

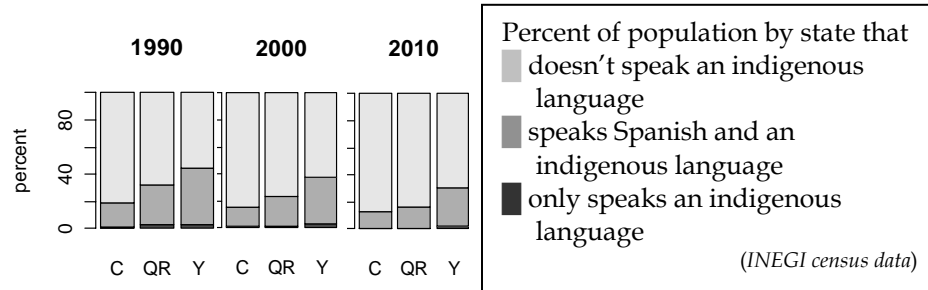
# FROM STRESS TO TONE: LOANWORDS IN YUCATEC MAYA

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## 1. INTRODUCTION

(1) Yucatec Maya (YM) is a Mayan language spoken by 706, 405 people in Quintana Roo, Yucatan, and Campeche, Mexico (2010 INEGI census).



- Most YM speakers also speak Spanish (Sp).

(2) Many YM words have been borrowed from Sp.

Some examples from Bricker et al. (1998):

deber	>	debèer	<i>should</i>
cebolla	>	sebòoyah	<i>onion</i>
hora	>	?òorah	<i>hour</i>
más	>	màas	<i>more</i>
santo	>	sàantoh	<i>saint</i>

*NB: Throughout this handout I use standard Sp orthography for Sp words; when appropriate stressed syllables are underlined. I use a slightly modified YM orthography for YM words; I specify word-initial glottal stops and low toned vowels (neither of which are normally marked in the written language).*

(3) Some phonological differences between YM and Sp:

	Spanish	Yucatec Maya
syll.: morph. ratio	high	low
phonotactics	- many words are vowel-initial and/or vowel-final - tautosyllabic CC clusters	- all words begin and end with a consonant - tautosyllabic CC clusters

	allowed	(mostly) banned
	-vowel hiatus allowed	-vowel hiatus banned
phonemic supra-segmentals	stress: v ~ 'v sábana <i>sheet</i> sabana <i>savannah</i>	length, tone, glottalization: v ~ v̄v ~ v̄v̄ ~ v̄v̄ chak <i>red</i> cháak <i>rain</i> chàak <i>boil</i> cha'ak <i>starch</i>
stress	one stressed syllable per content word	stress is not phonemic; long vowels are stressed; no published study of stress

(4) Focus of this project

- How does the grammar of YM accommodate Sp loans?
  - How do YM speakers implement Sp stress when producing Sp loans?
- Which hypothesis of loanword adaptation best accounts for the treatment of stress in the YM tonal system?
- What does the phonology of loanwords in YM tell us about the grammar of YM?

(5) Outline

- Phonetics of Sp stress
- Tone in YM loanwords
- The bilingual and perceptual hypotheses of loanword adaptation
- Conclusions

## 2. THE PHONETICS OF SPANISH STRESS

(6) Pitch

- Most sources agree that (high) F0 is the primary phonetic correlate of stress (Bolinger & Hodapp 1961, Contreras 1963, Quilis 1981).
- However, the pitch peak is most often realized on the syllable following the stressed syllable (at least in Peninsular Spanish; Garrido et al. 1993, Llisterri et al. 1995).

(7) Other cues

- Intensity may or may not be a correlate of stress (Novarro Tomás

(1967) says it is; others overlook it).

- Duration is not a correlate of stress in Mexican Spanish (all vowels are about the same length, though post-stress vowels tend to be longer; Samões 1996).

