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Chichahuaxtla Triqui¹ [tʃi.ka'waks.tʃa 'tri.ki] or *Nānj nī'in* [nã⁴h nu¹?u³] 'the complete language', as named by the Triqui people, is one of three languages in the Triqui subfamily of the Mixtecan family. The Instituto Nacional de Lenguas Indígenas (INALI 2014; <http://www.inali.gob.mx/clin-inali/>) lists two other Triqui languages with varying degrees of mutual intelligibility for speakers of Chichahuaxtla Triqui (Casad 1974: 79) – the first is spoken in San Martín Itunyoso and the other in San Juan Copala.²

The Mixtecan family, which also includes Mixtec and Cuicatec, is one of eight families that make up the Otomanguean stock. The Otomanguean language stock consists of Mixtecan, Zapotecan, Popolocan, Chinantecan, Amuzgo, Tlapanec, Otopamean and Chiapanec-Manguean.

¹ The spelling *Trique* was widely used by researchers for many decades. In this article, we use *Triqui* because it is the autonym that is preferred by native speakers of the language.

² Eugene Casad and Barbara Hollenbach (Casad 1974: 79) computed the percentage of cognates between each pair of Triqui languages using a standard 250-word list and a 100-word lexicostatic list. In their study, they found that Chichahuaxtla and Itunyoso Triqui are the most closely related; Copala and Itunyoso are the next closest and Copala and Chichahuaxtla Triqui are the least related. In a follow-up study, they had native speakers of Chichahuaxtla listen to two tapes from San Martín Itunyoso. They report that the tapes were identical except that 'one informant's speech style was slow with clearly enunciated words while the other was very rapid' (Casad 1974: 107). The Chichahuaxtla speakers averaged 87% in their comprehension of the clearly enunciated sentences but only 64% on the sentences that were presented to them a normal conversational rate of speech.

Chichahuaxtla³ Triqui is spoken in eleven communities:⁴ San Andrés Chichahuaxtla (SAC), La Laguna Guadalupe, San Isidro de Morelos, San Marcos Mesoncito, Santa Cruz, Zaragoza, Yosunduchi, La Cañada Tejocote, Miguel Hidalgo Chichahuaxtla, San José Xochixtlán, Santo Domingo and San Isidro del Estado (Hernández 2013). Although the Triqui variants listed above share the ISO code [trs], there are significant phonological and tonal differences in addition to lexical variation among the different varieties, some of which will be discussed below. This Illustration will focus primarily on the variant that is spoken in San Andrés Chichahuaxtla.

The language consultant is a 52-year-old native of San Andrés Chichahuaxtla who speaks Spanish and Triqui fluently. The consultant translated two versions of the ‘North Wind and the Sun’ passage into Chichahuaxtla Triqui, based on the Spanish version published by Martínez-Celdrán, Fernández-Planas & Carrera-Sabaté (2003: 259). He preferred the second translation because it sounded ‘more Triqui-like’ to him. Unless otherwise noted, the recordings included in this Illustration are from this language consultant.

Consonants⁵

	Bilabial	Dental	Alveolar	Alveo-palatal	Retroflex	Palatal	Velar	Labialized velar	Glottal
Plosive	p b	t̪ d̪					k g	k ^w g ^w	ʔ
Prenasalized plosive		nd					ng		
Affricate		t̪s		t̪ç	t̪ʂ				
Fricative			s z	ʃ ʒ	ʂ ʐ				h
Nasal	m m:		n n:						
Approximant						j j: j̃	w w:		
Lateral approximant			l l:						

Chichahuaxtla Triqui has the following consonants: four voiceless plosives /p t k k^w/, four voiced plosives /b d g g^w/, three affricates /t̪s t̪ç t̪ʂ/, five sibilants /s z ʃ ʒ ʂ ʐ/, two laryngeals /ʔ h/; two prenasalized plosives /nd ng/; and 10 lenis–fortis sonorants /m m: n n: l l: j j: w w:/

³ The word *Chichahuaxtla* [t̪ʃi.ka.'waks.t̪la] is derived from the Nahuatl word *chica* ‘strong’ and *tlax* ‘place’. Alternate pronunciations exist. The Triqui word for San Andrés Chichahuaxtla is *Yuman’ Niko* [ʃumã³? niko³] ‘big pueblo’.

⁴ In addition to the eleven major communities listed above, the Instituto Nacional de Lenguas Indígenas (INALI 2014) lists other areas where Chichahuaxtla Triqui is spoken: Barranca del Cucho, Concepción del Progreso (La Hacienda), Chapultepec, Charloco, El Chorrito de Agua, El Sesteadero, Joya Grande, La Cañada Tejocote, La Chirimoya (Pie de la Cuesta), La Muralla, La Orilla del Peñasco, La Trovadora, Llano de Zaragoza, Loma Flor de Sangre, Malpica, Miguel Hidalgo Chichahuaxtla, Pie del Encino, Plan de Ayala, Plan de Guajolote, Putla Villa de Guerrero, San Antonio Dos Caminos, San Juan Lagunas, Santa Cruz Progreso Chichahuaxtla, Santiago Amate Colorado, Tierra Colorada (San José Tierra Colorada) and Unión Nacional. Many of these are small communities located in close proximity to San Andrés Chichahuaxtla. (Source: http://www.inali.gob.mx/clin-inali/html/v_triqui.html, accessed 19 November 2014.)

⁵ Places and manners of articulation described herein are based on the results of preliminary linguo- and palatograms, which will be discussed in other research.

w/: The fortis alveolar lateral /l:/ is very rare in Chicahuaxtla Triqui. We found only one occurrence of this sound. For some consultants, /s/ and /ʃ/ occur in free variation with /z/ and /ʒ/, respectively. In addition, [j] is an allophone of /j/ that surfaces before nasal vowels.

