SEALS XVII

Paper Title: Tones in Hmong: Underlying binarity in Asian tonal contours

Sub-Field: Phonology

Author: Marlys Macken

Affiliation: University of Wisconsin-Madison

Email: macken@wisc.edu

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Distinctive feature (*df*) theory brings fundamental insights to patterns of segmental contrasts, constraints, and alternations in phonological systems. The Prague School markedness theory of Trubetskoy and Jakobson also predicts that for binary features there is an asymmetry in alternations such that one value, the unmarked feature value, is basic, and will have certain properties: e.g. the unmarked member of an alternation will occur in positions of neutralization, etc. In languages with complex morphologies or complex phonologies, alternations provide evidence for the distinctive feature composition of segments and the structure of the system, and for features like [voice] the Prague School predictions have been verified. Extension of *df* theory to tonal systems—particularly the Asian systems of contour tones—is more mixed. What are the unmarked tones? In African languages, alternations and constraints show in many clear cases that contour tones are composed of level tones, that tonal features are binary, and that they pattern asymmetrically like binary segmental features such as [voice]. In Hmong and many other Asian languages with simple word internal morphology and monosyllabic words, there are few or no alternations, and the structure of contours and the tonal system itself is controversial. The differences in tone between African and Asian languages have led some to challenge the binarity of features in Asian contour systems. But the Prague School distinctive feature theory also predicts distributional regularities, as for example, that the unmarked feature values have the fewest restrictions on their distribution within any given language. **Argument**. The central claim of this paper is that the eight contour tone system of Hmong is binary and is structured into a binary markedness system like that of African Bantu languages (e.g. Myers 1999). However, the primary evidence comes not from alternations but an analysis of the distribution of tones (and segments) in the lexicon: (i) the distributional predictions of markedness theory as applied to the lexicon show not only Hmong segmental features but also the tones to be binary; and (ii) mapping the markedness distributions of tone and voicing features across the synchronic lexicon provides new insight into the diachronic stages of binary tonogenesis in Hmong. **Evidence**. (1) Table 1 shows the distribution of classical segmental features of manner and voicing (data based on Heimbach 1980 dictionary). As predicted, the unmarked feature value is more frequent in the lexicon than the marked value: (i) voiceless unaspirated ([-spread glottis]) > voiceless aspirated segments, (ii) oral noncontinuants > nasal stops; (iii) nonsonorant noncontinuants > continuants; (iv) voiced sonorant > voiceless sonorant; (v) simple onsets > complex onsets (‘consonant clusters’). (2) A simple distributional analysis of the tones shows the challenge of Asian tonal contours (Table 2): the synchronic 8 tones and ternary contrasts for level and falling tones do not factor into binary features. (Tones are in pitch numbers and the orthographic representation (italicized symbol). The 213 tone is the rare noncontrastive tone.) (3) However, if we separate the tones by [spread glottis], we find a predictable binary markedness relationship where the low, unmarked tones (22 and 31?) are most frequent in unmarked [-spread glottis] words, and the high, marked tones (55 and 52) are most frequent in the marked [+spread glottis] words (Tables 3 and

4, respectively). The absence of the -*g* tone (which is falling and breathy) in words beginning with [+spread glottis] consonant onsets is due to a negative co-occurrence constraint. (4) Turning to the ternary contrasts, we find that if we subdivide the [+spread glottis] onsets into unmarked (A) and marked (B) sets (Table 5), there is an extraordinarily strong correlation between the marked B set and the mid tone consistent with an historical stage in which the *L tone split into two allophonic tones (higher after /phlm, mph, mphl, hm, hml/ onsets and lower after /ph, f/ onsets) that phonologized later into two synchronic L tones, the mid /33/ and the low /22/. The negative constraint on the –*g* tone indicates that the *L falling tone similarly split allophonically [42]-[31], giving rise today to 2 L falling tones. **Conclusion.** Both diachronically and synchronically, the Hmong tone system is a binary set of tonal feature contrasts.

Table 1. Frequency of initial labial consonant words by manner and voicing.

Labial					
[- spread glottis]			[+ spread glottis]		
Manner	Number	Percentage	Manner	Number	Percentage
p	261	23.2%	ph	129	11.5%
m	157	14.0%	hm	23	2.0%
pl	105	9.3%	phl	30	2.7%
mp	94	8.4%	mph	27	2.4%
mpl	73	6.5%	mphl	10	0.9%
ml	10	0.9%	hml	2	0.2%
v	110	9.8%	f	92	8.2%

Table 2. Distribution of tones in initial labial consonant words.

Level Tone			Falling Tone			Rising Tone		
Tone	Number	Percent	Tone	Number	Percent	Tone	Number	Percent
55 -*b*	187	16.6%	52 -*j*	198	17.6%	24 -*v*	157	14.0%
33 -ø	110	9.8%	42h -*g*	107	9.5%	(213)-*d*	4	0.4%
22 -*s*	177	15.8%	31ʔ -*m*	183	16.3%			

Table 3. Distribution of tones in initial [- spread glottis] words.

Level Tone			Falling Tone			Rising Tone		
Tone	Number	Percent	Tone	Number	Percent	Tone	Number	Percent
55 -*b*	110	13.6%	52 -*j*	134	16.5%	24 -*v*	103	12.7%
33 -ø	63	7.8%	42h -*g*	107	13.2%	(213)-*d*	4	0.5%
22 -*s*	150	18.5%	31ʔ -*m*	139	17.2%			

Table 4. Distribution of tones in initial [+ spread glottis] words.

Level Tone			Falling Tone			Rising Tone		
Tone	Number	Percent	Tone	Number	Percent	Tone	Number	Percent
55 -*b*	77	24.6%	52 -*j*	64	20.4%	24 -*v*	54	17.3%
33 -ø	47	15.0%	42h -*g*	–	–	(213)-*d*	–	–
22 -*s*	27	8.6%	31ʔ -*m*	44	14.1%			

Table 5. Distribution of tones in initial [+ spread glottis] words, contrasting /ph, f/ and /phl, mph, mphl, hm, hml/.

	Level Tone			Falling Tone			Rising Tone		
	Tone	#	%	Tone	#	%	Tone	#	%
A: /ph, f/	55 -*b* 33 -ø 22 -*s*	53 19 15	24.0 8.6 6.8	52 -*j* 42h -*g* 31ʔ -*m*	62 – 42	28.0 – 19.0	24 -*v* (213)-*d*	30 –	13.6 –
B: /phlm mph, mphl, hm, hml/	55 -*b* 33 -ø 22 -*s*	24 28 12	26.1 30.4 13.0	52 -*j* 42h -*g* 31ʔ -*m*	2 – 2	2.2 – 2.2	24 -*v* (213)-*d*	24 –	26.1 –

Select References

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