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Layered complexity in Zenzontepec Chatino verbal inflectional classes

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Abstract: Most verbs in Zenzontepec Chatino fall into one of seven inflectional classes according to which allomorphs of the aspect/mood prefixes they occur with (Campbell 2011), and they also fall into one of nine tone alternation patterns across the different inflectional categories. The intersection of these two layers of inflection, and some further irregularities within them, yields 39 distinct prefix-tone classes. Some of the prefix-tone classes are well populated, while others have only a few or even just one verb in them. Meanwhile, there are another 29 irregular verbs in the language that have either some stem suppletion or some exceptional prefixal inflection, bringing the number of distinct inflectional patterns up to 68. There are only 378 basic verbs that fall into these 68 inflectional patterns. The layered complexity of aspect/mood inflection, with the large number of small, even singleton, classes that it creates, blurs the line between inflectional classes and irregular verbs. While it makes sense to consider the more frequent patterns as inflectional classes, the less frequent patterns might just as well be considered irregular verbs instead of very small inflectional classes. Ultimately, there is no clear choice of exactly where such a line should be drawn between inflectional classes and irregular verbs, and Zenzontepec Chatino verbal inflection raises interesting and challenging questions for morphological typology.

Keywords: Zenzontepec Chatino, Oto-Manguean, inflectional classes, complexity, morphological typology, grammatical tone

1. Introduction

Oto-Manguean languages are known for having complex inflectional morphology (de Angulo 1933; Jamieson 1982; Smith Stark 2002; Palancar 2011), and Chatino languages are no exception (Rasch 2002; Pride 2004; Woodbury 2008a, 2008b; Campbell 2009, 2011; Villard 2010; Cruz 2011; Sullivant 2011). In Zenzontepec Chatino (ISO 693-6: czn), verbal aspect/mood inflection is realized jointly by two layers of morphology. One layer consists of prefixes, most of which have several allomorphs, and which in some cases are fused with verb stems. The other layer is tonal, as a verb stem may undergo tone change depending on which aspect/mood category it is inflected for. Table 1 shows a range of prefixal and tonal allomorphy in

Zenzontepec Chatino aspect/mood inflection. The table contains seven verb stems and their forms when inflected for each of the four primary aspect/mood categories in the language: Potential Mood (POT), Habitual Aspect (HAB), Progressive Aspect (PRG), and Completive Aspect (CPL). Each verb in the table is distinct from the rest in both its segmental and tonal layers of inflection.[1]

stem	gloss	POT	HAB	PRG	CPL
-ʃáʔā	'shout'	*ki-ʃaʔa*	*nti-ʃaʔa*	*nte-ʃáʔā*	*nka-ʃáʔā*
-ísū	'pay'	*k-isu*	*nt-isu*	*nte-k-isu*	*nk^{w}-ísū*
-kītę́ʔ	'snap (intr.)'	*ki-kitę̄ʔ*	*nti-kitę̄ʔ*	*ntē-kītę́ʔ*	*nkū-kītę́ʔ*
-túʔu	'leave (intr.)'	*tʲúʔu*	*n-tʲúʔu*	*ntē-túʔu*	*nkū-túʔu*
-jāʧíʔ	'tremble'	*ʧaʧíʔ*	*n-ʧaʧíʔ*	*nte-ʧaʧíʔ*	*nk-jāʧíʔ*
-ākéʔ	'get cooked'	*k-ākéʔ*	*ntī-kéʔ*	*nʧ-akēʔ*	*nkū-kéʔ*
-uhwīʔ	'sell'	*k-uhwiʔ*	*nt-uhwiʔ*	*nʧ-uhwīʔ*	*j-uhwīʔ*

Table 1. Allomorphy in Zenzontepec Chatino aspect/mood inflection

A verb's argument structure and its phonological shape may provide clues for predicting what its segmental inflection will be, but these factors are never sufficient for doing so. The tonal layer of aspect/mood inflection is even less predictable than the segmental layer. What makes aspect/mood inflection particularly complex in Zenzontepec Chatino is that the allomorphy within each layer is to some degree lexically conditioned and the two layers are largely independent of one another. On top of this layered complexity, there are additional idiosyncratic details in inflection that complicate the system even further. Ultimately, numerous distinct inflectional patterns must be recognized due to the interaction of the two layers of morphology and the irregularities within them.

Campbell (2011) details the segmental part of the problem of aspect/mood inflection in Zenzontepec Chatino, grouping verbs into 7 prefix classes according to which allomorphs of the prefixes they select. However, the tonal layer was not described in depth in that work, and verbs with irregular segmental inflection were largely left aside. One purpose of the present chapter is to fill these gaps by providing a complete description, both

[1] The orthography used here differs from the IPA as follows: Ɣ is a nasalized vowel, VV is a long vowel. Tone is represented as follows: V is toneless, V̄ is mid tone, V́ is high tone, + is a junction of two stems in a compound.

segmental and tonal, of the complexity and irregularities of Zenzontepec Chatino aspect/mood inflection.

Zenzontepec Chatino verbs exhibit 9 tone alternation patterns (or lack of alternation) across aspect/mood forms. If the tonal layer of aspect/mood inflection is given as much weight as the prefixal layer, as it deserves, one must count 9 tonal inflectional classes. Multiplying the 7 prefix classes by the 9 tone classes would yield a possible 63 prefix-tone classes, and of these 63 possibilities, 31 actually occur. Furthermore, of these 31 prefix-tone classes, some of the small to medium-sized ones can be further split into two or three even smaller classes because they are cross-cut by an additional unpredictable segmental idiosyncrasy in the Progressive Aspect. These irregular Progressive Aspect forms yield 8 additional inflectional patterns (see Table 21 in §6.1). Must we then concede that there are 39 inflectional classes in the language?

Going even further, there are 29 irregular verbs that have either some stem suppletion across aspect/mood categories or some exceptional prefixal inflection. This brings the number of distinct inflectional patterns up to 68. Meanwhile, there are only 378 basic verbs that fall into these 68 inflectional patterns. The layered complexity of verbal aspect/mood inflection, with the large number of small, even singleton, classes that it creates, blurs the line between inflectional classes and irregular verbs in Zenzontepec Chatino. While it makes sense to consider the more frequent patterns as inflectional classes, the less frequent patterns might just as well be considered irregular verbs instead of very small inflectional classes. However, it turns out that there is no clear choice of exactly where such a line between inflectional classes and irregular verbs should be drawn.

A result of this study is that Zenzontepec Chatino verbal inflection raises interesting and challenging questions for morphological typology. Can inflectional classes have irregular members? If so, what degree of irregularity is too great for an item to be placed in a particular class? If not, are lexemes with only minor inflectional irregularities best considered to be outside of the inflectional class system, or are they best considered to be distinct classes? How many member lexemes are necessary to justify positing a distinct inflectional class? How many distinct classes can a

language have before the descriptive power of the class system is brought into question or significantly weakened. Though I won't be able to answer all of these questions here, the Zenzontepec Chatino inflectional system will demonstrate that they must be asked.

The structure of the chapter is as follows. Some basic information about Zenzontepec Chatino, the structure of its verbs, and the data used in this study is given in §2. The prefix-based verb classes from Campbell (2011) are summarized in §3. The tone system and its role in aspect/mood inflection are discussed in §4. All of the basic verbs (see §2.3 for definition of "basic" here) are listed in §5, according to their prefix classes, the tone classes within them, and their irregularities. Discussion, conclusions, and a view of the system from the perspective of canonical typology (Corbett 2005, 2009) are presented in §6.

2. The language and the structure of verbs

This section provides some general and background information about Zenzontepec Chatino (§2.1), the structure of its verbs (§2.2), and the data used in this study (§2.3).

2.1. The language

The Zenzontepec Chatino language is spoken in a remote, mountainous area of southwestern Oaxaca State, Mexico. An estimated 8,000 people speak it, but most of them are bilingual in Spanish. Currently, an accelerating shift from Chatino to Spanish within the community and increased migration are eroding the language's vitality.

There are at least three Chatino languages (Boas 1913): Zenzontepec Chatino; Tataltepec Chatino; and Eastern Chatino, which is a cluster of about 15 varieties (Cruz & Woodbury 2014). Zenzontepec Chatino is the most divergent of the three (Campbell 2013a). Chatino is fairly closely related to Zapotec, a larger group of neighboring languages, and together the two make up the Zapotecan language group of the large and diverse Oto-

Manguean stock (Mechling 1912; Boas 1913). The map in Figure 1 shows the location and subgrouping of some of the varieties of Chatino.[2]

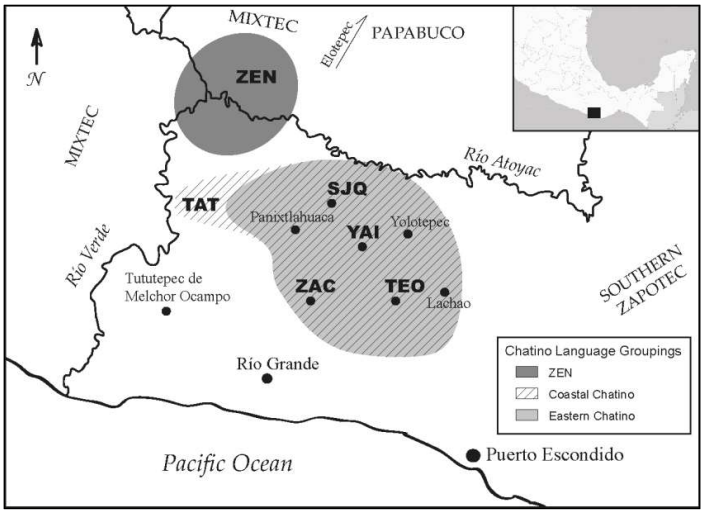

Figure 1: Location and subgrouping of Chatino languages (Campbell 2013a)

2.2. The structure of verbs

Zenzontepec Chatino is a predominantly head-marking language. Most of the morphology occurs on the verb, and verbs may be quite morphologically and prosodically complex, as shown in the Verbal Template in (1).

(1) Verbal template (from Campbell 2014) (ω = phonological word)

	Pos 3	**Pos 2**	**Pos 1**	**Root**			
(ASP-AUX)+	**ASP-**	**(CAUS/ITER-)**	**(DERV-)**	**root**	(+stem)*	(=ADV)*	(=SBJ)
ω	ω				ω	ω	ω
	Verbal Core						

The minimal well-formed verb consists of a verbal root with aspect/mood inflection. Aspect/mood prefixes occur in the third prefixal position before the root: Position 3. There are two derivational prefix positions between that position and the root: Position 2 and Position 1. The root and the three prefix positions are referred to as the Verbal Core (Campbell 2014). The Verbal

[2] Some of the Chatino villages (and language varieties) on the map are abbreviated: ZEN = Santa Cruz Zenzontepec; TAT = Tataltepec de Valdés; ZAC = San Marcos Zacatepec; YAI = Santiago Yaitepec; SJQ = San Juan Quiahije; and TEO = Santa Lucía Teotepec. All of these besides ZEN and TAT are Eastern Chatino varieties.

Core always makes up a single phonological word. The phonological word (Nespor & Vogel 1986; Hall 1999; Dixon & Aikhenvald 2002) is the domain of many phonotactic constraints and phonological processes in the language (Campbell 2014), and it is an important constituent for understanding inflectional patterns because it is the domain on which the distribution of tones is based (§4.2).

