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HOW HISTORICAL DATA COMPLEMENT FIELDWORK: NEW DIACHRONIC PERSPECTIVES ON ZAMUCOAN VERB INFLECTION*

Luca Ciucci

Abstract. This article shows how the unearthing of new historical data on a language can contribute to diachronic studies and language reconstruction. †Old Zamuco is an extinct Zamucoan language, for which the only extant dictionary was recently rediscovered. This dictionary is the main source on the language and is very rich in morphological information. In particular, it contains many new verb paradigms with previously undescribed or only conjectured characteristics. These features were analyzed in order to compare them with the present-day Zamucoan languages, Ayoreo and Chamacoco. This gave us the opportunity to formulate hypotheses on the historical development of Zamucoan verb morphology and to improve the already available reconstruction of Proto-Zamucoan verb inflection.

1. Introduction¹

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¹ Abbreviations: 1 = 1st person, 2 = 2nd person, 3 = 3rd person, AY = Ayoreo, CH = Chamacoco, EXCL = exclusive, GPL = greater plural, INCL = inclusive, IRR = irrealis, OZ = Old Zamuco, PL = plural, REAL = realis, SG = singular.

The present paper shows how the analysis of historical documents can successfully be coupled with data from fieldwork, in order to obtain new and more precise diachronic insights into a language family. The object of this study is the Zamucoan verb inflection. The previous reconstruction of Proto-Zamucoan verb morphology (Ciucci & Bertinetto 2015) was based on modern documentation of the living languages (Ayoreo and Chamacoco) and on the scarce historical data available for Old Zamuco verbs at the time of publication. The present author has rediscovered an unpublished dictionary of extinct †Old Zamuco (Ciucci 2018), the earliest documented language of the Zamucoan family. This Old Zamuco dictionary is the main source of information on the language, and the new data it contains allow us to broaden the perspective: Old Zamuco verbs reveal a number of irregularities never observed before, which can be compared with the morphological asset of Ayoreo and Chamacoco verbs. The new hypotheses on their development add important details to the reconstruction of Proto-Zamucoan verb inflection.

This section introduces the Zamucoan family, followed by discussion of the structure of Zamucoan verbs and their reconstruction in Proto-Zamucoan (§2). Section 3 presents the Old Zamuco dictionary, whose data are the main object of analysis in the rest of the paper. Several irregularities illustrate how the thematic vowel, an obligatory component of the morphological template of Zamucoan verbs, has changed over time (§4). Additionally, a new verb class emerges (§5), which can be reconstructed for Proto-Zamucoan (§6). In Section 7, the so-called ‘thematic verbs’ are analyzed. This small group of verbs displays several irregularities of particular importance for historical reconstruction. The comparison of Old Zamuco thematic verbs shows how each of their three subgroups has changed over time. Old Zamuco also has a few previously

undocumented verbs with unusual features, rarely found in the rest of the family (§8). These include another new and very small inflectional class. The conclusions are in Section 9.

1.1. *Old Zamuco and the Zamucoan family*

The Zamucoan family comprises three languages spoken in Northern Chaco: Ayoreo (**AY**, ca. 4,500 speakers), Chamacoco (**CH**, ca. 2,000 speakers) and †Old Zamuco (**OZ**). Old Zamuco, now extinct, was spoken in the 18th century in the lost Jesuit mission of *San Ignacio de Samucos*, in the Jesuit missions of Chiquitos (in eastern Bolivia). When the mission was abandoned, in 1745, its speakers moved to other missions of the area, where the main language was Chiquitano (aka Bésiro). Over time, this has led to the disappearance of Old Zamuco, documented by the Jesuits in the 18th century. Figure 1 shows the internal classification of Zamucoan. There are two branches. Old Zamuco and Ayoreo stem from Proto-Old Zamuco-Ayoreo (Proto-OZ-AY). They share most of their lexicon (Kelm 1964, Ciucci 2016), while the common lexicon between Ayoreo and Chamacoco amounts to about 30%. This is possibly due to lexical replacement in Chamacoco, which correlates with remarkable changes in the Chamacoco cosmivision (Ciucci *forthcoming* 2021b). Chamacoco, which alone forms the second branch of the family, has two dialects, Ebitoso (or *Ibitoso*) and Tomaraho, mutually intelligible and morphologically very similar. Although Chamacoco is often innovative, this language can exhibit shared features with Old Zamuco, which are lost in Ayoreo (Ciucci 2016). Old Zamuco is the most conservative language of this small family, and its data are of crucial

importance for comparative purposes (Ciucci 2016, Ciucci & Bertinetto 2015, 2017).

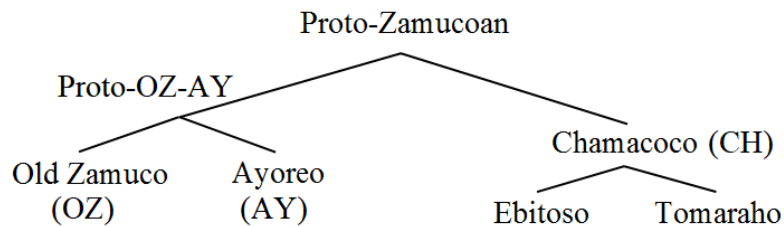


Figure 1. Internal classification of Zamucoan

Zamucoan languages are fusional. Their usual constituent order is A-V-O or S-V. The possessor precedes the possessed, and the adjective follows the noun. Zamucoan languages are strongly nominative-accusative. The majority of verbs are strictly transitive or intransitive, and some are extended transitives. Transitivity classes do not interact with verb inflection, expressing subject (A or S) and mood (realis or irrealis). Nouns can be inflected or uninflected for possessor. The former have prefixes to mark the possessor on the possessed. The possessive inflection has structural similarities with verb inflection (Bertinetto, present volume).

The present investigation was preceded by a reconstruction of Proto-Zamucoan verb and possessive inflection (Ciucci & Bertinetto 2015, 2017). The data for Ayoreo and Chamacoco were gathered during fieldwork carried out between 2008 and 2019 by Pier Marco Bertinetto (Ayoreo) and Luca Ciucci (Ayoreo, Chamacoco), in addition to the already existing literature. Indeed, useful sources of morphological information on Ayoreo verbs are Barrios et al. (1995), Higham et al. (2000) and Morarie (2011). For Chamacoco, the dictionary by Ulrich & Ulrich (2000) systematically reports verb paradigms. These data were checked and new information was added from fieldwork.

Ciucci (2016 [2013]) gives a detailed description of Zamucoan inflectional morphology. The previous comparison with Old Zamuco was based on data from a grammar written by the French Jesuit Ignace Chomé (1696-1768) in the mission of *San Ignacio de Samucos*. This work, *Arte de la lengua zamuca*, was posthumously published (Chomé 1958 [before 1745]).

Although there are also some minor sources available for Old Zamuco, they are of little interest for verb inflection. Hervás y Panduro (1784, 1786, 1787a, b) offers data provided by exiled Jesuits (other than Chomé) who had learned the language. Lussagnet (1961, 1962) compares the data from Chomé's grammar with those collected by d'Orbigny in the first half of the 19th century. Finally, Clark (1937:127–128) transcribes some materials that were used by Hervás y Panduro for his publications.

The need for this investigation emerges from the recent rediscovery of the only extant dictionary of Old Zamuco, which is also the most abundant source of data for the language (Ciucci *forthcoming*). In 1738, Ignace Chomé wrote a dictionary of Old Zamuco, *Vocabulario de la lengua zamuca*, but this document, although described by Vargas Ugarte (1931), remained for a long time inaccessible to scholars. The present author rediscovered it and is currently preparing a critical edition of this unique manuscript (Ciucci *forthcoming*). A first description of the dictionary is in Ciucci (2018), and §3 is an overview of the data on verbs available in the manuscript. In numerical terms, the Old Zamuco 242-page-long dictionary yields a corpus of $\approx 43,667$ words. By contrast, the Old Zamuco corpus obtained from the grammar has only $\approx 5,422$ words. Therefore, compared to the previously available sources, the dictionary provides an impressive amount of data for the analysis of this extinct language. For instance, almost nothing was known about classifiers in Old Zamuco: the data from the dictionary permit us to identify several

classifiers, their morphological properties and the different structures in which they are used. In Ciucci & Bertinetto (2019), the Old Zamuco classifiers are compared with those of the other Zamucoan languages.

In the rest of the paper, I will refer to each Zamucoan language in abbreviated form: **OZ** = Old Zamuco, **AY** = Ayoreo, **CH** = Chamacoco.

1.2. Transcription criteria and main sound correspondences in Zamucoan

Although each Zamucoan language has its orthography (see Ciucci 2016 for details), I will report data in phonological transcription for the convenience of the reader. For OZ, it was necessary to interpret Chomé's transcription, which is inspired by the Spanish orthography of his time, and, based on our knowledge of AY and CH, is mostly straightforward. There are only a few possible problems. The letter <i> usually represents /i/, while <u> or <ü> stand for /u/. When they are contiguous to a vowel, <i> and <u> / <ü> can respectively stand for /j/ and /w/. The digraphs <gu> and <gü> can represent either /w/ or /g/. For the purposes of the present study, such ambiguities were resolved by comparison with AY and CH. Also, when the word has nasality, but no nasal consonant, the symbol of nasality <^> is often omitted. However, since in Zamucoan there is nasal harmony, the presence of a nasalized affix in some word forms indicates that the root has nasality (see, e.g., ex. 28, §6). Stops can have aspirated realization, indicated by <h> after the consonant. Aspirated stops are not phonemic (see footnote 13).

In order to facilitate the comparison, Table 1 provides the main sound correspondences between the three Zamucoan languages. Some of the conditioning

factors have been addressed in Ciucci (2016) and Ciucci & Bertinetto (2015, 2017). For reasons of simplicity, I do not consider here nasal harmony and nasality on vowels, as well as other less frequent sound correspondences not relevant for this paper.

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/, /j/, Ø
*/m/	/m/	/m/	/m/
? (*/m̥/)	/m/	/m̥/	/m̥/
*/n/	/n/	/n/	/n/
? (*/ɲ/)	/n/	/ɲ/	/ɲ/
*/ɲ/	/ɲ/	/ɲ/, /ɲ̥/	/j/
? (*/ŋ/)	/g/ [ŋ] (or /ŋ/?)	/ŋ/	/j/, /w/, Ø
*/r/ [ɾ]	/r/ [ɾ]	/r/ [ɾ], Ø	/r/ [ɾ], Ø, /r̥/ < /h/ + /r/, [ɾ] < /r̥/ + /tɛ/ in intervocalic context, [z] < /r̥/ + /tɛ/ word-finally
*/j/	/j/	/j/	/j/, /j̥/, /l/, /l̥/
*/w/	/w/	/w/	/w/, /w̥/

Table 1. Main sound correspondences in Zamucoan

There are two issues concerning the phonological inventory of OZ. In OZ, [g] very likely underwent nasalization into [ŋ], although the latter is not represented in the orthography; it is not clear whether OZ [ŋ] was phonemic or whether it was a realization of /g/. Furthermore, both AY and CH have voiceless nasals /ɲ/ and /ɳ/. It is unknown whether they existed in OZ, since they never emerge in Chomé's transcription. For this reason, although I have indicated /ɲ/, /ɲ̥/ and /ɳ̥/ as doubtful in the Table, I have excluded them from the reconstruction of Proto-Zamucoan verb inflection.

2. The verb structure: basic features and Proto-Zamucoan reconstruction

This section outlines the Zamucoan verb and its reconstruction in the proto-language. The verb structure is described in Ciucci (2016) and Ciucci & Bertinetto (2015), from which I summarize the main points. Zamucoan makes use of prefixes and suffixes. In verbs, prefixes mark subject (A/S) and mood (realis vs. irrealis). Verb suffixes mark the plural of the subject. In this study, I only address verb prefixation, which has the same structural elements (although filled with different phonetic material) as the nouns' possessive inflection, described in Ciucci & Bertinetto (2017). Bertinetto (present volume) compares Zamucoan verb and possessive inflection, speculating on their development. The general template of Zamucoan verb inflection is in ex. (1). I will segment these elements in all examples. At the right boundary, some verbs may also add a derivational suffix (not included in 1). This is not part of the inflectional morphology, and I will only indicate it in the plural, to distinguish it from the pluralizer (see, e.g., the derivational suffixes *-om* and *-m* in ex. 61a-b, §7.4).

(1) PREFIX + THEMATIC / INFLECTIONAL VOWEL + ROOT + (PLURAL SUFFIX)

THEME

Root plus thematic vowel form the theme. The thematic vowel can be any vowel (leaving aside nasality and quantity), namely /i e a o u/ and, in CH, also /i/. Like thematic vowels in Latin verbs, Zamucoan thematic vowels are lexically idiosyncratic and remain stable over time, as shown by the previous comparison and the many examples throughout this paper. Although in many verbs the thematic vowel may be considered a part of the root, the approach proposed here is useful for descriptive purposes. This allows us to provide a general description of all Zamucoan verbs and to account for changes that can occur in the slot of the thematic vowel.

The most common, and regular, kind of vowel change takes place in the 2SG/PL person, where the thematic vowel slot is often filled by a vowel initially belonging to the prefix, as in ex. (2). This is the outcome of thematic-vowel replacement and I will provide evidence of this in Section 4. I use the term ‘inflectional vowel’ (or, more specifically, 1st person vowel, 2nd person vowel, 3rd person vowel, and so on) for any vowel occupying the thematic structural slot, unless I want to refer to the proper thematic vowel. Changes in the inflectional vowel are particularly interesting for diachronic reasons (see §4 and §7.4).

(2) OZ Realis (REAL): *a-i-mesẽre* (1SG), *d-a-mesẽre* (2SG), *æ-i-mesẽre* (3),

a-i-mesẽ-ko (1PL), *d-a-mesẽ-jo* (2PL) ‘to love’

Zamucoan languages are tenseless (Bertinetto 2014) and mood-prominent, showing a realis vs. irrealis distinction. In OZ, the irrealis is used after negation, in commands, or when the event is regarded as potential, hypothetical or merely uncertain. Temporality is inferred from the context or expressed by adverbs (see Bertinetto 2014 for more details). Tables 2-3 report the realis and irrealis mood in the Zamucoan languages. While AY and CH show complementary distribution of the irrealis person paradigm (1SG/PL and 2SG/PL in AY, 3 in CH), OZ preserves the fully-fledged realis vs. irrealis contrast which characterized Proto-Zamucoan. The OZ data in the Tables are updated with the new prefixes identified in this study. Allomorphy conditioned by nasality is indicated in curly brackets.

