section 4.2
Development of the pluralizer <i>o-</i> for the 3PL from the 3PL free pronoun <i>ōr</i>	verbs	Section 4.3
Reinterpretation of the GF allomorph <i>p-</i> as 1SG	possessable nouns	Section 5
Development of a new GF allomorph <i>o-</i> , possibly from the 3PL free pronoun <i>ōr</i> , from the noun <i>os</i> ‘people’ or from the verbal 3PL prefix <i>o-</i>	possessable nouns	Section 5
Replacement of the 1SG by the former 1PL <i>jok</i>	free pronouns	Section 6.1–6.2
Grammaticalization of the 1SG free pronoun <i>jok</i> (< 1PL) to the 1SG prefix <i>tVk-</i>	verbs	Section 6.2
Specialization of 1 st person <i>*j-</i> as 1PL marker and of 1 st person <i>*tɛ-</i> > <i>t-</i> as 1SG marker	verbs	Section 6.2
Loss of the pluralizing suffix <i>*-ko</i> for the 1PL	verbs	Section 6.2
Development of clusivity	free pronouns, verbs	Section 6.1–6.2
Introduction of a new pluralizing suffix <i>-lo</i> from the nominal system in the 2PL	verbs	Section 6.3
Development of a minimal/augmented system with greater plural	free pronouns, verbs	Section 6.4
Development of the 2GPL free pronoun <i>olaklo</i>	free pronouns	Section 6.4
Loss of productivity of the personal inflection	verbs, possessable nouns	Section 7
Loss of the 1PL and 2PL	possessable nouns	Section 7
Loss of personal inflection in many paradigms	possessable nouns	Section 7

Table 6: Changes in the Chamacoco person system.

The presentational strategy of this article might seem unusual at first sight: in historical linguistics, we start from the available data on modern languages and reconstruct the proto-language through the comparative method. Here, for expositional reasons, I go from the proto-language to the modern languages. This is possible, because the reconstruction of Proto-Zamucoan has already been carried out, which allows me to focus on the evolution of the person system in CH. Although I will motivate the most salient aspects of the reconstruction, it is impossible to offer here all details about the reconstruction of the Proto-Zamucoan person system: the reader can find a thorough discussion in Ciucci and Bertinetto (2015, 2017). The recent rediscovery of Chomé’s dictionary of OZ (Ciucci Forthcoming) made it possible to add some details to the Proto-Zamucoan verb system (Ciucci, Forthcoming 2021a) and to identify possessive prefixes that were previously unknown: *k-* for 3rd person, *ag-* for 1PL/2PL and *g-*, *k-* and *dVk-* for GF (cf. Table 4). Chomé (1958 [before 1745]) did not describe them, possibly because of their low frequency. Their presence confirms Ciucci and Bertinetto’s (2017) reconstruction of Proto-Zamucoan possessive inflection. Further studies on Proto-Zamucoan are Bertinetto and Ciucci (2019), and Bertinetto (Forthcoming 2021). The reader with a more general interest in the inflectional morphology of Zamucoan languages can consult Ciucci (2016) and Bertinetto et al. (2019).

The Zamucoan family has two branches: the OZ/AY branch and the CH one. This presents a potential risk for historical reconstruction, because each branch might present a different option, so that, all other factors being equal, it might be impossible to choose between the two options, or the reconstruction would be biased. However, there is almost never a complete divergence between the two branches. Indeed, OZ and AY often differ from each other, and in such cases CH is usually similar to either OZ or AY: this gives us precious indications for historical reconstruction.

When CH differs from both OZ and AY, CH has often innovated. Although this might look like a bias in favor of OZ and AY, there is usually evidence that CH is more innovative. When CH has lost a given feature, it can still display irregular paradigms that preserve a trace of it: we can reconstruct the 1PL suffix **-ko* in Proto-Zamucoan verbs, because this suffix was included in the root of the non-singular 1st persons of some CH verbs, such as ‘to accompany’ (14), which also shows other irregularities, not dealt with here. The reflex of **-ko*, *-kw-*, is in bold (14). Similar examples are shown in Sections 6.1 and 6.3.

(14)	CH
	‘to accompany’
1SG	tok-ō-ja
1PL.INCL	j-u- kw ĩja
1PL.EXCL	o-j-u- kw ĩja
2SG	m-e-ja
2PL	m-e-j-lo
3.REAL	Ø-ĩ-ja
3.IRR	n-o-ja

Language-internal evidence can also be useful. For instance, AY and OZ do not have clusivity, but CH has it. In (14), both the 1PL.INCL and 1PL.EXCL are irregular, having a relic of the same pluralizer **-ko*. This suggests that the 1PL.INCL and 1PL.EXCL come from the same form: in (14) and in Table 3, one can see that the 1PL.EXCL derives from the 1PL.INCL, so that the creation of the 1PL.EXCL is most likely the innovation which gave rise to clusivity. (The development of clusivity in CH is addressed in detail in Section 6.2.) In other cases, the source of the grammaticalization is transparent: OZ and AY do not have the 3PL in verb

inflection, while CH verbs form the 3PL via the pluralizer *o-*, which stems from the 3PL free pronoun *ōr*. Often one can combine different types of evidence: CH clusivity is also explained by language contact, as well as the CH greater plural (Section 6.4) and other innovations in grammar and lexicon. The two branches only present a few cases of divergence in which it is not possible to say which branch innovated. For instance, the 2SG free pronoun is *uwa* in OZ and AY, *owa* in CH: in this case, there is no evidence to say whether Proto-Zamucoan had **owa* or **uwa*, so that one can only reconstruct **V_{back}wa* (Section 6.1).

3 The partial neutralization of realis and irrealis

This section deals with the partial mood neutralization and other minor changes that occurred in Proto-Chamacoco verbs. The irrealis markers replaced the realis ones in the 1st and 2nd person. Such a neutralization of realis and irrealis implies that in CH mood is dependent on person (cf. Aikhenvald and Dixon 1998). The neutralization of realis and irrealis partially also concerns the 3rd person. Indeed, in some verbs the 3.IRR substituted the 3.REAL, giving rise to a new verb class with 3rd prefix *d-* (called *d*-verbs, cf. Table 5). These changes occurred along with the reorganization of other verb classes. In today's CH, there is an ongoing tendency to lose the realis vs. irrealis distinction in the 3rd person, but this time it is the 3.REAL that is replacing the 3.IRR.

Table 7 shows the initial evolution of Proto-Chamacoco verbs. Proto-Zamucoan verbs had a fully-fledged distinction between realis and irrealis, while in Proto-Chamacoco the 1.REAL and 2.REAL were replaced by the 1.IRR and 2.IRR, so that the current CH 1st and 2nd person are diachronically irrealis forms. The irrealis is 'functionally marked' (Dixon 2010: 237), i.e. it occurs in specific syntactic situations (cf. Section 2), with the realis being used in more neutral contexts. The literature offers a wide array of conceptions concerning the notion of 'markedness', to the extent that Haspelmath (2006) suggests avoiding the term altogether. However, if duly accompanied by a qualifying adjective, this notion can retain its place in the linguistics metalanguage. If diachronically the general tendency is for the marked element to be replaced by the unmarked one, the reverse can also happen (Lazzeroni 1987: 50; Campbell 2013: 317–318). Indeed, Bertinetto and Ciucci (2019) noted for Zamucoan several instances of substitution of the functionally unmarked term by the marked one.

	REALIS	IRREALIS
1SG	←	*te/j/s-V-ROOT
1PL	←	*te/j/s-V-ROOT-ko
2SG	←	*Ø-a/e/V-ROOT
2PL	←	*Ø-a/e/V-ROOT-o/jo
3	*te/t/s/Ø-(V-)ROOT	*d/t/n/Ø-(V-)ROOT

Table 7: Partial merger of realis and irrealis in Proto-Chamacoco.³

The replacement of the 1.REAL by the 1.IRR might be explained as follows: the Proto-Zamucoan 1.REAL prefix was **a-*, which formed a vowel sequence with the thematic vowel

³ Some details in Table 7 and the following tables are tentative, because some changes are unrelated, so that their exact sequence is uncertain. For instance, it is not possible to know whether the 2PL suffixes *-o/-jo* were lost before or after mood neutralization in 1st and 2nd person.

(cf. Table 2). AY and CH simplified vowel sequences, so that CH lost **a-* and the 1.REAL had Ø-exponence (as in AY). The replacement of the Ø-marked 1.REAL by the 1.IRR is expected if one considers that Ø-marking in the verb's 1st person is typologically rare (Cysouw 2003: 58–59). Similarly, the AY prefixless 1.REAL is in the process of being replaced by the 1.IRR (cf. Section 2).

Proto-Chamacoco likely inherited a verb class characterized by 3.REAL prefix **s-*, 1.IRR **s-* and 3.IRR **n-* (Table 7); they are called *s-* verbs (Table 5). Table 8 shows that these verbs changed by analogy with the other classes: only 3.REAL prefix **s-* remained and turned into *ε-*. The reconstruction of *s-* verbs is based on the comparison of OZ with traces of these verbs in AY and CH (for more details, see Ciucci Forthcoming 2021a). The shift **/s/ > /ε/* is regularly attested in CH (cf. Appendix).

	REALIS	IRREALIS
1SG	<i>*tɛ/j-V-ROOT</i>	
1PL	<i>*tɛ/j-V-ROOT-ko</i>	
2SG	Ø-a/e/V-ROOT	
2PL	<i>*Ø-a/e/V-ROOT-o/jo</i>	
3	<i>*tɛ/t/ε/d/Ø-(V-)ROOT</i>	<i>*d/t/Ø-(V-)ROOT</i>

Table 8: Subsequent development of Proto-Chamacoco verbal morphology.