If a verbal lexeme is a compound, the initial component stem is the head of the compound and any non-initial stem(s) fall outside of the Verbal Core. That is, they make up separate phonological words. A simple or compound verb stem may host adverbial enclitics, and a pronominal subject enclitic, when present, occurs in final position. All enclitics make up separate phonological words.

When a verb occurs with an auxiliary, the auxiliary precedes the main verb and forms a compound with it. The auxiliary bears the aspectual inflection of the entire complex verb. The main verb in an auxiliary construction occurs in a dependent form, which in some cases is the bare root and in other cases may include derivational prefixes in Position 1 and/or Position 2 and/or a semantically vacuous aspect/mood prefix in Position 3. A verb's dependent form is predictable from its aspect/mood prefix class (§3) and the particular auxiliary that it is combined with.

2.3. Notes on the data

The data presented in this work are from a Zenzontepec Chatino lexical database (Campbell & Carleton, in press) compiled under the auspices of the Project for the Documentation of the Languages of Mesoamerica and a documentary text corpus created in the Santa Cruz Zenzontepec community (Campbell 2013b). The database contains about 1,700 verbal lexemes and their forms when inflected for the four primary aspect/mood categories (see e.g. Table 1 in §1).

Much of the Zenzontepec Chatino verbal lexicon consists of complex lexemes of three types: compounds, phrasal lexemes, and combinations of stem plus clitic. However, the aspect/mood inflection of any complex verbal lexeme is exactly that of the initial verb stem within the lexeme. To illustrate this, Table 2 shows the inflectional pattern of the basic verb *-ūlá* 'make

music' and three complex verbal lexemes that are based on it: two compound verbs *-ūlá+tuʔwa* 'sing' (lit. 'make music'+'mouth') and *-ūlá+kijaʔ* 'dance' (lit. 'make music'+'foot') and the stem plus clitic lexeme *-ūlá=ɾīké* 'long for' (lit. 'make music'='chest').

stem	gloss	POT	HAB	PRG	CPL
-ūlá	'make music'	*k-ulā*	*nt-ulā*	*ntʃ-ūlá*	*j-ūlá*
-ūlá+tuʔwa	'sing'	*k-ulā+tuʔwa*	*nt-ulā+tuʔwa*	*ntʃ-ūlá+tuʔwa*	*j-ūlá+tuʔwa*
-ūlá+kijaʔ	'dance'	*k-ulā+kijaʔ*	*nt-ulā+kijaʔ*	*ntʃ-ūlá+kijaʔ*	*j-ūlá+kijaʔ*
-ūlá=ɾīké	'long for'	*k-ulā=ɾīké*	*nt-ulā=ɾīké*	*ntʃ-ūlá=ɾīké*	*j-ūlá=ɾīké*

Table 2. Verbal lexemes headed by the root *-ūlá* 'make music'

If all of the complex verbs in the language (roughly 1,300) were included in this analysis, they would skew the picture of the inflectional classes in favor of those that contain the verbs which most frequently occur as initial stems in complex lexemes. Therefore, only the single-stem, non-complex, verbs in the language are included here. That is, only verbal lexemes that consist of elements fully contained within the Verbal Core are included.

The Position 1 and Position 2 derivational prefixes are not highly productive. They derive new verbal lexemes that in all cases belong to different aspect/mood prefix classes than the more basic verbs from which they are derived. Therefore, verbs derived by the derivational prefixes are included in the data here. There is also an iterative prefix *i-* that is arguably not derivational even though it occurs in Position 2. A handful of verbs are lexicalizations of earlier verbs with the iterative prefix, and these are included in the data here. Otherwise, iterative verbs are not included. Table 3 shows three verbs that share the same root, with their aspect/mood inflection: the intransitive verb *-j-atiʔ* 'get untied', the transitive verb *-u-s-atiʔ* 'untie', and the iterative transitive verb *-i-s-atiʔ* 'untie again'. The first two are included in the data here, but the iterative form is not, since it is probably not lexicalized.

stem	gloss	POT	HAB	PRG	CPL
-j-atiʔ	'get untied'	*ʧ-atiʔ*	*n-ʧ-atiʔ*	*nte-j-atiʔ*	*nk-j-atiʔ*
-u-s-atiʔ	'untie'	*k-u-s-atiʔ*	*nt-u-s-atiʔ*	*nte-s-atiʔ*	*nka-s-atiʔ*
-i-s-atiʔ	'untie again'	*k-i-s-atiʔ*	*nt-i-s-atiʔ*	*nte-s-atiʔ*	*nk^{w}-i-s-atiʔ*

Table 3. Verbs based on the root *-atiʔ* 'untie'

Following the criteria outlined above, of the roughly 1,700 verbal lexemes in the database, only 378 (22%) are single-stem verbs, and only these are included in this study.

3. Prefix-based inflectional classes

This section summarizes previous work on aspect/mood prefix classes in Zapotecan languages (§3.1) and in Zenzontepec Chatino in particular (§3.2). After that, an additional irregularity in the segmental layer of Zenzontepec Chatino inflection is introduced (§3.3).

3.1. Previous research on prefix classes in Zapotecan languages

There is a long history of work on verbal inflection in Zapotecan languages. The Spanish Dominican friar Juan de Córdova (1578) noted that colonial-era Zapotec verbs did not all inflect in the same way, and they could be classed according to which inflectional allomorphs they occurred with. This is the case for all Zapotecan languages. However, Zapotec and Chatino verbal inflection poses a challenge for the analyst because there is considerable morphophonological interaction between aspect/mood formatives and stems.

Kaufman (1987, 1989) offers an elegant solution to the problem of Zapotec verbal inflection based on three key observations. First, he posits a set of rules that determine which of two vowels elides when vowel hiatus arises during inflection. Second, the vowelless allomorph of the Zapotec Potential Mood proclitic (*k*=) fuses with a single (or lenis) stem-initial consonant, making the latter become geminate (fortis). And third, some Zapotec verbs have stem-initial consonant alternations in which the stem used for the completive aspect differs from the stem used for the other categories (Kaufman's Class D verbs). With these insights, Kaufman groups verbs into just four classes (Table 4), and his analysis was adopted, with minor adjustments, in descriptions of other varieties of Zapotec (Smith Stark 2001, 2002; Beam de Azcona 2004; Pérez Báez & Kaufman 2012).

class	POT	HAB	CPL
A	*ki=*	*tʲi=*	*kʷe=*
B	*ki=*	*tʲi=*	*ko=*
C	*k=*	*tʲi=*	*ko=*
D	*k=*	*tʲi=*	*ko=* (w/ stem cons. change)

Table 4. Zapotec inflectional classes (Kaufman 1987, 1989)

Campbell (2009, 2011) applies Kaufman's Zapotec analysis to Zenzontepec Chatino and notes that no Chatino languages show any trace of the Class D stem-consonant alternations found in Zapotec. Chatino languages also show no gemination in the Potential Mood, because the Zapotecan geminate consonants (Swadesh 1947) merged with their single counterparts in Chatino (Kaufman 1993-2007). Despite these simplifications, the Chatino inflectional class system is more complex than that of conservative varieties of Zapotec for a couple of reasons. First, while Zapotec has four prefix-based classes, Chatino has more than that: Zenzontepec Chatino has 7 (Campbell 2011), Zacatepec (Eastern) Chatino has 9 (Villard 2010), and Tataltepec Chatino has 11 (Sullivant 2011). Second, Chatino displays the additional, tonal layer in its inflectional class system, while tone typically plays no role in defining Zapotec inflectional classes.[3]

3.2. Prefix classes in Zenzontepec Chatino

Table 5 presents the aspect/mood prefixes that make up the segmental layer of Zenzontepec Chatino inflectional classes. The class labels, following Campbell (2011), reflect how the classes correspond historically to Kaufman's Zapotec verb classes, with additional elaboration that reflects either their typical stem-initial segments (e.g. "c" for 'consonant', "y" for [j], and "a" for [a]) or the fact that they reflect a Chatino innovation that led to a split in an earlier class (e.g. A-2, C-2). Prefix Classes A-c/u, A-2, and B-c are distinguished solely by their Completive Aspect prefixes: *nka-*, *nkʷi-* and *nku-*, respectively. In Prefix Class B-t the notation (*t*→ *tʲ*) means that a stem-initial /t/ becomes palatalized [tʲ]. In Prefix Class B-y the notation (*j*→*ʧ*) means that a stem-initial /j/strengthens to [ʧ]. Prefix Classes C-a and C-2 differ from the rest in having the vowelless Potential Mood prefix *k-* and the Progressive

[3] Tone plays only a minor, and more predictable, role in Zapotec verbal inflection, where the Potential Mood prefix/proclitic (and in some varieties also a Progressive Aspect marker) carries a high or rising tone (Smith Stark 2002; Beam de Azcona 2004; Sicoli 2007: 97; Pérez Báez & Kaufman 2012), which may cause tonal perturbations on stems.

Aspect prefix *ntʃ-*, which in Prefix Class C-2 alternates with *ntej-*. Prefix Class C-2 also differs from Prefix Class C-a in having the *j-* Completive Aspect prefix (and its alternant *nkaj-*), instead of *nku-*.

prefix class	POT	HAB	PRG	CPL
A-c/u	*ki-*	*nti-*	*nte-*	*nka-*
A-2	*ki-*	*nti-*	*nte-*	*nk^{w}i-*
B-c	*ki-*	*nti-*	*nte-*	*nku-*
B-t	(*t*→ *t^{j}*)	*n-*(*t*→ *t^{j}*)	*nte-*	*nku-*
B-y	(*j*→ *ʧ*)	*n-*(*j*→*ʧ*)	*nte-*	*nk-*
C-a	*k-*	*nti-*	*ntʃ-*	*nku-*
C-2	*k-*	*nti-*	*ntʃ- ~ ntej-*	*j- ~ nkaj-*

Table 5. Zenzontepec Chatino prefix-based inflectional classes (Campbell 2011)

A verb's phonological shape and its lexical semantics provide some clues about which prefix class it belongs too, but ultimately class membership is not predictable. This is reminiscent of Bantu noun classes, which reflect an earlier semantic basis that has eroded or become obscured over time in individual Bantu languages (Denny & Creider 1976). Some lexical semantic and phonological characteristics that are typical of each Zenzontepec Chatino prefix class are listed in (2) (adapted from Campbell 2015).

(2) Prefix Class A-c/u unergative, transitive, and derived *u-* causative verbs
Prefix Class A-2 transitive verbs, all *i* or *e* initial verbs (tr. or intr.)
Prefix Class B-c unaccusative and inactive verbs (mostly intr.)
Prefix Class B-t some motion and posture verbs, a few unaccusatives
Prefix Class B-y all *j* initial verbs, many being derived unaccusatives
Prefix Class C-a unaccusative verbs, all but one begin with *a*
Prefix Class C-2 unergative or transitive verbs that begin in *a*, *o*, or *u*

As in Zapotec, vowel hiatus often arises between aspect/mood prefixes and verb stems in Chatino. In these cases one vowel elides since the phonotactics do not tolerate vowel hiatus within a single phonological word. Which vowel elides is represented in the vowel hierarchy in (3).

