

ACCENT IN USPANTEKO*

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1 INTRODUCTION

Mexico, Belize, Guatemala, and Honduras are home to about 30 Mayan languages spoken by over 6 million people. This project investigates the tone system of one of these languages, called Uspanteko (Tz'unun Kaab').

- As you might expect, the linguistic situation varies widely between these 30 languages.
- Some are large and robust, like K'ichee', which is spoken by more than a million people all over the western highlands of Guatemala (Richards 2003).
- Others, like Uspanteko, are in a much more precarious situation.
- Richards (2003) claims that there are 1231 speakers, and while this estimate is probably on the low end, there are likely no more than 2000 speakers.
- It is spoken in and around the municipality of Uspantán (Tz'unun Kaab'), which is surrounded by K'ichee' territory.
- Most Uspanteko speakers also speak K'ichee' and many children in the Uspantán area speak only K'ichee'.
- There are only a couple of villages, in an area called Las Pacayas, where everyone including the children still speak the language (Juan Us, p.c.).
- Documenting the phonology of Uspanteko is important, not just because the language is severely endangered, but because it is the only Mayan language in Guatemala to have lexical tone.

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- There is a grammar and a dictionary (Can Pixabaj 2006; Méndez and Oxlajuuj Keej Maya' Ajtz'iib' 2007), but the phonology is severely underdescribed.

Our current fieldwork is focused on the description and analysis of word-level accent in Uspanteko, which makes use of both **stress** and lexical **pitch accent**.

Core Proposal:

- Lexical tone in Uspanteko is a single H tone, *contra* Campbell (1977) and Can Pixabaj (2006).
- This lexical H tone always falls on the penultimate vocalic mora.
- Stress is normally word-final; but when pitch accent falls on the penultimate syllable, stress retracts to the penult as well.
- The result of tone-driven stress retraction is an iambic-trochaic foot shape reversal.
- Various tone-stress, tone-segment, and tone-morphology interactions can then be analyzed through the simple interaction of footing constraints and constraints barring final H tone.

An important orthographic note: We use standard Mayan orthography. The Mayan orthographic system is largely phonemic, with the following departures from the IPA consonant system:

	IPA	Standard Mayan
velar fricative	/x/	<i>j</i>
palato-alveolar fricative	/ʃ/	<i>x</i>
palatal approximant	/j/	<i>y</i>
palato-alveolar affricate	/tʃ/	<i>ch</i>
alveolar affricate	/ts/	<i>tz</i>
glottal stop	/ʔ/	'
glottalized consonants	/b̥/, /k̥/, etc.	<i>b'</i> , <i>k'</i> , etc.

2 TONE

This section considers the core properties of Uspanteko tone that we examine.

- Tone inventory
- Tone/stress interactions
- Tone/segment interactions
- Tone/morphology interactions

The Tone Inventory

The two previous treatments of Uspanteko tone propose that there are two distinct tones (Campbell 1977; Can Pixabaj 2006):

- An H tone that only occurs on penultimate short vowels [... CV^H.CV];
- and an L or falling tone that only occurs on final long vowels [... CVV^L].
- Long vowels only appear word finally, so there are no * [... CVV.CV(V)] words.

We simplify the tonal inventory, uniting both tones into a single H tone.

- The tone bearing unit (TBU) is the vocalic mora (μ_V).¹
- H tone accent can only appear on a non-final TBU, which is a well-attested property of H tones crosslinguistically (Yip 2002:29, 66, 90-1; Gussenhoven 2004:40).

For [... CV _{μ} [́].CV _{μ}] words: H surfaces on the penultimate light syllable because its nucleus is the rightmost non-final TBU.

- (1) Penultimate tone: [inplat] ‘my plate’ vs. [ínjla] ‘my ear of corn’

For [... CV _{μ} [́]V _{μ}] words: H can appear on a long final vowel because it can associate with its first mora, which is again the rightmost non-final TBU.

- (2) Final syllable tone: [siip] ‘tick’ vs. [síip] ‘gift’

We eliminate the L tone, which would (quite suspiciously) be in complementary distribution with H.

- Tone on long vowels is perhaps *perceived* as low or falling because the H target is on the first mora, and pitch may fall through the rest of the vowel (see e.g. Myers 1998).

