Bolyu tone in Vietic perspective

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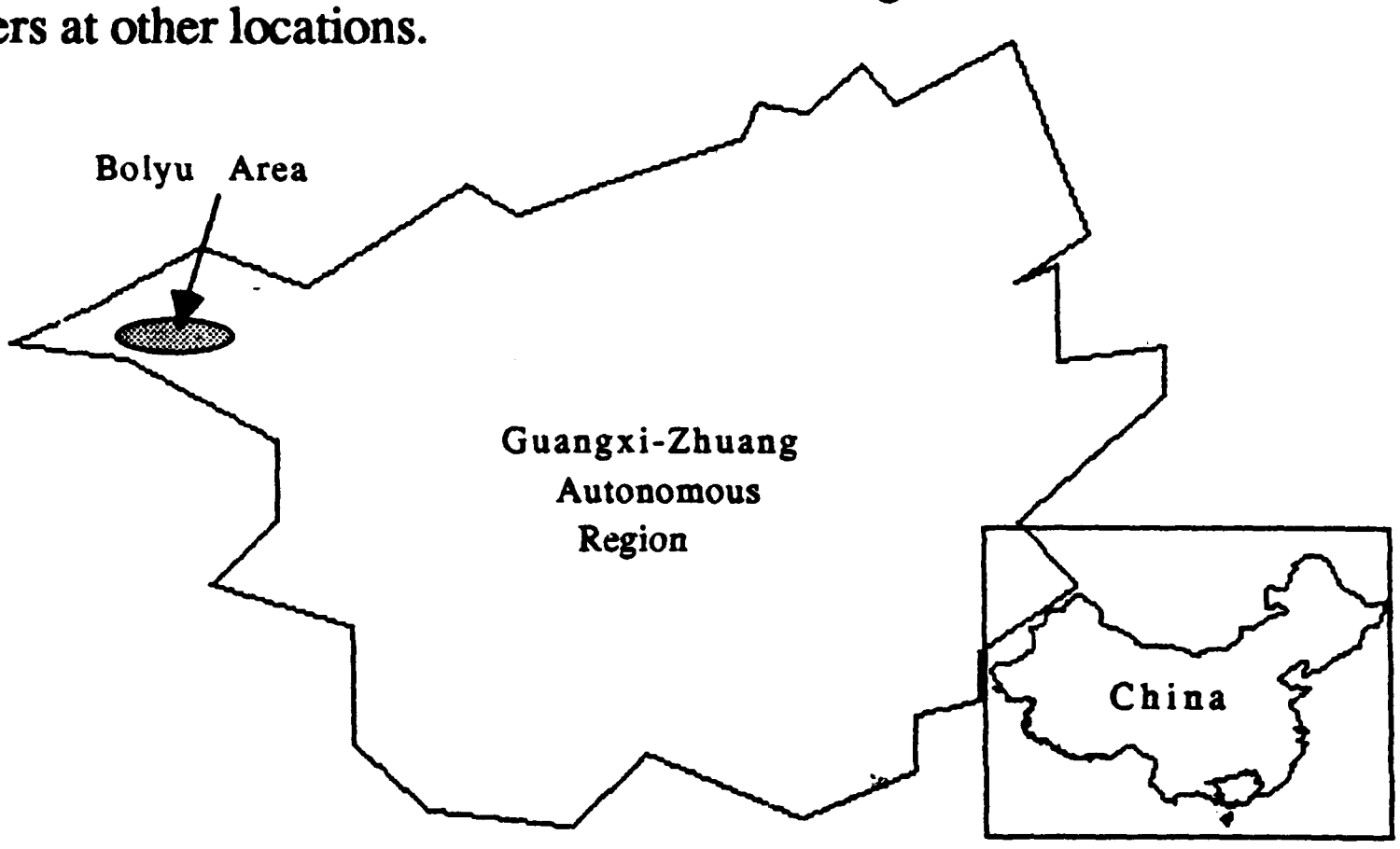
1. Introduction

One of the surprising languages of Guangxi-Zhuang Autonomous Region is Bolyu [pɔˈlljuˬ] (also referred to as Lai ").[1] The Bolyu live in mixed communities with Miao and others in Longlin Various Nationalities Autonomous County 隆林各民族溃治县 in extreme western Guangxi quite distant from other Mon-Khmer groups. According to Hang (1989), there are also some Bolyu living just south of Longlin in Xilin County 西林 at a location called Guosha. Ni (1990:232) reports that there are 1006 Bolyu located in Wenshan Prefecture, Guangnan County of Yunnan Province, cf. the discussion of Bugan below. There are no known speakers at other locations.