PERSON	OLD ZAMUCO (OZ)	AYOREO (AY)	CHAMACOCO (CH)
1SG	<i>a</i> -V-ROOT	[\emptyset -V-ROOT]	<i>t/tV_xk</i> -V _x -ROOT
2SG	<i>d</i> - <i>a</i> /V-ROOT	{ <i>b/m</i> }- <i>a</i> /V-ROOT	\emptyset - <i>a/e</i> /V-ROOT
3	<i>tc/t/s/j</i> / \emptyset -(V-)ROOT (§5, §8)	<i>tc/t</i> / \emptyset -(V-)ROOT	<i>tc/ts/t</i> /[{ <i>d/l/n</i> }]/ \emptyset - (V-)ROOT
1PL	<i>a</i> -V-ROOT- <i>ko/gol/ho</i>	[\emptyset -V-ROOT- <i>ko</i> / { <i>go/ŋo</i> }/ <i>ho</i>]	1PL.INCL <i>j</i> -V-ROOT 1GPL.INCL <i>j</i> -V-ROOT- <i>lo</i> 1PL.EXCL <i>o</i> - <i>j</i> -V-ROOT
2PL	<i>d</i> - <i>a</i> /V-ROOT- <i>o</i> / <i>teo</i> /[{ <i>jo/ŋo</i> }]	<i>wak</i> - <i>a</i> /V-ROOT- <i>teo</i> / { <i>jo/ŋo</i> }	\emptyset - <i>a/e</i> /V-ROOT- <i>lo</i>
3PL	–	–	<i>o</i> - + 3.REAL

Table 2. The realis mood in Zamucoan

PERSON	OLD ZAMUCO (OZ)	AYOREO (AY)	CHAMACOCO (CH)
1SG	ts/⟨j/p⟩/s-V-ROOT (§5, §8)	⟨j/p⟩-V-ROOT	–
2SG	∅-a/V-ROOT	∅-a/V-ROOT	–
3	{d/n}/t/n/⟨b/m⟩/∅-(V-)ROOT (§5, §8)	–	{d/n/l}/t/∅-(V-)ROOT
1PL	ts/⟨j/p⟩/s-V-ROOT-ko/go/ho	⟨j/p⟩-V-ROOT-ko/⟨go/ho⟩/ho	–
2PL	∅-a/V-ROOT-o/teo/⟨jo/po⟩	∅-a/V-ROOT-teo/⟨jo/po⟩	–
3PL	–	–	o- + 3.IRR

Table 3. The irrealis mood in Zamucoan

AY is losing the realis vs. irrealis distinction in the 1st person: the 1.IRR is replacing the 1.REAL (indicated in square brackets in Table 2). In this paper, for reasons of simplicity, I will report AY paradigms with full prefixation (thus also omitting the prefixless 2.IRR). For CH, Ciucci & Bertinetto (2015:76–81) show that the 3PL is an innovation, along with the clusivity split (Table 2). Indeed the 3PL is derived from the 3rd person (unmarked for number), and the 1PL.EXCL stems from the 1PL.INCL, which also has a greater plural. Since they are innovations of no use for the present study, I will omit these persons in the examples: the interested reader can consult Ciucci & Bertinetto (2015) and Ciucci (2020, *forthcoming* 2021a).

Zamucoan languages show nasal harmony, which often spreads to affixes. For instance, the AY 1st person prefix *j-* and 2SG prefix *b-* can nasalize into *n-* and *m-*, respectively, owing to nasal harmony, although both allomorphs are often found in the same verb (cf. 3a vs. 3b). Also the 3rd person prefix *d-* in CH and OZ can turn into *n-* under nasal harmony. In prefixation, nasal harmony is not always predictable and the

presence of nasalization seems to vary from speaker to speaker.² Besides, there are insufficient data on prefix nasalization in the OZ 2nd person. When discussing affixes in general terms, rather than for individual forms, I will often only report the oral allomorphs, but it is implicit that nasal harmony is a pervasive phenomenon; for more information, see Ciucci (2016).

- (3) a. AY *j-/ŋ-a-jona* (1SG), *b-/m-a-jona* (2SG), *tə-a-jona* (3), *j-/ŋ-a-jona-ŋo* (1PL),
wak-a-jona-ŋo (2PL) ‘to run after, to chase’
- b. AY *j-a-gu* (1SG), *b-a-gu* (2SG), *t-a-gu* (3), *j-a-ho* (1PL), *wak-a-təo* (2PL) ‘to eat,
to bite’

As shown in (1), the verb structure consists of PREFIX, THEMATIC/INFLECTIONAL VOWEL, ROOT and SUFFIX. From a taxonomic point of view, the 3.REAL plays a central role. Verbs form three primary groups depending on the shape of the 3.REAL, which can be formed by:

- (a) prefix + thematic vowel + root (e.g. CH *tə-e-ɛer* ‘to fish’): PREFIXAL verbs.
- (b) thematic vowel + root, which together form the theme (e.g. CH *Ø-i-jem* ‘to wait for’):
THEMATIC verbs.
- (c) pure root (e.g. CH *Ø-Ø-kaŋir* ‘to appreciate’): RADICAL verbs.

Table 4 shows the inflectional classes in each Zamucoan language and their reconstruction in Proto-Zamucoan. Among prefixal verbs, the classes are named after

² The data in all examples follow the respective sources as for prefix nasalization.

their 3.REAL prefix (or simply the 3rd person prefix in AY). Most verbs have the 3.REAL prefix *tɛ-* (*tɛ*-verbs) or *t-* (*t*-verbs). Although verb classes are altogether rather stable, some verb class changes are of particular interest from a diachronic perspective. In this study, two new verb classes emerge for OZ: the *s*-verbs (§5) and the *j*-verbs (§8). Sometimes, I will also use ‘prefixal’, ‘thematic’ and ‘radical’ to refer to the structure of the 3.IRR, without reference to the verb class.

	PREFIXAL VERBS				THEMATIC VERBS	RADICAL VERBS
OLD ZAMUCO (OZ)	<i>tɛ</i> -verbs	<i>s</i> -verbs (§5)	<i>j</i> -verbs (§8)	<i>t</i> -verbs	Thematic verbs	Radical verbs
AYOREO (AY)	<i>tɛ</i> -verbs		<i>t</i> -verbs		Thematic verbs (rare)	Radical verbs
CHAMACOCO (CH)	<i>tɛ</i> -verbs	<i>ts</i> -verbs (<i>ɛ-</i> , §6)	<i>t</i> -verbs	<i>d</i> -verbs	Thematic verbs (<i>i-</i> , <i>u-</i> , <i>i-</i>)	Radical verbs
PROTO-ZAMUCOAN	* <i>tɛ</i> -verbs	* <i>s</i> -verbs (§6)	* <i>t</i> -verbs		*Thematic verbs	*Radical verbs

Table 4. Verb classes in Zamucoan (updated from Ciucci & Bertinetto 2015)

Table 5 presents an updated reconstruction of Proto-Zamucoan verb inflection (see also Bertinetto & Ciucci 2019 and Bertinetto, present volume). I have indicated the sections that deal with the features investigated in this paper. Where reconstruction of those features is likely, but uncertain owing to lack of data in AY and CH, they are in square brackets.

Proto-Zamucoan verb inflection		
	Realis	Irrealis
1SG	* <i>a</i> -V-ROOT	*{ <i>j/n</i> }-V-ROOT * <i>tɛ</i> -V-ROOT (for * <i>tɛ</i> -verbs) [* <i>s</i> -V-ROOT] (for * <i>s</i> -verbs) (§5-6)
2SG	*{ <i>ba/ma</i> }-V-ROOT (§4) [*{ <i>da/na</i> }-V-ROOT]	* <i>a</i> -V-ROOT (§4)
3	* <i>tɛ</i> -V-ROOT (* <i>tɛ</i> -verbs)	*{ <i>d/n</i> }-V-ROOT
	* <i>t</i> -V-ROOT (* <i>t</i> -verbs)	* <i>t</i> -V-ROOT
	* <i>s</i> -V-ROOT (* <i>s</i> -verbs) (§5-6)	[* <i>n</i> -V-ROOT]
	*∅-V-ROOT (thematic verbs)	*∅-∅-ROOT (fortition of initial consonant) (§7.1-7.2) *{ <i>d/n</i> }- <i>o</i> -ROOT (irregular inflectional vowel) (§7.4) [*∅-V-ROOT] (§7.3)
	*∅-∅-ROOT (radical verbs)	*∅-∅-ROOT
1PL	* <i>a</i> -V-ROOT- <i>ko</i>	*{ <i>j/n</i> }-V-ROOT- <i>ko</i> * <i>tɛ</i> -V-ROOT- <i>ko</i> (only for * <i>tɛ</i> -verbs) [* <i>s</i> -V-ROOT]- <i>ko</i> (for * <i>s</i> -verbs) (§5-6)
2PL	*{ <i>ba/ma</i> }-V-ROOT- <i>o</i> /{ <i>jo/no</i> } [*{ <i>da/na</i> }-V-ROOT- <i>o</i> /{ <i>jo/no</i> }]	* <i>a</i> -V-ROOT- <i>o</i> /{ <i>jo/no</i> }

Table 5. Reconstruction of Proto-Zamucoan verb inflection

Before analyzing OZ verbs and comparing them with AY and CH, the next section will provide more information on the dictionary.

3. The new Old Zamuco data from Chomé's dictionary

The current reconstruction of Proto-Zamucoan verb inflection (Ciucci & Bertinetto 2015) is based, for OZ, on the verbs reported in Chomé's grammar (1958). This work presents

a number of paradigms (although mostly incomplete) which can be analyzed in modern terms (see Ciucci 2016:216–233). Since the grammar was conceived as complementary to the dictionary, the latter offers a large amount of unique and very detailed information on verb morphology (Ciucci 2018).

Below I report the entry of a regular verb of the dictionary (4), followed in (5) by its English translation with the OZ materials in IPA. The citation form adopted by Chomé for verb entries is the 1SG.REAL, followed by the other realis persons, and by the Spanish translation. Since the irrealis is obligatory after negation, Chomé also reports the negative particle *ca* /ka/ followed by the 1.IRR and 3.IRR. In (5), I have glossed all verb forms between parentheses. This citation structure is systematically used in the whole dictionary, so that we have the essential paradigm of each verb. The only missing persons are the 2SG.IRR, the 1PL.IRR and the 2PL.IRR, but these are easy to reconstruct for the reader acquainted with Chomé’s grammar: the 2SG.IRR only differs from the 2SG.REAL in that it lacks the prefix *d-*. The 1PL.IRR and 2PL.IRR derive from the respective singular persons by adding the same plural suffix used in the realis (see Tables 2-3). Thus, the dictionary gives access to the complete verb paradigm. Although in the dictionary Chomé *de facto* provides information on both the realis and irrealis mood, he does not use this terminology, and in his grammar he provides a more complicated description, identifying Latin-inspired temporal and modal categories which are totally alien to Zamucoan (see Ciucci 2016:216–217).

(4) ***Airaha***, *daraha*, *chiraha*, pl. *airahago*, *darahao*, saber, aprehender, aprender, N. *ca chiraha*, 3.^a *ca diraha*; *pirahac*, sabido, etc., pos. *chirahac*, *arahac*, *irahac*, pl. *ayirahac*; *pirahazore*, el que sabe, conoce; *pirahariga*, conocimiento, etc.; *Tupâde iraharigatie ome cuchaddoe ca iruericuz*, es infinita la sabiduria de Dios; *airaha*

ezabedayie, sé leer; *airaha poriyie*, saber trepar en árbol; *airaha teutie*, bolver en si el que desvariaba; *e airaha, ainarañumé*, resabiado ser; *airaha quitic*, comprender, alcanzar con el entendimiento; *ca diraha dirire peatic*, es basto, rudo, tupido de entendimiento; *ca araha dirire peatic*, sois una bestia, lo tienen por suma injuria; *irahesore*, vel, *iraheque*, el que no sabe; *chirahesore*, yo soi el que no sabe, *arahesore*, tu eres el que no sabe, etc., Fem. *iraheto*; *deatchatie iraheque*, vel, *irahesore, cuchuzoda dateputigatie*, etc., si alguno no supiere la gravedad del pecado, etc.

- (5) **Airaha** (1SG.REAL), **daraha** (2SG.REAL), **teiraha** (3.REAL), pl. **airahago** (1PL.REAL), **darahao** (2PL.REAL), to know, to learn, to understand, N. *ka* (NEG) **teiraha** (1SG.IRR), 3.^a *ka* (NEG) **diraha** (3.IRR); *pirahak*, known, etc., pos. *teirahak, arahak, irahak, pl. ajirahak*; *pirahasore*, the one who knows; *pirahariga*, knowledge, etc. *Tupāde iraharigatie ome kutæadoe ka iruerikus*, the wisdom of God is infinite; *airaha* (1SG.REAL) *esabedajie*, I know how to read; **airaha** (1SG.REAL) *porijie*, to know how to climb a tree; **airaha** (1SG.REAL) *teutie*, to come round, the one who was delirious; *e airaha* (1SG.REAL), *ainarañume*, to be knowing; **airaha** (1SG.REAL) *kitik*, to understand, to get to understand; *ka diraha* (3.IRR) *dirire peatik*, they have bad understanding; *ka araha* (2SG.IRR) *dirire peatik*, you are a brute, they consider it the supreme insult; *irahesore*, or, *iraheke*, the one who does not know; *teirahesore*, I am the one who does not know (lit. my unknowing one), *arahesore*, you are the one who does not know (lit. your unknowing one), etc., Fem. *iraheto*; *deatchatie iraheke*, or, *irahesore, kutæusoda dateputigatie*, etc., if someone did not know the gravity of the sin, etc.

The verb paradigm is followed by a series of deverbal nouns (often with their respective paradigms), which are not relevant for the present work. For a detailed comment of this entry, see Ciucci (2018). As one can see in (4-5), the dictionary entries are rich in examples, from which one can extract inflected forms not provided in the first part of each entry, but morphologically predictable, such as the 2.IRR *araha*, and even forms of verbs for which there is no specific entry. This is important, because some pages of the dictionary are lost. Since the 1.REAL (i.e. Chomé's citation form) has the prefix *a-*, the vast majority of entries for verbs are under the letter *A*, which covers 152 of the 242 pages of the dictionary, that is 900 entries out of 2,110. Excluding uninflected verbs, the dictionary reports, with their paradigms, about 850 verbs and verbal periphrases. In what follows, I will show how the new data from the dictionary contribute to our understanding of OZ verb inflection and Zamucoan historical linguistics.

4. The thematic vowel

Within the Zamucoan family, one can detect thematic vowel correspondences suggesting diachronic stability that goes back to Proto-Zamucoan. In all languages, non-high thematic vowels generally show up in the whole paradigm (see Ciucci 2016:254–270 for examples).