Tone/Stress Interactions

Like other Quichean branch Mayan languages, default stress in Uspanteko is on the final syllable.

- (3) a. ixpaqar ‘toad’
 b. tiqabana’ ‘we’re doing it’
 c. xinlowisaaj ‘I sheperded it.’

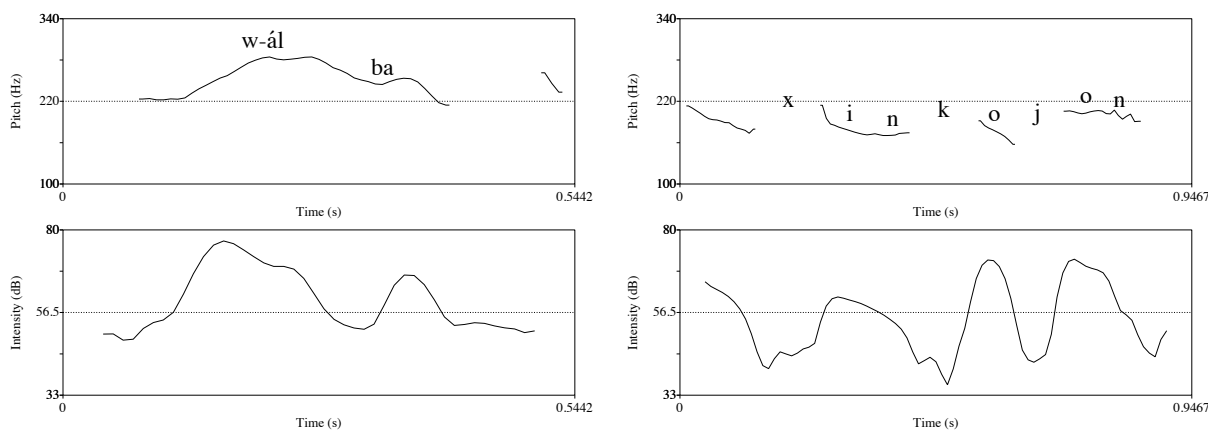
¹We need the vocalic mora because tone cannot fall on CV’C syllables, yet there is evidence that they are bimoraic. We discuss these facts in detail in appendix A.

If a word bears pitch accent, tone and stress must coincide, with tone placement taking precedence over default final stress.

- (4)
- wálib' 'my daughter-in-law'
 - áb'aj 'stone'
 - mú'xix 'bellybutton'
 - íwir 'yesterday'

We know that penultimate pitch accent is not merely stress shift. Note that penultimate high tones involve a pitch peak, while default stress does not:

- (5) Pitch (top) and intensity (bottom) for [wálba] vs. [xinkojon]



Non-tonal correlates of stress, like intensity, are similar in default final stress and penultimate stress triggered by H.

Tone/Segment Interactions

Tone interacts heavily with various segmental material. We find both segments that block tone realization, as well as segments that are correlated with its realization.

- While long vowels sometimes bear tone, long vowels can also block the realization of tone.
 - Possessive prefixes trigger an H tone (6), but it isn't normally realized on nominals with long vowels (7).

- (6)
- tz'i' 'dog'
 - ín-tz'i' 'my dog'
 - laq 'plate'
 - ín-laq 'my plate'

- (7) a. in-chaa ‘my obsidian’
 b. in-b’aaq ‘my bone’
 c. in-b’iis ‘my sadness’

- We see the same tone-blocking effect with CV’C syllables (where CV’C = [CV?C]).

- (8) a. in-ch’o’j ‘my fight’
 b. in-kuwa’y ‘my horse’
 c. in-ka’n ‘my animal’

Tone/Morphology Interactions

Finally, there are certain functional morphemes that bear an H tone.

Since tone has a phonologically restricted distribution, morphological tone almost never surfaces on the morpheme introducing it.

