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On Tonal Features in the Yucatecan Dialects

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ON TONAL FEATURES
IN THE YUCATECAN DIALECTS

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by

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In this paper I would like to establish that Proto-Yucatec had tones, and secondarily, bring to light some of the surviving features of those tones. By "Proto-Yucatec" I mean the language reconstructable as the unique ancestor of modern Yucatec, Mopan, Itz'á, and Lacandoné.

McQuown, in his article "The Classification of the Mayan Languages," (IJAL XXII, 3, 191-195, July 1956) lists tone as a feature of Proto-Mayan which has survived only in Yucatec, but presents no argument there that tone did not develop later in Yucatec. Modern Yucatec clearly has tones, and they are well documented in papers by McQuown, Blair's Ph.D. Thesis, and a set of Spoken Yucatec Maya course materials by Blair and Vermont-Salas. Recent publications by the Ulrichs, Bruce, and Schumann have documented the phonology of Mopan, Itz'á, and Lacandone, respectively. My analysis is based on this published data along with other unpublished data collected by the Ulrichs, Schumann, Freeze, and myself.

How might we argue for tone in Proto-Yucatec? Given that a daughter language has tone, I see three main arguments for reconstructing tone in a proto-language: 1. Other relevant features of the proto-language have been reconstructed with confidence, and none of them is likely to lead to the

development of tone; 2. In the non-tonal daughter languages, the reflexes of the different reconstructed tones are distinguished morpho-phonemically; and 3. The loss of tone in the non-tonal daughter languages is not implausible. Argument 2 is probably the strongest; it is equivalent to saying that cognates of tonally distinctive items are somehow still distinctive phonologically in the non-tonal dialects. This kind of evidence in the non-tonal dialects would be considered by many linguists to be sufficient evidence for the postulation of morpho-phonemic diacritics in their synchronic phonologies.

Can we make these arguments in the particular case of Proto-Yucatec?

Consider the first type of argument. The other dialects differ very little from Yucatec in non-syllabic phonemic segments. With the possible exception of l/r, the consonants of Proto-Yucatec can be reconstructed straight-forwardly, being in the main the consonants found in Yucatec, with the dialects having changed in little more than probability of application of several consonant-affecting rules. The consonantal environments so reconstructed don't provide a reasonable basis for the development of tone, just as they are in no way correlated with the tones in Yucatec.

Since argument 2 is the strongest, let's save it for last, and consider now argument 3: is the loss of distinctive tone in the non-tonal dialects plausible or implausible? I argue that it is plausible, for two reasons: in Yucatec and presumably in Proto-Yucatec, tonal contrasts are constrained, bearing less than full functional load; and in the non-tonal dialects, a vowel quality contrast not present in Yucatec reduces still further the number of homonyms which would result from the loss of Proto-Yucatecan tone. I can offer no hard data to back up my first contention. While the constraints on occurrence of tone in Yucatec are unclear, true minimal pairs differing only in tone seem rarer than one would expect on the assumption of unconstrained combinability with other phonemes, and Yucatec was studied by many scholars before tonal contrasts were revealed. As for the second point, there can be no doubt that Mopan, Itzá, and Lacandone have a sixth phonemic vowel, /ɨ/, lacking in Yucatec.

Now let's get into argument 2: are there morpho-phonemic alternations in the non-tonal dialects which dovetail with the occurrence of the tones in Yucatec, and which could therefore be explained by postulating an earlier tonal system? Yes, there are, and I will detail them below.

Perhaps now is the time to digress and touch on a subject peripheral to the main focus of this paper: were there 5 or 6 vowels in Proto-Yucatec? A cursory examination of cognates and morpho-phonemic alternations makes it clear that if there were 5, then Itz'á, Mopan, and Lacandone have merged neutral /a/ vowels to /ɨ/, and if there were 6, then Yucatec has merged all /ɨ/ vowels into /a/ and the other dialects have changed all non-neutral /ɨ/ to /a/. In Fisher (1973) the 5-vowel hypothesis was discarded, mainly because of the existence of a few items with reconstructed neutral /a/ which does not show up as /ɨ/ in the non-tonal dialects, but I am not so sure now. The rarity of such items is a strong point in favor of the 5-vowel hypothesis. But the question of tone in Proto-Yucatec is separable from the question of the number of vowels. Whether you accept the 5- or the 6-vowel hypothesis, the same synchronic morpho-phonemic alternations are present, ^{and} tone in Proto-Yucatec provides environments which explain them nicely.