Plosives

/p/ and /b/ are not native sounds of Chicahuaxtla Triqui (Elliott, Sandoval Cruz & Santiago Rojas 2012: 214). /p/ is realized as a voiceless bilabial plosive and may surface in word-initial or intervocalic position from influence of Spanish loanwords, many of which were adopted without modification except for tonal changes and final vowel lengthening.⁶ In polysyllabic words, the penultimate syllable or tonic vowel from Spanish is usually tone 3 (T3), i.e. the default tone in Triqui, while the final syllable, always a vowel unless morphophonologically inflected, lengthens and frequently evidences a lowered tone. Examples include [pre³si³ðe³te:³²] ‘president’, [pro³gra³ma:³²] ‘software program’, [t̥su³pe³re:³²] ‘pear’ and [t̥sū:³pos³te:³²] ‘post’. The word [la³pi³h] ‘pencil’, from Spanish *lápiz* [‘la.pis], retains the original <p> from Spanish; however, stress is shifted from the penultimate to the ultimate syllable with the addition of a fricative segment [h] to word-final position.

/b/ is realized as a voiced bilabial plosive and may occur in free variation with [ᵐb] in utterance-initial position or after a pause. Pre-nasalized stops have also been reported in other Otomanguean languages such as Mazatec, Mixtec and Otomí. Like /p/, the phoneme /b/ is not native to Chicahuaxtla Triqui and surfaces through Spanish contact (Elliott et al. 2012).

Similarly to Spanish, intervocalic /b/ is sometimes pronounced as an approximant or non-fricative continuant [β]; however, after a nasal, laryngeal /h/ or a pause it is articulated as a plosive. Examples include [ᵐbe⁴su:³] < ‘peso’ (< SP *peso* [‘pe.so]), [ᵐbele⁴tu:³] < ‘pleito’ (< SP [‘plei.to] ‘lawsuit’ or ‘dispute’), [bezu:⁴] < ‘Pedro’, [ᵐbalu:⁴] < ‘Pablo’ (< SP [‘pa.βlo]), [ag^wa⁴h baka:³] ‘muge la vaca’ (< SP *vaca* [‘ba.ka] ‘the cow moos’ and [ne:³²βere³nde:³] < ‘aguardiente’ (< SP [a.γar.‘djen.ɾe]) ‘firewater’.

[t] is a voiceless denti-alveolar plosive with long contact in Chicahuaxtla Triqui, see Ladefoged & Maddieson (1996: 22–23). /t/ in word-initial position may be pronounced as a consonant sequence [st̥] as a variant pronunciation of particular disyllabic words such as (s)*tane*⁷ [t̥ane:³] ~ [st̥ane:³] ‘goat’ – a finding that was previously reported by Hollenbach (1977) and Elliott et al. (2012). Denti-alveolar [t̥] occurs principally in word-initial and medial position but can also surface in word-final position in fused enclitic morphophonological forms, e.g. [na³ru³we³²t̥] ‘[you] pay 2S.FAM’, [si³t̥sa³t̥] ‘your (2S.FAM) song’, [sa¹t̥t̥] ‘[you are] good 2S.FAM’ or [jo¹³t̥t̥] ‘[you are] quick 2S.FAM’. Word-final /t/ for these forms may be released in careful or slow speech (e.g. [t̥]) but is frequently inaudible in vernacular or rapid speech (e.g. [t̥̚]) and may easily be confused with a glottal plosive [ʔ].

The segment /d/ is realized as a voiced denti-alveolar plosive [ḁ] with long contact, see Ladefoged & Maddieson (1996: 22–23). In word-initial position or after a pause, /d/ frequently evidences prenasalization and may be articulated as [ᵐd]. In intervocalic position, /d/ may be articulated as an interdental spirant [ð]⁸ (Hollenbach 1977, Elliott et al. 2012). /d/ does not occur in word-final position. Itunyoso Triqui <t> corresponds to [d] in Chicahuaxtla Triqui except for one example [ru³ða³ʔ³]⁹ (transcribed by DiCanio) ‘cylindrical

⁶ Chicahuaxtla Triqui has a word structure constraint that consists of long and extra long vowels (e.g. [V:]) in word-final position. The extra long forms surface with complex tone contours. Some researchers, such as Hernández (2013), transcribe extra long forms as [V::].

⁷ In Santo Domingo del Estado, ‘goat’ is pronounced as *bale* [bale:³] or *dale* [dale:³]. *tane* or *stane* are rarely, if ever, used.

⁸ Some speakers, however, may pronounce /d/ as a denti-alveolar plosive in this environment in careful or slow speech or when they are aware they are being recorded; consequently Labov’s observer’s paradox may come into play.

⁹ In Chicahuaxtla Triqui, laryngeals occur both lexically and morphologically. In this paper, mid-syllable glottals [ʔ h] will be superscripted to indicate these lexical items consist of one syllable (discussed below) as opposed to two.

grindstone',¹⁰ in which the intervocalic /d/ is fricativized, cited by DiCano (2010: 229). In Copala Triqui, the /d/ occurs natively in word-initial position and is pronounced as [ð] in intervocalic position only in Spanish loanwords (Hollenbach 1977), otherwise it is articulated as a plosive. As in Copala and Itunyoso Triqui, /d/ is not found in word-final position in Chicahuaxtla Triqui.

/k/ is a voiceless velar plosive. In word-initial position, /k/ may occur before an oral or nasalized central vowel (e.g. [a ã]) or oral back vowels (e.g. [u o u]) but never precedes a front vowel (e.g. [e i]). In word-medial position, /k/ may follow [i a u] but not before other vowels. In this environment, it may precede [a u o u] or [ã û]. When [u] precedes [k] in word-medial position, [u] must also follow (Hollenbach 1977). Examples include [ˈguku^hu] 'ocote pinecone' and [ˈgudu²³k] 'carnival'. /k/ is not found in word-final position.

/g/ (and its prenasalized variant [ˈg]) is realized as a voiced velar plosive and surfaces only in word-initial or word-medial position. Like /b d/ in intervocalic position, /g/ may be pronounced as a voiced velar fricative [ɣ]; however, there are some speakers for whom [g] and [ɣ] occur in free variation in this environment. In running speech, word-initial and intervocalic [g] may undergo lenition to the degree that it is almost inaudible.

