

## **Kuki-Thaadow: An African Tone System in Southeast Asia**

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### **1. Introduction**

Since the publication of Pike (1948), it has often been assumed that tone systems fall into two types: (i) Chinese, Vietnamese, and nearby languages of East and Southeast Asia are said to have “contour tone systems” in which the various combinations of rises and falls function as complex units. (ii) African and most other tone systems are said to have register tone systems, whose primary oppositions consist of level tones such as High (H) and Low (L). Hs and Ls may combine to form complex rising (LH) and falling (HL) sequences on single tone-bearing units, but these are not complex units like affricates or prenasalized consonants in segmental phonology, but are instead tonal sequences comparable to consonant clusters (Yip 1989). One additional striking observation about Southeast Asian-type languages is their tendency towards what Bickel (2003) terms TAUTOMORPHEMICITY: Each word is a single morpheme and single syllable. While Bickel excludes prosody from the definition, the tautomorphemic condition is met when each tone stays on its own syllable = morpheme (Schuh 1978; Chen 1992).

In his comprehensive volume on the phonological structures of African languages, Creissels (1994:241) takes note of the Southeast Asian type and adds, “aucun système de ce type n’a été signalé en domaine négro-africain.” He goes on to explain that the contour tones which appear in register systems are almost always transparently segmentable into combinations of level tones in African languages.

While a Southeast Asian-type tone system is yet to be unambiguously documented in Africa, the goal in the present paper is to show the reverse—that a bona fide African-type tone system is attested in Southeast Asia. The language I will describe in the following sections is Kuki-Thaadow [kùkí t<sup>h</sup>à:dǒw], a member of the Kuki-Chin subgroup of Tibeto-Burman. Spoken in Northeast India and neighboring Myanmar, it will be seen that Kuki-Thaadow (henceforth, KT) is packed full of properties that we typically associate with African tone systems: two levels, H- and L-tone spreading, downstep, floating tones, polar tones—in short, the very phenomena which we know so well from the study of tone in African languages.<sup>1</sup>

The paper is organized as follows. In §2 I present the isolation tones in KT. §3 presents the tonal alternations on lexical morphemes, while §4 considers grammatical tone. The consequences for typology of tone systems are considered in the conclusion in §5.

### **2. The KT Isolation Tones**

<sup>1</sup> My investigations of KT began in 2001 with weekly consultant work over an 18 month period with Rev. Thien Haokip from Lamka district in Northeast India. In Fall 2003 I then taught the first half of a year-long field methods course at Berkeley with the assistance of Ms. Vei Ning, a speaker of KT from Myanmar. The phonetic differences between the two speakers are minimal, mostly concerning vowels: While Thien pronounces /ie/ and /uo/ as diphthongs, Ning pronounces these as [e] and [o]. Both pronounce /e/ and /o/ as [ɛ] and [ɔ] and have the same tone system reported in this study. I am extremely grateful to both of them for their dedication to our efforts and for their wisdom and patience.

KT is a tone language in which every syllable carries one of three underlying tones. In isolation, the three tones are realized as high to low falling (HL), low to high rising (LH), and a low (L) tone which is fairly level but downglides before pause. Examples from different word classes are given in the following tables:

HL falling tone (HL)

<i>nouns</i>		<i>verbs</i>		<i>other</i>	
vâa	‘bird’	tsôo	‘buy’	tûu	‘now’
lâm	‘path, road’	hlûŋ	‘arrive’	kûo	‘nine’
lôw	‘field’	tâaw	‘pray’	kêy	‘I, me’
mâay	‘face’	ŋâʔ	‘wait’	kît	‘again’
khûup	‘knee’	kâap	‘shoot’	tsiêʔ	‘each’
môot	‘banana’	lûut	‘enter’	gîet	‘eight’

LH rising tone (LH)

<i>nouns</i>		<i>verbs</i>		<i>other</i>	
thôo	‘fence’	vêe	‘watch’	lii	‘four’
khûo	‘village’	nâm	‘smell’	ŋǎa	‘five’
gǎm	‘country’	kǎan	‘bind, tie’	thûm	‘three’
hûul	‘hole’	vûuy	‘bury’	ǎa	(oblique)
khûoy	‘bee’	vǎʔ	‘feed’	pěen	(superlative)
nǎʔ	‘nose’	ŋiêʔ	‘growl’	sěʔ	‘only’

L level tone (L)

<i>nouns</i>		<i>verbs</i>		<i>other</i>	
hlàa	‘wing’	mùu	‘see’	nii	‘two’
màn	‘price’	kòw	‘call’	lòw	(negative)
zàan	‘night’	dòon	‘sprout’	kwòy	‘who’
pùul	‘plague’	gùoy	‘hire’	sòom	‘ten’
hùon	‘garden’	kàp	‘cry’	khàt	‘one’
vòʔ	‘pig’	pèt	‘bite’	gùup	‘six’

In terms of realization, where a higher number represents a higher pitch, HL = 41, LH = 23, and L = 21. The following tonal transcriptions and abbreviations are adopted in this study:

[â]	HL	falling tone	[á]	H	high tone
[ǎ]	LH	rising tone	[↓á]	↓H	downstepped high tone
[à]	L	low tone	[â]	↓HL	downstepped falling tone

As can be seen in the following minimal triplets, tone is important in KT, often being the only feature distinguishing between words:

sâa	‘animal’	lôw	‘field’	hâm	{question}
sǎa	‘hot’	lǒw	‘medecine’	hǎm	‘snatch’
sàa	‘build’	lòw	{negative}	hàm	‘wheat’

mâu	‘seed’	lêy	‘earth, dirt’	în	‘house’
mũu	‘hawk’	lěy	‘tongue’	in	{ergative}
mùu	‘see’	lèy	‘bridge’	ĩn	{instrumental}

### 3. Tonal Alternations

Although a word carries only HL, LH or L in isolation, tones are modified in context, where a fourth tone, high (H), is observed, as well as contrastive downstep ( $\downarrow$ ). The major tone rules operating in KT are contour simplification and tone spreading.

#### 3.1. Contour simplification

KT allows HL and LH contour tones only in pre-pausal position. As we have seen, words in isolation may carry HL, LH or L tone. In the following phrases, the L tone noun *kèel* ‘goat’ is followed by adjectives and numerals representing the three contrastive tones:

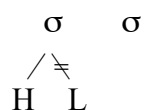
L + HL:	kèel	tsôm	‘short goat’	kèel	gîet	‘eight goats’
L + LH:	kèel	gõoŋ	‘thin goat’	kèel	thũm	‘three goats’
L + L:	kèel	lien	‘big goat’	kèel	gùup	‘six goats’

As seen, when preceded by a L tone, the tones of all words are realized exactly as they would be in isolation.