Another change to the allomorphs of the 3rd person affected the verbs with 3.REAL **s-* > *ε-*. Proto-Zamucoan 3.REAL **tɛ-* split into *tɛ-* and *ts-* in CH;⁴ their distribution is lexically determined and they characterize two different verb classes (Table 5). The verbs with 3.REAL *ε-* merged with those with 3.REAL *ts-* (the so-called ‘*ts-* verbs’, cf. Table 5) and the distribution of *ts-* and *ε-* changed: *ε-* now occurs if the thematic vowel is /i/ or /u/, *ts-* with the other thematic vowels. Only *ts-* is reported in Table 5, because it is the most frequent allomorph, while *ε-* is a secondary allomorph of the former.

CH also has the exponent *d-* for 3.REAL. While *d-* is the most common allomorph for 3.IRR, 3.REAL *d-* is only found in a small group of verbs with identical 3.REAL and 3.IRR. This can be due to replacement of the 3.REAL by the 3.IRR. The CH verbs with the 3.REAL prefix *tɛ-* (the so-called ‘*tɛ-* verbs’, Table 5) have the 3.IRR allomorph *d-* (Table 3), which can also be reconstructed for this group of verbs in Proto-Zamucoan. The CH verb in (15) has *d-* for both 3.REAL and 3.IRR. Its AY cognate shows that the original 3.REAL prefix was *tɛ-*, which was replaced by 3.IRR *d-* in CH. In other verbs, *d-* for both 3.REAL and 3.IRR is due to the reanalysis of the root-initial consonant as a prefix: this change is dealt with in Section 4.1 (ex. 17).

(15)	AY	CH
	‘to climb, to mount, to ride’ ⁵	‘to go up’
1SG	j-o-ru	tok-o-hir
1PL	j-o-ko	j-o-hir (INCL)
2SG	b-o-ru	Ø-o-hir
2PL	wak-o-tɛo	Ø-o-hir-lo
3.REAL	tɛ-o-ru	d-o-hir

⁴ OZ and AY /tɛ/ regularly correspond to CH /tɛ/ and /ts/ (cf. Appendix).

⁵ The root of AY ‘to climb’ is *-ru-*; this syllable undergoes replacement by plural suffixes.

3.IRR *te-o-ru*

d-o-hir

The neutralization of 3.REAL and 3.IRR in certain verbs did not only happen at an early stage of CH, but is still ongoing. In some paradigms, the 3.REAL can also be used for 3.IRR; an example is the verb in (16).

(16)	CH
	‘to go down, to come down’
1SG	<i>tik-i-ŋimite / tik-i-ŋimite</i>
1PL.INCL	<i>j-i-ŋimite</i>
2SG	<i>Ø-a-ŋimite</i>
2PL	<i>Ø-a-ŋimite-lo</i>
3.REAL	<i>Ø-i-ŋimite</i>
3.IRR	<i>Ø-i-ŋimite / Ø-Ø-tsoŋimite</i>

Among younger speakers, one can note an overgeneralization of the 3.REAL, which is replacing the 3.IRR in all verbs. This phenomenon is the opposite of the substitution of the realis by the irrealis, described above, and is very likely due to decreasing language competence, as an effect of Spanish interference. This suggests that realis and irrealis might be on their way towards full neutralization in CH.

4. The third person

After having addressed the neutralization of realis and irrealis in the verb inflection, this section deals with changes that only concern the 3rd person: the creation of 3rd person prefixes (Section 4.1), the grammaticalization of 3rd person free pronouns (Section 4.2) and the formation of the verb’s 3PL (Section 4.3).

4.1 The emergence of new third-person prefixes in verbs and possessable nouns

The present section discusses how in several instances root-initial consonants were reinterpreted as 3rd person markers. This development concerns: (i) some CH verbs with 3rd person prefixes *d-* and *t-*; (ii) some CH nouns with 3rd person prefixes *k-* and *w-*.

In (17), a CH verb with 3rd prefix *d-* (for both realis and irrealis) is compared with its OZ and AY cognates, whose 3rd person only consists of the root. In OZ and AY, ‘to walk’ belongs to the so-called ‘radical verbs’ (cf. ex. 13 and Table 5), which have no realis/irrealis distinction in the 3rd person. The root-initial /r/ of OZ and AY ‘to walk’ undergoes fortition to /d/ word-initially, that is in the 3rd person. The same occurred in CH ‘to walk’, which was also a radical verb: the root-initial consonant (/r/ > /d/) was reinterpreted as a 3rd person prefix, so that the rest of the paradigm was restructured accordingly.

(17)	OZ	AY	CH
	‘to walk’	‘to walk’	‘to walk’
1SG	<i>a-i-rik (REAL), j-i-rik (IRR)</i>	<i>j-i-rik</i>	<i>tik-i-rk</i>
1PL	<i>a-i-ri-ho (REAL)</i>	<i>j-i-ri-ho</i>	<i>j-i-rk (INCL)</i>
2SG	<i>d-a-rik (REAL)</i>	<i>b-a-rik</i>	<i>Ø-e-rk</i>

2PL	d-a-ri-teo (REAL)	wak-a-ri-teo	Ø-e-rk-i-lo ⁶
3.REAL	Ø-Ø-dik	Ø-Ø-dik	d-i-rk
3.IRR	Ø-Ø-dik	Ø-Ø-dik	d-i-rk

The same mechanism also generated new CH verbs with 3rd person prefix *t-*, called ‘*t*-verbs’ (18) (cf. Table 5). Actually, all Zamucoan languages have a class of *t*-verbs, in which 3.REAL and 3.IRR overlap. However, *t*-verbs are more numerous in CH than in OZ and AY, also owing to the reinterpretation of root-initial /t/ as a 3rd person prefix (18).

(18)	OZ	AY	CH
	‘to yawn, to open the mouth’	‘to yawn’	‘to yawn, to lick’
1SG	a-i-tiboḥa (REAL), j-i-tiboḥa (IRR)	j-i-tiboḥa	tik-i-buḥu
1PL	a-i-tiboḥa-go (REAL)	j-i-tiboḥa-go	j-i-buḥu (INCL)
2SG	d-a-tiboḥa (REAL)	b-a-tiboḥa	Ø-e-buḥu
2PL	d-a-tiboḥa-o (REAL)	wak-a-tiboḥa-jo	Ø-e-buḥu-lo
3.REAL	Ø-Ø-tiboḥa	Ø-Ø-tiboḥa	t-i-buḥu
3.IRR	Ø-Ø-tiboḥa	Ø-Ø-tiboḥa	t-i-buḥu

The creation of *t*-verbs in CH is, however, less frequent than previously assumed. Ciucci and Bertinetto (2015: 58, ex. 98–99) compared the AY and CH 3rd persons of the verbs in (19). Considering the larger percentage of *t*-verbs in CH, the most straightforward hypothesis was that *titei* and *titirãḥa* in (19) were the result of innovation, with the 3rd person prefix *tə-* (as in AY *teutei* and *teutiraha*) turning into *t-* in CH. However, new historical data available for OZ (Ciucci Forthcoming) show that this is not the case: the 3rd person prefix *t-* is also in OZ and can thus be reconstructed in Proto-Zamucoan. This suggests a reversal of the change, indicating that in these verbs Proto-Zamucoan **t-* was replaced by *tə-* in AY. This occurred because most AY verbs have the 3rd person prefix *tə-* and thus exerted an attraction on the other verbs.

(19)	OZ	AY	CH	
3.REAL/IRR	t-u-tei	tə-u-tei	t-i-tei	‘to defecate’
3.REAL/IRR	t-u-tirã	tə-u-tiraha	t-i-tirãḥa	‘to spit’

The reinterpretation of the root-initial consonant as a 3rd person prefix also took place in possessable nouns, although this occurs less frequently than in verbs. In (20), the CH 3rd person prefix *k-*, which cannot be reconstructed for Proto-Zamucoan (Table 4), corresponds to the initial /k/ of the OZ 3rd person and the AY GF (in bold); AY and OZ /g/ undergoes fortition into /k/ in the 3rd person, when it is in word-initial position (another instance of fortition is in ex. 17).

(20)	OZ	AY	CH
	‘knee’	‘knee’	‘knee’
1SG	j-i-gatade	j-i-gatade	p-i-tita
2SG	Ø-a-gatade	b-a-gatade	Ø-e-tita
3	Ø-Ø- katade	Ø-i-gatade	k -e-tita
REFL	d-a-gatade	d-a-gatade	d-e-tita

⁶ In the CH 2PL person *Ø-e-rk-i-lo*, /i/ is an epenthetic vowel.

The rare CH 3rd person prefix *w-* also derives from reanalysis of the root-initial consonant in nouns such as (21). In (21), one has to consider that CH /w/ often corresponds to OZ and AY /g/ (cf. Appendix).

(21)	AY	CH
	‘hip’	‘hip’
1SG	j-o-goro	p-o-ɰa
2SG	b-o-goro	Ø-o-ɰa
3	Ø-o-goro	w-o-ɰa
REFL	d-o-goro	d-o-ɰa

The reanalysis of the root-initial consonant as a 3rd person prefix in CH (ex. 17–18, 20–21) is the opposite of what is predicted by Watkins’ Law. According to Watkins (1962: 90–96), there is a universal tendency for the 3rd person to have Ø-exponent, so that 3rd person affixes are naturally reinterpreted as a part of the root or stem. The resulting Ø-marked 3rd person is the new base of the paradigm, which is accordingly remodeled. Paradigm restructuring by analogy with the 3rd person also took place in CH, but with the difference that the CH verbs in (17–18) and (20–21) created a new prefix. These data indirectly confirm the results of the statistical study by Bickel et al. (2015): although Watkins’ Law is useful to describe changes that have occurred in single languages, it does not express a cross-linguistic tendency. Indeed, Seržant (this issue) mentions other examples that contradict Watkins’ Law. Finally, the mechanisms of change are not the same throughout the Zamucoan family: while examples (17–18) and (20–21) are antithetic to Watkins’ Law, the latter is observed in the development of some OZ and AY verbal paradigms (Ciucci Forthcoming 2021a).

