

'African' tone in the Sinosphere*

Jonathan P. Evans
Institute of Linguistics, Academia Sinica

Abstract.

Linguists often refer to tonal languages as belonging to 'types' – African, East Asian, etc. This paper documents the tonal system of the Mianchi dialect of Southern Qiang, a Tibeto-Burman language located squarely in the East Asian tone environment. Although tone has developed in Southern Qiang under heavy influence from Chinese, the tone system found in Mianchi fits an 'African' typology much better than it does a 'Chinese' or 'East Asian' type. The degrees of African-ness and Chinese-ness are evaluated, and African-style features are found to be lurking throughout the Qiangic family. Similarities of word structure and word length between African and Qiangic languages are held responsible for the similarities.

Key words: Tibeto-Burman, Qiang, tone typology, floating tone.

Introduction.

Since Pike (1948), languages in which pitch is a non-predictable aspect of lexical items have been grouped into those in which level (or register) tones are basic, as is commonly found in Africa, and those in which contour tones are at least as basic as level tones, as in East Asia (Chinese dialects, Thai, Vietnamese, etc.). Recent research has elaborated on the typologies of 'African' tone (e.g., Odden 1995, Yip 2002:130-170, Hyman 2003, Downing 2004) and 'East Asian' tone (e.g., Matisoff 1999, Yip 1995, 2002:171-211).

It is widely held that within the Qiang language (Tibeto-Burman: Qiangic; Sichuan Province, China), Southern dialects are tonal and Northern dialects are not (H. Sun 1981). While this is a good rule of thumb, phonemic lexical pitch patterns have been identified in at least two Northern dialects, Qugu (Huang & Zhou 2006) and Hongyan (Evans 2006a), where it should be noted that tone plays a marginal role. Tonal varieties have generally been described with Chao tone numbers (ranging from a low pitch of one to a high of five; cf. Chao 1930) or tone letters that visually represent the pitch contour. These transcriptions give the sense that Qiang tone resembles the prototypical Sinosphere contour tone system. However, Qiang researchers have noted that tones at the level of the morphosyllable do not always surface in polysyllabic words, leading Wen (1943) to refer to tone in Mianchi as a 'word tone' system, and prompting comments such as "no stable tone system can be established for any of the Ch'iang dialects." (Chang 1967) A close inspection of the tone system of the Mianchi dialect of Southern Qiang (SQ) shows that its tone system behaves more like a prototypical African language than it does like Chinese, even though the tone system arose under heavy influence

* The contents of this paper have been improved by discussions with Larry Hyman, Yen-Hwei Lin, You-Jing Lin, Sam Rosenthal, Moira Yip, two anonymous reviewers, and several Mianchi Qiang speakers, especially Mr. Xiao-Xin Wang. Any remaining errors are my original contribution. An earlier version of this paper was presented at the 8th ISCLL, in Taipei (2002). For their support, I wish to thank the Academia Sinica Institute of Linguistics, the National Science Council of Taiwan (grant #96-2411-H-001-069), and my family.

from Chinese, (Evans 2001), and there is virtually one hundred percent bilingualism in the Sichuan variety of Southwest Mandarin at the present time. Mianchi Qiang has only binary level tones in its underlying representation, culminativity of H, morphological tones, floating tones, toneless syllables, tonal polarity, and a tendency toward H on a fixed syllable of polysyllabic words. All of these features are familiar to the Africanist, but not commonly reported in East Asia, especially within a single language.¹

The following section presents the tonal properties of Mianchi Qiang, section 3 evaluates the African-ness versus East Asian-ness of its tone system, and section 4 presents some thoughts about other places in the Sinosphere where African tone traits may be lurking.

2. Tone in Mianchi.

2.1 Previous analysis.

The only previous analysis of this dialect comes from Wen (1943), where the dialect is called Wasi, the previous name of the administrative region which is now referred to as Mianchi. Wen analyzed the Mianchi tonal system as one of word tone, identifying the following patterns:

(1) Wen's (1943) transcription of Mianchi 'word tone'.

high level (55)		mid level (33)		low rising (15)		mid falling (31)	
po	'buy'			po	'sell	(po ⁵⁵) po	'elder brother'
p ^{hu}	'blow'	p ^{hu}	'clothes'	p ^{hu}	'overflow'	p ^{hu} (sua ³¹)	'lapel'
bu	'board'			bu (mia ⁵⁵)	'cloth'	bu	'thin'
wa	'to hang'	wa	'help'	wa (lo ⁵⁵)	'down stairs'	wa	'five'
ta	'to pull'	ta (tʂ ^{hu} ³³)	'walking stick'			ta	'beams'
cçie (bz ^a ³¹)	'tender'	cçie	'daughter'	cçie (pi ⁵⁵)	'steamed dumpling'	cçie	'this'
cç ^h ia	'tea'	cç ^h ia (tʂ ^h ³³)	'pheasant'			cç ^h ia	'wine, liquor'
		gu	'nine'	gu	'wear, put on'	gu	'steel'

In Wen's view, the tones of Mianchi are melodies that are mapped over a word, and can be expressed as contours on monosyllables, or in longer words as sequences of level tones. However, it appears that Wen's analysis mixes lexical and morphosyntactic tone processes, as he only gives verbs as examples for monosyllabic low rising contour, a morphological tone in my data. If the morphologically complex low rising tone is removed from his inventory,

¹ As this paper was nearing completion, I was made aware of Hyman (2007 [forthcoming]), in which African tonal features are reported in Kuki-Thaadow, another Tibeto-Burman language.

then the only difference between his inventory and the present one is the contrast of mid-level and mid-falling (here L) tone, a phonemic contrast that was not produced by the speakers I worked with. Although my data do not require a word tone analysis, there are certainly word-level effects that cause the output of polymorphemic words to differ from their underlying forms, as will be demonstrated presently.

2.2 Present analysis.

The present analysis is based on the author's fieldwork. The most common lexical tones in Mianchi are High and Low:

(2) High and Low tones in Mianchi

Tone value	form	gloss	form	gloss
Low [L]	mà	Qiang nationality	ηò	cow
High [H]	má	oil	ηó	silver

High (á) and Low (à) tones occur on about 95 percent of the syllables in a lexicon of around three thousand entries, with Low tones about twice as frequent as High. In addition to these two level tones, there are two lexical contour tones, which are much less common. The Low-Rising tone (ǎ) occurs most frequently on borrowings from the Sichuan dialect of Mandarin Chinese (/pěi mù/ 'fritillary bulb'), but also on a few native lexical items (/bzǎ/ 'snake', /biǎ/ 'urine'). A Mid-Rising tone (ǎ̃) is found on three borrowings (e.g., /pěi tǎi kù/ 'spine'), as well as on one native form (/mzǎ tsà/ 'afternoon'). The first syllable in 'afternoon' appears to have combined the 'weather' morpheme /mú/ (/mú-dòu/ 'overcast', /mú-pià/ 'sky, weather'), and another (unknown) morpheme. Such coalescence may be observed in /mzǎ/ 'rain' (from /mú-zǎ/), which is the only other instance of /mzǎ-/ in the lexicon. This tone is so rare (four instances), that its internal structure cannot be determined. The remainder of this paper focuses on the lexical tones High, Low, and Low-Rising, although morphological tones are also explored (sec 2.3).

