Lexical versus postlexical tones in Chácobo (Pano): A corpus study based on naturalistic speech

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This paper provides a detailed description and reanalysis of certain tonal phenomena in Chácobo, a southern Pano language of the northern Bolivian Amazon. I argue that Chácobo consists of a LH lexical tone and a H boundary tone, in contrast to previous studies that suggest that Chácobo only has a postlexicacl H* that attracts to a single culminative and obligatory stressed syllable within a prosodic word and M and L tones are inserted postlexically [1,2,3]. I argue that the apparent examples of L and M* tones are either the result of catathesis over phonological phrases or interpolation between specified LH and H tones [4]. Statistical analyses of phonetic data are provided to support this claim. The H tones of Chácobo cannot be seen as only reflecting stress because in sentential contexts words need not surface with a high pitch unless they have an underlying LH tone as in *rămi* 'Rami' in (2) (compare with *Rabi* in (1)). The L of the bitonal LH surfaces on the syllable to its left (see Figures 1-2).

(1) [kà.ʂá.kɨ.ɾa.βi↓]		(2) [kàʂá=kɨ̀ ɾámi↓]	
kaʂă=kɨ	ɾabi	kaʂă=kɨ	ɾămi
play=DECL:PAST	Rabi	play=DECL:PAST	Rami
'Rabi has/had played.'		'Rami has/had player'	

Chácobo prosodic words *can* surface with two LH tones if they are present underlyingly and not adjacent. For instance, the word *pǐ-tɨk-ǐ=kɨ* [WING-break-INTR-DECL:PAST] 'it broke its own wing' will surface with two prosodic contours. These data show that Chácobo tones are lexically listed and that pitch is not simply a correlate of 'stress' [5]. Previous literature describes a tone sandhi rule whereby a lexical H tone is deleted if it is adjacent to another [1] which applies word-internally and in many word-word junctures as well as in (3). H-tones are inserted on words prior to the clause-type/rank morpheme (*=kɨ* 'past declarative' in the examples below) when the word has no underlying H tone as in rabi 'Rabi' in (4). In such cases the tone reduction rule does not apply resulting in adjacent high tones: the H tone of kaʂá does not delete as it does in (3) (Figures 3-4).

(3) [kà.ʂá.ɾá.βi.kɨ↓]			(4) [ka.ʂà.ɾá.mi.kɨ↓]		
kaʂă	ɾaβi	=kɨ	kaʂă	ɾămi	=kɨ
play	Rabi	=DECL:PAST:	play	Rami	=DECL:PAST:
'Rabi played.'			'Rami played'		

These facts cannot be accounted for in the previous analysis without positing rule ordering between the insertion of H tones and the application of tone sandhi. However, in the current analysis the difference (3) and (4) has a ready explanation if the lexical H tone is in fact an LH tone. The sandhi rule can be reformulated as LH.LH → LL.H. It does not apply in (4) because it is not triggered by an LH.H. I also argue that the default boundary H tone found on *ɾabi* in (4) is a phrase level tone rather than a word level tone, contra Tallman [2,3]. This explains its absence on *rabi* in (1). I provide a phonetic study based where a total 1600 tokens of LH and H tones are coded across 8 speakers using data from naturalistic speech. A Bayesian multilevel linear model controlling for duration and F0 slope found no strong difference in F0 peak across LH and H tones across speakers. Figure 4 plot displaying the mean posteriors probability distributions of the F0 peak of H versus LH according over one of the speakers in the sample [6]. I show, however, that a difference in pitch slope can be observed. I interpret these results as showing that both the lexical LH and H both contain the same phonological H tone target, but that the former has a lower starting point accorded to it by its L tone, following the phonological analysis sketched above. We show that this analysis can elegantly account for the pitch contours over toneless syllables, without the need to posit rules of postlexical M and L insertion or rule ordering. This study shows how phonetic data extracted from naturalistic speech can be used to enrich the description of lesser described languages and help tease apart competing analyses. I also illustrate how the phonetic data are useful in the community-led construction of a Chácobo dictionary.