/p/	[p]	[sopa: ³²]	'soup' (< SP <i>sopa</i>)
/t/	[t̥]	[t̥ane: ³]	'goat' (other consultant)
	[s̥t̥]	[s̥t̥ane: ³]	'goat'
	[ʔt̥] or [t̥]	[d̥aku ⁴ ʔt̥]	'your nose 2S.FAM'
/k/	[k]	[ku: ⁵³]	'bone'
/b/	[b]	[besu: ³²]	'peso' (< SP <i>peso</i>)
	[β]	[ne: ³² βeɾeɲde: ³]	'firewater'
/d/	[d̥]	[da ² ʔmã: ² ni ³ h]	'her leg' (ni ³ h = 'her')
	[ⁿ d̥]	[ⁿ daʔmũ ¹ ʔ]	'our legs' (other consultant)
	[ð]	[zuðã ³² a]	'cylindrical grindstone'
/g/	[g]	[gono ³ ʔo: ⁴³]	'medicine'
	[ⁿ g]	[ⁿ ga ³ to: ⁴]	'shirt' (other consultant)
	[ɣ]	[aɣã ³ a]	'bottle'

/k^w/ and /g^w/ are voiceless and voiced bilabial-velar plosives, respectively. There are some instances in which [g^w] evidences prenasalization, as in [ˈg^wi:³¹] 'person – soul' (refer to the sound file in supplementary materials accompanying the online version of the present Illustration (<http://journals.cambridge.org/IPA>)). Pronunciation of /g^w/ varies on a continuum from careful speech (e.g. [g^w]) to the vernacular or rapid speech, where it may be pronounced [ɣ^w] or simply [w] as in [d̥ʂuwiʔi:⁴] 'sad' in the transcription section below. Merrill (2008) reported a similar finding for Tilquiapan Zapotec, another language belonging to the Otomanguean stock.

/k ^w /	[k ^w e ³ h]	'pus'
	[d̥uk ^w a: ⁴⁵]	'my house'
	[sa ³ k ^w ã: ²³]	'blue'
/g ^w /	[ⁿ g ^w i: ³¹]	'person – soul' (prenasalized)
	[d̥uʔwe ³ h wi: ³]	'ray of sunshine'
	[d̥ʂuwiʔi: ⁴]	'sad'
	[we ³ ʔã ³² ã]	'Saturday' ¹¹

¹⁰DiCano (2010: 229) translates [ru³ðã³] as 'grinding stone leg'. We believe 'cylindrical grindstone' is a more appropriate translation.

¹¹[d̥uʔwe³h wi:³] 'ray of sunshine' is spelled *du'huej gui*; [d̥ʂuwiʔi:⁴] 'sad' is spelled *rugui* 'i and [we³ʔã³²ã] 'Saturday' is spelled *guetan* 'an. Like in Spanish, the days of the week are not capitalized in Chicahuaxtla Triqui.

Laryngeals

There are two laryngeals in Chicahuaxtla Triqui: /ʔ/ and /h/. In Itunyoso Triqui, DiCano (2010: 229) notes that /ʔ/ is realized ‘as short duration creak with significant pitch perturbation’ in intervocalic position while as a word-final coda consonant, complete glottal closure is evident. Both /ʔ/ and /h/ surface as mid-syllable interrupts (i.e. glottally interrupted vowels) in monosyllabic words in addition to word-final coda position.

The voiceless glottal plosive [ʔ] surfaces in initial, medial and final positions in Chicahuaxtla Triqui. In word-initial position, the degree of glottal constriction varies among consultants, compare [ʔũ:ⁿ²] and [ʔũ:ⁿ²] ‘nine’. In medial position, [ʔ] can be followed by a sonorant but not by an obstruent, for example /ʔm ʔn ʔl ʔj ʔŋ ʔw/. In Itunyoso Triqui, DiCano (2010: 232) states that glottalization precedes and overlaps the initial portion of the consonant and is voiced throughout its duration. Contrary to DiCano’s findings, glottal stops surfacing before sonorant consonants in Chicahuaxtla Triqui rarely maintain voicing and most always involve complete closure of the glottis prior to the onset of the following consonant. While DiCano (2010: 232) argues that ‘glottalized consonants are better treated as undecomposable [sic], complex segments rather than sequences’ for all three Triqui languages, we believe, like Longacre (1952, 1957) and Hollenbach (1977, 1984), that glottal stop followed by a sonorant consonant constructions are best analyzed as sequences in Chicahuaxtla Triqui rather than a single preglottalized segment as per DiCano (2010).¹²

Edmondson et al. (2012) found that tone and glottals co-occur in patterns such as 3^h, 4[?], 3[?]3 and 3^h3, in addition to other tone–glottal combinations that we do not list here. Some glottal consonants [ʔ h] are not lexical but arise in constructions of tone–laryngeal marking of morphological form, for example [ʔ] in word-final position serves as a marking morpheme in verbs, possessed nouns, adjectives and prepositions, and indicates person and number for first person plural inclusive forms. In Chicahuaxtla Triqui, fused enclitics usually surface in word-final position, but they can, however, appear in mid-syllable positions – for example, where V is a vowel and [T] represents tone, exponents can be word-final: [Vʔ/hV^T] or [V:ᵀ]; or mid-syllable: [V^TV V^{hT}V]. Both constructions, [V^TV] and [VʔV^T], appear to be identical but demonstrate different syllable patterns depending upon which vowel carries phonemically contrastive tone. [V^{ʔ/hT}V] is a ‘split’ or glottally interrupted syllable that consists of only one syllable while [VʔV^T] is a two-syllable construction (Elliott et al. 2014). Some researchers refer to the glottally interrupted syllable as echo vowels, rearticulated constructions, extra harmonic vowels (Matsukawa 2008, 2012: 109–118) or laryngeally interrupted vowels (Silverman 1997: 242). Longacre (1952: 75–76 fn. 2) argued long ago that mid-syllable glottal interrupts did not result in an additional syllable. In this Illustration, mid-syllable glottals [ʔ h] will be superscripted to indicate that glottally interrupted vowels (e.g. [V^{ʔ/hT}V]) consist of one syllable. The following are examples of glottal stops [ʔ] in Chicahuaxtla Triqui:

[gat̪ci ^{2?} i]	‘fever’
[zuʔwi ^{3?} i]	‘coal’
[n:e ^{3?} e]	‘rope’
[neʔe ³ h]	‘little child’
[^h gaya ^{3?} a]	‘bottle’ (< SP <i>botella</i>)
[goʔo:³]	‘plate’
[ʔũ:ⁿ²]	‘nine’
[ʔũ:ⁿ²]	‘nine’ (other consultant)
[gaʃũ ¹ ʔũ ³ h]	‘shadow’
[dako ^{4?} ʔ]	‘our foot – feet’
[to ¹ ʔ]	‘we are on top’

¹²For a more thorough discussion of preglottalized consonants, see Edmondson et al. (2004).