(3) Zenzontepec Chatino vowel hierarchy: *e* » *u* » *i* » *a*, *o*

When two vowels are in hiatus, the leftmost one on the hierarchy remains, and the rightmost one elides. There is one exception: if V_1 is /a/ and V_2 is /u/, then the /u/ elides. Not all possible vowel sequences arise in the language, and /a/ and /o/ cannot be ranked against each other. Table 6 shows verbs from each of the prefix classes and their inflected forms. Beneath each

form is its underlying morphophonemic representation prior to vowel hiatus resolution. If a prefix class contains both consonant-initial and vowel-initial stems, one example of each is provided.

class	stem	gloss	POT	HAB	PRG	CPL
A-c/u	*-hjā*	‘play’	*ki-hja*	*nti-hja*	*nte-hjā*	*nka-hjā*
			/ki-hja/	/nti-hja/	/nte-hjā/	/nka-hjā/
	-u-wíī	‘clean’	*k-u-wii*	*nt-u-wii*	*nte-wíī*	*nka-wíī*
			/ki-u-wii/	/nti-u-wii/	/nte-u-wíī/	/nka-u-wíī/
A-2	*-lʲēʔé*	‘lick’	*kī-lʲēʔé*	*ntī-lʲēʔé*	*ntē-lʲēʔé*	*nkʷī-lʲēʔé*
			/ki-lʲēʔé/	/nti-lʲēʔé/	/nte-lʲēʔé/	/nkʷi-lʲēʔé/
	-isę	‘get wrapped’	*k-isę*	*nt-isę*	*nte-sę*	*nkʷ-isę*
			/ki-isę/	/nti-isę/	/nte-isę/	/nkʷi-isę/
B-c	*-lákʷi*	‘boil (intr.)’	*kī-lákʷi*	*ntī-lákʷi*	*ntē-lákʷi*	*nkū-lákʷi*
			/ki-lákʷi/	/nti-lákʷi/	/nte-lákʷi/	/nku-lákʷi
B-t	*-tāáʔ*	‘get torn’	*tʲaāʔ*	*n-tʲaāʔ*	*ntē-tāáʔ*	*nkū-tāáʔ*
			/tʲaāʔ/	/n-tʲaāʔ/	/nte-tāáʔ/	/nku-tāáʔ/
B-y	*-j-ātę́*	‘get burned’	*ʧ-atę̄*	*n-ʧ-atę̄*	*nte-j-ātę́*	*nk-j-ātę́*
			/ʧ-atę̄/	/n-ʧ-atę̄/	/nte-j-ātę́/	/nk-j-ātę́/
C-a	*-āsúʔ*	‘get old’	*k-āsúʔ*	*ntī-súʔ*	*nʧ-asūʔ*	*nkū-súʔ*
			/k-āsúʔ/	/nti-āsúʔ/	/nʧ-asūʔ/	/nku-āsúʔ/
C-2		‘sting (tr.)’	*k-ohoʔ*	*nti-hoʔ*	*nʧ-ohoʔ*	*j-ohoʔ*
			/k-ohoʔ/	/nti-ohoʔ/	/nʧ-ohoʔ/	/j-ohoʔ/

Table 6. Examples of prefixal aspect/mood inflection and vowel elision

3.3. An additional layer of complexity in prefix classes

Two of the prefix classes in Zenzontepec Chatino are crosscut by an additional irregularity that is not represented in Table 5 or Table 6. Classes A-2 and B-y both contain some verbs that behave differently in the Progressive Aspect. For example the Class A-2 verb *-íkʷą̄* ‘sew’ in Table 7 has an intrusive *k-* between the typical Progressive Aspect prefix and the verb stem, and the Class B-y verb *-juʔū* ‘take root’ has a stem-initial /ʧ/ instead of /j/in the Progressive Aspect. The /ʧ/ in the latter likely came from an earlier sequence of /k/ + /j/, which is one of the few sources of the affricate /ʧ/ in Zenzontepec Chatino (Campbell 2013a).

class	stem	gloss	POT	HAB	PRG	CPL
A-2	*-íkʷą̄*	‘sew’	*k-ikʷą* /ki-ikʷą/	*nt-ikʷą* /nti-ikʷą/	*nte-**k**-ikʷą* /nte-**k**-ikʷą/	*nkʷ-íkʷą̄* /nkʷi-íkʷą̄/
B-y	*-juʔū*	‘take root’	*ʧuʔū* /ʧuʔū/	*n-ʧuʔū* /n-ʧuʔū/	*nte-**ʧ**uʔū* /nte-**ʧ**uʔū/	*nk-juʔū* /nk-juʔū/

Table 7. Class A-2 and Class B-y verbs with exceptional Progressive Aspect

These Progressive Aspect forms can be characterized by rules of referral (Stump 2001) in which the Progressive Aspect prefix takes as its stem the Potential Mood form of the verb. These forms resemble auxiliary constructions because the dependent form of some main verbs in auxiliary constructions is created by adding the Potential Mood prefix, a construction that is old and widespread in Eastern Oto-Manguean languages (Kaufman 1987). An example of this in Zenzontepec Chatino is given in the textual utterance in (4). Though the full auxiliary+verb construction is in the Completive Aspect, the dependent form of the main verb *-īʔjá* ‘transport’ includes a Potential Mood prefix *k(i)-*.[4]

(4) *kenaʔa tī kʷítī ta j-a+k-īʔjá=ą̄ʔ*
a.lot TPLZ remedy PRF CPL-go+POT-transport=1SG[5]
‘I have gone to get a lot of medicine already.’ [historia medicina 47: 33]

The implications that these alternate Progressive Aspect forms have for the Zenzontepec Chatino inflectional class system are significant. Within Classes A-2 and B-y, it is not possible to predict which verbs have the exceptional Progressive Aspect form and which verbs do not. Therefore, at the finest level these two prefix classes must be further split into smaller (sub-)classes. Complicating things a bit further, within the Class B-y verbs, some of them show variation and may occur with either stem-initial /j/ or/ʧ/ in the Progressive Aspect. Since not all Class B-y verbs that have the exceptional Progressive Aspect form freely alternate this way, it must be stipulated for each Class B-y verb whether its Progressive Aspect stem begins solely in /j/, solely in /ʧ/, or either /j/ or /ʧ/. When the effect of the orthogonal tonal layer of inflectional classes is considered, a total of 8 additional inflectional patterns must be recognized due to the irregular Progressive Aspect forms. In §5 the

[4] The Class A-2 and Class B-y verbs that have traces of an intrusive *k-* in them may betray that the *nte-* Progressive Aspect prefix, which has no identified Zapotec cognate, grammaticalized via an auxiliary construction in Chatino (Campbell 2011).

[5] Abbreviations: CPL = completive aspect; POT = potential mood; PRF = perfect; SG = singular; TPLZ = topicalizer.

verbs of each prefix-tone class are listed, and the Progressive Aspect splits in Prefix Class A-2 and Prefix Class B-y are indicated there as well. However, the basics of Zenzontepec Chatino tone, and its role in aspect/mood inflection must be outlined first (§4).

4. Tone in Zenzontepec Chatino inflectional classes

This section provides a brief description of the Zenzontepec Chatino tone system, focused on the details of it that are necessary for understanding the role of tone in verbal inflection: the tone inventory (§4.1), the distribution of tones (§4.2), and the tone alternation patterns in aspect/mood inflection (§4.3). A more thorough description of Zenzontepec Chatino tone can be consulted in Campbell (2014).

4.1. Tone inventory

The tone bearing unit (TBU) in Zenzontepec Chatino is the mora. A mora may bear one of three tonal specifications: high tone (H), mid tone (M), or no tone (Ø). The default phonetic realization of the toneless category is a mid-to-low relaxed falling pitch. The minimal pairs of monomoraic words in (5) demonstrate the three-way tonal specification contrast.

(5)

/H/	≠	/M/	*hlʲá*	‘fast (adj.)’	*hlʲā*	‘morning’
/H/	≠	Ø	*hnʲá*	‘work (n.)’	*hnʲa*	‘griddle’
/M/	≠	Ø	*hnē*	‘money’	*hne*	‘finger of’

This tone system is typologically unusual for a three-height tone system (Campbell 2014) because the unspecified category is the one with the lowest pitch. In contrast, most three-height tone systems with an unspecified category have the mid-level pitch category as the unspecified or unmarked one (Maddieson 1978; Hyman 2012).

4.2. Distribution of tone

Relatively few words in Zenzontepec Chatino are monomoraic like those in (5). Most words are bimoraic or trimoraic, and the distribution of tones within them is restricted. While some sequences of tones are common, others are less common, non-occurring, or morphologically specialized. The following discussion summarizes the distribution of tones on bimoraic words (§4.2.1) and

trimoraic words (§4.2.2). Based on the tones of their final two moras, the trimoraic tone patterns can be conflated with the bimoraic ones (§4.2.3).

4.2.1. Tone on bimoraic words

Given the three-way tonal specification contrast on the mora (§4.1), there would be nine possible combinations that a bimoraic word could have. Two of these possibilities, HH and MØ, do not occur. Two others, MM and ØH, occur only on stems bearing second person singular pronominal inflection (Campbell 2016). The remaining five combinations, ØØ, ØM, MH, HM, and HØ, are the only ones that occur on single phonological words without 2SG pronominal inflection. These are the **five basic tone patterns**, listed in order from most to least frequent in the lexicon. Words with each basic bimoraic tone pattern are listed in (6), with monosyllabic (long vowel) nouns on the left, bisyllabic nouns in the middle, and bisyllabic verbs with aspect/mood inflection on the right.

(6)a.	ØØ	*kee*	‘rock’	*ʧaha*	‘tortilla	*nk-jatę*	‘slept’
		toǫ	‘knot’	*kukʷęʔ*	‘armadillo’	*nt-aku*	‘eats’
b.	ØM	*koōʔ*	‘moon’	*kʷanā*	‘thief’	*nʧ-oʔō*	‘is drinking’
		kʷaą̄	‘sky’	*tiʔī*	‘voice of’	*ʧ-alā*	‘will melt’
c.	MH	*nkāą́*	‘coconut’	*sūtę́ʔ*	‘knee of’	*k-ūkéʔ*	‘will cook’
		nkʷīíʔ	‘ring’	*lūtí*	‘vine’	*nkā-ʔjá*	‘bought’
d.	HM	*ʃíī*	‘light (n.)’	*kʷénā*	‘snake’	*nkʷ-ísū*	‘paid’
		ʦáą̄	‘day’	*lísū*	‘vulture’	*nk-jánō*	‘stayed’
e.	HØ	*tíi*	‘ten’	*lʲúnkʷi*	‘firefly’	*n-tʲúʔu*	‘leaves (v.)’
		tʲáą	‘throat of’	*nʲátę*	‘nest of’	*k-íʧą*	‘will store’

4.2.2. Tone on trimoraic words

On trimoraic words one of the five basic bimoraic tone patterns aligns to the final two moras, and the tonal specification of the antepenultimate (initial) mora is predictable. If the penultimate mora is toneless, then the antepenultimate mora is also toneless, as in the ØØ (7) and ØM (8) basic tones patterns.