The same three modifier tones are observed when the preceded by the F tone noun *úy* ‘dog’:

HL + HL:	úy	$\downarrow$ tsôm	‘short dog’	úy	$\downarrow$ gîet	‘eight dogs’
HL + LH:	úy	gõoŋ	‘thin dog’	úy	thũm	‘three dogs’
HL + L:	úy	lien	‘big dog’	úy	gùup	‘six dogs’

As seen, the HL becomes a level H tone by a process of CONTOUR SIMPLIFICATION (CS). This can be represented by delinking the L from its syllable ( $\sigma$ ) whenever it is followed by another syllable:



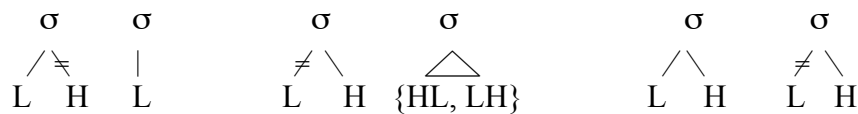
If the following syllable is /HL/, then this falling tone will begin at a lower level. This lowering, known as DOWNSTEP, is marked by  $\downarrow$ . As further examples will also show, downstep occurs whenever a free or “floating” L tone is preceded by a H tone syllable and is followed by either a H or HL syllable:



As seen in preceding examples, the floating L tone can be followed by an utterance-final LH tone: *úy gǒoŋ* ‘thin goat’. Now compare, however, what happens when a LH tone noun such as *zǒoŋ* ‘monkey’ occurs in pre-final position:

LH + HL:	<i>zǒoŋ tsôm</i>	‘short monkey’	<i>zǒoŋ g̃tət</i>	‘eight monkeys’
LH + LH:	<i>zǒoŋ góoŋ</i>	‘thin monkey’	<i>zǒoŋ thúm</i>	‘three monkeys’
LH + L:	<i>zòoŋ lien</i>	‘big monkey’	<i>zòoŋ g̃up</i>	‘six monkeys’

When followed by a HL or another LH tone, a LH tone word will be realized H. The combination LH + L, on the other hand, surfaces as L + HL. This might at first suggest that there are three rules of LH simplification as below:



The first CS rule delinks the H of the LH rising tone when followed by a L. (As discussed in the next section, the floating H will be realized on the next syllable.) The second CS rule delinks the L of LH when followed by either a HL falling or LH rising tone. As seen in the phrases *zǒoŋ góoŋ* ‘thin goat’ and *zǒoŋ thúm* ‘three goats’, the third CS rule delinks the L of the second LH of a LH-LH sequence. The major problem is why the delinked L in the last rule does not trigger downstep: an input of LH + LH is realized H-H, not H-<sup>↓</sup>H. The solution in the next section will not only account for this absence of downstep but also denecessitate all but the first of the LH contour simplification rules.

### 3.2. Underlying /H/

Up until now it has been assumed that there is an underlying /LH/ tone in KT. This assumption actually leads to complications. As seen in §3.1, a LH contour would have to simplify sometimes as L, sometimes as H, and in the latter case, the resulting floating L never triggers downstep. There is good reason, therefore, to propose that the LH tone be analyzed as underlying /H/. Assuming the underlying system /HL, H, L/, the tonal alternations exemplified thus far are summarized in the following table:

	<i>isolation</i>	+ HL	+ H	+ L
HL	HL	H- <sup>↓</sup> HL	H-LH	H-L
H	LH	H-HL	H-H	L-HL
L	L	L-HL	L-LH	L-L

As seen, whenever /H/ is realized LH or L, it is because it is utterance-initial or preceded by /HL/ or /L/ tone. Before introducing the two rules of tone spreading, the following table shows the realizations of the 27 combinations of tones found on sequences of three syllables:

ûy	+	tsôm	+	gîet	→	úy	↓tsóm	↓gîet	‘eight short dogs’
ûy	+	tsôm	+	thúm	→	úy	↓tsóm	thũm	‘three short dogs’
ûy	+	tsôm	+	gùup	→	úy	↓tsóm	gùup	‘six short dogs’
ûy	+	góoŋ	+	gîet	→	úy	↓góoŋ	gîet	‘eight thin dogs’
ûy	+	góoŋ	+	thúm	→	úy	↓góoŋ	thúm	‘three thin dogs’
ûy	+	góoŋ	+	gùup	→	úy	gòoŋ	gùup	‘six thin dogs’
ûy	+	lien	+	gîet	→	úy	lien	gîet	‘eight big dogs’
ûy	+	lien	+	thúm	→	úy	lien	thũm	‘three big dogs’
ûy	+	lien	+	gùup	→	úy	lien	gùup	‘six big dogs’
zóoŋ	+	tsôm	+	gîet	→	zóoŋ	tsóm	↓gîet	‘eight short monkeys’
zóoŋ	+	tsôm	+	thúm	→	zóoŋ	tsóm	thũm	‘three short monkeys’
zóoŋ	+	tsôm	+	gùup	→	zóoŋ	tsóm	gùup	‘six short monkeys’
zóoŋ	+	góoŋ	+	gîet	→	zóoŋ	góoŋ	gîet	‘eight thin monkeys’
zóoŋ	+	góoŋ	+	thúm	→	zóoŋ	góoŋ	thúm	‘three thin monkeys’
zóoŋ	+	góoŋ	+	gùup	→	zóoŋ	góoŋ	gùup	‘six thin monkeys’
zóoŋ	+	lien	+	gîet	→	zòoŋ	lien	↓gîet	‘eight big monkeys’
zóoŋ	+	lien	+	thúm	→	zòoŋ	lien	thũm	‘three big monkeys’
zóoŋ	+	lien	+	gùup	→	zòoŋ	lien	gùup	‘six big monkeys’
kèel	+	tsôm	+	gîet	→	kèel	tsóm	↓gîet	‘eight short goats’
kèel	+	tsôm	+	thúm	→	kèel	tsóm	thũm	‘three short goats’
kèel	+	tsôm	+	gùup	→	kèel	tsóm	gùup	‘six short goats’
kèel	+	góoŋ	+	gîet	→	kèel	góoŋ	gîet	‘eight thin goats’
kèel	+	góoŋ	+	thúm	→	kèel	góoŋ	thúm	‘three thin goats’
kèel	+	góoŋ	+	gùup	→	kèel	gòoŋ	gùup	‘six thin goats’
kèel	+	lien	+	gîet	→	kèel	lien	gîet	‘eight big goats’
kèel	+	lien	+	thúm	→	kèel	lien	thũm	‘three big goats’
kèel	+	lien	+	gùup	→	kèel	lien	gùup	‘six big goats’

The input/output tones are summarized as follows:

HL-HL-HL	→	H-↓H-↓HL	H-HL-HL	→	H-H-↓HL	L-HL-HL	→	L-H-↓HL
HL-HL-H	→	H-↓H-LH	H-HL-H	→	H-H-LH	L-HL-H	→	L-H-LH
HL-HL-L	→	H-↓H-L	H-HL-L	→	H-H-L	L-HL-L	→	L-H-L
HL-H-HL	→	H-↓H-HL	H-H-HL	→	H-H-HL	L-H-HL	→	L-H-HL
HL-H-H	→	H-↓H-H	H-H-H	→	H-H-H	L-H-H	→	L-H-H
HL-H-L	→	H-L-HL	H-H-L	→	H-H-HL	L-H-L	→	L-L-HL
HL-L-HL	→	H-L-HL	H+L+HL	→	H-H-↓HL	L-L-HL	→	L-L-HL
HL-L-H	→	H-L-LH	H+L+H	→	L-H-LH	L-L-H	→	L-L-LH
HL-L-L	→	H-L-L	H+L+L	→	H-H-L	L-L-L	→	L-L-L

The above noun + adjective + numeral combinations and the corresponding summary table are representative of three-syllable sequences in KT. Regardless of the syntactic relation, unless interrupted by pause, whenever the indicated tones are inputted, they are realized as indicated. The following subsections discuss the alternations seen in these tables.