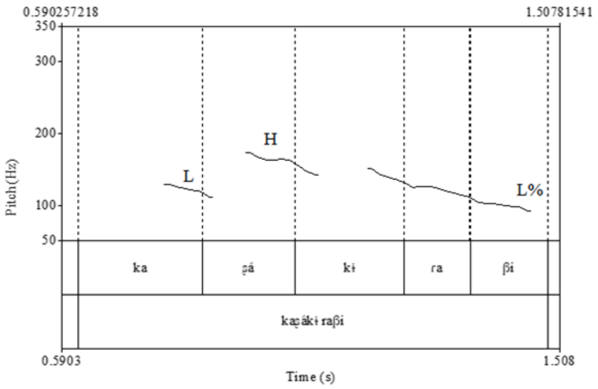

Figure 1. Pitch contour for (1)

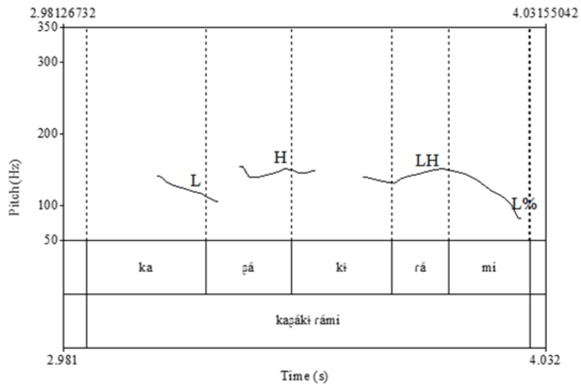

Figure 2. Pitch contour for (2)

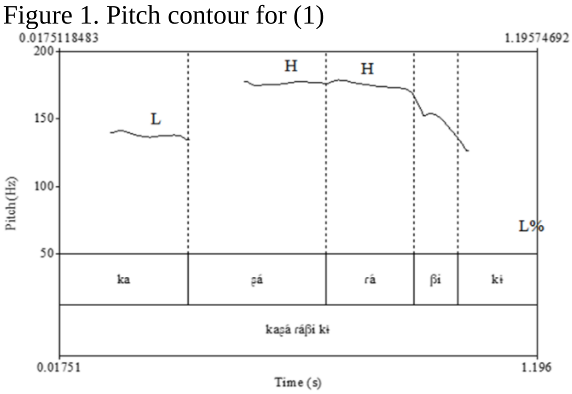

Figure 3. Pitch contour for (3) (no tone sandhi)

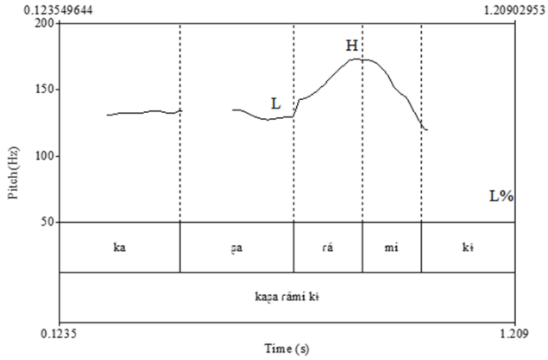

Figure 4. pitch contour for (4) (tone sandhi)

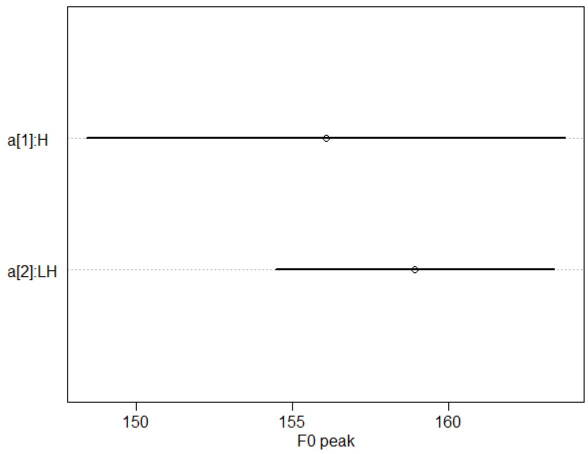

Figure 5. Posterior probabilities of F0 peak for values H and LH in one speaker; H ~ Normal (μi, σ), μi = α + βT + βD + βS + βST, α ~ Normal (155, 60), βD ~ Normal (90, 60), βS ~ Normal (0, 100), σ ~ Uniform (0, 50), where H is pitch F0 in the syllable, βT is the tone type (LH vs. H) βD is duration in milliseconds and βS is F0 slope. Prior probabilities for phonetic variables are informed by previous experimental studies [5]. The model is built using ulam() function from Rstan [6].

References

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