4.2 The grammaticalization of third-person free pronouns

The present section deals with the grammaticalization of demonstrative pronouns and of the 3rd person reflexive to 3rd person free pronouns in CH.

OZ and AY lack a dedicated 3SG free pronoun and employ a demonstrative, a situation inherited from Proto-Zamucoan (Table 1). The lack of a specific 3SG pronoun is rather common (Siewierska 2004; Jacquesson 2008, among others). For the 3SG, CH can use *witei* (M) and *wate* (F), stemming from Proto-Zamucoan **wite* (M) and **wate* (F). Although CH *witei* and *wate* were originally demonstratives, they now behave as both articles and free pronouns; the same applies to their plural *wir*, common to both genders (see Brown 1985: 311 for the polysemy between 3rd person and article worldwide).

The following examples illustrate the functions of *witei*, *wate* and *wir*: they can be the only pre-modifier of the NP, like *wir* in (22), but they do not indicate spatial deixis, unlike the demonstrative *nahu* ‘these’ in (23). In (24), *witei* precedes the demonstrative *ese* ‘that’, while in (25) *wir* is used as 3PL pronoun.

(22)	Chamacoco				
	<i>wir</i>	Ø-imah-o	o-ε-u:	<i>wir</i>	d-ek-i
	the.M.PL	3-enemy-M.PL	PL-3.REAL-kill	the.M.PL	3-grandfather-M.PL
	<i>wiε=ni</i>				
	poor.M.PL=RETR				
	‘The enemies killed his/her poor grandfathers.’				

- (23) Chamacoco
 awr, ite Ø-ent nahu p-akili-jo
 now EMPH 2SG-listen these.M 1SG-suggestion-M.PL
 ‘Now, listen to these suggestions of mine.’
- (24) Chamacoco
 Ø-ōya witei ese pi-te berz-t!
 2SG-bring the.M.SG that.M stick-M.SG long-M.SG
 ‘Bring me that long stick!’
- (25) Chamacoco
 wir o-te-iwāha u: popi-Ø=ke par_xe
 3PL PL-3.REAL-sell the.PL surubi.fish-F.PL=RETR SUB
 o-t-ija okijut-e
 PL-3-buy type.of.bread-M.PL
 ‘They sell the surubi fish in order to buy bread.’

To sum up, CH went further in the grammaticalization of the 3rd person, for which demonstratives are cross-linguistically the most common source (Heine and Song 2011: 595).

CH has also introduced a more specific 3SG free pronoun, *ir(e)*, which comes from the homophonous 3rd person reflexive pronoun (final /e/ optionally drops). CH *ir(e)* corresponds to the reflexive pronouns =*re* / *ir(e)* (3rd person) in OZ and =*re* (3SG) in AY, so that one can reasonably reconstruct a Proto-Zamucoan 3rd person reflexive pronoun *=*re*. Like demonstratives, reflexives are a common source for 3rd person (Heine and Song 2011: 598).

CH initial /i/ is probably a prothesis allowing *ir(e)* to be a phonological word, rather than a clitic as in OZ and AY. Indeed, in Zamucoan languages phonological words cannot begin with a rhotic. A similar example is the Spanish adjective *redondo* ‘round’, which was borrowed and adapted as *irnonto* ‘round’ in CH: here /i/ is necessary to avoid word-initial /r/. In CH, one can also find /i/ as a dummy vowel in many instances of epenthesis (cf. ex. 17, footnote 6) and proparalepsis (Ciucci 2020b).

CH *ir(e)* is more frequently used as a personal pronoun than *witei/wate*. Unlike *ir(e)*, which originally was only a reflexive pronoun, *witei* and *wate* are never employed as reflexive pronouns.

4.3 The formation of the third-person plural

CH is the only Zamucoan language to have a dedicated 3PL in verb inflection. The 3PL is obtained through the pluralizer *o-*, which stems from the CH 3PL free pronoun *ōr*. In both realis and irrealis, the prefix *o-* precedes the 3rd person to form the 3PL, as one can see in (26) with verbs belonging to different inflectional classes (cf. Table 5). This innovation is restricted to verbs, since there is no 3PL form in the possessive inflection.

(26)	CH	CH	CH	CH
	‘to know, to understand’	‘to end, to finish’	‘to shout, to yell’	‘to be ashamed’
3.REAL	te-i-raha	ts-o-wa	t-i-bite	Ø-Ø-po:k
3.IRR	d-i-raha	d-o-wa	t-i-bite	Ø-Ø-po:k
3PL.REAL	o-te-i-raha	o-ts-o-wa	o-t-i-bite	o-Ø-Ø-po:k
3PL.IRR	o-d-i-raha	o-d-o-wa	o-t-i-bite	o-Ø-Ø-po:k

There are three reasons to consider the CH 3PL an innovation: (i) there are no traces of verbal 3PL or its marker in either OZ or AY; (ii) the 3PL is not obtained by adding a prefix to the stem, but derives from another person (in this case the 3rd person) so that, if the 3rd person is non-zero marked, the 3PL displays a sequence of two prefixes (ex. 26), which is only documented in innovative CH forms (cf. Figure 1); (iii) the origin of the pluralizer *o-* is transparent: indeed, its source is the 3PL free pronoun *ōr* corresponding to OZ and AY *ore*, from Proto-Zamucoan **ore* (3PL).

Considering that, cross-linguistically, person-marking prefixes are expected to precede number affixes (Trommer 2003; Mayer 2009), the CH 3PL inflection is unusual. From CH, the pluralizer *o-* spread to Kadiwéu, a neighboring Guaycuruan language, where *o-* precedes the 3(SG) prefix *y- /j-/* in the 3PL subject of transitive verbs with a 3rd person object: e.g. *o-y-i-gidi* (PL-3A-EPENTH-answer) ‘they answered him/her/them’ (Nevins and Sandalo 2010), with the same sequence pluralizer + personal marker as in CH. For more details on this case of contact, see Ciucci (2014, 2020a).

In CH, the morphological expression of the verbal 3PL depends on the following animacy hierarchy: human > big animal / medium-sized animal > small animal / inanimate. Humans require the 3PL, which is optional for big and medium-sized animals. By contrast, the 3PL marker is not available if the subject is a small animal or is inanimate. Cross-linguistically, the expression of number often interacts with animacy: humans and higher animates are more likely to have number agreement than lower-level categories (Smith Stark 1974; Corbett 2000; Dixon 2012: 70–71; Aikhenvald 2015: 114). Cross-linguistically, optional number marking is usually found on the NP, but it is rare on verbs and pronouns, where it is expressed by a regular morphological process (Dixon 2012: 52): this is precisely what occurs with higher animates in the CH verbal 3PL.

5 The indefinite person

In the Zamucoan family, many possessable nouns also have a form for indefinite or unspecified possessor, the so-called ‘generic form’ (GF) (see ex. 9, Section 2). In Zamucoan languages, some GFs and 3rd person allomorphs are identical, which indicates that in the past one of the two forms replaced the other. In CH, the most common GF allomorph, *p-*, substituted the original 1SG prefix **j-* and, as a consequence, most possessable nouns no longer have a dedicated GF. CH has created a new GF allomorph *o-*, which comes from the development of a construction employed to express indefinite possessor or from the verbal 3PL prefix *o-*.

As one can see in Table 9 (extracted from Table 4 and repeated here for clarity), the GF displays noteworthy morphological variability in the three Zamucoan languages, where all GF allomorphs are lexically determined. The most widespread GF prefix is *p-*, but is not found in any CH GF, which correlates with the loss of the GF in most CH possessable nouns: only about twenty GFs are documented in CH (Ciucci 2016: 395–396) and each CH GF allomorph occurs on fewer nouns than its OZ and AY cognates.

	OLD ZAMUCO	AYOREO	CHAMACOCO	PROTO-ZAMUCOAN
1SG	j/te/s-V-ROOT	j-V-ROOT	p-V-ROOT	*j-V-ROOT
3	d/g/k/Ø-(V-)ROOT	d/g/k/j/p/Ø-(V-)ROOT	d/j/w/k/Ø-(V-)ROOT	*d/g/j/Ø-(V-)ROOT
GF	p/d/g/k/dVk/Ø-(V-)ROOT	p/g/k/dVk/Ø-(V-)ROOT	d/k/dVk/Ø-(V-)ROOT	*p/d/k/dVk/Ø-(V-)ROOT

			o- + 3 rd PERSON	
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Table 9: Generic form, first singular and third person in Zamucoan possessable nouns.

Table 9 also shows the 1SG and 3rd person, which in the past interacted with the GF. In Zamucoan, the 3rd person and the GF display some identical allomorphs, which results from a possible reinterpretation of the GF as a 3rd person (or vice versa) already in the case of Proto-Zamucoan **d-*. Typologically, indefinite pronouns can evolve into 3rd person pronouns (Mithun 1993; Cristofaro 2013; Aikhenvald 2018a), and this indeed occurred with the AY 3rd person prefix *p-*, originally a GF.⁷

The other homophonous GF and 3rd person prefixes in the Zamucoan family are *g-* and *k-*. One can reconstruct **g-* in the Proto-Zamucoan 3rd person and **k-* in the Proto-Zamucoan GF, for reasons discussed in Ciucci and Bertinetto (2017: 318–324). This suggests the following hypotheses: (i) Proto-Zamucoan **k-* (GF) was partly reinterpreted as 3rd person prefix in OZ and AY. Note that the CH 3rd person allomorph *k-* stems from the reinterpretation of the root-initial vowel (Section 4.1, ex. 20). (ii) Proto-Zamucoan **g-* (3rd person) partly turned into a GF allomorph in OZ and AY. However, both hypotheses are doubtful, because *g-* and *k-* have low frequency in the Zamucoan languages, which affects their reconstruction in Proto-Zamucoan. The impossibility to reconstruct **g-* for the GF and **k-* for the 3rd person might just depend on the scarcity of their reflexes in the modern languages.