I will present 5 cases of such alternation.

Case No. 1

In Yucatec, a number of inherently transitive verb roots with neutral tone form the intransitive incomplete and nominal forms by taking low tone, and in the non-tonal dialects,

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Case No. 1

In Yucatec, a number of inherently transitive verb roots with neutral tone form the intransitive incomplete and nominal forms by taking low tone, and in the non-tonal dialects,

cognates of these roots with /ɛ/, the sixth vowel, have intransitive and nominal forms with /a/. For example, consider the verb root "to treat, cure" as shown below in Figure 1:

ENG	I treat him	I am curing	my cure	
YUC	kin ɛ́ak-ik	kin ɛ́aak V'	?in ɛ́aak	✗ V'
MOP, ITZ, NLAC	kin ɛ́ak-ik	kin ɛ́ak V'	?in ɛ́ak	✓
SLAC <i>Small</i>	kin ɛ́ak-ik	kin ɛ́aak (V)?	?in ɛ́aak	(V)?

Fig. 1. Example of Transitive-Intransitive-Noun Alternation

Notice that these cognates distinguish two dialects of Lacandone. The one I call "North Lacandone" and abbreviate "NLAC" is the one reported on by Bruce, who gathered most of his data at Nahá. The vocabulary I collected at Lacanhá generally has long vowels corresponding to Yucatec low tone, where North Lacandone has short vowels. This second dialect is called "South Lacandone", abbreviated "SLAC".

From independent evidence such as shown below, it is clear that if Proto-Yucatec had a tonal system like Yucatec's, then the long low tone has merged into short or neutral in MOP, ITZ, and NLAC, but has kept its vowel length in SLAC.

V^h

~~arg~~'

CSNO	10	83	131	226	299	484
ENG	vine	boat, table	guts	iguana	milpa	clothes
YUC	?aak'	čəem	čəoč-	hūuh	kəol	nəok'
MOP, ITZ, NLAC	?ak'	čəm	čəč-	huh	kol	no'
SLAC	?aak'	čəem	čəoč-	huuh	koor	nook'

Fig. 2. Cognates of Yucatec Low-Toned Items. The CSNO's refer to the list of cognates in Fisher (1973)

Reconstructing neutral tones in the verb roots and low tone in the intransitive and nominal forms gives us just the environment needed for the prediction of this /a/~/ɨ/ quality alternation: /ɨ/ correlates with Proto-Yucatec neutral tone and /a/ with Proto-Yucatec low tone.

Case No. 2

As a general rule, where Yucatec has long high tone all the other dialects have long vowels. The major class of exception to this rule comprises multi-syllabic words, and in the dialects where most data is available, Mopan and Lacandone, there is evidence for synchronic rules shortening vowels in multi-syllabic items, although the available data do not support exact specification of these rules. As a preliminary rule of thumb, we should reconstruct a Proto-Yucatec long high tone where Yucatec has long high tone,

and the non-tonal dialects, with the exceptions mentioned above, generally preserve the vowel length.

There are a few odd items in the non-tonal dialects which show alternations between /aa/ and /i/. Precisely in these items, Yucatec has odd alternations of high and neutral tone:

CSNO	182(intr) 182(tr)	248	264
ENG	to space apart	to get drunk	drunk
YUC	hāap- hap-	kāaltal	kalā'an
MOP	haap- hīp-	kaalīl	kīla'an
ITZ			kīla'an
NLAC			kīla'an
SLAC		kaartal	kīla'an

Fig. 3. Cognates of Odd Yucatec High-Neutral Alternations

Again, reconstructing tone similar to that heard in Yucatec provides the appropriate environment for otherwise unexplainable morpho-phonemics in the other dialects. In this case /i/ corresponds to proto-neutral-tone and /aa/ corresponds to proto-high.