(7)	ØØ	Non-verbs (Ø)ØØ		Verbs (Ø)ØØ	
		kʷi-tuluʔ	‘cockroach’	*nte-witi*	‘is drying (intr.)’
		kʷi-seeʔ	‘raccoon’	*nku-toǫ*	‘was standing’
(8)	ØM	Non-verbs (Ø)ØM		Verbs (Ø)ØM	
		kʷi-natę̄	‘mosquito’	*nte-kaʧīʔ*	‘is burying’
		kʷi-ʦaā	‘happiness’	*k-u-saāʔ*	‘will tear (tr.)’

If the basic tone pattern on the final two moras is MH and the root of the word is non-verbal, then the antepenultimate mora is toneless, as shown on the left in (9). If the root is verbal, then the antepenultimate mora has M tone, as in the examples on the right in (9).

(9)

MH	Non-verbal root (Ø)MH		Verbal root (M)MH	
	kisōʔná	‘master of’	*kʷī-ʦāʔą́*	‘sorcerer’
	kʷi-līxí	‘butterfly’	*nkā-lōó*	‘took out’

If the final two moras have the HM basic tone pattern and the word is not a verb, then the antepenultimate mora has M tone, as in the examples on the left in (10). If the word is a verb, then the antepenultimate mora is toneless, as shown in the examples on the right in (10).

(10)

HM	Non-verbs (M)HM		Verbs (Ø)HM	
	tī-kélā	‘stiff (adj.)’	*nku-kélā*	‘became stiff’
	ʃ̄i-nkʷéē	‘chin of’	*nte-húų̄*	‘is spinning thread’

Finally, if the final two moras of a trimoraic word bear the HØ basic tone pattern, then the antepenultimate mora has M tone, regardless of root or word class (11).

(11)

HØ	Non-verbs (M)HØ		Verbs (M)HØ	
	kū-náʔa	‘female’	*nkʷī-tʲána*	‘searched for’
	lā-túwe	‘chopped up’	*ntē-tákʷi*	‘is flying’

4.2.3. Summary of basic tone patterns

The tone on the antepenultimate mora of a trimoraic word is always predictable from the tone pattern on its final two moras, and in a couple of cases it also depends on root or word class. Therefore, the trimoraic tone patterns can be conflated with the bimoraic ones, and we can speak of the five basic tone patterns regardless of mora count.[6]

Key to this analysis is the fact that when a verb undergoes tone change as part of its aspect/mood inflection, the change is always from one of the five basic tone patterns to another.

[6] Even where inflected verbs are (rarely) monomoraic, we may still speak of the basic tone patterns regardless of mora count. The monomoraic tone possibilities Ø, M, and H correspond to the bimoraic tone patterns ØØ, ØM, and MH, respectively, as evidenced in the lexicon by doublets in which one form has lost a syllable (*īʦáʔ* ~ *ʦáʔ* ‘word’, *latīʔ* ~ *=tīʔ* ‘living core’, *ike* ~ *ke* ‘head’).

4.3. The role of tone in aspect/mood inflection

Verbs can be placed into 9 classes according to how their tone pattern changes, or does not change, across the four primary aspect/mood categories. The tone pattern of a verb in the Completive Aspect is taken to be the underlying tone pattern of the stem because that is the tone pattern that occurs in most auxiliary constructions, which in some cases involve the bare stem. The tone alternations that are part of aspect/mood inflection are lexically conditioned and ultimately independent of the phonological shape of the stem, the meaning and argument structure of the verb, and the segmental layer of aspect/mood inflection (Campbell 2016). Furthermore, it is usually not possible to predict the tone pattern that a verb will have in all of its inflected forms from its tone in any one of those forms. A few sets of verbs will serve to demonstrate these facts below.

Table 8 contains two segmentally identical verb stems and their forms when inflected for each of the four primary aspect/mood categories. The inflected forms are all segmentally identical as well. The first verb, *-túkʷā* 'get chafed', is toneless (ØØ) in the Potential Mood and Habitual Aspect, and it has the HM basic tone pattern in the Progressive and Completive aspects. The second verb, *-tūkʷá* 'be sitting' has the MH tone pattern in all inflected forms. Therefore, this set of minimal pairs serves to illustrate the contrastive phonological status of tone in Zenzontepec Chatino.

stem	*gloss*	*POT*	*HAB*	*PRG*	*CPL*
-túkʷā	*'get chafed'*	*tʲukʷa*	*n-tʲukʷa*	*nte-túkʷā*	*nku-túkʷā*
-tūkʷá	*'be sitting'*	*tʲūkʷá*	*n-tʲūkʷá*	*nte-tūkʷá*	*nku-tūkʷá*

Table 8. Segmentally identical stems with different aspect/mood tone patterns

Considering only the data in Table 8, one might wonder if knowing that the verb *-túkʷā* 'get chafed' has the HM tone pattern in the Progressive and Completive Aspects would make it possible to predict that it is toneless in the Potential and Habitual forms. However, the verb *-tásū* 'fall to the ground' in Table 9 shows that this is not the case. That verb is not toneless in the Potential and Habitual but has the HM tone pattern in all four inflected forms. Alternatively, one might wonder if knowing that the verb *-túkʷā* 'get chafed' is toneless in the Potential and Habitual would allow the HM tone pattern in the Progressive and Completive forms to be predicted. The third verb in Table 9, *-teē* 'be hanging', shows that this is not the case. It is indeed toneless in the

Potential and Habitual forms, but it has the ØM tone pattern in the Progressive and Completive aspects, not the HM tone pattern.

The fourth verb in Table 9 *-tehę̄* 'pass' is like the third verb *-teē* 'be hanging' in having the ØM tone pattern in the Progressive and Completive, but instead of being toneless in the Potential and Habitual forms like *-teē* it has the ØM pattern in all four forms. Therefore, one cannot simply predict the tone patterns in all of the cells of a verb's paradigm from any one cell.

stem	gloss	POT	HAB	PRG	CPL
-túkʷā	'get chafed'	*tʲukʷa*	*n-tʲukʷa*	*nte-túkʷā*	*nku-túkʷā*
-tásū	'fall to ground'	*tʲásū*	*n-tʲásū*	*nte-tásū*	*nku-tásū*
-teē	'be hanging'	*tʲee*	*n-tʲee*	*nte-teē*	*nku-teē*
-tehę̄	'pass'	*tʲehę̄*	*n-tʲehę̄*	*nte-tehę̄*	*nku-tehę̄*

Table 9. Tone alternation patterns are unpredictable across aspects

The pair of verbs in Table 10 demonstrates that tone alternations in aspect/mood inflection are independent of the meaning and argument structure of the verb. The two verbs *-teē* and *-tákʷī* have the same argument structure and meaning: 'be hanging', 'be suspended above'. Both verbs are toneless in the Potential and Habitual forms, but the first verb has the ØM tone pattern in the Progressive and Completive, where the second verb has the HM tone pattern.

stem	gloss	POT	HAB	PRG	CPL
-teē	'be hanging'	*tʲee*	*n-tʲee*	*nte-teē*	*nku-teē*
-tákʷī	'be hanging'	*tʲakʷi*	*n-tʲakʷi*	*nte-tákʷī*	*nku-tákʷī*

Table 10. Aspect/mood tone patterns are independent of semantics

The tone alternation patterns across aspect/mood forms of a verb are not predictable from the segmental/prefixal layer of aspect mood inflection. All of the different verbs presented so far in this sub-section are repeated in Table 11. They are all identical in their segmental aspect/mood inflection, belonging to Prefix Class B-t (§5.4). Even though all of the verbs in the table share the same segmental inflection, only the first and last ones have the same tone alternation pattern.

stem	gloss	POT	HAB	PRG	CPL
-túkʷā	‘get chafed’	*tʲukʷa*	*n-tʲukʷa*	*nte-túkʷā*	*nku-túkʷā*
-tūkʷá	‘be sitting’	*tʲūkʷá*	*n-tʲūkʷá*	*nte-tūkʷá*	*nku-tūkʷá*
-tásū	‘fall to ground’	*tʲásū*	*n-tʲásū*	*nte-tásū*	*nku-tásū*
-teē	‘be hanging’	*tʲee*	*n-tʲee*	*nte-teē*	*nku-teē*
-tehę̄	‘pass’	*tʲehę̄*	*n-tʲehę̄*	*nte-tehę̄*	*nku-tehę̄*
-tákʷī	‘be hanging’	*tʲakʷi*	*n-tʲakʷi*	*nte-tákʷī*	*nku-tákʷī*

Table 11. Tone alternation patterns are not predictable from prefixal inflection

Just as tone alternation patterns are not predictable from prefixal inflection, the tonal alternation patterns are never restricted to just one prefix class. Taking the verb *-túkʷā* ‘get chafed’ as an example again, it is toneless in the Potential and Habitual forms, and it has the HM tone pattern in the Progressive and Completive forms. It is shown again in Table 12, listed along with four verbs from four different prefix classes that share the same tone alternation pattern.

prefix class	stem	gloss	POT	HAB	PRG	CPL
B-t	*-túkʷā*	‘get chafed’	*tʲukʷa*	*n-tʲukʷa*	*nte-túkʷā*	*nku-túkʷā*
A-c/u	*-ʃáʔā*	‘shout’	*ki-ʃaʔa*	*nti-ʃaʔa*	*nte-ʃáʔā*	*nka-ʃáʔā*
B-c	*-líhī*	‘get lost’	*ki-lihi*	*nti-lihi*	*nte-líhī*	*nte-líhī*
B-y	*-j-ánō*	‘stay’	*ʧ-ano*	*n-ʧ-ano*	*nte-j-ánō*	*nk-j-ánō*
C-2	*-únē*	‘dig’	*k-une*	*nt-une*	*nʧ-únē*	*j-únē*

Table 12. Tone alternation patterns are not restricted to particular prefix-classes

To summarize, the tone pattern alternation, or lack thereof, that a verb has as part of its aspect/mood inflection is lexically conditioned. It is not predictable from the phonological shape of the stem, its underlying tone pattern, its argument structure, or the segmental/prefixal layer of its aspect/mood inflection, nor is it predictable for any particular morphological category. Since the tone alternation patterns of verbs are not predictable, verbs must be grouped into classes on the basis of these patterns. This tonal layer is orthogonal to the prefix classes, and it is the intersection of these two layers of inflectional classes that makes aspect/mood inflection in Zenzontepec Chatino particularly complex.

Even though the tone alternation patterns are ultimately not predictable, many generalizations can be stated in terms of their tendencies to occur with particular prefix-classes, which in turn have some loose connection to the

phonological shape of stems and their lexical semantics. Also, though one cannot predict the tone patterns in all of the aspect/mood forms of a verb from any single cell in its paradigm, one can nevertheless narrow down the possibilities considerably. For example, the Potential Mood and Habitual Aspect forms of a verb always have the same tone pattern. The Progressive and Completive forms of 94% of all verbs share the same tone pattern. These and other similar generalizations will be taken up in the conclusions in §6, after all of the basic verbs and their prefix-tone classes are presented in §5.