The most obvious tonal property of polysyllabic words is culminativity: no more than one H may occur per native phonological word (e.g., /tí/ 'bear' + /χuá/ 'thin' = [tí-χuà] 'thin bear'). When an input contains two or more H, generally the leftmost one is pronounced. Exceptions to this pattern are discussed at the end of this section.

H tones are not pronounced in words containing Low-Rising tone, showing that Low-Rising tone consists of the sequence LH. Hence, a H tone on the second element of a compound surfaces in compounds with [mǎ] 'person', but does not surface when combined with Low-Rising [bzǎ] 'snake' (the syllable with the changed tone is underlined):

(3) Mianchi 'person-', 'snake-' compounds.

/L + L.H/ -> L-L.H /mǎ + cì.peí/ -> [mǎ-cì.peí] 'human body'
 /LH + L.H/ -> LH-L.L /bzǎ + cì.peí/ -> [bzǎ-cì.peì] 'snake body'

Words borrowed from the local Mandarin dialect can violate the one-H-per-word restriction; e.g., [tá pí fán], 'for example' from Sichuanese [ta⁵¹ pi⁵¹ faŋ⁵⁵]. High falling contours on

words borrowed from local Mandarin are expressed as H tones in Mianchi; the Mianchi High-falling tone only occurs clause-finally (sec 2.3). The remaining examples in the paper are limited to native vocabulary, except as noted.

Less obvious than the limit on H is the observation that some syllables are unspecified for tone, and that tones can float. Toneless syllables surface with Low tone; unless demonstrated otherwise, a syllable's surface L tone is assumed to correspond to \emptyset in the underlying representation. The existence of toneless syllables and floating tones may be demonstrated by the homophonic pair [mù], the surface form of low-toned /mù/ 'dung' and toneless /mu/ 'hair'. Both words combine with 'horse' and 'mule'. 'Horse' has an attached L and a floating H, represented as (H); the underlying form is /zou (H)/. 'Mule' /ke.ti/ has no tones. The compounds are as follows:

(4) Mianchi toneless syllables and floating tones.

(a) floating (H) tone

/zou (H)-mu/ /L (H) \emptyset / L (H) /zou-mu/ [zou-mú] 'horse hair'	/zou (H)-mù/ /L (H) L/ L (H)-L /zou-mu/ [zou-mù] 'horse dung'
--	---

(b) toneless syllables

/ke.ti-mu/ / \emptyset \emptyset \emptyset / /ke.ti-mu/ [kè.tì-mù] 'mule hair'	/ke.ti-mu/ / \emptyset \emptyset L/ L /ke.ti-mu/ [kè.tì-mù] 'mule dung'
--	---

Floating tones do not form contours in Mianchi, they only link to toneless syllables. Thus, the (H) from 'horse' can be assigned to toneless 'hair', but not to L-tone 'dung'; this reflects that 'hair' is toneless, and 'dung' has L. 'Mule' has no tonal effect on 'hair' or 'dung'.

Because Mianchi contains both floating tones and toneless syllables, elucidation of the tone system requires examining a large number of compounds. Numeral-Classifier (NUM-CL) compounds are ideal for this purpose. Numerals 'one' to 'ten' are bound morphemes in Mianchi and must occur with a classifier; e.g., /dzí/ 'long, straight thing', /lie (H)/ 'piece of land'. A NUM-CL compound forms a phonological word, and any noun that is counted is followed by a NUM-CL word. The noun and its NUM-CL complement form separate phonological words (and hence each allow one H), as seen by the permitted occurrence of two H tones (underlined):

(5) Noun-Noun + NUM-CL form two phonological words.

/ŋò-qá.bz̥a.tsə/ /à-qó/
 [ŋò-qá.bz̥à.tsə à-qó]
 cow-head one-CL
 ‘one/a cow head’

Seventy different classifiers have been identified, which belong to only four tonal patterns: H, (H), L (H), (L-H). All classifiers contribute H or (H) to the NUM-CL compound. This generalization can be captured by assigning floating (H) to the category of classifiers. This designation simplifies the representation of the tones of the individual classifiers, arranged in order of subsequent discussion:

(6) Two representations of classifier tone categories.

lexical	lexical + word class	# of members
(H)	∅ + (H)	16
(L-H)	(L) + (H)	33
L (H)	L + (H)	7
H	H + (H)	14

Note that if (H) is assumed to be present in all classifiers (second column), then Mianchi classifiers exhibit all of the possible simple lexical tonal categories: ∅, (L), L, H. The only missing lexical category is (H), yielding the lexical-word class combination (H) (H), which is not distinguishable from ∅-(H), given the limit of one surface H per phonological word (that is, no more than one (H) would link to the NUM-CL compound). Similarly, (H) in the last row is redundant, because only the linked H can surface.

The numerals ‘one’ to ‘ten’ (7) contain only toneless and L syllables, as will be shown presently by the behavior of NUM-CL compounds. The numeral ‘ten’ contains both toneless and low syllables. ‘Two’ (from Proto-Tibeto-Burman *g-ni-s) and ‘seven’ (PTB *s-ni-s) are distinguished only by tone. A similar phenomenon obtains in non-retroflexing dialects of Mandarin, in which ‘four’ [sɿ⁵¹] and ‘ten’ [sɿ³⁵] differ only in tone. This historical merger is distinct from the ‘contamination’ of neighboring numbers which has occurred elsewhere in Tibeto-Burman (Matisoff 1997a):

(7) Input tones of Mianchi numerals:

<u>Low</u>		<u>Toneless</u>	
/à/	‘one’	/si/	‘three’
/nə/	‘two’	/tʂou/	‘six’
/zə/	‘four’	/nə/	‘seven’
/kuà/	‘five’	/gu/	‘nine’
/tʂhè/	‘eight’	/hà.diu/	‘ten’

Evidence for the distinction between toneless and L syllables comes from combining numerals with classifiers whose only tone is the word class tone (H). This group is exemplified by the generic classifier /qo (H)/, whose floating tone links to the leftmost

toneless syllable. When paired with a L-toned numeral, a classifier in this group surfaces with H; if the numeral is toneless, (H) links to the numeral:

(8) Mianchi NUM-CL and linking of (H).

<u>Low numerals:</u>		<u>Toneless numerals:</u>	
/L-(H)/		/∅-(H)/	
		/	
/a-qó/		/sí-qò/	
[à-qó]		[sí-qò]	
one-CL		three-CL	
‘one (thing)’		‘three (things)’	
[nè-qó]	‘two (things)’	[tşóú-qò]	‘six (things)’
[zè-qó]	‘four (things)’	[nó-qò]	‘seven (things)’
[ɣuà-qó]	‘five (things)’	[gú-qò]	‘nine (things)’
[tş ^h è-qó]	‘eight (things)’	[fà.díú-qò]	‘ten (things)’

(H) also occurs on lexical items outside of the NUM-CL system, such as ‘horse’ (4).