Map 1: The Bolyu area

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[1]This research was supported by the Committee for Scholarly Communication with the People's Republic of China and the Nationality Endowment for the Humanities for Jan-Jun 1990. Many thanks also go to Mr. Lu, first name unfortunately unknown, of Changmo Village and also to friend and colleague Professor Yang Quan of Central Institute of Nationalities, Beijing, who both in April 1990 spent so many evenings by candlelight helping me with these word lists. The Bolyu data are available on disk from the authors.

The self-designation of the Bolyu at other locations is apparently [pəˈlljuˬ] judging from the transcriptions of Liang Min (1984) and Ni Dabai (1990). See further Appendix 1: The Bolyu people.

The first widely available study of this language was conducted by Professor Liang Min of the Nationalities Research Institute, Beijing in 1984. There are also some data in Ni (1990). At first, Bolyu was thought by some to be a Kam-Tai (Kadai) language; others proposed that it might be a mixed language incorporating features of the Kadai and Miao groups; while still others viewed it as a form of Gelao. Liang suggested a Mon-Khmer connection and Paul K. Benedict (1990) was able to find considerable confirmation of that status. Still, the question deserves much more detailed study by specialists now that there is a larger body of data available (Edmondson, 1995). To be noted are several peculiar circumstances in connection with the Mon-Khmer heritage of Bolyu. First of all, the Bolyu are geographically quite distant from other major Mon-Khmer speaking groups. Secondly, the Bolyu language possesses many lexical items that do not seem closely cognate to items found in Mon-Khmer languages elsewhere. Thirdly, the gross linguistic features of the Bolyu language are those of Kadai languages, though it has, to be sure, some Mon-Khmer features as well.

Linguistically, Bolyu fits perfectly into the local linguistic landscape, in the sense that it demonstrates a rich inventory of tone contrasts with mostly monosyllabic roots, only /-p -t -k/ syllable codas, a consonant inventory resembling Zhuang (except for uvular stops and velarized initials), and vowel length contrasts in closed syllables (See Appendix 2:Notes on phonological segments). It doesn't possess many of the distinctive Mon-Khmer phonological traits such as sesqui-syllabic word structure, a rich system of syllable codas, and voice quality (register) contrasts (see below, however, that the related Bugan language has a tense vs lax opposition). Indeed, on most typological tests it more closely resembles the surrounding Kadai languages (Bouyei and Gelao) than the geographically more distant Mon-Khmer group. These factors led Paul K. Benedict to speak of Bolyu as a breed apart, "a distinct branch of MK, on an equal footing with any of the others, rather than [belonging to] Palaungic, Khmuic, VM or some combination of these." (1990:21).

We are inclined to agree with Benedict as to the difficulty, considering our present state of knowledge, of definitively assigning Bolyu a clear position within any established Mon-Khmer subgrouping. At the same time we are struck by the well developed nature of the Bolyu tone system and see in it some points of similarity with patterns in perhaps the richest area of tone variety within Mon-Khmer, namely, Vietic. At this stage we are content merely to suggest that a Vietic typology offers a fruitful frame of reference for investigating tone processes in microcosm that may have implications further afield within Mon-Khmer and Austroasiatic.[2]

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[2] In general discussion at the oral presentation of this paper (SEALS Conference, May 1994, Bangkok) G. Diffloth suggested that considering an affinity with Palaungic (rather say than Vietic) might make sense for Bolyu. While this may turn out ultimately to be a fruitful proposal, in an inspection, albeit a cursory one, of Proto-Wa, for example, one is not overwhelmed with evidence in this direction. This is not to say that there are no interesting forms in this regard, e.g.

B. ljiŋ˦	horse	Cf. P.Wa *mrɐŋ
B. (mai˨) jɔ˧	(one) hundred	Cf. P.Wa *ryah
B. qə˨pjin˥	hail	Cf. P.Wa *mprel, Samtau ʔa phɛl, Lawa pyɛ

To add to the interest on Mon-Khmer languages in China, we have just received initial results from research in 1994 by Li Jinfang of the Central University of Nationalities of Beijing on Bugan, a language of Yunnan that appears to be rather closely related to Bolyu (See References and Ni 1990). Li also promises forthcoming studies of Bugan tone and its historical relationships. Suffice it to say here that Bugan is reported to have six live tones: two level (55, 33), two rising (35, 13), one falling (31), as well as one '0' (atonal) prosody appearing on some prefixes. Dead tones are recorded by Li as 55, 31, and a much less frequent 33. Apparently, tone variants are not uncommon for given lexical items, and tone sandhi is prevalent as well. Vowels are characterized as lax vs. tense (underlined), as in *kui*^{33} 'fire smoke' vs. *ku̲i*^{33} 'to dry by smoke'. Some final stops in forms found in common with Bolyu are lost in Bugan as are some final nasals, which either become nasalized vowels or disappear completely. We reproduce here just a few examples that Li notes, reflecting both commonalities and differences between Bugan and Bolyu (transcription of the latter also Li's):

