

Tone and Inflection



New Facts and New Perspectives

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7 Tone and inflection in Zenzontepec Chatino

1 Introduction

Tone plays a crucial role in person inflection as well as aspect/mood inflection in Zenzontepec Chatino (ISO 693–6: czn), a Zapotecan language of the deep and diverse Oto-Manguéan linguistic stock of Mesoamerica. However, the role of tone in person inflection differs in almost every respect from its role in aspect/mood inflection. First of all, tone in person inflection is entirely predictable from the tone of the uninflected stem, while tone patterns associated with aspect/mood inflection are largely unpredictable, and ultimately, lexically specified. Secondly, tone is always the sole exponent of second person singular pronominal inflection, while it is at most only part of the realization of aspect/mood inflection. That is, when aspect/mood inflection involves tone, there is always some segmental material that accompanies it. The purpose of this chapter is to describe these facts and offer an account of why tone behaves so differently in the two types of Zenzontepec Chatino inflectional morphology.

Oto-Manguéan languages offer some striking examples of inflectional complexity (Wichmann 2006; Palancar 2012). These languages tend to be strongly head-marking, with person and TAM inflection occurring on or adjacent to the verb. The stock consists of eight family-level groupings (Kaufman 1987; 2006), and languages from most of the member families share a common pattern in which person inflection follows the verb and TAM inflection precedes it. This structure is found in varieties of Mazatec (Mazatecan family, Jamieson 1982), Chinantec (Chinantecan family, Westley & Merrifield 1990), Mixtec (Mixtecan family, Macaulay 1996), Zapotec (Zapotecan family, López & Newburg 2005), and Me'phaa (Tlapanec-Subtiaba group, Wichmann 2010). Languages of the Oto-Pamean family of Oto-Manguéan do not share this pattern, as they typically have both TAM and (subject)person inflection preceding the verb, often fused together (see e.g. Palancar 2009: 175 for Otomi and Martínez Ortega 2012 for Ocuilteco). Zenzontepec Chatino behaves like most other Oto-Manguéan languages, having postverbal person inflection and preverbal aspect/mood inflection.

The reason for the divergent behavior of tone in person inflection versus aspect/mood inflection in Zenzontepec Chatino lies in the different prosodic statuses of their respective positions on the verb. Person inflection (other than 2SG) is realized by enclitics, which make up separate phonological words from their

hosts and do not affect the tone of their hosts. The purely tonal 2SG person inflection is realized by replacing the tone of the final phonological word of the host, a tonal effect from the same direction where the enclitics occur. Aspect/mood inflection, on the other hand, typically involves some segmental prefixal material, modifying the stem from the opposite direction. Prefixes, even if syllabic, fall within the same phonological word as their stem. Any tonal effects from the TAM prefixes are now opaque and part of the lexical information encoded in verbs, since the tone patterns are not predictable from the prefixes or the phonological shape of the stems.

The rest of this chapter is organized as follows. First, some background information on Zenzontepec Chatino is provided in §2, and then an overview of its tone system is given in §3. The structure of verbs and the relevant prosodic domains are discussed in §4. Person inflection is treated in §5, aspect/mood inflection in §6, and finally, a summary and conclusions are in §7.

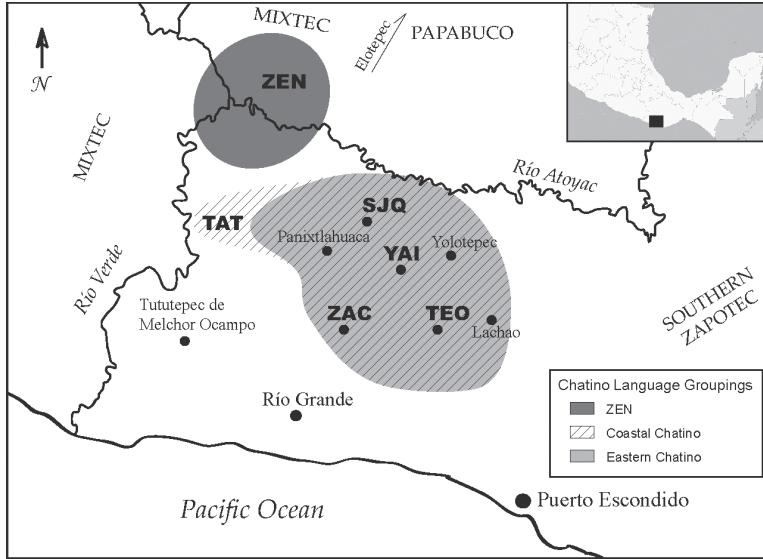
2 Language background

Chatino refers to a group of languages spoken in rural southwestern Oaxaca State, Mexico. It consists of at least three languages: Zenzontepec, Tataltepec, and Eastern Chatino (Boas 1913; Campbell 2013a), with the last being spoken in some 15 villages (Cruz 2011; Cruz & Woodbury 2014) between which there are varying degrees of mutual intelligibility, from quite high to very low. Tataltepec and the Eastern Chatino group together make up a higher-level grouping, Coastal Chatino (Campbell 2013a). The location and subgrouping of some of the Chatino languages is shown in Map 1. Chatino is sister to Zapotec and together they make up the Zapotecan language family of Oto-Manguean (Boas 1913; Kaufman 1987).

Zenzontepec Chatino is the most geographically removed from the rest, and it is the most linguistically divergent. There are an estimated 8,000 speakers of the language, but at most only one quarter of them are monolinguals. This would make it sound as if the language were quite vital, but there are also an estimated 8,000 monolingual Spanish speakers in the community, and the shift to Spanish is accelerating.