Case No. 3

In South Lacandone, some nouns when possessed change from short to long vowel, and if the vowel of the unpossessed

form is /ɛ/, an /aa/ is heard in the possessed form. In Yucatec a similar alternation occurs, with some nouns taking a low tone when possessed. Some examples of this are shown below.

CSNO		283		648	
ENG	candle	my candle	sandal	my sandal	
YUC	kib'	?in kiib'	šanaḃ'	?in šaanab'	
SLAC	kib'	?in kiib'	šináb'	?in šaanáb'	

Fig. 4. SLAC Cognates of Yucatec Possessed-Noun Alternation

no *vok* *POSS*

Reconstructing tone ǎ la Yucatec provides the environment for rules to give the alternations in South Lacandone and Yucatec. /ɛ/ corresponds to Yucatec neutral tone and /aa/ to Yucatec low.

Case No. 4

Another unusual morpho-phonemic alternation heard in Lacandone involves alternation of /a/ and /o/, as in /šan-ik/, "to shoot (it)", and /šo(o)n/, "gun". Once again, proto-tone as reconstructed based on Yucatec brings an older environment to the rescue, as can be seen in the following examples:

yuc low!

CSNO	97	96	665	
ENG	to shoot (it)	gun	to cut (it)	half (cut off)
YUC	ʔon-ik	ʔoon	ʂot-ik	ʂoot
LAC	ʔan-ik	ʔo(o)n	ʂat-ik	ʂo(o)t

Fig. 5. Cognates of LAC /a/ /o/ Alternation

Lacandone /a/-quality corresponds to Yucatec neutral tone,
and Lacandone /o/-quality corresponds to Yucatec long low.

Case No. 5

There is one last example of morpho-phonemic alternation in the dialects supporting argument 2 for tone in Proto-Yucatec. In all the dialects, there is an "echo-vowel" rule for forming intransitive verb stems from some verb roots: the suffix /-V1/ is added to the root, the vowel of the suffix being short and taking the quality of the root vowel. In Mopan and Itz'á there is a class of exceptions to this rule in which a suffix vowel /i/ echoes a root vowel of /a/-quality. Some examples of cognates showing this alternation are given below.

V/v. 11

	CSNO	15	28	8	248
	ENG	to awaken	to play	to talk	to get drunk
Sahad Motul	YUC	?ah-al	ˈbʰaʰ-al	?aʰ-al-al	kʰaʰtal
	MOP	?aah-ɨl	baʰ-ɨl	?ad-ɨl	kaal-ɨl
	ITZ		baʰ-ɨl		

	CSNO	251	329	465	584
	ENG	to get tired	to pour, fall	to ascend	to remain
	YUC	kʰaʰan-al	ˈkʰaʰ-al	naʰak-al	ˈpaat-al
	MOP	kaʰn-ɨl	ˈkaʰ-ɨl	nak-ɨl	ˈpaat-ɨl
	ITZ			nak-ɨl	

	CSNO	605	722	725
	ENG	to lose, get lost	to drip	to burn
	YUC	sʰaʰat-al	ˈtaah-al	ˈtaʰab-al
	MOP	saʰt-ɨl	ˈtaah-ɨl	ˈtab-ɨl
	ITZ			

Fig. 6. Cognates Showing Exception to the Echo-Vowel Rule

In all but one example of this morpho-phonemic peculiarity, the Yucatec cognate has non-neutral tone. Concerning the one exception, /?ah-al/, "to awaken", the Motul dictionary

lists the Yucatec item with an accent on the root vowel, so the root vowel probably had a high tone in earlier Yucatec. Reconstructing Proto-Yucatec with the tones of Yucatec again gives us an environment -- tonally marked /a/ root vowel -- which correlates with an otherwise obscure morpho-phonemic variation in the non-tonal dialects.