The other set of classifiers which consists only of floating tones contains (L) followed by the word class tone (H); this category includes about half of all of the classifiers in Mianchi. For these classifiers, (L) associates with the leftmost toneless syllable, followed by (H). When (L)(H) classifiers follow a L toned numeral, the (H) tone does not have a corresponding syllable to which it can link, and is not expressed; e.g., /za (L)(H)/ ‘ox (CL)’:

(9) Classifier with (L)(H) pattern.

<u>Low numerals:</u>		<u>Toneless numerals:</u>	
/L-(L) (H)/		/∅-(L) (H)/	
		/	
/a-za/		/sí zá/	
[à zà]		[sí zá]	
‘one (ox)’		‘three (oxen)’	
[nè-zà]	‘two (oxen)’	[tşòú zá]	‘six (oxen)’
[zè-zà]	‘four (oxen)’	[nè-zá]	‘seven (oxen)’
[ɣuà zà]	‘five (oxen)’	[gù zá]	‘nine (oxen)’
[tş ^h è zà]	‘eight (oxen)’	[fà diù zá]	‘ten (oxen)’

The noun /qa.bz.a.tsə (L)(H)/ ‘head’ has the same tonal pattern as this group of classifiers. In (10) the (L)(H) sequence of ‘head’ links to the two left-most toneless syllables. In (10.a, b), these are the first two syllables of the word. In (10.c), (L)(H) links to the third and fourth syllables, while in (10.d), (L) links to the second syllable, and expression of (H) is blocked by the H tone present in the LH contour tone on the first syllable:

(10) The outcome of floating tones (L) (H) in ‘head’ compounds.

a. 'head'

/ (L) (H) /
 | |
 /qa.bz̥a.tsə/
 [qà.bz̥á.tsə]

b. /ŋo/ 'cow' + 'head'

/Ø-(L) (H)/
 /ŋo-qa.bz̥a.tsə/
 [ŋò-qá.bz̥à.tsə]

c. /mè.ŋou/ 'cat' + 'head'

/ L L (L) (H) /
 | | | |
 /me.ŋou-qa.bz̥a.tsə/
 [mè.ŋou-qà.bz̥á.tsə]

d. /bz̥ě/ 'snake' + 'head'

/ LH (L)(H) /
 | |
 /bz̥e-qa.bz̥a.tsə/
 [bz̥ě-qà.bz̥à.tsə]

The remaining two sets of classifiers have linked L or H, along with the floating (H) that accompanies all classifiers; in the second case, (H) is redundant because linked H is pronounced.

L with word class (H) occurs on seven of the 70 recorded classifiers; all are borrowed from Chinese, most are reduplicated morphemes, such as /tiè tie (H)/ ‘wad, pile’, /t̥shuàn t̥shuan (H)/ ‘string (of pearls)’. For these classifiers, the tone of the first syllable is unchanging, and (H) associates to the leftmost toneless syllable. When combined with L-toned numerals, (H) attaches to the second syllable of the classifier; with toneless numerals, (H) links to the numeral. A non-reduplicated example is given in order to demonstrate that the tone pattern is not merely a reduplication effect:

(11) Classifier with L (H) pattern.

Low numerals:

/L-L (H) /
 | | |
 /a-lo.k^huaŋ/²
 [a-lò.k^huán]
 ‘one basket of’

Toneless numerals:

/Ø- L(H) /
 | |
 /si-lo.k^huaŋ/
 [sí-lò.k^huàn]
 ‘three baskets of’

[nè-lò.k^huán] ‘two baskets of’
 [zè-lò.k^huán] ‘four baskets of’
 [ɕuà-lò.k^huán] ‘five baskets of’
 [t̥shè-lò.k^huán] ‘eight baskets of’

[t̥sou-lò.k^huàn] ‘six baskets of’
 [nó-lò.k^huàn] ‘seven baskets of’
 [gú-lò.k^huàn] ‘nine baskets of’
 [fà.diú-lò.k^huàn] ‘ten baskets of’

The crucial observation here is that linked L does not stop (H) from linking to the leftmost toneless syllable, even if metathesis occurs in the process. Goldsmith (1990:24-27)

² Standard Mandarin Chinese *luó kuāng* (籬筐) ‘wicker/bamboo basket’.

demonstrates floating tones metathesizing with linked tones in San Miguel El Grande Mixtecan; in this dialect of Mixtec, unlike in Mianchi Qiang, floating tones cause linked tones to delink.

The final set of classifiers consists of those with linked H, redundantly accompanied by word class (H). Because of the limit of one H per phonological word, it is to be expected that H-toned CL's would cause all attached numeral morphemes to have low tone; e.g., /fià.diu-tó/, [fià.diù-tó] 'ten (bridges)'. As a result, ambiguity between segmentally homophonous 'two-' and 'seven'-CL would ensue; in fact H-toned CL's are divided into two groups, depending on how they resolve this ambiguity. The first group, H₁, changes the predicted tone pattern of 'seven'-CL, and the second group, H₂, changes the predicted tone pattern of 'two'-CL:

(12) Tonal patterns of H₁ set of NUM-CL compounds

<u>Low numerals:</u>		<u>Toneless numerals:</u>	
/ L - H (H)/		/Ø- H (H)/	/Ø- H (H)/
/nə-dou/		/si-dou/	/nə-dou/
[nè-doú]		[sì-doú]	*[nè-doú] (→ [nó-doù])
'two times'		'three times'	'seven times'
[à-doú]	'one time'	[tʂoù-doú]	'six times'
[zè-doú]	'four times'	[nó-doù]	'seven times'
[ɬuà-doú]	'five times'	[gù-doú]	'nine times'
[tʂhè-doú]	'eight times'	[fià.diù-doú]	'ten times'

In the H₁ set of NUM-CL words, all compounds but 'seven'-CL have the expected surface form with H on the classifier. The H-L pattern on 'seven times' is not derivable from the arrangement of input tones and morphemes. A similar type of change is found on 'two'-CL in the H₂ set of NUM-CL compounds:

(13) Tonal patterns of H₂ set of NUM-CL compounds.

<u>Low numerals:</u>		<u>Toneless numerals:</u>	
/ L - H (H)/	/ L - H (H)/	/Ø- H (H)/	
/nə-dzᵢ/	/ a-dzᵢ/	/nə-dzᵢ/	
*[nè-dzᵢ́] (→ [nè-dzᵢ̀])	[à-dzᵢ́]	[nè-dzᵢ́]	
'two (pens)'	'one (pen)'	'seven (pens)'	
[à-dzᵢ́]	'one (pen)'	[tʂoù-dzᵢ́]	'six (pens)'
[zè-dzᵢ́]	'four (pens)'	[nó- dzᵢ̀]	'seven (pens)'
[ɬuà-dzᵢ́]	'five (pens)'	[gù-dzᵢ́]	'nine (pens)'
[tʂhè-dzᵢ́]	'eight (pens)'	[fià.diù-dzᵢ́]	'ten (pens)'

In the pronounced form of 'two (pens)', there is no trace of the classifier's H tone. With the exception of 'two' and 'seven', the remaining numerals have their expected tonal value of L when combined with H₁ or H₂ classifiers: [zə̌-doú] 'four times', [sì-dzǐ́] 'three (pens)', etc.