High thematic vowels are replaced by /a/ in the 2nd person of OZ and AY, and by /a/ or /e/ in CH (6-7). CH /e/ is a frequent reflex of Proto-Zamucoan */a/ (see Table 1).

- (6) a. OZ REAL: *a-i-hotɛa* (1SG), *d-a-hotɛa* (2SG), *tɛ-i-hotɛa* (3), *a-i-hotɛa-go* (1PL),
d-a-hotɛa-o (2PL); IRR: *tɛ-i-hotɛa* (1SG), *d-i-hotɛa* (3) ‘to dig, to make a hole’
- b. AY *j-i-hotɛa* (1SG), *b-a-hotɛa* (2SG), *tɛ-i-hotɛa* (3), *j-i-hotɛa-go* (1PL), *wak-a-hotɛa-jo* (2PL) ‘to dig, to carve’
- c. CH *t-i-hĩtsa* (1SG), \emptyset -a-*hãtsa* / \emptyset -e-*hĩtsa* (2SG), *tɛ-i-hĩtsa* (3.REAL), *j-i-hĩtsa* (1PL.INCL), \emptyset -a-*hatsã-lo* / \emptyset -a-*hãts-lo* / \emptyset -a-*hatsĩ-lo* / \emptyset -e-*hĩtsi-lo* (2PL) // *n-i-hitsã* (3.IRR) ‘to dig, to excavate’
- (7) a. OZ REAL: *a-u-mate* (1SG), *d-a-mate* (2SG), *tɛ-u-mate* (3), *a-u-ma-ko* (1PL),
d-a-ma-tɛo (2PL); IRR: *tɛ-u-mate* (1SG), *d-u-mate* (3) ‘to finish’
- b. AY *j-i-mate* (1SG), *b-a-mate* (2SG), *tɛ-i-mate* (3), *j-i-ma-ko* (1PL), *wak-a-ma-tɛo* (2PL) ‘to finish, to complete’
- c. CH *t-i-mit* (1SG), \emptyset -e-*mit* (2SG), *tɛ-i-mit* (3.REAL), *j-i-mit* (1PL.INCL), \emptyset -e-*mit-lo* (2PL) // *n-i-mit* (3.IRR) ‘to finish, to complete’³

The vowel /a/ or /e/ in (6-7) fills the slot of the thematic vowel. In Proto-Zamucoan, */a/ (> /a/, /e/) belonged to the original prefix; later it replaced the original thematic vowel and was reanalyzed as thematic vowel; such a process possibly started already in Proto-Zamucoan. The erstwhile state of affairs is illustrated by some CH and OZ conservative paradigms. In (8), thematic /i/ is preserved as a palatal glide after the 2nd person vowel /e/. In (9), the high thematic vowel (again /i/) is not replaced and /a/ preserves its position

³ Example (7) shows that a high thematic vowel in one language can often correspond to a high vowel of different quality in the others (cf. Ciucci 2017:254–270). In OZ and AY, some final syllables of the root can be replaced by the plural suffix, as in (7). Such syllables were called ‘mobile syllables’ in Ciucci & Bertinetto (2015:28, 34–35).

in the prefix.

(8) CH *t-i-behe* (1SG), *e-j-behe* (2SG), *ɬ-i-behe* (3.REAL), *j-i-behe* (1PL.INCL),
e-j-behe-lo (2PL) // *d-i-behe* (3.IRR) ‘to change’

(9) OZ REAL: *a-i-se* (1SG), *da-i-se* (2SG), *ɬ-i-se* (3), *a-i-ko* (1PL), *da-i-so* (2PL);
IRR: *ɬ-i-se* (1SG), *d-i-se* (3) ‘to reach’

Examples such as (9) were exceedingly rare in Chomé’s grammar, but similar paradigms emerge in the dictionary. In particular, there are a few verbs, as in (10), where /a/ of the 2nd person prefix does not replace thematic /u/, a fact not documented in AY or CH.

(10) OZ REAL: *a-u-sik* (1SG), *da-u-sik* (2SG), *ɬ-u-sik* (3), *a-u-si-ho* (1PL), *da-u-si-ɬo*
(2PL); IRR: *ɬ-u-sik* (1SG), *d-u-sik* (3) ‘to tease cotton’

Besides occasionally preserving the original sequence /au/ (10), OZ also has innovations in the 2nd person. In (11a, 12a), thematic /u/ is preserved in the OZ 2nd person, but with deletion of the 2nd person vowel /a/ (* /au/ > /u/). This is unusual, since AY /a/ and CH /a/ or /e/ regularly substitute /u/ in the 2nd person (* /au/ > /a/).⁴ The loss of /a/ in (11a, 12a) is not the only OZ innovation in the 2nd person. Indeed, the language has also lost the Proto-Zamucoan prefix **ba-*/*ma-* for 2.REAL (cf. Tables 2 and 5; for more details, see

⁴ There is just one case in which the loss of the prefix vowel /a/ in the 2nd person can be reconstructed for Proto-Zamucoan: it concerns the OZ and CH verb used for causative constructions (Ciucci & Bertinetto 2015:56). It is the only case where CH has no 2nd person vowel /a/ or /e/. There are no such exceptions in AY verb morphology.

Ciucci & Bertinetto 2015:70–71).

- (11) a. OZ REAL: *a-u-ta* (1SG), *d-u-ta* (2SG), *tɛ-u-ta* (3), *a-u-ta-go* (1PL), *d-u-ta-o* (2PL);
IRR: *tɛ-u-ta* (1SG), *d-u-ta* (3) ‘to water, to irrigate’
- b. AY *j-u-ta* (1SG), *b-a-ta* (2SG), *tɛ-u-ta* (3), *j-u-ta-go* (1PL), *wak-a-ta-jo* (2PL) ‘to water, to irrigate, to sprinkle’
- c. CH *t-i-ta* (1SG), \emptyset -*e-ta* (2SG), *ts-i-ta* (3.REAL), *j-i-ta* (1PL.INCL), *e-ti-lo* (2PL) // *d-i-ta* (3.IRR) ‘to water, to irrigate’

- (12) a. OZ REAL: *a-u-nina* (1SG), *d-u-nina* (2SG), *tɛ-u-nina* (3), *a-u-ko-na* (1PL),
d-u-tɛo-na (2PL); IRR: *tɛ-u-nina* (1SG), *d-u-nina* (3) ‘to hear, to perceive’
- b. AY *n-u-nina* (1SG), *m-a-nina* (2SG), *tɛ-u-nina* (3), *n-u-nina-ŋo* (1PL),
wak-a-nina-ŋo (2PL) ‘to hear, to perceive, to be surprised’
- c. CH *tuk-u:-na* (1SG), \emptyset -*e:-na* (2SG), *tɛ-u:-na* (3.REAL), *j-u:-na* (1PL.INCL),
\emptyset-*e:-ni-lo* (2PL) // *n-u:-na* (3.IRR) ‘to hear, to perceive’

In this paper, I will show other paradigms like (12), where OZ has innovated with respect to AY and CH (see ex. 38b, 40, §7.1; ex. 68, §8). In the next section, I will describe a new inflectional class which emerges from the OZ dictionary.

5. Prefixal verbs in *s-*

By reinterpreting Chomé’s grammar (1958:150), Ciucci (2016) singled out a group of OZ

verbs in which:

- (i) the 3.REAL begins with /s/;
- (ii) the 1.IRR also begins with /s/;
- (iii) /s/ is replaced by /n/ in the 3.IRR.

Since *n-* can be a nasal allomorph of the 3.IRR prefix *d-*, Ciucci (2016:227–228) surmised that this could be a group of prefixal verbs with prefix *s-* for 3.REAL and 1.IRR, but the prefixal status of *s-* was unclear and is discussed later in this section. The usage of the same exponent for 3.REAL and 1.IRR is a feature of the most conspicuous verb class, the so-called *tɛ-*verbs (see Tables 4-5). However, the problem was that Chomé’s grammar only offered example (13). The 2.REAL was missing and the paradigm segmentation was problematic, since it was not clear whether /s/ and /n/ were prefixes or part of the root. The corresponding AY verb (14) is regular, apart for the presence of both a radical and a prefixal 3rd person. In AY, 3rd person initial /s/ is part of the root and several radical verbs display (from a synchronic perspective) word-initial fortition of /h/ into /s/ (Ciucci 2016:97–98). Was this also the case in OZ?

(13) OZ REAL: *a-horu* (1SG), *soru* (3), *a-ho-ko* (1PL), *d-a-ho-jo* (2PL); IRR: *soru* (1SG),
noru (3) ‘to close’

(14) AY *j-u-hu(ru)* (1SG), *b-a-hu(ru)* (2SG), \emptyset - \emptyset -*su(ru)* / *tɛ-u-hu(ru)* (3), *j-u-hu-ko* (1PL),
wak-a-hu-tɛo / *wak-a-hu-jo* (2PL) ‘to close (in), to shut in’

In the dictionary, one can find the missing 2SG.REAL of *soru*, but, more importantly, there are several regular paradigms such as (15-16), which belong to the same group as (13).

(15) OZ REAL: *a-u-s* (1SG), *da-u-s* (2SG), *s-u-s* (3), *a-u-ko* (1PL), *da-u-so* (2PL);

IRR: *s-u-s* (1SG), *n-u-s* (3) ‘to look after (someone)’

(16) OZ REAL: *a-o-ta* (1SG), *da-o-ta* (2SG), *s-o-ta* (3), *a-o-ta-go* (1PL), *da-o-ta-o* (2PL);

IRR: *s-o-ta* (1SG), *n-o-ta* (3) ‘to soak’⁵

These verbs are prefixal and display the following features:

- (i) 3.REAL prefix *s-*;
- (ii) 1.IRR prefix *s-*;
- (iii) 3.IRR prefix *n-*.

Based on the 3.REAL prefix *s-*, they can be called *s*-verbs. The problem in (13) was that the non-systematic /h/-insertion between root and thematic vowel made it difficult to distinguish the prefixes from the root. Besides, (13) was a unique case in the grammar. If one considers /h/ an insertion, (13) is like the other *s*-verbs. Example (17) offers the correct segmentation. Comparing (17) with its AY cognate in (14), repeated in (18), one can see that the /h/-insertion and the subsequent thematic vowel have become part of the root in AY. This correlates with the loss of the 1.IRR and 3.IRR, which lack /h/-insertion in

⁵ Note that in Zamucoan the 2nd person vowel /a/ generally deletes before thematic /o/. The 2nd persons of (16) are thus exceptions.

OZ (17). One can surmise that /h/ was originally a hiatus filler.

(17) OZ *a-h-o-ru* (1SG), *da-h-o-ru* (2SG), *s-o-ru* (3), *a-h-o-ko* (1PL), *da-h-o-jo* (2PL);

IRR: *s-o-ru* (1SG), *n-o-ru* (3) ‘to close’

(18) AY *j-u-hu(ru)* (1SG), *b-a-hu(ru)* (2SG), \emptyset - \emptyset -*su(ru)* / *tɛ-u-hu(ru)* (3), *j-u-hu-ko* (1PL),

wak-a-hu-tɛo / *wak-a-hu-jo* (2PL) ‘to close (in), to shut in’

The prefix *s-* of the OZ 3.REAL *s-o-ru* (17) has also become part of the root in the AY radical 3rd person \emptyset - \emptyset -*su(ru)* (18), thus giving rise to the /h/ ~ /s/ alternation. In other words, an OZ (and presumably Proto-Zamucoan, §6) *s-*verb has been reinterpreted as a radical verb in AY.⁶ Subsequently, AY has created a new regular 3rd person, *tɛ-u-hu(ru)*, with the same theme as the rest of the paradigm, as a result of analogy with *tɛ-*verbs, the most regular and by far largest class in Zamucoan.⁷ What synchronically may at best be described as word-initial fortition of /h/ into /s/ for AY, actually originated from unetymological reinterpretation.

The insertion of /h/ in OZ is not systematic: for instance, in (19) it only occurs in the 1PL.REAL *ahoko*. In its AY cognate, by contrast, /h/ has once again been reanalyzed as part of the root (20).

(19) OZ REAL: *a-o-s* (1SG), *da-o-s* (2SG), *s-o-s* (3), *a-h-o-ko* (1PL), *da-o-so* (2PL); IRR:

⁶ In CH, it is mostly the opposite phenomenon which is documented, that is the root-initial consonant is reinterpreted as a prefix (Ciucci & Bertinetto 2015:57–58).

⁷ This process is well documented in Zamucoan and contributes to explain the low number of radical verbs in CH (Ciucci & Bertinetto 2015:61–62).

s-o-s (1SG), *n-o-s* (3) ‘to throw out animals’⁸

(20) AY *j-i-hose* (1SG), *b-a-hose* (2SG), \emptyset - \emptyset -*sose* / *tɛ-o-se* / \emptyset - \emptyset -*hose* (3), *j-i-ho-ko*
(1PL), *wak-a-ho-so* (2PL) ‘to push (the enemy) back, to squeeze’

Similarly, OZ exhibits no /h/-insertion in (21), but its AY cognate does (22). Generally, this kind of insertion is never found in the OZ 1.IRR and 3.REAL, nor in the AY cognate of the latter, indicating that Proto-OZ-AY (Figure 1) had no /h/-insertion in the 3.REAL of *s*-verbs. Section 6 will offer CH evidence that the /h/-insertion was also present in the rest of the Proto-Zamucoan paradigm.

(21) OZ REAL: *a-u-s* (1SG), *da-u-s* (2SG), *s-u-s* (3), *a-u-ko* (1PL), *da-u-so* (2PL);
IRR: *s-u-s* (1SG), *n-u-s* (3) ‘to look after (someone)’

(22) AY *j-u-huse* (1SG), *b-a-huse* (2SG), \emptyset - \emptyset -*suse* / *tɛ-u-se* / *tɛ-u-huse* (3), *j-u-hu-ko*
(1PL), *wak-a-hu-so* (2PL) ‘to care for’ (used with *gio*)

As already seen, the AY 3rd person is polymorphic. Apart from the radical 3rd person beginning with /s/, (20) and (22) also have a variant with prefix *tɛ-* plus the original theme: *tɛ-o-se* (20) and *tɛ-u-se* (22). Two hypotheses are possible: (i) the original *s-*, no longer a prefix in AY, has directly been replaced by *tɛ-*, the most frequent 3rd person prefix; (ii) *tɛ-u-se* and *tɛ-o-se* derive from drop of *-Vh-* in regularized forms, such as

⁸ For this verb Chomé’s grammar only reported the 1SG.REAL, so that it was not possible to have any information on its inflectional class.

**teihose* > *te-o-se* (20) and *teuhuse* > *teuse* (22) (Ciucci 2016:98–100). Example (20) also displays a radical 3rd person *hose*, corresponding to the new AY root.