Zenzontepec Chatino is a head-marking and head-initial language, with VSO basic constituent order, a distinction between alienable and inalienable noun possession, and complex inflectional verb classes. It shares many of the other traits characteristic of the Mesoamerican linguistic area (Campbell et al. 1986), such as a vigesimal numeral system, relational nouns, a lack of plural marking on nouns, and a distinction between inclusive versus exclusive first person plural

pronouns. While some varieties of Chatino have five tones (e.g. Zacatepec Eastern Chatino, Woodbury 2012) and as many as twelve (e.g. San Juan Quiahije Chatino, see Cruz 2011 and Woodbury 2012), Zenzontepec Chatino has only two tones. The nature, distribution, and behavior of Zenzontepec Chatino tone is outlined in the next section.



Map 1: Chatino languages (from Campbell 2013a)

3 Overview of Zenzontepec Chatino tone

In order to understand the role that tone plays in inflection in Zenzontepec Chatino, one must first understand the basic tonal phonology. Therefore, this section provides a brief description of the Zenzontepec Chatino tone system. First, the tonal inventory is presented in §3.1, then the distribution of tones (§3.2), and finally, the main phonological processes that involve tone (§3.3).

3.1 Tone inventory

In Zenzontepec Chatino the tone-bearing unit (TBU) is the mora, and a mora may bear a high tone (/H/, < \acute{v} >), a mid tone (/M/, < \bar{v} >), or no tone (\emptyset , < v >). Monomoraic

words, though fairly uncommon in lexical word classes, illustrate the three-way tonal contrast (1).¹

(1)	/H/ ≠ /M/	<i>jlyá</i>	‘lunch’	<i>jlyā</i>	‘morning’
	/H/ ≠ ∅	<i>jnyá</i>	‘work’	<i>jnya</i>	‘griddle’
	/M/ ≠ ∅	<i>jne</i>	‘money’	<i>jne</i>	‘finger of’

Figure 1 (adapted from Woodbury 2012) shows averaged pitch tracks for the three tonal specifications on monomoraic forms for one male speaker at about 50 years of age. Each track is based on between seven and nine total tokens of four or five words. For each token the f_0 value is measured in Hertz (y-axis) at eleven equidistant points (x-axis) over the duration of the vowel.² The H and M tones both have slight rises and relatively high (for this speaker) final pitch targets. The default realization of the toneless category is a relaxed, mid-to-low falling pitch.

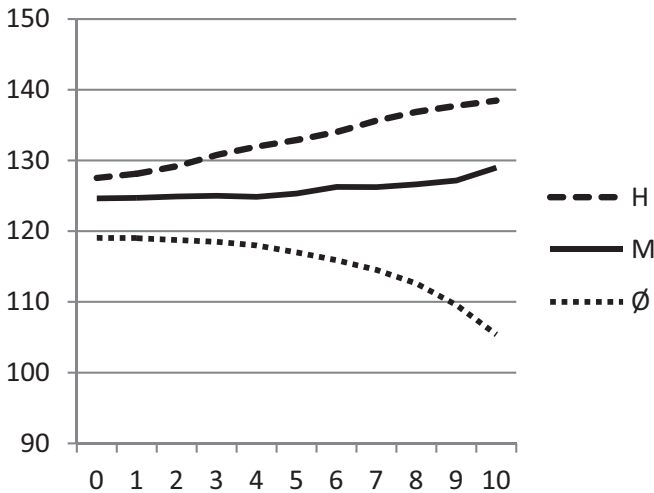


Figure 1: Avg. f_0 (Hz) of tones on monomoraic words (Woodbury 2012)

¹ The orthography used here differs from the IPA as follows: *kw* = [k^w], *tz* = [ts], *r* = [r], *ty* = [tʲ], *ly* = [lʲ], *ny* = [nʲ], *ch* = [tʃ], *x* = [ʃ], *y* = [j], *ky* = [kʲ], *j* = [h], *ṽ* = nasalized vowel, *VV* = long vowel, *ṽ* = mid tone, *ṽ̇* = high tone.

² Thanks to John Kingston for sharing his Praat script for averaging f_0 tracks, and thanks to Tony Woodbury for sharing the chart.

The lowest pitch category is considered tonally unspecified for four reasons.³ First, and perhaps most importantly, the lowest tone does not trigger any phonological processes (§3.3), while /H/ and /M/ are phonologically active (see Myers 1998; Hyman 2012: 3). Second, H tone spreads through any following moras that bear no tone (§3.3.1), reflecting the fact that there really is nothing there. Third, it is the most common, by a significant margin.⁴ Fourth, and finally, its relaxed falling pitch trajectory is due to the lack of any tone target. It is mere declination, which is the default intonational pattern in Zenzontepec Chatino, as it is in many other languages (Cohen & ‘t Hart 1967; Ladd 1984; Connell & Ladd 1990). Underlyingly toneless TBUs are well known in African tone languages (Stevick 1969; Myers 1998; Hyman 2001) and other American tone languages (McDonough 1999; Daly & Hyman 2007), and they are even attested in Asian tone languages (Chen 2000; Evans 2009).

Considering the details above, the Zenzontepec Chatino tone system would nearly fit what Hyman (2009, 2012) calls a three-height, privative tone system. However, it is unusual in that the toneless category is not M but rather the lowest one. Neither Yip (2002: 26) nor Hyman (2012: 3) admit the possibility that a three-height privative system may have an unspecified category other than M, though neither of them overtly excludes the possibility. Maddieson’s (1978: 341) third tone universal, however, states that “Phonetically central tones are unmarked[.] Extreme tones are highly marked.” Zenzontepec Chatino thus offers an exception to the typology of tone systems. Paster (2003) argues that Leggbo (an Upper Cross Niger-Congo language) has a tone system of /H/ vs. /M/ vs. Ø, which is equivalent to the Zenzontepec Chatino inventory, but that is the only other case of such a system that I know of in the literature.⁵

3.2 The restricted distribution of tones

The distribution of tones in Zenzontepec Chatino is best stated with reference to a prosodic constituent of one to three moras that includes a root and any prefixal formatives attached to it. Other phonotactic patterns and phonological processes

³ Full exemplification and argumentation for the tone analysis are not included here but can be consulted in Campbell (2014).

