

Texts and the grammar of tones: discoveries and challenges in the documentation of San Martín Itunyoso Triqui

Christian DiCanio
cdicanio@buffalo.edu

Department of Linguistics
University at Buffalo

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Where do you find grammatical tones?

Many tone languages possess morphological alternations where tones change. Such alternations are cases of *grammatical tone* (cf. Rolle (2018)). Examples below from Yoloxóchitl Mixtec (Palancar et al., 2016)

Morphology	‘to break’ (tr)	‘hang’ (tr)	‘to change’ (intr)	‘to peel’ (tr)	‘to get wet’
Stem	ta ³ ʔβi ⁴	tʃi ³ kũ ²	na ¹ ma ³	kwi ¹ i ⁴	tʃi ³ i ³
NEG	ta ¹⁴ ʔβi ⁴	tʃi ¹⁴ kũ ²	na ¹⁴ ma ³	kwi ¹⁴ i ¹⁴	tʃi ¹⁴ i ³
COMP	ta ¹³ ʔβi ⁴	tʃi ¹³ kũ ²	na ¹³ ma ³	kwi ¹ i ⁴	tʃi ¹³ i ³
INCOMP	ta ⁴ ʔβi ⁴	tʃi ⁴ kũ ²	na ⁴ ma ¹³	kwi ⁴ i ¹⁴	tʃi ⁴ i ⁴
1S	ta ³ ʔβi ⁴²	tʃi ³ kũ ² =ju ¹	na ¹ ma ³²	kwi ¹ i ⁴²	tʃi ³ i ²

We can discover many tonal-morphological alternations while eliciting paradigms (Hyman, 2014), but does a focus on elicitation in tonal fieldwork miss important contexts where tonal changes may occur?

Thesis

Examining tone in narrative/spontaneous speech texts can reveal deeper tonal alternations that one might not observe in an elicitation-based paradigm.

Grammatical tone does not simply “hide at the surface.” It may be deeply embedded into specific discourse or syntactic patterns.

For languages with morphological tone, text-based analysis should be included as a vital part of tonal analysis.

Outline

- 1 The Otomanguean family and Itunyoso Triqui tone
- 2 Easy-to-find morphological processes influencing tone
- 3 Hard-to-find morphological processes influencing tone
 - Topical marking
 - Optative marking
 - Relativized nouns
- 4 Relevance of processes to phonological theory of tone

The stages of tonal analysis (Hyman, 2014)

In **Stage I** the goal is to determine the surface tonal contrasts and their approximate phonetic allotones. This is first done by considering words in isolation.

In **Stage II** the goal is to discover any tonal alternations (“morphotonemics”) which may exist in the language. This can be done either by putting words together to make short phrases or by eliciting paradigms.

Stage III comprises the tonal analysis itself, the interpretation of what has been discovered in Stages I and II. At this point one typically draws on theoretical constructs and formal devices, e.g. autosegmental notation, to help express one’s insights as to how the tone system works.

An assumption in both Hyman (2014) and earlier work (Pike, 1948) is that it is only necessary to set the proper frame/paradigm for the realization of a morphological alternation and then to elicit the alternation.

Several types of morphological alternations can be low on a hierarchy of elicibility (Silverstein, 1979).

- Meithei (Tibeto-Burman) marks evidentiality and degree of assertion in its morphology and such categories are difficult to elicit overtly (Chelliah, 2001).
- Cup'ik affective suffixes appear in natural discourse but disappear in translation (Woodbury, 1998).

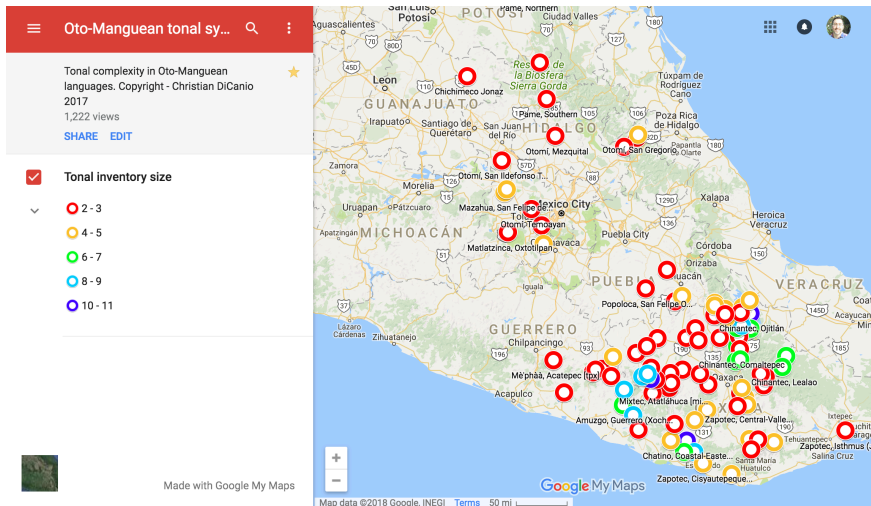
What happens when tonal morphology is similarly difficult to elicit overtly? You need to look at texts.