Examples (23-24) show an unusual correspondence between OZ and AY. The AY verb has two alternating forms for 3rd person, *sue* and *ηue* (23). The former corresponds to the OZ 3.REAL *sue*, the latter to the OZ 3.IRR *nue* (24). Both have turned into plain 3rd persons in AY (23). The original 3.IRR prefix **n-* was included in the new root *ηue* (the former 3.IRR), which has been extended to the rest of the AY paradigm (23). AY /*η*/ can correspond to OZ /*n*/ or /*h*/ (see Table 1). If AY /*η*/ corresponds to /*h*/, it stems from the /*h*/-insertion and not from the 3.IRR prefix **n-* (in Proto-OZ-AY). However, one has to consider that the OZ root lacks nasality, which is present in AY, and the source of nasality can only be the 3.IRR prefix **n-*, with subsequent devoicing (on the possible lack of voiceless nasals in OZ, see §1.2).

(23) AY *n-u-ηue* (1SG), *m-a-ηue* (2SG), *∅-∅-sue* / *∅-∅-ηue* (3), *n-u-ηue-ηo* (1PL),

wak-a-ηue-ηo (2PL) ‘to be bigger/greater than’ (used with *gaj*) (also: *sure* /

ηure); *∅-∅-sue* (3) ‘to sprout’

(24) OZ REAL: *a-h-u-e* (1SG), *da-h-u-e* (2SG), *s-u-e* (3), *a-h-u-go-i* (1PL), *da-h-u-jo-i*

(2PL); IRR: *s-u-e* (1SG), *n-u-e* (3) ‘to go, to pass by, to sprout’

OZ has few verbs with the hybrid behavior of radical and prefixal verbs (25a, 26a). They show a 3.IRR beginning with /*n*/ and coinciding with the root, but the 3.REAL has a radical 3rd person beginning with /*s*/. The alternation /*n*/ ~ /*s*/ suggests that initially they were 3rd person prefixes. The prefix *n-* of the 3.IRR was then reinterpreted as part of the

root for the whole paradigm (excluding the 3.REAL). This process partly began in Proto-OZ-AY (and possibly even in Proto-Zamucoan), since the root of the AY cognates (25b, 26b) begins with a nasal consonant, stemming from the 3.IRR.

(25) a. OZ REAL: *a-i-naru* (1SG), *d-a-naru* (2SG), \emptyset - \emptyset -*saru* (3), *a-i-na-ko* (1PL),
d-a-na-no (2PL); IRR: *j-i-naru* (1SG), \emptyset - \emptyset -*naru* (3) ‘to have something going
down the throat’

b. AY *j-i-nire* (1SG), *b-a-nire* (2SG), *tɛ-i-nire* (3), *j-i-ni-ko* (1PL), *wak-a-ni-tɛo* (2PL)
‘to swallow’

(26) a. OZ REAL: *a-i-nari* (1SG), *d-a-nari* (2SG), \emptyset - \emptyset -*sari* (3), *a-i-na-ko-j* (1PL),
d-a-na-no-j (2PL); IRR: *j-i-nari* (1SG), \emptyset - \emptyset -*nari* (3) ‘to urge someone while
asking for something’ (followed by =*pusi*)

b. AY *j-i-ŋari* (1SG), *b-a-ŋari* (2SG), \emptyset - \emptyset -*ŋari* (3), *j-i-ŋa-ko-j* (1PL), *wak-a-ŋa-tɛo-j*
(2PL) ‘to want very much, to have great desire’

In (26b), the radical AY 3rd person was originally a 3.IRR: a recurring phenomenon in AY (§7). An alternative hypothesis is that (25a) and (26a) were radical verbs whose initial /n/ has been reinterpreted as 3.IRR prefix on the model of *s*-verbs. However, examples such as (23-24) suggest as more likely that in AY and OZ a prefixal 3.IRR has become the new root. This has occurred in former AY thematic verbs (ex. 59 and 61, §7) and in OZ exceptions such as (68, 70), see §8. Concerning the classification of (25a) and (26a), they are not proper *s*-verbs, because their 1.IRR prefix is *j-*, as typical of radical verbs, rather than *s-*.

Finally, there are OZ radical verbs with a root beginning with /s/, with no connection with *s*-verbs (27). In this case, 3.REAL and 3.IRR coincide, and the 1.IRR prefix is *j*-, two typical properties of radical verbs.

(27) OZ REAL: *a-i-seta* (1SG), *d-a-seta* (2SG), \emptyset - \emptyset -*seta* (3), *a-i-seta-go* (1PL), *d-a-seta-o* (2PL); IRR: *j-i-seta* (1SG), \emptyset - \emptyset -*seta* (3) ‘to groan, to gasp, to sob, to hiccup’

In the next section, the comparison will be extended to CH, with important consequences for Proto-Zamucoan reconstruction.

6. Can 3.REAL *s- be reconstructed for Proto-Zamucoan?

Having shown that the 3.REAL prefix *s- characterized Proto-OZ-AY, one wonders whether the *s-class was also present in Proto-Zamucoan. Assuming, hypothetically, that this was the case, the main problem is that *s*-verbs have undergone remarkable changes in CH, where only one verb can undoubtedly be traced back to this group: compare ex. (28) with the CH verb in (29), which has 3.REAL prefix ϵ -.

(28) OZ REAL: *a-h-o-kāru* (1SG), *da-h-o-kāru* (2SG), *s-o-kāru* (3), *a-h-o-kā-ko* (1PL), *da-h-o-kā-ŋo* (2PL); IRR: *s-o-kāru* (1SG), *n-o-kāru* (3) ‘to do something’⁹

⁹ Chomé often omitted nasality on vowels (§1.1), as he did in this verb, but the presence of the 2PL suffix *-ŋo* (instead of *-jo*) indicates that nasality is in the root.

(29) CH *t-i-jokōr* (1SG), *a-hakōr* (2SG), *ε-i-jokōr* / *ε-i-jōr* (3.REAL), *j-i-jokōr* (1PL.INCL),
a-hakōr-lo (2PL) // *n-i-jokōr* / *n-i-jokōr* (3.IRR), *o-ŋ-i-jōr* (3PL.IRR) ‘to build, to
make, to do’

In (28-29), the OZ theme *-okāru* corresponds to CH *-okōr* (with the occasional drop of intervocalic /k/ in some persons). The difference between OZ /a/ and CH /o/ may be due to vowel harmony. Significantly, the CH root contains the former /h/-insertion in the 2nd person, where the following vowel undergoes vowel harmony (/o/ > /a/). Ciucci & Bertinetto (2015:53–54) show that, in some CH paradigms, root-initial /h/ has turned into /j/ and is only preserved after inflectional /a/ (i.e. in the 2nd person). This can be seen in (30), where OZ /h/ corresponds to AY /ŋ/ (owing to nasal harmony) and CH /h/ or /j/ (depending on the preceding vowel).

- (30) a. OZ REAL: *a-u-hokāre* (1SG), *d-a-hokāre* (2SG), *ɬ-u-hokāre* (3), *a-u-hokā-ko*
(1SG), *d-a-hokā-ŋo* (2PL); IRR: *ɬ-u-hokāre* (1SG), *d-u-hokāre* (3) ‘to frighten
someone who runs away, to frighten the game’
- b. AY *ŋ-i-ŋokāre* (1SG), *m-a-ŋokāre* (2SG), *ɬ-i-ŋokāre* (3), *ŋ-i-ŋokā-ko* (1PL),
wak-a-ŋokā-ŋo (2PL) ‘to frighten’
- c. CH *t-i-jok* (1SG), *∅-a-hok* / *∅-e-jok* (2SG), *ɬ-i-jok* (3.REAL), *j-i-jok* (1PL.INCL),
∅-a-hok(i)-lo / *∅-e-jok-lo* (2PL) // *d-i-jok* (3.IRR) ‘to frighten’

In (29), /j/ is only found in the 3.IRR, while elsewhere it has simplified to /j/. If this is so (/h/ > /j/ > /j/), (28) and (29) are cognates. The alternation /h/ ~ /j/ ~ /j/ in the root can thus be interpreted as a preservation of the /h/-insertion. Such insertion is found in all

Zamucoan languages and can be reconstructed for Proto-Zamucoan *s*-verbs, although we do not know whether it applied to all persons, because AY and CH do not preserve the entire paradigm (see Tables 2-3). Note that all CH verbs with 3.REAL prefix *ε*- and thematic vowel /i/ have root-initial allomorphy, with the alternation /h/ ~ /j/ (Ciucci & Bertinetto 2015:43).

Synchronically, the CH 3.REAL prefix *ε*- is in complementary distribution with *ts*- (this is why *ε*- is between parentheses in Table 4) and occurs when the thematic vowel is /i/ or /u/, otherwise the verb has *ts*- (Ciucci & Bertinetto 2015:43). Since *ts*- stems from Proto-Zamucoan **tε*-, in previous work *ε*- was considered a deaffrication of *tε*- (Ciucci & Bertinetto 2015:55–56). However, CH /*ε*/ can also stem from palatalization of /s/, as in CH verbs such as (31c), with root-initial alternation /s/ ~ /*ε*/, corresponding to /s/ in OZ and AY (31a-b).

- (31) a. OZ REAL: *a-u-sake* (1SG), *d-a-sake* (2SG), *tε-u-sake* (3), *a-u-sa-ho* (1PL),
d-a-sa-tεo (2PL); IRR: *tε-u-sake* (1SG), *d-u-sake* (3) ‘to break, to smash’
- b. AY *j-u-sake* (1SG), *b-a-sake* (2SG), *tε-u-sake* (3), *j-u-sa-ho* (1PL),
wak-a-sa-tεo (2PL) ‘to crack open, to split open’ (with this meaning it is followed by *gaj*)
- c. CH *tik-i-εak* / *t-i-εak* (1SG), *∅-a-sak* (2SG), *tε-i-εak* (3.REAL), *j-i-εak* (1PL.INCL),
∅-e-εak-lo / *∅-e-εaki-lo* (2PL) // *d-i-εak* (3.IRR) ‘to break’

To sum up, examples (30-31) provide indirect evidence that OZ *s-okāru* (28) and CH *ε-ijokōr* (29) are cognates. Their comparison invites the hypothesis that Proto-Zamucoan had a small group of verbs with 3.REAL prefix **s*-.

However, not all CH verbs with 3.REAL prefix ϵ - can be traced back to Proto-Zamucoan * s -verbs. It is indeed challenging to find clear cognates between OZ s -verbs and CH (where ϵ -verbs are rare). The CH verb in (32) has two possible cognates: (33) or (34). In the first case (32 cognate of 33), there is the same thematic vowel, while AY /g/ and /a/ in the root often correspond to CH /j/ and /e/, respectively (Table 1). However, the CH root-initial alternation /h/ ~ /j/ (32) stems from /h/-insertion, also to be observed in OZ and AY s -verbs (34).

(32) CH *t-i-geru* (1SG), \emptyset -*a-heru* (2SG), ϵ -*i-geru* (3.REAL), *j-i-geru* (1PL.INCL),

\emptyset-*a-heru-lo* (2PL) // *d-i-geru* (3.IRR) ‘to close, to tie’

(33) AY *j-i-garu* (1SG), *b-a-garu* (2), *\text{t}\epsilon*-*i-garu* (3), *j-i-garu-ko* (1PL), *wak-a-garu-t\epsilon o*

(2PL) ‘to tie, to fasten’

(34) a. OZ REAL: *a-h-o-ru* (1SG), *da-h-o-ru* (2SG), *s-o-ru* (3), *a-h-o-ko* (1PL), *da-h-o-jo*

(2PL); IRR: *s-o-ru* (1SG), *n-o-ru* (3) ‘to close’

b. AY *j-u-hu(ru)* (1SG), *b-a-hu(ru)* (2SG), \emptyset - \emptyset -*su(ru)* / *\text{t}\epsilon*-*u-hu(ru)* (3),

j-u-hu-ko (1PL), *wak-a-hu-t\epsilon o* / *wak-a-hu-jo* (2PL) ‘to close (in), to shut in’

If one surmises that (32) and (33) are cognates, the /h/ ~ /j/ alternation can only be explained by assuming that root allomorphy depends on assimilation to the CH verbs stemming from * s -verbs (such as 29). The /h/ ~ /j/ alternation is instead expected if (32) is a cognate of (34). However, a problem remains: the first vowel of the root is /e/ in CH (32), /o/ in OZ and /u/ in AY (34). This might be the result of some mechanism of vowel

harmony or assimilation in the root (for instance, by final /u/ in OZ and AY or by /j/ in CH), but it is not clear what the original root vowel might have been. By contrast, the different thematic vowels of (32) and (34b) can be explained by assuming that an additional default vowel /i/ or /u/ (depending on vowel harmony) has been added after the reinterpretation of the root boundaries.

In conclusion, CH has one verb which undoubtedly belonged to the *s*-verbs (29), and another which may have this origin (32). Whatever the case, these two paradigms (particularly ex. 29) allow us to claim that **s*-verbs existed in Proto-Zamucoan. However, while the 3.REAL prefix **s*- belonged to Proto-Zamucoan, there are no traces of the 1.IRR prefix **s*- in CH. This is not surprising, though, as CH underwent many changes in the 1st person (including total loss of 1.IRR). One might conjecture the previous presence of 1.IRR **s*- owing to analogy with Proto-Zamucoan **tɛ*-verbs, which had identical 3.REAL and 1.IRR prefix **tɛ*- (Table 5).

Concerning the 3.IRR, OZ *s*-verbs have the prefix *n*-. This is the usual nasal allomorph of *d*-, but in *s*-verbs *n*- does not depend on nasal harmony. One can reconstruct **n*- for the 3.IRR of *s*-verbs in Proto-OZ-AY (see §5), although it is not clear whether they had **d*- (which could nasalize into **n*-) or only **n*- in Proto-Zamucoan. If the Proto-Zamucoan prefix was **n*-, it has become indistinguishable from the standard 3.IRR prefix *d*-/*n*- in CH, so that this point remains obscure (Table 5).

7. Thematic verbs

The so-called thematic verbs form a small class in all Zamucoan languages. Particularly

in CH, they display several useful irregularities for historical reconstruction. In the OZ grammar, however, there is only a little information on them, so that a detailed analysis is only possible with the paradigms from the OZ dictionary. The comparison shows that Proto-Zamucoan thematic verbs displayed more morphological variety than previously assumed.

7.1. Thematic verbs with theme in *ij-* and radical 3.IRR

For Proto-Zamucoan, one can reconstruct two subgroups of thematic verbs: (i) verbs with 3.REAL beginning with **ij-* (thematic **/i/* + root initial **/j/*) and radical 3.IRR, cf. (35); (ii) verbs with 3.IRR prefix **d-*, cf. (36) (Ciucci & Bertinetto 2015:71–72). This section deals with the first subgroup. Thematic verbs have almost completely disappeared from AY, where they have turned into radical (35b) or *te-*verbs (36b). The development of Proto-Zamucoan thematic verbs in AY will be one of the main topics of this and the following sections (§7.2-7.4; a summary is at the end of §7.4).