Bugan	Bolyu	
bɔ^{55} /mɔ^{55}	mə^{33} /məi^{33}	'one'
biɔ^{31}/bi^{31}	mbi^{55}	'two'
mse^{31}	pa:i^{55}	'three'
pau^{33}	pu:n^{53}	'four'
mi^{33}	me^{33}	'five'
pi̲o̲^{33}	piu^{53}	'six'
po̲u̲^{31}	pai^{55}	'seven'
sã^{33}	sa:m^{53}	'eight'
ɕi^{33}	ɕən^{53}	'nine'
mã^{31}	ma:n^{33}	'ten'
pə^{0} lai^{33}	lim^{31}	'tongue'
ɣau̲u̲^{13}	ʑi^{11}	'root'
lo̲u̲^{13}	lɔ^{11}	'leaf'
to̲u̲^{33}	mau^{11}	'stone, rock'
da^{35}	nde^{53}	'water'
mtsa^{31}	ɬet^{55}	'die'

On the other hand, few of the numbers look promising between Bolyu and Waic languages, whereas they compare much more closely with Vietic and other MK language subgroupings. Likewise body parts seem not to connect Bolyu uniquely with Waic languages as opposed to other groups, including Vietic. In short, at this point Bolyu seems most reasonably designated as an independent group—unless or until the definitions of Palaungic, or for that matter Vietic are modified.

2. Bolyu Tones

Bolyu has six tones, which in various publications have appeared with the following representations: the numbering system by Benedict (1-6), pitch level values (55, 33, etc) by Liang and Ni, and the IPA/Chao tone symbols (˥, ˧, etc.) which will appear in our citations:

Benedict	Liang & Ni,		IPA	Gloss
1	55	˥ e.g.	mbi˥	'two'
2	33	˧ e.g.	njo˧	'house'
3	11	˩ e.g.	yi˩	'root'
4	53	˥˩ e.g.	nde(k)˥˩	'water'
5	31	˧˩ e.g.	mai˧˩	'one'
6	13	˩˥ e.g.	ma:n˩˥	'ten'

Tone 3 is relatively the least frequent. A low tone often marked as 11, it actually begins with a falling contour from above a 2 level and drops to a low 2 or 1 level. One good example is *yi*˩ 'root'. Tone 53 is accompanied with glottal or other stop constriction at the end of the syllable. For example, *nde*˥˩ 'water' on several occasions still appears to retain a stop coda *ndek*˥˩. In isolation the final *-k* was sometimes seen as closure or voicing at the extreme end of the syllable. In some words, however, the constriction must have come from another final, e.g. *pum* ˥˩ 'four' reflects a possible prior glottalized final. Occasionally, Mr. Lu, who recorded all the forms in this study, exhibited a breathy voice in low (11˩) and low rising (13 ˩˥) tones. He would then repeat the word with and without this quality.

In order to provide quantitative information about the pitch trajectories in Bolyu, a number of the recorded utterances were subjected to instrumental analysis. In these plots a semitone scale, as opposed to the hertz scale, was used. The semitone scale is interval-preserving so that a drop of one semitone at 40 semitones is the same interval as a drop of one semitone at 30 semitones; the more popular hertz scale does not have this feature. More on this difference is found in Ross, Edmondson et al., (1986). Figure 1 and Figure 2 provide plots of the six tone trajectories which are relatively sure. The tone designated 11 by Liang Min and Ni Dabai is not strictly level in this plot but falls, perhaps as 21 ranging from about 34 to 30 semitones; whereas the 31 tone falls from 37 to 30 semitones. One must also consider that the initial portions of the 55 and 33 tones are subject to a potential FØ-depressing influence from the initial consonant.