### 3.3. Downstep

The phrase *úy* <sup>↓</sup>*tsóm* <sup>↓</sup>*gîet* ‘eight short dogs’, from /úy + tsóm + gîet/, shows that it is possible to obtain multiple downsteps in KT. If we were to prepose *kéy* <sup>↓</sup>*pâa* ‘my father’, from /kêy + pâa/, to this phrase we would obtain two more downsteps: *kéy* <sup>↓</sup>*pâa* <sup>↓</sup>*úy* <sup>↓</sup>*tsóm* <sup>↓</sup>*gîet* ‘my father’s eight short dogs’. Similarly, if we were to follow this by *kéey* <sup>↓</sup>*tôo* ‘foot’, from /kêey/ ‘leg’ + /tôo/ ‘bottom, end’, this would produce a total of six downsteps: *kéy* <sup>↓</sup>*pâa* <sup>↓</sup>*úy* <sup>↓</sup>*tsóm* <sup>↓</sup>*gîet* <sup>↓</sup>*kéey* <sup>↓</sup>*tôo* ‘my father’s eight short dogs’ feet’. Each of these downsteps is contrastive with the absence of a downstep. As can be inferred from this rather extreme example, there is no principled upper end to the number of downsteps one can find in succession in a single utterance. Note that while the downsteps in this paragraph derive from successive HL tones, it is also possible to get a downstep from an input of HL + H + HL and HL + H + H: *úy* <sup>↓</sup>*tsóm* *gîet* ‘eight short dogs’, *úy* <sup>↓</sup>*tsóm* *thúm* ‘three short dogs’.

Although the downstep mark <sup>↓</sup> suggests that the process is one of lowering the following H tone, it is more appropriate to say that the H of the preceding syllable(s) is raised to anticipate the downstep. This is seen in the following phrases:

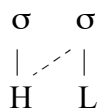
/bóoy vóm thúm hí/	→	bóoy vóm thúm hí	[ - - - ]	‘these three black cows’
/mêey vóm thúm hí/	→	mêey <sup>↓</sup> vóm thúm hí	[ ^ - - ]	‘these three black cats’
/bóoy tsóm thúm hí/	→	bóoy tsóm <sup>↓</sup> thúm hí	[ - ^ - ]	‘these three short cows’
/mêey tsóm thúm hí/	→	mêey <sup>↓</sup> tsóm <sup>↓</sup> thúm hí	[ - ^ - ]	‘these three short cats’

The schemas to the right of the first output shows that an entirely H phrase will be realized rather mid in pitch, say 3-3-3-3. The H of the one syllable preceding the downstep is raised in the second phrase (4-3-3-3), while both H tone syllables are raised in the third phrase (4-4-3-3). The last phrase shows that there will be a separate, successive anticipatory raising for each downstep (5-4-3-3).

Finally, note that successive changes of H’s and L’s condition an automatic downstep or DOWNDRIFT. Thus, each successive H of *nà húnj ñj ká dèy êe* ‘I want you to come’, from /nà húnj ñj ká dèy êe/, is realized on a successively lower pitch.

### 3.4. H Tone Spreading (HTS)

Several of the phrases cited in earlier sections reveal the need for the following rule of H tone spreading (HTS):



A H tone will spread onto a following L tone syllable: /zóoy góoy gùup/ → *zóoy góoy gùup* ‘six thin monkeys’. As schematized, HTS converts an underlying /H-L/ sequence into H-HL. However, just as was seen with respect to underlying /HL/, the HL derived by HTS will be simplified to H if followed by another tone. The following phrases show HTS applying to a /H-L/ noun + numeral sequence, followed by each of the three underlying tones:

- /H/ + /L/ + /HL/ → hítsyé kéel ˩gîet ‘these eight goats’  
 /H/ + /L/ + /H/ → hítsyé kéel thǔm ‘these three goats’  
 /H/ + /L/ + /L/ → hítsyé kéel gùup ‘these six goats’

The sequences in question are preceded by the near speaker demonstrative *hítsyé* whose /H/ spreads onto the L of /kèel/ ‘goat’. Although the result would have been a HL falling tone in final position (*hítsyé kèel* ‘this goat’), a H surfaces on [kéel] in non-final position by CS. In *hítsyé kéel thǔm* ‘these three goats’, the L of /kèel/ spreads onto the H tone numeral /thúm/ ‘three’.

### 3.5. L Tone Spreading (LTS)

The above three phrases demonstrate that HTS applies to a /H-L/ sequence independent of the tone that follows. The following phrases show that the analogous process of L tone spreading (LTS) is more restricted:

- /L/ + /H/ + /HL/ → kà zóon̄ gîet ‘my eight monkeys’  
 /L/ + /H/ + /H/ → kà zóon̄ thúm ‘my three monkeys’  
 /L/ + /H/ + /L/ → kà zòon̄ gùup ‘my six monkeys’

By itself the possessive + noun sequence /kà zóon̄/ ‘my monkey’ is realized *kà zǒon̄* by LTS: the L of /kà/ ‘my’ spreads onto the H tone syllable /zóon̄/ ‘monkey’. However, the first two phrases above show that a /L-H/ sequence will be realized unchanged if followed by either a /HL/ or /H/ tone. On the other hand, when it is followed by a /L/ tone, both LTS and HTS will apply:

kà zòon̄ gùup ‘my six monkeys’  
 |     †     |  
 L     H     L

As seen, the LH which results from LTS is simplified by CS, while the HL which results from HTS is realized in final position. The result is a L-L-HL sequence.

The following phrases show similar facts when the input sequence is /HL-H/:

- HL+H+HL → káy ˩zóon̄ gîet ‘my eight monkeys’  
 HL+H+H → káy ˩zóon̄ thúm ‘my three monkeys’  
 HL+H+L → káy zòon̄ gùup ‘my six monkeys’

The pronoun *káy* ‘I, me, my’ has been substituted for the proclitic *kà* ‘I, my’ in the previous set (cf. *káy zǒon̄* ‘my monkey’). As expected, its underlying /HL/ simplifies to H by CS. The delinked L produces a downstep in the first two phrases, where LTS fails to apply before a /HL/ or /H/ tone. In the third phrase, however, both LTS and HTS apply:

káy zòon̄ gùup ‘my six monkeys’  
 / † |  
 H L H L

From this example it can be seen that LTS is triggered by both /L/ and /HL/ tones: LTS converts underlying /L-H/ and /HL-H/ to L-LH and H-LH before pause. In addition, the sequences /L-H-L/ and /HL-H-L/ are realized L-L-HL and H-L-HL by an interplay of LTS, HTS and CS, as demonstrated above. Neither /L-H/ nor /HL-H/ will undergo LTS when they are followed by a /HL/ or /H/ tone.