An exceptional tone pattern is also found on NUM-CL compounds involving the round numbers 'thirty' to 'ninety'. Tones on these round number-classifier compounds share a common lexical pattern, with H on the second syllable, regardless of tonal input. We consider as an example the classifier /doú/ 'time(s)', which has the tonal category H₁; it causes the numbers 'one' to 'ten' and 'twenty' to appear with the expected L tone (except for 'seven', (12)). It would be expected that the remaining round numbers of the form /NUM-sa (H)-doú/ 'tens of times' would likewise surface with a H on /doú/, and with the remaining syllables L. However, for the round numbers 'thirty' and above, the common Southern Qiang L-H lexical pattern surfaces, rather than the compositionally determined pattern L-L-H:

(14) Mianchi round number tone patterns.

Expected form:	Higher round numbers (L)	Higher round numbers (Ø)	
/L-(H)-H/ 	/L-(H)-H/ 	/Ø-(H)-H/ 	
/nə̌-sa-dou/	/zə̌-sa-dou/ *[zə̌-sà-doú]	/sì-sa-dou/ *[sì-sà-doú]	
[nə̌-sà-doú] 'twenty times'	[zə̌-sá-doù] 'forty times'	[sì-sá-doù] 'thirty times'	
Low numerals:		Toneless numerals:	
[nə̌-sà-doú]	'twenty times'	[sì-sá-doù]	'thirty times'
[zə̌-sá-doù]	'forty times'	[tʂoù-sá-doù]	'sixty times'
[ɬuà-sá-doù]	'fifty times'	[nə̌-sá-doù]	'seventy times'
[tʂhè-sá-doù]	'eighty times'	[gù-sá-doù]	'ninety times'

The same pattern is found across higher round number NUM-CL words of all tone classes of classifier (predicted form is given when it differs from the output):

(15) Round number-classifier combinations yield L-H output

CL group	L-tone numeral	toneless numeral
(H)	[zə̌-sá-liè] 'forty fields'	[sì-sá-liè] 'thirty fields' *[sì-sà-liè]
(L-H)	[zə̌-sá-zà] 'forty oxen' *[zə̌-sà-zá]	[sì-sá-zà] 'thirty oxen'
L-(H)	[zə̌-sá-loù-k ^h uàŋ] 'forty baskets' *[zə̌-sà-loù-k ^h uáŋ]	[sì-sá-loù-k ^h uàŋ] 'thirty baskets'

Thus, the tones on the round number compounds 'thirty' and above are determined as a lexical class, rather than being based on the tones of the component morphemes. It may not be coincidental that this noncompositional tone pattern is L-H. In the Mianchi and Longxi dialects of SQ, L-H is the second most common pattern found on disyllables, following L-L

(Evans 2001). Both Muka (Evans 2006b) and Puxi (C. Huang 2004:37) have second syllable peak as their default pattern.³ The following cognate sets reflect the antiquity of this pattern:

(16) PSQ *L-H words

Muka	Longxi	Mianchi	gloss
ì tshá	ì tshá	ì tshé	bird, sparrow
dzuà ɓá	zuà ɓà	dzuà ɓá	buckwheat
bè ɲé	bù mià	bzù miá	cloth
nè ɲá	--	nə-ɲá	crow (n.)
nè ká	ɲì ká	nè ké	ear

Cognate iambicity suggests that a system of second syllable prominence should be reconstructed as common in Proto-Southern Qiang (PSQ). In addition to the prevalent iambic pattern, additional evidence for a system of culminative prominence ('accent' in some analyses) comes from the fact that in nearly all SQ dialects for which we have data, there is a limit of not more than one peak per native prosodic word (the only exception thus far is Lobuzhai, based on author's fieldwork). Further evidence for an accentual system comes from those varieties that lack tonal oppositions on monosyllables; e.g., Muka/Jiuzi (Wen 1950, Evans 2006b) and Puxi (C. Huang 2004). At this time, the data are insufficient to show whether culminative tone or stress should be reconstructed for PSQ.

Among noun compounds, there are also some words (less than ten percent of the lexicon) whose tone patterns are lexically determined, rather than compositional:

(17) Non-compositional tones in compounds

a. Disyllabic compounds:

/H + H/ -> L-L	/tí + pɕí/ -> [tì-pɕì]	'panda' (bear-white)
/L + L/ -> L-H	/lə + bzà/ -> [lè-bzà]	'long month' (month-big)
/L + H/ -> H-L	/lò + pɕí/ -> [lò-pɕì]	'flint' (stone-white)
/L + Ø/ -> H-L	/tshè + mu/ -> [tshé-mù]	'wool' (goat-fur)

b. Trisyllabic compounds:

/L-H + L/ -> L-L-H	/ɓà.mú + phò/ -> [ɓà.mù-phó]	'almond tree' (almond-tree)
/L-H + L/ -> L-L-L	/bè.liú + bzà/ -> [bè.liù-bzà]	'bachelor' (young.man-big)

Having seen the complexities of lexical tone patterns in Mianchi, we now turn our attention to effects of morphology on tone.

2.3 Morphological tone processes.

In addition to morpheme-level and lexical-level tone processes, Mianchi also has morphological tone processes, as exemplified by morphological contours, and by tone polarity.

³ This is also the default pattern in the Qiangic language Muya (Ikeda 2002).

As in the lexicon, contour tones are infrequent in texts; most have a morphological origin, falling on the last syllable of the verb complex. If the verb root has a directional prefix, but is non-suffixed, then it surfaces with a LH tone, as in the third person perfective forms:

(18) Morphological LH tone.

zǐ	'dry'	tə-zǐ	'dry in sun'
bzà	'big'	dà-bzǎ	'enlarge'

Similarly, causativized perfective verbs in which the causative suffix is the last syllable of its clause appear with a HL tone on the causative suffix:

(19) Morphological HL tone.

fià-ŋà	bùzà	ʂè-q ^h àlà-z ^h à.	Causative is the last syllable of its clause.
3-pl	wall	DIR-knock.down-CAUS	
'They knocked down the wall.'			

ŋà	bùzà	ʂè-q ^h àlà-z ^h à-cà.	Causative is not the last syllable of its clause.
1sg	wall	DIR-knock.down-CAUS-PERF:1sg	
'I knocked down the wall.'			

Another morphological tone process in Mianchi is tonal polarity, as in negated existential verbs, where NEG always appears with L tone, and the tone on the verb is reversed from its citation form:

(20) Tonal polarity.

root	NEG + root	Gloss
ŋá	mì-ŋà	have (wealth), there is (a matter)
zì	mì-zí	there is (person)
wè	mì-wé	there is (something fixed in place, as a tree)
lè	mì-lé	there is (something contained)
tì	mì-tí	there is (something on a surface)

To summarize the observations made thus far, tonal patterns in Mianchi exhibit the following characteristics (numbers of examples in parentheses):

(21) Summary of properties of Mianchi tone

- Syllables may have H, L, or \emptyset tone in their underlying representations (2, 4, et passim).
- Toneless syllables are pronounced with a L tone, unless assigned H (4, 8 - 11).
- Contour tones are secondary, consisting of sequences of level tones (3).
- No more than one syllable in a native word may have H tone (culminativity). Borrowings from Mandarin Chinese can violate culminativity (discussion following (2)).
- There are both (H) and (L) floating tones. (passim)
- A floating tone associates to the leftmost toneless syllable (8 - 11).
- Within a paradigm, tonal changes may disambiguate homophonous forms. These changes do not override culminativity of H (12 - 13).
- Some compounds have tonal patterns that are lexically determined, rather than being based on the tones of component morphemes (14, 15, 17).
- There is a tendency toward a L-H tonal pattern (14 - 16).
- Morphological tone effects yield clause-final contours (18, 19) and tone polarity (20).