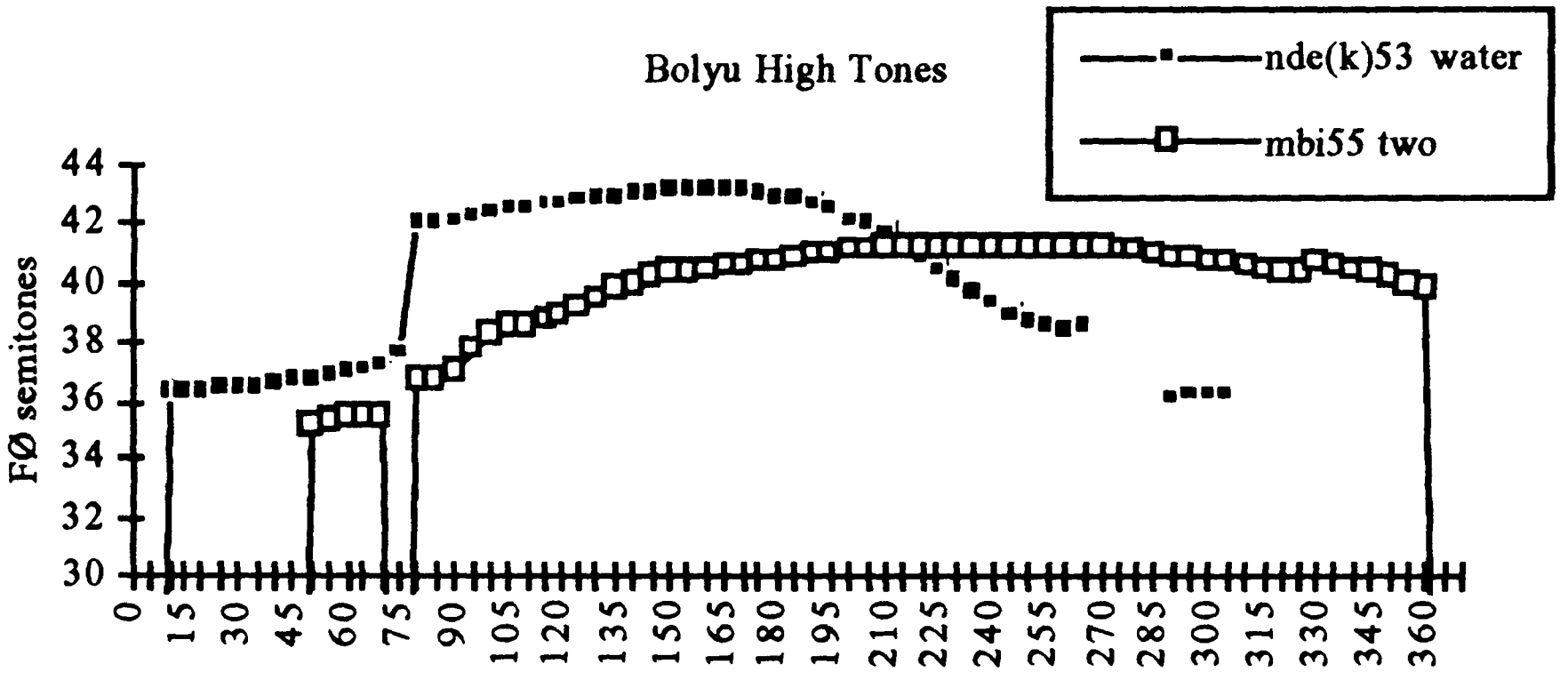

Figure 1: High Tone Pitch Trajectories 55 and 53

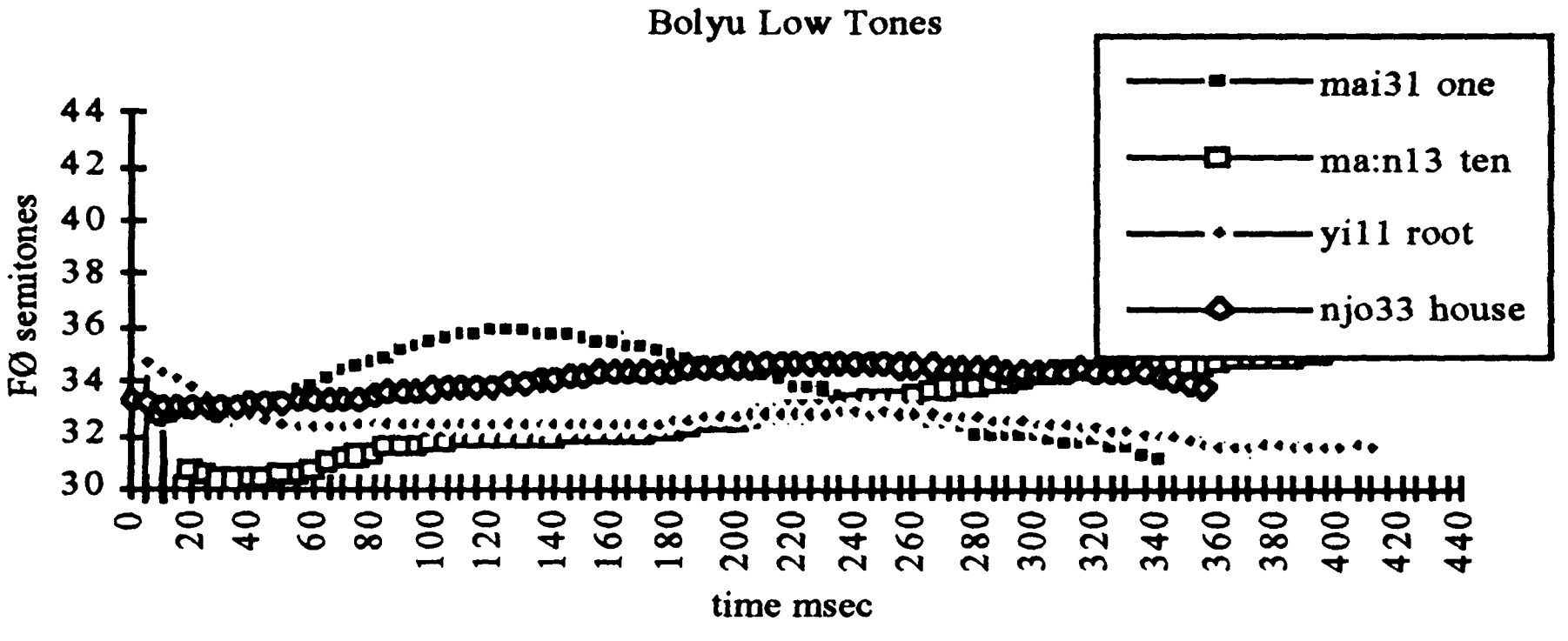

Figure 2: Low Tone Pitch Trajectories: 33, 31, 13, and 11 (21)

The following chart summarizes some of the main associations between consonant types and tones in Bolyu:

	DISTINCTIVE INITIALS		COMMON INITIALS	
High Tones: (˥ ˦)	mb, nd	ɬ, s	p, t, k, q	ts/ɕ, ʔj, j(ʑ), ɣ
Low Tones: (˧ ˩ ˨ ˦ ˩)	m, n, (ɲ), ŋ			
	p^h, t^h, k^h, q^h, h	l, v	p, t, k, q	ts/ɕ, ʔj, j(ʑ), ɣ

Figure 3: Consonant types and tone sets

That is, as indicated in Figure 3 above:

1. /mb nd ɬ s/ are found only in high tones (Benedict's tones 1, 4).
2. Vl. stops, affricates and /j ʔj(ʑ) and ɣ/ occur in both high and low tones.
3. /m n ɲ ŋ l v/ and /h/ occur predominantly in low tones (2, 3, 5, 6).
4. Aspirated consonants are found only in low tones.

3. Bolyu Tone and Vietic Categories

Bolyu is phonologically interesting as a Mon-Khmer language for, among other things, its well developed six-termed tonal system. Among the branches of Mon-Khmer, Vietic is, by comparison, also notable for its repertoire of languages possessing such full-blown pitch patterns.

Ferlus (1991:2) in *Vocalisme du Proto Viet-Muong* summarizes the tonal systems in a number of Vietic languages (Arem, Sach, etc.), which we schematize in the following comparative framework (with each tone category represented uniquely in its own descriptive box and symbolized with the vowel **a**, e.g. **a**^{1}, **a**^{2}):