(8) Summary

- The only consistent phonetic correlate of stress is high pitch, with the pitch peak generally in post-stress position.
- Prediction:
  - If YM speakers are interpreting the pitch associated with stress as tone, they should produce either stressed or post-stressed syllables with high tone.

### 3. PRODUCTION OF LOANWORDS

(9) There is little information in print regarding the production of loanwords in YM.

(10) Hanks (1984):

“Contrary to what one might expect, primary stress in Spanish loans is usually not assigned high tone in Yucatec, not at least by speakers of Yucatec as a first language. The general rules appear to be as follows: Span primary stress becomes low tone; secondary or unstressed in Span becomes high tone in Yucatec. This gives a distinctly foreign sound to Span words in Yucatec. Hence:

familia faámiilyáah  
 escuela 'eéskwèeláah  
 ahora 'aáwrah  
 tacos tàakos  
 amigo 'aámigóoh “

(original emphasis, abbreviations, and transcriptions)

(11) Is this description generally true?

- Phonological data from Bricker et al. (1998)
- Phonetic data from Blair and Vermont Salas (1965)

### 3.1 DATA FROM BRICKER ET AL.

(12) 96 loanwords from Spanish are included in the dictionary.

- Excludes those whose origin is marked with a question mark.
- Most are proper names or names of (parts of) plants.
- Each loanword coded for relevant properties (grammatical category, number of syllables, position of Sp. stress, tonal realization of stress, etc.).

(13) Stressed syllables tend to be produced with low tone.

- 50% stress > **low tone** (almúd > mùut 'measure')
- 11% stress > **high tone** (hierba > yéerbah 'type of plant')
- 11% stress > **no tone** (arroz > ?áaros 'rice')
- 27% stressed syllable **not present** (cucaracha > kùuruch 'cockroach')

(14) Many one- and two-syllable words are clippings of proper names.

some clippings include the stressed syllable:	some do not:
<u>L</u> ázaro > làas	Jac <u>i</u> nto > hàas
Er <u>n</u> esto > nèetoh	Inoc <u>e</u> ncio > ?iinós

(15) Patterns by number of syllables in YM word:

tone in YM	number of syllables			
	1	2	3	4
high tone	0	8 (20%)	2 (13%)	1 (17%)
low tone	13 (38%)	22 (54%)	9 (60%)	4 (67%)
no tone	0	6 (15%)	4 (27%)	1 (17%)
not present	21 (62%)	5 (12%)	0	0
<i>total</i>	<i>34</i>	<i>41</i>	<i>15</i>	<i>6</i>

- 5 of 6 four-syllable words have tone on the first and third syllables.

aderezo	>	?áaderèesoh	<i>Cissampelos pareira L.</i>
agrimonia	>	?áagremðonyoh	<i>Teucrium cubense</i>
artemisa	>	?áalkaniisah	<i>Artemisia herb</i>
orégano	>	?óoregàanoh	wild oregano
albahaca	>	?áalbaháakah	<i>Ocimum basilicum L.</i>

(16) Placement of Sp. stress does not influence tone:

tone in YM	placement of Spanish stress		
	antepenult	penult	ultimate
high tone	2 (25%)	9 (13%)	0
low tone	4 (50%)	34 (50%)	10 (50%)
no tone	2 (25%)	4 (6%)	5 (25%)
not present	0	21 (31%)	5 (25%)
<i>total</i>	<i>8</i>	<i>68</i>	<i>20</i>

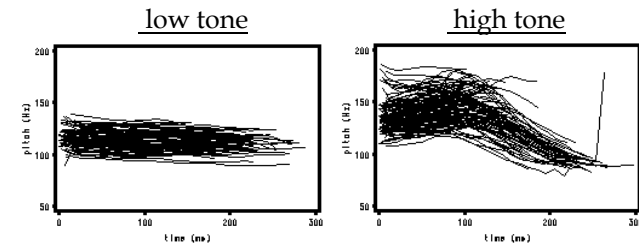
(17) Summary

- Stress tends to be replaced with low tone.
  - When not replaced with low tone, it is equally likely to be replaced with high tone or no tone.
  - High tone tends to occur two syllables before low tone.
- Absolutes:
  - No loanword has high tone on the syllable following the Sp stressed syllable.
  - No loanword has a glottalized vowel.
  - Every loanword has at least one toned syllable.
- Hanks is correct that stress tends to be replaced with low tone (though this is not an absolute), but there is no general pattern of placing high tone on all other syllables.