The following are representative examples of glottal stop [ʔ] plus sonorant consonant sequences (e.g. /ʔm ʔn ʔl ʔj ʔŋg ʔw/) in Chicahuaxtla Triqui:

[aʔmi: ⁴³]	‘I speak’
[daʔnu: ⁴⁵]	‘my uncle’
[ʔjo: ²]	‘humid’
[aʔjã ²¹ h]	‘to blow’
[ʔŋgo ¹³ h]	‘one’
[naʔŋga: ⁴³]	‘deceased – corpse’
[aʔŋga: ³]	‘is born’
[ʔwe ^{3h} e]	‘thread’
[duʔwi ⁴ ʔ]	‘our aunt’

Prenasalized plosives

[ŋɖ ŋg] are segmental sequences that are found in many varieties of Mixtecan languages.

/nd/	[ŋɖa: ²³ j:a: ¹²]	‘until now’
	[sãŋɖu: ⁴]	‘cent’
	[sũŋɖu ^{2h} u]	‘favor’
/ng/	[ŋg ^w e ¹ ʔ]	‘both’
	[ŋgo ¹ h]	‘deep voice’

Affricates

Chicahuaxtla Triqui has three voiceless affricates: /t͡s/, /t͡ɕ/ and /t͡ʂ/. [t͡s] is an apico-dental affricate and surfaces in word-initial and word-medial positions. It appears before /i u/ and not before any other vowel.

[t͡si: ³²]	‘corn on the cob’
[t͡si: ¹]	‘hard’ (other consultant)
[duɡu͡t͡si: ³]	‘she is breastfeeding’
[si ³ na͡t͡si: ⁴⁵]	‘my tomato’
[^ɹ ɡa͡t͡si: ^{3?} i]	‘honey’
[ma͡t͡su ^{3h} u]	‘sheep’
[^ɹ ɡu͡t͡su ^{3?} u]	‘comb’

/t͡ɕ/¹³ is a voiceless prepalatal affricate that surfaces in word-initial and word-medial positions and appears only before /i e/. /t͡ɕ/ is never found in word-final position.

[t͡ɕi: ^{2?} ʔ]	‘ten’
[t͡ɕi: ² h]	‘seven’
[du͡t͡ɕi: ³]	‘Ocotepéc’
[su͡t͡ɕi: ^{2h} i]	‘lice’
[^ɹ ɡa͡t͡ɕi: ^{2h} i]	‘cotton’
[^ɹ ɡa͡t͡ɕi: ^{2?} i]	‘fever’
[t͡ɕe: ⁵³]	‘bundle of firewood’

/t͡ʂ/ is a voiceless affricate retroflex with airflow striking the tip of the tongue. It occurs in word-initial and word-medial positions. In word-initial or medial position it may surface before [i e a o u]; /t͡ʂ/ never surfaces before [ə u].

¹³Previous researchers have transcribed this sound as /t͡ʃ/; however, based on findings from recent linguo- and palatograms, we have opted to use /t͡ɕ/ (research in progress).

[tʃi ^{3?} ih]	‘pasture – grass’
[tʃe ^{3h} e]	‘road’
[sitʃe ³]	‘devil’
[tʃa ³]	‘tortilla’
[tʃa ^{3?} a]	‘music – song’
[sitʃã ^{2?} ã]	‘purse’
[ʃitʃo ^{3h} o]	‘pants’
[tʃu ³]	‘cricket’
[tʃu ^{3?}]	‘powder’

Sibilants

/s/ is a voiceless narrow groove apical denti-alveolar fricative [s]. Based on the data collected for this study, /s/ appears mostly in word-initial position and may be voiced or voiceless without being semantically contrastive (i.e. [s] ~ [z]). /s/ may also surface before all vowels with the exception of [ə u]. Although rather infrequent in word-medial position, it may occur before /i u/, e.g. [si³ zazũ² ne³h si³h] ‘their thing(s)’, and is commonly found in Spanish loanwords such as [me³sa³] ‘table’ (< SP *mesa*), [la³su³] ‘lasso’ (< SP *laso*) and [da³su³] ‘piece’, from the Spanish word *pedazo* ‘piece’.

[si ^{5?}]	‘man’
[sigui ^{3?} u]	‘chewing gum’
[sa ^{3?}]	‘thing’
[sãḍu ⁴]	‘cent’
[sa ^{2?} ã ^{2h} ã]	‘money’
[so ^{1?}]	‘you (2S.FAM)’ (other consultant)
[zo ^{4?}]	‘he (PRO)’ (other consultant)
[soʔo ³]	‘deaf’ (other consultant)
[sũḍu ^{2?}]	‘doll’

/ʃ/ is a voiceless alveo-palatal fricative and surfaces before /i e a o u/ but not in conjunction with /ə u/. Our data suggest that [ʃ] may occur in free variation with [ʒ] for the same consultant.

[ʃiã ^{1?}]	‘delicious’
[ʃuwe ³]	‘dog’
[ʃuḍã ³]	‘bee’
[uḍã ³ mã ⁴ ʒaḍã ³]	‘there are many eagles’
[ʒã ¹]	‘eleven’

Although /ʃ/ and /ʒ/ may occur in free variation for some consultants, for others, this sound is almost always voiced /ʒ/, as in the following examples

[ʒiã ^{1?}]	‘delicious’ (other consultant)
[ʒilu ^{5?}]	‘worm’ (other consultant)
[ʒuḍã ³]	‘bee’ (other consultant)
[we ³ h ʒuwe ³]	‘the dog jumps’ (other consultant)

Orthographically represented as <r>, rhotic /r/ in word-initial position has been commonly described as a voiced alveolar trill [r] in the Triqui languages (Hollenbach 1977, DiCanio 2010, Elliott et al. 2012); however, based on our most recent findings, trilled [r] is not as common in this environment as once believed. Hollenbach (1977: 53) and Elliott et al. (2012) note that /r/ in word-initial position may be pronounced as [dr] but is more commonly pronounced with acoustic frication, either as voiced [z] or voiceless [ʃ]. For other speakers, varied articulations of /z/ have been observed: [r dʒ dz tʃ tʒ]. /z/ in intervocalic position may be pronounced as a voiced alveolar flap [r] but may be assibilated [z] as well, compare

[^ɓguruwi:³] with [^ɓguzuwi:³] in the examples to follow. Voiced alveolar flap [r] is not found in word-initial position.