- (35) a. OZ REAL: *a-i-jage* (1SG), *d-a-jage* (2SG), *Ø-i-jage* (3), *a-i-jage-go* (1PL),
d-a-jage-o (2PL); IRR: *j-i-jage* (1SG), *Ø-Ø-teage* (3), *j-i-jage-go* (1PL),
Ø-a-jage-o (2PL) ‘to stand up’
- b. AY *j-i-jage* (1SG), *b-a-jage* (2SG), *Ø-Ø-teage* (3), *j-i-jage-go* (1PL),
wak-a-jage-jo (2PL) ‘to stand up’
- c. CH *t-i-jehet* / *tik-i-jehet* / *tik-i-jehet* (1SG), *Ø-a-lehet* (2SG), *Ø-i-jehet* (3.REAL),
j-i-jehet (1PL.INCL), *Ø-a-leheti-lo* / *Ø-a-lehet-lo* (2PL) // *Ø-Ø-tsehet* (3.IRR)

‘to stand, to stand up’

- (36) a. OZ REAL: *o-si* (1SG), *Ø-i-si* (3); IRR: *j-i-si* (1SG), *Ø-a-si* (2SG), *d-o-si* (3) ‘to give’
- b. AY *j-i-si* (1SG), *b-a-si* (2SG), *ɬ-i-si* (3), *j-i-si-go* / *j-i-si-ŋo* (1PL), *wak-a-si-jo* / *wak-a-si-ŋo* (2PL) ‘to give’
- c. CH *tok-o-ɛi* (1SG), *Ø-e-ɛi* (2SG), *Ø-i-ɛi* (3.REAL), *j-o-ɛi* (1PL.INCL), *Ø-e-ɛi-lo* (2PL) // *d-o-ɛi* (3.IRR) ‘to pay, to give, to contaminate, to deliver’

Despite their relevance for diachronic reconstruction, any previous comparison for thematic verbs was partial, because Chomé’s grammar only offered a few thematic verbs, with just two complete paradigms. By contrast, Chomé’s dictionary offers several thematic verbs for comparison. For instance, in AY verbs such as (35b), the original 3.REAL has been replaced by a radical 3.IRR. In previous work (Ciucci & Bertinetto 2015:58–60), this type of change, which has turned several AY thematic verbs into radical ones, could only find support in the comparison with two OZ thematic verbs (ex. 35a and 59a, §7.4).

Some newly available OZ paradigms, such as (37) and (38), confirm the substitution of the 3.REAL by the 3.IRR in AY. For *ijo* (37a), Chomé’s grammar only reported the 1SG.REAL. The new data show that OZ (37a) and CH (37c) have almost identical 3.REAL and 3.IRR, with the latter corresponding to the AY 3rd person.

- (37) a. OZ REAL: *a-i-jo* (1SG), *d-a-jo* (2SG), *Ø-i-jo* (3), *a-i-jo-go* (1PL), *d-a-jo-o* (2PL);
IRR: *j-i-jo* (1SG), *Ø-Ø-ɬo* (3) ‘to jump, to fly’
- b. AY *j-i-jo* (1SG), *b-a-jo* (2SG), *Ø-Ø-ɬo* (3), *j-i-jo-go* (1PL), *wak-a-jo-jo* (2PL) ‘to

jump, to leap, to fly’

- c. CH *tik-i-jo* (1SG), *Ø-a-lo* (2SG), *Ø-i-jo* (3.REAL), *j-i-jo* (1PL.INCL), *a-li-lo* /
a-lo-lo (2PL) // *Ø-Ø-tso* (3.IRR) ‘to jump, to fly’¹⁰

For (38a), Chomé’s OZ grammar only reported the forms *aijaw* and *ijaw*, which could only be compared with (38c-d). However, it is more appropriate to compare (38c-d) with *ija* ‘to wait for’ (38b), from Chomé’s dictionary. Unlike *ijaw* (38a), *ija* (38b) alternates *ija* and *tea* in the 3.IRR. This appears to be an OZ innovation due to assimilation of the 3.IRR by the 3.REAL, and this shows that OZ is not necessarily the most conservative language. The same innovation did not spread to a derivation of *ija* such as *ijaihi* (39).

- (38) a. OZ REAL: *a-i-jaw* (1SG), *d-a-jaw* (2SG), *Ø-i-jaw* (3), *a-i-ja-go* (1PL), *d-a-ja-jo* (2PL); IRR: *j-i-jaw* (1SG), *Ø-Ø-teaw* (3) ‘to leave, to give up, to interrupt briefly’
- b. OZ REAL: *a-i-ja* (1SG), *d-a-ja* (2SG), *Ø-i-ja* (3), *a-i-ja-go* (1PL), *d-a-ja-o* (2PL); IRR: *j-i-ja* (1SG), *Ø-i-ja* / *Ø-Ø-tea* (3) ‘to wait for, to stop, to rest’
- c. AY *j-i-ja* (1SG), *b-a-ja* (2SG), *Ø-Ø-tea* (3), *j-i-ja-go* (1PL), *wak-a-ja-jo* (2PL) ‘to stop, to quit’
- d. CH *t-i-jehe* / *tik-i-jehe* (1SG), *Ø-a-lehe* (2SG), *Ø-i-jehe* (3.REAL), *j-i-jehe* (1PL.INCL), *Ø-a-lehe-lo* (2PL) // *Ø-Ø-tsehe* (3.IRR) ‘to stop’

- (39) OZ REAL: *a-i-jaihi* (1SG), *d-a-jaihi* (2SG), *Ø-i-jaihi* (3), *a-i-ja-go-hi* (1PL),
d-a-ja-o-hi (2PL); REAL: *j-i-jaihi* (1SG), *Ø-Ø-teaihi* (3) ‘to be somewhere’

¹⁰ See Ciucci (2014:37) for the similarities between this verb and ‘to fly’ in other Chaco languages.

OZ also has two other verbs beginning with *ij-*, with identical 3.REAL and 3.IRR (40). Here no cognates are found in the other Zamucoan languages. All CH thematic verbs beginning with *ij-* have radical 3.IRR, which means that 3.REAL and 3.IRR never overlap (see the examples in this section). Also considering that OZ *ija* (38b) exhibits the innovative, but still partial, convergence of 3.REAL and 3.IRR, one can surmise that in (40) the same OZ innovation has led to a full overlap of 3.REAL and 3.IRR.

- (40) a. OZ REAL: *a-i-jaru* (1SG), *d-a-jaru* (2SG), *∅-i-jaru* (3), *a-i-ja-ko* (1PL), *d-a-ja-jo* (2PL); IRR: *j-i-jaru* (1PL), *∅-i-jaru* (3) ‘to boast, to pride themselves’
- b. OZ REAL: *a-i-jihi* (1SG), *d-a-jihi* (2SG), *∅-i-jihi* (3), *a-i-jihi-go* (1PL), *d-a-jihi-o* (2PL); IRR: *j-i-jihi* (1SG), *∅-i-jihi* (3) ‘to hunt’

Ijahi (41) is a defective OZ thematic verb, only used in the 3rd person. It has the full paradigm in CH, so that it is not clear which language has innovated. The two languages, however, have systematic correspondence between 3.REAL and 3.IRR. For the 3.IRR, one has to consider that CH /ts/ is a possible outcome of Proto-Zamucoan */tɛ/ (Table 1).

- (41) a. OZ REAL: *∅-i-jahi* (3); IRR: *∅-∅-tɛahi* (3) ‘not to reach’
- b. CH *t-i-jehi* (1SG), *∅-a-lehi* (2SG), *∅-i-jehi* (3.REAL), *j-i-jehi* (1PL.INCL), *a-lehi-lo* (2PL) // *∅-∅-tsehi* (3.IRR) ‘not to reach’

In some cases, the data from the dictionary allow us to explain irregular forms. For instance, the CH thematic verb in (42) finds no cognate in Chomé’s grammar or in AY. It

has an irregular 3.IRR, *tɛ-o-ɛi*, whose initial *tɛ-* was analyzed in previous works as a 3.REAL prefix re-used for the 3.IRR, a unique case in CH (Ciucci 2016:182).

(42) CH *tuk-u:-ɛi* (1SG), *a:-ɛi* (2SG), *∅-u:-ɛi* (3.REAL), *j-u:-ɛi* (1PL.INCL), *a:-ɛi-lo* (2PL) // *tɛ-o-ɛi* (3.IRR) ‘to run’

Its OZ cognate reported in the dictionary (43) offers an entirely different perspective. It is a thematic verb with root-initial /j/, and with an irregular radical 3.IRR, with fortition of word-initial /j/ into /tɛ/: *-jogesi* → *-tɛogesi* (43).

(43) OZ REAL: *a-i-jogesi* (1SG), *d-a-jogesi* (2SG), *∅-i-jogesi* (3), *a-i-jogesi-go* (1PL), *d-a-jogesi-o* (2PL); IRR: *j-i-jogesi* (1SG), *∅-∅-tɛogesi* (3) ‘to run, to run away’.

The root of the corresponding CH verb (42) has lost the first two syllables: **-jogesi* > *-ɛi*. This has been favored by the frequent deletion of Proto-Zamucoan */g/ in CH (see Table 1). The thematic vowel correspondence between CH /u/ (42) and OZ /i/ (43), two high vowels, is not unprecedented (see Table 1 and ex. 7, footnote 3). In the CH 3.IRR *tɛoɛi*, the fortition of root-initial /j/ into /tɛ/ has preserved the word-initial syllable (**/jo/* > */tɛo/*), with loss of the following syllable /ge/: **-jogesi* > **-tɛogesi* > *tɛoɛi*. This makes the CH 3.IRR *tɛoɛi* (42) longer than the rest of the paradigm, and in turn favors the unetymological reinterpretation of the initial /tɛ/ as a prefix.

In Proto-Zamucoan thematic verbs beginning with **ij-* (thematic **/i/* + root-initial **/j/*), **/j/* underwent fortition into **/tɛ/* word-initially (Table 4), as one can see in OZ and AY (ex. 37-38, among others), while word-initial /tɛ/ has turned into /ts/ in CH verbs in

ij- (ex. 41, among others). The exceptionality of (43) is that this CH verb preserves word-initial /tɕ/ (> /j/). Its reanalysis as a prefix has possibly blocked the change /tɕ/ > /ts/.

7.2. Other thematic verbs with radical 3.IRR

OZ has other thematic verbs with radical 3.IRR. Some of them show fortition of word-initial /g/ into /k/ (44-45).

(44) OZ REAL: *a-i-gam* (1SG), *d-a-gam* (2SG), \emptyset -*i-gam* (3), *a-i-ga-ko* (1PL), *d-a-ga-no* (2PL); IRR: *j-i-gam* (1SG), \emptyset - \emptyset -*kam* (3) ‘to get agitated’

(45) OZ REAL: *a-i-gakaj* (1SG), *d-a-gakaj* (2SG), \emptyset -*i-gakaj* (3), *a-i-gaka-go-j* (1PL), *d-a-gaka-o-j* (2PL); IRR: *j-i-gakaj* (1SG), \emptyset - \emptyset -*kakaj* (3) ‘to leave, to get out of the way’

In (46), the OZ thematic verb ‘to laugh’ corresponds to an AY radical verb. This is reminiscent of AY radical verbs originated by replacement of the thematic 3.REAL by the radical 3.IRR (35b, 37b, 38c, §7.1). CH ‘to laugh’ (46c) has turned instead into a prefixal verb.

(46) a. OZ REAL: *a-i-gana* (1SG), *d-a-gana* (2SG), \emptyset -*i-gana* (3), *a-i-gana-go* (1PL), *d-a-gana-o* (2PL); IRR: *j-i-gana* (1SG), \emptyset - \emptyset -*kana* (3) ‘to laugh, to play around’

b. AY *j-/jn-i-ηana* (1SG), *b-/m-a-ηana* (2SG), \emptyset - \emptyset -*kana* (3), *j-/jn-i-ηana-ηo* (1PL),

wak-a-ɲana-no (2PL) ‘to laugh’

c. CH *tik-i-na* (1SG), *∅-a-na* (2SG), *j-a-na* (3.REAL), *j-i-na* (1PL.INCL), *a-ni-lo* (2PL)

// *j-a-na* (3.IRR) ‘to laugh’

Ciucci & Bertinetto (2015:56–57) could only compare ‘to laugh’ in AY (46b) and CH (46c). For this reason, Ciucci (2016:280–281) hypothesized that the CH verb had shifted from radical to prefixal, via root reinterpretation. However, since its OZ cognate is thematic, the development of CH *jana* (46c) can now find a better explanation.

For ‘to laugh’ (46), one can reconstruct the Proto-Zamucoan thematic 3.REAL **∅-i-gana*. Note that OZ /g/ and AY /ŋ/ can correspond in CH to either *∅* or /j/ (see Table 1). In the given CH verb (46c), the velar consonant has dropped and thematic /i/ has been reinterpreted as a semiconsonantal prefix /j/ in the 3.REAL: **∅-i-gana* > **∅-i-ana* > *j-a-na*. Subsequently, the 3.REAL has replaced the 3.IRR, and the rest of the paradigm was restructured accordingly. In the 1st person, the theme **-i-ana* (> **-i-gana*) has simplified the vowel sequence /ia/ into /i/, yielding *-i-na*, with the now irregular inflectional vowel /i/ (actually a preservation of the original thematic vowel). This explains why *j-a-na* (46c) is the only CH verb with prefix *j-* (not reported in Tables 2-3). Ciucci (2016:172–174) assigned *j-a-na* to a small group of verbs with 3rd person allomorphs *d-*, *l-* or *n-* (*d-*verbs). The replacement of the 3.IRR by the 3.REAL, as in CH *j-a-na*, is an innovation observed in both OZ (38b, 40, §7.1) and CH (49, §7.2), and has originated a few thematic verbs with identical 3.REAL and 3.IRR. For this reason, one might perhaps consider *j-a-na* a thematic verb.

The replacement of the 3.REAL by the 3.IRR in AY is also seen in (47). In (48), AY has simplified the root, losing the first syllable and turning into a prefixal verb.