5. Inflectional classes

In this section all of the Zenzontepec Chatino single-stem verbal lexemes (§2.3) that have been so far documented are listed according to their prefix class (§3). Each prefix class is presented in its own sub-section and table. The table for each prefix class is divided up according to the tone alternation patterns (§4.3), or lack of tone alternation, that its verbs undergo. Some prefix-tone classes within Prefix Class A-2 and Prefix Class B-y have the further division between verbs that have exceptional Progressive Aspect stems and those that do not (§3.3). Each prefix-tone class has an additional row for any verb that has stem suppletion or is irregular in its segmental inflectional morphology. Each row in each table is therefore a unique inflectional pattern, and in the strictest sense of the term, a unique inflectional class.

The prefix classes are presented and discussed in the following order: Prefix Class A-c/u (§5.1), Prefix Class A-2 (§5.2), Prefix Class B-c (§5.3), Prefix Class B-t (§5.4), Prefix Class B-y (§5.5), Prefix Class C-a (§5.6), and Prefix Class C-2 (§5.7). Finally, three irregular verbs that do not appear to be most similar to any particular prefix class are presented in (§5.8).

5.1. Prefix Class A-c/u verbs

The largest prefix class is Prefix Class A-c/u. Of the 378 basic verbs in the database, 130 of them (34.4%) belong to it. It contains several consonant-initial unergative and underived transitive verbs (Class A-c) and many causative verbs derived by the causative prefix *u-* (Class A-u). The prefixes that define this class are Potential *ki-*, Habitual *nti-*, Progressive *nte-*, and Completive *nka-* (see Table 6 for examples of inflection).

Among the 130 Prefix Class A-c/u verbs, 96 of them have invariant tone across their four primary aspect/mood forms: 36 of these are toneless in all inflected forms, 32 have the MH basic tone pattern, 18 have the ØM basic tone pattern, and 10 have the HØ basic tone pattern (Table 13).

The other 34 Prefix Class A-c/u verbs have some tone change in their aspect/mood inflection. There are two main tone change patterns: 17 verbs are toneless (ØØ) in the Potential Mood and Habitual Aspect and have the HM basic tone pattern in the Progressive and Completive Aspects, and 16 others have the ØM basic tone pattern in the Potential and Habitual and the MH tone pattern in the Progressive and Completive. Finally, there is one verb, *-hjā* 'play' that is toneless in the Potential and Habitual and has the ØM basic tone pattern in the Progressive and Completive.

Of the 5 irregular Prefix Class A-c/u verbs, 3 of them begin in /t/ and have palatalization of the /t/ in the Potential and Habitual forms, making them similar to Prefix Class B-t in this respect.

Tone pattern; # of verbs	Uninflected verb stems with glosses
Invariant tone 96 verbs	**ØØ invariant (34):** *-hnaʔ* 'defecate'; *-lʲa* 'break wind'; *-nee* command'; *-sesu* 'turn over (intr.)'; *-suuʔ* 'urinate'; *-u-kalaʔ* 'cool off (tr.)'; *-u-kaʔa* 'hoard', 'deny'; *-u-kehę* 'scratch an itch'; *-u-kili* 'make slippery'; *-u-kiʔi* 'toast'; *-u-laʔa* 'break (tr.)'; *-u-liʔi* 'moan'; *-u-loʔo* 'kick'; *-u-nakǫʔ* 'knock', 'tap'; *-u-nuʔu* 'ruin'; *-u-roǫ* 'scrape'; *-u-s-atą* 'peel', 'skin'; *-u-s-atiʔ* 'untie'; *-u-su* 'remove'; *-u-sukʷi* 'suck'; *-u-s-uweʔ* 'scrape', 'make smooth'; *-u-t-alaʔ* 'weave'; *-u-t-ano* 'leave (tr.)'; *-u-teę* 'carry'; *-u-tihi* 'make it hard'; *-u-tika* 'make stink';*-u-tikąʔ* 'swing (tr.)'; *-u-tikʷę* 'lengthen'; *-u-tǫ* 'foam up (tr.)'; *-u-wini* 'stretch out (tr.)'; *-u-ʃiką* 'choose'; *-u-ʃikʷą* 'yank out'; *-ʃiti* 'laugh'; *-ʔni* 'beat', 'hit'; **MH invariant (31):** *-sǫ* 'fight'; *-ū-hnáʔ* 'throw out'; *-ū-hní* 'lengthen (tr.)'; *-ū-kēlá* 'extend (tr.)'; *-ū-kīɻ́* 'open (tr.)'; *-ū-kītsɛ́* 'stagger (tr.)'; *-ū-kōʔó* 'mate'; *-ū-kɻ́* 'shoot'; *-ū-lāhá* 'clean out'; *-ū-lāstí* 'abandon', 'let fall'; *-ū-lātíʔ* 'stop (tr.)'; *-ū-līhí* 'lack (tr.)'; *-ū-lītíʔ* 'sink (tr.)'; *-ū-lōó* 'remove'; *-ū-nēʔé* 'throw'; *-ū-nītsáʔ* 'ask'; *-ūrá* 'hit'; *-ū-sāʔą́* 'attach (tr.)', 'write'; *-ū-s-āʔwé* 'split'; *-ū-s-ēlú* 'pour out', 'empty'; *-ū-sōsá* 'lay down flat'; *-ū-stí* 'hit'; *-ū-s-ūkʷá* 'spray'; *-ū-tāʔą́* 'move through (tr.)'; *-ū-tētsá* 'distribute'; *-ū-tīkɻ́* 'make stink'; *-ū-tīté* 'make astringent'; *-ū-tūkʷá* 'put in', 'plant corn'; *-ū-t-ūʔú* 'put in', 'pour'; *-ū-ʃɛ́* 'squeeze out'; *-ū-ʃūʔú* 'cut'; **ØM invariant (17):** *-lʲaʔā* 'be smelly'; *-u-hnʲā* 'build', 'make'; *-u-hnʲāʔ* 'liquefy (tr.)'; *-u-katʃīʔ* 'bury'; *-u-katę̄* 'whiten (tr.)'; *-u-katsǭ* 'heat up (tr.)'; *-u-lakʷā* 'count'; *-u-lukʷā* 'sweep'; *-u-luʔū* 'show';*-u-s-akʷę̄* 'mix up', 'shake up'; *-u-s-atę̄* 'put in', 'insert'; *-u-s-enē* 'spread (seeds)'; *-u-suʔū* 'show'; *-u-tisāʔ* 'scratch'; *-u-titā* 'crush'; *-u-tiʔī* 'spend money';*-u-wanā* 'steal'; **HØ invariant (10):** *-ū-tʃīkʷę* 'shake (tr.)'; *-ū-línto* 'destroy', 'waste'; *-ū-nána* 'ask for'; *-ū-níkʷę* 'shake (tr.)'; *-ū-s-áta* 'crush', 'finely chop'; *-ū-t-ísę* 'wrap over'; *-ū-tótsa* 'put on top'; *-ū-túkʷi* 'chase off'; *-ū-túwe* 'cut into pieces'; *-ū-ʃ-íti* 'dry (tr.)'
	Irregular(ØØ): *-tuuʔ* 'cough' (*tʲuuʔ*, *n-tʲuuʔ*, *nte-tuuʔ*, *nka-tuuʔ*)
	Irregular(ØØ): *-ʔne* 'do' (*ʔne*, *ʔne*, *nte-ʔne*, *nka-ʔne*)
	Irregular (MH): *-tāá* 'give' (*tāá*, *n-tāá*, *nte-tāá*, *nka-tāá*)
	Irregular (ØM): *-tehę̄* 'have diarrhea' (*tʲehę̄*, *n-tʲehę̄*, *nte-tehę̄*, *nka-tehę̄*)

ØØ POT, HAB HM PRG, CPL 17 verbs	*-húʔū* ‘get embarrassed’; *-húɻ̱* ‘spin into thread’; *-u-báʔā* ‘blow on’; *-u-háwī* ‘whistle’; *-u-láā* ‘take away’; *-u-l-ásū* ‘put in place’; *-u-látsā* ‘let go of’; *-u-lúū* ‘dig’; *-u-s-úkʷāʔ* ‘shell’, ‘degrain’; *-u-t-áhā* ‘bore through’; *-u-téēʔ* ‘shave’; *-u-tótsā* ‘put’, ‘hang up’; *-u-tʲélē* ‘yank’;*-ú-tsū* ‘pop (tr.)’, ‘crack (tr.)’; *-u-wíī* ‘clean’; *-ʃáʔā* ‘shout’
	Irregular: *-náʔā* ‘see’ (*nʲaʔa*, *nʲaʔa*, *nte-náʔā*, *nka-náʔā*)
ØM POT, HAB MH PRG, CPL 16 verbs	*-lālá* ‘scold’, ‘be angry’; *-ū-hlʲá* ‘smear (tr.)’; *-ū-kātá* ‘blacken (tr.)’; *-ū-kātí* ‘have tantrum’; *-ū-kītɨ́ʔ* ‘break (tr.)’, ‘snap (tr.)’; *-ū-lāʔá* ‘play music’; *-ū-nākʷɨ́* bless’; *-ū-s-āáʔ* ‘rip’, ‘tear (tr.)’; *-ū-sāná* ‘open (tr.)’; *-ū-sóʔ* ‘gather up’; *-ū-t-ākɨ́* ‘burn (tr.)’; *-ū-t-ākɨ́ʔ* ‘cover (tr.)’; *-ū-tēhɨ́* ‘send (tr.)’; *-ū-tūsúʔ* ‘grab’; *-ū-ʃī-kɨ́ʔ* ‘tie up’; *-ūʔjá* ‘buy’
ØØ POT, HAB ØM PRG, CPL 1 verb	*-hjā* ‘play’

Table 13. Prefix Class A-c/u verbs, by tone class

5.2. Prefix Class A-2 verbs

Prefix Class A-2 is a small class consisting of just 39 basic verbs. It includes some consonant-initial transitive verbs and unergative verbs, as well as all of the basic verbs in the language that begin with either /e/ or /i/. The prefixes that occur in the class are Potential *ki-*, Habitual *nti-*, Progressive *nte-*, and Completive *nkʷi-* (Table 6).

Prefix Class A-2 is quite irregular in terms of its number of tone alternation patterns. The 39 verbs fall into 5 different tone classes, and 2 of the resulting prefix-tone classes are further split in two because some verbs within them have the exceptional Progressive Aspect form with an intrusive /k/ between the prefix and the stem (§3.3), while others do not.

Again, a majority of the verbs (29 out of 39) have invariant tone across aspect/mood forms: 11 verbs are toneless in all forms, 7 have the MH basic tone pattern, 5 have the ØM tone pattern, and 6 have the HØ tone pattern (Table 14).

Among the 10 verbs that have some tone change across aspects, one is toneless in the Potential Mood and Habitual Aspect while it has the ØM basic tone pattern in the Progressive and Completive Aspects. The other 9 have tonal alternation patterns in which the Progressive Aspect has the same tone as the Potential and Habitual, while the Completive Aspect form is tonally distinct. In these cases, the Progressive Aspect form appears to be built upon the Potential Mood form (§3.3).