⁴ To give an idea of how common tonelessness is, about 62% of vocabulary from the 100-word Swadesh and Leipzig-Jakarta (Tadmor 2009: 69–71) lists is toneless (Campbell 2014).

⁵ Preliminary comparative work suggests that proto-Chatino low tone (*L) was lost (in some contexts) in Zenzontepec Chatino, merging with the toneless category (Campbell & Woodbury 2010), perhaps giving rise to this unusual tone system.

in the language refer to, or operate within, this same domain (Campbell 2014). Therefore, this domain is considered the phonological word (Nespor & Vogel 1986; Dixon & Aikhenvald 2002). Crucially for tone distribution, and for the role of tone in inflection, enclitics and separate stems within compounds each make up separate phonological words (see §4).

Most uninflected words in the language are bimoraic, but some few are monomoraic and a few others are trimoraic. Given the three-way mora-borne tonal contrast, there are nine logically possible tone combinations on bimoraic phonological words. However, only five of the nine possibilities occur on basic stems not inflected for person: $\emptyset\emptyset$, $\emptyset M$, MH, HM, and $H\emptyset$. These are the five basic tone patterns, listed in order from most to least frequent (2).

(2) a. $\emptyset\emptyset$	<i>koq</i>	‘tuber’	<i>chaja</i>	‘tortilla’
	<i>jaaʔ</i>	‘sleeping mat’	<i>tisqʔ</i>	‘tasty’
b. $\emptyset M$	<i>keē</i>	‘flower’	<i>kixēʔ</i>	‘herbaceous plant’
	<i>jwīi</i>	‘whistle’	<i>nyatē</i>	‘person’
c. MH	<i>nkāq̄</i>	‘coconut’	<i>lūtī</i>	‘vine’
	<i>nkwīiʔ</i>	‘ring’	<i>yāná</i>	‘corn cob’
d. HM	<i>yūū</i>	‘cliff’	<i>kíʔyū</i>	‘man (adj.)’
	<i>léē</i>	‘strong’	<i>lījā</i>	‘sugar cane’
e. $H\emptyset$	<i>tīi</i>	‘ten’	<i>súkwa</i>	‘forty’
	<i>tyáq</i>	‘throat’	<i>nkwitzq</i>	‘child’

Of the other possible bimoraic tone combinations, $\emptyset H$ and MM also occur, but they function exclusively as 2SG pronominal inflection, and they are the sole exponents of that category (§5.2). The two remaining imaginable bimoraic tone patterns, $M\emptyset$ and HH , never occur within a single phonological word.

In trimoraic phonological words, the basic tone patterns align to the end of the word, and the tone of the initial (antepenultimate) mora is predictable from the basic tone pattern of the final two moras and the grammatical class of the root or stem. When the penultimate mora is toneless, the antepenultimate mora is likewise toneless, as with the $\emptyset\emptyset$ (3a) and $\emptyset M$ (3b) basic tone patterns, and also the 2SG $\emptyset H$ pattern (§5.2). For words whose final two moras have the MH pattern, the antepenultimate mora is toneless if the root is a noun, but it will have M tone if the root is verbal (3c). A somewhat opposite pattern is found on words with the HM basic tone pattern: when the stem is a noun, the antepenultimate mora has M; when the stem is a verb, the antepenultimate mora is toneless (3d). Finally, trimoraic phonological words with the $H\emptyset$ basic tone pattern always have M on their antepenultimate mora (3e). Antepenultimate moras never bear /H/.

(3) a.	$\emptyset\emptyset\emptyset$	<i>kwisee?</i>	‘raccoon’	
	$\emptyset\emptyset\emptyset$	<i>nkay-aku</i>	‘ate’	
b.	$\emptyset\emptyset M$	<i>kwinatē</i>	‘mosquito’	
	$\emptyset\emptyset M$	<i>k-u-saā?</i>	‘will tear’ (tr.)	
c.	$\emptyset MH$	<i>kwilixí</i>	‘butterfly’	(noun root)
	MMH	<i>ntē-tētzá</i>	‘is distributing’	(verb root)
d.	MHM	<i>xī-nkwéē</i>	‘jaw of’	(noun stem)
	$\emptyset HM$	<i>nka-xá?ā</i>	‘shouted’	(verb stem)
e.	$MH\emptyset$	<i>kū-ná?a</i>	‘female’	
	$MH\emptyset$	<i>ntē-tákwí</i>	‘is flying’	

The patterns just described illustrate that the distribution of tones is quite restricted in Zenzontepec Chatino (see Hyman 2011 for similar cases in other languages). Furthermore, tone distribution is increasingly restricted the further from the end of the word one goes. This fits with other phonotactic patterns in the language, since contrastive vowel length and vowel nasalization occur only in final syllables, and the vowel /o/ only rarely occurs outside of final syllables. The lack of HH as a basic tone pattern calls to mind the Obligatory Contour Principle (Leben 1973), but it is also explainable by H tone culminativity since a phonological word never has more than one underlying H tone.