- (47) a. OZ REAL: *a-i-ganaore* (1SG), *d-a-ganaore* (2SG), \emptyset -*i-ganaore* (3),
a-i-gana-go-ore (1PL), *d-a-gana-o-ore* (2PL); IRR: *j-i-ganaore* (1SG),
 \emptyset - \emptyset -*kanaore* (3) ‘to play lewdly (with a woman), to fool around (with a man)’
- b. AY *n-i-ŋaŋare* (1SG), *m-a-ŋaŋare* (2SG), \emptyset - \emptyset -*kaŋare* (3), *n-a-ŋaŋa-ko* (1PL),
wak-a-ŋaŋa-tɛo (2PL) ‘to play, to gamble on’ (also: \emptyset - \emptyset -*kanare*)¹¹

- (48) a. OZ REAL: *a-i-gaka* (1SG), *d-a-gaka* (2SG), \emptyset -*i-gaka* (3), *a-i-gaka-go* (1PL),
d-a-gaka-o (2PL); IRR: *j-i-gaka* (1SG), \emptyset - \emptyset -*kaka* (3) ‘to enter’
- b. AY: *j-a-ka* (1SG), *b-a-ka* (2SG), *tɛ-a-ka* (3), *j-a-ka-go* (1SG), *wak-a-ka-jo* (2SG)
‘to enter’

The CH verbs for ‘to see’ and ‘to sleep’ are irregular. They are thematic verbs sharing identical forms, except for the 3.IRR (49). The same occurs in AY (50), where they only differ in the 3rd person. The scarce data in Chomé’s grammar (51) did not reveal the inflectional class of OZ ‘to see’ and ‘to sleep’. The correspondence between CH thematic /u/ and OZ and AY /i/, already seen in (42-43), is not surprising (Table 1).

- (49) CH *tok-o-mo* / *tuk-u-mo* (1SG), \emptyset -*a-mo* (2SG), \emptyset -*u-mo* (3.REAL), *j-u-mo* (1PL.INCL),
 \emptyset -*a-m-lo* (2PL) ‘to sleep, to see’

‘to see’ → *n-o-mo* (3.IRR)

‘to sleep’ → \emptyset -*u-mo* (3.IRR)

¹¹ The main difference between these two verbs is that *-ore* is a derivational suffix in OZ, while in AY it is included in the root.

(50) a. AY *j-i-mo* (1SG), *m-a-mo* (2SG), *tɛ-i-mo* (3), *j-i-mo-ŋo* (1PL), *wak-a-mo-ŋo* (2PL)

‘to see’

b. AY *j-i-mo* (1SG), *m-a-mo* (2SG), *∅-∅-mo* (3), *j-i-mo-ŋo* (1PL), *wak-a-mo-ŋo*

(2PL) ‘to sleep’

(51) a. OZ REAL: *a-i-mo* (1SG); IRR: *j-i-mo* (1SG) ‘to see’

b. OZ REAL: *a-i-mo* (1SG); IRR: *j-i-mo* (1SG), *j-i-mo-go* (1PL) ‘to sleep’

Since the verb ‘to see’ is thematic in CH (49) and prefixal in AY (50a), it was not clear which language had innovated. The new OZ data in (52) show that Proto-Zamucoan ‘to see’ was thematic. Thus, AY ‘to see’ (50a) has assimilated to the most conspicuous inflectional class, the *tɛ*-verbs (Table 4). Note that OZ (52) and CH (49) ‘to see’ have identical 3.IRR. The irregular 3.IRR vowel /o/ (49-52), a well-documented phenomenon in CH, was only observed in the OZ verb ‘to roll’ (59a, §7.4). The new data indicate that the irregular 3.IRR vowel /o/ characterizes more OZ thematic verbs (§7.4) and can even be reconstructed for Proto-Zamucoan (Table 5).

(52) OZ REAL: *a-i-mo* (1SG), *d-a-mo* (2SG), *∅-i-mo* (3), *a-i-mo-go* (1PL), *d-a-mo-o* (2PL);

IRR: *j-i-mo* (1SG), *n-o-mo* (3) ‘to see’

The mere availability of the CH and AY data in (49, 50b) for ‘to sleep’ suggested the following reasoning (Ciucci & Bertinetto 2015:62–63): (i) AY ‘to sleep’ is a radical verb; (ii) CH ‘to sleep’ has identical 3.REAL and 3.IRR, a feature mainly observed in radical

verbs, which are mostly lost in CH; (iii) therefore, ‘to sleep’ was originally a radical verb which has become thematic in CH, maintaining the formal identity between 3.REAL and 3.IRR. However, the OZ dictionary shows a different scenario: since OZ ‘to sleep’ (53) is thematic, as in CH (49), Proto-Zamucoan ‘to sleep’ must also have been thematic.

(53) OZ REAL: *a-i-mo* (1SG), *d-a-mo* (2SG), *Ø-i-mo* (3), *a-i-mo-go* (1PL), *d-a-mo-o* (2PL);
IRR: *j-i-mo* (1SG), *Ø-Ø-mo* (3) ‘to sleep, to go to bed’

In (53), OZ has a radical 3.IRR. This indicates that in AY ‘to sleep’ (50b) the 3.IRR (subsequently lost across the board in this language: see Tables 2-3) has replaced the 3.REAL. Developments such as this have fostered the loss of AY thematic verbs (ex. 35, 37 and 38, §7.1, and 46-47). As for the CH 3.IRR of ‘to sleep’ (*Ø-u-mo*), which is identical to the 3.REAL, one would expect a radical 3.IRR **mo*. Since in all CH verbs that have OZ cognates, 3.REAL and 3.IRR never coincide, this is a likely CH innovation. The AY 3rd person *mo* (50b), originally a 3.IRR, is indirect evidence that indeed the 3.IRR of ‘to sleep’ was **mo* in Proto-Zamucoan.¹²

In this section and in Section 7.1, thematic verbs with originally radical 3.IRR were discussed. Verbs such as ‘to laugh’ (46) and ‘to see’ (53) suggest that in Proto-Zamucoan not only verbs with a theme beginning with *ij-* (§7.1), but also other thematic verbs had radical 3.IRR. Hence, this subgroup displayed more internal variation than previously assumed. Over time, two opposite innovations have taken place in such cases: (i) the systematic loss of the 3.REAL in AY, which was replaced by the 3.IRR (before this form

¹² As pointed out in Ciucci (2014) and Ciucci & Bertinetto (2015:62, fn. 34) the Proto-Zamucoan root **-mo* ‘to sleep’ should be compared with the Mataguayan family: Maká *-ma?*, Nivaçle *-ma*, Chorote *-ma*: and Wichí *-ma?* ‘to sleep’.

was definitely lost in AY); (ii) the occasional replacement of the 3.IRR by the 3.REAL in OZ (ex. 38b, 40, §7.1) and in CH (ex. 46, 53). The substitution of the 3.REAL by the 3.IRR is a recurring phenomenon in AY and was also noted in the discussion of verbs stemming from Proto-Zamucoan **s*-verbs (§5). Indeed, marked features (such as irrealis vis-à-vis realis) can sometimes replace the unmarked ones (Lazzeroni 1987:50). This phenomenon has been documented for other verb forms (see examples in Bertinetto & Ciucci 2019:10–12).

7.3. A third group of thematic verbs?

Sections 7.1 and 7.2 have shown that in OZ and CH, the 3.REAL of some thematic verbs has replaced the 3.IRR. In CH, apart from ‘to sleep’ (49), there are two other verbs that probably exhibit this behavior (54–55). No cognates of these verbs were found. In (54), *iṅimitɛ* seems to be a CH innovation, as it is derived from the noun *ṅimitɛ* ‘earth, ground’. In addition, its paradigm is modeled on that of thematic verbs with 3.REAL beginning with *ij-* (§7.1), even though *iṅimitɛ* does not have such a 3.REAL form.

(54) CH *tik-i-ṅimitɛ* / *tik-i-ṅimitɛ* (1SG), \emptyset -*a-ṅimitɛ* (2SG), \emptyset -*i-ṅimitɛ* (3.REAL), *j-i-ṅimitɛ* (1PL.INCL), \emptyset -*a-ṅimitɛ-lo* (2PL) // \emptyset -*i-ṅimitɛ* / \emptyset - \emptyset -*tsoṅimitɛ* (3.IRR) ‘to go down, to come down’

In (55), the only reason to surmise that the alternate forms of the 3.IRR might be an innovation is that the distinction between 3.REAL and 3.IRR is weakening in CH, with a

tendency of the 3.REAL to replace the 3.IRR.

(55) CH *tik-i-mehe* (1SG), *Ø-a-mehe* (2SG), *Ø-i-mehe* (3.REAL), *j-i-mehe* (1PL.INCL),
Ø-a-mehe-lo (2PL) // *Ø-i-mehe* / *n-i-mehe* (3.IRR) ‘to squash, to crush’

Some of the newly available OZ paradigms (56-58a) have identical 3.REAL and 3.IRR. Here, there are no arguments to say that this is an innovation, and one wonders whether the verbs in (56-58a) preserve a Proto-Zamucoan feature. Note that OZ thematic verbs usually have the 1.IRR prefix *j-*; (57) is an exception, since 1.IRR *tɛ-* is typical of *tɛ-*verbs (see Table 5).

(56) OZ REAL: *a-e-nonare* (1SG), *d-e-nonare* (2SG), *Ø-e-nonare* (3), *a-e-nona-ko-j* (1PL),
d-e-nona-jo-j (2PL); IRR: *j-e-nonare* (1SG), *Ø-e-nonare* (3) ‘to become fond of something, to like with affection’

(57) OZ REAL: *a-u-das* (1SG), *da-u-das* (2SG), *Ø-u-das* (3), *a-u-da-ko* (1PL), *da-u-da-so*
(2PL); IRR: *tɛ-u-das* (1SG), *Ø-u-das* (3) ‘to be lazy, weak, idle’

(58) a. OZ REAL: *a-pa* (1SG), *d-a-pa* (2SG), *Ø-a-pa* (3), *a-pa-go* (1PL), *d-a-pa-o* (2PL);
IRR: *j-a-pa* (1SG), *Ø-a-pa* (3) ‘to stay without doing what needs to be done, to be idle’¹³

b. AY *j-a-pahi* (1SG), *b-a-pahi* (2SG), *Ø-a-pahi* / *tɛ-a-pahi* (3), *j-a-pa-go-hi* (1PL),
wak-a-pa-jo-hi (2PL) ‘to stay temporarily in a place’

¹³ In this verb, Chomé transcribes /p/ as <ph> to indicate its realization as [p^h]. Aspirated consonants are not phonemic in OZ and are rarely represented in the orthography (cf. §1.2).

The only cognate of (56-58a) is (58b), one of the rare AY thematic verbs, which alternates a thematic and a prefixal 3rd person. This verb suggests that the thematic nature of (58a) is not an OZ innovation. Since (56-58) find no cognate in CH, one cannot be certain that Proto-Zamucoan had a small subgroup of thematic verbs with identical 3.REAL and 3.IRR, although this is very likely (see Table 5). By contrast, other thematic verbs with identical 3.REAL and 3.IRR (§7.1-7.2) are an independent innovation of OZ and CH.

In (56-58a), one can find non-high 3.REAL vowels in OZ thematic verbs, while CH thematic verbs only show a high 3.REAL vowel (/i/, /i/ or /u/). Since CH /i/ can be the outcome of any Proto-Zamucoan vowel (Table 1), one can surmise that Proto-Zamucoan thematic verbs could also have non-high 3.REAL vowels. However, the lack of CH cognates for (56-58) prevents any solid conclusion.

The diachronic considerations presented so far only apply to Proto-Zamucoan. As pointed out by Bertinetto (present volume), before the Proto-Zamucoan stage, the 3rd person had probably zero marking. All verbs were thus either radical or thematic, with syncretism of 3.REAL and 3.IRR. One can also speculate that the thematic verbs with radical 3.IRR used to be radical verbs which later, in Proto-Zamucoan, developed a thematic 3.REAL. By contrast, the other Proto-Zamucoan thematic verbs were also thematic at a previous stage. If this is so, it is possible that Proto-Zamucoan still preserved some thematic verbs with identical 3.REAL and 3.IRR. Subsequently, (56-58) might maintain this primordial state of affairs. At the same time, the comparison shows that in other cases the formal overlap of 3.REAL and 3.IRR is an innovation that occurred after the Proto-Zamucoan stage (see e.g. ex. 38a and 40 for OZ, 49 for CH).

7.4. Thematic verbs with 3rd person irrealis prefix *d-/n-

Another subgroup of Proto-Zamucoan thematic verbs had the 3.IRR prefix *d-/n- (Table 5). In CH, this subgroup has irregular inflectional vowels: /o/ in the 1SG and 3.IRR, and a high vowel in the 3.REAL. In the OZ grammar, the only paradigm available was (59a), which, like its CH cognate (59c), has several irregular features (discussed in Ciucci & Bertinetto 2015:63–64), which explains why it was reported in the grammar. The inflectional vowels of (59a) approximately correspond to those of the CH cognate (excluding the 2nd person), with /o/ in the 3.IRR and in most of the paradigm, /i/ in the 3.REAL. AY (59b) has regularized the paradigm, generalizing thematic /i/. The above discussion has shown that there may be two possible developments for the 3rd person of former AY thematic verbs: (i) the original 3.IRR has been preserved as a radical 3rd person, (ii) a new 3rd person with prefix *tɛ-* has been created. One can observe both in (59b).

- (59) a. OZ REAL: *o-na* (1SG), *d-o-na* (2SG), *∅-i-na* (3), *o-ko-na* (1PL), *d-o-jo-na* (2PL);
IRR: *j-a-hi-na* (1SG), *m-o-na* (2SG), *n-o-na* (3), *i-ko-na* (1PL), *m-o-jo-na* (2PL)
 ‘to roll, to go round’¹⁴
- b. AY *j-i-ḡina* (1SG), *b-a-ḡina* (2SG), *∅-∅-nona* / *tɛ-i-ḡina* (3), *j-i-ḡina-ḡo* (1PL),
wak-a-ḡina-ḡo (2PL) ‘to accompany, to go with’
- c. CH *tok-ō-ja* (1SG), *m-e-ja* (2SG), *∅-ĩ-ja* (3.REAL), *j-u-kwĩja* / *j-ũ-ja* (1PL.INCL),
j-ō-j-lo [*ḡōjlo*] (1GPL.INCL), *m-e-j-lo* (2PL) // *n-o-ja* (3.IRR) ‘to accompany’

¹⁴ In this example, the OZ verb has a different meaning from AY and CH. However, in Chomé’s data there are hints that ‘to accompany’ was a secondary meaning, at least originally associated with this verb. OZ here has undergone a semantic change with respect to AY and CH.

Example (60a) presents a newly available OZ verb with prefix *n-* (cf. 52, §7.2), to compare with (60c). Here again, the 3.IRR has inflectional /o/, which differs from the 3.REAL vowel (60a, c).