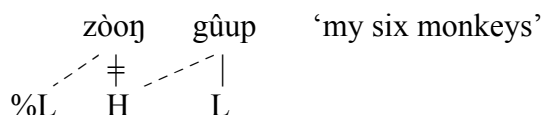
The application vs. non-application of LTS is summarized below:

Applies:	(i) before pause	(ii) before /L/
	/L-H/ → L-LH	/L-H-L/ → L-L-HL
	/HL-H/ → H-LH	/HL-H-L/ → H-L-HL
Does not apply:	(i) before /HL/	(ii) before /H/
	/L-H-HL/ → L-H-HL	/L-H-H/ → L-H-H
	/HL-H-HL/ → H- <sup>l</sup> H-HL	/HL-H-H/ → H- <sup>l</sup> H-H

A comparison of these outputs suggests an generalization: In the two environments where LTS applies, the underlying /H/ is realized on the surface. Before pause, the result of spreading will be a LH rising tone; before /L/, the /H/ will spread onto the following syllable to produce an output HL—which will simplify to H(<sup>l</sup>) if not in final position. Compare this to the environments where LTS does not apply: If /L-H-HL/ were to become L-L-HL there would be no trace of the underlying /H/ of the second syllable. Note that this output would also merge with /L-L-HL/. If LTS were to apply more generally, a surface L-HL sequence could either have come directly from /L-HL/ or from /H-HL/ when preceded by either /L/ or /HL/. However, avoidance of merger can't be the entire story. If LTS were to apply to all /L-H/ input sequences, then a surface L-H would unambiguously derive from an underlying /H-H/ sequence preceded by /L/ or /HL/. This is because /L-H/ is realized L-LH before pause and would be realized L-L by CS in non-final position.<sup>2</sup>

The more inclusive statement is that KT does not allow LTS to apply if the result will be the non-realization of an underlying H tone feature. In fact, the H feature of both underlying /H/ and /HL/ tones is never lost on the surface in KT. On the other hand, when HL becomes H by CS, an input L feature may fail to be realized. Interestingly, this never results in merger, since the delinked L always has a recoverable effect: it either triggers LTS, conditions downstep, or blocks HTS.

While either /L/ or /HL/ can trigger LTS, we have also seen that /H/ words have LH tone in isolation: /zóoŋ/ → zóoŋ ‘monkey’, /khúo/ → khúo ‘village’. LTS will in fact apply to an utterance-initial /H/ that is either final (as in citation) or followed by a /L/ tone: /zóoŋ gùup/ → zóoŋ gùup ‘six monkeys’. To account for this, a boundary L tone is set up utterance-initially and after pause. This tone, symbolized %L, can then appropriately trigger LTS:



<sup>2</sup> What this means is that that LTS is not blocked because of a recoverability problem, but rather because the language “wants” every input /H/ to have a surface realization in the output. In optimality theoretic terms the KT facts are elegantly captured by the ranking: MAX(H) >> SPREAD (H,L) >> MAX(L).



Finally, note that LTS never applies to a syllable with /HL/ tone: /kà ûy/ → kà ûy ‘my dog’ rather than \*kà ǔỹ, \*kà ǔy or \*kà ùy.

#### 4. Grammatical Tone

The tone rules discussed in §2 are completely general and show that the underlying tones of each word of morpheme can be modified by the same processes of contour simplification and H- and L-tone spreading long known to occur in African tone systems (Hyman & Schuh 1974; Creissels 1994; Hyman, in press). Most of the above discussion has centered around the realization of tones on monomorphemic nouns, verbs, and adjectives. Another difference sometimes cited between African and Southeast Asian tone systems is that the latter do not make use of tone for grammatical properties. In this section we examine three areas where KT again sides with Africa in exploiting tone for morphological purposes: pronominal proclitic tone, tonal morphemes, and stem2 tone. The need for floating H tones will further place KT in the African column.

##### 4.1. Pronominal Proclitic Tone

There are four pronominal proclitics in KT whose underlying tone varies between /L/ and /HL/ according to the tone of the following word:

before /HL, H/	before /L/	
/kà/	/kâ/	first person (excl)
/nà/	/nâ/	second person
/à/	/â/	third person
/ì/	/î/	first person (incl)

These proclitics, which are used with both nouns and verbs, have an underlying /L/ tone when followed by a /HL/ or /H/ tone, but /HL/ tone when followed by a /L/ tone:

	‘my’	‘your’	‘his/her’	‘our (dual incl)’	
/L/ :	kà ûy	nà ûy	à ûy	ì ûy	‘dog’
/L/ :	kà zǒoŋ	nà zǒoŋ	à zǒoŋ	ì zǒoŋ	‘monkey’
/HL/ :	ká kèel	ná kèel	á kèel	í kèel	‘goat’

In the above phrases, the /L/ of /kà, nà, à, ì/ found before /HL/ and /H/ tones is realized L. In the phrases involving /zǒoŋ/ ‘monkey’, this /L/ triggers LTS, thereby creating the rising tone on zǒoŋ. The /HL/ of the representations /kâ, nâ, â, î/ required before a /L/ tone, is realized H by CS. If /H/ had been set up instead, HTS spreading would have incorrectly applied to yield \*ká kèel (or \*kà kèel via LTS) instead of the correct form ká kèel ‘my goat’. In addition, if zòol ká kèel á mùu êe ‘a friend saw my goat’ had been set up with /zòol ká kèel.../, we would have expected LTS also to apply, to yield the incorrect \*zòol kà kèel ʷá mùu ê. Historically, it can be hypothesized that these proclitics originally carried \*HL tone which simplified to L in Pre-KT \*HL-HL and \*HL-H sequences. If this reconstruction is correct, it would mean that all pronouns were \*HL in Pre-KT (cf. kèy ‘me’, nèy ‘you’).

Although the forms given in the preceding table are unmarked for number, the same tonal allomorphy is observed when the dual /hlòn/ or plural /ùu/ postposition follows the noun: kà

*úy hlòn* ‘our (dual excl) dog’, *nà zòoŋ hlôn* ‘your (dual) monkey’, *á kèel ùu* ‘their (pl.) goat’, *ì úy ùu* ‘our (pl. incl) dog’, etc.

The same four proclitics appear with identical tonal variation in verb constructions:

	<b>‘I’</b>	<b>‘you’</b>	<b>‘he, she’</b>	<b>‘we (dual incl)’</b>	
/HL/ :	kà née ↓êe	nà née ↓êe	à née ↓êe	ì née ↓êe	‘eat’
/H/ :	kà núuy êe	nà núuy êe	à núuy êe	ì núuy êe	‘laugh’
/L/ :	ká kàp êe	ná kàp êe	á kàp êe	í kàp êe	‘cry’

The verbs are /nêe/ ‘eat’, /núuy/ ‘laugh’, and /kàp/ ‘cry’. In this case /kà núuy êe/ ‘I am laughing’ and other forms in the second row do not undergo LTS because of the following /HL/ tone of the declarative marker /êe/. Again, dual and plural forms show the same alternations: *kà née hlòn êe* ‘we (dual excl) are eating’, *nà núuy hlôn ↓êe* ‘you (dual) are laughing’, *á kàp ùvêe* ‘they (pl.) are crying’, *ì née ùvêe* ‘we (pl. incl) are eating’.