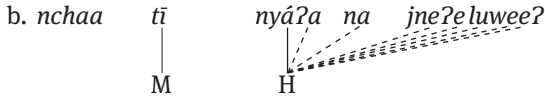
3.3 Phonological processes involving tone

To complete this sketch of the Zenzontepec Chatino tone system before delving more directly into the role of tone in inflection, there are three main tonal phonological processes that must be understood: H tone spreading, M and H downstep, and M tone substitution. Each of these processes is illustrated below with textual examples and representations in autosegmental phonology (Goldsmith 1976).

3.3.1 High tone spreading

High tone spreads through any following toneless moras until another tone (M or H) occurs, or otherwise until the end of the intonational phrase is reached. Spreading is blind to phonological word boundaries, occurring both within and across multiple words. The example in (4) contains only two tones, the M tone on the particle *tī* and the H tone on the first mora of *nyá?a* ‘mother’, which spreads through the remaining seven moras in the clause, since they are toneless (4).

- (4) a. *nch-aa tī nyáʔa na jneʔe luwe=Vʔ*
 PRG-go TPLZ mother DEF scorpion small.PL=DEM
 ‘The mother of the small scorpions went away.’
 [MMG.raton 0:32]



High tone spreading of some form or another is common in African languages (Hyman & Schuh 1974; Odden 1995), and within Oto-Manguean it is attested in varieties of Mazatec (Jamieson 1977) and Mixtec (Daly & Hyman 2007). The Mazatec case reported by Jamieson (1977) shows a long distance spreading similar to that found in Zenzontepec Chatino. Zacatepec Chatino, a conservative variety of the Eastern Chatino subgroup, has long distance H tone spreading (Woodbury 2012) that is cognate to that of Zenzontepec Chatino.

3.3.2 Downstep

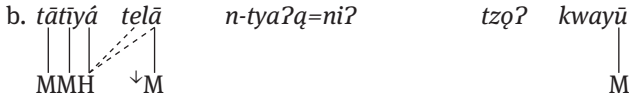
When a spreading high tone comes into contact with another tone, either H or M, that second tone is downstepped. Though a downstepped \downarrow H tone may be realized at a mid-level pitch, it is still phonologically /H/, and not /M/, because it will spread just like any other H tone (5).

- (5) a. *ta tāká tzaka nkwítzq*
 already exist one child
 ‘There already was a child.’ [DSF.santa.maria2 3:16]



A M tone downstepped by a spreading H tone (6) will have a low pitch realization. However, it remains phonologically /M/, and not \emptyset , as it will trigger mid tone substitution (§3.3.3) in the appropriate context.

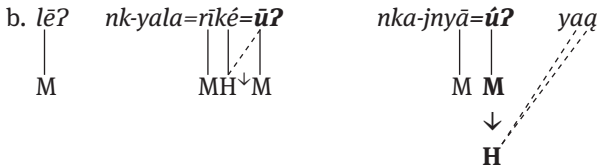
- (6) a. *tatīyá telā n-tyaʔq=niʔ tʔoʔ kwayū*
 every night HAB-go.around=3RSP back horse
 ‘She went around on horseback every night.’ [TCR.nikolasa 3:53]



3.3.3 Mid tone substitution

An underlying /M/ tone on a monomoraic enclitic will be replaced by /H/ if and only if its host bears only a single M tone on its final mora. This can be viewed as a dissimilatory process. The mid-toned 3PL enclitic = \bar{u} ? occurs twice in the example in (7). In the first instance its M tone is downstepped by the immediately preceding H tone. In the second instance its M tone is substituted with /H/ since its host bears only a final-mora M tone. The new tone is truly a phonologically /H/ tone, as evidenced by its spreading through the final, toneless word *yaq* ‘sweat bath’.

- (7) a. $l\bar{e}\text{?}$ $nk\text{-}yala\text{=}r\bar{i}k\acute{e}\text{=}\bar{u}\text{?}$ $nka\text{-}jny\bar{a}\text{=}\acute{u}\text{?}$ yaq
 then CPL-fill=chest=3PL CPL-make=3pl sweat.bath
 ‘They made a plan and built a sweat bath.’ [TCR.ni7.rosa 2:24]



4 The verbal template and prosodic domains

It was stated above in §3.2 that the distribution of tones is best captured by referring to a constituent of one to three moras, and that this constituent is the phonological word. There are five basic bimoraic tone patterns that occur on uninflected phonological words, and the corresponding trimoraic patterns are predictable from those (§3.2). In order to understand how tone works in inflection, it is crucial to understand the prosodic status of the positions of different types of inflection. This is best done by examining the structure of verbs, which are where the majority of the morphology is found in Zenzontepec Chatino.

Verbs may be fairly morphologically and prosodically complex once they are fully elaborated, and they may contain several phonological words. The verbal template is given in Figure 2. The Verbal Core makes up a single phonological

word (ω) and consists of the head verbal root and three prefixal positions (adapted from Campbell in press, following in spirit Kaufman's 1987 work on comparative Oto-Manguean morphology). If the verb has an auxiliary, the auxiliary and its own aspect/mood prefix precede the Verbal Core, forming a compound with it, but making up a separate phonological word from the Core. A verbal lexeme may itself be a compound with the head verb root in the Verbal Core and the incorporated stem (or stems) following it. Any such stems are separate phonological words. One or multiple adverbial enclitics may follow the simple or compound verb stem, and finally, a pronominal subject enclitic, if present, occurs last. Each enclitic is also a separate phonological word.