Summing up the data presented for the second argument type, we have seen that 5 different types of unusual morpho-phonemic variation in the non-tonal dialects -- all the types I know of which involve vowel quality changes -- can be explained using the environment of Proto-Yucatecan tones postulated to agree with Yucatec tones, along with independently motivated and general rules of tonal change in the non-tonal dialects. Cognates of Yucatecan tonally-distinguished items are distinguished morpho-phonemically in the other dialects.

Summing up the rules of change briefly alluded to:

1. Yucatec preserves tone unchanged.
2. Mopan, Itzá, and North Lacandone merge low tone into neutral tone.
3. Mopan and Lacandone change some high tones in multi-syllabic items to neutral.

and 4. In Mopan, Itz'á, and Lacandone, the distinction between high and low tone is lost, vowel length being preserved.

I have a few figures to end up with which illustrate some surviving tonal supra-segmental features.

page 13

To begin with, Fig. 8, shows pitch and intensity curves for 5 examples each of the Yucatecan short neutral, long high, and long low tones in mono-syllables. Lack of space prohibits labelling the graphs; the scales on all of them are as given on the example graph below.

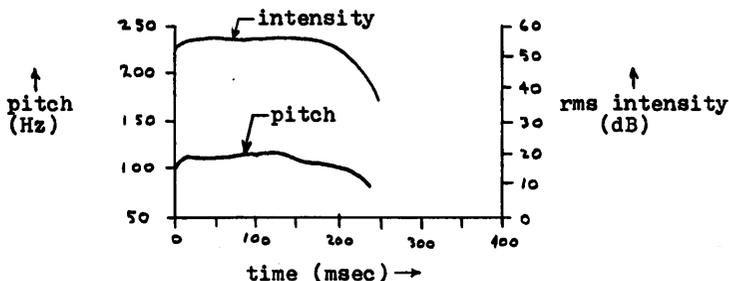


Fig. 7. Sample Pitch and Intensity Graph Showing Scales

interesting
petek →



šič↓



tšič↓



šič↓



ʔek↓



ʔšek↓



ʔšek↓



bat↓



bāt↓



bāk↓



koh↓



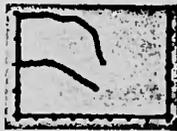
pōk↓



kōh↓



ʔuk↓



šuk↓



šuk↓

Fig. 8. Pitch and Intensity Curves, Yucatec Neutral, High, and Low Tones. Items from pronunciation exercise number 7, lesson 1.

In each graph, the higher curve is intensity and the lower curve is pitch. The intensity scale is on the right and the pitch scale is on the left. The measurements are as accurate as is possible to make. The data are pitch-synchronous, derived with the aid of an interactive computer program enabling the user to scan through the speech pressure wave and pick each successive glottal period for analysis.

The utterances analysed in Fig. 8 are taken from the pronunciation exercises in the Spoken Yucatec course materials mentioned earlier, spoken by Refugio Vermont-Salas, a native speaker of Yucatec. This hard data agrees in general with the subjective description of the features given in the course materials. The features distinguishing the tones are quite clear: 1. Neutral tone is short; high and low tones are long. 2. The high tone begins higher than neutral and falls. 3. The low tone begins at the same pitch as neutral, may take a sudden short dip, and then remains level.

Two other Yucatecan tonal types are illustrated in Fig. 9, page 15. On the left is the glottal or broken tone in monosyllables, and on the right is the most marked case of an allotone -- high tone in the first syllable of di-syllabic



sf?is↓



mfisteh↓



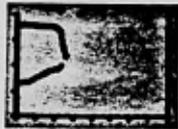
tš?eš↓



kēelā'an↓



yā'aš↓



mā(a)kal↓



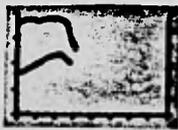
tš'on↓



pōlā'an↓



kū'uk↓



lūbul↓

Fig. 9. Pitch and Intensity Curves, Yucatec Broken and Di-Syllabic High Tones. Items from pronunciation exercise 30, lesson 4, and 9, lesson 2.