The Proto-Zamucoan GF prefix **p-* turned into a 1SG marker in CH, replacing the original 1SG **j-*. There is indirect evidence for this: indeed, most OZ and AY possessable nouns have the GF allomorph *p-*, which is not found in CH, where most possessable nouns lack the GF. The change of *p-* from GF to 1SG explains the scarcity of GFs in CH and why 1SG *p-* is only documented in this language. In addition, the Proto-Zamucoan 1SG prefix **j-* is found in the very first data collected on CH. Between 1817 and 1835, the Austrian explorer Johann Natterer transcribed the form <ioté> for ‘mother’ (Adelaar p.c.; on Natterer, see Adelaar and Brijnen 2014). This form can be interpreted as *j-o-te* (1SG) and compared with the present-day irregular form *Ø-o-te* (1SG) ‘mother’. Evidently, *j-* in Natterer’s data is the original 1SG prefix, but it was already absent in Boggiani’s data (1894), where one can instead observe nouns with the 1SG prefix *p-*. The prefix *j-* disappeared before the turn of the 19th century, but we do not know how long before: even though it was documented in the first half of the 19th century, it is possible that it was already a relic that had been preserved in a high-frequency word.

Typologically, a possible development path for indefinite person markers is to turn into 1PL markers (Chafe 1990; Mithun 1991; Kuteva et al. 2019). A well-known example is the French indefinite pronoun *on*, which has replaced the 1PL pronoun *nous* in non-standard contemporary French. In some Arawak languages, for instance, reflexes of Proto-Arawak **pa-* turned from impersonal to 1PL (Wakerena of Xié) or 1PL.INCL (Tariana, Baré), while in other Arawak languages **pa-* marks the 3rd person (Aikhenvald 2018a). There is no evidence to say that CH *p-* turned into a 1PL and then into a 1SG marker, but this is not impossible, since something similar occurred in CH free pronouns, where the 1SG *jok* is ostensibly a former 1PL pronoun (see Section 6.1). However, it is hard to compare the pathway leading to the CH 1SG with other languages, since the typological literature offers scarce information on the origin of the 1SG (Heine and Song 2011: 610), and in this sense the CH development (GF > 1SG) offers new data for cross-linguistic comparison.

⁷ Also in ‘knee’ (ex. 20, Section 4.1), the original AY 3rd person, *Ø-Ø-katade*, turned into the GF; indeed, the 3rd person of ‘knee’ is *Ø-Ø-katade* in OZ and *k-e-tita* in CH. These data also indicate that the current AY 3rd person *Ø-i-gatade* is an innovation.

The reinterpretation of *p-* as a 1SG has left a gap in the GF. In addition, many CH nouns have lost their possessive inflection (Section 7, ex. 38–40), so that only a few CH nouns still have the GF. The weakening of the GF is also evident in syntax. In principle, a GF should not co-occur with a possessor within an NP: for instance, in CH one cannot say **jok* (1SG) *o-Ø-Ø-bitε* (GF-Ø-Ø-job) ‘my job’. However, some CH GFs permit the juxtaposition of possessor and GF-marked possessed: for instance, *jok* (1SG) *k-u-rkite* (GF-V-hammock) ‘my hammock’ is equivalent to *p-u-rkite* (1SG) ‘my hammock’. In other words, the syntactic behavior of *k-u-rkite* (GF) ‘hammock’ no longer coincides with that of a typical GF but with that of the unique form of a non-possessable noun.

Despite the severe weakening of the GF, CH shows an innovation that contrasts with this general trend. Indeed, the language has a new type of GF, consisting of the prefix *o-* added to the 3rd person: e.g. *j-o-ni:t* (3rd person) → *o-j-o-ni:t* (GF) ‘spirit master’;⁸ *Ø-Ø-ṃartita* (3rd person) → *o-Ø-Ø-ṃartita* (GF) ‘ring’. This new GF is homophonous with the innovative CH verbal 3PL marker (Section 4.3); in fact, the verbal 3PL can sometimes refer to impersonal subjects (this use is however infrequent). The GF marker *o-* was possibly introduced to fill the gap left by the reinterpretation of *p-* as 1SG, but the new GF currently only involves a few nouns.

The GF-related change described so far can be seen in (27): the OZ and AY GF of ‘food’ are marked by *p-* (in bold), which in CH is the 1SG prefix.⁹ The initial consonant of the root, /b/, undergoes word-initial fortition to /p/ in the 3rd person, as in AY *poti* and CH *poεt*. Interestingly, /p/ is maintained in the CH GF *opoεt*, although the bilabial is in intervocalic position, which is further evidence that the GF derives from the 3rd person.

(27)	OZ	AY	CH
	‘food’	‘food’	‘food’
1SG	j-i-bos-	j-i-boti	p -o-biet
2SG	Ø-a-bos-	b-a-boti	Ø-a-biet
3	[no data available]	Ø-Ø-poti	Ø-Ø-poεt
REFL	d-a-bos-	d-a-boti	d-a-biet
GF	p -i-bos-	p -i-boti	o-Ø-Ø-poεt

The reasons to say that the GF prefix *o-* is an innovation are analogous to those pointed out for 3PL *o-* (Section 4.3): (i) GF *o-* is not found in the other Zamucoan languages; (ii) while in all Zamucoan languages the prefixes of possessable nouns are always added to the stem, *o-* is added to the 3rd person, which indicates that *o-* entered the person system at a later stage.

It is also possible to explain the pathway of grammaticalization leading to the GF marked by *o-*. Indeed, in the absence of a GF, the unspecified possessor is expressed by two constructions. The 3rd person can be preceded by either (i) the 3PL free pronoun *ōr* or (ii) the noun *os*, a reduced form of *oso* ‘people’. One can say, for instance, *ōr* (3PL) *Ø-a-kĩre* (3-V-hair) ‘their hair, hair in general’; *os* (people) *Ø-a-kĩre* (3-V-hair) ‘the hair of the people, hair in general’. The 3PL *ōr* can convey impersonal meaning, and ambiguity may arise between 3PL and impersonal possessor. By contrast, the construction with *os* seems more specific for impersonal possessor. Boggiani (1894) systematically reports *os* + 3rd person to refer to body parts in general, while in OZ and AY a number of body parts employ a GF to convey this

⁸ The existence of the GF of *joni:t* might look unusual if one does not consider the meaning of the possessive inflection of this noun: if the possessor is human, it refers to the person who met the spirit master; if the possessor is an animal, it is protected by the spirit master.

⁹ Since the few inflected forms of ‘food’ documented in OZ do not occur with the same nominal suffix, for simplicity reason I have omitted the suffix in (27). In the CH paradigm of ‘food’, the root vowel can reduce to /i/.

meaning. The presence of *os* + 3rd person in Boggiani confirms that, at that stage (shortly after the first contact with the Western world in 1885) the GF was already largely lost. The innovative GF prefix *o-* stems from either *os* or *ōr*, but it is hard to establish which one is the actual source. On the one hand, ‘people’ is typologically a common source for indefinite person (Mithun 1993: 332; Kuteva et al. 2019: 239–240). On the other hand, the grammaticalization *ōr* > *o-* is already documented in the verbal 3PL (Section 4.3); based on these data, one may also wonder whether 3PL *o-* stems from *os*: this is unlikely, because, when the 3PL subject is not lexically expressed, *ōr* serves to disambiguate the subject, while *os* never has this function. Finally, although it is less likely, one cannot exclude the possibility of a morphomic reuse of verbal 3PL *o-* as a GF prefix.¹⁰

6 The first person in verbs and free pronouns

This section focuses on those changes that occurred in the 1st person of free pronouns and verbs. I will first describe the development of free pronouns for speech act participants (SAP) in Proto-Chamacoco (Section 6.1), then I address clusivity (Section 6.2), the 2PL of verbs (Section 6.3) and the greater plural in verbs and free pronouns (Section 6.4).

6.1 The free pronouns for speech act participants in Proto-Chamacoco

Before the introduction of clusivity and the greater plural in the person system, SAP free pronouns reduced the number of forms in Proto-Chamacoco. In this process, the original 1SG was replaced by a variant of the 1PL and some irregular phonological changes took place in the 1PL and 2PL.

Table 10 (extracted from Table 1 and repeated here for clarity) shows the SAP free pronouns in the Zamucoan family. Two general features emerge: (i) SAP pronouns have a shorter and a longer form, which adds an initial vowel;¹¹ (ii) The plural of SAP pronouns differs from the singular because of final /k/, similar to the Proto-Zamucoan verbal pluralizer **-ko* (Table 3). Since these characteristics are found in almost all forms, they can be reconstructed in Proto-Zamucoan.

	OLD ZAMUCO	AYOREO	CHAMACOCO	PROTO-ZAMUCOAN
1SG	ju uju	ju uju	jok	*jV _{back} *V _{back} jV _{back}
1PL	jok ujok	jok ujok	1PL.INCL ejok 1GPL.INCL ejoklo 1PL.EXCL ōrjok	*jV _{back} k *V _{back} jV _{back} k
2SG	wa uwa	wa uwa	owa	*wa *V _{back} wa
2PL	wak uwak	wak uwak	PL olak GPL olaklo	*wak *V _{back} wak

Table 10: SAP free pronouns in Zamucoan.

