

### Markedness and the Phonological Typology of Two-Height Tone Systems

- (1) Previous work on the typology of tone systems has largely focused on
  - a. defining what a tone system is (Pike 1948, Welmers 1959, 1973)
  - b. contrasting tone vs. “pitch-accent” systems (McCawley 1970, 1978, Hyman 1977, 2006, 2009, Beckman 1988, van der Hulst & Smith 1988, Gussenhoven 2004, 2006, etc.)
- (2) Attempts to typologize properties which distinguish “true” tone systems from each other have been based on
  - a. (relatively surface) contrasts, e.g. the number of tone heights, the presence vs. absence of contours, tonal downstep, phonations (Maddieson 1978, 2005)
  - b. distributional restrictions, leading to proposals to distinguish syllable tone, word tone, and “pitch-accent” ((Donohue 1997, Matisoff 1999, Mazaudon 2005)
  - c. lexical vs. grammatical functions (Welmers 1973, Ratliff 1992ab, Hyman 2001)
  - d. presence vs. absence of phonological alternations (sandhi): assimilations, dissimilations, contour simplification, reductions (Chen 1992, 2000; Hyman & Schuh 1974, Hyman 2007, Schuh 1978)

- (3) Pike (1948) distinction between contour vs. register systems (roughly Sinosphere vs. the world)

<i>A. “Contour tone systems”</i>	<i>B. “Register tone systems”</i>	<i>KT</i>	<i>Lai</i>
Fewer level tones than contours	More level tones than contours	B	A
Contour tones = units	Contour tones = sequences (clusters)	B	(B)
Contour tones have free distribution	Contour tones (clusters) often limited to the last syllable	B	A
Dissimilation of contour + contour	Dissimilation of contour tones = rare	B	A
Metathesis of features within a contour	Metathesis of contour tones = rare	(B)	A
No downstep	Downstep	B	A
Floating tones = rare	Floating tones = frequent	(B)	A
Tone spreading = rare	Tone spreading = frequent	B	(A)
Function of tone = lexical	Function = lexical <i>and/or</i> grammatical	(A)	A
Words are monosyllabic	Words come in various sizes	A	A
Tones are restricted by syllable type	Tones may occur on any syllable type	A	A

Two SE Asian Kuki-Chin languages: Kuki-Thaadow (3A, 8B), Hakha Lai (10A, 1B) (see below)

- (4) Goal of this paper: To present a phonologically-driven typology of two-height tone systems, based on markedness, drawing from a current database of over 550 tone systems (approx. 400 are two-height).
- (5) Some languages have a binary contrast underlyingly, but derive up to five tone heights, which may be surface contrastive. Some of the ways to derive a third tone height (→ contrastive when the trigger is lost):
  - a. lowering of H after L, e.g. Kom (Hyman 2005) L-H → L-M → M
  - b. raising of L before H, e.g. Ik (Heine 1993) L-H → M-H → M
  - c. raising of H before L, e.g. Engenni (Thomas 1978) H-L → <sup>h</sup>H-L → <sup>h</sup>H

“A low tone is realized as mid if followed by a high tone in the same word. The mid tone is retained even when the high tone is deleted due to word-final devoicing.” (Heine 1993:18)

- (6) *Question:* Does Ik have a two-height or three-height tone system?

We need a typological approach where both underlying and surface contrasts are considered, e.g. Ik = a 2T3 (read: “two-tone-three”) height system: 2 input vs. 3 output tone heights

- (7) The major question concerning two-height systems is whether they are best analyzed as

“equipollent” : /H/ vs. /L/      “privative” : /H/ vs. Ø, /L/ vs. Ø      both : /H/ vs. /L/ vs. Ø

/H, L/ : Baule, Bole, Mende, Nara, Falam, Kuki-Thaadow, Siane, Sko, Tanacross, Barasana

/H/ vs. Ø : Afar, Chichewa, Kirundi, Ekoti, Kiwai, Tinputz, Una, Blackfoot, Navajo, Seneca

/L/ vs. Ø : Malinke (Kita), Ruund, E. Cham, Galo, Kham, Dogrib, Tahltan, Bora-Miraña