Given the above allomorphy, the following interesting surface contrast arises:

/kà/ + /H/ + /L/	→	kà L HL	e.g. kà zòoŋ gúup	‘my six monkeys’
/ká/ + /L/ + /HL/	→	ká L HL	e.g. ká kèel gîet	‘my eight goats’

In the first phrase, the /L/ of the proclitic *kà* triggers LTS, since a /H/ + /L/ sequence follows. The output is L-L-HL. On the other hand, an underlying /HL/ proclitic followed by a /L/ + /HL/ sequence is realized H-L-HL. A L-HL sequence can thus be derived from two distinct underlying representations. As a result, there are potential minimal pairs such as the following:

/à bù? kùo/	→	à bù? kùo	‘his frost pit’
/â bù? kùo/	→	á bù? kùo	‘his nine colds’

The first phrase has a /L/ proclitic /à/ because of the /H/ of /bù?/ ‘pit, hole’, while the second has a /HL/ proclitic /â/ because of the /L/ of /bù?/ ‘cold (n.)’.

We see in these contrasts that the choice of a /L/ vs. /HL/ proclitic is determined on the basis of the UNDERLYING tone of the following word. In addition, *ka*, *na*, *a* and *i* exhibit the same tonal allomorphy independently of whether they are used as subject or possessive pronouns. There is exactly one exception to this statement: When occurring as subject markers before the past tense proclitic /ná/, the four pronominal proclitics have /H/ tone:

ká ná múu ↓êe	‘I saw it’	/mùu/	‘see’
ná ná záam ↓êe	‘you ran away’	/záam/	‘run away’
á ná lúut ↓êe	‘s/he entered’	/lúut/	‘enter’
í ná núuy êe	‘you and I laughed’	/núuy/	‘laugh’

This shows that the tones of pronominal proclitics are not only sensitive to the following tone, but also partly receive their tone paradigmatically.

Of the remaining pronominal elements which accompany the verb, *êy* ‘first person object’ and *nêy* ‘second person subject + first person object’ are independent words which carry HL tone: *éy mùu êe* ‘he sees me’, *néy mùu êe* ‘you see me’. This leaves the reflexive marker *kì*. Rather than varying between /L/ and /HL/, /kì/ has underlying /L/ tone in all contexts:

á kì khúot ↓êe	‘he scratched himself, he was scratched’	/khúot/	‘scratch’
á kì hlénj êe	‘he chose himself, he was chosen’	/hlénj/	‘choose’
á kì pèt êe	‘he bit himself, he was bitten’	/pèt/	‘bite’

As seen, *kì* is pronounced L independently of the tone of the following verb. As a result, the subject proclitic takes the /â/ allomorph and is pronounced H by CS.

Finally, note that when a CVV is reduced to CV by vowel shortening, a process that occurs, for example, in noun + adjective sequences, its tone is realized exactly the same as full syllables:

/vâa/	‘bird’	vá lien	‘big bird’	kà vá lien	‘my big bird’
/lúu/	‘head’	lù lien	‘big head’	kà lù lien	‘my big head’
/khùo/	‘foot’	khwò lien	‘big foot’	ká khwò lien	‘my big foot’

Thus, when vowel shortening applies before the (deverbal) adjective /lien/ ‘big’, the above phrases maintain distinct tonal properties. The correct proclitic allomorph, /kà/ or /ká/, is again chosen on the basis of the underlying tone.

## 4.2. Tonal morphemes

While the surface tones of utterances can usually be calculated on the basis of the input tones found on the syllables of each concatenated word or grammatical marker, there are constructions where an additional H tone unexpectedly occurs. As will be seen, we shall treat such a H as a TONAL MORPHEME whose effect can be seen both within complex noun phrases as well as within the verb complex.

### 4.2.1. Genitive H Tone

The tonal morpheme found within complex noun phrases will be referred to as GENITIVE H TONE. In the following noun phrases, a sequence of a L tone noun followed by one or more L tone modifiers is realized all L:

vò? lien	‘big pig’	vò? lien nìi	‘two big pigs’
vò? nìi	‘two pigs’	vò? lien hòo	‘two pigs’
vò? hòo	‘pigs’	vò? lien nìi hòo	‘two big pigs’

The same is true of noun + noun compounds or possessives whose second element is modified:

vò? mìt	‘pig eye, pig’s eye’	vò? mìt lien	‘big pig eye’
vò? mìt nìi	‘two pig eyes’	vò? mìt lien nìi	‘two big pig eyes’
vò? mìt hòo	‘pig eyes’	vò? mìt lien nìi hòo	‘two big pig eyes’

Finally, there will be no tonal changes if a multiple noun compound is strictly right-branching:

vò? mìt ùul	‘pig’s eye perspiration’	vò? mìt ùul thà?	‘pig’s eye perspiration itch’
vò? mìt thà?	‘pig’s eye itch’	vò? mìt ùul nàm	‘pig’s eye perspiration odor’

Now compare the following phrases, where all of the words have underlying /L/ tone:

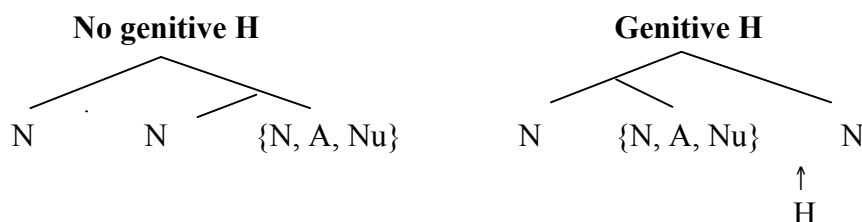
zòol bùu	‘friend’s food’	zòol lien bùu	‘big friend’s food’
zòol hòo bùu	‘friends’ food’	zòol lien hòo bùu	‘big friends’ food’
zòol nìi bùu	‘two friends’ food’	zòol lien nìi bùu	‘2 big friends’ food’
zòol nìi hòo bùu	‘two friends’ food’	zòol lien nìi hòo bùu	‘2 big friends’ food’

While there is no difference between a compound vs. possessive noun + noun in KT, *zòol bùu* ‘friend’s food, friend food’ was chosen to allow semantic separability. In each of the above phrases, when the first element /zòol/ ‘friend’ is modified, the head noun /bùu/ ‘food’ is unexpectedly realized HL. The same is involved in the following phrases which involve a compound + noun structure:

hàaw sàa	‘chief’ (lit. wealth builder)	hàaw sàa bùu	‘chief’s food’
hùuy kòt	‘window’ (lit. wind + door)	hùuy kòt mún	‘window’s place’

Here the /L/ tone nouns /bùu/ ‘food’ and /mún/ ‘place’ are also realized HL.

The difference between the two tonal contexts can be schematized as follows:



No tone change will take place if the branching constituent is on the right. If it is on the left, the genitive H tone will be inserted. As shown, the H will follow a branching noun-noun, noun-adjective, noun-numeral, or noun-plural constituent.