What is an Otomanguean language?

177 languages spoken in Southern Mexico; the largest language family in the Americas and the 9th largest in the world



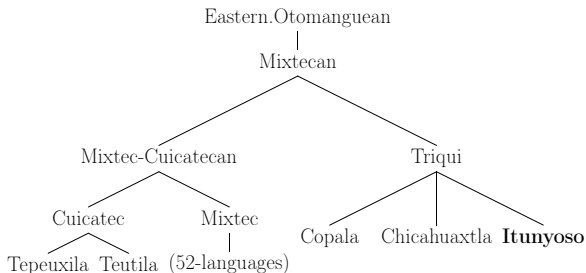
Tonal complexity in Otomanguean languages



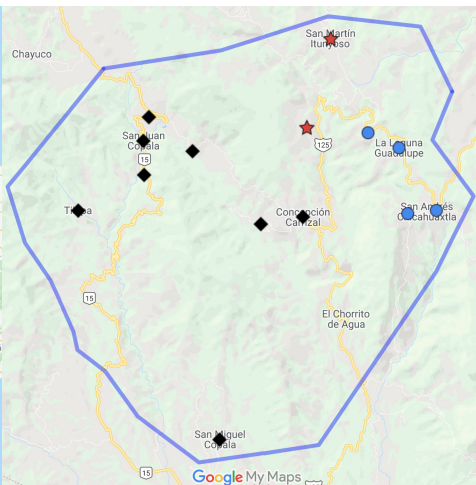
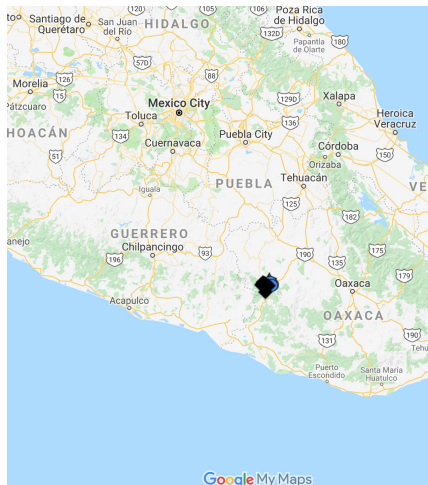
Triqui in Mixtecan

The Otomanguean stock is approximately 4,000 - 6,000 years old (Rensch, 1976) and the Mixtecan branch within the stock is 2,000 - 3,000 years old (Josserand, 1983).

Mixtecan languages are highly diversified. Colonial-era documents even discuss the extensive diversity of Mixtec languages (de Los Reyes, 1593).



The Triqui region



Itunyoso Triqui language documentation

- Fieldwork on phonological and morphological system: 2004 - 2008
- Literacy development and research on tone perception/production: 2009 - 2012
- Major documentation project: 2013 - present



A snapshot of Itunyoso Triqui

- Approximately 2,500 speakers (Instituto Nacional de Estadística y Geografía, 2015), most of whom are bilingual in Triqui and Spanish.
- Triqui is the dominant language within the community and is used in public meetings/announcements, in local commercial transactions, within families, and among children.
- Spanish is used in education and with outsiders to the community.

Itunyoso Triqui tone

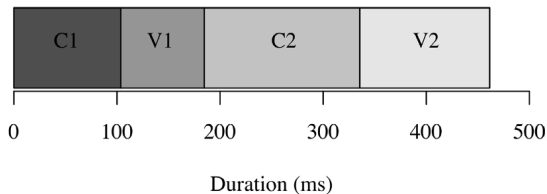
Tone has a heavy functional load, marking not only lexical contrast, but person, aspect, possession, and “other” categories. It is also used to mark partitives. However, there are no processes of tone sandhi across words (DiCanio, 2016).

