

## IPA illustration of Q'anjob'al

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This IPA illustration was written jointly by the seven members of the Fall 2008 Field Methods class at the University of Illinois and revised by the first author. It presents the consonants and vowels of Q'anjob'al, borrowed sounds, syllable structure, suprasegmentals, allophonic variation, and phonemic and phonetic transcriptions of the North Wind and the Sun story. All data is drawn from work sessions with a single Q'anjob'al speaker from Santa Eulalia, Guatemala.<sup>1</sup> Santa Eulalia is considered one of the more conservative areas linguistically (Raymundo et al., 2005); however, we found some phonetic changes associated with the more novel areas.

Q'anjob'al is a Mayan language of the mountainous Huehuetenango department of northwestern Guatemala, also spoken by diasporic communities in the United States. There are roughly 77,700 speakers of this language (Lewis, 2009; data from 1998). As a Mayan language, it belongs to a linguistic branch which also includes Chuj and Jakaltek.

One male speaker from the town of Santa Eulalia was our consultant for the development of this IPA illustration of Q'anjob'al. The transcriptions presented here use the IPA phonetic symbols. Where IPA symbols are not used, words are written in the standard orthography approved by the Academia de Lenguas Mayas de Guatemala, and verified in Sosa, Tuy, Aceytuno, & Sanic's (2003) dictionary wherever possible.

### 1. Consonants

Q'anjob'al has 25 phonemic consonants, shown in Table 1 below. All the sounds are pulmonic except for the voiced implosive /ɓ/. Voicing is not distinctive, but ejectives are.

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<sup>1</sup> We thank our consultant for his collaboration on this project and his patience in teaching us the sounds of Q'anjob'al.

Voicing		Bilabial	Alveolar	Post-alveolar	Retro-flex	Palatal	Velar	Uvular	Glottal
Unvoiced	Plosive	p	t				k	q	ʔ
	Ejective		t'				k'	q'	
	Ejec. Aff.		ts'	tʃ'	tʂ'				
	Affricate		ts	tʃ	tʂ				
	Fricative		s	ʃ	ʂ		x		
Voiced	Nasal	m	n						
	Approx.			l		j			
	Tap/Trill		r <sup>2</sup>						
Voiced bilabial implosive						ɓ			
Voiced labio-velar approximant						w			

Table 1. Phonemic consonants in Q'anjob'al

### 1.1. Stops and Affricates

The following near-minimal sets exemplify Q'anjob'al stop consonants and affricates:

Word	[IPA]	Gloss	Word	[IPA]	Gloss
paj	[pax]	sour	a'ej	[aʔex]	water
b'aq	[baχ]	bone	tzan	[tsan]	a few
taj	[tax]	pine tree	atz'am	[ats'am]	salt
t'aptoj	[t'aptox] <sup>3</sup>	big bite	cham	[tʃam]	Mr.
kami	[kami]	die	ch'an	[tʃ'an]	a little
k'oj	[k'ox]	mask	txamej	[tʂa:mex]	nose
q'oj	[q'ox]	stump	tx'an un	[tʂ'an un]	the paper

<sup>2</sup> While Barreno et al. (2005) list both tap and trill as phonemes, de Diego Antonio (1996) and Raymundo et al. (2000) list only a single rhotic tap. Raymundo et al. (2000) state that /r/ is a trill in initial environments, and a tap in final environments, as in Spanish. We have elected a single-phoneme analysis as no minimal pairs exist. See section 1.4.

<sup>3</sup> Stress falls on the last syllable of words in isolation, and also tends to fall on the last syllable of phrases. We have not marked stress in each transcription since it is not contrastive. For treatment of stress, see section 4.

All stop consonants can be found contrastively in syllable-initial and syllable-final positions, with the exception of /ʔ/. While many vowels in syllable-initial position are preceded by a /ʔ/, such as *a'ej* /ʔaʔex/, ‘water,’ in some cases the glottal stop does not appear, as in *hemasanil* /emasanil/, ‘everyone’. No minimal pairs were found distinguishing glottal stop word-initially. The glottal stop seems to be contrastive only between two vowels or word-finally, as in *no'* [noʔ] ‘animal’ vs. *na* [na:] ‘house’.

The traditional view is that in Q'anjob'al, as in other Mayan languages, all vowel-initial words begin with glottal stops (Barreno et al. 2005: 36). These word-initial glottal stops are not written because they are predictable; rather, an *h* is written before the few vowel-initial words that do *not* have a glottal stop. If an ergative marker is added as a prefix to a vowel-initial root, the glottal stop disappears (Barreno et al. 2005: 36). We found that word-initial glottal stops may also disappear in casual speech even without ergative affixation, but in careful speech word-initial glottal stops are generally present.

Non-ejective stop consonants /p/, /t/, /k/, and /q/ were typically found without release bursts, except when recorded in careful speech. This finding differs from Barreno, Mateo, & Pérez (2005: 26), who describe unreleased voiceless consonants as occurring only at the end of words following nonhigh vowels [e], [o], and [u]. We found no such vowel-based pattern in our recordings, but rather free variation with more unreleased than released nonejective voiceless consonants.

The voiced bilabial implosive /ɓ/ can be realized as unreleased [ɓ̚], especially word-finally, but voicing is usually visible in the spectrogram in this case. There are also some word-final devoiced realizations as [p̚]. In connected speech, the underlying /ɓ/ can be acoustically similar to pulmonic [b]. However, as no minimal pairs have been found, and in agreement with existing literature (Barreno et al., 2005: 31-32; Raymundo, Pascual, Mateo Pedro, Mateo Toledo, 2000), we list only a single phonemic /ɓ/. This sound often imparts a creaky quality to surrounding vowels, which is visible as irregular pulses in a spectrogram, as in Figure 1 below. This creakiness indicates glottalization.