**3.2 DATA FROM BLAIR & VERMONT SALAS**

(18) Methods

- Measurements taken from recordings on the language learning CDs that accompany Blair and Vermont Salas (1965).
  - Almost all Spanish loans used in the CDs are proper names; the exceptions are numbers and function words (the latter not reported here).
- Vermont Salas is the speaker
  - Production of tone in native words (see Frazier 2009):



- PRAAT used to demarcate vowels and measure pitch in all available Spanish loans in the first four lessons

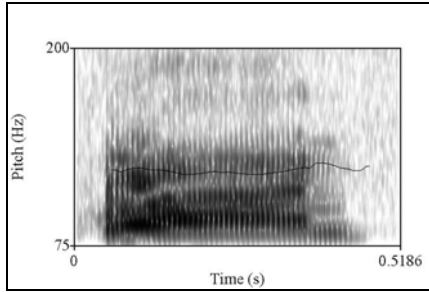
(19) Results for vowel length (ms; long vowels underlined):

word	n	pre-a.p.	antepen.	penult	ultimate
<i>Sp. antepenult stress:</i>					
México	2		<u>176</u>	51	69
<i>Sp. penult stress:</i>					
Alberto	6		<u>114</u>	68	87
castellano	6	<u>92</u>	63	<u>138</u>	51
Chicago	7		46	<u>169</u>	64
cinco	3			<u>261</u>	79
cuatro	2			<u>133</u>	80
estados	6		67	<u>138</u>	75
Julio	8			<u>155</u>	62
Luisa	6		88	92	90
Marcelino	8	<u>88</u>	57	<u>132</u>	61
Margarita	6	<u>83</u>	80	<u>127</u>	67
Pablo	4			<u>190</u>	59
Pedro	8			<u>164</u>	57
unidos	6		56	<u>118</u>	79
<i>Sp. ultimate stress:</i>					
David	6			77	75
Jose	6			70	89
Juan	12				<u>142</u>
Yucatan	2		<u>89</u>	67	<u>177</u>

- Sp stress > long vowel
  - exceptions: Alberto, Luisa, David, José
  - Luisa is not an exception if [ui] is treated as a diphthong
- Two syllables before Sp stress > long vowel

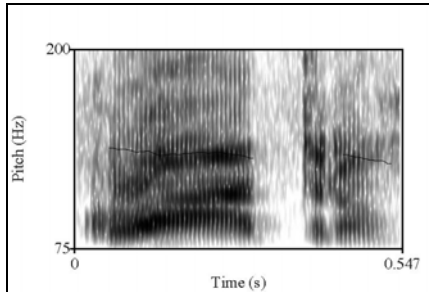
(20) Pitch contours for some representative words:

a. One syllable: final stress > low tone

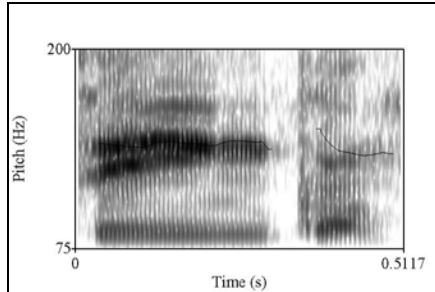


Juan > [(h)wàan]