1. Arem

a plain syllables	**a**^{7} glotto-pharyngeal tension

Devoicing of initials. Pitch height is imperceptible.

2. Sach

a^{1} high plain	**a**^{3} high glottal + breathy, diphthongized open vowels
a^{2} low plain + breathy, diphthongized open vowels	**a**^{4} low glottal

Devoicing of Initials. Final -h is preserved.

3. Ruc and Thavung

a^{1} high plain	**a**^{3} high glottal
a^{2} low plain +breathy, diphthongized open vowels	**a**^{4} low glottal +breathy, diphthongized open vowels

Devoicing of Initials. Final *-s* is preserved as *-l*^{h} / *-r*^{h} in Ruc and as *-j*^{h} in Thavung.

4. Malieng and Pakatan

a^{1} high plain	**a**^{3} high falling glottalized (Pakatan), rising (Malieng)
a^{2} low plain +breathy, diphthongized open vowels	**a**^{4} low glottal +breathy, diphthongized open vowels

Devoicing of initials. Final *-r ~-l* is partially preserved in Pakatan and is reflected in *-w~ -l* in Malieng.

5. Pong

a^1 high plain	a^3 high glottal
a^2 low plain	a^4 low glottal

Devoicing of initials. Final *-h* has been lost, but with no independent tonal reflexes (i.e. no hỏi-ngã-like tone development as in VN/Muong). Final *-s* is represented by *-c*.

6. Muong

a^1	a^3	a^5
a^2	a^4 some dialects distinguish/some combine with a^6	

The ancient liquid finals occur as *-ə* in Hòa Bình, *-l* in Sơn La and *-n* in Thanh Hóa.