¹⁰ The term ‘morpheme’ was introduced by Aronoff (1994). Morphemes can be defined as “systematic morphological identities that do not map onto morphosyntactic or semantic natural classes” (Herce 2020: 2).

¹¹ According to Chomé (1958), the OZ longer forms are used as subjects, the shorter forms as objects. In AY, the longer forms function as both subjects and objects, the shorter ones as objects (Morarie 1980). The longer forms of AY pronouns are used for emphasis (Bertinetto 2014: 382).

Table 11 shows the putative evolution of Proto-Chamacoco SAP pronouns (the changes introduced in each stage are in bold). The pronominal forms in Stage II are also in present-day CH, but the system still lacked clusivity and the greater plural, to which I turn in Sections 6.2–6.4.

	PROTO-ZAMUCOAN	PROTO-CHAMACOCO STAGE I	PROTO-CHAMACOCO STAGE II
1SG	*jV _{back} *V _{back} jV _{back}	*jV _{back} ? *ojV _{back} ?	jok
1PL	*jV _{back} k *V _{back} jV _{back} k	*jok *ojok > *ejok	ejok
2SG	*wa *V _{back} wa	*wa *owa	owa
2PL	*wak *V _{back} wak	*wak *owak	olak

Table 11: Putative evolution of SAP free pronouns in Proto-Chamacoco.

In Zamucoan languages, SAP pronouns have shorter and longer forms. The latter have the initial vowel /o/ in CH and initial /u/ in OZ and AY (Table 10). Since this is not a regular correspondence (cf. Appendix), it is impossible to reconstruct whether Proto-Zamucoan had */o/ or */u/, and which branch innovated (cf. Section 2.1): suffice it to say that at an initial stage (Stage I, Table 11) the longer forms of Proto-Chamacoco free pronouns had initial */o/.

The CH 1PL.INCL *ejok* corresponds to OZ and AY 1PL *ujok* (Table 10), so that *ejok* was originally the longer form of the 1PL (Table 11). In CH, longer forms have the initial vowel /o/, with *ejok* being the only exception: for this reason, one can surmise that **ojok* > *ejok* (Stage I). Here it is necessary to posit an *ad hoc* change */o/ > /e/, of which there are no other instances in CH (cf. Appendix). Such a change has two possible explanations: (i) dissimilation of the first of the two */o/ of **ojok* (> *ejok*); (ii) assimilation of the */o/ of **ojok* to the following /j/.

As already noted, the plural forms of SAP pronouns have final /k/ (Table 10). The only exception is the CH 1SG *jok*, which corresponds to the shorter form of the OZ and AY 1PL pronoun *jok*. This suggests that in CH the shorter form of the 1PL pronoun replaced the 1SG (Stage II), while **ojok* > *ejok* remained the only 1PL pronoun. The replacement of the 1SG by the 1PL in CH might have been originated by a special use of the 1PL. Indeed, cross-linguistically the 1PL can be employed as a plural of majesty or, conversely, indicate modesty or respect (Siewierska 2004: 216–221). It is, however, impossible to ascertain whether the reuse of *jok* as 1SG was due to social deixis, because there is no information on the CH society at that time. Regardless of its specific causes, the change from 1PL to 1SG is the most common one in Bates' database of person marking referent shifts (Bates, this issue).

The reconstruction of the original CH 1SG free pronoun is uncertain, because none of its forms has remained in the language, so that we do not know whether its last vowel was */o/ or */u/.

In Zamucoan languages, the only SAP pronouns that do not have both a shorter and a longer form are the CH 2SG *owa* and 2PL *olak*, whose forms correspond to the longer forms

uwa (2SG) and *uwak* (2PL) of OZ and CH (Table 10). Since also the original CH 1PL had a longer and a shorter form, one can surmise that this was a characteristic of all Proto-Zamucoan SAP free pronouns and that the CH 2nd person pronouns lost the shorter forms.

Finally, in the 2PL **owak*, **/w/* underwent fortition into */l/*. The reason to reconstruct **owak* instead of **olak* in Proto-Zamucoan is that */l/* is a phonological innovation of CH (cf. Appendix). The change **/w/ > /l/* is unique in the available data for CH. A similar case of fortition concerns the CH glide */j/*, which turns into */l/* when contiguous to */a/*, as in some 2nd person forms: e.g. *Ø-i-jehet* (3.REAL) ‘s/he stands’ → *Ø-a-lehet* (2SG) ‘you stand’; *Ø-i-jertε* (3rd person) ‘his/her/their place’ → *Ø-a-lertε* (2SG) ‘your place’. However, if one surmises that also the glide */w/* underwent fortition next to */a/*, it is not possible to explain why */w/* is preserved in *owa* (2SG). Another hypothesis is that *owa* and *olak* differentiated, because in CH the final consonant is often dropped, hence the need to distinguish **owak* (2PL) > **owa* from *owa* (2SG): also this reasoning is speculative, because we do not know the relative chronology of the phenomena involved.

6.2 The development of clusivity

After having discussed the initial changes involving SAP free pronouns, here I focus on the 1st person. In verb inflection, there was initially a reorganization of the 1st person allomorphs, which correlates with the loss of the pluralizing suffix **-ko* (1PL): the Proto-Zamucoan 1st person allomorph **tε-* turned into *t-* and its use was restricted to the 1SG, while 1st person **j-* became the 1PL marker. At the same time, the 1SG free pronoun *jok* (originally a 1PL) grammaticalized to a new verbal 1SG prefix. Then, the 1PL of verbs and free pronouns was reinterpreted as 1PL.INCL, while the 1PL.EXCL originated. I will provide evidence that clusivity was most likely borrowed from a Tupí-Guaraní language spoken in the Chaco.

Before addressing the development of clusivity in CH, it is necessary to compare the CH verbal 1st person with OZ and AY in order to discuss the relevant aspects of Proto-Zamucoan reconstruction (Table 12).

	OLD ZAMUCO	AYOREO	CHAMACOCO	PROTO-ZAMUCOAN
1SG.REAL	a-V-ROOT	[Ø-V-ROOT]	t/tVk-V-ROOT	*a-V-ROOT
1SG.IRR	tε/j/s-V-ROOT	j-V-ROOT		*tε/j/s-V-ROOT
1PL.REAL	a-V-ROOT-ko/go/ho	[Ø-V-ROOT-ko/go/ho]	j-V-ROOT (1PL.INCL) j-V-ROOT-lo (1GPL.INCL)	*a-V-ROOT-ko
1PL.IRR	tε/j/s-V-ROOT-ko/go/ho	j-V-ROOT-ko/go/ho	o-j-V-ROOT (1PL.EXCL)	*tε/j/s-V-ROOT-ko

Table 12: The verbal 1st person in Zamucoan languages.

As noted in Section 3, the CH 1.REAL was replaced by the 1.IRR: for this reason, I do not consider here the 1.REAL, whose reconstruction in Proto-Zamucoan is made possible by the comparison of OZ and AY with some CH exceptions that are discussed in Ciucci and Bertinetto (2015: 69–70).

OZ has three allomorphs for 1.IRR, whose distribution depends on the verb class: *tε-* is found in verbs with 3.REAL prefix *tε-* (*tε*-verbs), *s-* in verbs with 3.REAL prefix *s-* (*s*-verbs) and

j- in the other verb classes (see Table 5, Section 2). I leave apart *s-*, because *s*-verbs are lost in AY and CH (cf. Section 3 for more details). The AY 1.IRR only preserves *j-*, which is found in all CH verb classes, but marks the 1PL.INCL and the forms derived from the latter, i.e. the 1PL.EXCL and the 1GPL.INCL.

In Proto-Zamucoan, the 1PL was obtained by adding the suffix **-ko* to the 1SG. This mechanism is no longer preserved in the CH 1st person, but there are irregular verbs that preserve reflexes of this suffix, so that one can reconstruct **-ko* in Proto-Zamucoan. An example of this is ‘to go’ (28). Both AY and CH have the pluralizer *-ko*. Note that ‘to go’ underwent regularization in OZ, where the verb also replaced *-ko* with the allomorph *-go*. The latter suffix cannot be reconstructed in Proto-Zamucoan. Other reflexes of **-ko* are in CH ‘to accompany’ (14), Section 2.1, and ‘to leave’ (33), Section 6.3.

(28)	OZ	AY	CH
	‘to go’	‘to go’	‘to go’
1SG	<i>a-i-no</i> (REAL) <i>j-i-no</i> (IRR)	<i>j-i-hi</i> / <i>ji</i>	<i>tak-a-ha</i>
1PL	<i>a-i-no-go</i> (REAL) <i>j-i-no-go</i> (IRR)	<i>j-i-ko</i>	<i>j-u-ko</i>

This and other CH exceptions indicate that the CH 1PL.INCL was the original 1PL, as already seen in free pronouns. They also show that the same 1st person prefix, such as *j-*, was used for both singular and plural; **-ko* possibly disappeared in CH because it lost its functional justification when *j-* specialized for 1PL and spread to all verb classes.

The CH 1SG has two allomorphs, *t-* and *tVk-*. Their distribution depends on the verb class: *t-* is mostly found with *tɛ*-verbs and *ts*-verbs (which historically come from *tɛ*-verbs, see Section 3), *tVk-* in the other verb classes. These prefixes have thus the same distribution as OZ *tɛ-* (1.IRR in *tɛ*-verbs) and *j-* (1.IRR in the remaining verbs): as illustrated in (29) and (30), which compare the 1SG and the 3.REAL of some OZ and CH verbs. These correspondences (in bold in 29–30) invite the hypothesis that CH *t-* (1SG) and OZ *tɛ-* (1.IRR) are reflexes of the same 1.IRR prefix. By contrast, CH *tVk-* is found in no other Zamucoan language, and it is very likely a CH innovation that has replaced another allomorph, most likely *j-*, which became a 1PL prefix.