Tone pattern # of verbs		Uninflected verb stems with glosses
Invariant tone 29 verbs	No *k* in PRG (25)	**ØØ (7):** *-ene* 'make sound'; *-isę* 'get wrapped'; *-teę* 'carry'; *-tihi* 'be stingy'; *-t-itʂu* 'unwind', 'unravel (tr.)'; *-ʂoʔo* 'get high'; *-ʃiką* 'choose'; **MH (6):** *-ī-hní* 'stretch oneself'; *-i-nīí* 'demand';*-lʲēʔé* 'lick'; *-nīí* 'get purified'; *-tʲēʔę́* 'grind finely'; *-ʂ-ūkúʔ* 'fold (tr.)'; **ØM (3):** *-i-s-uwīʔ* 'turn off', 'put out'; *-i-tʲ-alā* 'melt' (tr.); *-lʲā* 'water (tr.)'; **HØ (4):** *-ī-tʲ-éʔe* 'lower' (tr.), 'lay egg'; *-kúti* 'soften (tr.)'; *-sésu* 'turn over (tr.)'; *-súlu* 'make into powder'
		Irregular (ØØ): *-taa* 'finish' (*tʲaa*, *n-tʲaa*, *nte-taa*, *nkʷi-tʲaa*)
		Suppletive stem (ØØ): *-ii* 'want', 'feel' (*k-ii*, *nt-ii*, *nʧ-ā=tíʔ*, *nkʷ-ii*)
		Irregular (MH): *-i-tʲāá* 'give back' (*tʲāá*, *nt-i-tʲāá*, *nte-tʲāá*, *nkʷ-i-tʲāá*)
		Irregular (ØM): *-etʂāʔ* 'inform' (*k-etʂāʔ*, *nt-etʂāʔ*, *nte-l-etʂāʔ*, *nkʷ-etʂāʔ*)
		Irregular (HØ): *-tʲána* 'search for' (*tʲána*, *n-tʲána*, *ntē-tʲána*, *nkʷi-tʲána*)
	k in PRG (4)	**ØØ (1):** *-eta* 'wait for'; **ØM (1):** *-iʧī* 'get damaged'; **HØ (1):** *-íʧą* 'store'
		Irregular (ØØ): *-eʔe* 'go down' (*k-eʔe*, *nti-ʔe*, *nte-k-eʔe*, *nkʷ-eʔe*)
ØØ POT, HAB ØM PRG, CPL 1 verb	*k* in PRG (1)	*-ijē* 'succeed'
ØM POT, HAB, PRG MH CPL 3 verbs	No *k* in PRG (2)	*-nʲáʔ* 'wash hands'; *-sóʔ* 'pick up'
	k in PRG (1)	*-īʔjá* 'transport'
ØØ POT, HAB, PRG HM CPL 5 verbs	*k* in PRG (5)	*-íʧaā* 'arrive there'; *-íʧaą̄* 'arrive here'; *-íkʷā* 'weave'; *-íkʷą̄* 'sew'; *-ísū* 'pay'
ØØ POT, HAB, PRG ØM CPL 1 verb	*k* in PRG (1)	*-itʂū* 'come untangled'

Table 14. Prefix Class A-2 verbs, by tone class

5.3. Prefix Class B-c verbs

With 74 members, Prefix Class B-c is the second largest prefix class after Prefix Class A-c/u. Most of its verbs are morphologically simplex intransitive roots with unaccusative or inactive semantics. The stems are consonant-initial. The prefixes that occur in the class are Potential *ki-*, Habitual *nti-*, Progressive *nte-*, and Completive *nku-* (see Table 6).

Of the 74 verbs in this class, 58 of them (about 78%) have invariant tone across the four primary aspect/mood forms: 22 are toneless, 18 have the MH basic tone pattern, 14 have the ØM basic tone pattern, and 4 have the HØ basic tone pattern (Table 15).

Tone pattern # of verbs	Uninflected verb stems with glosses
Invariant tone 58 verbs	**ØØ (21):** *-hnii* ‘grow’; *-kalaʔ* ‘cool off’; *-kaʔa* ‘keep water out’; *-kehę* ‘get itchy’; *-kili* ‘slip’; *-kiʔi* ‘get toasted’; *-laha* ‘get cleaned out’; *-lakʷi* ‘run off’; *-laʔa* ‘get broken’; *-naa* ‘sting (intr.)’; *-nuʔu* ‘break down’; *-nʲaʃęʔ* ‘get angry’; *-sti* ‘go across’; *-tihi* ‘become hard’; *-tika* ‘to stink’; *-tikąʔ* ‘swing (intr.)’; *-tikʷę* ‘become long’; *-tijaʔ* ‘get delayed’; *-wini* ‘get stretched’; *-witi* ‘dry out’; *-ʃę* ‘get late’; **MH (18):** *-hnʲá* ‘move’, ‘quake’; *-kāʔá* ‘become colored’; *-kēlá* ‘be grafted/added’; *-kīį́* ‘open (intr.)’; *-kītsę́* ‘be staggered/out of line’; *-kūnáʔ* ‘get thrown away’; *-nāá* ‘be cleared (field)’; *-nāʔá* ‘to loosen (intr.)’; *-sāą́* ‘fall over’; *-sę́* ‘get wider’; *-tētsá* ‘be distributed’; *-tīkų́* ‘smell of decomposing’; *-tīté* ‘become astringent’; *-tsá* ‘be mistaken’; *-tsāʔą́* ‘change (intr.)’; *-wīʔí* ‘get skinny’; *-ʃę́* ‘get squeezed’; *-ʃūʔú* ‘get cut’; **ØM (13):** *-hiʔī̱* ‘be one's turn’; *-hlʲā* ‘slide’, ‘smear (intr.)’; *-hnʲāʔ* ‘get blended’; *-katʃī* ‘ripen early’; *-katʃīʔ* ‘get buried’; *-kanā* ‘open up (intr.)’; *-katę̄* ‘become white/colorless’; *-katsǭ* ‘heat up (intr.)’; *-lakʷā* ‘get counted’; *-lalā* ‘be early’; *-nakʷą̄* ‘get blessed’; *-sanā* ‘open up’; *-ʃijāʔ* ‘be dying’; **HØ (4):** *-kúti* ‘soften (intr.)’; *-lákʷi* ‘boil (intr.)’; *-láʔwa* ‘get washed away’; *-lítiʔ* ‘sink (intr.)’
	Irregular (ØØ): *-saʔą* ‘be attached’(*saʔą*, *nti-saʔą*, *nte-saʔą*, *nku-saʔą*)
	Irregular (ØM): *-sukʷā* ‘be lying down’(*sukʷā*, *nti-sukʷā*, *nte-sukʷā*, *nku-sukʷā*)
ØØ POT, HAB HM PRG, CPL 10 verbs	*-káʔnē* ‘get whipped’; *-kélā* ‘stiffen’; *-láā* ‘get loose’; *-látī* ‘become thin’; *-líhī* ‘get lost’; *-líntō* ‘go to waste’, ‘spoil’; *-líjā* ‘sink’; *-lúū* ‘get dug’; *-tíkʷī* ‘become steep’; *-wíī* ‘get cleaned’
ØM POT, HAB MH PRG, CPL 4 verbs	*-hná* ‘flee’; *-kātá* ‘darken (intr.)’, ‘get bruised’; *-kītę́ʔ* ‘get snapped’; *-lūkʷá* ‘get swept’
ØØ POT, HAB ØM PRG, CPL 1 verb	*-sū* ‘come off’
ØØ POT, HAB, PRG ØM CPL 1 verb	*-titā* ‘get crushed’

Table 15. Prefix Class B-c verbs, by tone class

There are 16 verbs in Prefix Class B-c that have some tone change across aspect/mood forms. Only one verb has a tone pattern in the Progressive Aspect that is different from the tone in the Completive: *-titā* ‘get crushed’. This verb is unusual in that it appears to have a Progressive Aspect form based on the Potential Mood form (§3.3) but there is no evidence of any intrusive /k/ as we might expect. It is possible that this verb migrated from Prefix Class A-2 to Prefix Class B-c, perhaps due to its inactive semantics. Future comparative work may shed light on this question. The two irregular verbs in Prefix Class B-c have stems that begin in /s/. They have no segmental prefix in the Potential Mood, making them similar to Prefix Class B-t in that respect (§5.4). Since they are verbs of posture, they fit in semantically with Prefix Class B-t as well.

5.4. Prefix Class B-t verbs

Prefix Class B-t is a small prefix class, containing only 28 basic verbs, which begin in /t/. However, they are an important and frequently occurring set of verbs because they include many of the verbs of motion and posture, the latter of which are used as secondary predicates and existential predicates (Campbell 2015). A few unaccusative verbs that begin in /t/ are also in this class. Though there is some phonological and semantic basis for membership in this class, it is not entirely predictable since some unaccusative verbs that begin in /t/ belong to Prefix Class B-c (§5.3). The segmental layer of aspect/mood inflection that defines the class is palatalization of the stem-initial /t/ in the Potential, *n-* with palatalization of the stem /t/ in the Habitual, Progressive *nte-*, and Completive *nku-* (see Table 6).

Among the 28 Prefix Class B-t verbs, 20 of them have invariant tone across aspect/mood forms: 8 of these are toneless, 3 have the MH basic tone pattern, 2 have the ØM basic tone pattern, and 5 have the HØ basic tone pattern (Table 16). The remaining 2 verbs with invariant tone have the HM basic tone pattern in all aspect/mood forms, a pattern not found on any other tonally invariant verbs in the language.

Of the 8 verbs that have some tone change in their aspect/mood inflection, 5 are toneless in the Potential and Habitual and have the HM basic tone pattern in the Progressive and Completive. Another 2 verbs have the ØM basic tone pattern in the Potential and Habitual and the MH basic tone pattern in the Progressive and Completive. Finally, one verb, *-teē* 'be hanging', is toneless in the Potential and Habitual and has the ØM basic tone pattern in the Progressive and Completive. There are no Prefix Class B-t verbs with stem suppletion or irregular segmental inflection.

Tone pattern # of verbs	Uninflected verb stems with glosses
Invariant tone 20 verbs	**ØØ (8):** *-takąʔ* 'be visible'; *-taʔą* 'go around'; *-teʔę* 'be located'; *-tijaa* 'arrive there'; *-tijaą* 'arrive here'; *-toǫ* 'be standing'; *-tunu* 'grow'; *-t-uʔu* 'exist', 'be inside'; **MH (3):** *-tākąʔ* 'suffer'; *-tējá* 'be standing'; *-tūkʷá* 'be sitting', 'be inside'; **ØM (2):** *-tehę̄* 'pass (intr.)'; *-tʲehnā* 'begin'; **HØ (5):** *-tákʷi* 'fly'; *-tátsa* 'get dizzy', 'faint'; *-túwe* 'get cut into pieces'; *-túʔu* 'leave (intr.)'; *-túʔja* 'reach other side'; **HM (2):** *-t-ákę̄* 'burn (intr.)'; *-tásū* 'fall to ground'
ØØ POT, HAB HM PRG, CPL 5 verbs	*-t-áhā* 'get pierced'; *-tákʷī* 'be hanging'; *-tákʷī* 'owe (tr.)'; *-téēʔ* 'get shaved'; *-t-úkʷā* 'get chafed', 'get a rash'
ØM POT, HAB MH PRG, CPL 2 verbs	*-tāáʔ* 'get torn'; *-tʲūkʷá* 'go out of'
ØØ POT, HAB ØM PRG, CPL 1 verb	*-teē* 'be hanging'

Table 16. Prefix Class B-t verbs, by tone class

5.5. Prefix Class B-y verbs

Prefix Class B-y consists of 52 basic verbs, all of which have underlying stems that begin in /j/. Many of these verbs are intransitive verbs (unaccusative or inactive) that are derived by the Intransitivizer prefix *j-*. Others are intransitive or transitive roots that begin in *j*. The segmental layer of inflection that defines the prefix class is change of the stem-initial /j/ to /ʧ/ in the Potential Mood (likely a fusion of an earlier sequence *k(i)-* + *j*), Habitual *n-* with change of stem-initial /j/ to /ʧ/, Progressive *nte-*, and Completive *nku-* (see Table 6 for examples). Of the 52 Prefix Class B-y verbs, 36 of them have invariant tone.