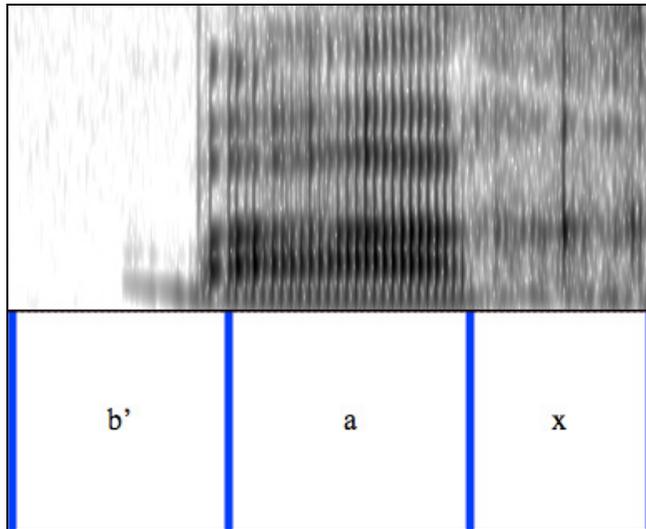


Figure 1. Spectrogram for [bax], showing irregular voicing bars at the beginning of [a]

We found alveolar /t/ realized as dental [t̪] word-finally, as in [sat̪], the classifier for fruit, which is not noted by other authors. In rare cases, /k/ is voiced intervocally as [g]. Ejective [kʰ] can sound quite similar to [qʰ], particularly before back vowels, as in the minimal pair [qʰox] ‘stump’ and [kʰox] ‘mask’. The [kʰ], however, is of higher frequency than the [qʰ], and the difference is also clearer before front vowels.

Barreno et al. (2005) and Raymundo et al. (2000: 31) both note variable realization of /qʰ/, listing uvular ejective [qʰ] and glottal stop [ʔ], as its typical allophones, in addition to velar ejective [kʰ] in two western communities. We found the basic [qʰ] pronunciation and realizations as glottal stop [ʔ], but we also found /qʰ/ becoming fricativized as uvular [χ] and [ɣ] in connected speech. While Raymundo et al. consider this fricativization to be a precursor to merger of /q/ with /x/ and /qʰ/ with /kʰ/, these phonemes do not seem to be merging in the Santa Eulalia dialect. Allophony of /qʰ/ will be elaborated in section 5, and can be seen in the variants of *kaqʰeʔ* /kaqʰeʔ/ ‘wind’ in the North Wind and the Sun passage, section 6.

The phoneme /q/ is undergoing weakening and loss in Q’anjob’al and other western Mayan languages (Barreno et al., 2005: 29). We found no direct evidence of the phoneme /q/ pronounced as [q]. Instead, we found it most often realized as the voiceless uvular fricative [χ], with some realizations as voiceless velar fricative [x]. This differs from Barreno et al.

(2005) and Raymundo et al. (2000), who list [χ], [qʔ], and [q] as allophones of the phoneme /q/. Since /q/ is a marker of irrealis or potential aspect, there are no monomorphemic words beginning with /q/ (Barreno et al. 2005: 30). In intervocalic and word-final positions, we recorded free variation between [χ] and [x] within the same words and phrases across repetitions. Careful speech favored [χ], while casual speech favored [x]. In the variety of Q'anjob'al spoken in Soloma, a larger town near Santa Eulalia, /q/ is thought to be merging with /x/ (Barreno et al. 2005: 54). We found that /q/ indeed seems to be no longer present as [q], but in the variety we recorded, it is still consistently distinguishable from /x/ because of its realization as [χ] in careful speech. Figure 2 shows such a fricative realization.

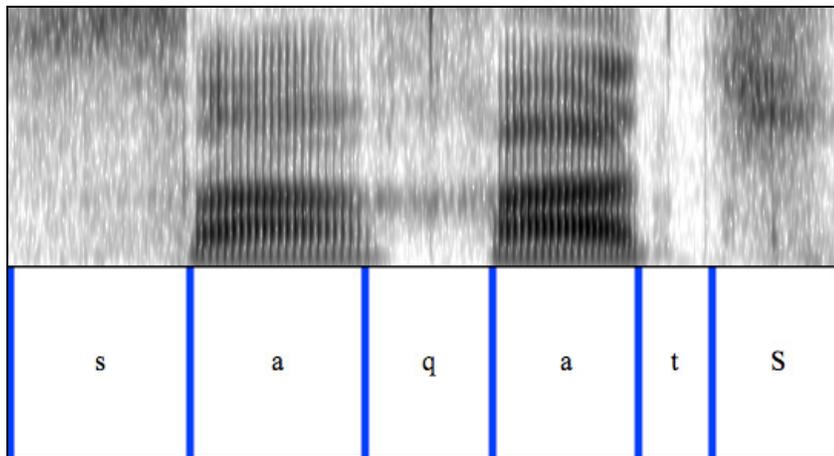


Figure 2. *saqach*, 'play,' showing fricativization of /q/: [saxatʃ]

The different pronunciations of /q/ and /qʔ/ vary regionally. Santa Eulalia is thought to be one of the more conservative towns, preserving [q] word-medially (Barreno et al. 2005:56) except before /j/ and sometimes before /b/, where it is realized as [χ] (Raymundo et al., 2000). However, our consultant, despite growing up in a hamlet of Santa Eulalia, has the more advanced pattern associated with Soloma and San Juan Ixcuy of fricativization in all environments. Whether this means that the phenomenon is advancing across the entire region, or is idiolectal, would require a larger study.

## 1.2. Fricatives

Q'anjob'al has four voiceless fricative phonemes: /s/, /ʃ/, /s̺/, and /x/ (Barreno et al., 2005). Evidence for each phoneme is presented in the following near-minimal pairs:

Alveolar vs. retroflex

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
asun	[asun]	cloud	yaxul	[jaʃul]	name of river
sik'	[sik']	cigar	xim	[ʃim]	spider
sat	[sat]	eye	xab'	[ʃa:ɓ]	hole
saqach	[saχatʃ]	play	xaxoj	[ʃaʃox]	thin
is	[is]	potato	ix	[iʃ]	woman

Alveolar vs. velar

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
is	[is]	potato	ij	[ix]	weevil

Alveolar vs. postalveolar

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
sik	[sik]	cold	xhi	[ʃi]	says

Retroflex vs. velar

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
xu	[ʃuʔ]	blow	jun	[xun]	one
ix	[iʃ]	woman	ij	[ix]	weevil
xaxoj	[ʃaʃox]	thin	pojajoj	[poxajox]	split

Retroflex vs. postalveolar

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
xilej	[ʃilex]	hair	xhi	[ʃi]	says

Velar vs. postalveolar

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
jun	[xun]	one	Xhunik	[ʃunik]	John

All fricatives can be found in initial, middle and final word position; in front of a vowel (#\_V), after a vowel (V\_#) or between vowels (V\_V).