- (9) Possessive prefixes
- a. ixk’eq ‘fingernail’
 b. w-íxk’eq ‘my fingernail’
- c. aqan ‘leg’
 d. r-áqan ‘his leg’
- e. teleb’
 f. in-téleb’

- (10) *-ib*’ plural
- a. ajk’ay ‘seller’
 b. ajk’áy-ib’ ‘sellers’
- c. ajchak ‘worker’
 d. ajchá-k-ib’ ‘workers’

- (11) *-wu* VP focus clitic
- a. Kla’ xintíj-wu ‘It was there where I ate.’
 b. Lamaas wí-wu? ‘Where did you eat?’

- (12) Phrase final status suffix *-ik*
- a. xinchakun ... ‘I worked ...’
 b. xinchakún-ik. ‘I worked.’
- c. xinel ... ‘I left ...’
 d. xinél-ik. ‘I left.’

The case of possessive prefixes is especially interesting.

- The possessive prefixes are homophonous with the language’s ergative prefixes. . .
- . . .but ergative prefixes do not trigger tone when crossreferencing the subject of a transitive verb.

- (13) a. t-in-loq’
 INC-E1s-buy
 ‘I bought it’.
- b. *t-ín-loq’

The conclusion is that the H tone is associated with possession itself, and not with the ergative prefixes in general.

3 ANALYSIS

With the basic facts laid out, this section builds an analysis of Uspanteko tone.

Since there is only one tone, we assume that words bearing tone in the output are indexed with a floating H tone in the input.²

- The eventual placement of H is determined by surface phonological constraints.
- Consequently, it is irrelevant whether or not tone is underlyingly linked to a particular position.

- (14) a. /anim, H/ ‘woman’ → ánim
- b. /-ib’, H/ PLURAL → ajchákib

While H-indexing works well for specifying tones in the lexicon, there are certain cases where tone applies across a paradigm.

- In particular, possession is marked with *both* tone and ergative prefixes (e.g. (9) above).
- We don’t want to stipulate a whole separate set of tone-bearing ergative prefixes in the lexicon. Instead, we use the declarative constraint POSS = T.³

²See Yip (2002:§9.3), Gussenhoven (2004:§3.5), and Kubozono (2008:171) on related ‘diacritic’ approaches to tone and pitch accent.

³Yip (1998) proposes a similar analysis for possessive marking in English, but in the segmental domain. An alternative, not explored here, is to treat H tone as the exponent of genitive Case. POSS = T can then be thought of as a constraint requiring the phonological expression of genitive Case.


- (15) POSS = T
The feature POSS in the input is associated with a tone in the output.

With these features driving the introduction of tone, we now consider its distribution.

- First, we capture the generalization that tone is never final with the constraint NONFIN(T, TBU), which is undominated.

- (16) NONFIN(T, TBU)
H tone may not be associated with the final TBU in a word.

(17)

/ axix, H /	NONFIN(T, TBU)
a.  á.xix	
b. a.xíx	*!


We don't want to achieve tonal non-finality in terms of general extrametricality, because default stress is word-final.

- (18) a. alq'oom, *alq'oom 'thief'
b. mewa, *mewa 'fast' (Can Pixabaj 2006:14)

We saw that default final stress placement can be violated in the presence of tone, because stress and H tone *must* coincide.

- We capture this with the constraint *UNSTRESSED-H (de Lacy 2002): H tone must appear in a stressed syllable.

(19)

/ axix, H /	NONFIN(T, TBU)	*UNSTRESSED-H
a.  'á.xix		
b. á.'xix		*!
c. a.'xíx	*!	

If stress shifts one syllable leftward to align with tone, why not shift *two* syllables leftward?

- (20) a. in-chíkich 'my large basket'
b. *ín-chikich (Can Pixabaj 2006:61)

In other words, why is there no *antepenultimate* accent in Uspanteko?

- Solution: the distribution of tone and stress is strictly governed by *foot structure*.
- All feet in Uspanteko must be word-final (high-ranked ALL-FT-R).

- Assume that footing is iambic in Uspanteko.

(21) a. (chen.'kleen) 'lame'

b. (o.'keb') 'entry' (Can Pixabaj 2006:21-2)

- Stress is uniformly at the right edge of the word.

- There are no penultimate long vowels, so the only possible right-edge feet are (L H), (L L), (H), and (L).