/z/	[z]	[zumi: ³]	‘ball’
		[zumi: ² ʔ]	‘dark’
		[zuwi ⁴ ʔi: ³]	‘peach’
		[za ³ t̪s̪u: ⁵³]	‘bread’
	[ʃ]	[ʃeto: ³]	‘blanket – cloak’
		[ʃo ³ ʔo ⁴ ʔ]	‘our hand(s)’
	[r] ~ [z]	[^ɓ guruwi: ³]	‘monkey’
		[^ɓ guzuwi: ³]	‘monkey’ (other consultant)
		[^ɓ guzuwiʔ ²]	‘we are going to grill it’ (other consultant)
	[t̪ʃ]	[t̪ʃo: ⁴]	‘bull’
		[t̪ʃuwi ⁴ ʔi: ³]	‘peach’

As previously stated, some consultants pronounce <r> as a voiced alveolar trill [r], as in the following examples:

/r/	[r]	[riʔni: ⁴]	‘huiopil’ (other consultant)
		[gu ² duwe: ² rãʔã: ³]	‘I will sell mushrooms’ (other consultant)
		[ro: ⁴]	‘bull’ (other consultant)

Fortis–lenis contrasts

Perhaps one of the most striking features of the consonantal system of Chicahuaxtla Triqui are the fortis–lenis¹⁴ phonological contrasts: [m m: n n: l l: j j: w w:]. Fortis phonemes are limited to monosyllabic words in Chicahuaxtla Triqui (Longacre 1952, Hollenbach 1977).

Although DiCanio (2010: 230) notes that there are two groups of fortis–lenis consonantal contrasts in Itunyoso Triqui consisting of obstruents and sonorants, no such distinction has been found for obstruents in Chicahuaxtla Triqui. In Chicahuaxtla Triqui, fortis contrasts are limited to sonorants only.

The fortis consonants differ from their lenis counterparts by a ‘perceptible lengthening of the fortis phonemes’ (Longacre 1959: 37) and are restricted to word-initial position in monosyllabic words. Fortis voiced bilabial nasal [m:] is limited in its distribution and only surfaces before [i a]. [n:], fortis voiced alveolar nasal, appears only before [i e a ã u] but does not surface before back labial rounded vowels [o u]. We found only one instance of the fortis voiced alveolar lateral approximant [l:]: [ma³² l:e⁴ʔ] ‘hello, sister’, by another consultant.

The lenis voiced palatal approximant /j/ surfaces in word-initial position before [ɛ a o u]. Longacre (1957) claimed that /j/ has a nasal allophone, transcribed here as [j̃], when preceding a nasal vowel and surfaces in word-initial position before [ã ü]. In Chicahuaxtla Triqui there is no fortis counterpart to [j̃]. Fortis voiced palatal approximant /j:/ appears only before [a o]. Fortis voiced velar approximant /w:/ may precede front vowels [i ɛ]. The following are examples of lenis–fortis contrasts.

¹⁴Fortis–lenis is a controversial term. In addition to consonantal duration, strength of articulation or articulatory effort (DiCanio 2012) has also been examined a possible feature that may distinguish fortis from lenis contrasts in Triqui. Using measures of perspiration, closure duration, burst duration and VOT for obstruent fortis–lenis contrasts, DiCanio (2012) found that burst duration (i.e. strength of articulation) was the only variable that did not account for the fortis–lenis contrast.

/m/	[mãka: ⁴ [mãjũ: ³]	‘Mexico City’ ‘handkerchief – napkin’ (other consultant)
/n/	[nĩmã: ³ [neʔe ³ h]	‘his heart’ ‘little child’
/l/	[lupi: ³ li ³ h] [laka ³ h]	‘little turkey’ ‘rattle’
/j/	[je ³ h] [jaʔa ³ h] [jaʔar: ³] [jo: ⁴] [jo ^{3ʔ} o] [joʔo: ⁵³] [ju: ¹] [jã: ³²³] [jã ^{3h} ã] [jũ ¹ ʔ] [jũ: ⁴]	‘rock’ ‘chile’ ‘root’ ‘palm basket’ ‘year’ ‘land – dirt’ (other consultant) ‘sour’ ‘salt’ ‘grime’ ‘we’ ‘earthquake – tremor’
/w/	[wiʔi: ⁴] [we ^{3ʔ} e] [weʔe: ⁴]	‘blonde’ ‘house’ ‘fine/good’
/m:/	[mĩ: ⁴] [mĩ: ³¹³] [mã ^{3h} ã]	‘ancestors – mythical beings’ ‘bridge’ ‘nightmare’
/n:/	[ne: ³] [nã: ⁴] [nã: ³]	‘plow’ ‘heat from sun’ (other consultant) ‘bed’
/l:/	[mã: ³² l:e ⁴ ʔ]	‘hello, sister’
/j:/	[aʔmi: ³² ja: ³] [jo ⁴ ʔ]	‘he speaks truthfully’ (other consultant) ‘our forehead’
/w:/	[wi: ¹] [we: ³⁵³] [we: ³²³]	‘hidden’ ‘palm mat’ ‘maguey’

Fortis consonants [m: n: j: w:] were measured for their duration and subsequently compared to their lenis counterparts. Based on the data, on average, fortis /m:/ was 125% longer, fortis /n:/ was 129% longer, fortis /j:/ was an average of 75% longer and fortis /w:/ was 89% longer in comparison to their lenis counterparts. Independent samples *t*-tests were carried out using the Statistical Package for the Social Sciences (SPSS) indicated that the duration of the fortis consonants was significantly different ($p < .05$) in comparison to the consultant’s pronunciation of the lenis contrast (i.e. fortis phonemes are longer than their lenis counterparts). Since there was only one instance of fortis voiced alveolar lateral in our data set in the word [mã:³² l:e⁴ʔ], [l:] was excluded from the statistical analyses. Post hoc Student–Newman–Keuls testing for significant differences between the fortis–lenis pairings confirmed the results of the previous analysis.