A very interesting issue in Q'anjob'al is the contrast between retroflex [ʂ] and postalveolar [ʃ]. While retroflex [ʂ] is very common, postalveolar [ʃ] is rare—Sosa et al.'s (2003) dictionary lists almost ten times as many instances of [ʂ] as [ʃ]. A majority of words with postalveolar [ʃ] are older Spanish borrowings:

<u>Q'anjob'al</u>	<u>Old Spanish</u>	<u>Modern Spanish</u>	<u>Gloss</u>
mexha [meʃa]	[meʃa] <sup>4</sup>	mesa [mesa]	table
xhila [ʃila]	[ʃiʎa]	silla [sija]	chair
kamixh [kamiʃ]	[kamiʃa]	camisa [kamisa]	shirt
mexhtol [meʃtol]	[maeʃtro]	maestro [maestro]	teacher
xhalten [ʃalten]	[ʃarten]	sartén [sarten]	frying pan
Xhuxhep [ʃuʃep]	[ʃoʃef]	José [xose]	a name
kaxha [kaʃa]	[kaʃa]	caja [kaxa]	box
kaxhlan [kaʃlan]	[gaʎina] <sup>5</sup>	gallina [gajina]	hen

Examining the words above, the postalveolar [ʃ] seems to be an adaptation of the sounds [s] and [x] in (present-day) Spanish. This may seem unusual since both /s/ and /x/ are phonemes in Q'anjob'al. However, in the fifteenth century, words such as *dijo*, now pronounced [dixo], were realized with a prepalatal fricative as [diʃo], while /s/ used to have a more retracted apico-alveolar position as in [meʃa]. These sounds were very close articulatorily and acoustically and were confused by speakers of the era (Hualde 2005: 157; Penny, 2002). Thus, both these sounds were still similar to [ʃ] when the first conquistadores arrived in Zacaleu, Huehuetenango, in 1525 (however, it should be noted that there was little contact between the Q'anjob'al Maya and the Spanish, so all these borrowings may have passed through other Mayan languages first.<sup>6</sup>) The change in these fricatives over the history of Spanish explains why newer borrowings including *escuela* 'school,' the days of the week, and the

<sup>4</sup> Old Spanish had a contrast between voiced and voiceless fricatives. For instance, the medial fricatives in *mesa*, *camisa*, and both the initial and medial fricatives of *Josef* would have been voiced, but the contrast between voiced and voiceless fricatives was already being lost in Spanish in this time period (Penny, 2002).

<sup>5</sup> The status of *kaxhlan* as a borrowing of *gallina* vs. a native word is not clear to us, but the [ʃl] sequence could represent interpretation of the palatal lateral [ʎ] as both a palatal [ʃ] and a lateral [l].

<sup>6</sup> In *roxax* [roʃaʃ] 'rose', a borrowing of Spanish *rosa*, the *s* was adapted as a retroflex fricative rather than as a postalveolar fricative. This could be due to borrowing through a different intervening language.

Spanish number words maintain an alveolar [s] as in the modern Spanish pronunciation rather than being adapted as [ʃ].

But [ʃ] is not only found in borrowings—there are also native Q’anjob’al words with this sound:

wuxhta <span>q</span>	[wuʃta <span>χ</span> ]	‘my brother’
yalixh	[jali <span>ʃ</span> ]	‘small’
xhulq’ab’	[ʃulq’a <span>β</span> ]	‘whistle’
xholtoq	[ʃolto <span>χ</span> ]	‘eat only beans’

The clear cases of retroflex [ʃ] can be distinguished in spectrograms by a dark band around 2000 Hz (Figure 3 below), which is perceptible as a whistling sound. In contrast, [s] has a much higher frequency band, near 3000 Hz (Figure 4 below.)