- Tone-driven stress-shift is actually a tone-driven iambic-trochaic reversal, forced by the ranking *UNSTRESSED-H, NONFIN(T, TBU) ≫ IAMB.⁴

(22) No tone

a. (o.'kox) 'mushroom'

b. (chu.'kej) 'cramp' (Can Pixabaj 2006:24-5)

(23) Tone on long vowel

a. (in.'wúuj) 'my paper'


b. (in.'kúuk') 'my squirrel' (Can Pixabaj 2006:69)

(24) Tone on short vowel: iambic-trochaic reversal

a. ('lé.kej) 'up'

b. ('á.k'el) 'child' (Can Pixabaj 2006:59)


(25) No tone-stress interaction for long vowels

/ in + siip /	ALL-FT-R	NONFIN(T, TBU)	WSP	IAMB	POSS = T
a.  (in.'síip)					
b. ('ín.siip)			*!	*!	

siip - 'tick' (Can Pixabaj 2006:69)


⁴Foot-form reversals of this sort have also been proposed for Choctaw, Southern Paiute, Ulwa, Axininca Campa (Prince and Smolensky 1993/2004:58), Nanti (Crowhurst and Michael 2005), Takia (de Lacy 2007), and Awajún (McCarthy 2008).

(26) Tone on a short vowel drives iambic reversal: NONFIN \gg IAMB

/ lekej, H /	ALL-FT-R	NONFIN(T, TBU)	WSP	IAMB
a.  ('lé.kej)				*
b. (le.'kéj)		*!		

- Undominated ALL-FT-R blocks any leftward shift of foot boundaries, making antepenultimate accent impossible.
 - Uspanteko only allows perfectly right-aligned feet, essentially creating a two-syllable stress window at the right-edge of the word.

(27) No tone-conditioned rightward foot shift: ALL-FT-R \gg IAMB, ID(T)


/ léke-l-ik /	ALL-FT-R	NONFIN(T, TBU)	WSP	IAMB	ID(T)
a.  le('ké.lik)				*	*
b. (le.'ké)lik	*!				
c. ('lé.ke)lik	*!			*	
d. le(ke.'lík)		*!			*

lekélik - ‘to be high up’, from *lékej* - ‘high up’ (Can Pixabaj 2006:58, 124)

Long vowels are restricted to word-final position in Uspanteko.

- Ranking IDENT(LENGTH) below foot-structure constraints guarantees that long vowels will only appear word-finally.

(28) No non-final long vowels: ALL-FT-R, WSP, IAMB \gg ID(LENGTH)

/ x-r-elk'waal-aj /	ALL-FT-R	WSP	IAMB	ID(LENGTH)
a.  xrel(k'wa.'laj)				*
b. xrel('k'waa.laj)			*!	
c. xrel(k'waa.'laj)		*!		
d. (xrel.'k'waa)laj	*!			

xrelk'walaj - ‘I sired him/her’, from *alk'waaal* - ‘son’ (Can Pixabaj 2006:123)

- The only way a non-final long vowel can be prosodified is by violating ALL-FT-R, WSP, or IAMB, which all dominate ID(LENGTH)
- Iambic reversals *can* be conditioned by tone (high-ranked NONFIN(T, TBU)), but *not* by length (low-ranked ID(LENGTH)).

Potential problem: a non-final long vowel with underlyingly-specified tone is wrongly predicted to surface faithfully.

(29) Tone + length \neq non-final long vowel

/ júun-kitz /	NONFIN(T, TBU)	WSP	IAMB	ID(LENGTH)
a. ☹ ('jún.kitz)			*	*!
b. ☹ ('júun.kitz)			*	

júnkitz - 'a little' (Can Pixabaj 2006:58, 144)

Solution: *HL.

- Uneven ('H L) trochees are more marked than even ('L L) trochees (e.g. Prince 1991; Kager 1993, 1999; Mester 1994).

(30) Tone can't save non-final long vowels: *HL \gg ID(LENGTH)

/ júun-kitz /	IAMB	*HL	ID(LENGTH)
a. ☹ ('jún.kitz)	*		*
b. ('júun.kitz)	*	*!	

An interesting EMERGENCE OF THE UNMARKED effect: iambic-trochaic reversals are permitted *if and only if* they result in the least-marked trochaic form ('L L).