As discussed in §3.3, some Prefix Class B-y verbs have a stem-initial /j/ in the Progressive Aspect, others have a stem-initial /ʧ/ in that form, and still others appear to freely alternate between stem-initial /j/ and /ʧ/. Therefore, this prefix-tone class is divided to reflect this further dimension of complexity. The only verb listed as otherwise irregular in this prefix class is *-jatę* 'sleep', which begins with k^j in the Potential Mood instead of *ʧ*, has nt^j in the Habitual instead of *nʧ*, and which has no distinct Progressive Aspect form, probably because of the verb's stative semantics.

Tone pattern # of verbs		Uninflected verb stems with glosses
Invariant tone 36 verbs	PRG stem in /j/(15)	**ØØ (5):** *-j-alaʔ* 'be woven'; *-j-atą* 'get peeled/skinned'; *-j-uteʔ* 'be hungry'; *-j-uweʔ* 'be leveled/scraped'; *-j-uʔu* 'get put in', 'live'; **MH (5):** *-j-ālú* 'get spilled/emptied'; *-jāʔné* 'to be lacking'; *-j-āʔwé* 'be split'; *-j-ūkʷá* 'get sprayed'; *-jūkʷą́* 'tremble'; **ØM (2):** *-j-akę̄* 'get burned'; *-j-anē* 'get scattered'; **HØ (2):** *-j-áku* 'get eaten'; *-j-áta* 'get crushed'
		Irregular(ØØ): *-jatę* 'sleep' (*k-jatę*, *nt-jatę*, *nt-jatę*, *nk-jatę*)
	PRG stem in /ʧ/ (16)	**ØØ (9):** *-jaa* 'go (back)'; *-jaą* 'come (back)'; *-jakʷa* 'run into'; *-jakʷa* 'weave'; *-jakʷę́ʔ* 'swallow'; *-j-asu* 'be paid for'; *-jata* 'plant'; *-j-atsu* 'unwind (intr.)'; *-j-uwi* 'flash', 'shine'; **MH (2):** *-jāá* 'catch up to'; *-j-ūkų́ʔ* 'get folded', 'get rolled up'; **ØM (5):** *-j-ahā* 'find'; *-j-akā* 'become', 'heal'; *-jatę̄* 'be washed'; *-j-ukʷą̄* 'receive'; *-juʔū* 'take root';
	PRG stem in /j/ ~ /ʧ/ (5)	**ØØ (3):** *-jala* 'burp'; *-j-atiʔ* 'get untied'; *-jaʔne* 'abound'; **HØ (2):** *jála* 'open', 'bloom'; *-jáʔą* 'get accustomed'
ØØ POT, HAB HM PRG, CPL 7 verbs	PRG stem in /j/(5)	*-j-áhā* 'get holes'; *-j-ánō* 'remain'; *-j-úkʷā* 'get chafed', 'get a rash'; *-j-úkʷāʔ* 'get shelled/degrained'; *-júkʷą̄* 'sprain'
	PRG stem in /ʧ/ (1)	*-jáʔą̄* 'wash'
	PRG stem in /j/ ~ /ʧ/ (1)	*-j-ánā* 'wilt'
ØM POT, HAB MH PRG, CPL 5 verbs	PRG stem in /j/(4)	*-jāáʔ* 'be made'; *-j-ākąʔ* 'get tied up'; *-j-ākʷę́* 'rise'; *-j-ātę́* 'enter', 'get put in'
	PRG stem in /j/ ~ /ʧ/ (1)	*-j-ākǫ́ʔ* 'get closed/covered'
ØM POT, HAB, PRG MH CPL 4 verbs	PRG stem in /ʧ/ (3)	*-jāʧíʔ* 'shrink'; *-jakʷā* 'warm up in sun'; *-j-ālá* 'dissolve', 'melt'
	PRG stem in /j/ ~ /ʧ/ (1)	*-j-ūwíʔ* 'go out', 'get turned off'

Table 17. Prefix Class B-y verbs, by tone class

5.6. Prefix Class C-a verbs

Prefix Class C-a is the smallest prefix class, consisting of only 21 verbs. All of them begin in /a/ except for one: *-uʔwe* 'dry up'. These verbs are primarily inactive or unaccusative intransitive verbs. The segmental layer of inflectional morphology that defines the class is Potential *k-*, Habitual *nti-* (with elision of the stem /a/), Progressive *nʧ-*, and Completive *nku-*.

A couple of verbs have an uncommon tone alternation pattern in which the Potential and Habitual forms have the MH basic tone pattern and the Progressive and Completive forms have the ØM basic tone pattern. The only other prefix class with this tone alternation pattern is Prefix Class C-2.

One third of Prefix Class C-a verbs (7 out of 21) have a unique tone alternation pattern in which the Completive Aspect has the same tone pattern as the Potential and Habitual, while the Progressive Aspect has a separate tone pattern. No other tone alternation pattern involves only the Progressive Aspect having a distinct tone pattern. This may be an archaic feature that reflects an earlier stage during which the Progressive Aspect prefix carried a M tone, as it still does today in Zacatepec Eastern Chatino (Villard & Woodbury 2012).

Tone pattern # of verbs	Uninflected verb stems with glosses
Invariant tone 10 verbs	**ØØ (7):** *-akʷaʔ* 'leak'; *-ala* 'be born'; *-anaʔ* 'thicken'; *-asija* 'be lying down' (lacks PRG); *-atsaʔ* 'get wet'; *-atsu* 'burst'; *-uʔwe* 'dry up'; **MH (1):** *-ākáʔ* 'have sex'; **ØØ (1):** *-atʃī* 'ripen well'
	Irregular(ØØ): *-ahi* 'die' (*k-aha*, *nti-hi*, *ntej-aha*, *nku-hwi*)
ØØ POT, HAB ØM PRG, CPL 2 verbs	Irregular: *-akā* 'be done' (*k-aka*, *nti-ka*, *nʧ-akā*, *nk-aā*)
	Irregular: *-akā* 'be able' (*k-aka*, *nti-ka*, *nʧ-akā*, *nku-kā*)
MH POT, HAB ØM PRG, CPL 2 verbs	*-alā* 'abound (of liquid)'
	Irregular: *-ahī* 'get' (*k-āhá*, *ntī-hí*, *nʧ-ahā*, *nku-hwī*)
MH POT, HAB, CPL ØM PRG 7 verbs	*-ākéʔ* 'get cooked'; *-ākʷí* 'decompose'; *-ālú* 'get fat'; *-āsǫ́* 'get worn out'; *-āsúʔ* 'get old'; *-ātę́* 'get destroyed'; *-ātsúʔ* 'rot'

Table 18. Prefix Class C-a verbs, by tone class

5.7. Prefix Class C-2 verbs

Prefix Class C-2 is fairly small, consisting of 31 verbs, 8 of which are considered irregular in their segmental inflection. Most Prefix Class C-2 verbs are transitive or unergative. They all begin with a vowel: /a/, /o/, or

/u/. The segmental layer of inflection that defines this prefix class is Potential *k-*, Habitual *nti-*, Progressive *ntʃ-* (with its alternate *ntej-*), and Completive *j-* (with its alternant *nkaj-*).

Prefix Class C-2 is unusual in its tonal layer of inflection because about 42% of the verbs (13 out of 31) have some type of tone change as part of their inflection, which is a larger percentage than that found in other prefix classes. Of these, 4 verbs have the unusual tone alternation pattern found elsewhere only in Prefix Class C-a and in which the Potential and Habitual havethe MH tone pattern while the Progressive and Completive have the ØM basic tone pattern.

Tone pattern # of verbs	Uninflected verb stems with glosses
Invariant tone 18 verbs	**ØØ (12):** *-alaʔ* ‘hold (tr.)’; *-ata* ‘take a bath’; *-atiʔ* ‘suckle’; *-ohoʔ* ‘sting (tr.)’; *-u-hwi* ‘kill’; *-ukʷẹʔ* ‘smell (tr.)’; *-una* ‘hear’; *-una* ‘twist into rope’; *-u-ʦaʔ* ‘make wet’; *-uʦẹ* ‘fear’; *-uwe* ‘get ground’; *-u-ʔne* ‘have sex’; **ØM (1):** *-ukʷą̄* ‘grab’
	Irregular(ØØ): *-aa* ‘go’ (*ʦ-aa*, *ntʃ-aa, ntʃ-aa*, *j-aa*)
	Irregular(ØØ): *-aą* ‘come’ (*nihj-aą*, *ntej-aą*, *nʲ-aą*, *j-aą*)
	Irregular(ØØ): *-aku* ‘eat’ (*k-aku*, *nt-aku*, *ntʃ-aku*, *j-aku*)
	Irregular(ØØ): *-akʷiʔ* ‘speak’ (*ki-kʷiʔ*, *nt-ikʷiʔ*, *ntʃ-akʷiʔ*, *j-akʷiʔ*)
	Irregular(ØØ): *-ulaʔ* ‘be cold’ (*j-ulaʔ, ntʃ-ulaʔ*, no PRG, *j-ulaʔ*)
ØØ POT, HAB HM PRG, CPL 2 verbs	*-únē* ‘to dig’; *-útī* ‘bark’
ØM POT, HAB MH PRG, CPL 5 verbs	*-ātáʔ* ‘chew’; *-ū-kéʔ* ‘cook (tr.)’; *-ūlá* ‘sing’; *-ūná* ‘cry’; *-ū-tę́* ‘break apart (tr.)’
ØØ POT, HAB ØM PRG, CPL 2 verbs	*-aʔnā* ‘clear field’; *-uhwīʔ* ‘to sell’
MH POT, HAB ØM PRG, CPL 4 verbs	*-akʷę̄* ‘vomit’
	Irregular: *-oō* ‘grind’ (*k-ōó*, *ntij-ōó, ntʃ-oō*, *j-oō*)
	Irregular: *-oʔō* ‘drink’ (*k-ōʔó*, *ntī-ʔjó, ntʃ-oʔō*, *j-oʔō*)
	Irregular: *-oʔǭ* ‘punch’ (*k-ōʔǫ́*, *ntī-ʔjǫ́, ntej-oʔǭ*, *nkaj-oʔǭ*)

Table 19. Prefix Class C-2 verbs, by tone class

5.8. Irregular verbs that do not fit in any prefix class

Three verbs have been identified that are so irregular or defective in their inflection that they cannot be placed into any particular prefix class (Table 20). The verb meaning ‘know’ and ‘realize’ has a suppletive stem in the Habitual Aspect, and the Completive Aspect prefix has been reduced to *n-*, making it hard to classify into any of the prefix classes. The two verbs meaning ‘to say’ or ‘to tell’ have no formal difference in the Habitual, Progressive, and Completive Aspects, and have only a change in vowel from

/e/ to /i/ in the Potential Mood. The monosyllabic verb is likely a lexicalized phonological reduction of the bisyllabic form. These three irregular verbs all have invariant tone patterns.

stem	gloss	POT	HAB	PRG	CPL
-kʷātíʔ	'know/realize'	*kʷātíʔ*	*n-tʲōtíʔ*	*nte-kʷātíʔ*	*n-kʷātíʔ*
nakʷę	'say'	*nikʷę*	*nakʷę*	*nakʷę*	*nakʷę*
nee	'say'	*nii*	*nee*	*nee*	*nee*

Table 20. Irregular verbs not clearly in anyparticular prefix class

6. Discussion and conclusions

This concluding section contains a summary of the aspect/mood inflectional patterns of Zenzontepec Chatino verbs (§6.1), a discussion about irregularity and the limits of inflectional classes (§6.2), and the Zenzontepec Chatino inflectional classes from the perspective of canonical typology (§6.3).