Concerning the historical source of the inserted H, two hypotheses are worthy of consideration. First, it may be the relic of an old genitive marker, perhaps related to the headless possessive marker /áa/ found in KT today: *kà píuu áa* ‘my grandfather’s’, *kéy áa* ‘mine’. Alternatively, it may derive from the third person proclitic /a/ which would have underlying /HL/ and surface H tone before a following L (§4.1). In this case, /zòol + lien + ‘ + bùu/ ‘big friend’s food’ may have derived from ‘friend big his food’. This second hypothesis has the advantage of explaining why the H is present only if the following noun is L tone (see below).

The following three facts should be noted concerning the genitive H:

First, the above left-branching configuration is required in order for there to be a genitive H. Thus, /zòol khùt nìi/ ‘friend’s two hands’ can only be pronounced *zòol khùt nìi*, not \**zòol khùt nìi* or \**zòol khùt nìi*.

Second, there appears to be variation, some of which can be predicted. In principle, a noun+noun+noun compound could be either left- or right-branching. Thus, we expect *kèel khwò gùu* ‘goat’s leg-bone’ vs. *kèel khwò gùu* ‘goat-leg bone’. When *hùuy kòt mùn* ‘window’s place’ is pronounced without a genitive H, it could be that speakers are treating the compound *hùuy kòt* ‘window’ (‘wind’ + ‘door’) as a single unit. These and other subtleties most likely account for some of the variation. This variation may at times be useful in disambiguating phrases such as the following:

*kèel gùup bùu né hò* ‘six food-eating goats, eaters of six goat’s food’  
*kèel gùup bùu <sup>l</sup>né hò* ‘eaters of six goat’s food’

The first phrase, which lacks the genitive H on *bùu* ‘food’, has two meanings, while the second phrase, where the genitive H is observed on *bùu*, has only one. In this latter case, a genitive relation must exist between the goats and the food.

Third, the genitive H occurs only if the preceding tone is also L. Thus, although we obtain *kèel gùup bùu* ‘six goats’ food’ from /*kèel* + *gùup* + ‘+ *bùu*/, there is no genitive H when we substitute *bóon* ‘cow’ or *gîet* ‘eight’: *bòon gùup bùu* ‘six cows’ food’, *kèel gîet bùu* ‘eight goats’ food’ (not: \**bòon gùup <sup>l</sup>bùu*, \**kèel gîet <sup>l</sup>bùu*).

To conclude this section, note that a proclitic + noun combination also provides the required left-branching for the genitive H to be inserted:

*ká zòol bùu* ‘my friend’s food’      *á zòol bùu* ‘his/her friend’s food’  
*ná zòol bùu* ‘your friend’s food’      *í zòol bùu* ‘our (incl dual) friend’s food’

#### 4.2.2. Subject H Tone

Another grammatical H tone effect is involves the marking of the subject relation. As seen in the following examples, KT has two types of nominalization:

*stem1:*    *pèt*      *kèel pèt*    ‘goat biter’  
*stem2:*    *pèe*      *kèel pèe*    ‘goat biting’ (of/by the goat)  
*stem2:*    *pèe*      *kèel pèe*    ‘goat biting’ (by the goat)

Most KT verbs have two forms, known as *stem1* and *stem2* (§4.2.4). A noun+*stem1* verb nominalization creates a subject-oriented noun, often but not necessarily agentive (cf. *bùu kî gùu* ‘stolen food’, constructed with reflexive *kî* and *stem1* *gùu* ‘steal’). Either or both the internal noun or the whole compound can be pluralized: *kèel hòo pèt* ‘biter of goats’, *kèel pèt hòo* ‘goat-biters’, *kèel hòo pèt hòo* ‘biters of goats’.

A noun+*stem2* verb creates an action or event nominalization comparable to deverbal forms ending in *-ing* in English. A form such as *kèel pèe* can be translated as ‘goat biting’, ‘goat’s biting’, or ‘biting of a goat’. When pronounced *kèel pèe* the goat can either be the one doing the biting or the one being bitten. As seen in the second *stem2* nominalization, *kèel pèe* has only the one meaning ‘biting by a goat’: ‘goat’ must be the subject of the verb ‘bite’. Unlike *stem1* nominalizations, only the internal noun of *stem2* nominalizations can be pluralized: *kèel hòo pèe* ‘biting of goats’ (ambiguous), *kèel hòo pèe* ‘biting of goats’ (the goats are doing the biting).

This subject H tone is no doubt related to the genitive H seen in §4.2.1, possibly deriving from historical \**kèel á pèe* ‘goat its biting’. It differs, however, in not requiring a branching

noun phrase to the left of the stem2 verb. As the following examples show, it requires a /L/ + /L/ input:

/HL + L/	méeŋ pèe	‘cat biting’ (of/by the cat)
/H + L/	zòŋ pèe	‘monkey biting’ (of/by the monkey)’

Thus, when the noun has either /HL/ or /H/ tone, there is no subject H tone and the result is ambiguous.

Subject H tone is limited to stem2 verb nominalizations, which can only bear /L/ or /HL/ tone. If the stem2 verb form is /HL/, there is no subject H and the resulting nominalizations are also ambiguous:

/HL + HL/	méeŋ <sup>1</sup> pûo?	‘cat carrying’ (of/by cat)
/H + HL/	zòŋ pûo?	‘monkey carrying’ (of/by cat)
/L + HL/	kèel pûo?	‘goat carrying’ (of/by goat)

#### 4.2.3. *hlòn* and *dìŋ* Allomorphy

The following two grammatical morphemes share important properties:

<i>after /HL/</i>	<i>after /H/ or /L/</i>	<i>within the verb complex</i>	<i>within a noun phrase</i>
/hlòn/	/hlôn/	‘dual subject/object’	‘dual possessor’
/dìŋ/	/dìŋ/	‘future, irrealis’	‘for benefit of’

The two morphemes are postpositional, appear within both the verb complex and the noun phrase, and exhibit the indicated tonal allomorphy: /L/ after /HL/ vs, /HL/ after /H/ and /L/.

The following sentences show *hlon* following all three tones, first on verbs, then on nouns:

kà táaw hlòn êe	‘we (dual) are praying’	/táaw/	‘pray’
nà núuy hlòn <sup>1</sup> êe	‘you (dual) are laughing’	/núuy/	‘laugh’
á kàp hlòn <sup>1</sup> êe	‘they (dual) are crying’	/kàp/	‘cry’
kà lów hlòn	‘our (dual) field’	/lów/	‘field’
nà khúo hlòn	‘your (dual) village’	/khúo/	‘village’
á hùon hlòn	‘their (dual) garden’	/hùon/	‘garden’

In the first example of each set, /hlòn/ clearly has an underlying /L/ after the preceding /HL/ tone. In the last example of each set, /hlôn/ is realized with HL after an underlying /L/. This alternation between L and HL might suggest that there is a floating grammatical tone comparable to the genitive and subject H tones, i.e. /kà lów <sup>1</sup>hlòn/ ‘our (dual) field’, etc. In this case pre-*hlòn* H would occur only after a /L/ tone. However, the preservation of the /H/ of *núuy* ‘laugh’ and *khúo* ‘village’ shows that this analysis is incorrect. If the underlying representation of ‘you (dual) are laughing’ and ‘your (dual) village’ were /nà núuy hlòn êe/ and /nà khúo hlòn/, respectively, we would expect LTS to apply to yield \*nà núuy hlòn <sup>1</sup>êe and \*nà khúo hlòn.