4 NOMINAL COPHONOLOGIES

There are a number of different sub-classes of possessed nouns in Uspanteko, which show different interactions between tone and vowel length.

4.1 SHORTENING UNDER POSSESSION

Some nouns show vowel shortening when they appear with a tone-bearing possessive affix.⁵

(31) a. kaa' 'mortar'
 b. ín-ka' 'my mortar' (Can Pixabaj 2006:53)

(32) a. teem 'chair'
 b. ín-tem 'my chair' (Can Pixabaj 2006:66)

⁵There are also some nouns that lengthen under possession, e.g. *k'áj* 'wheat' becomes *in-k'áj* 'my wheat' (Can Pixabaj 2006:70). Lengthening under possession is a common morphophonemic change in Mayan languages (see Dayley 1985 for Tz'utujil), and is almost certainly not phonological in character.

But vowel shortening isn't necessary to allow the realization of tone!

- Forms like **in-káa'*, **in-téem*, etc. are attested elsewhere in the language (cf. *in-cháaj*, *in-b'óot*, etc.; Can Pixabaj 2006:69)

4.2 NO TONE

Some nouns containing a long vowel fail to realize tone when possessed.

- (33) a. *chij* 'tape'
 b. *j-chij* 'his tape'
 c. **j-chíij*, **j-chij* (Can Pixabaj 2006:68)

- (34) a. *keem* 'weaving'
 b. *in-keem* 'my weaving'
 c. **in-kéem*, **ín-kem* (Can Pixabaj 2006:68)

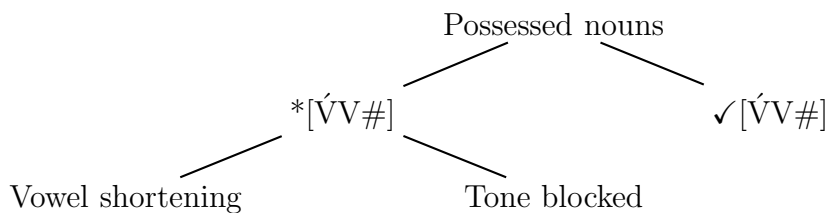
What do these forms have in common with nouns that shorten under possession?

- The output forms avoid having tone on a (final) long vowel.
- Not a fully general pattern: some possessed words do allow tone on a final long vowel.

- (35) a. *ooj* 'avocado'
 b. *aw-óoj* 'your avocado' (Can Pixabaj 2006:93)

Proposal: Uspanteko nouns are sorted into distinct cophologies.

- (36) Structure of Uspanteko noun cophologies



What constraint penalizes final long vowels bearing tone?


- $\text{NONFIN}(\text{T}, \sigma)$, a version of $\text{NONFIN}(\text{T})$ parameterized to the syllable rather than the TBU.⁶

⁶See Flack (2009) and Gordon and Applebaum (2010) for arguments that metrical markedness constraints can be parameterized to different levels of the prosodic hierarchy.

Required rankings:


- For nouns that undergo shortening, it's more important to satisfy $\text{NONFIN}(\text{T}, \sigma)$ than to protect underlying vowel length.
 - $\text{POSS} = \text{T}, \text{NONFIN}(\text{T}, \sigma) \gg \text{IAMB}, \text{ID}(\text{LENGTH})$.

(37) Vowel shortening under possession

/ in + kaa' /	$\text{NONFIN}(\text{T}, \sigma)$	$\text{POSS} = \text{T}$	$\text{ID}(\text{LENGTH})$	IAMB
a.  ('ín.kaa')			*	*
b. (in.'kaa')		*!		
c. (in.'káa')	*!			