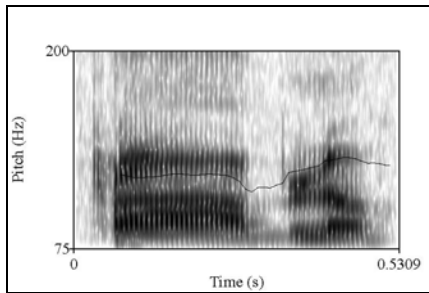
b. Two syllables: penultimate stress > low tone



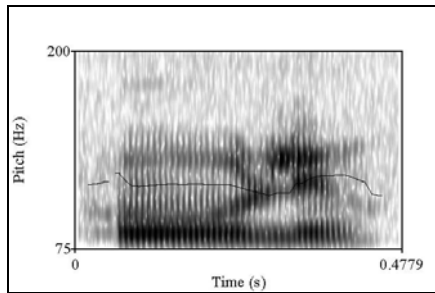
cuatro [kwàatroh]



cinco [siinkoh]



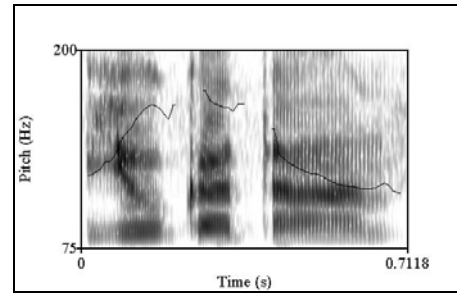
Pablo [pàabloh]



Julio [hùljo]

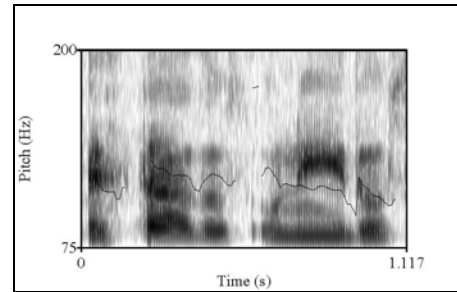
c. Two syllables: final stress > no tone (José, David)

d. Three syllables: final stress > low tone + antepenultimate high tone



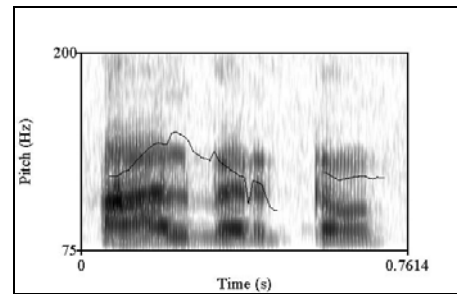
Yucatán > [júukatàan]

e.i. Three syllables: penultimate stress > low tone



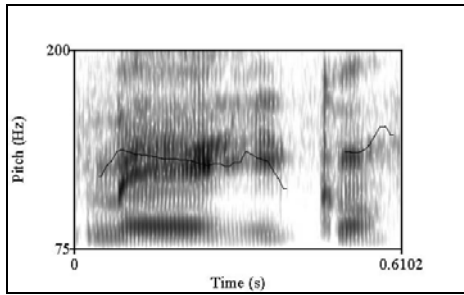
estados [?estàados] unidos [?uniidos]

e.ii. Three syllables: penultimate stress > no tone + antepenultimate high tone



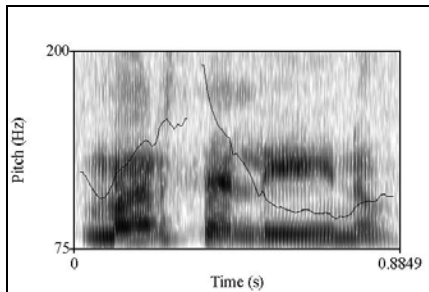
Alberto [?áalbertoh]

f. Three syllables: antepenultimate stress > low tone

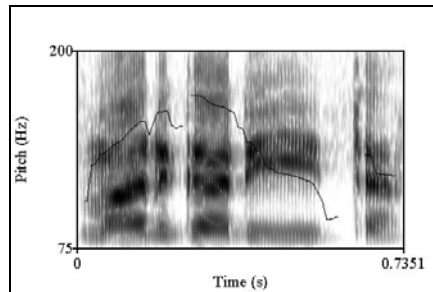


México > [mèehikoh]

g. Four syllables: penultimate stress > low tone + initial high tone



Marcelino > [máarseliinoh]