Nine contrastive lexical tones in Itunyoso Triqui (4 level and 5 contour tones):

Tone	IPA	Gloss	Tone	IPA	Gloss
4	$\beta:e^4$	'hair'	43	li^{43}	'small'
3	$n:e^3$	'plough'	32	$n:e^{32}$	'water'
2	$n:e^2$	'to lie'	31	$n:e^{31}$	'meat'
1	$n:e^1$	'naked'	45	jof^{45}	'my forehead'
			13	jo^{13}	'light'

Phonological characteristics of Triqui words

1. Stem-final syllables have stress, which is phonetically realized via duration (DiCano, 2010) and phonologically realized by distributional asymmetries. All stem-final syllables are bimoraic.



Segments found in non-final syllables: /p, t, k, k^w, β, s, tʃ, m, n, l, r, j, i, e, a, u/
 Segments found in final syllables: /p, t, k, k^w, β, s, tʃ, m, n, l, r, j, i, e, a, o, u, ï, ù, ã, ⁿd, ⁿg, ⁿg^w, ^ʔm, ^ʔn, ^ʔr, ^ʔl, ^ʔj, ^ʔβ, ^ʔn^d, ^ʔn^g/

2. Tones can be divided by register (DiCano, 2008, 2016).

Tones in the upper pitch range = [+Upper]

Tones in the lower pitch range = [-Upper]

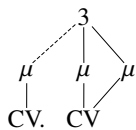
Tone Feature		Level Tone	Falling Tone	Rising Tone
+Upper	+High	/4/	/43/	/45h/
	-High	/3/		
-Upper	+High	/2/	/32/	/13/
	-High	/1/		

The morphology is sensitive to register. Words with lower register tones show different alternations than words with higher register tones.

3. Tones are asymmetrically distributed with respect to coda consonants (h, ʔ) (DiCano, 2008, 2016).

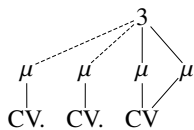
Tone	Open syllable		Coda /h/		Coda /ʔ/	
	Word	Gloss	Word	Gloss	Word	Gloss
/4/	yũ ⁴	‘earthquake’	yãh ⁴	‘dirt’	niʔ ⁴	‘see.1DU’
/3/	yũ ³	‘palm leaf’	yãh ³	‘paper’	tsiʔ ³	‘pulque’
/2/	ũ ²	‘nine’	tah ²	‘delicious’	ttʃiʔ ²	‘ten’
/1/	yũ ¹	‘loose’	kãh ¹	‘naked’	tsiʔ ¹	‘sweet’
/45/			toh ⁴⁵	‘forehead’		
/13/	yo ¹³	‘fast (adj.)’	toh ¹³	‘a little’		
/43/	ra ⁴³	‘want’	nnãh ⁴³	‘mother!’		
/32/	rã ³²	‘durable’	nnãh ³²	‘cigarette’		
/31/	rã ³¹	‘lightning’				

4. Tones are associated to the final syllable and then spread to the left.



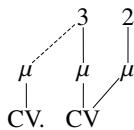
tʃu. ku

'animal'



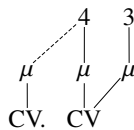
tʃi. ko. yo

'tadpole'



ru. ne

'bean'



ru. ne

'avocado'

The easy-to-find tonal changes

Person marking with tone

The 1S, 2S, and 1P/Du forms of words all involve tonal changes on the root.

Stem	Gloss	1S	2S	1P
(a) a ³ tʃi ³	'to peel'	a ³ tʃih ⁵	a ³ tʃi ⁴ =reʔ ¹	a ³ tʃiʔ ⁴
(b) so ³ ʔo ³	'be deaf'	so ³ ʔoh ⁵	so ³ ʔo ⁴ =reʔ ¹	so ³ ʔoʔ ⁴
(c) a ³ tʃih ³	'to grow'	a ⁴ tʃi ⁴³	a ³ tʃih ¹ =reʔ ¹	a ³ tʃiʔ ³
(d) ŋgah ³	'to lie down'	ŋga ⁴³	ŋgah ⁵ =reʔ ¹	ŋgoʔ ⁴

The 1S forms involve a toggle - if the stem does not contain a coda /h/, it is inserted. If they do contain a coda /h/, it is deleted. The tonal changes are rather complex and irregular here (DiCanio, 2016).