The following section elucidates the ways in which tonal behavior in Mianchi more closely resembles prototypical African tone properties than prototypical Chinese properties.

3. African-ness of Mianchi tone.

The properties of Mianchi tone that have been demonstrated in section 2 should look very familiar to Africanists, but are not considered typical of Chinese dialects. The following table illustrates the ways in which Mianchi tone straddles the two typologies, although with a definite bent toward African-ness. The table is roughly arranged in the following order: properties of binarity, core role of level tones, and morphological properties of tone.

(22) African vs. East Asian tone properties

African languages (typical)	Chinese dialects (typical)	Mianchi more like...
Privative /T, Ø/ or binary contrast (/H, L/ or /H, L, Ø/)	Rich tonal inventory	African (/H, L, Ø/)
Limits on adjacency of marked tone (OCP) or co-occurrence at word level (culminativity)	Limited OCP	African
Sparse distribution of tone specifications	Every lexical syllable has a tone	African
Toneless syllables receive default tone (usually L)	Pitch of toneless syllables determined by context	African
Tones can float.	Tones are pre-linked to syllables. No floating tones.	African
One-to-many tone associations (spreading)	Mostly one-to-one tone associations	Chinese
Downstep caused by L	No downstep	Chinese
Level tones primary	Level and contour tones are both primary	African
Contour tones are sequences of level tones	Contour tones form units at a deeper level of structure	African
Restricted occurrence of contour tones	Contour tones occur freely	African
Morphological tones	No morphemes that lack segmental content.	African
Tonal polarity of some affixes	Phonological tone polarity	African
Tendency toward fixed tone patterns.	No higher order restrictions.	African

The following discussion fleshes out the typological generalizations given above, roughly in the same order as presented in the above table.

3.1 Binariness of tone and its implications.

The data in section 2 have shown that Mianchi has two surface tones H, L, which correspond to a distinction /H, L, Ø/ in underlying representation. As has been well established, this type of inventory is very common among African languages, as "many [African] languages have only a two-way contrast in tone: phonetically high versus low, but phonologically often high tone versus the absence of tone." (Yip 2002:133, see also Hyman 2001) Chinese dialects, on the other hand, range in number of phonemic tones from three to eleven (Cheng 1973). By way of example, we consider the tones of 'Standard' Cantonese, presented in categories of prose description (Matthews & Yip, 1994:21) and using Chao tone numbers (Yip, 2002:175); only open syllable tones are given:

(23) Tones of Standard Cantonese

	M & Y (1994)	Yip (2002)
High level	yāu 'worry'	55 si: 'poem' 53 si: 'silk' (mostly merged with 55)
High rising	yáu 'paint'	35 si: 'to cause, make'
Mid level	yau 'thin'	44 si: 'to try, taste'
Low falling	yàuh 'oil'	22/21 si: 'time'
Low rising	yáuh 'have'	24 si: 'market, city'
Low level	yauh 'again'	33 si: 'undertaking'

Three of the level tones can occur on stop-final syllables, albeit with shorter duration; this is often represented with a single tone digit: /sik⁵/ 'style, type'; /si:p⁴/ 'to wedge'; /sik³/ 'to eat' (Yip 2002:175).

This type of system is not unusual in East Asia, where tonal languages "generally have a much richer tonal inventory [than African languages] including a set of contour tones in addition to several levels." (Yip 2002:172) As for the variety of Chinese spoken in and around Mianchi, Yang (1984:915) lists the citation tones of the Wenchuan county variety of Sichuanese Mandarin as 55, 31, 42, 24; no minimal tone set is provided.

In a system of simple tonal opposition – either /H, L, (Ø)/ or /T, Ø/ – it is common for one tone to be marked, and the other tone value to function as the default. Marked tones are often subject to restrictions. In Bantu languages, restrictions against H-H sequences are common; this restriction is often referred to as Meussen's Rule, or, more broadly, the Obligatory Contour Principle (OCP). Culminativity is a stronger form of the OCP, which Myers (1997) terms 'OCP!'. Culminativity of the marked tone is found throughout Africa. Languages such as Mawu (Bamba 1991, Liberman 1995) and Somali (Hyman 2006) permit up to one H tone per word, while Kinga, Nubi, and Safwa all have exactly one H per word (Hyman 2006).

Chinese dialects exhibit limited OCP effects, such as the well-known rule in Mandarin whereby L (tone 3) becomes a rising tone (tone 2) before another low tone. Tianjin Mandarin has a broader restriction against adjacent identical tones:

(24) Tianjin tone sandhi (Chen 2000:106, Yip 2002:179)

L.L	→	LH.L	/feiL/	feiLH.jiL	'airplane'
LH.LH	→	H.LH	/xiLH/	xiH.lianLH	'wash one's face'
HL.HL	→	L.HL	/jingHL/	jingL.zhongHL	'net weight'

In spite of OCP effects, the n-ary tone systems of Chinese do not appear to have culminative restrictions (OCP!) on any of the tones.

A binary tone system in which one tone is marked allows for the other tone to be treated as the default, tolerating a system with toneless lexical syllables (not just function words/affixes). Toneless syllables are common throughout African tone systems; here we consider two languages with the same tonal inventory as is found in Mianchi. The tonal

inventory /H, L, Ø/ has been noted in at least two African languages, Margi (Chadic: Nigeria; Hoffman 1963, Pulleyblank 1986, cited in Odden 1995) and Nande (Central Bantu: Congo; Hyman and Valinande 1985). In Mianchi, toneless syllables are paradigmatically assigned a default Low, whereas in Margi, toneless syllables (underlined) receive their tonal specifications syntagmatically from a neighboring syllable; if no neighboring tone is present, L is assigned:

(25) Margi assignment of tone to toneless syllables (Odden 1995:465-466)

	H Suffix			
H root	tá + bá	→	tábá	'cook all'
L root	ndàl + bá	→	ndàlbá	'throw out'
Toneless root	<u>dəl</u> + bá	→	<u>dəlbá</u>	'buy'
	L suffix			
H root	ná + dā	→	nádā	'give me'
L root	hèi + dā	→	hèidā	'bring me'
Toneless root	<u>skə</u> + dā	→	<u>skədā</u>	'wait for me'
	Toneless suffix			
H root	tá + <u>na</u>	→	táná	'cook and put aside'
L root	ndàl + <u>na</u>	→	ndàlnà	'throw away'
Toneless root	<u>dəl</u> + <u>na</u>	→	<u>dəlnà</u>	'sell'

Similarly, in Nande (Hyman and Valinande 1985), toneless syllables surface as L, unless they are assigned a boundary tone. Thus, in Mianchi, Margi, and Nande, if a toneless syllable is not assigned a tone by some phonological process, then it is pronounced with Low tone.