Figure 1 illustrates the fortis–lenis contrast of [l: l] spoken by another consultant. The fortis token in [mã:³² l:e⁴ʔ] ‘hello, sister’ has a duration of 148 ms in comparison to its lenis counterpart in [wa: li³h] ‘he is small’ which is 104 ms. The fortis voiced alveolar lateral is 44 ms or approximately 42% longer in duration in comparison to the lenis voiced alveolar lateral. Although this difference is not quite as great as those found for the other fortis–lenis contrasts, unlike the other comparisons, the contrast measured here was used in running speech and not in isolated repetitions.

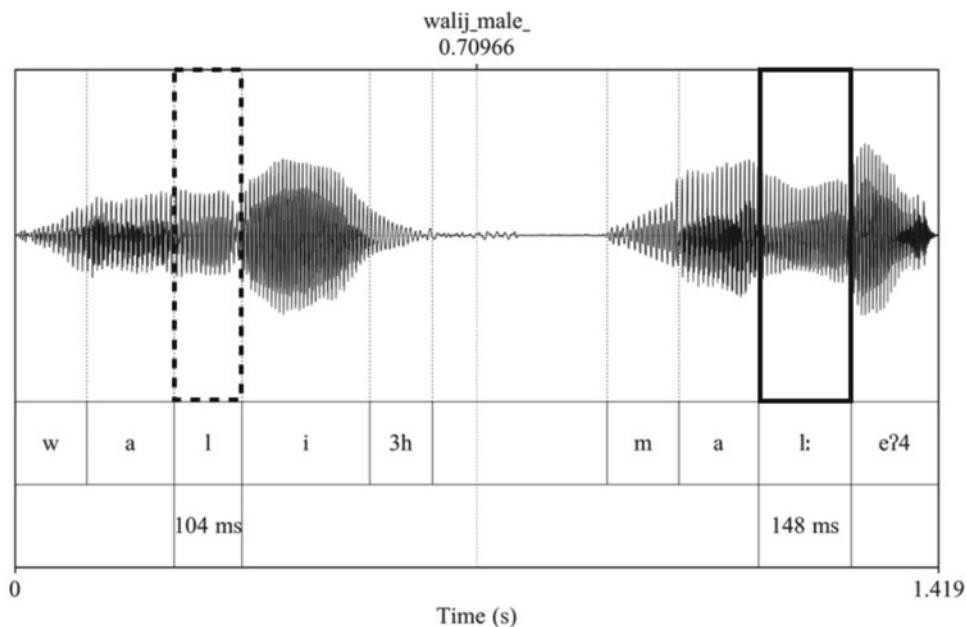


Figure 1 Spectrogram depicting duration of lenis /l/ in [wa:³² li³h] 'he is small' with fortis /l:/ in [mā:³² l:e⁴?] 'hello, sister'.

Tone

Chichahuaxtla Triqui has five basic tones (Ts) and from 10 to 15 tonal contours (Longacre 1957, Good 1979). In this Illustration, tones are designated from 1 to 5 superscripted, with 1 being the lowest and 5 the highest. Contrastive phonemic tone is generally found in word-final position except for some constructions such as the formation of the future and the past in which contrasting phonemic tone is generally found word-initially. The anticipatory mode (called potential in other investigations of Triqui and Mixtec) undergoes tone lowering in the aspectual prefix, [ga]-, [gi]- or [gV]-, with a concomitant lowering of tone in the final syllable, e.g. [ʃũ¹h a³?mi:⁴³] 'I speak – I am speaking', [ʃũ¹h ga³?mi:⁴³] 'I spoke', [ʃũ¹h ga²?mi:²] 'I will speak' by another consultant. Matsukawa (2009: 1) identified one rising tone /13/ and three falling tones /43 32 31/. Longacre (1957) reports two sequences of three-tone segments /323/ and /312/ in open syllables.¹⁵ Here we report on an additional three-tone segment of /353/ in [w:e:³⁵³] 'palm mat', listed in the examples below.

Elliott et al. (2012) provided a plot of Chichahuaxtla Triqui tones by extracting pitch trajectories (f0) for T5 through T1 using PRAAT v. 5.3.14 and plotting the results in MS Excel, see Figure 2. Based on the differences in semitones (with 0 set at 100 Hz), Elliott et al. (2012: 218) show that the differences in semitones between tone /1/ and tone /2/ (i.e. low tones) and tone /3/ and tone /4/ (i.e. mid-tones) are minimal. Tone /5/ (i.e. extra high tone) averages approximately 5 semitones higher at its peak in relation to /4/.¹⁶

¹⁵Longacre (1957) proposes the existence of a floating tone 3 following nouns, out of context, as here in [ku:⁵³] 'bone'. In Copala Triqui (Hollenbach 2008) it is manifested as [a:³²].

¹⁶Elliott et al. (2012: 221) report that the closeness in tones as shown in the tone plot in Figure 2 has prompted some teachers in the village to favor an orthographic system denoting three tone registers (high, medium and low) as opposed to marking all five tones and/or complex tone contours.

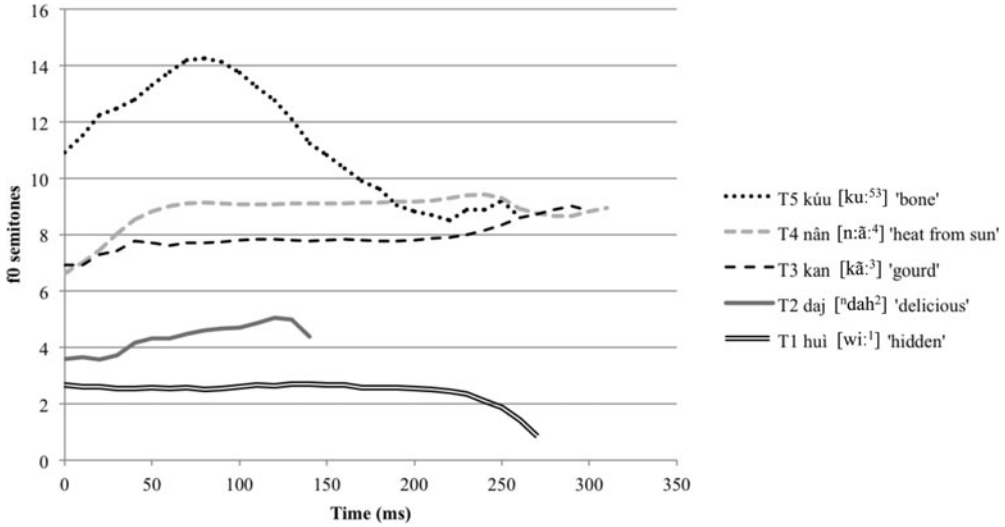


Figure 2 Chicahuaxtla Triqui tone trajectories (Elliott et al. 2012: 218, reprinted with permission) extracted from the following lexical items: T5 – [ku:⁵³] ‘bone’; T4 – [n:â:⁴] ‘heat from the sun’; T3 – [kâ:³] ‘squash’; T2 – [ʰdah²] ‘delicious’; and T1 – [wi:¹] ‘hidden’.