items. Considering the graphs on the left, note that the broken tone starts high and falls, as with the high tone, with a more rapid pitch drop in the middle, and that the intensity curve clearly shows two maxima. In none of these examples of broken or glottal tone is there evidence of a real glottal stop, or cessation of voice, in the middle of the vowel. Two main features are worthy of note in the disyllabic variant of the high tone: the pitch is rising instead of falling, and the vowel is shorter than the monosyllabic high tone vowel. It is still longer than a neutral vowel in the same position, of course; it is probably a phonetic universal that vowels are shorter in multi-syllabic than in mono-syllabic items.

page 17
 Fig. 10_a shows pitch and intensity curves for several items in Mopan, as spoken by one of the Ulrichs' informants, Salamon Ka?ál of San Luís, Petén. The left column contains items with short vowels, the middle column contains items with long vowels, and the right column shows examples of the broken or glottal (V?V) nucleus. The long vowels and the broken vowels do not seem to be distinguished by these pitch and intensity curves, and in fact, it is very easy for the



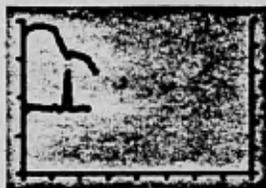
paʔ, "fat"



ʔaak, "turtle"



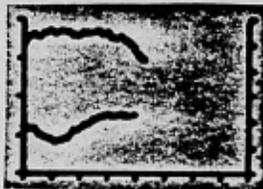
kaʔan, "high"



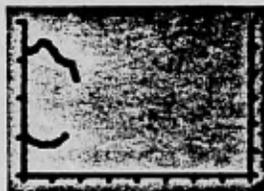
kot, "fence"



čaaak, "thunder"



haʔas, "banana"



bač, "quail"



kiʔiš, "thorn"



čik, "red"

Fig. 10. Pitch and Intensity Curves for Some Mopan Items

transcriber to confuse Mopan long vowels with broken vowels. The examples of Mopan long vowels shown all correspond with Yucatec high-toned items, and the examples of Mopan broken vowels all correspond with Yucatec broken or glottal-toned items. Three of the four short Mopan vowels illustrated correspond with Yucatec neutral-toned vowels; the second short-vowel item from the top, /kot/, "fence", has a long low tone in Yucatec. In length and pitch it clearly patterns with the other short Mopan vowels. Incidentally, Mopan has a phrase-final accent which shows up here in the graphs of the long vowels as rising pitch.

Fig. 11, page 19, similarly illustrates some items from South Lacandone, as spoken by Kin Yuc, son of Bor, of Lacanhá, Chiapas. The left hand column shows items cognate with Yucatec neutral-toned items, the middle column shows examples corresponding to Yucatec high tone, and the right column contains items whose vowel has low tone in Yucatec. Although there is some overlap, and considerable variation, the correspondents of Yucatec are clearly shorter than the other two groups, and I can see no features in these graphs to distinguish the middle from the right column. With

*pohp

*ka'g



ʔuk, "louse"



poop, "mat"



baak, "bone"



wiŋ, "hill"



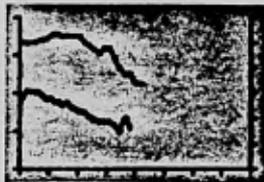
poop, "mat"



yiiŋ, "his resin"



čič, "hard"



čiič, "bird"



čiič, "grandmother"



čik, "red"



ʔaak, "turtle"

Fig. 11. Pitch and Intensity Curves for Some South
Lacandone Items.

regard to the variation, notice that the second pronunciation of /poop/, "mat" -- the second graph from the top in the middle column -- is shorter than some of the "short" items in the left column.

The difficulty of obtaining accurate measurements from field-recorded tapes has limited the extent of this illustration of surviving supra-segmental features in dialects other than Yucatec. If we assume that Proto-Yucatec had tones as in modern Yucatec, what I have shown, however, backs up some of my earlier points -- that the reflexes of both short and low Proto-Yucatec vowels are short in Mopan, that the reflexes of both low and high Proto-Yucatec vowels are long in South Lacandone, and that pitch is not distinctive in the non-tonal dialects, although length is.

v - v^h

END
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