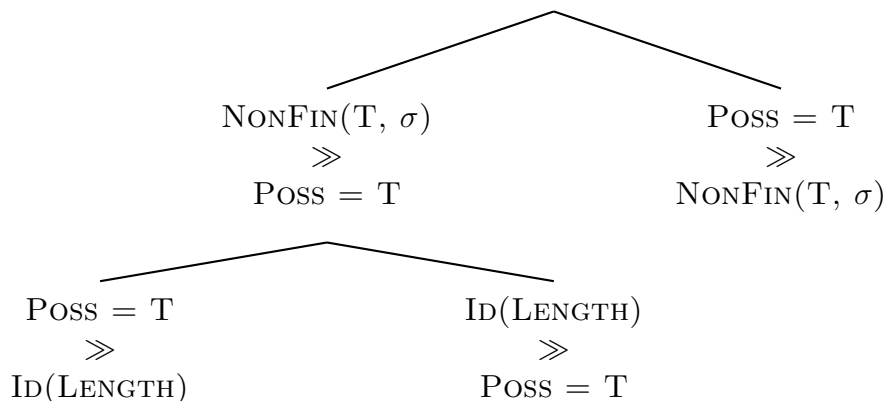
- For nouns that fail to realize tone, it's more important to preserve underlying vowel length than to mark possession with H tone.
 - $\text{ID}(\text{LENGTH}), \text{NONFIN}(\text{T}, \sigma) \gg \text{POSS} = \text{T}$.

(38) Tone realization blocked

/ in + keem /	$\text{ID}(\text{LENGTH})$	$\text{NONFIN}(\text{T}, \sigma)$	$\text{POSS} = \text{T}$
a.  (in.'keem)			*
b. (in.'kéem)		*!	
c. ('ín.kem)	*!		

- The difference between these two sub-classes lies in a re-ranking of $\text{IDENT}(\text{LENGTH})$ and $\text{POSS} = \text{T}$.
 - Shortening to realize tone: $\text{POSS} = \text{T} \gg \text{IDENT}(\text{LENGTH})$
 - No tone on long vowels: $\text{IDENT}(\text{LENGTH}) \gg \text{POSS} = \text{T}$
- The difference between the two major cophologies lies in a re-ranking of $\text{NONFIN}(\text{T}, \sigma)$ and $\text{POSS} = \text{T}$.
 - $\checkmark[\acute{\text{V}}\text{V}\#]$: $\text{POSS} = \text{T} \gg \text{NONFIN}(\text{T}, \sigma)$
 - $*[\acute{\text{V}}\text{V}\#]$: $\text{NONFIN}(\text{T}, \sigma) \gg \text{POSS} = \text{T}$

- (39) Uspanteko noun cophonologies: a partial-ordering model (Anttila 2002, Inkelas and Zoll 2007, among others)



5 CONCLUSION

- Uspanteko contributes valuable data to the typology of accent systems.
 - Uspanteko makes use of *two* distinct non-iterative accent systems.
 - Unlike other accent systems that combine stress and tone (e.g. Stockholm Swedish, Gussenhoven 2004:210), toneless words are permitted in Uspanteko.
 - But unstressed words are *not* permitted.
 - Uspanteko thus simultaneously instantiates both an obligatory accent system (stress) and a non-obligatory accent system (pitch accent) (Hyman 2006).
 - Both systems are governed by strict constraints on foot structure.
 - Foot structure has major ramifications for segmental phonotactics, despite the relative simplicity of the foot system itself.
 - Indeed, the foot is central to Uspanteko phonology, even though stress placement (by itself) provides little or no evidence for foot structure in the first place!

- Tone and vowel length interact in a non-uniform way in Uspanteko nouns.
 - Some nouns, but not all, ban tone from appearing on a word-final syllable.
 - This otherwise intractable data can be elegantly captured using cophologies.
- Uspanteko provides clear evidence that tone placement can be subject to non-finality requirements holding at different levels of the prosodic hierarchy.
 - Uspanteko shows that NON-FINALITY(TONE) can be active at the level of the TBU and the syllable.
 - What about higher levels of the prosodic hierarchy?
 - Previous authors have argued that antepenultimate accent in Tokyo Japanese should be analyzed using an ‘extrametrical’ final foot.
 - Compound accent (Poser 1990, Kubozono 1995, *et seq.*)
 - Default accent in native and loanword vocabularies (e.g. Kubozono 2008)
 - Jazz musician reversal argot (‘zuuja-go’; Itô, Kitagawa, and Mester 1996)

(40) ‘Extrametrical’ final feet in Tokyo Japanese compounds (Poser 1990)

a. nuno ‘cloth’ + fukuró ‘bag’ → nuno-búkuro ‘cloth bag’

(i) [nu.no.bú(ku.ro)]

b. sato ‘village’ + kokóro ‘spirit’ → sato-gókoro ‘homesickness’

(i) [sa.to.gó(ko.ro)]

- We reinterpret foot-level non-finality effects in Tokyo Japanese as the satisfaction of NONFINALITY(T, FT) (see especially Kubozono 1995).
 - Taken together, Uspanteko and Tokyo Japanese round-out the typology of tonal non-finality effects across the lower levels of the prosodic hierarchy.