(29)	OZ	CH	OZ	CH
	‘to know, to understand’	‘to know, to understand’	‘to end, to finish’	‘to end, to finish’
VERB CLASS	<i>tɛ</i> -verbs	<i>tɛ</i> -verbs	<i>tɛ</i> -verbs	<i>ts</i> -verbs
1SG	<i>a-i-raha</i> (REAL) <i>tɛ-i-raha</i> (IRR)	<i>t-i-raha</i>	<i>a-u-ena</i> (REAL) <i>tɛ-u-ena</i> (IRR)	<i>t-i-ŋa</i>
3.REAL	<i>tɛ-i-raha</i>	<i>tɛ-i-raha</i>	<i>tɛ-u-ena</i>	<i>ts-i-ŋa</i>

(30)	OZ	CH	OZ	CH
	‘to yell’	‘to shout, to yell’	‘to be ashamed’	‘to be ashamed’
VERB CLASS	<i>t</i> -verbs	<i>t</i> -verbs	radical verbs	radical verbs

1SG	a-i-bit (REAL)	tik -i-bite	a-i-pok (REAL)	tik -i-po:k
	j -i-bit (IRR)		j -i-pok (IRR)	
3.REAL	t-i-bit	t-i-bite	Ø-Ø-pok	Ø-Ø-po:k

After having discussed the reconstruction of the Proto-Zamucoan verbal 1st person and the innovations that have taken place in CH, one can formulate a hypothesis concerning the evolution of 1st person marking in CH free pronouns and verbs before the introduction of clusivity (Table 13).

		FREE PRONOUNS	VERBS
STAGE I	1SG	*ojV _{back} / *jV _{back}	*tɛ/j-V-ROOT
	1PL	ejok / jok	*tɛ/j-V-ROOT-ko
STAGE II	1SG	jok	*t/j-V-ROOT
	1PL	ejok	*t/j-V-ROOT-ko
STAGE III	1SG	jok	*t/jV k -V-ROOT
	1PL	ejok	*j-V-ROOT-ko
STAGE IV	1SG	jok	t/tV k -V-ROOT
	1PL	ejok	j-V-ROOT

Table 13: Possible development of person marking in the 1st person in Proto-Chamacoco.¹²

The starting point for CH verbs is the situation in which the verbal 1st person had already lost the realis/irrealis distinction (Table 13, Stage I; cf. Table 8, Section 3). The 1SG and 1PL had the same prefixes, *tɛ- and *j- (depending on the verb class), and were distinguished by the suffix *-ko.

As seen in Table 11, the original 1SG free pronoun was replaced by 1PL *jok*, while the longer form *ejok* remained as the only 1PL pronoun (Table 13, Stage II). At the same time, the verbal 1st person prefix *tɛ- underwent deaffrication into *t*-. Proto-Zamucoan verbs with 3.REAL *tɛ- had 1.IRR *tɛ-, as discussed above for OZ. When in Proto-Chamacoco the 1.IRR *tɛ- replaced the 1.REAL, the result was homophony with the 3.REAL *tɛ*- (Table 8, Section 3). The dissimilation of 1st person *tɛ- into *t*- solved the problem (Table 13, Stage II). The syncretism between 1st and 3rd person is cross-linguistically rare (Cysouw 2003: 45–48; Baerman et al. 2005: 59–60) and the process *tɛ- > *t*- (only found in the CH 1SG, cf. Appendix) is an example of change motivated by the avoidance of homophony (Campbell 1996: 77–80).

The CH 1SG allomorph *tVk*- cannot be reconstructed in Proto-Zamucoan. At the same time, one can note some similarity with the CH 1SG pronoun *jok*. One can surmise that in the verbal 1SG, *j- was replaced by *jok*. The vowel /o/ harmonized to the thematic vowel of the verb, yielding *jV**k**- (Table 13, Stage III). In Zamucoan languages, the subject precedes the verb, which facilitates the change from free pronoun into subject prefix. The prefix *j*- spread to the 1PL of all verbs, replacing *t- < *tɛ-.

Finally (Table 13, Stage IV), since *j*- had become a dedicated 1PL marker, there was no need for the pluralizer suffix *-ko, which was lost. A minor change also occurred in Stage IV:

¹² The stages in Tables 13 and 14 should not be compared chronologically with those in Table 11, since they are just arbitrary labels for consecutive stages, not historically identifiable, absolute stages.

the 1SG prefix *jVk-* turned into *tVk-* owing to analogy with its allomorph *t-*. This allows us to explain a change **/j/ > /t/* that is not regular in CH (cf. Appendix).

CH free pronouns and verbs have one remarkable feature: the combination of clusivity and a greater plural. Table 14 outlines their development.

		FREE PRONOUNS	VERBS
STAGE V	1SG	jok	t/tVk-V-ROOT
	1PL.INCL	ejok	j-V-ROOT
	1PL.EXCL	õrjok	o-j-V-ROOT
	2PL	olak	*Ø-a/e/V-ROOT-o/jo > Ø-a/e/V-ROOT-lo
<hr/>			
STAGE VI	1SG	jok	t/tVk-V-ROOT
	1PL.INCL	ejok	j-V-ROOT
	1GPL.INCL	ejok-lo	j-V-ROOT-lo
	1PL.EXCL	õrjok	o-j-V-ROOT
	2PL	olak	Ø-a/e/V-ROOT-lo
	2GPL	olak-lo	

Table 14: Possible development of clusivity and greater plural in the 1st person of Chamacoco.

CH first introduced clusivity in both free pronouns and verbs: a new 1PL.EXCL was created, while the former 1PL turned into the 1PL.INCL. The fact that CH forms such as the 1PL.INCL and 1PL.EXCL of ‘to go’ (28) maintain traces of **-ko* confirms their common origin. The verbal 1PL.EXCL derives from the 1PL.INCL via the prefix *o-*. This is possibly a morphomic reuse of the innovative pluralizer *o-* for 3PL (a possibility already mentioned for the noun’s GF in Section 5, see footnote 10). This hypothesis is strengthened by similarity with the 1PL.EXCL free pronoun *õrjok*, which can be interpreted as *õr* (3PL) + *jok* (1SG), or possibly *õr* (3PL) + *ejok* (1PL.INCL), with deletion of initial /e/. As pointed out by a reviewer, although the former hypothesis is more likely for phonological and semantic reasons, the latter hypothesis is favored by the fact that the verbal 1PL.EXCL is based on the 1PL form that turned into 1PL.INCL.

Clusivity spreads relatively easily owing to language contact (Jacobsen 1980; Nichols 1992), and CH may have developed this feature under the influence of a neighboring language. This hypothesis is discussed in Ciucci (2020a). The Chaco, where Zamucoan languages are spoken, has been proposed as a linguistic area (see, e.g., Comrie et al. 2010); among Chaco languages, the most likely donors for clusivity are Eastern Bolivian Guaraní (aka Chiriguano) and Tapiete (both Tupí-Guaraní). Indeed, Eastern Bolivian Guaraní has the 1PL.EXCL pronoun *óre* and the 1PL.EXCL verbal prefix *ro-* (Dietrich 1986: 86, 155). Tapiete has the same 1PL.EXCL pronoun *ore*, from Proto-Tupí-Guaraní **oré*, while verbs have a prefix and the suffix *-ha* for 1PL.EXCL; for the transitive and ‘active’ intransitive subject (A/Sa), the verbal 1PL.EXCL prefix completely overlaps with the 3rd person prefixes *Ø-*, *wV-* or *o-* (González 2005: 143). In Tupí-Guaraní, one thus finds exponents similar to those that mark the CH 1PL.EXCL-forms. If there was no direct borrowing of morphological material, the presence of a look-alike in Tupí-Guaraní made it possible for CH to replicate a morphological pattern. As a matter of fact, the morphomic reuse of CH *o-* (3PL) for 1PL.EXCL reminds the Tapiete morpheme *o-* in 1PL.EXCL and 3rd person. Two Arawak languages, Mawayana

(Brazil, Suriname) and Resígaro (southeastern Colombia), have developed clusivity out of contact, and, like CH, their 1PL turned into the 1PL.INCL (Aikhenvald 2018b: 18–19).

6.3 The second-person plural and the quotative

Before addressing the formation of the greater plural, it is necessary to deal with the 2PL of CH verbs, which is obtained by adding *-lo* to the 2SG: e.g. *Ø-a-msaha* (2SG) ‘you.SG enter’ → *Ø-a-msaha-lo* (2PL) ‘you.PL enter’. The pluralizer *-lo* is a CH innovation that comes from the nominal system. This section also discusses the CH quotative, whose inflection is similar to the verb: it has clusivity and the 3PL, but lacks a dedicated 2PL. This can give us an indication on the relative chronology of the introduction of *-lo* in CH verbs.

In the previous section, Table 14 (Stage V) shows a change involving the verbal 2PL: the Proto-Zamucoan 2PL suffixes **-o/-jo* were replaced by *-lo* in CH. Although Proto-Zamucoan **/j/* can correspond to CH */l/* (cf. Appendix), Ciucci and Bertinetto (2015: 74–75) show that *-lo* is not a continuation of Proto-Zamucoan **-jo*, but comes from the nominal system. As shown in (31), CH nominals can exhibit the masculine plural suffix *-lo*, cognate with OZ *-(o)doe* and AY *-(o)de*. Indeed, Proto-Zamucoan **/d/* can correspond to CH */d/* or */l/*; the latter consonant is an innovation of CH (cf. Appendix).