The easy-to-find tonal changes

Aspect marking

Verbs are marked for perfective or potential aspect. The potential aspect involves a tone change.

Gloss	'to bother'	'to grow'	'to explode'
HAB	tʃa ³ ʔjũh ³	a ³ tʃih ³	a ³ nĩ ¹
PERF	ki ³ -tʃa ³ ʔjũh ³	k-a ³ tʃih ³	ka ³ nĩ ¹
POT	ki ² -tʃa ³ ʔjũh ³	k-a ² tʃih ²	ka ¹ nĩ ¹

On vowel-initial roots, the potential usually changes the root's initial syllable tone to /2/. In certain cases, the entire stem changes to tone /2/.

The hard-to-elicited categories

Tonal changes with person morphology are quite complex. One needs to examine 400-500 paradigms before the patterns emerge clearly. This type of morphology dominates the fieldworker's time.

Additional rarer alternations occur which involve tonal morphology on the right edge of the stem.

- Topical third person
- Optative marking on verbs
- Tone and relativized nouns

Triqui text collection

- 289 texts, comprising approximately 29 hours of speech; 34 different speakers.
- 27 hours (264 texts) have been transcribed by our team, but only 8.8 hours (104 texts) have been checked over.
- Research pipeline: elicitation/description → text analysis → analysis of rarer alternations → additional elicitation
- Additional elicitation helps determine the phonological conditions on the tonal changes.

The topical 3rd person

When I started doing fieldwork on Triqui, there had been no work on the Itunyoso variant, so I tried to see if cognate morphologies from another variant existed.

Copala Triqui possesses a form of the 3rd person (generic) which is tonally distinct from the stem, e.g. /nawih³/ 'ended' > /nawi³/ 'he ended', /ku³nãh⁵/ 'ran' > /ku³nã³/ 'he ran.' (Hollenbach, 1984, 359).

Attempts at eliciting this form in Itunyoso Triqui were unsuccessful from 2004 - 2012, but....it exists!

The form is used to refer to a recent specific referent in the discourse and is ostensibly more restricted in Itunyoso Triqui than in Copala.

From text “How does one prepare to weave” by Carmen López González and Nieves López Guzmán, lines 47 and 65.

- (1) sa³ni² βe⁴ ke¹ ŋgo²yã² ũ²?ũ²?... ka³kĩh⁵ **bĩh³**
 but TOP exactly equal.to five... pegs **be.3TOP**

‘But it’s equal to exactly five... pegs it is.’

- (2) ni² riã³² tʃa¹kã¹ βe⁴ ta³ ŋgo² si³ ββih¹ si³ βa¹?nĩh¹ ma³ka¹ra¹
 and where be.wide TOP that one or two or three hand.measures
 βah³ **riãh³**
 go **face.3TOP**

‘And where one’s hands are wide, one or two or three measures go above it.’

Compare the 3PS forms with the stem forms /βĩ³/ ‘to be’ and /riã³²/ ‘above.’

The referent in (2) is the topic of the portion of the discourse - the warp of the loom when one is weaving. The unmarked 3rd person form is used to refer back to this entity.

In both example sentences, the referent used with the 3rd person form is inanimate, but this is not a requirement for using the form.

(3) tʃa⁴³ nĩʔ² sĩʔ³ ta³ pera ʔnah³
 eat.PERF PL child these pear come.3TOP

‘These children came and ate the pears.’

The stem form for ‘come’ is /ʔnaʔ³/, without a coda /h/.

(from text “The pear story” by Basileo Martínez Cruz, line 73.)

Why is this hard to find?

When referring to specific entities, speakers tend to use either the 3S.Masc /= sih^3 / or 3S.Fem /= ũh^3 / forms. For plural referents, they often use the generic 3P /= neh^3 /.

On verbs, this morphology refers to 3rd person entities recently mentioned in the discourse, but on nouns it refers to a recently mentioned possessor.

Elicitation of topical possession usually fails with speakers since referents in an elicitation paradigm are usually not backgrounded.