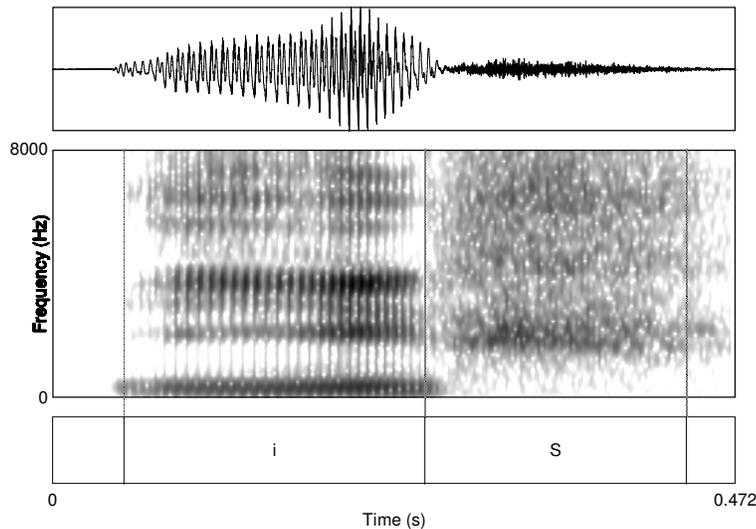


Figure 3. *ix* [iʃ] ‘woman,’ showing dark band near 2000 Hz

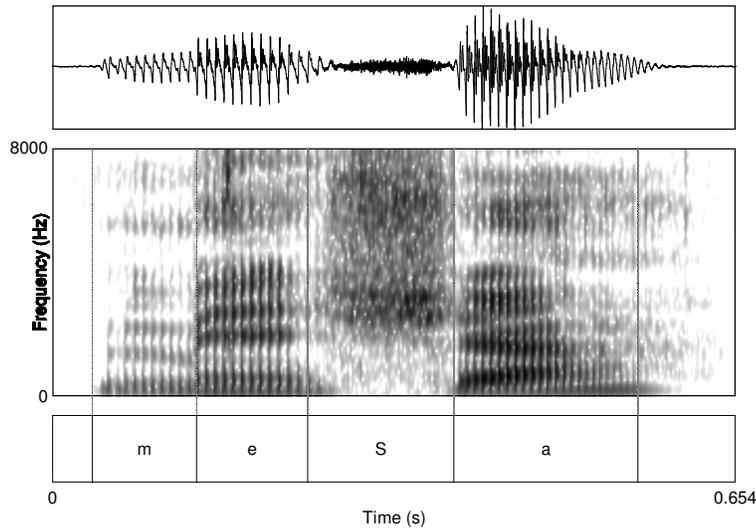


Figure 4. *mexha* [mɛʃa] ‘table,’ showing dark band near 3000 Hz

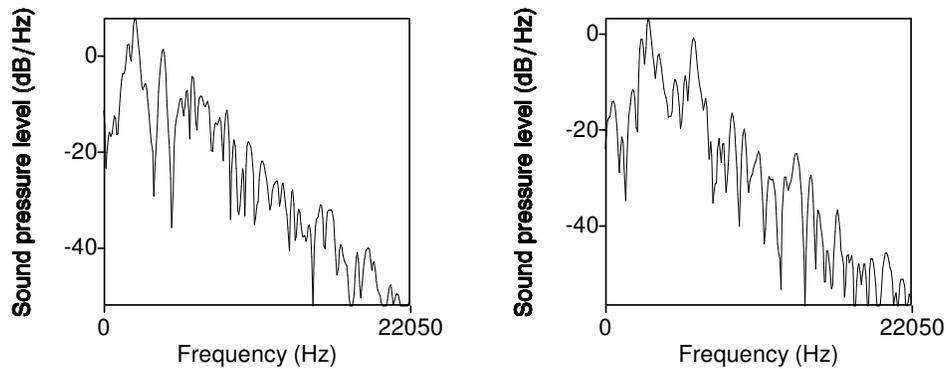


Figure 5. Spectral slices for [ʃ] (left) and [ʃ] (right)

Figure 5 above shows spectral slices for [ʃ] and [ʃ]. The retroflex has a center of gravity of 2893 Hz, while the postalveolar has a higher center of gravity at 4002 Hz.

### 1.3. Nasals

There are two nasal consonants in Q’anjob’al: bilabial /m/ and alveolar /n/. They occur both syllable-initially and syllable-finally. We were interested to see if velar nasal [ŋ] or uvular nasal [ɴ] were present in Q’anjob’al, whether phonemically or phonetically, given a relatively large inventory of obstruents that have the [+back] feature. We supposed that when an

alveolar nasal is followed by a velar or uvular obstruent, we are most likely to find a velar or uvular nasal. In the sequence of /n/+/k/ (such as in /xuninka/ ‘my teeth’), some velarization of the alveolar nasal is observed. Therefore, /n/ may have an allophone of [ŋ] when it is followed by a velar consonant. However, such a coarticulatory effect was not found in /n/+/q’/ (there is no sequence of /n/+/q’/ in our data). Barreno et al. (2005:39) describe both velar and uvular consonants as triggering a possible [ŋ] allophone. They also describe [ɲ] as an allophone of /n/ occurring before [j] and [m] as an allophone of /n/ occurring before [β], combinations which did not occur in our data. The formants of [N] should be evenly spaced with an 800Hz interval between them, but this is not found in /n/ that is followed by /q’/. We reason that the ejectives of /q’/ could “distort” the acoustics of /n/ if uvularization should occur, and are not able to conclude whether [N] is an allophone of /n/. This allophone is not noted in existing literature.

The examples below show initial and final near-minimal pairs for /n/ and /m/:

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
najat	[naxat]	far	pim	[pim]	thick
maktxel	[maktʂel]	who	q’in	[q’in]	party

#### 1.4. Liquids, Taps, and Trills

In terms of liquids, only the alveolar lateral /l/ is found. Note that there is no velarization of /l/ in the syllable-final position; in Q’anjob’al, /l/ retains alveolar constriction syllable-finally.

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
al	[al]	heavy	luqum	[luχum]	worm

We do not find any instance of tap /ɾ/, trill /r/, or retroflex /ɻ/ in words of Q’anjob’al origin. (Barreno et al. (2005:42) note that the /r/ of Proto-Mayan became /j/ in Q’anjob’al.) However, transfer of trill from Spanish is observed in the “North Wind and the Sun” text, in which our speaker pronounced the /r/ in norte (‘north’) as a trill. Sosa et al. (2003) list only four Q’anjob’al words beginning with /r/, three of which are direct borrowings (*repoya* from *repollo* ‘cabbage’, *Rap* from the name *Rafael*, and *roxax* from *rosa* ‘rose’); the fourth, *ranroni* ‘noise made by a motor’

is onomatopoeic and also a possible borrowing. The same pattern is found between /l/ and /r/ as between /s/ and /ʃ/: /l/ is much more common (over ten times as many instances of /l/ as /r/ are cited by Sosa et al., 2003); and /l/ is found as a nativization of /r/ in older Spanish borrowings:

<u>Q'anjob'al</u>	<u>Spanish</u>	<u>Gloss</u>
mexhtol [meʃtol]	maestro [maestro]	teacher
xhalten [ʃalten]	sartén [sarten]	frying pan
pale [pale]	padre [padre]	priest
chichalon [tʃitʃalon]	chicharrón [tʃitʃaron]	pork rinds

Like /s/, /r/ was nativized in some older borrowings. But words like *roxax* 'rose' and *ropil* (a typical short, heavy wool cloak or *capixay*; *ropil* is an adaptation of the word *ropa* 'clothing') are older borrowings in which the [r] was maintained. In newer borrowings including *Barillas* 'name of a city,' *norte* 'north,' *pero* 'but,' *treinta* 'thirty,' and *fevrero* 'february,' the original [r] or /r/ is maintained with the Spanish pronunciation. Unlike /s/ and /ʃ/, this discrepancy between older and newer borrowings is not due to any change in the Spanish pronunciation over time, but could be related to either borrowing through intermediate languages or to greater familiarity of Q'anjob'al speakers with Spanish as educational access has increased.

### 1.5. Glides

There are two glides in Q'anjob'al: /j/ and /w/. Both glides occur word-initially and (less commonly) word-finally. We think that the glide in vowel+glide combinations such as /ew/ in /tʃew/ 'snow' and /aj/ in /aj/ 'there is/there are' should not be full vowels /u/ and /i/, as the language has never been described as having any diphthongs (Barreno et al. 2005, Sosa et al. 2003, Raymundo et al. 2000). Spanish words with a diphthong such as 'Eulalia' (a name) are nativized with a glide rather than a diphthong: *Ewul*. Therefore, when these sounds occur syllable-finally, we consider them as off-glides. Glide examples are presented below.

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>	<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
yalan	[jalan]	under	waqan	[waʒan]	my foot
ay	[aj]	there is/are	chew	[tʃew]	snow

## 2. Vowels

Q'anjob'al has a five-vowel system, as can be seen in Figure 6 below. Near-minimal pairs are provided to support the phonemic status of these five vowels.