Although never offered spontaneously or attested in elicited utterances, the use of *hlôn* after /HL/ is judged to be an acceptable alternative: *kà táaw* <sup>↓</sup>*hlón* <sup>↓</sup>*êe*, *kà lów* <sup>↓</sup>*hlôn*. This suggests that the historical tone was \*HL, which is also attested in the related stem1 reflexive verb *kì hlôn* ‘go together, match’. Synchronically, the most common realization is to use /hlôn/ after both /L/ and /H/ words, but /hlòn/ after /L/.

The following sentences show the same tonal variants with respect to the future/irrealis marker *diŋ*:

<i>nà né?</i> <i>diŋ á hii êe</i>	‘we will eat’	/nêe/, /nê?/	‘eat’
<i>à núuy diŋ</i> <sup>↓</sup> <i>á hii êe</i>	‘he will laugh’	/núuy/, /núy/	‘laugh’
<i>ná kàa diŋ</i> <sup>↓</sup> <i>á hii êe</i>	‘you will cry’	/kàa/, /kàa/	‘cry’

The verbs /nê?/ ‘eat’ and /kàa/ ‘cry’ appear in stem2, while /núuy/ ‘laugh’ appears in stem1. As seen, /diŋ/ has L tone after /kàa/, but /HL/ tone after both /nê?/ and /núuy/. LTS fails to apply in the second sentence since the underlying representation is /à núuy diŋ.../ rather than /à núuy diŋ.../. In contradistinction to /hlôn/, /diŋ/ is less acceptable as an alternative after /HL/: \**nà né?* <sup>↓</sup>*diŋ* <sup>↓</sup>*á hii êe*.

The same facts are observed in the nominal use of *diŋ* which marks benefactives:

<i>súo?</i> <i>diŋ ɿn</i>	‘for the slave’	/súo?/	‘slave’
<i>zúol diŋ ɿn</i>	‘for the friend’	/zúol/	‘friend’
<i>kèel diŋ ɿn</i>	‘for the goat’	/kèel/	‘goat’

That the same tonal allomorphy is involved supports the contention that the same morpheme *diŋ* is involved in marking future and irrealis verb forms and benefactive noun phrases. *diŋ* is also used as a complementizer:

<i>nà húŋ diŋ ká dèy êe</i>	‘I want you to come’	/húŋ/	‘come’
<i>ná núuy diŋ</i> <sup>↓</sup> <i>ká dèy êe</i>	‘I want you to laugh’	/núuy/	‘laugh’
<i>ná tàaw diŋ</i> <sup>↓</sup> <i>ká dèy êe</i>	‘I want you to pray’	/tàaw/	‘pray’

The French translation ‘à l’intention de’ seems particularly apt to capture the relation between these uses of *diŋ*: an action is done with a future or irrealis intention or for the intention of someone or some other action.

The following sentences show that it is possible to combine *hlon* and *diŋ* in this order:

<i>kà né?</i> <i>hlòn diŋ</i> <sup>↓</sup> <i>á hii êe</i>	‘we dual will eat’
<i>à núuy hlón diŋ á hii êe</i>	‘they dual will laugh’
<i>ná kàa hlón diŋ á hii êe</i>	‘you dual will cry’

In this case the tone of *hlon* depends on the preceding word, while the tone of *diŋ* depends on *hlon*. As seen, /diŋ/ has /HL/ tone after the /L/ of /hlòn/ in the first sentence, but /L/ tone after the /HL/ of /hlôn/ in the other two sentences. What this means is that the allomorphy is determined on a left-to-right basis.

This last point is dramatically underscored in cases where *hlon* or *diŋ* follow a HL tone derived from an underlying sequence of /H/ + /L/ via HTS:

/à bóoŋ gùup hlòn/ → à bòoŋ gúup hlòn ‘their (dual) six cows’  
 /kà gúol hùon hlòn/ → kà gùol húon hlòn ‘our (dual) friend’s garden’  
 /gúol hùon dìŋ ín/ → gùol húon dìŋ ín ‘for a friend’s garden’

In the above phrases, HTS converts /gúol hùon/ and /gúol kèel/ to intermediate *gùol húon* and *gùol kèel*, which then become *gùol húon* and *gùol kèel* by CS. As seen, the L tone allomorphs /hlòn/ and /dìŋ/ are chosen on the basis of intermediate *húon* and *kèel*.

Whereas the choice between /HL/ and /L/ pronominal proclitics in §4.1 was based on the underlying tone of what follows, the postpositions *hlon* and *dìŋ* choose their /HL/ and /L/ allomorphs based on the derived tone of the preceding word. While the choice of allomorph must follow HTS, it must precede LTS. If /kà gúol/ first becomes intermediate *kà gùol*, and /hlòn/ is then chosen, the output would be \**kà gùol hlòn* rather than *kà gúol hlòn* ‘our (dual) friend’.

#### 4.2.4. Stem2 Tone

As mentioned in passing, KT verbs have two forms: stem1 and stem2. Historically, stem2 was derived from stem1 by adding a suffix which had tonal consequences. Stem2-formation may have segmental effects which are only partially predictable in present-day KT. This is seen in the verbs in the left columns below:

	<i>stem1</i>	<i>stem2</i>		<i>stem1</i>	<i>stem2</i>	
HL → L	hlùŋ	hlùn	‘arrive’	hùon	hùn	‘cook’
	tsôw	tsòo	‘dig’	sêy	sèy	‘speak’
	nûom	nùop	‘agree’	tâaw	tàaw	‘pray’
	vâ?	vàa	‘wander’	ŋâ?	ŋà?	‘wait’
	lîe?	liè	‘lick’	lûut	lùut	‘enter’
H → L	věe	vèt	‘watch’	thîi	thii	‘die’
	hlěŋ	hlèn	‘choose’	kăl	kàl	‘climb’
	vũuy	vùy	‘bury’	lăam	làam	‘dance’
	kě?	kèe	‘burst’	vă?	và?	‘feed’
	hlỏ?	hlòo	‘soft’	zěep	zèep	‘whip’

In addition, stem2-formation can simply involve a tone change, as in the verbs in the right columns.

The above examples show that verbs whose stem1 is either /HL/ or /H/ typically change their tone to L in stem2. Verbs which are already /L/ remain L in stem2:

	<i>stem1</i>	<i>stem2</i>		<i>stem1</i>	<i>stem2</i>	
L → L	sùu	sù?	‘pound’	mùu	mùu	‘see’
	tòŋ	tò?	‘work’	kòl	kòl	‘hug’
	sòon	sòt	‘push’	hàaw	hàaw	‘yawn’
	kàp	kàa	‘cry’	zèp	zèp	‘swim’
	pèt	pèe	‘bite’	thòt	thòt	‘send’



If there is no segmental change, /L/ verbs will have identical stem1 and stem2, as in the examples on the right. Of 589 lexical verbs, 554 have L tone in stem2. The remaining 35 have HL tone. Of these, 30 have the stem1 shape CVV and take -ʔ or -t in stem2.