/H, L/ vs. Ø : Ga, Kinande, Margi, Sukuma, Tiriki, Munduruku, Puinave, Yagua

- (8) The guiding principle is to posit the one vs. two tones which are “phonologically active”, i.e. invoked by the language’s constraints/rules. Cf. Clements’ (2001, 2003) notion of “representational economy”:  
 “... features are specified in a given language only to the extent that they are needed in order to express generalizations about the phonological system” (Clements 2001:2).  
 NB. A feature (tone) may be underlyingly active, or may become active in the course of the derivation (lexically, postlexically), as perhaps in the case of the M tone in Ik.
- (9) Privative systems typically have low “tonal density” (Gussenhoven 2001:15296). In a privative /H/ vs. Ø system, since L is underspecified (Ø), the H in principle
- cannot form HL and LH contours on a single TBU
  - can be a floating tone, whereas L cannot
  - can be subject to an OCP constraint (\*H-H), whereas L cannot
  - can shift over long distances, since there are no specified L tones to block the shift
  - can interact with (“see”) another H tone at long distance, since there is no L between them
  - is a pitch target, whereas Ø is not
- (10) Additional observations
- Ls may be introduced by rule or by default, at which point they are “phonologically active” by definition
  - although less common, privative /L/ vs. Ø systems have the same but inverted properties as /H/ vs. Ø; cf. floating L, OCP(L) in Bora-Miraña (Weber & Thiesen 2000; Seifart 2005).
- Working hypothesis:* There is nothing that a H tone can do that a L tone cannot do.
- (11) What about tonal markedness in two-height tone systems? Old (and intuitive) view that H = marked, L = unmarked (Pulleyblank 1986, 2006:415)
- in privative systems, the one specified tone = marked; cf. the distinction between “high-marked” vs. “low-marked” tone systems in Athabaskan (Hargus & Rice 2005:11-17)
  - in equipollent /H, L/ systems, where both features are “activated” (hence necessarily specified), two possible approaches:
    - universal markedness: H = marked, L = unmarked, e.g. de Lacy (2002a:28)
    - language-specific markedness: H = marked in some (most) languages, L in others
- (12) Maddieson (1978:341) distinguishes *possible* (marked-H, marked-L) vs. *probable* (marked-H) systems  
 “It may be that high tones are more frequently marked because an upward deflection of pitch is naturally salient against an overall downward intonational contour than a downward deflection. Falling intonations seems the most frequent in speech” (Maddieson 1978:342n).
- (13) If both /H/ and /L/ are specified, how can one tell which is “marked”? Among the possibilities:
- quantitative arguments, e.g. a tone which is more frequent in lexical entries or texts = less marked; cf. “a less frequent tone is marked” (Maddieson 1978:341) (this is certainly true in privative systems)  
*But:* A tone which is more frequently activated by the phonological constraints/rules = marked
  - qualitative arguments, e.g. the marked tone overrides the unmarked tone, i.e. is preserved in output  
 “marked elements are subject to greater preservation than less marked ones” (de Lacy 2002b:196)
- (14) Recent OT proposals that tonal markedness in particular (Pulleyblank 2004) and markedness in general (de Lacy 2002b, 2006) fall out from the ranking of Faithfulness constraints, e.g. MAX(Tone):  
 “Input tones are realized in the output (i.e. no deletion)” (Akinlabi & Mutaka 2001:353)
- (15) According to this approach we can restate the two markedness possibilities of /H, L/ as follows
- universal markedness:
    - MAX(H) >> MAX(L) (= marked H)
  - language-specific markedness:
    - MAX(H) >> MAX(L) (= marked H)
    - MAX(L) >> MAX(H) (= marked L)

- (16) So which is it? Evidence from Kuki-Thaadow and Hakha Lai (two Kuki-Chin languages spoken in NE India and Myanmar) shows that both of the language-specific possibilities in (15b) exist
- (17) Kuki-Thaadow (KT): three-way contrast on words, which are monosyllabic (Hyman 2010)
- a. /H/ : /hláaŋ/ ‘mountain’ /zóoŋ/ ‘monkey’ /thúm/ ‘three’  
 b. /L/ : /hùon/ ‘garden’ /làam/ ‘dance’ /gùup/ ‘six’  
 c. /HL/ : /lôw/ ‘field’ /ûy/ ‘dog’ /gîet/ ‘eight’
- (18) A contour tone can only be realized on the last syllable of a phrase, hence /HL/ → H(˘) / \_\_ σ
- a. /lôw/ + /làam/ → lów làam ‘field dance’ (˘ = delinked floating L)  
 HL L H˘ L  
 b. /lôw/ + /ûy/ → lów úy ‘field dog’ (˘ = downstep)  
 HL HL H˘ HL  
 c. /lôw/ + /ûy/ + /gîet/ → lów úy gîet ‘eight field dogs’ (with 2 downsteps)  
 HL HL HL H˘ H˘ HL
- (19) H tone spreading (HTS) applies whenever /H/ is followed by /L/, e.g. creating a HL falling tone on *gùup* ‘six’
- /hláaŋ + zóoŋ + gùup/ → hláaŋ zóoŋ gùup ‘six garden monkeys’  
 H H L H H HL
- (20) L tone spreading (LTS) may apply to a /L + H/ sequence, e.g. creating the LH rising tone on *zòoŋ* ‘monkey’
- a. /hùon + zóoŋ/ → hòon zòoŋ ‘garden monkey’ (L + H → L + LH)  
 L H  
 |-----  
 |-----  
 b. /lôw + zóoŋ/ → lów zòoŋ ‘field monkey’ (HL + H → H + LH)  
 HL H  
 /-----  
 /-----  
 (L tone spreading + pre-final contour simplification)
- (21) Application of LTS, HTS, and contour simplification to /L/ + /H/ + /L/
- /hùon + zóoŋ + gùup/ → hòon zòoŋ gùup ‘six garden monkeys’  
 L H L  
 |-----  
 |-----  
 (L + H + L → L + L + HL)
- (22) However: LTS does not apply when /L/ + /H/ is followed by /H/ or /HL/, hence no change:
- a. /hùon + zóoŋ + thúm/ → hòon zòoŋ thúm ‘three garden monkeys’  
 L H H  
 b. /hùon + zóoŋ + gîet/ → hòon zòoŋ gîet ‘eight garden monkeys’  
 L H HL
- (23) LTS applies to L + H if the H is either (i) phrase-final or (ii) followed by L (to which the H spreads by HTS). But not if followed by H or HL. Why this restriction?
- (24) First, consider what the output would have been if LTS could apply.
- by LTS*                      *by contour simplification*
- a. /L + H + H/ → L + LH + H → L + L + H  
 b. /L + H + HL/ → L + LH + HL → L + L + HL
- Question:* What’s wrong with the above? *Answer:* second syllable input Hs are not realized in output.
- (25) *Generalization about KT:* Every input H is always realized on the surface! The same is not true of input Ls, which are often not realized, e.g. when /HL + L/ is realized H + L, as in (18a) above
- (26) Resulting ranking of constraints: MAX(H) >> SPREAD(Tone) >> MAX(L)  
 i.e. tones will spread unless the result is the non-preservation of an input /H/