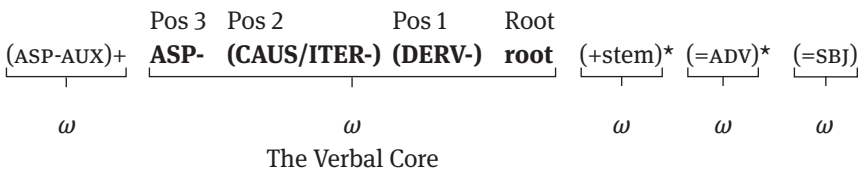


Figure 2: ZEN verbal template (from Campbell in press)

The two types of inflection in Zenzontepec Chatino are pronominal person inflection (§5), which occurs on stems of various grammatical classes, and aspect/mood inflection (§6), which is restricted to verbs. With person enclitics that have some segmental makeup, the behavior of tone follows the tonal phonology outlined in (§3). Inflection for 2SG person is purely tonal, and it occurs only on the final phonological word of the full stem, which may be the head root/stem, the final stem in a compound, or an adverbial enclitic. The segmental part of aspect/mood inflection, on the other hand, is prefixal and occurs in Position 3 of the Verbal Core, which is part of the same phonological word as the root and any derivational formatives (Pos 2 and Pos 1) associated with it. This difference in prosodic status of the positions of person versus aspect/mood inflection has significant ramifications for the behavior of tone in Zenzontepec Chatino inflection.

5 Person inflection

Zenzontepec Chatino has a single set of dependent pronouns, and they can serve any function that a pronominal NP can serve. The dependent pronouns for all person/number categories, except for 2SG, are enclitics (§5.1), and 2SG pronomi-

nal inflection (§5.2) alone is realized exclusively by tone change on the basic (3rd person) stem.

5.1 Dependent pronouns

The pronominal inflectional enclitics are listed in Table 1. First person plural has a distinction between exclusive and inclusive, and the third person singular category is elaborated with several sub-categories: nonspecific, masculine, feminine, and respectful. Any third person pronoun, singular or plural, may have no overt coding if its referent is highly topical. As represented in the verbal template shown in Figure 2, dependent pronouns always occur at the very end of any form that they inflect, which may be a verb, a noun in an inalienable possession construction, or an adjective or quantifier used predicatively.

Table 1: Dependent pronouns of Zenzontepec Chatino

		SG	PL
1 st	EXCL	= \bar{q} ʔ	= <i>ya</i>
	INCL	—	= <i>na</i> / = <i>q</i>
2 nd		TONE	= <i>wq</i>
3 rd	(any)	∅	∅ / = \bar{u} ʔ
	NSPC	= \bar{u} ʔ	
	M	= <i>yu</i>	
	F	= <i>ch\bar{u}ʔ</i>	
	RSP	= <i>ni</i> ʔ	

Three of the pronominal enclitics (= \bar{q} ʔ, = \bar{u} ʔ, = *ch \bar{u} ʔ*) are monomoraic with M tone, and therefore undergo M tone substitution (§3.3.3) if their host bears only M tone on its final mora. Mid tone substitution, however, is a post-lexical phonological process, and none of the tones in its input or output are ever the sole exponent of any inflectional category. Second person singular inflection, on the other hand, is always and only realized by tone change on the basic (i.e. third person) stem.

5.2 Tone in 2SG pronominal inflection

Second person singular pronominal inflection is purely tonal, and in that respect it is different from pronominal inflection of other person/number categories. Pronominal 2SG inflection is realized strictly by two specialized tone patterns, and the rules for 2SG inflection are quite simple. First, if the final phonological word of the basic stem has only M tone on its final mora, then the 2SG stem is formed by substituting that M tone with H tone. This applies to monomoraic, bimoraic, and trimoraic phonological words alike. A few examples that consist of a single phonological word of various sizes, with only final M tone, are listed in (8), with basic stems on the left hand side and 2SG-inflected forms on the right.

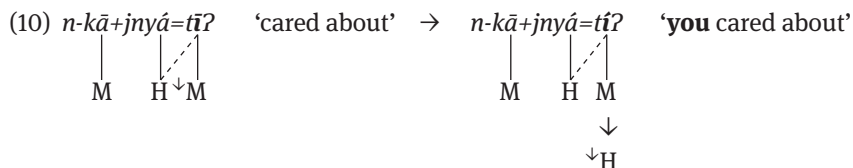
(8)	<i>jlyū</i>	‘is big’	M	→	H	<i>jlyú</i>	‘ you are big’
	<i>yaāʔ</i>	‘hand of’	ØM	→	ØH	<i>yaáʔ</i>	‘ your hand’
	<i>nch-ujwīʔ</i>	‘is selling’	ØM	→	ØH	<i>nch-ujwíʔ</i>	‘ you are selling’
	<i>teʔyū</i>	‘naked’	ØM	→	ØH	<i>teʔyú</i>	‘ you are naked’
	<i>xi-kiyāʔ</i>	‘pay of’	ØØM	→	ØØH	<i>xi-kiyáʔ</i>	‘ your pay’
	<i>nt-u-saāʔ</i>	‘tears (tr.)’	ØØM	→	ØØH	<i>nt-u-saáʔ</i>	‘ you tear (tr.)’

Some uninflected and 2SG-inflected pairs of complex lexemes that consist of multiple phonological words, but whose final phonological word has only a single final M tone, are in (9). The final phonological word may be an unbound stem, the final stem of a compound, or an enclitic.

(9)	<i>jne jlyū</i>	‘thumb of’	→	<i>jne jlyú</i>	‘ your thumb’
	<i>nka-ʔni+tzoʔō</i>	‘repaired it’	→	<i>nka-ʔni+tzoʔó</i>	‘ you repaired it’
	<i>tyána+sanā</i>	‘will investigate’	→	<i>tyána+saná</i>	‘ you ’ll investigate’
	<i>ch-uʔu=tzoʔō</i>	‘will live well’	→	<i>ch-uʔu=tzoʔó</i>	‘ you will live well’

The example in (10) shows a case of 2SG inflection with tone substitution in an autosegmental representation. The process operates just as M tone substitution (§3.3.3) does, except there is no segmental pronominal enclitic and the tone substitution occurs right on the stem.⁶

⁶ This fact of course suggests that at some point in time there was a 2SG enclitic with M tone, but its segmental features were lost. The loss of segmental features likely occurred at some pre-Proto-Chatino stage, since no attested Chatino variety conserves any of the segments.