- (60) a. OZ REAL: *a-i-mo* (1SG), *d-a-mo* (2SG), \emptyset -*i-mo* (3), *a-i-mo-go* (1PL), *d-a-mo-o* (2PL); IRR: *j-i-mo* (1SG), *n-o-mo* (3) ‘to see’
- b. AY *n-i-mo* (1SG), *m-a-mo* (2SG), *tɛ-i-mo* (3), *n-i-mo-ŋo* (1PL), *wak-a-mo-ŋo* (2PL) ‘to see’
- c. CH *tok-o-mo* / *tuk-u-mo* (1SG), \emptyset -*a-mo* (2SG), \emptyset -*u-mo* (3.REAL), *j-u-mo* (1PL.INCL), \emptyset -*a-m-lo* (2PL) // *n-o-mo* (3.IRR) ‘to see’

The available data suggest that Proto-Zamucoan thematic verbs with 3.IRR prefix **d-* /*n-* always had the 3.IRR vowel /o/. Another example is (61): cf. OZ \emptyset -*i-om* (3.REAL) ~ CH \emptyset -*i:-m* (3.REAL). The 3.IRR of OZ and CH exhibits identical prefix and thematic vowel: cf. OZ *n-o-m* ~ CH *n-o-jm*. They correspond to the AY radical 3rd person \emptyset - \emptyset -*nojome* (61b), originally a 3.IRR. Interestingly, this AY verb also preserves traces of Proto-Zamucoan 3.REAL ** \emptyset -i- η ome*, which has become the root *-hijome* in the rest of the paradigm. Its initial /h/ used to be an /h/-insertion separating the inflectional vowel from **-i η ome*. The OZ theme has lost the final vowel, while root-initial **/ η /*, preserved by AY (61b), can be deleted. Root-initial /j/ in CH (61c) is a reflex of **/ η /*. It is worth noting that (61), like (59), is a rare example where CH maintains the original 2.REAL prefix in bilabial consonant, preserved in AY, but generally lost in OZ (Ciucci & Bertinetto 2015:70–71).

- (61) a. OZ REAL: *a-i-om* (1SG), *d-a-om* (2SG), \emptyset -*i-om* (3), *a-i-o-go-m* (1PL), *d-a-o-jo-m* (2PL); IRR: *n-i-om* (1SG), *d-o-m* / *n-o-m* (< **n-o-om*) (3) ‘to escape from fear’¹⁵
- b. AY *j-i-hi(n)ome* (1PL), *b-a-hi(n)ome* (2PL), \emptyset - \emptyset -*nojome* (3), *j-i-hi(n)o-jo-me* (1PL), *wak-a-hi(n)o-jo-me* (2PL) ‘to leave’
- c. CH *tok-o-jm* (1SG), *m-o-jm* (2SG), \emptyset -*i:-m* (3.REAL), *j-u-kwim* (1PL.INCL),
m-o-jm-lo (2PL) // *n-o-jm* (3.IRR) ‘to leave’¹⁶

Chomé’s dictionary is a formidable source of data, but, unfortunately, many pages are lost. The main gap concerns the letters from *N* to *T*: the entry *natu* is followed by *toriga*. Since the lemmatized form for verbs was the 1SG.REAL, with prefix *a-*, almost all verbs are under the letter *A* (Ciucci 2018). However, *a-* mostly deletes before the 1st person vowel /o/.¹⁷ Since the letter *O* is lost, this implies the loss of thematic verbs with inflectional vowel /o/ in the 1SG.REAL and 3.IRR prefix *d-/n-*. For this reason, the OZ paradigm in (59a) is only documented in the grammar. One can, however, extract some verb forms from the examples reported in the dictionary, although the information on these verbs remains fragmentary.

Putting together the examples of the grammar and the dictionary, one can obtain some

¹⁵ In this OZ paradigm the 1.IRR has nasalization of *j-* into *n-*. This can happen whenever there is nasal harmony, but it is infrequent in the dictionary, possibly because prefix nasalization was not obligatory, as in AY (ex. 3, §2). In addition, OZ and AY show the derivational suffixes *-m* and *-me*, from the adposition *ome* (OZ and AY) ~ *im* (CH). In CH *im* only remains as a relic in verbs. On the diffusion of this adposition in the Chaco, see Ciucci (2014:28).

¹⁶ In AY, there is also another verb which seems related to (61a): (i) *j-a-jome* (1SG), *b-a-jome* (2SG), *te-a-jome* (3), *j-a-jo-go-me* (1PL), *wak-a-jo-jo-me* (2PL) ‘to run away from’. The development of this verb is not clear: its root *-jome* corresponds to the OZ theme *-iom*, which also has very similar meaning. However, its thematic vowel is /a/, while /i/ would be expected. One can hypothesize that the same Proto-Zamucoan verb has developed in two different ways in AY: *nojome* (61b) and *teajome*, or even that the latter is a borrowing from OZ.

¹⁷ There are indeed exceptions, such as (16).

forms of OZ ‘to give’ (62a). The irregular behavior of the inflectional vowel, with the alternation /o/ ~ /i/, corresponds to the CH alternation /o/ ~ /i/ (62c) (Ciucci & Bertinetto 2015:60–61). The OZ 3.IRR *d-o-si* confirms that the 3.IRR of this thematic verb had inflectional vowel */o/ and prefix */d-/n- in Proto-Zamucoan. By contrast, AY has introduced the 3rd person prefix *tɛ-* and regularized the thematic vowel.

- (62) a. OZ REAL: *o-si* (1SG), *∅-i-si* (3); IRR: *j-i-si* (1SG), *∅-a-si* (2SG), *d-o-si* (3) ‘to give’
 b. AY *j-i-si* (1SG), *b-a-si* (2SG), *tɛ-i-si* (3), *j-i-si-go* / *j-i-si-ŋo* (1PL), *wak-a-si-jo* / *wak-a-si-ŋo* (2PL) ‘to give’
 c. CH *tok-o-ɛi* (1SG), *∅-e-ɛi* (2SG), *∅-i-ɛi* (3.REAL), *j-o-ɛi* (1PL.INCL), *∅-e-ɛi-lo* (2PL), *o-ɛi* (3PL) // *d-o-ɛi* (3.IRR) ‘to pay, to give, to contaminate, to deliver’

The OZ forms in (63a) and (64a) are extracted from dictionary examples. They represent the final piece of evidence that these verbs were thematic in Proto-Zamucoan and that they have turned into prefixal verbs in AY.

- (63) a. OZ REAL: *o-hi* (1SG), *∅-i-hi* (3), *o-hi-go* (1PL) ‘to drink’
 b. AY *j-o-hi* (1SG), *b-o-hi* (2SG), *tɛ-o-hi* (3), *j-o-hi-go* (1PL), *wak-o-hi-jo* (2PL) ‘to drink’
 c. CH *tok-o-ho* (1SG), *∅-e-he* (2SG), *∅-i-hi* (3.REAL), *j-o-ho* (1PL.INCL), *∅-e-he-lo* (2PL) // *d-o-ho* (3.IRR) ‘to drink’

- (64) a. OZ REAL: *∅-i-tɛo* (3); IRR *j-i-tɛo* (1SG) ‘to shoot with an arrow’
 b. AY *j-i-tɛo* (1SG), *b-a-tɛo* (2SG), *tɛ-i-tɛo* (3), *j-i-tɛo-go* (1PL), *wak-a-tɛo-jo* (2PL) ‘to

shoot'

c. CH *tok-o-tso* (1SG), *Ø-a-tso* (2SG), *Ø-i-tso* (3.REAL), *j-o-tso* (1PL.INCL),

Ø-a-tsi-lo (2PL) // *l-o-tso* (3.IRR) 'to throw, to shoot'

Although the OZ paradigms in (63-64) are incomplete, one can see that the inflectional vowel corresponds to the irregular pattern of CH: /o/ (1SG and 3.IRR) ~ /i/ or /i/ (3.REAL). This is further evidence that one can reconstruct the alternation */o/ ~ */i/ for Proto-Zamucoan thematic verbs with 3.IRR prefix **d-/n-*.

The present comparison also illustrates the development of Proto-Zamucoan thematic verbs in AY. Indeed, Proto-Zamucoan thematic verbs with radical 3.IRR (§7.1-7.2) have turned into AY radical verbs (the only exception is in ex. 48b). Proto-Zamucoan thematic verbs with 3.IRR prefix **d-/n-* (§7.4) have usually turned into AY *tɛ-*verbs, but they can also correspond to an AY radical verb (ex. 59b, 61b). One of the few AY thematic verbs (ex. 58b, §7.3) could be instead the remnant of a third group of Proto-Zamucoan thematic verbs with identical 3.REAL and 3.IRR (§7.3).

8. Irregular verbs and a new inflectional class

In Chomé's dictionary, one can find previously unknown patterns which appear to be irregular. Although it is not always possible to find cognates for them in AY and CH, one can formulate some hypotheses on their development.

OZ has some radical verbs with roots beginning with velar consonant (/k/ or /g/), which is absent in the 3rd person (65-67). As in all radical verbs, the 1SG.REAL prefix is

j-, and 3.REAL and 3.IRR coincide (65-67). These verbs have two cognates in AY (66-67), which exhibit a fully-fledged paradigm. AY, like OZ, also has no initial velar in the 3rd person. In (66), the AY verb has two alternating 3rd persons: one with the initial velar consonant, *kiṅoke*, the other without, *iṅoke*. Its CH cognate is defective. CH defective verbs only have the 3rd person (common to realis and irrealis), which can optionally take the pluralizers *o-* (3PL) and *-lo* (2PL, 1GPL.INCL)

(65) a. OZ REAL: *a-i-kujak* (1SG), *d-a-kujak* (2SG), \emptyset - \emptyset -*ujak* (3), *a-i-kuja-ho* (1PL),
d-a-kuja-tɛo (2PL); IRR: *j-i-kujak* (1SG), \emptyset - \emptyset -*ujak* (3) ‘to be full’

b. OZ REAL: *a-i-gehu* (1SG), *d-a-gehu* (2SG), \emptyset - \emptyset -*ehu* (3), *a-i-gehu-go* (1PL),
d-a-gehu-o (2PL); IRR: *j-i-gehu* (1SG), \emptyset - \emptyset -*ehu* (3) ‘to be consoled’

(66) a. OZ REAL: *a-i-kenok* (1SG), *d-a-kenok* (2SG), \emptyset - \emptyset -*enok* (3), *a-i-keno-go* (1PL),
d-a-keno-tɛo (2PL); IRR: *j-i-kenok* (1SG), \emptyset - \emptyset -*enok* (3) ‘to have run out’ (also used as negative existential)

b. AY *j-i-kiṅoke* (1SG), *m-a-kiṅoke* (2SG), \emptyset - \emptyset -*iṅoke* / \emptyset - \emptyset -*kiṅoke* (3), *j-i-kiṅo-ho* (1PL), *wak-a-kiṅo-tɛo* (2PL) ‘to be exhausted, to faint’; \emptyset - \emptyset -*iṅoke* (3) ‘there is not’

c. CH *nijok* (3) ‘there is not’ (defective)

In (67), the OZ and AY 3rd person should be compared with defective CH *ika* ‘to be alive’. The CH verbs in (66-67) have no initial velar, which was possibly absent in the Proto-Zamucoan 3rd person. The alternative hypothesis is that the velar was lost in CH. However, since these CH verbs are defective, it is impossible to say anything more about

the rest of the Proto-Zamucoan paradigm.

- (67) a. OZ REAL: *a-i-geka* (1SG), *d-a-geka* (2SG), \emptyset - \emptyset -*eka* (3), *a-i-geka-go* (1PL),
d-a-geka-o (2PL); IRR: *j-i-geka* (1SG), \emptyset - \emptyset -*eka* (3) ‘to live, to be healthy’
- b. AY *j-i-keka* (1SG), *b-a-keka* (2SG), \emptyset - \emptyset -*eka* (3), *j-i-keka-go* (1PL), *wak-a-keka-jo*
(2PL) ‘to live, to exist’
- c. CH *ika* (3) ‘to be alive’ (defective)

Another exception is (68), which has root allomorphy between *-du* in the 3rd persons and *-todu* in the rest of the paradigm. If one only considers the 3rd persons, the 3.REAL \emptyset -*i-du* looks thematic, while the 3.IRR *d-o-du* has prefix *d-* and inflectional vowel /o/, as typical of the thematic verbs described in Section 7.4. The 3.IRR *dodu* corresponds to the AY uninflected verb *duṇu* and the defective CH verb *duḷu*. One can surmise that, initially, the verb only had the 3.REAL and 3.IRR, or else that they are what remains of the original paradigm. According to the former (more likely) hypothesis OZ has built the rest of the paradigm using the 3.IRR as a root. The same development can be pointed out for other verbs discussed in this paper (see examples 25-26, §5). The only difference is that in (68) the initial consonant of *dodu* has devoiced word-medially, possibly a dissimilation process. In conclusion, the paradigm of (68a) is an innovation of OZ, which is otherwise the most conservative language.

- (68) a. OZ REAL: *a-i-todu* (1SG), *d-a-todu* (2SG), \emptyset -*i-du* (3), *a-i-todu-go* (1PL),
d-a-todu-o (2PL); IRR: *j-i-todu* (1SG), *d-o-du* (3) ‘to get burned’
- b. AY *duṇu* ‘to get burned’ (uninflected verb)

c. CH *duļu* (3) ‘to burn, to be hot’ (defective verb)

The correspondence between word-initial /d/ and word-internal /t/ also characterizes a few radical verbs, such as the one in (69). Its AY and CH cognates are uninflected predicates, which are often ambiguous between verbs and adjectives.¹⁸ This, again, invites the hypothesis that OZ (69a) has developed its full paradigm out of the root *derok*, thus strengthening the view formulated for (68).

(69) a. OZ REAL: *a-i-terok* (1SG), *d-a-terok* (2SG), \emptyset - \emptyset -*derok* (3), *a-i-tero-ho* (1PL),
d-a-tero-tɛo (2PL); IRR: *j-i-terok* (1SG), \emptyset - \emptyset -*derok* (3) ‘to be tasteless,
insipid’

b. AY *derok* ‘to lack flavor’ (uninflected verb)

c. CH *d̄irok* ‘tasteless, insipid’ (uninflected adjective)

Something similar occurred in (70a, 71a). These verbs are hybrids of radical and prefixal verbs. While they have the 3.REAL prefix *tɛ-* and the 3.IRR prefix *d-/n-*, it is likely that the 3.IRR has been reinterpreted as a root for the rest of the paradigm, with devoicing of /d/ (70a), preceded in (71a) by loss of nasality. In (70a, 71a) one might also hypothesize that the 3.REAL has become the new root: in this case, initial /tɛ/ has undergone deaffrication into /t/. This seems however less probable than the reinterpretation of the 3.IRR as a root. As shown in (71c), also the AY cognate has expanded the paradigm, although this verb is only used in the plural (Morarie 2011).