- (38) Frequency counts + tonal distribution by syllable type (T = stop, R = sonorant; (x) = few)

KT	#	CVV	CV(V)R	CVT	CVVT	Lai	#	CVV	CV(V)R	CVT	CVVT
H	503	x	x			LH	338	x	x	x	
L	513	x	x	x		L	206	x	x		x
HL	473	x	x		x	HL	291	x	x		

NB. The CVT tone is also the tone that verbs get in a tone reduction process (Stem<sub>1</sub> → Stem<sub>2</sub>)

- (39) KT: unmarked L is slightly more frequent, the only tone in CVp/CVt syllables, reductions; Lai is less consistent:
- /L/ is less frequent and cannot occur in CVT syllables, suggesting it is marked
  - but odd that /LH/ would be unmarked, given its phonetic complexity? Maddieson (2004:744-5) however finds /LH/ is shorter than the other tones on CV(V)R syllables
  - [L] is a less complex tone and the L output of the rules in (31a) suggests it is unmarked
- (40) “Markedness as faithfulness” (Pulleyblank 2004) / “Faithfulness to the marked” (de Lacy 2002b, 2006) vs. “Markedness as complexity” (cf. Haspelmath 2006:26)  
The “repairs” in Hakha Lai are structure-preserving and “show strict adherence to the universal, phonetically grounded, markedness scale: \*R >> \*F >> \*L” (Hyman & VanBik 2004:827)
- (41) Does “markedness as faithfulness” actually account for privative systems? Haya /H/ vs. Ø mostly has rules of H deletion; similarly, Bora-Miraña /L/ vs. Ø mostly has rules of L deletion; in some privative systems, the one underlying tone is culminative (“at most one per word”).
- (42) Haspelmath’s (2006:64-5) 12 senses of the term “markedness”. Particularly relevant here:
- “markedness as specification for a phonological distinction”
  - “markedness as phonetic difficulty”
  - “markedness as rarity in texts [and lexicons]”
  - “markedness as rarity in the world”
  - “markedness as restricted distribution”
  - “markedness as deviation from default parameter setting”
- “Markedness” is thus an incoherent notion—Haspelmath suggests replacing it with detailed study of the relevant properties and their distributions. This is typology! And linguistics!
- (43) The same holds for tones at the phrase and utterance level, although various reported “intonemes” seem usually to involve both H and L features or equivalent (Beckman & Pierrehumbert 1986, Bruce 1977, Riad 1998, Gussenhoven 2004, Jun 2005, Ladd 2008 etc.), but perhaps with skewings not unlike the lexical level (cf. the numerous African languages which mark questions with final L% (Rialland 2007)).
- (44) Kuki-Thaadow and Hakha Lai have opposite utterance-initial boundary tones
- KT %L : /H/ → LH / pause \_\_\_ e.g. /hláaŋ/ → [hlâaŋ] ‘mountain’
  - Lai %H : /LH/ → HL / pause \_\_\_ e.g. /thlâaŋ/ → [thlâaŋ] ‘grave’
- (45) Conclusion: It’s not about markedness, rather differences in phonological ACTIVATION (Clements)!  
Which tone is activated (H, L, both), where in the phonology, and how?

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