To which may be added the following tone schema to round out the picture:

7. Vietnamese

a^1	a^3	a^5
a^2	a^4	a^6 distinct from a^5 in the North; elsewhere one tone

Ancient liquid finals occur as *-y /-i*; final *-s /-h* are lost, normally reflected in tones a^5/a^6

Figure 4: Vietic Tone Arrays (1-7 above)

The tonal picture for Vietic which emerges above ranges from the simplest pattern for Arem to the most complex for Northern Vietnamese, summarizable as follows:

1. Arem simply opposes glottally constricted/stopped syllables to all other syllable types, i.e. [S_{+glot} vs. S_{-glot}] with no significant pitch distinction.

2.-5. Sach, Ruc, Thavung, Malieng, Pakatan, and Pong further multiply the Arem pattern x2 via a High vs. Low Pitch parameter resulting in a four-termed system.

6.-7. Muong and Vietnamese expand the tone array further to a 5 or (in the case of Northern Vietnamese) to a 6-box system. As indicated above, Muong combines categories a^4 and a^6, while Central and Southern varieties of Vietnamese combine a^5 and a^6. This enlarged tonal system results from pitch contours that evolved in the (now lost) environments of *-h* and *-s*.

Taking the Vietic tone systems as a heuristic frame of reference, one may also categorize parallel Bolyu tone types in a four-box array, whose quadrants we shall refer to as I-IV as shown in Figure 5.

I

Bol ˥ : VN *ngang*

ti˥	'arm'		
(lɔ˧˩)tɕa:i˥	'ear'		
hən˧˩ ni˥	'today'		
pa:i˥	'three'		
qon˥	'son'		
mɔ˧˩ sɔŋ˥	'pine tree'		
mbɔŋ˥	'bamboo shoots'		
jɔŋ˥	'foot'		
tɕəm˥	'right side'		

Bol ˨˦ : VN *ngang*

nə:m˨˦	'year'
pa:u˨˦	'dream'

Bol ˥ : VN *hỏi*

pei˥	'seven'
ɬɔ˥	'split'
ɕi˥	'select'
ɕi˥	'intelligent'

II

Bol ˧˥ : VN *sắc*

ɬjit˧˥	'to die'	sa:m˧˥	'eight'
nde˧˥	'water'	sa:m˧˥	'blood'
ʔut˧˥	'drink'	jam˧˥	'cry'
ɕət˧˥	'have fever'	ljim˧˥	'lick'
		qam˧˥	'chaff'
		pu:n˧˥	'four'
qɔ˧˥	'fish'	sən˧˥	'navel'
pju˧˥	'six'	ɕən˧˥	'nine'
tsu˧˥	'dog'	tɕən˧˥	'ripe'
ɬai˧˥	'fruit'	tɕaŋ˧˥	'bitter'

but note tone in:
sən˧˥ 'bird'

III

Bol ˨˦ : VN *huyền*

ma:n˨˦	'ten'
ma:i˨˦	'you pl'
(mi˦	'you sg')

Bol ˦ : SV *huyền*

tɕen˦	'money'
tə:ŋ˦	'sugar'
lɔ˦	'mule'
ɲɔ˦	'house'

(but also note:
lou˦ 'thigh'

Bol ˩ : VN ngã

ji˩	'root'

IV

Bol ˧˩ : VN *nặng*

ma:i˧˩	'one'
pu˧˩	'penis'
ju˧˩	'to fear'
ma˧˩	'mother'
qhəp˧˩	'arrive'
nak˧˩	'lean meat'
ŋəm˧˩	'hold in mouth'

but note unexpected tone in:
(mɔ˧˥) lja:ŋ˧˩ 'eagle'

Bol ˧˩ : VN *ngã*

lɔ˧˩ (tɕa:i˥)	'(ear) hole'
lɔ˧˩ (lji:m˧˥)	'tongue'

Figure 5. Bolyu-Vietic Tone comparisons

The Bolyu tone groupings in the four-box figure may be identified in preliminary fashion with the following apparently parallel forms in the Vietic languages :

Bol ⅄ : VN *ngang*

ti˥	'arm'	VN tay, M thaj², saj², si² Thv si¹,
lɔ˧˩ tɕa:i˥	'ear'	VN tai, S-Ruc sa:j¹
hən˧˩ ni˥	'today'	VN hôm nay, M hom² ni²
pa:i˥	'three'	VN ba, M pa:¹,ba:¹ S-Ruc et al.pa:¹
qon˥	'son'	VN con, M,S-Ruc et al. kɔn¹
mo˧˩ sɔŋ˥	'pine tree'	VN thông
mbɔŋ˥	'bamboo shoots'	VN mang, M baŋ¹/ vaŋ¹, Ar aɓaŋ, S-Ruc təbaŋ¹
jɔŋ˥	'foot'	VN chân, Ar ciɲ S-Ruc Thv ci:ŋ²
tɕəm˥	'right side'	VN đăm, M tam¹, dam¹, Ar tam, S-Ruc təam²