The following are tone examples in final syllable position in Chicahuaxtla Triqui:

Final syllable /N:/ tone samples

- 53 [za³tšũ:⁵³] ‘bread’
- 4 [gaŋo:⁴] ‘shirt’
- 3 [n:e:³] ‘plow’
- 2 [naŋo:²] ‘banana’
- 1 [wi:¹] ‘hidden’
- 45 [atçi:⁴⁵ si³h] ‘he asks’
- 43 [naŋga⁴³] ‘cadaver – corpse’
- 32 [n:e:³²] ‘water’
- 31 [n:e:³¹] ‘meat’
- 21 [nãne:²¹] ‘wind’ (other consultant)
- 13 [jo:¹³ si³h] ‘he is quick’

Final syllable /Vh/ tone samples

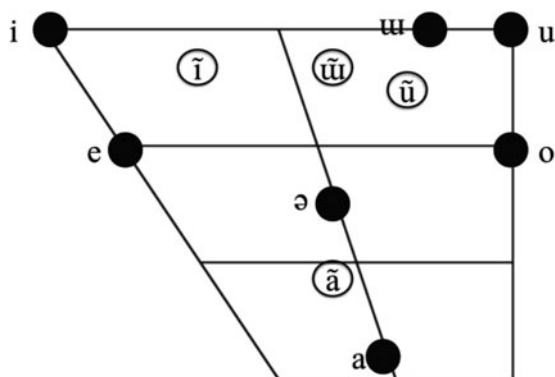
- 4h [we⁴h] ‘this (PRO)’ (other consultant)
- 3h [tšũ³h] ‘egg’
- 2h [m:â²h] ‘thick – big’
- 1h [ŋgo¹h] ‘deep voice’
- 32h [ku³²h] ‘dirty’

Final syllable /Nʔ/ tone samples

- 3ʔ [gũ³ʔ] ‘stink – smell’ (other consultant)
- 1ʔ [gã¹ʔ] ‘far’
- 2ʔ [tçi²ʔ] ‘ten’
- 32ʔ [tši³²ʔ] ‘we succeeded’

Final syllable /N/: three-tone samples

353	[w:e: ³⁵³]	‘palm mat’
323	[m:ĩ: ³²³]	‘sweet potato’
313	[m:ĩ: ³¹³]	‘bridge’
	[n:ĩ: ³¹³]	‘last night’ (other consultant)

Vowels

Chicahuaxtla Triqui has eleven vowels: seven oral vowels /i e ə u o u/ and four nasal vowels /ĩ ã ũ ũ/. Medial nasal vowels /ẽ õ/ exist but only surface as fused enclitics in morphophonological forms in verbs, possessed nouns, and adjectives (Elliott 2013, Hernández 2013), e.g. [ʰgã²nã²ruʰwẽ:³²³] ‘[he – she] will pay’, [si³ nã²fõ:²³] ‘[his – her] banana’, [jõ:³²³] ‘[he – she is] quick’.

Similarly to the Copala and Itunyoso Triqui variants (Hollenbach 1977, DiCanio 2010), Chicahuaxtla Triqui has no diphthongs. When two vowels occur, they are always pronounced as the nucleus of a separate syllable (Hollenbach 1977, Longacre 1952: 75 fn. 2). Spanish loanwords containing diphthongs and triphthongs may vary in their pronunciation depending upon the consultant. Some speakers may pronounce these sounds as they do in Spanish (i.e. as diphthongs or triphthongs), while others may pronounce them as labialized /k^w/ and /g^w/, e.g. [si³li⁴h sk^we³la:²] ‘student – scholar’ from the Spanish borrowing *escuela* ‘school’ or [g^wa¹ju:³] from *caballo* ‘horse’. Orthographically represented as <ë ĩ>, [ə u] mostly surface in final syllables, e.g. [ku³h u] ‘mountain – hill’ or [ə:⁴³] ‘what?’. [ə u] may surface in non-final syllables provided that the same vowel is found in the final syllable as well, for example, [ga³ku²ʔũ³] ‘sin; blame’ and [əʔə³²h ʃio⁴ʔ] ‘hiccough’. Longacre (1957) and Hollenbach (1977) found a similar restriction on the distribution of /o/ in both Chicahuaxtla and Copala Triqui, respectively, however no mention was made regarding the distribution of /ə u/.

Matsukawa (2012: 72) reports that [ũ] is not used by some speakers of Chicahuaxtla Triqui and is frequently pronounced by younger speakers as [ĩ]. Recent fieldwork carried out by Elliott (October–November 2012, July 2013 and November 2014) lends credence to Matsukawa’s claim. Consider the following examples:

[ũ] ~ [ĩ]	[ʃiʔnũ: ³]	‘huipil’
	[riʔni: ³]	‘huipil’ (other consultant)
	[ʔũ: ⁿ²]	‘nine’
	[ʔĩ: ⁿ²]	‘nine’ (other consultant)

Based on our data, pronunciation of /ə/ may vary (e.g. /ə ~ e/) for the same speaker, compare [əʔə³²h ʃio⁴ʔ] with [eʔe³²h ʃio⁴ʔ] ‘hiccough’.

Both oral and nasal vowels of Chicahuaxtla Triqui are plotted in the vowel diagram. The data for the vowel plot come from the mean of acoustic measures of F1 and F2–F1 for both stressed oral and nasal vowels produced by the male speaker. Several tokens for each nasal and oral vowel were recorded in isolated words – minimally three repetitions of each word. The number of tokens that were recorded and analyzed was determined by the number of occurrences we had.