Toneless syllables in Mandarin Chinese have two origins. First, grammatical function words, such as the question particle /ma/ or the possessive/nominalizer clitic /de/ have no indication of tone in their underlying representations. Second, in Beijing Mandarin, non-initial syllables in compounds may lose their tones, as an indicator of their non-stressed status; Taiwanese Mandarin does not exhibit this process. Whatever the origin of tonelessness, syllables without tone have a pitch pattern that can be predicted by the tonal category of the previous syllable, and which show either a continuation of the previous contour, or a movement toward a neutral, mid-range pitch (Shih 1987). This type of pitch trajectory assignment, which may be predicted by phonetic environment, differs from the patterns of phonological tone assignment that have been demonstrated for Mianchi, Margi, and Nande.

Floating tones have been widely documented across African, especially Bantu, languages. However, until Hyman (2007 [forthcoming]), they do not appear to have been documented in the Sinosphere, as in Cahill's (2007) observation: "No floating tones are known to me in East Asian languages." Milliken (1989) analyzes the Mandarin third tone as L (H), but subsequent analyses have shown the floating tone to be unnecessary (Duanmu 1999). Conceptually, there appears to be a progression of properties – a system with just a simple opposition allows for one value to be marked and the other to be assigned by default. This binarity permits sparse tone specification, which then introduces toneless syllables, which provide a

location for floating tones to dock and be expressed. By contrast, in a densely specified tone system as is found in Mandarin Chinese, toneless syllables are restricted to metrically weak positions, are never assigned a tonal value, and receive their pitch value by predictable processes, in a manner similar to unstressed vowels in English.

Sparse tonal specification predicts the possibility of multiple linking of tones as in Shona (Bantu: Zimbabwe, Mozambique):

(26) Multiple linking of tones in Shona (Odden 1995)

mbwa	hove	mbundudzi	benzibvunza
	\ /	\ /	\ /
H	H	H	H H
'dog'	'fish'	'army worm'	'inquisitive fool'

Tone spreading is found in Wu dialects of Chinese, where the tone of the metrically prominent first syllable spreads rightward, and tones in non-prominent positions are irrelevant:

(27) Shanghai tone spreading (Duanmu 1999, Yip 2002:187).

se52 + pe52	→	55 21	‘three cups’
se52 + bø23	→	55 21	‘three plates’
sz34 + pe52	→	33 44	‘four cups’
sz34 + bø23	→	33 44	‘four plates’

The underlying tones of non-first syllables are irrelevant in predicting word tone behavior in Shanghai. On the other hand, the Mianchi Qiang data that we have collected support an analysis in which the tone(s) of each morpheme are significant. With regard to multiple linking of tone, Mianchi behaves more like the non-spreading dialects of Chinese. Tone specification in Mianchi, while not required on every syllable, is still more dense than it is in Shona, which may account for the lack of multiply-linked tones.

In African tonal languages, downstep of high tones is a common phenomenon, often caused by a floating L. Until the appearance of Hyman (2007 [forthcoming]), it does not appear to have been reported in East Asia. Like Chinese dialects, Mianchi lacks downstep. It should be pointed out that the environment for downstep does not appear to exist in native words, because of the culminative restriction that prevents two H tones from surfacing within one word (*H-L-H).

3.2 Primary status of level tones

Maddieson (1978) has observed, "If a language has contour tones, it also has level tones." Thus, for languages with privative tone, it is to be expected that the contrast is between a level tone and Ø, which is the case for many African (especially Bantu) languages. It is also to be expected that in a language in which two level tones are basic, that contour tones should behave like sequences of level tones, and that contour tones are treated as special; e.g., they

may be restricted in the morphosyntactic locations where they may occur, or type of syllable on which they may occur.

It has been shown above that in Mianchi, lexical tonal phenomena can be accounted for with just the level tones /H, L/ and toneless syllables. Contour tones in Mianchi behave like sequences of level tones, and are treated as phonotactically marked.

First, we observe that Mianchi contours behave like sequences of level tones; for example, the presence of /bzǔě/ 'snake' in compounds, prevents the pronunciation of H on subsequent syllables, showing that the low-rising tone contains the sequence LH (3). Similarly, compositionality of contour tones is typical of African languages in which they are present. Mende monomorphemic nouns may be taken as exemplary (cf. Leben 1978, Zoll 2003):

(28) Tones on Mende nouns

H	kó 'war'	pélé 'house'	háwámá 'waistline'
L	kpà 'debt'	bèlè 'trousers'	kpàkàlì 'tripod chair'
HL	mbû 'owl'	ngílà 'dog'	félàmà 'junction'
LH	mbǎ 'rice'	fàndé 'cotton'	lèlémá 'mantis' (Zoll) ndàvúlá 'sling' (Leben)
LHL	mb`â 'companion'	nyàhâ 'woman'	nìkìlì 'groundnut'
HLH	--	ndéwě 'sibling'	yámbùwú 'tree (sp.)'
HLHL			kónùgû 'centipede' dúmbèékà 'star'

The data show that Mende tone patterns consist of sequences of level tones; in cases where the number of tones is greater than the number of syllables, multiple level tones are pronounced on the rightmost syllable, leading to contour tones.

Chinese dialects generally do not show that contours consist of sequences of level tones. As an example, we may consider the restriction against adjacent identical tones (OCP) found in Tianjin Mandarin, shown in (24) and repeated here:

(29) Tianjin tone sandhi (Chen 2000:106, Yip 2002:179)

L.L	→	LH.L	/feiL/	feiLH.jiL	'airplane'
LH.LH	→	H.LH	/xiLH/	xiH.lianLH	'wash one's face'
HL.HL	→	L.HL	/jingHL/	jingL.zhongHL	'net weight'

The second and third examples show that it is adjacency of the entire syllable-level tone pattern that is at issue, and not adjacency of individual H's or L's; otherwise these forms would have no dissimilation. The case of Shanghai tone spreading (27) is one example where it appears that a Chinese dialect treats contour tones as sequences of level tones. In these disyllables, the pitch contour of a single syllable has been spread over two syllables. It could be argued that two tonal targets have been separated and then individually linked to the syllables of each word. However, if the disyllabic foot is taken as the TBU, then it is not

necessary to posit spreading of individual level tones to account for Shanghai tone spreading, and the contour tone remains intact as a unit.

As in other languages where level tones are primary, we note that contour tones in Mianchi are treated as special. As mentioned in section 2, Mianchi level tones occur on more than 95 percent of the syllables in a lexicon of about three thousand items (including more than six thousand syllables). In texts, contour tones are similarly infrequent; most have a morphological origin, falling on the last syllable of the verb complex (18, 19).

In African tone systems, similar properties obtain. As shown for Mende, contours can be restricted to the right edges of words due to a mismatch in the number of tones and syllables, or they can be rigidly restricted to particular syllables of words (Mawu), or to stressed syllables (Xhosa, Ciyao; Zhang 2002). Zhang (2004) notes that "the preference to have contour tones on prosodic-final syllables is indeed widely attested in African languages." In contrast, Mandarin Chinese allows contour tones on any syllable: /faŋ⁵¹bian⁵¹mian⁵¹/ 'instant noodles'.