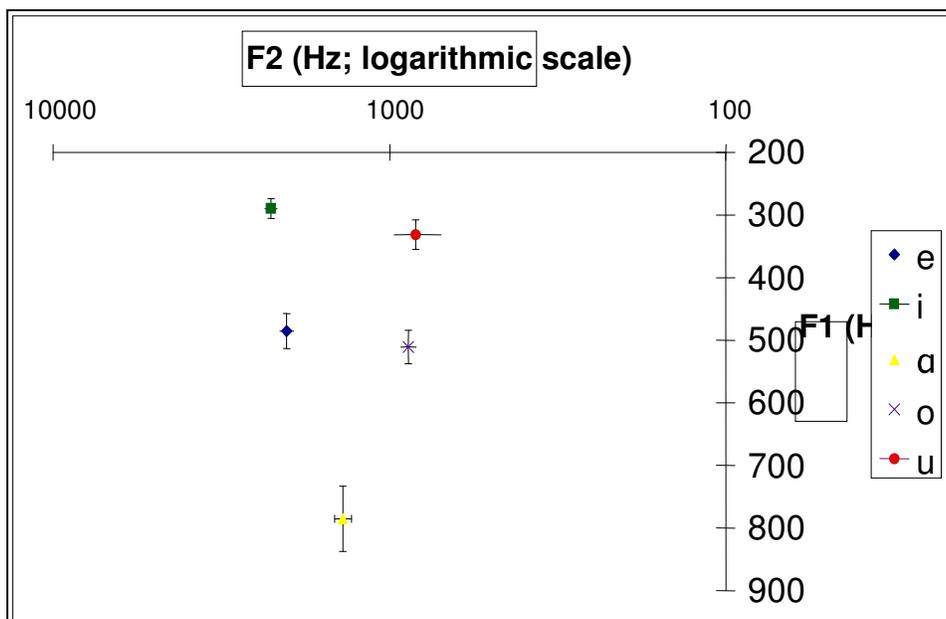


Figure 6. Formant values for phonemic vowels in Q'anjob'al.

Word	[IPA]	Gloss	F1 mean (SD)	F2 mean (SD)
jib'an	[xiβan]	on/above	290 Hz (16)	2254 Hz (92)
jet	[xet]	ours	485 Hz (28)	2024 Hz (95)
jab'il	[xaβil]	smell	785 Hz (52)	1378 Hz (79)
jotol	[xotol]	climb	511 Hz (27)	880 Hz (45)
junej	[xunex]	together	332 Hz (24)	836 Hz (132)

The vowel chart shows the frequency of the first formant on the vertical axis plotted against the second formant on the horizontal axis. The formant data were obtained from 20 VCV syllables (e.g., /iβi/, /eke/). Because we were concerned that production of nonsense syllables could be influenced by our consultant's Spanish or English phonology, we tried to provide a Q'anjob'al context (e.g., /eβe/ as in *t'eb'eb'i* /t'eβeβi/ 'soft', and /iki/ as in *tz'ikin* /ts'ikin/ 'bird') during the recording so as to reduce possible L2 influence. The place of articulation of consonants was controlled—bilabial, alveolar, velar, and uvular consonants are equally distributed. The

factor of voicing was not considered because no voiced obstruent is found in Q'anjob'al. Although ejectives were not controlled here, it is a variable to consider in further acoustic data collection. For each vowel in the chart, the perpendicular lines are the standard deviations of the formant values; the mean value is indicated where the two lines meet.

In terms of vowel length as a phonemic feature, we only managed to find one minimal pair for /i:/ and /i/, but since *yil* as 'take off' is not found in the dictionary, it may be dialectal. Other than that, no vowel length contrasts were found. This agrees with Raymundo et al. (2000), who find minimal pairs for vowel length only in San Miguel Acatán and San Rafael. Nasalization is not a relevant feature in the Q'anjob'al vowel system. No nasal vowels are found, and the nasalization of vowels in the vicinity of nasal consonants is noted in only one instance (see section 5).

<u>Word</u>	<u>[IPA]</u>	<u>Gloss</u>
<i>yil</i>	[ji:l]	take off
<i>yil</i>	[jil]	see

One of the greatest transcription discrepancies among the group members lies in transcription of /e/ vs. /ɛ/. Based on the formant characteristics, /e/ should be the phoneme, because it has a lower F1 than that of /ɛ/. In terms of possible allophonic variation of /e/, we first posited that /e/ alternates with /ɛ/ depending on the syllable structure (i.e., open vs. closed). However, as can be determined from the spectra of words like *penek* /penek/ 'knee' and *ch'enej* /tʃ'enex/ 'stone', /e/ does not seem to differ in formant patterns between open and closed syllables. Therefore, we tentatively claim that /e/ is the phoneme and has no allophonic variant.

Similar debate occurs with the transcription of tense [o] and lax [ɔ]. There are certainly some data where the vowel sounds more like [ɔ] than [o], for example, *jos* [xɔs] 'egg'. In most other cases, the extracted [o] sound is still acoustically approximate to a tense [o]; however, it is not diphthongized or long in duration. Additionally, upon examination of the spectrograms of words that have [o] in open syllables as well as closed syllables (e.g., *k'ojoch* [k'oxotʃ] 'cane'), no distinct formant pattern difference is found. In light of our current data, we consider the phoneme to be /o/.

### 3. Syllable Structure

Q'anjob'al licenses the following syllables:

V	/a/	a- <sup>7</sup>	topicalizer
VC <sup>8</sup>	/ɛb'/	heb'	'they'
CV	/na/	na	'house'
CVC	/noʔ/	no'	'animal'

Consonants in Onset position:

∅  
C

Consonants in Coda position:

∅  
C

As we can see, Q'anjob'al allows for up to one consonant in both the onset and coda positions. It does not seem to be the case that Cs in coda positioned are restricted; in other words, all Cs can be found in coda position. This is true as well for Cs in the onset position. For instance, even rarer sounds like /ʃ/ can be found word-initially in *xhi* 'says' and word-finally in *Anixh* 'Ana (a name).' The same is true of common sounds such as /b'/ and /q'/, found in any position in roots such as *b'aq'* 'seed' and *q'ab'* 'hand.'