/i/	[tsi: ³²]	‘corn on the cob’ (other consultant)
/e/	[tce: ⁵³]	‘bundle of firewood’
/ə/	[əʔə ³² h jio ⁴ ʔ]	‘hiccough’
/a/	[tʃa: ³]	‘tortilla’
/u/	[kuw ^{3h} u]	‘mountain – hill’
/o/	[tʃo: ³²]	‘swan’
/u/	[tʃu: ³]	‘dust – powder’
/ĩ/	[w:ĩ: ³²³]	‘[he – she] is’
/ã/	[kã: ³]	‘squash’
/ũ/	[dũ: ³⁵]	‘quiet’
/ũ/	[tũ: ³]	‘blood’

Transcription of ‘The North Wind and the Sun’

Broad transcription

[na³ne¹ ta³ ni² ja³ʔa²ah gwi³ / sũ³² ũnuʔũ³¹ nũ² na³ne¹ ta³ ŋga² ʃa³ʔã^{2h} gwi³ zaʒiʔi⁵ awĩ³ ʔŋgoʔŋgo² ŋgwe^{1h} si^{3h} nu²kwa^{3h} do^{3h} ŋga³ ga³tci⁴³ ʔŋgo³ si⁵ atce⁵ ne^{3h} zuma³ʔa³ wa^{32h} si^{3h} si⁵ dã^{3h} ni² ni²ke² si³ ze³to² wa^{32h} si^{3h} ga³ʔwe³ gutei³ ŋgwe^{1h} sa³tci^{2h} dã³ ʔŋgo¹³ nugwa³ʔã³ ni² ga³ta^{3h} ne^{3h} si^{3h} awĩ³ go³ʔŋgo³ gi²ʔja^{3h} ga²ʔne³ si⁵ mã^{3h} ze³to² ta^{1h} zitsa⁴ si^{3h} ni² we⁴ʔ ga²wĩ³ si⁵ nukwa^{2h} do^{3h} // uta³ nu²kwa^{3h} gu⁴zuma⁵ nane¹ ta³ sani² si⁵ dã⁵ ni² do¹ʔ si³ nanike³ we³ʔe⁴ si^{3h} ze³to² we⁵dã³ ni² giniʔi na³ne¹ ta³ ni² gaʔnu³ zua^{3h} we⁴ dã³ ni² gisi^{3h} gwi³ natʃa³ gatci³ʔi³ ni² gu³ʃu³ si⁵ atce⁵ zeto² ta^{1h} zitsa⁵ si^{3h} ju^{3h} dã³ nani³ʔi³ na³ne¹ ta³ si³si² ja²ʔa^{2h} gwi³ wĩ³ sa³² nu²kwa^{3h} do^{3h} //]

Narrow transcription

[nã³nẽ:¹ ʔa:³ ni:² ʃã³ʔẽ^{3h} ŋgwi:³ / sũ:³² ũnũ³²ũ³ nũ:³² nã³nẽ:²¹ ʔa:³ ŋgã¹ ʃã³ʔẽ^{3h} vwi:³ dʒaʒiʔi:⁵³ awĩ:³ ʔŋgõ³ŋgõ:² ŋgwe^{1h} si^{3h} nu²kwa^{3h} n̄do^{3h} ŋga:¹ ʔa³tci:⁴³ ʔŋgo:³ zi:⁴⁵ atce:⁵ ne^{53h} ʃuma³ʔa³ wa^{32h} si^{3h} si:³⁴ ðã:⁴ nĩ:³² ni²ke:² zi:³ ze³to:²³ wa^{32h} si^{3h} ŋga³ʔwe:³ ʔu³tci:³ʔ ŋgwe^{1h} sa³tci^{2h} ðã:³ŋgõ:¹³ nu³vãwã³ã³ nĩ:² ʔa³ʔa^{3h} ne^{3h} si^{3h} awĩ:³ ŋgõ³ŋgõ:³ gi²ʔja^{3h} fi a²ʔne:² si:⁵ mã⁵³fi ze³to:³² ʔa¹fi ʃĩʃa:⁴ zi^{32h} ni:² we⁴ʔ vã²wi:²³ zi:⁴⁵ nu³²kwa^{2h} ðo^{3h} // u⁴ʔa:³² nu²kwa^{3h} v⁴zũmã:⁵ nã³nẽ:¹ ʔa:³ zani:³² si:⁵ ðã:⁵³ nĩ:² n̄do¹ʔ zi:³ nã³nĩ³kẽ:³ we³ʔe:⁴ zi^{3h} ze³o:² we⁵ ðã:³ nĩ:² ʔĩ³nĩ³ĩ:³ nã³nẽ:¹ ʔa:³ nĩ:³² ŋgã³nũ³ zua^{3h} we:⁴ ðã:³ nĩ:² gi³zi^{3h} ŋgwi:³ nãʔʃa:³ gatci:³ʔi³ nĩ:³² gu²ʃu:³² zi:⁵ a³tce:⁵³ ʃeto^{2t} ʔa¹fi ʔĩʃa:⁵ si^{3h} ju³fi ðã:³ nã³nĩ³ĩ:³ nã³nẽ:¹ ʔa:³ zi³zi² ʃã²ʔã^{2h} hwi:³ wĩ:³ za:³² nu²kwa^{3h} ðo^{3h} //]

‘The North Wind and Sun’ in Spanish

El viento norte y el sol discutían sobre cuál de ellos era el más fuerte, cuando pasó un viajero envuelto en ancha capa. Conviniéron en que quien antes lograra obligar al viajero a quitarse la capa sería considerado el más poderoso. El viento norte sopló con gran furia, pero cuanto más soplabá, más se envolvía en su capa el viajero. Por fin el viento norte se dio por vencido.

Entonces brilló el sol con ardor e inmediatamente el viajero se quitó su capa; por lo que el viento norte tenía que reconocer la superioridad del sol.

'The North Wind and the Sun' in English

The North Wind and the Sun were disputing which was the stronger, when a traveler came along wrapped in a warm cloak. They agreed that the one who first succeeded in making the traveler take his cloak off should be considered stronger than the other. Then the North Wind blew as hard as he could, but the more he blew the more closely did the traveler fold his cloak around him; and at last the North Wind gave up the attempt. Then the Sun shone out warmly, and immediately the traveler took off his cloak. And so the North Wind was obliged to confess that the Sun was the stronger of the two.

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