Topic marking is also optional!

Lines 10 and 14 of ‘*The man who was sent to the sun*’ by Rosa Marínez Santiago

- (4) nne³=sih³ tu³kwa⁴ tʃeh³ βi³ ta³ nne³=sih³
 sit=3SM house.of priest be this sit=3SM

‘He was in the priest’s house, that’s where he was.’

(Then the priest proceeds to give instructions to the man in the story.)

- (5) yeh¹³ a³ta³ ni² be⁴ ta³ ni² kã³ʔã³ ni² mã⁴³ saʔ¹
 yes **says.3TOP** and then **go.3TOP** and many good
 ma⁴yã⁴³=sih³ si²
 trick=3SM because...

‘“Yes”, said the man_i and then he_i went and he (the priest) played many good tricks because...’

In the same stretch of discourse, the same entity in the story (a poor man) is referenced using an overt pronoun (/= sih^3 / 3SM) and then with 3TOP. Both are backgrounded contexts.

The degree of backgrounding may vary. In the second example, the priest is marked with the 3SM pronoun, so it may be more unambiguous that a topical marker refers only to the poor man.

Speakers have an option to overtly mark an entity with either a gendered clitic pronoun or with a topic marker when they are backgrounded, but they will seldom use the topic marker. This tonal morphology is hard to elicit.

Tonal alternations with the 3TOP

Like the 1S clitic, the 3TOP involves a toggle with the coda /h/. If it is present in the stem, it is deleted. If it is absent, it is inserted.

Stem	Gloss	1S	3TOP
(a) a ⁴ tʃi ⁴³	'to pass'	a ⁴ tʃi ^h ⁴	a ³ tʃi ^h ³
(b) so ³ ʔo ³	'be deaf'	so ³ ʔoh ⁵	so ² ʔoh ³
(c) a ³ tʃih ³	'to grow'	a ⁴ tʃi ⁴³	a ³ tʃi ³
(d) ŋgah ³	'to lie down'	ŋga ⁴³	ŋga ³

Tone /3/ replaces the final syllable tone on the root and this associates leftward.

BUT, if a root has tones /2/ or /1/, the tone must append to the right edge, creating a contour.

Stem	Gloss	1S	3PS
(a) na ³ ko ¹	'to dry oneself'	na ⁴ koh ⁴	na ³ koh ¹³
(b) na ³ ni ¹ kah ¹	'be deaf'	na ³ ni ¹ ka ¹	na ³ ni ¹ ka ³
(c) a ³ ʔi ¹	'to be hurting'	a ⁴ ʔih ⁴	a ³ ʔih ¹³
(d) tʃa ³¹	'head'	tʃah ⁴	tʃah ³¹³

Rising contours are normally prohibited on the final syllable of a disyllabic word, but you can not replace a low register tone in Triqui. This creates some novel tonal contours.

Tonal constraints that are sensitive to register are rare but interesting since they demonstrate that tones have features - [\pm Upper] (Hyman, 2011; McPherson, 2017).

Optative reduplication

Itunyoso Triqui permits two constructions for the expression of epistemic modality:

(A) Use of /a³ʔβe³/ 'be able to' + Verb, e.g.

ka²ʔβe³ na²-ki³ʔyoʔ⁴
 POT.able ITER-fix.1P

'We'll be able to keep fixing it.'

(B) Use of reduplication on verb.

Stem	Gloss	POT	POT.OPT
(a) nne ³	'to sit'	ka ² ne ²	ka ² ne ² eʔ ⁴
(b) ko ⁴ ʔo ⁴³	'to drink'	ko ² ʔo ²	ko ² ʔo ² oʔ ⁴
(c) tʃa ⁴³	'to eat'	tʃa ²	tʃa ² aʔ ⁴
(d) rã ⁴ ʔãh ⁴	'to dance'	ki ² rã ² ʔãh ²	ki ² rã ² ʔã ² ãʔ ⁴

- Speakers will mark epistemic modality periphrastically using the verb 'able.'
- The simplest context for elicitation is as a complement of the verb 'ought to', e.g. ought to + optative = 'may they do X', though this was only discovered after seeing the process in examining texts.
- Very limited use - found only in three texts thus far (a couple speakers), both describe methods for preparation of items for personal use. The referent is generic, i.e. 'one can'

How do you form the optative?