#### 3.1. Evidence for CCV syllables

Barreno et al. (2005: 58) list some marginal examples with CCV syllables where the second C is restricted to /w/ (or /j/), as *Xhwin* [ʃwin] 'a name' and *nwej* [nwex] 'woman's brother.' We have not included these because, besides their rarity, we found them realized more commonly as two syllables: [ʃuwin] (*Xhuwin*, the spelling found in Sosa et al. 2003).

However, we found that syllables of the shape CCV may be created through affixation. In syllables of the shape C<sub>1</sub>C<sub>2</sub>V, it appears that certain tense/aspect markers such as *x-* /ʃ/ 'completive', and *ch-* /tʃ/ 'incompletive' are allowed in the C<sub>1</sub> position, as noted in Raymundo et al. (2000: 34-35). Both of these fricative tense/aspect markers exist in free variation with

<sup>7</sup> The topicalizer *a-* does not appear in isolation; however, V is still a licensed syllable type.

<sup>8</sup> Barreno et al. (2005) and other published sources do not list VC as a permissible syllable because most vowel-initial words begin with a glottal stop. However, all sources agree that orthographic *h* represents lack of an initial glottal stop, so in accordance with this we have listed VC as a permissible (while rarer) syllable.

syllabic variants *max-* [maɕ] for *x-*, and *chi-* [tʃi] for *ch-*, as in Figures 7 and 8 below. We posit that although syllables of the type CCV are found, because they are restricted and in free variation with CV.CV or CVC.CV, that CCV is not a true syllable shape allowed in Q'anjob'al. No evidence was found for CC in the coda position.

Figures 7 and 8 are spectrograms for two productions of *chi lowi*, /tʃi+/lowi/, 'eating.' Figure 7 shows the vowel being pronounced, and Figure 8 shows it being elided, creating a CCV syllable.

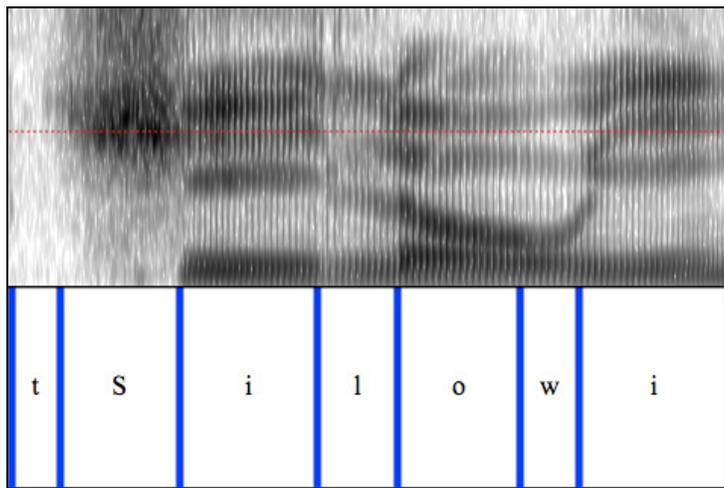


Figure 7. *chi lowi* 'to eat' with the vowel [i] pronounced: [tʃi lowi]

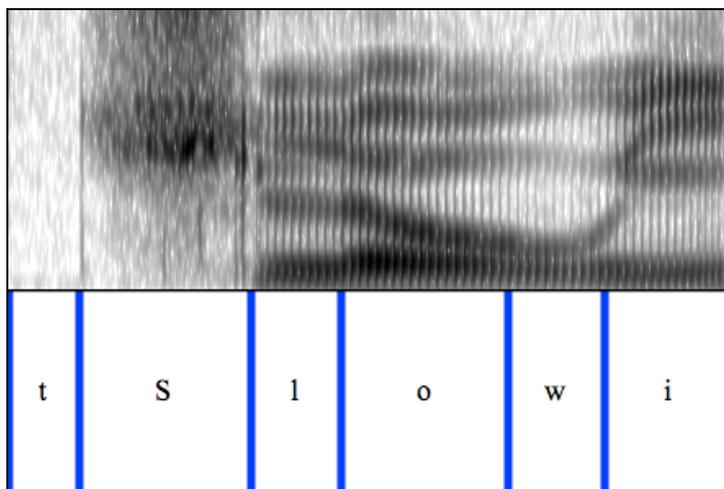


Figure 8. *chi lowi* 'to eat' with the vowel [i] elided: [tʃlowi]

## 4. Suprasegmentals

No evidence for lexical tone was found in Q'anjob'al.

In single word elicitation, word stress always occurred on the final syllable, in agreement with Barreno et al. (2005: 57). Therefore, our initial analysis was that words are always stressed on the final syllable. Exceptions to this occurred in Spanish borrowings such as *norte*, where both syllables appeared to be stressed. However, in the *North Wind and the Sun* passage, syllables other than the final syllable appeared to be stressed (see passage below).

The following are three phrases from the *North Wind and the Sun*<sup>9</sup>. Within, lexical stress is marked as ' , phrasal stress is marked with **bold** and pauses are marked with | .

a kaɛʔ 'nor|te 'q'al 'q'u | ma:ʃia'**leb'** | mak'tʃel jĩn kawãn eb' 'tu | kawal  
a'jip<sup>h</sup> | a'jet maʃ 'ektoɣ 'xun 'ekxawom | 'q'otbil ja'**sub'** |

One possible explanation for stress on the first syllable of words like /'ektoɣ/ could be related to a misinterpretation of word boundaries. The authors and the consultant were inconsistent in their placement of word boundaries during elicitation. However, this word is consistently produced with stress on the final syllable in isolation.

Another possible explanation is that syllables with ejective consonants receive secondary stress in larger discourse. Many of our examples with perceived stress on a syllable other than the final one in larger discourse contain ejective consonants, such as /'ek'toɣ/, and /'q'otbil/. Barreno et al. (2005) find that the accent is somewhat flexible, so there may also be some free variation.

Regarding intonation, a pattern emerges for elicited words in isolation. We find that in di- or poly-syllabic words, the final syllable of each word is stressed and accompanied by a slight rise in intonation.