The second rule of 2SG inflection is the following: If a basic (i.e. 3rd person) stem has any tone pattern other than a single M tone on its final mora, then its 2SG inflected form will have M tone on all moras of its final phonological word. Examples of uninflected and 2SG-inflected monomoraic, bimoraic, and trimoraic stems consisting of a single phonological word are listed in (11), grouped according to their basic tone patterns: (Ø)Ø, (M)H, HM, HØ.

- (11) a. *jne* ‘finger of’ Ø → M *jnē* ‘your finger’
tyuu? ‘will cough’ ØØ → MM *tyūū?* ‘you’ll cough’
yane ‘neck of’ ØØ → MM *yānē* ‘your neck’
kilitu? ‘navel of’ (Ø)ØØ → (M)MM *kilitū?* ‘your navel’
- b. *jlyá* ‘is fast’ H → M *jlyā* ‘you are fast’
k-ōó ‘will grind’ MH → MM *k-ōō* ‘you’ll grind’
sūtē? ‘knee of’ MH → MM *sūtē?* ‘your knee’
nkā-tūsú? ‘grabbed’ (M)MH → (M)MM *nkā-tūsū?* ‘you grabbed’
- c. *nk-y-ánō* ‘stayed’ HM → MM *nk-y-ānō* ‘you stayed’
xī-nkwéē ‘jaw of’ (M)HM → (M)MM *xī-nkwēē* ‘your jaw’
- d. *nyá?a* ‘mother of’ HØ → MM *nyā?ā* ‘your mother’
ntē-tákwī ‘is flying’ (M)HX → (M)MM *ntē-tákwī* ‘you’re flying’

Again, for complex lexemes or stems made up of more than one phonological word, the 2SG tone pattern occurs strictly on the final phonological word.

- (12) *nyá? kula* ‘grandma of’ → *nyá? kūlā* ‘your grandma’
tāká=kā?á ‘lives too’ → *tāká=kā?ā* ‘you live too’
?ne+tii=ríké ‘can guess’ → *?ne+tii=ríkē* ‘you can guess’
y-akwi?+kí?yū ‘bragged’ → *y-akwi?+kí?yū* ‘you bragged’
nt-e+k-ū-líjī ‘loses (tr.)’ → *nt-e+k-ū-líjī* ‘you lose (tr.)’

It is possible to view this type of 2SG tonal inflection as involving delinking of whatever tones are associated with the final phonological word of the host and

addition of a purely M tone (moraless) enclitic, whose M tone then spreads to the beginning of that domain (13).



Like the 2SG tonal marking, the non-2SG person/number enclitics, which are all at least partly segmental, only attach to the final phonological word of their host. Therefore, as regards their distribution and function, the 2SG inflectional tone patterns are much the same as the other person/number enclitics. The crucial difference is that while the phonological makeup of the other person/number categories is either (i) strictly segmental or (ii) both segmental and tonal, the substance of 2SG inflection is strictly tonal. Since the exponent of a discourse participant pronoun, with its high frequency of use, is purely tonal, tone can be said to have a high functional load in Zenzontepec Chatino. However, some of that load is perhaps lightened by the fact that the tone patterns of second person singular inflection are unique to that function and therefore stand out as such.

6 Aspect/mood inflection

Aspect/mood inflection involves two largely independent layers of complexity: (i) segmental prefixation (§6.1), which may be fusional, and (ii) alternation in a stem's basic tone pattern across different aspect/mood categories (§6.2). The role that tone plays in aspect/mood inflection is quite different from the role of tone in 2SG pronominal inflection, a fact that is due to the difference in prosodic status of the positions of the two types of inflection (§4). Though aspect/mood inflection involves tone, the tone of the inflected form is not predictable from the tone of the uninflected stem as it is in 2SG person inflection. Also, although aspect/mood categories may have many allomorphs, no allomorph of any category is purely tonal, whereas 2SG person inflection is always purely tonal.

6.1 Prefixal aspect/mood inflection

The four primary aspect/mood categories that Zenzontepec Chatino verbs inflect for are Potential Mood (POT), Habitual Aspect (HAB), Progressive Aspect (PRG), and Completive Aspect (CPL). Most verbs can be grouped into one of seven pre-

fix-based inflectional classes according to which allomorphs of the four primary aspect/mood prefixes they select. Table 2 shows the prefix classes of Zenzontepec Chatino (Campbell 2011), modeled on Kaufman's (1987) analysis of Zapotec verb classes. The notation ($t \rightarrow ty$) means that a stem-initial /t/ becomes palatalized [tʲ].

Table 2: ZEN Aspect prefix (sub-)classes (Campbell 2011)

	POT	HAB	PRG	CPL
Ac/A2	<i>ki-</i>	<i>nti-</i>	<i>n-te-</i>	<i>nka-</i>
A2	<i>ki-</i>	<i>nti-</i>	<i>n-te-</i>	<i>nkwi-</i>
Bc	<i>ki-</i>	<i>nti-</i>	<i>n-te-</i>	<i>nku-</i>
Bt	($t \rightarrow ty$)	<i>n-</i> ($t \rightarrow ty$)	<i>n-te-</i>	<i>nku-</i>
By	($y \rightarrow ch$)	<i>n-</i> ($y \rightarrow ch$)	<i>n-te-</i>	<i>nk-</i>
Ca	<i>k-</i>	<i>nti-</i>	<i>nch-</i>	<i>nku-</i>
C2	<i>k-</i>	<i>nti-</i>	<i>nch-</i> ~ <i>n-tey-</i>	<i>y-</i> ~ <i>nkay-</i>

In some cases the phonological shape and/or lexical semantics of a verb may provide clues about which prefix-class it will belong to, but the prefix-class of many verbs cannot be reliably predicted on such grounds. A summary of the phonological and/or semantic characteristics that tend to associate with each prefix-based verb class is given in (14) (from Campbell in press, see also Campbell 2011).