Bol ⅄ : VN *ngang*

nə:m⅄	'last year'	VN năm, M nam¹, Pk sənam¹, Thv cɔm¹, P cɨm¹
pa:u⅄	'dream'	VN chiêm bao, Arem mpɔ, S-Rc capo:¹

Bol ˥ : VN h*ỏ*i

pei˥	'seven'	VN bảy, M paj⁴, pac³ Ar pah, Pk palʰ¹, Thv pih¹
ɬɔ˥	'split firewood'	VN chẻ 'split' (Cf. R təhlah 'be split')
ɕi˥	'select'	VN chỉ 'point, show'
ɕi˥	'intelligent'	?VN gi*ỏ*i

Bol ⅄ : VN h*u*yền

ma:n⅄	'ten'	VN mười, M mười²
mi˧	'you'	?VN mì, (cf. PP mi³ 'thou')
ma:i⅄	'you pl'	?VN mày, M mi² 'thou', (Cf. Kharia 'ampe, Sora am'ben 'ye')

Bol ˧ : SV h*u*yền

tɕen˧	'money'	VN tiền, M thiên, Ch qian
tə:ŋ˧	'sugar'	VN, M đường < Ch tang
ɲɔ˧	'household'	VN nhà

But also note:

lou˧	'thigh'	S-Ruc palu:¹, Thv malu:², M blu:¹

Bol ˧˥ : VN *sắc*

ɬjit˧˥	'to die'	VN chết, Ruc kəci:t¹, Pk ce:t², (Cf. R hlat, also ?Proto Wa *hlat, Sam. hḷát 'fear')
nde(k)˧˥	'water'	VN nước M ɗak³ S-Ruc, Ml da:k¹ Pk da:k²
ʔut˧˥	'drink'	VN h*ú*t 'smoke', M hút 'suck'
ɕət˧˥	'have fever'	VN sốt, M khôt³

Bol ˥ : VN *sắc*

qɔ˥	'fish'	VN *cá*, Ar akæ:ʔ, S-Ruc aka:^{3}, Thv ka:^{3}
pju˥	'six'	VN *sáu*, M phaw^{5}, Ar pəraw^{ʔ}, Pk p^{h}law^{3}
tsu˥	'dog'	VN *chó*, Arem aca:^{ʔ} , Thv cɔ:^{3}
ɬai˥	'fruit'	MidVN *blái*, VN *trái*, Ar ulɛ^{ʔ} , Ml ple:^{3}
sa:m˥	'blood'	Ar at^{h}æ:m^{ʔ} Sach, Ruc asa:m^{3}, Pk sam^{3}
sa:m˥	'eight'	Ar t^{h}æ:m^{ʔ}, Pk sam^{3}, M sam^{5}, tham^{5}
ljim˥	'lick'	VN *liếm*, Thv halɛ:m^{3}
qam˥	'chaff'	VN *cám*, Ar kæ:m, Pk tkæ:m^{3} 'bran'
pu:n˥	'four'	VN *bốn*, M pon^{3}, Arem puon^{ʔ}, SR po:n^{3}
sən˥	'navel'	VN *rốn*, M.(Dô) son^{1}son^{5}
ɕən˥	'nine'	VN *chín*, Arem ci:n^{ʔ}, Pk ci:n^{3}
tɕən˥	'ripe'	VN *chín*, Arem ci:n^{ʔ}, Pk ci:n^{3}, əci:n^{1}
tɕaŋ˥	'bitter'	VN *đắng*, S-Ruc taŋ^{3} (Cf. Lwa sɔ:ŋ, Khr ɔ'sɔŋ)
sən˥	'bird'	VN *chim*, Ar ici:m, S-Rc ci:m^{1}(Cf. Nik ceco:n)

Bol ˩ : VN *nặng*

ma:i˩	'one'	VN *một*, M môch^{2}, Ml mu:c^{2}, Mon mwai, Gu mui
ju˩	'to fear'	VN *sợ* (Cf. R yuʔ)
pu˩	'penis'	M pu^{4}; po^{3} kha^{1}
ma˩	'mother'	VN *mẹ*, M me^{4}, S-Ruc miɛ^{4}, Thv mə:^{4}, P me:^{4}
qhəp˩	'arrive'	VN *gặp* 'meet'
nak˩	'lean meat'	VN *nạc*
ŋəm˩	'hold in mouth'	VN *ngậm*

Bol ˩ : VN *ngã*

lɔ˩ (tɕa:i˥)	'hole (ear)'	VN *lỗ* 'hole', cf. Kharia lat
lɔ˩ (lji:m˧˥)	'tongue'	?VN *lưỡi*, Vinh dial. lại, M laj^{5} , lan^{5}, Ar liəh, Sach laal^{h1}, Ruc laar^{h1}, Thv laaj^{h1}, Ml laaw^{h1}

4. Some General features of Bolyu and Vietic tone

Our goal in this paper is a modest one. We do not propose here to reconstruct proto-systems at some specific level, but rather to observe some patterns and features of overlap that emerge when Bolyu and Vietic tone are viewed within a common Mon-Khmer typological grid.