¹⁸ In Zamucoan, nouns and adjectives can be the head of the intransitive predicate and mostly have specific forms marking the predicative function (see Bertinetto, Ciucci & Farina 2019).

- (70) a. OZ REAL: *a-i-toda* (1SG), *d-a-toda* (2SG), *tɛ-o-da* (3), *a-i-toda-go* (1PL),
d-a-toda-o (2PL); IRR: *tɛ-o-da* (1SG), *d-o-da* (3) ‘to be fat’
- b. Possibly related to CH *tsoʎa* (3) ‘fat’ / ‘to be fat’ (uninflected adjective / defective verb)
- (71) a. OZ REAL: *a-i-tomarã* (1SG), *d-a-tomarã* (2SG), *tɛ-o-marã* (3), *a-i-tomarã-go* (1PL), *d-a-tomarã-o* (2PL); IRR: *j-i-tomarã* (1SG), *n-o-marã* (3) ‘to be alone’ (scil. ‘to be one’)
- b. OZ *tɛomarã* / *nomarã* ‘one’ (forms with predicative value)
- c. AY *tɛoṃara* / *toṃara* (3), *j-i-toṃaraṃo* (1PL), *wak-a-toṃaraṃo* (2PL) (followed by *ihi ṃumi*) ‘to be united’ (scil. ‘to be one’)
- d. AY *tɛoṃara* ‘one’ (form with predicative value)
- e. CH *tsoṃira*[?] / *noṃira*[?] ‘one’ (forms with predicative value)

The OZ and CH number words ‘one’ (71b, e) exhibit two reflexes of the verb’s 3.REAL and 3.IRR (71a). This is evidence that they stem from a Proto-Zamucoan verb which distinguished 3.REAL and 3.IRR, possibly its only forms. If inflected, number words have the same morphology as nouns and adjectives, which includes forms with predicative value, as well as others not reported here (see Ciucci 2016 and Bertinetto, Ciucci & Farina 2019 for details). However, as nominals do not mark mood, the uses of the two forms of ‘one’ (71b, e) have changed: in CH, for instance, *tsoṃira*[?] and *noṃira*[?] (71e) are in free alternation. The fact that AY only has *tɛoṃara* for ‘one’ reflects the loss of the 3.IRR prefix **d-/n-* in the language.

The verbal origin of ‘one’ is not surprising. In Amazonian languages, numbers may often derive from words whose original meaning is not strictly numerical (Aikhenvald 2012:350–355). Jarawara (Arawá; Brazil) has no lexical number for ‘one’, which is expressed by the verb ‘to be alone, to be the only (one/thing)’ (Dixon 2004:559). In Kwaza (isolate; Brazil), the number ‘one’ is a bound root meaning ‘to be one, alone’ (Van der Voort 2004:214).

The verb in (72), with 3rd person prefix *g-*, finds no cognate in the other Zamucoan languages. If this is not a mistake by Chomé, this verb is a *unicum*, because such a prefix is only found in some nouns inflected for possessor.

(72) a. OZ REAL: *a-neragu* (1SG), *d-a-neragu* (2SG), *g-a-neragu* (3), *a-nera-ho* (1PL),
d-a-nera-tso (2PL); IRR: *j-a-neragu* (1SG), *g-a-neragu* (3) ‘to shorten, to abbreviate’

In OZ, there are a few verbs with 3.REAL prefix *j-* and 3.IRR prefix *b-* (73-74). Chomé’s grammar does not discuss them. They are a new and very small inflectional class: the *j-*verbs (Table 5), not found in the other Zamucoan languages. The 3.REAL prefix *j-* is only observed in one CH verb (cf. 46c, §7.2), unrelated to any OZ *j-*verbs. The 1.IRR prefix is also *j-*. In (74a), CH *juwo* corresponds to the OZ 3.REAL, but is defective. (75a) presents an AY cognate with identical root, but this is a *tso*-verb, indicating that it must have been prefixal in Proto-OZ-AY. The glide /j/ is also found in CH ‘to escape’ (74b), which is defective. Two hypotheses are possible for (74): (i) the verb had the prefix **j-* in Proto-Zamucoan, but CH lost the full paradigm; (ii) OZ (or Proto-OZ-AY) has developed the inflection paradigm, turning the root-initial /j/ into a 3.REAL prefix.

(73) OZ REAL: *a-ho* (1SG), *d-a-ho* (2SG), *j-a-ho* (3), *a-ho-go* (1PL), *d-a-ho-jo* (2PL); IRR:
j-a-ho (1SG), *b-a-ho* (3) ‘to go in front’

(74) a. OZ REAL: *a-u-ho* (1SG), *d-u-ho* (2SG), *j-u-ho* (3), *a-u-ho-go* (1PL), *d-u-ho-o* (2PL);
IRR: *j-u-ho* (1SG), *b-u-ho* (3) ‘to escape’¹⁹

b. CH *juwo* (3) ‘to escape’; *juwi* (3) ‘to escape (with someone)’ (defective verb)

(75) a. OZ REAL: *a-jo udi* (1SG), *d-a-jo udi* (2SG), *j-a-jo udi* (3), *a-jo-go udi* (1PL),
d-a-jo-o udi (2PL); IRR: *j-a-jo udi* (1SG), *b-a-jo udi* (3) ‘to throw (tie, rope)’

b. AY *j-a-jo* (1SG), *b-a-jo* (2SG), *ʔ-a-jo* (3), *j-a-jo-go* (1PL), *wak-a-jo-jo* (2PL) ‘to stretch’ (used followed by *udi*)

In (76), the 3.IRR prefix *b-* has nasalized into *m-*. Since, however, *j-*verbs are only observed in OZ, their presence in Proto-Zamucoan is doubtful.

(76) OZ REAL: *a-u-hõre* (1SG), *d-u-hõre* (2SG), *j-u-hõre* (3), *a-u-hõ-ko* (1PL),
d-u-hõ-jo (2PL); IRR: *j-u-hõre* (1SG), *m-u-hõre* (3) ‘to dodge a blow, to avoid’

The small class of *j-*verbs is reminiscent of a few other irregular verbs with the hybrid behavior of radical and *j-*verbs. They show root allomorphy, since root-initial /j/ in the 3.REAL corresponds to /p/ (77-78) or /b/ (79-80) in the 1st and 2nd person. The 3.IRR can

¹⁹ This verb has lost the original prefix-vowel /a/ in the 2nd person. Such irregularity is discussed in Section 4.

coincide with the 3.REAL (79-80) or exhibit initial /b/ (or /m/ under nasal harmony) (77-78).

(77) OZ REAL: *a-i-para* (1SG), *d-a-para* (2SG), \emptyset - \emptyset -*jara* (3), *a-i-pa-ko-a* (1PL),
d-a-pa-jo-a (2PL); IRR: \emptyset - \emptyset -*bara* (3) ‘to like, to fit, to suit, to match, to go with’

(78) OZ REAL: *a-i-paim* (1SG), *d-a-paim* (2SG), \emptyset - \emptyset -*jaim* (3), *a-i-pai-ko* (1PL),
d-a-pai-jo (2PL); IRR: *j-i-paim* (1SG), \emptyset - \emptyset -*maim* (3) ‘to be decrepit, to be old
and worn’

(79) OZ REAL: *a-i-botaw* (1SG), *d-a-botaw* (2SG), \emptyset - \emptyset -*jotaw* (3), *a-i-bota-go* (1PL),
d-a-bota-jo (2PL); IRR: *j-i-botaw* (1SG), \emptyset - \emptyset -*jotaw* (3) ‘to go over what has
occurred or what is about to occur’

(80) OZ REAL: *a-i-botaore* (1SG), *d-a-botaore* (2SG), \emptyset - \emptyset -*jotaore* (3), *a-i-bota-go-re*
(1PL), *d-a-bota-jo-re* (2PL); IRR: *j-i-botaore* (1SG), \emptyset - \emptyset -*jotaore* (3) ‘to argue, to
quarrel, to fall out with’

To sum up the data in (77-80), the root-initial consonant displays the following correspondences:

(i) /p/ (1st and 2nd persons) → /b/ ~ /m/ (3.IRR) → /j/ (3.REAL), (ex. 77-78);

(ii) /b/ (1st and 2nd persons) → /j/ (3.IRR) → /j/ (3.REAL), ex. (79-80).

One can thus observe apparent lenition from 1st and 2nd person to 3.IRR and 3.REAL.

AY and CH have no cognates of these OZ verbs; they might be an OZ innovation. One can speculate that they were *j*-verbs, later reinterpreted as radical verbs with a root based on the original 3.IRR with prefix *b-/m-*. The reinterpretation of the 3.IRR as base for 1st and 2nd persons has indeed occurred for some OZ *s*-verbs (ex. 25-26, §5) and for the verbs in (68-70). A trace of the 3.IRR prefix *b-/m-* is still detectable in the 3.IRR root of (77-78), as well as in the 1st and 2nd persons of (79-80), in which the original 3.IRR has later been replaced by the 3.REAL (originally with *j*-prefix), as in some OZ thematic verbs (ex. 38b and 40, §7.1). In the 1st and 2nd person of (77-78), root-initial /p/ stems from word-internal devoicing of the original 3.REAL prefix *b-*. A similar devoicing process in word-medial position was described for (68-70).

In conclusion, (77-80) are irregular radical verbs derived from *j*-verbs. The development of these paradigms combines several phenomena observed in this study. One has to postulate that the class of *j*-verbs (77-80) is a diachronic antecedent, but we do not know whether these verbs were already present in Proto-Zamucoan or have developed at a later stage. Based on the present knowledge, it is not clear whether *j*-verbs can be reconstructed for Proto-Zamucoan or are an OZ innovation.

9. Conclusions

The present investigation had its starting point in the large amount of new data on OZ reported in an unpublished dictionary, the *Vocabulario de la lengua zamuca*, written in the 18th century by the Jesuit missionary Ignace Chomé (Ciucci *forthcoming*). This

dictionary is the most abundant source of data for OZ and reports many paradigms with morphological features not previously available. The grammar of Old Zamuco by Chomé (1958 [before 1745]) offers a few complete verb paradigms and describes verb inflection as mostly regular, neglecting many unusual paradigms, which are instead described in the dictionary. This allows us to compare such new data with those from the two living Zamucoan languages, AY and CH, thus enriching the reconstruction of Proto-Zamucoan verbs (Ciucci & Bertinetto 2015).

The analysis confirms the existing historical reconstruction but adds new details, providing a more complex picture of the Proto-Zamucoan verb system and its development. The so-called thematic vowels are usually stable, but they have frequently been replaced in the 2nd person, as confirmed by some significant irregularities shown in the dictionary (§4).

OZ reveals now a new class of verbs characterized by the 3.REAL prefix *s-* (§5). One can recognize in AY and CH some relics of this class, which can thus be reconstructed for Proto-Zamucoan (§6). In addition, the dictionary offers many OZ paradigms of thematic verbs, whereas the grammar only reports two complete paradigms. This class, almost vanished from AY, is especially interesting because of the irregular paradigms that it shows in CH.

The new data from the dictionary (§7) show that OZ thematic verbs had more internal morphological diversity than previously assumed and allow us to better explain what has occurred in AY. There were three subgroups of OZ thematic verbs: two of them can be reconstructed for Proto-Zamucoan, while the third invites some speculation (§7.1-7.4). Ciucci & Bertinetto (2015) noted an irregular behavior of the inflectional vowel in a subgroup of CH thematic verbs, and the new data show that OZ has a similar alternation

/o/ ~ /i/, to be traced back to Proto-Zamucoan (§7.4).

OZ has other exceptions: some of them are also found in AY, so that they stem at least from Proto-OZ-AY, while several others lack a cognate in AY or CH (§8). Among the latter, one can identify for the first time a very small class of verbs with 3.REAL prefix *j-* (§8). In Section 8, as well as in Sections 5 and 7.4, there are several OZ and AY verbs in which the development described by the so-called Watkins' Law (Watkins 1962) has occurred: the 3rd person prefixes are reanalyzed as part of the root, and the verb paradigm is subsequently modeled by analogy with the new radical 3rd person. Interestingly, the opposite change, that is reinterpretation of the root-initial consonant as 3rd person prefix, is documented in CH (Ciucci & Bertinetto 2015, Ciucci *forthcoming* 2021a).

In this paper, several OZ innovations were pointed out that are especially significant, because the data previously available highlighted OZ as the most conservative Zamucoan language (Ciucci & Bertinetto 2015). Needless to say, it is only possible to demonstrate that OZ has innovated when it differs from features documented in both AY and CH, which is made hard by the relatively low lexical similarity between these two languages. However, such cases do exist. An example, not dealt with here, is the loss of the prefix **ba-/ma-* in the 2.REAL (Ciucci & Bertinetto 2015:70–71). Another is the 1PL of the verb 'to go', in (80). For the sake of simplicity, example (80) only reports the 1st and 3rd persons (the full paradigm is discussed in Bertinetto & Ciucci 2019:7–8).

(80) OZ REAL: *a-i-no* (1SG), *no* (3), *a-i-no-go* (1PL); IRR: *j-i-no* (1SG), *no* (3), *j-i-no-go*

(1PL)

AY: *j-i-hi* / *ji* (1SG), *no* (3), *j-i-ko* (1PL)

CH: *tak-a-ha* (1SG), *no* (3.REAL), *j-u-ko* (1PL.INCL) // *do* (3.IRR)

In the 1st and 3rd persons, OZ behaves like a regular radical verb, while AY and CH have irregular 1st persons. Aside from the 1SG, which is different in each language, AY and CH have the same 1PL (inflectional vowel aside), *jiko* and *juko*, respectively. The prefix *j-* indicates that they are reflexes of the Proto-Zamucoan 1PL.IRR. By contrast, OZ has the 1PL.IRR *jinogo*, which is an innovation due to regularization. With the data from Chomé's dictionary, spanning about 850 verb paradigms, the number of similar innovations identified in OZ has increased, and indeed they regularly emerge throughout the present study. This is a very welcome result: it reinstates OZ to its deserved role as a normal member of the Zamucoan family, eliminating its false image as the only conservative language. Indeed, OZ was often ignored in the literature on Zamucoan languages, since it was implicitly considered an archaic version of AY. Such misconception was motivated by the lexical similarities between OZ and AY, and by the fact that some ancestors of the present-day AY had lived for a while in the Jesuit mission of *San Ignacio de Samucos*, where OZ was the language of evangelization. Indeed, the AY culture shows some traces of the Jesuit influence (cf. Fischermann 1988, Combès 2009, among others) and some shared cultural features contrast OZ and AY with CH (Ciucci *forthcoming* 2021b). However, the presence of morphological innovations in OZ is a key factor which allows us to establish that, although OZ and AY belong to the same branch of the family, they should be considered two separate entities stemming from Proto-OZ-AY.

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