- (14) Sub-class Ac/Au unergative or transitive verbs (Ac), derived *u-* causative verbs (Au)
- Sub-class A2 transitive and all *i* or *e* initial verbs (tr. or itr.)
- Sub-class Bc unaccusative verbs
- Sub-class Bt motion and posture verbs
- Sub-class By *y-* initial verbs, many being derived unaccusative
- Sub-class Ca unaccusative, *a-* initial
- Sub-class C2 unergative or transitive, begin in *a-*, *o-*, or *u-*

Table 3 shows the aspectual paradigms of one verb from each of the seven prefix-classes. Each of these verbs is toneless in all four of its inflected forms, so the lack of tone cannot be correlated with any particular prefix or prefix-class.

Table 3: Aspectual paradigms for toneless verbs of each prefix-class

		Stem	POT	HAB	PRG	CPL
Ac	'laugh'	-xiti	ki-xiti	nti-xiti	n-te-xiti	nka-xiti
A2	'choose'	-xikq	ki-xikq	nti-xikq	n-te-xikq	nkwi-xikq
Bc	'get toasted'	-kiʔi	ki-kiʔi	nti-kiʔi	n-te-kiʔi	nku-kiʔi
Bt	'go around'	-taʔq	tyaʔq	n-tyaʔq	n-te-taʔq	nku-taʔq
By	'get burned'	-y-atiʔ	ch-atiʔ	n-ch-atiʔ	n-te-y-atiʔ	nk-y-atiʔ
Ca	'be born'	-ala	k-ala	nti-(a)la	nch-ala	nku-(a)la
C2	'hold'	-alaʔ	k-alaʔ	nti-(a)laʔ	nch-alaʔ	y-alaʔ

6.2 Tone alternations in aspect/mood inflection

Unlike the verbs in Table 3, the tone pattern of many verbs varies depending on which aspect/mood category they are inflected for. Table 4 shows eight prefix-subclass Bc verbs inflected for the four primary aspect/mood categories. Even though each verb in the table shares the same set of prefixes, each verb has a different cross-aspect tone pattern. This demonstrates that cross-aspect tonal alternations are independent of any prefixal part of aspect/mood inflection. Therefore, just as verbs can be classified according to which allomorphs of the aspect/mood prefixes they select, they can also be placed into inflectional classes according to the tonal dimension of their aspect/mood inflection.

Just as the aspect-prefix classes cannot be used to predict the tone pattern across a verb's aspectual forms, the phonological shape of the stem itself does not help predict a verb's tone pattern either. The two verbs 'be hanging' and 'fly' in Table 5 illustrate this well. The segmental makeup of the two stems (and their prefixes) is identical, and the verbs' only formal difference is in their tone patterns. The verb 'be hanging' is toneless in the Potential Mood and Habitual Aspect, but it has the HM basic tone pattern in the Progressive and Completive Aspects. In contrast, the verb 'fly' has invariant HØ tone across all aspect/mood forms.

Table 4: Prefix sub-class Bc verbs with varying tone patterns across aspects

	POT	HAB	PRG	CPL	tone pattern
‘get angry’	<i>ki-nyaxə?</i>	<i>nti-nyaxə?</i>	<i>n-te-nyaxə?</i>	<i>nku-nyaxə?</i>	∅∅ invariant
‘get counted’	<i>ki-lakwā</i>	<i>nti-lakwā</i>	<i>n-te-lakwā</i>	<i>nku-lakwā</i>	∅M invariant
‘fall over’	<i>ki-sāq̄</i>	<i>nti-sāq̄</i>	<i>n-te-sāq̄</i>	<i>nku-sāq̄</i>	MH invariant
‘sink (itr.)’	<i>ki-líti?</i>	<i>nti-líti?</i>	<i>n-te-líti?</i>	<i>nku-líti?</i>	H∅ invariant
‘get beaten’	<i>ki-ka?ne</i>	<i>nti-ka?ne</i>	<i>n-te-ká?nē</i>	<i>nku-kā?nē</i>	∅∅POT/HAB; HM PRG/CPL
‘get snapped’	<i>ki-kitē?</i>	<i>nti-kitē?</i>	<i>n-te-kītē?</i>	<i>nku-kītē?</i>	∅MPOT/HAB; MH PRG/CPL
‘come off’	<i>ki-su</i>	<i>nti-su</i>	<i>n-te-sū</i>	<i>nku-sū</i>	∅∅POT/HAB; ∅M PRG/CPL
‘get crushed’	<i>ki-tita</i>	<i>nti-tita</i>	<i>n-te-tita</i>	<i>nku-titā</i>	∅∅POT/HAB/PRG; ∅M CPL

Table 5: Segmentally identical verbs with different tone across aspects

	Stem	POT	HAB	PRG	CPL
‘be hanging’	Bt <i>-tákwī</i>	<i>tyakwi</i>	<i>n-tyakwi</i>	<i>n-te-tákwī</i>	<i>nku-tákwī</i>
‘fly’	Bt <i>-tákwī</i>	<i>tyákwi</i>	<i>n-tyákwi</i>	<i>n-te-tákwī</i>	<i>nku-tákwī</i>

Another pair of verbs that are segmentally identical in all of their inflected forms and only differ in their tone alternation patterns across aspects is given in Table 6. The verb *-una* ‘hear’ is toneless in all four aspects, while the verb *-úná* ‘cry’ has the ∅M basic tone pattern in the Potential Mood and Habitual Aspect and the MH basic tone pattern in the Progressive and Completive Aspects.