1. Delete the stem-final consonant (h/?); e.g. /ʔyah³/ 'to do' > /ʔya³/
2. Reduplicate/Copy the vowel at the right edge of the verb; e.g. /ʔya³a/
3. This extra vowel carries tone /4/ and ends with a coda /ʔ/; e.g. /ʔya³aʔ⁴/

Interestingly, in a verb-noun compound, **both** the verb and the noun undergo these changes.

- (7) ta³ʔβi³i⁷4 si³ ki²-ʔya³a⁷4 sũ³ũ⁷4
ought.to.OPT that POT-do.OPT work.OPT

'May they/one/he/she work.'

- (8) ta³ʔβi⁷ʔ³=sih³ si³ ki²-ʔyah³ sũ³²=sih³
ought.to=3SM that POT-do work=3SM

'He ought to do some work.'

- (9) na²-ki²-ʔya³a⁷4 sa¹a⁷4
ITER-POT-do.OPT good.OPT

'May they/one/he/she fix (it).'

- (10) na²-ki²-ʔyah³ sa⁷1=sih³
ITER-POT-do good=3SM

'He is going to fix (it).'

Examples from texts show cases of the optative without potential aspect marking.

- (11) ni³ʔyãh³ sa¹aʔ⁴ neh³ kwe⁴nta⁴³ ko²ʔoʔ²
 serve good=OPT also for POT.drink.GER

'It also can work well for drinking.'

- (12) ...kwe⁴nta⁴³ ri³ʔya³aʔ⁴ ni² tʃoʔ⁴
 for boil=OPT and eat.1P

'...for boiling and (for) us to eat'

In (12), the speaker is describing how to prepare a medicinal plant. In (13), the speaker is describing an edible green. The implied sense is that one can boil the green as a possible way to prepare it.

(from texts 'Etnobiología de kkoj yaka' and 'Etnobiología de kkweej chabi' by Francisco Fernández López.)

This is phonologically odd!

Recall that only level tones may precede a glottal stop, /1, 2, 3, 4/
(DiCanio, 2008, 2010).

The main acoustic cue listeners use for perceiving glottal codas is vowel duration (DiCanio, 2014).

Yet with optative marking, the vowel is lengthened before a glottal stop and we observe otherwise unattested contours (/14, 24, 34/) on the stem-final syllable of the verb.

Morphological necessity may produce otherwise unattested tonal patterns (Hyman, 2016).

Relativized nominals

Just as texts can reveal a rarer morphological pattern with verbs, they reveal a rather specific pattern with nouns.

In Itunyoso and Copala Triqui, a pattern occurs where nominals show a tonal change when relativized (Broadwell, 2004). A similar process occurs in Itunyoso Triqui, e.g. /ru³ku⁴/ 'behind' > /ru¹ku¹/ 'behind which'

- (13) *ba*³² *ta*³*koj*⁵ *bbej*³² *ru*¹*ku*¹ *nan*³ *ni*²
 βa³² ta³koh⁵ ββeh³² **ru¹ku¹** nã³ ni²
 be foot cave behind.which here and

'It is at the foot of the cave, which is behind here.'

From "Story of the four dead people of San Martín Itunyoso" by Crispin Celestino Martínez, line 74.

What are the contexts for this alternation?

Embedded nominals in interrogatives

- (14) *un3 sin3 nnin23 ka3bih3 oh1*
 ũ³ sī³ nnĩ²³ k-a³βiʔ³ oʔ¹
 which person/thing mother.PP PERF-die WHQ
 'Of whom was the mother that died?'

- (15) *ka3bih3 nnin3=sij3*
 k-a³βiʔ³ nni³=sih³
 PERF-die mother=3SM
 'His mother died.'

'Of/to whom/which' constructions

- (16) *ni3hinj5 sinj5 rian2 koh3=reh1 sa3hanj2*
ni³ʔih⁵ sɪh⁵ riã² k-oʔ³=reʔ¹ sa³ʔãh²
 know.1S man face/to.PP PERF-give=2S money

'I know the man to whom you gave the money.'

- (17) *koh3=reh1 sa3hanj2 rian32 sinj5*
k-oʔ³=reʔ¹ sa³ʔãh² riã³² sɪh⁵
 PERF-give=2S money face man

'You gave the money to the man.'