3.3 Morphological aspects of tone.

Both morphological contour tones and tonal polarity were demonstrated in section 2.3. Tonal polarity is a common morphophonological process in African languages (Cahill 1998, Yip 2002:159-161), but probably can only occur in a system with 'opposite' tones; that is, a binary or privative tone system. Tonal polarity has been shown to operate in Chinese dialects at a phonological level where adjacent tones dissimilate, as in Tianjin (29). Chinese examples of tonal polarity (Duanmu 1999, Lin 2004) are phonologically predictable, rather than morpheme-specific, as they are Mianchi.

3.4 Default tone tendencies.

Mianchi, along with other SQ dialects, shows a tendency toward second syllable H. Similarly, many Bantu languages show a preference for H (if present) to occur on the penultimate syllable. In Giriyama, the rightmost H tone in a verb shifts to the penult (Downing 2004, citing Cassimjee & Kisseberth 2000). In Hibena, "most verbs require a High tone on the penult." (Downing 2004, citing Odden 1988). Similarly, H tones in Digo surface only on the final foot (Yip 2002:137, citing Hewitt & Prince 1989). However, Sinospheric languages are not noted for preferring certain tones in certain locales within a polysyllable. This may be a difference between Eastern and Western Sinospheric languages, as Tibetan dialects restrict HL contours to the right edges of words (Watters 2002), and rGyalrongic languages show positional restrictions on tonal contrasts (J. Sun 2005, 2008; Youjing Lin, p.c.).

It has been demonstrated throughout this section that the tonal properties of Mianchi line up with an 'African' typology much more than they do with tone systems of Chinese dialects. Implications for these findings are discussed below.

4. Further Directions.

Given the sheer number of African features in the tone system of Mianchi (and likewise of Kuki-Thaadow), it is right to wonder whether at least some of these features are lurking in other Sinospheric languages. The Qiangic languages are a good place to look, as well as

western Tibeto-Burman branches: Bodic, Tamangic, etc. In recent years there have been a number of papers on Qiangic languages that delve into the layered complexities of tone at the morpheme and word or phrase level. Rather than tone systems being treated as "unstable," recent works have shown how higher levels of prosodic organization affect tonal output. The following table, an expansion of (22), shows how the properties of these languages compare to trends for African languages, Chinese dialects, and the Qiangic languages Shixing (Chirkova 2007), Muya (Ikeda 2002), Caodeng Jiarong (J. Sun 2005, 2008), and Niuwozi Pumi (Ding 2006, see also Matisoff 1997b). Naturally, the table is an oversimplification that reflects this author's interpretations of the works mentioned; readers are referred to the original papers for details and complexities:

(30) Typological profiles of Qiangic tone systems.

	"African"	"Chinese"	Mianchi	Shixing	Muya	Jiarong	Pumi
tonal inventory	1 to 2	3 to 11	H, L, Ø	H, HL, LH	H, HL, LH	HL, LH, Ø (L)	H, L
culminativity	Common	No	Yes	Yes	Yes	Yes	Yes
OCP ⁴	Yes	Limited	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
obligatory tone in word	H (some lang's)	None	None	H	H	H	H
density of specification	Sparse	Nearly each syllable	Less than Chinese	1 per word	1 per word	1 per word	1 per word
toneless syllable pitch	Default, usually L	Prior tone + intonation	L	Assigned by root	L	L	L
floating tones?	Yes	No	Yes	No	No	No	No
spreading	Yes	Rare	No	Yes	Yes (limited)	No	Yes (limited)
downstep	Yes	No	No	No	No	No	No
level vs. contour	Level tones primary	Both are primary	Level tones primary	Level tones primary	Level tones primary	Level tones primary	Level tones primary
contour structure	Sequence of level tones	Deeper structure	Sequence of level tones	Sequence of level tones	Level tone + intonation	Level tone + coda	Sequence of level tones
contour location restriction	Yes	No	Yes (_#)	Yes (mono-syllables)	Yes (_#)	Yes (_#)	Yes (mono-syllables)
morphological category effects	Yes	No	Yes	Yes	Yes	Yes	?
morphological tonal polarity	Common	No	Yes	No	No	Yes	No
default tone pattern	Yes	No	Yes	No	Yes (verbs)	Yes	No

⁴ OCP implied by culminativity.

In addition to the languages mentioned in (30), we may note that the Lobuzhai dialect of Southern Qiang has privative tone (Evans 2006b), commonly found in African languages.

Tone in Qiangic appears to be a recent phenomenon, as it is impossible to reconstruct tonal correspondences at even shallow levels of time depth. Even at the recent level of Proto-Southern Qiang, it is difficult to reconstruct tones with certainty on most protoforms (Evans 2001). In addition, we note that within the Qiang language, toneless dialects of Qiang are more phonologically conservative than tonal varieties. Thus, it appears that what has been observed in Mianchi and in (30) are universal tendencies in tonal development: namely an interaction between morphological complexity and tonogenesis. The agglutinative complexity of these languages (Yadu verbs have four prefix slots and eleven suffix slots (LaPolla with Huang 2003:120)) enhances the potential for lexical level tone processes. Morphological complexity and longer lexical items, hallmarks of African languages, have played a greater role in the development and structure of tone in these languages than has contact with the densely tonal Chinese language. Although modern Chinese dialects show a strong preference for disyllabic words, tone arose in Chinese at a time when most words were still monosyllabic. As a consequence, in modern dialects, morphosyllables retain identifiable tones, but word-level processes (e.g., stress) can reduce the number of these morphosyllabic tones that are expressed in a polysyllable. Tone spread in Shanghai (27) is but one example of this widespread phenomenon.

In order to discover such word-level and clause-level tone processes as have been demonstrated in Mianchi, linguists working on East Asian languages must delve deeper into tonology than just the recording of surface Chao tone letters. Morpheme-, word-, and clause-level tones must all be recorded, with an assumption that an underlying system permeates the various levels. Perhaps most importantly, it is necessary to let tone systems speak for themselves, and not interpret them based on areal or familial expectations.

References

- Bamba, Moussa. 1991. *De l'interaction entre tons et accent*. PhD thesis, Université du Québec à Montréal.
- Cahill, Mike. 1998. Tonal Polarity in Kɔnni Nouns: An Optimal Theoretical Account. *OSU Working Papers in Linguistics* 51:19-58.
- Cahill, Mike. 2007. More universals of tone. ms. Dallas: SIL International. pp. 1-10.
- Cassimjee, Farida & Charles W. Kisseberth. 2000. Opaque and depressed: Giryama tonology. Paper presented at the Tone Symposium, Tromsø, Norway, June 2000.
- Chang, Kun. 1967. A comparative study of the Southern Ch'iang dialects. *Monumenta Serica*, XXVI:422 – 443.
- Chao, Yuen-Ren. 1930. A system of tone letters. *Le Maître Phonétique* 45:24-27
- Chen, Matthew. 2000. *Tone sandhi: patterns across Chinese dialects*. Cambridge: CUP.
- Cheng, C. C. 1973. A quantitative study of tone in Chinese. *Journal of Chinese Linguistics* 1.93-1 10.
- Chirkova, Katia. 2007. Zai zhongyin yu shengdiao de lianxuti shang kan Shixingyu. *Dongfang Yuyanxue* 2.143-152.