Table 6: Prefix-class C2 verbs with different tone across aspects

	Stem	POT	HAB	PRG	CPL
‘hear’	C2 <i>-una</i>	<i>k-una</i>	<i>nt(i)-una</i>	<i>nch-una</i>	<i>y-una</i>
‘cry’	C2 <i>-úná</i>	<i>k-unā</i>	<i>nt(i)-unā</i>	<i>nch-úná</i>	<i>y-úná</i>

There are 9 cross-aspect tone alternation (or lack thereof) patterns that occur in the language, and they are listed in Table 7, along with the percentage of non-compound verbs in the lexicon on which they occur. Of the 375 basic verbs so far documented, 71.2% of them have invariant tone (or invariant tonelessness) across aspects.

Table 7: Summary of tone pattern alternations across aspects

Tone alternation pattern across aspects		% of non-compound verbs in lexicon		
Invariant (same tone in all aspects)		71.2 %		94.3 %
∅∅POT/HAB	HM PRG/CPL	10.9 %	23.1 %	
∅M POT/HAB	MH PRG/CPL	8.5 %		
∅∅POT/HAB	∅M PRG/CPL	2.1 %		
MH POT/HAB	∅M PRG/CPL	1.6 %		
∅M POT/HAB/PRG	MH CPL	1.9 %	5.7 %	
MH POT/HAB/CPL	∅M PRG	1.9 %		
∅∅POT/HAB/PRG	HM CPL	1.4 %		
∅∅POT/HAB/PRG	∅M CPL	0.5 %		

Another 23.1% of non-compound verbs follow a pattern in which the Potential Mood and Habitual Aspect forms have the same basic tone pattern and the Progressive and Completive Aspect forms share a different tone pattern. In the remaining 5.7% of non-compound verbs, the tone is also always the same in the Potential and Habitual forms, but tone varies between the Progressive and Completive Aspects. The majority of these are verbs in which the Progressive Aspect form is built on the Potential Mood form, and that is why only the tone on the Completive Aspect form is different. The few verbs that have a unique tone solely in the Progressive Aspect may reflect an earlier pattern in which the Progressive Aspect prefix bore M tone, as it still does today in Zacatepec Eastern Chatino (Villard & Woodbury 2012).

Given the above patterns, some generalizations can be made. First of all, the tone in the Potential and Habitual is always identical, without exception, and the tone is almost always identical between the Progressive and Completive Aspects (94.3% of the time). Second, even though tone is ultimately not predictable across the various aspect/mood inflected forms of a verb, knowing the tone in one or two aspect forms can narrow down the possibilities of which tones may occur in the other forms. For example, if a verb has no tone in the Completive Aspect, then it will be toneless in all other aspects. Also, if a verb has ∅M tone in the Potential Mood and Habitual Aspect, it can only have either ∅M or MH tone in the Progressive and Completive Aspects. If a verb has either the HM or H∅ tone pattern in the Potential and Habitual forms, then its tone must be invariant across all forms, and if a verb has HM tone in the Completive Aspect, then all other forms must have either no tone or the same HM tone pattern.⁷

⁷ This is not an exhaustive list of the cross-aspect tone predictive possibilities that can be drawn for the summary in Table 7.

7 Discussion and conclusions

The system of TAM inflection in Zenzontepec Chatino is quite complex because there are two orthogonal layers, the prefixal system and the tone alternation system, simultaneously at play. Excluding verbs with irregular prefixes that would make up singleton inflectional classes, the seven prefix classes and nine tone alternation classes combine to yield 63 possibilities. Of these possibilities, 31 are actually populated (Campbell 2013b), so the language can be said to have at least that many inflectional classes.

Since there is considerable allomorphy in all of the aspect/mood inflectional categories and the selection of allomorphs is often not predictable based on the phonological shape or lexical semantics of a verb, aspect/mood inflection in Zenzontepec Chatino is morphomic, i.e. purely morphological (Aronoff 1994: 25), at least for some verbs. Interestingly, the same is true for other Chatino languages (Villard 2010; Sullivant 2011) and Zapotec languages of several primary subgroups within Zapotec (Bartholomew 1983; Kaufman 1987; Smith Stark 2002; Beam 2004). Therefore, the inflectional class system is old and relatively stable despite being an example of apparently spurious complexity.

Person inflection, on the other hand, is completely regular in Zenzontepec Chatino. Even in 2SG inflection, with its two allomorphs that are purely tonal, the selection of one of the allomorphs is predictable from the tone of the uninflected stem. Therefore, person inflection does not contribute to the complexity of the inflectional classes.

Aspect/mood inflection precedes the verb stem and always falls into the same phonological word as the stem, while person inflection is realized by enclitics that follow the verb, and if segmental, make up a separate phonological word from it. The different positions of the two types of inflection, and the differing prosodic statuses of those positions, are the reason why the role of tone is quite distinct in each type of inflectional morphology in Zenzontepec Chatino.

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Abbreviations

CPL	Completive Aspect	POT	PotentialMood
DEF	definite	PRG	Progressive Aspect
DEM	demonstrative	RSP	respectful
HAB	Habitual Aspect	TPLZ	topicalizer
itr.	Intransitive	tr.	transitive
NSPC	non-specific		

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