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<sup>9</sup> This recording of these phrases is in a file named 'NorthWindandSun\_part1'

xolaq te'	[ʒolaχ 'tɛʔ]	'forest'
xumak	[ʒu'mak]	'flower'
a'ej	[ʔa'ʔɛx]	'water'

When recorded, declarative sentences such as “you are sleeping” and “are you sleeping” had similar intonation contours. The interrogative particle /ma:/ differentiated the two. Further investigation is needed to determine which aspects of intonation, if any, are relevant in Q'anjob'al questions.

tol chach wayi	[tol tʃatʃ waji]	'you are sleeping'
ma tol chach wayi	[ma: tol tʃatʃ waji]	'are you sleeping'

## 5. Allophonic variation

The speed of speech is one factor that may account for differences in the realization of a particular phoneme. We asked the consultant to produce passages at different rates of speed in order to investigate allophony. In this section we will generally consider the productions found in slower speech (in consultation with the written version, since the orthography is generally phonemic) to be phonemic, and the rapid speech phonetic representations as allophonic variants. It is acknowledged that slow speech may be stilted, but it still gives the listener and reader some insight into the consultant's intuitions about the appropriate articulation of an underlying sound. Processes of allophonic variation addressed in this section demonstrate assimilation, reduction and elision, deletion, and gliding.

### 5.1. Assimilatory processes

Assimilation is the process whereby one phoneme takes on some of the qualities of a neighboring phoneme. Anticipatory assimilation happens when a phoneme acquires place, manner, or voicing characteristics of a subsequent phoneme, “anticipating” it, and perseverant assimilation is the reverse—a phoneme acquires place, manner, or voicing characteristics of a preceding phoneme.

One example of anticipatory assimilation is in place of articulation. In example (1), we see the uvular /q/ front to a velar position to ease the articulation of the following /j/, a palatal glide.

- (1) opanoq yetoq 'the sun shined'  
/opanoq jetoq/ →<sup>10</sup> [opanoχ jetoχ] → [opanox jetoχ]

Barreno et al. (2005: 56) note that Santa Eulalia pronounces /q/ as [χ] before /j/, but do not describe the further fronting to [x] shown here. We see further evidence of this place assimilation in (2a) and (2b). The consultant was recorded telling a spontaneous rendition of the history of Santa Eulalia, which was transcribed phonetically. A week later, each word in the story (as transcribed by the consultant orthographically) was isolated, and the consultant was asked to record each word from an alphabetical list to avoid contextual influence. The original transcription in normal speed is shown in (2a), and the isolated words in (2b).

- (2) ch'il ay x-altoq y-uninal 'take their child'  
a. [tʃ'ilaiʃaltox juninal]  
b. [tʃ'ilaiʃaltoχ juninal]

Again, we have the final sound, /q/ pronounced as [χ], fronting to meet the /j/ that follows. Another form of assimilation is the voicing of a phoneme following voiced segments, as in (3), in which /k/ → [g] after /e/ in rapid speech.

- (3) ek'jab'wom<sup>11</sup> 'traveler'  
/ek'xawom/ → [egxawom]

Assimilation is also demonstrated in (4). Here there is voicing and frication of stops in rapid speech between voiced segments, although the order of processes is thus far unclear. However, based on (5), in which a voiceless uvular fricative undergoes intervocalic voicing, we can posit the fricativization before the intervocalic voicing as a hypothesis.

- (4) kaq'e' 'wind'  
/kaq'e'/ → [kaʁʔe] or [kaʁe]  
(5) junoq heb' 'one of them'  
/xunoχ εb/ → [xunoʁεb]

<sup>10</sup> Arrows indicate the conversion of underlying to surface forms, or of full forms to weakened forms. We make no claims about whether these processes are obligatory or universal; merely that they occur in the speech of our consultant.

<sup>11</sup> While Sosa et al. (2003) list *ek'jab'wom*, we never heard a [b] in this word, and the *k'* was pronounced as a non-ejective.

5.2. Reduction and elision

Reduction and elision appear to be the most common phoneme changes in rapid speech, through processes such as devoicing, degemination, fricativization, and loss. As has already been mentioned, there is evidence of unreleasing or devoicing of stops in word-final and syllable-final positions. Example (6a) shows /b/ unreleasing word-finally, while (6b) shows /b/ unreleasing syllable-finally before a following consonant.

- (6) a. nab'            'rain'  
       /na**b**/ → [na**β**']  
       b. kab'nal      'mountain men (Lacandones)'  
       /ka**b**nal/ → [ka**β**'nal]

We found no geminates within single morphemes in either elicitations or published sources. However, the same phoneme at the end of a morpheme may appear at the beginning of the following morpheme, as in example (7).

- (7) ek'toj jun            'he passed a...'  
       /ekt**oX** xun/

When these identical consonants occur next to each other, one of the sounds is sacrificed to degemination, resulting in (8) below.

- (8) ek'toj jun            'he passed a...'  
       [ekt**oX**un]

By comparing (8) with (9), we can see that all phonemes are retained (even fortified) in fast speech when two distinct consonants are adjacent:

- (9) yetoq masanil        'he folded all [his clothes]'  
       [jet**oX** masanil] → [jeto**X** masanil]

We have already seen how the uvular ejective is fricativized in rapid speech. Similarly, the velar ejective fricativizes in rapid speech, as shown in (10).

- (10) naq tolch(i) tek' naq pelota 'He is kicking the ball'  
 /naχ toltʃ tek' naχ pelota/ → [naχ toltʃ tex naχ pelota]

Another form of weakening or reduction is glottalization. In example (11), we see evidence of the velar fricative reducing to the glottal fricative (or arguably the voiceless semivowel) [h] in rapid speech. Variation between [x] and [h] for the phoneme /x/ was rather common.

- (11) lajoneb' 'ten'  
 /laxoneβ/ → [lahoneβ]

### 5.3. Loss

Loss is the endpoint of the weakening process, and occurs in Q'anjob'al in various ways. In example (12), we see deletion of a word-final nasal, with the nasality retained by the vowel:

- (12) aton 'that one'  
 /aton/ → [atõ]

Syncope, or vowel loss in a medial syllable, has already been demonstrated in environments such as (13), with certain tense/aspect markers added to consonant-initial roots, in section 3.1 above.

- (13) xi yochej 'they wanted to'  
 /ʃijotʃex/ → [ʃjotʃex]

Apocope (word-final deletion of a vowel) also occurs in rapid speech, as in (14).

- (14) /santa eulalia tu/ → [santa eulal tu]  
 'Santa Eulalia' + narrative marker

Other loss in rapid speech is the end result of a reductive process. We have already seen the unreleasing of word-final and syllable-final /β/; in very rapid speech this β is deleted, as in (15). Deletion also occurs in word-final environments with other stops, as in the [t] deletion in (16).