- Ding, Picus S. 2006. A typological study of tonal systems of Japanese and Prinmi: Towards a definition of pitch-accent languages. *Journal of Universal Language* 7.1-35.
- Downing, Laura. 2004. What African languages tell us about accent typology. *ZAS Papers in Linguistics* 37. 2004:101 – 136.
- Duanmu, San. 1999. Metrical Structure and Tone: Evidence from Mandarin and Shanghai. *Journal of East Asian Linguistics* 8:1–38
- Evans, Jonathan P. 2001. Contact-Induced Tonogenesis in Southern Qiang. *Language and Linguistics* 2.2:63 - 110.
- Evans, Jonathan P. 2006a. Vowel quality in Hongyan Qiang. *Language and Linguistics* 7.4: 937-960.
- Evans, Jonathan P. 2006b. How do you analyze a three-tone system, when all three tones are H?. Paper presented at 39th International Conference on Sino-Tibetan Languages and Linguistics. Seattle, USA. 21 pp.
- Goldsmith, John A. 1990. Autosegmental and metrical phonology. Oxford: Blackwell.
- Hewitt, Mark, and Alan Prince. 1989. OCP, locality, and linking: the N. Karanga verb. In E. J. Fee and K. Hunt (eds.), *Proceedings of WCCFL 8*, Stanford: SLA , pp.176-191.
- Hoffmann, Carl. 1963. *A Grammar of the Margi Language*. London: Oxford University Press.
- Huang Bufan and Zhou Facheng. 2006. *Qiangyu Yanjiu* [Studies on the Qiang Language]. Chengdu: Sichuan People's Publishing House.
- Huang, Chenglong. 2004. *A reference grammar of the Puxi variety of Qiang*. Hong Kong: CUHK dissertation.
- Hyman, Larry M. 2001. “Privative tone in Bantu.” In Shigeki Kaji (ed.), *Cross-linguistic studies of tonal phenomena*, 237-257. Tokyo: Institute for the Study of Languages and Cultures.
- Hyman, Larry M. 2003. African languages and phonological theory. *GLoT International* Vol. 7, No. 6, 153-163.
- Hyman, Larry M. 2006. Word Prosodic Typology. *Phonology* 23.225-257.
- Hyman, Larry M. 2007. Kuki-Thaadow: An African tone system in Southeast Asia. Berkeley, USA: UC Berkeley Phonology Lab Annual Report. 19pp. To appear in a forthcoming festschrift (not publicly announced).
- Hyman, Larry M. & Nzama Valinande. 1985. Globality in the Kinande tone system. In D. Goyvaerts (ed.), *African Linguistics*, 239-260. Amsterdam: Benjamins.
- Ikeda Takumi. 2002. On pitch accent in the Mu-nya language. *Linguistics of the Tibeto-Burman Area*. 25.2. pp. 27-45.
- LaPolla, Randy J. with Chenglong Huang. 2003a. *A Grammar of Qiang, with Annotated Texts and Glossary* (Mouton Grammar Library). Berlin: Mouton de Gruyter.
- Leben, William R. (1978). The representation of tone. In Fromkin, Victoria A., ed., *Tone: A Linguistic Study*, 177-220. New York: Academic Press.

- Liberman, Mark. 1995. The sound structure of Mawu words: a case study in the cognitive science of speech. In L. Gleitman and M. Liberman, eds. *An Invitation to Cognitive Science, Vol. 1: Language*. Cambridge: MIT Press, 1995. 55-85
- Maddieson, Ian. 1978. Universals of Tone. In Greenberg, Joseph H. (ed.), *Universals of Human Language*, v.2, 335-336. Stanford University Press.
- Matthews, Stephen and Virginia Yip. 1994. *Cantonese: a comprehensive grammar*. London: Routledge.
- Matisoff, James A. 1997a. *Sino-Tibetan numeral systems: prefixes, protoforms and problems*. Canberra: Pacific Linguistics Series B-114.
- Matisoff, James A. 1997b. Dàyáng Pumi phonology and adumbrations of comparative Qiangic. *Mon-Khmer Studies* 27 (Issue dedicated to Paul Benedict):171-213.
- 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'*, pp. 3-32. Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies.
- Myers, Scott. 1997. OCP effects in Optimality Theory. *NLLT*. 15:847-92.
- Odden, David. 1988. Predictable tone systems in Bantu. In Harry van der Hulst & Norval Odden, David. 1995. Tone: African Languages. In J. Goldsmith (ed.) *The Handbook of Phonological Theory*. Blackwell. pp. 445-475.
- Pike, Kenneth L. 1948. *Tone Languages*. Ann Arbor: University of Michigan Press.
- Pulleyblank, Douglas. 1986. *Tone in Lexical Phonology*. Dordrecht: Reidel.
- Shih, Chilin. 1987. The phonetics of the Chinese tonal system. AT&T Bell Labs technical memo.
- Smith, eds. *Autosegmental Studies on Pitch Accent*. Dordrecht: Foris, 225-251.
- Sun, Hongkai. 1981. *Qiangyu Jianzhi* [A Brief Description of the Qiang Language]. Beijing: Nationalities Press.
- Sun, Jackson T.-S. 2005. Jiarongyuzu yuyan de yingao: Liangge ge an yanjiu. *Minzu Yuwen* 2005.1:50-59.
- Sun, Jackson T.-S. 2008. Tonality in Caodeng rGyalrong. In Huber, Brigitte, Volkart, Marianne, and Widmer, Paul (eds.). *Chomolangma, Demawend und Kasbek: Festschrift for Roland Bielmeier*. Halle: Institute for Tibetan and Buddhist Studies, 257-280.
- Watters, Stephen A. 2002. The sounds and tones of five Tibetan languages of the Himalayan region. 25.1: 1-65.
- Wen, Yu. 1943. "Wenchuan Wasi zu Qiangyu yinxi" [Phonology of the Qiang Language, Group I, Wasi dialect]. *Studia Serica* 3.293-308.
- Wen, Yu. 1950. "An abridged Ch'iang vocabulary (Chiu Tzu Ying dialect)." *Studia Serica* 9:2.17-54.
- Yang, Shih-feng. 1984. *Sichuan Fangyan Diaocha Baogao* [Report on a survey of the dialects of Sichuan]. Taipei: Academia Sinica. 2 vols.

- Yip, Moira (2002). *Tone*. Cambridge: Cambridge University Press.
- Yip, Moira. 1995. Tone in East Asian Languages. In J. Goldsmith (ed.) *The Handbook of Phonological Theory*. Blackwell. pp. 476-494.
- Zhang, Jie (2002). *The effects of duration and sonority on contour tone distribution*. Routledge, Taylor and Francis Books, Inc., NY.
- Zhang, Jie (2004). Contour tone licensing and contour tone representation. *Language and Linguistics* 5.4: 925-968.
- Zoll, Cheryl. 2003. Optimal tone mapping. *Linguistic Inquiry* 34.2:225-268.