(31)	OZ	AY	CH	
M.PL	<i>dir-odoe</i>	<i>dir-ode</i>	<i>da-lo</i>	‘day’
M.PL	<i>-bos-odoe</i>	<i>pos-ode</i>	<i>pos-i-lo</i>	‘food’ (epenthesis of <i>/i/</i> in CH)

The following examples (32–33) provide evidence that *-lo* is an innovation in CH verbs. Some Zamucoan verbs have a derivational suffix, such as *-me* in AY, *-m* in OZ and *-im* or *-im* in CH, as in (32). These derivational suffixes are not indicated in the segmentation, but they follow the pluralizers in the AY and OZ 1PL and 2PL: see the elements in bold in (32). By contrast, *-im/-im* is followed by *-lo* in CH, where it is no longer productive and has merged with the root.

(32)	OZ	AY	CH
	‘to bury’	‘to bury’	‘to bury’
1SG	a-i-hoteam	j-i-ṅoteame	t-i-hitsim
1PL	a-i-hotea- go-m	j-i-ṅotea- go-me	j-i-hitsim (INCL)
2SG	d-a-hoteam	b-a-ṅoteame	Ø-e-hitsim
2PL	d-a-hotea- ṅo-m	wak-a-ṅotea- jo-me	Ø-e-hits im-lo
3.REAL	te-i-hoteam	te-i-ṅotea-me	te-i-hitsim
3.IRR	d-i-hoteam	te-i-ṅotea-me	d-i-hitsim

Consider now example (33), which is an irregular verb: what is relevant here is that CH shows a relic of the Proto-Zamucoan 1PL suffix **-ko*, *-kw-*, which corresponds to OZ *-go* and AY *-ṅo* (the voiced velar in these OZ and AY forms is very likely an innovation). In CH, *-kw-* precedes the former derivational suffix *-im*, as its OZ and AY cognates do with *-m* and *-me*, respectively. The OZ and AY 2PL suffixes also precede *-m* and *-me*, as expected.¹³ By contrast, CH *-lo* follows *-im* (*/i/* turns into a glide after vowel in *m-o-jm-lo*). This indicates

¹³ The suffixes *-ṅo* (1PL) and *-ṅo* (2PL) in (32–33) are due to nasal harmony.

that CH *-im/-im* used to follow the pluralizer, as in the 1PL.INCL *jukwim* (33), but *-lo* was introduced in CH after that *-im/-im* had lost its productivity and had already been included in the root. The family-internal comparison reveals other similar examples, not discussed here (see Ciucci and Bertinetto 2015; Ciucci Forthcoming 2021a for more details).

(33)	OZ	AY	CH
	‘to escape from fear’	‘to leave’	‘to leave’
1SG	a-i-om (REAL) n-i-om (IRR)	j-i-hijome	tok-o-jm
1PL	a-i-o- go-m (REAL)	j-i-hi(n)o- no-me	j-u- kwim (INCL)
2SG	d-a-om (REAL)	b-a-hi(n)ome	m-o-jm
2PL	d-a-o- po-m (REAL)	wak-a-hi(n)o- po-me	m-o- jm-lo
3.REAL	Ø-i-om	Ø-Ø-nojome	Ø-i:-m
3.IRR	d-o-m / n-o-m (< * <i>n-o-om</i>)	Ø-Ø-nojome	n-o-jm

CH has a quotative inflected for person, which forms a word-class on its own and might give us some chronological indication on the introduction of *-lo* in CH verbs. The inflection of the quotative, in (34), is irregular and reminiscent of a verb (for more details, see Ciucci 2016: 316–326).

(34)	CH
	Quotative
1SG	to:
1PL.INCL	jōr
1PL.EXCL	o-jōr
2	on
3.REAL	im
3PL.REAL	o-tsi:
3.IRR	ilo / tsole

The quotative shows clusivity: as in verbs and free pronouns, *o-* is added to the 1PL.INCL to obtain the 1PL.EXCL. In *o-tsi:* (3PL.REAL), the initial element is possibly the pluralizer *o-* (see Ciucci 2016: 324–325 for the origin of *-tsi:*), but this is limited to the realis, because the 3.IRR does not have a corresponding plural form. Also, there is no 2PL and the quotative does not have the greater plural of the 1PL.INCL (cf. Table 3, Section 2): in verbs, both are obtained via the pluralizer *-lo*, which has a very regular behavior. What is interesting in (34) is that the quotative has clusivity, but no 2PL: this might indicate that *-lo* for 2PL was adopted by CH verbs after the introduction of clusivity.

6.4 The greater plural

This section deals with the formation of the greater plural in verbs and free pronouns. The pluralizer *-lo*, discussed in Section 6.3, spread to the 1PL.INCL of verbs and free pronouns, yielding the 1GPL.INCL; *-lo* was also added to the 2PL free pronoun *olak*, giving rise to the 2GPL *olaklo*. I will discuss how the CH greater plural is a pattern borrowing from Nivaçle (Mataguayan).

The typological notion of greater plural can correspond to the expression of a high number of referents or their totality (Corbett 2000: 30). The CH 1GPL.INCL has both meanings: ‘we (inclusive) many’, ‘we (inclusive) all’, and often there is ambiguity between the two senses. An example of greater plural is in (35). The speaker first utters the 1PL.INCL *ejok*, then he decides to use the greater plural pronoun *ejoklo* and inflects the verbs in the 1GPL.INCL to specify that he refers to all of the Chamacoco people. Note that another possible interpretation is that the speaker also wants to highlight the fact that, from his perspective, the Chamacoco people are many: only the context (not provided here) permits us to interpret the meaning of the greater plural.

- (35) Chamacoco
- | | | | | |
|------------|----------|-----------|--------------------------|--------------------|
| uxe | ejok, | ejoklo | ieir-o | j-i:ti-lo |
| SUB | 1PL.INCL | 1GPL.INCL | Chamacoco-M.PL | 1GPL.INCL-tell-GPL |
| kute-e, | ite | je | j-oti:s-lo=je | |
| thing-M.PL | and | NEG | 1GPL.INCL-doubt-GPL=RECP | |
- ‘When we, we all the Chamacoco tell something, we all do not doubt each other.’

The greater plural is optional in CH and is a rare feature within number systems (Corbett 2000: 30; Velupillai 2012: 162). More generally, terms with relative reference (such as paucal or greater plural) were so far never observed in minimal/augmented systems (Dixon 2012: 49), that is, systems in which the inclusive person has two different person values (minimal inclusive vs. augmented inclusive; see below for more details).

Finally, the 2PL pronoun *olak* added *-lo* to create the greater plural *olaklo*, modeled on *ejoklo*: *olak* is contrasted with *olaklo* in (36). However, the greater plural did not extend to the verbal 2PL-person, which already employs *-lo* as pluralizer.

- (36) Chamacoco
- a. tok-osim olak loeip-o
 1SG-give 2PL animal-M.PL
 ‘I give you the animals.’
- b. tok-osim olaklo loeip-o
 1SG-give 2GPL animal-M.PL
 ‘I give you all (or: you many) the animals.’

As one can see, CH clusivity displays some unusual features. Usually, when 1SG, 1PL.EXCL and 1PL.INCL are morphologically related, the association is between 1SG and 1PL.EXCL (Daniel 2005; Cysouw 2005; Jacquesson 2008); this is indeed the case in CH free pronouns, if one considers *ōrjok* (1PL.EXCL) < *ōr* (3PL) + *jok* (1SG) (Section 6.2). In the world’s languages, the 1PL.INCL usually has an independent stem, unrelated to non-inclusive 1st persons (Daniel 2005); this indicates that the diachronic connection between 1PL.INCL and the other 1st persons, discussed in this section, is not typologically frequent. In particular, the 1PL.EXCL of CH verbs derives from what is now the 1PL.INCL (originally a 1PL). This is only documented in a few languages (see Daniel 2005: 6–7; Jacquesson 2008: 115; Harbour 2016: 106 ff.; Pertsova 2017).

In addition, the inclusive displays an unusual number split. CH clusivity is analyzable as a minimal/augmented system, with the 1PL.INCL as minimal inclusive and the 1GPL.INCL as augmented inclusive: this is shown in Table 15 for CH free pronouns. Note that *-lo* cannot be

added to the 1PL.EXCL of verbs and free pronouns, which confirms the analysis of CH clusivity in terms of minimal/augmented system: the 1PL.EXCL does not have a greater plural, since it is already the augmented term of the 1SG. However, this is a non-canonical minimal/augmented system, because the minimal inclusive is usually a dual, the augmented a plural (Cysouw 2003: 85–90). Note also that the system is asymmetrical because the 2nd person has both a plural and a greater plural, which is a further CH innovation. Note, however, that the CH combination of clusivity and greater plural is very rare, but not unique, because it is also documented in Nivaêlé, a neighboring Mataguayan language, where the inclusive distinguishes a plural and a greater plural in both pronouns (Table 15) and verbs (Fabre 2016: 102, 279). As in CH, the greater plural is optional.

	Chamacoco		Nivaêlé	
	Minimal	Augmented	Minimal	Augmented
EXCLUSIVE	jok (1SG)	õrjok (1PL.EXCL)	ji-vâţfa (1SG)	ji-vâţfe-eţ (1PL.EXCL)
INCLUSIVE	ejok (1PL.INCL)	ejok-lo (1GPL.INCL)	kas-vâţfa (1PL.INCL)	kas-vâţfe-eţ (1GPL.INCL)
2	owa	olak (2PL) olak-lo (2GPL)	a-vâţfa	a-vâţfe-eţ
3	ir(e) [witei (M)] [wate (F)]	õr [wir]	ła-vâţfa	ła-vâţfe-eţ

Table 15: Minimal/augmented analysis of Chamacoco and Nivaêlé free pronouns.