- (15) kab'nal /kabnal/ → [kaβ ˈnal] → [kaɲnal] 'mountain men'  
 (16) a yet /ajet/ → [ajeʔ] ~ [aje] 'when'

#### 5.4. Segmentation, onglides, and offglides

Onglides sometimes appear in Q'anjob'al when a word begins with a vowel that is not preceded by a glottal stop. In examples (17) and (18), we see the onglide [h] preceding the vowels. This may either provide a basis for the orthographic convention of writing *h* to represent lack of a glottal stop, or be a spelling pronunciation; though the first hypothesis is far more convincing given that our consultant learned to write Q'anjob'al as an adult.

- (17) heb'            ebʼ → <sup>h</sup>ebʼ            'they'  
 (18) hemasanil    ej masanil → <sup>h</sup>ej masanil    'all of them'

A common offglide is the labiovelar [w], which in (19) results from the partial perseverant assimilation of the labial stop to the following rounded vowel. While *w-unin* means 'my children,' in this context the consultant was telling a historical story rather than talking about his own children.

- (19) heb' unin      /eb unin/ → [eb<sup>w</sup>unin] 'the children'

We by no means suggest that the allophonic processes detailed above are comprehensive. However, the processes appear to be motivated by ease of articulation and contextually-salient cues.

#### 6. Transcriptions

The narrow, phonetic transcription of "The North Wind and the Sun" is based on an audio recording of the text as translated by our consultant in his own orthography. Educated only in Spanish, he taught himself to read and write as a young adult based on an older spelling standard found in an earlier published Bible. We have provided the modern standard spelling in 6.1 to the best of our ability, our consultant's orthography in 6.2, a phonemic transcription based on the rules of allophonic variation established above in 6.3, and a phonetic transcription in 6.4.

## 6.1. Standard orthography

Akaq'e' norte kal k'u max xhialeb' maktxel yin kawon heb' tu kawal ayyip, ayet max ek'toq jun ek'jawom q'otbil yaxub'. Max xiaq'eb jun laj q'anej maktxel junoq heb' b'ab'el xi je'e yionel yaxub' jun ek'jawom tu aton jun tu ayyip. Axa tu xin a kaq'e' norte xchaonoq ye'k xuyuyoq yetoq masanil yip kaxlajon ok yip yek xuyuyok kax ajun ek'jawom tu xin lajon q'ax ok yip mitz'onoq ya tz'ub' tu yin axa kaq'e' norte maxa yaq yip. A yet tu xin a yak'an k'u max elteq jopanoq yetoq masanil yipal ayman tu xin ajun ek'jawom tu ayman max yil yatz'ub' tu. Ajun kaq'e' norte tu xin xi yojtaqnej jantaq yipalil yak'an k'u tu.

6.2. Orthographic version<sup>12</sup>

A-caq'e norte g'al-g'u max-xialeb mactz'el yin-cawon eb-tù cauwal-ay-yip, a-yet max eg'to'k jun-eg'jawom g'utbil yax'ub. Max-xiaq'eb jun lajq'anej-mactz'el juno'k eb-babel xi-je'e yion-el yax'ub jun egjawon-tù aton jun-tù ay-yip. Axa-tu-xin a caq'ee-norte xchaon-o'k ye'g-xuyuyo'k ye-to'k masanil yip cax-lajon ok-yip yeg-xuyuyok cax a-jun egjawom-tù-xin lajon q'ax ok-yip mitz'on o'k yatz'ub tù-yin axa caq'e-norte max'a ya'k yip. A yet-tu-xin a yak'an-g'u ma'x elte'k jòp'ano'k yeto'k masanil yipal ayman-tu-xin a-jun egjawom-tù aiman max-yiil yatz'ub-tù. A-jun caqe'e norte-tù-xin xi yojta'knej janta'k yipalil yak'an g'u-tù.

## 6.3. Phonemic transcription

a kaq'e? norte q'al q'u maşşialeb' maktfel jin k'awan eb' tu kawal ajip ajet maş ektoq xun ekxawom q'otbil jaşub'. maşşiaq'eb' xun laxq'anex maktfel xunoq'eb' babel şixe? jionel jaşub' xun ekxawom tu atun xun tu ajip. aşatuşin a kaq'e? norte şitfaon ok jek şujujoq jetoq masanil jip kaşlaxon ok jip jek şujujoq kaş a xun ekxawom tu şinşilaxon k'aş ok jip mi:tf'un ok jaşub' tujin aşıa kaq'e? norte maşıa yak yip. ajet tu şin a jaqan q'u maş elteq xopanox jetoq masanil jipal aiman tu şin a xun ekxawom tu aiman maşjil jaşub' tu. a xun kaq'e? norte tuşin şi joxtaqnex xantaq jipalil jaqan q'u tu?.

<sup>12</sup> A note about orthographic convention: the consultant was asked to divide his written text into words. When the consultant grouped together two or more things that appeared with spaces between them in the original written version, a hyphen was used to connect the pieces.

#### 6.4. Phonetic transcription

a kʌɛʔ 'nor,te q'al 'q'u ma:ʃia'lebʔ maktʃel jĩn kawān ebʔ 'tu kawal a'jip<sup>h</sup>  
a'jet maʃ 'ektoχ 'xun ekxawom q'otbil ja'ʃubʔ. ma:ʃiaɛbʔ 'xun laxq'anex  
maktʃel xuno'ɛbʔ b̃abel ʃixeʔ jionel jaʃubʔ xun ekxawom 'tu atũn xũn tu  
a'jip<sup>h</sup>. aʃatu'ʃin a karʔeʔ 'nor,te ʃtʃaõn ok<sup>h</sup> jek ʃujujoχ jetoχ masa'nil jip  
kaʃ'laxõn ok jip jek ʃujujoχ kaʃ a xun ekxawom tu ʃinʃlaxon k'aʃ ok jip<sup>h</sup>  
mi:tʃ'un ok<sup>h</sup> jaʃubʔ tujĩn aʃa karʔeʔ 'nor,te maʃa yak yip. ajetʔ tu ʃin a:  
jaχān q'u maʃ elteχ xopa'nox jetoχ masanil jipal aimān tu ʃin a xun  
ekxawom 'tu ai'mā:n maʃji:l jaʃubʔ 'tu. a xun kʌɛʔ 'nor,te tu'ʃin ʃi  
'joxtaχnex xāntaχ 'jipalil jaχān q'u 'tuʔ.

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