Margarita > [máargariitah]

(21) Tone patterns

- Sp stress > low tone
  - Exceptions:
    - two syllables + final stress > two short vowels (no tone)
    - Alberto > [ʔáalbertoh]
- The initial vowel receives high tone if the third vowel has low tone.

#### 4. HYPOTHESES OF LOANWORD ADAPTATION

(22) Primary patterns in loanwords:

- Stress is replaced with low tone.
- High tone occurs two syllables before low tone (when possible).
- Which hypothesis about loanword adaptation provides the best account of these patterns?

(23) **Perceptual hypothesis** (e.g. Silverman 1992): “the input to loanword phonology is merely a superficial non-linguistic acoustic signal” p. 289.

- The borrower hears a phonetic form (“acoustic signal”) produced by a speaker of the source language and must interpret this form in the context of the native language grammar.

$$[\text{Sp}] \quad \xrightarrow{\text{YM } \textit{percep} \textit{ grammar}} \quad /YM/ \quad \xrightarrow{\text{YM } \textit{prod} \textit{ grammar}} \quad [\text{YM}]$$

(24) Predictions of perceptual hypothesis

- Depends on whether or not YM speakers are 'stress deaf' (Pepperkamp & Dupoux 2002)
  - YM speaker hears *Marcelino* as [marselíno] or [marselinó] and interprets signal as /marseliino/ or /marselinóo/.
  - YM speaker hears *Marcelino* as [marse'líno] or [marse'linó] and interprets signal as /marse'liino/.

(25) The predictions of the perceptual hypothesis are not borne out.

- Stressed syllables rarely receive high tone.
- The post-stress syllable never receives high tone.

(26) **Bilingual hypothesis** (e.g. LaCharite & Paradis 2005): bilinguals, who are familiar with the phonological structure of the source language, introduce loanwords.

- Such speakers have access to the phonological form of the source language, and this form is the input to the recipient language's grammar.

$$/Sp/ = /YM/ \quad \xrightarrow{\text{YM } \textit{prod} \textit{ grammar}} \quad [\text{YM}]$$

(27) Predictions of bilingual hypothesis for /marse'liino/

- Ignore 'underlying' stress and use default stress and length/tone (whatever that may be).

- Remain faithful to stress, which would likely trigger vowel-lengthening, and hence tone: /marseliino/ or /marseliino/.
  - High tone is more marked than low tone in YM, so /marseliino/ is more likely .

#### (28) Summary

- The perceptual hypothesis cannot explain the occurrence of low tone.
- The bilingual hypothesis provides a plausible account of how stress is reinterpreted as low tone.
  - Underlying stress triggers the production of a long vowel (in OT terms, STRESSTOWEIGHT is high-ranking in YM).
  - Long vowels must bear tone; if no tone marker is present in the input, default low tone is produced (\*HIGHTONE » \*LOWTONE).
- Presence of high tone two syllables before low tone is still unaccounted for.

## 5. DISCUSSION AND CONCLUSIONS

#### (29) Tone in loanwords

- It is likely that most YM loanwords were introduced by bilinguals.
  - Is this true across all centuries of contact between YM and Sp?

#### (30) YM phonotactics

- Why do most loanwords have at least one toned syllable?
  - Why are two syllable words with final stress the only exception?
- Why does high tone tend to occur two syllables before low tone?

#### (31) Conclusions

- Sp stress tends to be replaced with low tone in YM; this fact can be explained by the bilingual hypothesis of loanword adaptation.
- In order to better understand all the patterns presented here, we need more data!

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