Common with relational nouns in texts

Relative location is encoded via relational nouns in Triqui. This is a common feature of Mesoamerican languages (Campbell et al., 1986).

Nouns like 'face', 'back', 'stomach' encode directions like 'above', 'behind', 'underneath', e.g. /tʃi³rah⁵/ 'back/behind' > /tʃi¹rah¹/.

- (18) *nanh3 ri2hyun4=sij3 neh2 chi1raj1 ta1manj3*
nãʔ³ ri²ʔjũ⁴=sih³ neʔ² tʃi¹rah¹ ta¹mãh³
 return again=3SM towards behind.which way.over.there

'They (men) returned again towards the place which was behind way over there.'

(From '*The first municipal building*' by Pedro González Martínez and Crescencio de la Cruz Ramírez, line 51.)

But why so hard to find?

There are, again, multiple options for relativization of nominals and this optionality may contribute to the difficulty in finding this morphological pattern.

Speakers may choose to either produce a relative clause with a complementizer, /si³/, or to produce the forms with relativized nominals.

This morphology also does not readily fit into a nominal paradigm; it's a distinct syntactic context that conditions the tonal changes.

Phonological characteristics

If the stem tone is [+Upper, +High] (a)-(b), replace with tone /1/.

If the stem tone is /3/ ([+Upper, -High]) (c)-(d), replace with tone /2/.

If the stem tone is [-Upper] (e)-(f), no changes occur.

Gloss	Stem	Relativized stem
(a) 'nose'	ta ³ kĩh ⁵	ta ¹ kĩh ¹
(b) 'fingernail'	stĩ ⁴	stĩ ¹
(c) 'thing'	ra ³ sũ ³²	ra ² sũ ²
(d) 'family'	tu ³ k ^w iʔ ³	tu ² k ^w iʔ ²
(e) 'mask'	ja ¹ ʔnã ³	ja ¹ ʔnã ³
(f) 'knee'	si ³ ru ¹ ih ¹	si ³ ru ¹ ih ¹

Discussion: The relevance of texts for morphology

In Itunyoso Triqui, the contexts for rarer morphology are precisely those contexts for rarer tonology.

Apart from the optionality of the different processes, the processes which affect nouns do not fit neatly within a paradigm for person marking encoding person, number, and gender.

Processes like this are likely to be overlooked in research on tonal morphophonology with solely a paradigmatic focus.

Methods for conducting tonal fieldwork should also include text-based analyses.

Lost in translation

Difficulty in translation of certain morphemes may inhibit elicibility (c.f. Kim, to appear).

One can not elicit a backgrounded topic directly.

Translations for the optative marking rely on what is a periphrastic construction in Spanish, e.g. 'Se puede...', which will elicit the equivalent in Triqui (and the conditional and future verb forms in Spanish are always translated using the potential aspect in Triqui.)

Translateable equivalents depend on strongly balanced bilingualism. Most Triqui speakers are heavily Triqui-dominant.

Tonal discoveries

The morphological patterns observed in Triqui texts provide stronger evidence for a phonological distinction between tonal registers in the language.

“Because of its autonomy, feature systems that have been proposed, even those which relate tones to laryngeal gestures, are not reliable except perhaps at the phonetic level.” (Hyman, 2011, 14)

“However static constraints have never carried the same weight in feature analysis as patterns of alternation, the question being whether they are actually internalized as phonological rules by native speakers.” (Clements et al., 2011, 19)

The work here contributes to an emerging view that tones have features (McPherson, 2017), but one needs to look at languages with a sufficient number of tones to find them.

But why should we find evidence for tonal features here?

“In small inventories, basic gestures achieve perceptually adequate differences. Larger systems on the other hand place greater demands for intrasystemic distinctiveness and therefore recruit additional dimensions for elaborated and complex segments.” (Lindblom and Maddieson, 1988, 188).

Tonal features emerge in complex tonal systems with morphological tone.

Conclusions

- The analysis of texts is prone to uncover a larger set of alternations than one can find solely from exploring well-known paradigms.
- Given the complexity of the tonal inventory in Itunyoso Triqui and the high functional load of tone, such morphological processes will likely involve tonal alternations.
- Patterns of discovery in tonal languages are aided by exploring a wider set of contexts than previously discussed in established methodologies.

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