The augmented term of the system in Nivaêlé is always marked by the suffix *-eţ*, which resembles CH *-lo*. Although these pluralizers are similar, there was possibly no exchange of morphological material between Nivaêlé and CH. Incidentally, earlier forms of these suffixes can be reconstructed in Proto-Mataguayan and Proto-Zamucoan, where they are the result of an old case of areal diffusion. Indeed, a pluralizer of the type $-C_{lateral}(V)$ is found all over the Chaco area (Comrie et al. 2009; Ciucci 2020a: 296–297). However, the presence of a look-alike made it possible for CH to replicate a morphological pattern of Nivaêlé. The rarity of the greater plural in the inclusive strongly suggests that this is a contact-induced change, while it is uncertain whether the use of *-lo* in the CH 2PL is a language-internal development or is also due to pattern borrowing. The minimal/augmented system of CH is not the only transfer between Mataguayan and Zamucoan languages: other possible traces of contact are discussed in Ciucci (2014, 2020a). In South America, Palikur (Arawak) has developed a canonical minimal/augmented system owing to contact with northern Cariban languages (Aikhenvald 2018b: 21–22).

7 The decline of personal inflection in verbs and nouns

The person marking is weakening in CH verbs and nouns. In both word classes, the personal inflection is no longer productive. The decline of personal inflection is more advanced in nouns: indeed, the CH possessive inflection has lost the 1PL and 2PL person, and comparison with AY and OZ shows that many CH nouns are no longer possessable.

In CH, the intense contact with Spanish has led to a loss of productivity in personal inflection. This affects both possessable nouns and verbs. CH has many Spanish loanwords, which cannot inflect for possessor (thus being non-possessable). The only exception is *ixit* ‘child’, from Spanish *hijo* /‘ixo/, which was possibly introduced at an early stage of contact (37). The Spanish origin of *ixit* is clear if one considers that final *-it* is a CH suffix for masculine singular (see Ciucci 2016 for more details), which is regularly added to borrowed nouns, and that the autochthonous CH root for ‘child’ is *a:p*, which corresponds to OZ and AY *ap* ‘child’.

(37)	CH	
		‘child’, ‘son, daughter’
1SG	p-ixit	
2SG	e-jxit	
3	Ø-ixit	
REFL	de-jxit	

Similarly, many CH nouns have lost their possessive inflection, but their OZ and AY cognates still preserve it. In (38–39), for instance, the CH non-possessable noun corresponds to the GF of OZ and AY. However, the CH non-possessable noun can also correspond to another inflected form, or to the original root as in (40).

(38)	OZ	AY	CH
	‘path’	‘path’	‘path’
3	Ø-u-rahek	Ø-ũ-rahej	–
GF	Ø-Ø-dahek	Ø-Ø-dahej	dehet (non-possessable)

(39)	AY	CH
	‘tomb, grave’	‘cemetery’
3	Ø-o-de	–
GF	duk-o-de	dukuta (non-possessable)

(40)	OZ	AY	CH
	‘village’	‘village’	‘village’
3	Ø-i-daj	Ø-i-daj	–
GF	g-i-daj	g-i-daj	d̥it / dut (non-possessable)

The verb inflection is maintained in the traditional CH lexicon, but lost its productivity in recently borrowed verbs. The only exceptions are the affixes of most recent introduction: *-lo* for 2PL and 1GPL.INCL, and *o-* for 3PL (but not for 1PL.EXCL), which, however, are not obligatorily used in borrowings. For instance, the verb *kaj* ‘to fall’, from Spanish *caer*, has the optional inflected forms *kaj-lo* (2PL/1GPL.INCL) and *o-kaj* (3PL). If the verb is uninflected, the subject is obligatorily expressed by an NP.

Finally, the CH possessive inflection underwent simplification also in those nouns that still preserve it. Indeed, as shown by comparison with the sister languages (Table 4), CH possessable nouns have lost the 1PL and 2PL. Proto-Zamucoan nouns had very likely a 2PL inflection, although the scarcity of data does not permit us to reconstruct it (there are no 2PL relics in CH nouns). By contrast, some relics of the CH 1PL inflection are attested in earlier studies. Baldus (1932: 392–393) reports *aset* (1PL) ‘our mother’, *al(d)e* (1PL) ‘our father’ and

<áirumme> (/ 'ajrume/) (1PL) 'our hands'; Sušnik (1972: 22) documents *asit* (1PL) 'our mother'. Initial *as-*, *aj-* and *al-* (< **aj-*) were thus CH 1PL prefixes, which allows us to reconstruct **as-* and **aj-* in the Proto-Zamucoan 1PL (Table 4).

8 Conclusions

This paper has discussed the evolution of the Chamacoco person system, illustrating the mechanisms of change, and pointing out the interaction between the different persons, as well as between bound and free pronouns.

Although pronominal categories tend to remain stable over time despite changes in morphological material (Nichols 1992: 123), CH has considerably restructured its person reference system, introducing for instance clusivity. Paradigmatic change finds a parallel in CH lexicon and culture. Indeed, the loss of the original Zamucoan lexicon went hand in hand with the decay of the traditional cosmivision (Ciucci Forthcoming 2021b).

After the partial merger of realis and irrealis, some verb paradigms developed a syncretism between 1SG and 3rd person (Section 3); over time, the need to differentiate between them led to changes in the 1SG allomorphs (Section 6.2). Free pronouns were a source for new bound person markers: *jok* (1PL) replaced the original 1SG and was then grammaticalized to a new verb prefix for 1SG (Section 6.2). A specific verb form for the 3PL was created via prefixation of the 3PL pronoun *ōr* > *o-*.

The development of clusivity most likely followed that of the 3PL. Indeed, the 3rd person pluralizer *o-* was employed to form the verbal 1PL.EXCL out of the original 1PL, which was reanalyzed as a 1PL.INCL. A parallel development occurred in free pronouns, in which 3PL *ōr* combined with (*e*)*jok* (originally a 1PL), yielding the 1PL.EXCL *ōrjok* (Section 6.2). Both free pronouns and verbs used the pluralizer *-lo*, already found in the verb's 2PL, to obtain the greater plural of the 1PL.INCL; *-lo* comes from the nominal system (Section 6.3). Such a combination of clusivity and greater plural is almost unique cross-linguistically, and also the derivation of the 1PL.EXCL from the 1PL.INCL is typologically unexpected. In free pronouns, the greater plural also spread to the 2nd person (Section 6.4).

The 1SG was especially unstable in CH, not only in verbs and free pronouns, but also in nouns: the 1SG of possessive inflection was substituted by the most frequently used allomorph for indefinite possessor. Consequently, the unspecified possessor acquired a new prefix *o-* (GF), formally identical to the verbal pluralizer for 3PL. The new exponent for indefinite possessor stems from the 3PL pronoun *ōr* or the noun *os* 'people'. A less likely hypothesis is that *o-* is due to a transfer from verbal to nominal morphology (Section 5).

The possessive inflection has lost the 1PL and 2PL. Furthermore, since the turn of the 19th century, CH was heavily affected by contact with Spanish. This has determined the partial or total loss of productivity in verbal and possessive inflection (Section 7).

Finally, it was possible to note another interesting phenomenon for the typology of language change: some CH verbs acquired a 3rd person prefix out of reanalysis of the root-initial consonant; their inflection was later restructured by analogy with the new 3rd person. Such a change is antithetic to the so-called Watkins' Law, which predicts the reinterpretation of 3rd person affixes as a part of the root or stem (Section 4.1). Although some counterexamples to Watkins' Law are known (cf. Seržant, this issue), further research is needed to identify and compare further cases of reanalysis that, as in CH, show the opposite change to that described by Watkins' Law.

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Appendix

Proto-Zamucoan	Old Zamuco	Ayoreo	Chamacoco
*/a/	/a/	/a/	/a/, /a:/, /e/, /e:/, /i/
*/e/	/e/	/e/	/e/, /e:/, /i/
*/i/	/i/	/i/	/i/, /i:/, /i/, /i:/
*/o/	/o/	/o/	/o/, /o:/, /i/
*/u/	/u/	/u/	/u/, /u:/, /i/, /i:/
*/p/	/p/	/p/	/p/
*/b/	/b/	/b/	/b/
*/t/	/t/	/t/	/t/, /tɛ/
*/d/	/d/	/d/, /ɲ/	/d/, /l/, /l̥/
*/tɛ/	/tɛ/	/tɛ/	/tɛ/, /ts/, /ɛ/
*/k/	/k/	/k/	/k/
*/g/	/g/	/g/	/j/, /w/, Ø
*/s/	/s/	/s/	/s/, /ɛ/
*/h/	/h/, Ø	/h/, /ɲ/, Ø	/h/, /x/, /j̥/, Ø
*/m/	/m/	/m/	/m/
? (*/m̥/)	/m/	/m̥/	/m̥/
*/n/	/n/	/n/	/n/
? (*/ɲ/)	/n/	/ɲ/	/ɲ/
*/ɲ/	/ɲ/	/ɲ/, /ɲ̥/	/j/
? (*/ɲ̥/)	/g/ [ɲ] (or /ɲ/?)	/ɲ/	/j/, /w/, Ø
*/r/ [ɹ]	/r/ [ɹ]	/r/ [ɹ], Ø	/r/ [ɹ], Ø, /r̥/ < /h/ + /r/, [ɹ] < /r̥/ + /tɛ/ in intervocalic context, [z] < /r̥/ + /tɛ/ word-finally
*/j/	/j/	/j/	/j/, /j̥/, /l/, /l̥/
*/w/	/w/	/w/	/w/, /w̥/

Table 16: Main sound correspondences in Zamucoan (Ciucci 2016, Forthcoming 2021a; Ciucci and Bertinetto 2015, 2017).