6.1. Summary of aspect/mood inflectional patterns in Zenzontepec Chatino

Table 21 summarizes the inflectional patterns that occur on the basic, non-compound verbs that make up the Zenzontepec Chatino verbal lexicon. Each larger column of the table represents one of the seven prefix-based verb classes as outlined in Campbell (2011) and sketched above in §3. As explained in §3.3, Prefix Class A-2 is further split into two sub-classes since some of its verbs unpredictably have the intrusive /k/ in the Progressive Aspect form. Prefix Class B-y is split further into three sub-classes, since in the Progressive Aspect some verbs have stems that begin in /j/, others begin in /ʧ/, and still others appear to freely alternate between /j/ and /ʧ/. Which stem-initial consonant a Prefix Class B-y verb has in the Progressive Aspect is unpredictable.

Each row of Table 21 represents one of the 9 tone alternation patterns (or lack of alternation) that verbs may have across the four primary aspect/mood categories. As argued in §4.3, the tone alternation patterns are unpredictable and therefore lexically-specified; they are independent of the prefix classes, the phonological shape of stems, and the lexical semantics of stems. Therefore, the 9 tone alternation patterns can be viewed as an additional layer of inflectional classes independent of the prefixal layer.

	Ac/Au	A2		Bc	Bt	By			Ca	C2	
		No *k*	*k*			*j*	*ʧ*	*j*/*ʧ*			Total
Invariant tone	96 (4)	25 (5)	4 (1)	58 (2)	20	15	16	5	10 (1)	18 (5)	**267**
ØØ POT/HAB, HM PRG/CPL	17 (1)	—	—	10	5	5	1	1	—	2	**41**
ØM POT/HAB, MH PRG/CPL	16	—	—	4	2	4	—	1	—	5	**32**
ØØ POT/HAB, ØM PRG/CPL	1	—	1	1	1	—	—	—	2 (2)	2	**8**
MH POT/HAB, ØM PRG/CPL	—	—	—	—	—	—	—	—	2 (1)	4 (3)	**6**
ØM POT/HAB/PRG, MH CPL	—	2	1	—	—	—	3	1	—	—	**7**
MH POT/HAB/CPL, ØM PRG	—	—	—	—	—	—	—	—	7	—	**7**
ØØ POT/HAB/PRG, HM CPL	—	—	5	—	—	—	—	—	—	—	**5**
ØØ POT/HAB/PRG, ØM CPL	—	—	1	1	—	—	—	—	—	—	**2**
Subtotal		27	12			24	20	8			
Total	**130**	**39**		**74**	**28**	**52**			**21**	**31**	**375**

Table 21. Summary of prefix-tone inflectional classes and the total number of verbs in each, with number of those that are segmentally irregular in parentheses

6.2. Complexity and irregularity: does Zenzontepec Chatino have inflectional classes?

The great complexity of the Zenzontepec Chatino aspect/mood inflectional system arises from several factors. First of all, determining which of the 7 prefix classes a verb belongs to requires successful identification of the underlying segmental shape of the stem and the prefixes. This involves some abstraction because if two vowels are in hiatus at a prefix-stem boundary, one of them elides (§3.2). Second, the tonal layer of aspect/mood inflection is largely independent of the segmental layer (§4.3), compounding the number of prefix-tone classes. Third, the exceptional Progressive Aspect stems in Prefix Class A-2 and Prefix Class B-y further divide the prefix-tone classes within them. The interaction of the prefix class system with the tone alternation class system and the exceptional Progressive stems altogether yields 39 distinct inflectional patterns that verbs show, as reflected by the 39 cells in Table 21 that are instantiated.

There are 29 verbs that have either some irregular segmental aspect/mood morphology or stem suppletion across aspects. Of these 29

irregular verbs, 26 are able to be assigned to one of the prefix classes, and they are absorbed into the table. The numbers in parentheses in some cells indicate where these irregular verbs are classified. The three remaining irregular verbs that cannot be assigned to any prefix class are not counted in the table. Adding these 29 additional irregular inflectional patterns to the 39 prefix-tone patterns yields 68 distinct inflectional patterns that occur across the 378 basic verbs in the language.

If we subtract the number of irregular verbs from the total number of verbs in each cell in Table 21, it is interesting to note that 13 of the 39 prefix-tone classes are displayed by only one verb, and another 4 patterns are displayed by only two verbs, making these prefix-tone classes in effect no different, or hardly different, from otherwise irregular verbs in terms of the quantity of lexemes that display them. Does it make any sense to count a singleton or two-member set as an inflectional class?

If the answer to the preceding question is “yes”, then we must concede that Zenzontepec Chatino has 68 inflectional classes, of which 42 are singleton classes. If the answer is “no”, then we must decide where to draw the line between inflectional classes and what are merely irregular verbs.

How many verbs must a unique inflectional pattern occur with in order to be considered an inflectional class? If we say “at least 2”, then Zenzontepec Chatino has 26 inflectional classes, instead of 68. If the answer is “at least 3”, then there are 21 inflectional classes. If we draw the line at “at least 5”, then there are 17 inflectional classes, and if we say “at least 7”, there would be 12 classes. If we draw the line at “at least 10” verbs, there would be 10 classes, and if we draw it at “at least 16”, then there would be just 7 classes, but these would not be the same as the 7 prefix classes identified in Campbell (2011). What this discussion shows is that there is no obvious, non-arbitrary answer to the question of how many inflectional classes Zenzontepec Chatino actually has, since it is not possible to draw any line between what would be classes and what would be merely irregular verbs that fall outside of the classes.

Nevertheless, despite the high degree of complexity and irregularity in Zenzontepec Chatino aspect/mood inflection, there is much that can be generalized about the inflectional patterns that occur in the language. For

example, if a verb is transitive and begins in /a/, it will almost certainly belong to Prefix Class C-2. If a stem begins in /e/ or /i/, we know that it will belong to Prefix Class A-2, but we cannot then predict whether or not it will undergo tone change (and if so which tone change pattern), or whether it will have the intrusive /k/ in the Progressive Aspect or not.

Of the 375 basic verbs in Table 21, a majority of them, 267 (71%), have invariant tone across all aspect/mood categories. Of the invariant tone verbs, 120 of them (32% of all verbs) have no tone in any of their inflected forms. All verbs, without exception, have the same basic tone pattern in the Habitual Aspect as they have in the Potential Mood, and about 94% of all verbs have the same basic tone pattern in the Completive Aspect as they have in the Progressive Aspect, which is a very strong tendency.

Though we usually cannot predict the basic tone patterns in all of the cells of any verb from any one cell of its paradigm, we can narrow the possibilities down in some cases. For example, if a verb is toneless in the Completive Aspect, then it is toneless in all other forms. If a verb has the MH basic tone pattern in the Potential Mood (and Habitual Aspect), then it will have either the MH or the ØM basic tone pattern in the Completive Aspect. If a verb has the HM basic tone pattern in the Progressive or Completive Aspect, then it will have that same basic tone pattern or be toneless in the Potential and Habitual forms. There are many other statements like these that can be drawn from the data in Table 21, and such restrictions perhaps attenuate, to some degree, the overall complexity of the system since they restrict so many of the logical possibilities. It is likely that language acquirers and second language learners make inferences from the intuitions that they develop due to these restrictions.

This chapter began with the ambitious goal of going beyond the prefix class analysis in Campbell (2011) to detail all of the complexities and irregularities in aspect/mood inflection in Zenzontepec Chatino. This has been achieved, but instead of getting a clearer picture of exactly how many inflectional classes the language has, the results raise the question of whether the language has inflectional classes at all or whether it just has 378 basic verbs whose inflectional details are fully specified in the lexicon and memorized. The number of inflected forms that would need to be

memorized, 1512 (378 multiplied by 4), is not so many that the latter possibility should be discarded out of hand.

6.3. Zenzontepec Chatino inflectional classes in a canonical typological perspective

If Zenzontepec Chatino does have inflectional classes, then from a canonical typological perspective, they are highly non-canonical. Corbett (2009) outlines nine criteria by which inflectional class systems can be compared against a canonical ideal. The Zenzontepec Chatino inflectional classes would score as quite non-canonical on five of his criteria.

Corbett's Criterion 1 states that in "the canonical situation, forms differ as consistently as possible *across* inflectional classes, cell by cell." This is clearly not the case in Zenzontepec Chatino, where for example all prefix classes besides Prefix Classes C-a and C-2 have the Progressive Aspect prefix *nte-*, while the Progressive Aspect prefix *ntʃ-* is a hallmark of Prefix Classes C-a and C-2. All prefix classes besides Prefix Classes B-t and B-y have the Habitual prefix *nti-*.[7]

Criterion 4 from Corbett (2009) states that in "a canonical inflectional class each paradigm cell is of equal status", allowing the forms in all cells of a paradigm to be predicted from any one cell. This was shown above to not be the case in Zenzontepec Chatino as regards the tonal layer of aspect/mood inflection. It is also not the case within the prefixal layer, as can be seen in Table 5.

Corbett's Criterion 6 and Criterion 7 state that in canonical inflectional classes, class membership is not phonologically or syntactically motivated, respectively. At least in its segmental layer, the Zenzontepec Chatino inflectional class system is non-canonical in both of these respects since there are some phonological and syntactic (lexical semantic) bases for class membership, even if not absolute.

Finally, in canonical inflectional classes, all of the classes would be relatively well populated. Otherwise, some question might remain about

[7] The fusional Habitual inflection of Prefix Classes B-t and B-y does not fall out of the synchronic phonology of the language.

whether the items in question might just be fully listed in the lexicon. This is Corbett's Criterion 5. In Zenzontepec Chatino there are so many inflectional patterns that are instantiated by only 1, 2, or 3 verbs that the usefulness of positing inflectional classes in the language is called into question. In terms of numbers, these small prefix-tone classes are not clearly distinguishable from otherwise irregular or suppletive verbs. However, they fit into larger prefix classes in one dimension and larger tone alternation classes in another dimension. Since the prefixal and tonal layers are largely independent of one another, and there are additional irregularities in the system, the intersection of the two types of morphology creates a layered complexity in Zenzontepec Chatino inflection that poses challenges for the notion of inflectional classes.

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