Both the segmental realization and the use of stem1 vs. stem2 are interesting and complex issues in themselves which go far beyond the scope of this paper. The important point here is that tone is implicated in a morphological process, which is not what one normally associates with the Southeast Asian prototype, to which we return in the following conclusion.

## 5. Conclusion

In the preceding sections we have seen that KT has a tone system that is highly reminiscent of what we know from African languages: It is a primarily level-tone language contrasting /H/, /L/ and /HL/.<sup>3</sup> It has the familiar processes of H- and L-tone spreading, shows a need for tonal morphemes, tonal allomorphy, and paradigmatic tone in the case of the pronominal proclitics. Returning to Pike's (1948) distinction, in the following table I assume Chinese to be prototypical of "contour tone systems" (A) and African languages such as Bambara, Yoruba, Igbo and Luganda (to mention only a few) as representative of "register tone systems" (B).

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

Most of the above properties are straightforward. By contour dissimilation and metathesis I have in mind Chinese examples such as Tianjin 35-35 → 55-35 and Pingyao 53-53 → 35-53 (Yip 1989, Bao 1990, Chen 2000). As seen, KT sides with the A tone systems only with respect to syllable issues: First, KT is a largely monosyllabic language. Second, tones are partly restricted by syllable type. As seen in the following distribution of 1000 monosyllabic lexemes by tone and syllable structure, where T = /p, t/ and R = /m, n, ŋ, l, w, y/, shorted stopped syllables (CVT) are almost completely limited to L tone, while long stopped syllables (CVVT) are overwhelming HL tone.

<sup>3</sup> Since /HL/ is realized as a falling tone only before pause, one might instead posit a /H/ followed by a floating L. This will work as long as we are careful not to allow LTS to apply to these /H/'s.

	CVV	CVR	CVVR	CV?	CVT	CVVT	<i>totals</i>
HL	57	106	78	37	Ø	41	319
LH	39	118	159	41	Ø	(4)	361
L	77	88	72	36	44	(2)	320
<i>totals</i>	174	312	309	114	44	47	1000

While African languages have been known to restrict contour tones to heavy syllables, tones are generally not restricted by specific syllable codas. In fact, many African languages lack codas altogether.

In short, KT appears to have most of the properties that we associate with African tones systems, in fact with tone systems from throughout the world. In other words, the Southeast Asia tone system, if a valid type, may be the “odd man out”. There are to be sure sporadic languages throughout the areas where tone systems are found which, like Southeast Asian systems, tend towards monosyllabicity, multiple tone levels, and extensive contours (see especially Edmondson & Gregerson 1992). However, these seem distinctly in the minority, and in any case it is not always clear that we are dealing with tonal contours rather than tone clusters.

One final question that therefore arises is whether Pike’s (1948) “contour tone language” is in fact a distinct type. KT shows that monosyllabicity is not a sufficient indicator. Other than the apparent unitary nature of tonal contours (Yip 2002:50-52), the only other criterion that might help is an extension of Bickel’s (2003) tautomorphemicity to tone. It is certainly true that the Chinese-type systems generally do not have tone spreading of the sort found elsewhere, e.g. where /H-L/ → [H-HL] and /L-H/ → [L-LH], and there is a distinct tendency for tones to stay on their own tone-bearing units (Schuh 1978, Chen 1992). However, tones sometimes keep to themselves in African languages unless segments interact (e.g. coalesce) across words. Thus consider the following characterization of Igede, a Benue-Congo language of Nigeria:

“The function of tone is primarily lexical, though it does have some grammatical function. Each morpheme retains its tonal characteristics in all circumstances apart from the effect various types of vowel elision have. The absence of tonal perturbation is a very significant feature of the tonal system.” (R. & N. Bergman 1974:43)

If Chinese dialects suggest a distinct typology, it may be because they favor monosyllabicity, unitary contours, and tautomorphemicity, even if each of these criteria sometimes leaks. As recognized by Matisoff (1999), Mazaudon (2005) and other Tibeto-Burman scholars, the languages of Southeast Asia exhibit a wide range of prosodic types, particularly in terms of the relevant tone-bearing units, domains, and interfaces with syllable structure, consonant/phonation types. The present study has demonstrated that a truly African tone system is also thriving there among them.

## REFERENCES

- Bao, Zhiming. 1999. *The structure of tone*. Oxford University Press.  
 Bergman, R. & N. 1974. Igede. in John Bendor Samuel (ed.), *Studies in Nigerian languages*, 43-50. Kano, Nigeria; Center for the Study of Nigerian Languages, Ahmadu Bello University.

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- Bickel, Balthasar. 2003. Prosodic tautomorphemicity in Sino-Tibetan. In D. Bradley et al (eds), *Variation in Sino-Tibetan and South East Asian languages*, 89 – 99. Pacific Linguistics 555. Canberra: The Australian National University.
- Chen, Matthew. 1992. Tone rule typology. In the *Special Session on the Typology of Tone Languages*, 54-66. Proceedings of the 18th Annual Meeting of the Berkeley Linguistics Society.
- Chen, Matthew. 2000. *Tone sandhi*. Cambridge University Press.
- Creissels, Denis. 1994. *Aperçu sur les structures phonologiques des langues négro-africaines*. Grenoble: Ellug.
- Edmondson, Jerrold A. & Kenneth J. Gregerson. 1992. On five-level tone systems. In Shina Ja J. Huang & William R. Merrifield (eds), *Language in context: Essays for Robert E. Longacre*, 555-576. Dallas: Summer Institute of Linguistics & Arlington: University of Texas.
- Hyman, Larry M. In press. Universals of tone rules: 30 years later. In Carlos Gussenhoven & Tomas Riad (eds), *Tones and Tunes: Studies in Word and Sentence Prosody*. Berlin: Mouton de Gruyter.
- Hyman, Larry M. & Russell G. Schuh. 1974. Universals of tone rules: Evidence from West Africa. *Linguistic Inquiry* 5.81–115.
- Matisoff, James A. 1999. Tibeto-Burman tonology in an areal context. In Shigeki Kaji (ed.), *Proceedings of the Symposium Cross-linguistic Studies of Tonal Phenomena: Tonogenesis, typology, and related topics*, 3-32. ILCAA Dec. 10-12, 1998. Tokyo University of Foreign Studies.
- Mazaudon, Martine. 2005. On tone in Tamang and neighbouring languages: synchrony and diachrony. In Shigeki Kaji (ed.), *Proceedings of the Symposium Cross-linguistic Studies of Tonal Phenomena: Historical development: Tone-syntax interface, and descriptive studies*, 79-96. ILCAA, Dec. 14-16 2004. Tokyo University of Foreign Studies.
- Schuh, Russell G. 1978. Tone rules. In Victoria A. Fromkin (ed.), *Tone: A linguistic survey*, 221–256. New York: Academic Press.
- Pike, Kenneth L. 1948. *Tone languages*. Ann Arbor: University of Michigan Press.
- Yip, Moira. 1989. Contour tones. *Phonology* 6.149–174.
- Yip, Moira. 2002. *Tone*. Cambridge University Press.