A CV'C SYLLABLES AND DISAPPEARING TONES

When a tonal morpheme attaches to a word ending in a [CV'C] syllable, tone fails to be realized (Can Pixabaj 2006:67).

- (41) a. kar 'fish'
 b. ín-kar 'my fish' (Can Pixabaj 2006:64)

- (42) a. ka'n 'animal'
 b. in-ka'n 'my animal'
 c. *ín-ka'n

- (43) a. ch'o'j 'fight'
 b. in-ch'o'j 'my fight'
 c. *ín-ch'o'j

- (44) a. q'a'm 'staircase'
 b. in-q'a'm 'my staircase'
 c. *ín-q'a'm

In some forms, underlying [CV'C] becomes [CV'] when tone appears (Can Pixabaj 2006:57).

- (45) a. q'u'n-iik 'wool coat'
 b. ín-q'u' 'my wool coat'
 c. *ín-q'u'n

- (46) a. ti'n-iik 'meat'
 b. ín-ti' 'my meat'
 c. *ín-ti'n

- Nouns undergoing such final C deletion are normally inalienably possessed nouns.

The proposal: [CV'C] syllables create a clash between stress-placement constraints and tone-placement constraints.

- Some forms repair this clash by tonal deletion.
- Some forms repair this clash by segmental deletion.

Why would [CV'C] syllables affect stress placement?


- Assume that [CV'C] syllables are *bimoraic*.
 - Like long vowels, [CV'C] syllables are only found word-finally, i.e. in stressed syllables (Can Pixabaj 2006:72-75, 90).

- Some [CV'C] roots alternate with [CVV] allomorphs (though the details need to be worked out; Can Pixabaj 2006:77).

- (47) a. j-**po't**=aq ~ j-**po**=t'aq 'their blouses'
 b. j-**to'q**=aq ~ j-**to**=t'aq 'their diaper'


- Final [CV'C] syllables should attract stress if heavy/bimoraic (WSP).
- If tone appears, it must appear on a stressed syllable (*UNSTRESSED-H).
- A [CV'C] syllable would have tone on the penultimate mora, but on the *ultimate* TBU (= **vocalic** mora μ_V), violating NONFIN(T, TBU).
 - Words containing both a tone and a [CV'C] syllable must thus violate either (i) WSP, or (ii) NONFIN(T, TBU).
 - Non-realization of tone (violating POSS = T or ID(T)) satisfies both WSP and NONFIN(T, TBU).

(48) Final [CV'C] blocks tone realization: low-ranked POSS = T

/ in + ka'n /	NONFIN(T, TBU)	WSP	*UNSTRESSED-H	POSS = T
a.  in.'ka'n				*
b. ín.'ka'n			*!	
c. 'ín.ka'n		*!		
d. in.'ká'n	*!			

- What about forms that delete the final consonant of a [CV'C] syllable to allow tone to surface?
 - Cophonology: these forms are subject to the ranking POSS = T \gg MAX-C.

(49) [CV'C] forms with C-deletion

/ in + ti'n /	WSP	NF(T, TBU)	*UNSTR-H	POSS = T	MAX-C
a.  ín.ti'					*
b. in.'ti'n				*!	
c. ín.'ti'n			*!		
d. in.'tí'n		*!			
e. 'ín.ti'n	*!				

- Note that tone *can* appear on a [CV'C] root when it is followed by a vowel-initial suffix, i.e. when resyllabification breaks up the [C] coda.

- (50) a. wá'l-ik → [wá'.lik] 'stopped'
 b. x-at-wí'n-k → [xat.'wí'.nik] 'you ate' (Can Pixabaj 2006:60, 203)

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