To begin with, one may summarize Bolyu tone categories in terms of the following syllable (or phonological word) classes:

Tones I, II < *continuant rimes (oral, nasal, laryngeal)	Tones III, IV < *radical constriction rimes (oral and laryngeal)
*CV	*CV?
*CVN (-m,-n, [-ɲ-ŋ]	*CVN (-m,-n, [-ɲ]-ŋ)?
*CVH	*CVP (-p, -t, [-c],-k)

Figure 6: Syllable types and tones

That is, Bolyu forms in Tones I and II include historically open, nasal continuant, and laryngeal continuant rimes, while Tones III and IV involve historically more radically constricted rimes either oral or laryngeal of some kind (where ?=laryngeal component, whether prosodic or segmental).

Comparing the above patterns with other Vietic languages, one observes the following general outlines:

1. *CV and *CVN appear in categories I, II in Bolyu. Forms of this shape involve the quintessential bằng-type tones in their Vietic and Sino-Vietnamese (SV) counterparts, e.g. in the high set:

tiˀ	'arm'	VN tay, M thaj^{2}, saj^{2}, si^{2}, Thv si^{1}
paːiˀ	'three'	VN ba, M paː^{1}, baː^{1}, S-Ruc et al. paː^{1}
qonˀ	'son'	VN *co*n, M, S-Ruc et al. kɔn^{1}
tɕəmˀ	'right side'	VN đăm, M tam^{1}, dam^{1}, Ar tam, S-Ruc təam^{2}

The B. ˨ 13 tone is associated with VN ngang and h*u*yền-type forms such as the following, the first pair matching Vietic high tones (I) and the second pair, Vietic low tones (II):

nəːm˨	'last year'	VN năm, Pk sanam^{1}
paːu˨	'dream'	VN *chiêm bao*, Arem *mpɔ*, S-Rc *capoː*^{1}
maːn˨	'ten'	VN mười, M mườl^{2}
maːi˨	'you pl'	?VN mày, M mi^{2} 'thou',

Note that the first pair above (nəːm˨ and paːu˨) are forms that historically involve a voiceless spirant in the pretonic syllable and nasal initials in the tonic syllable, while in the second pair (maːn˨ and maːi˨) only initial nasals turn up historically.

Not surprisingly, Bolyu shares numerous forms with Vietnamese that are of Chinese provenience. In category II such forms as the following involve Bolyu tone ˧33 and Vietnamese huyền:

tɕen˧	'money'	VN tiền, M thiên < Ch qian
təːŋ˧	'sugar'	VN, M đường < Ch tang

However, a non-Han form also shows Bolyu ꜒ with a I or II category tone in Vietic:

lou꜒ 'thigh' S-Ruc palu:[1] Thv malu:[2] M blu:[1]

2. *CVH is retained in I, II for Bolyu. This feature is parallel to the pattern of a number of Vietic languages. Arem, for example, agrees and even retains the *-*h* in its conflated I-II slot, whereas Sach, Ruc, Pakatan, and Thavung having lost *-h, still reflect tones 1 or 2. In Pong, however, this syllable type migrates to box III (and IV?), apparently generalizing III-IV as an all-laryngeals (-ʔ and -h) category. In Mường *CVH generally breaks out of the four-box system, spawning a new tonal category V but only in the high set of tones, while retaining its status as a tone IV for the lower set. Vietnamese carries the expansion from the four-box system to a 5 or 6 box array in which *CVH receives its own category V-VI as a single tone in Southern and Central dialects and as two independent tones V vs. VI in the North. The form for 'seven' is diagnostic of some of these treatments of *CVH tones:

pei꜒ 'seven' VN bảy, M paj[5], Ar pah, Pk pal[h1], Thv pih[1], P pal[3]

3. **CVP syllables occur in III, IV in Bolyu, where like Vietnamese and* Mường the occurrence of final stops is restricted to a certain subset of tones in the system. For Vietnamese, these consonants may cooccur only with the sắc-nặng tone set. For Bolyu, the 53꜓ and 31꜔ tones function in parallel fashion, as exemplified in the following forms, respectively:

ʔut꜓ 'drink' VN h*út* 'smoke', M h*út* 'suck'
qhəp꜔ 'arrive' VN gặp 'meet'

4. *CVʔ and *CVNʔ appear as III-IV class forms. The correlation of final stops with Vietnamese sắc-nặng has, of course, figured into historical observations on tone since the work of Maspero (1912) and the tonogenetic hypothesis of Haudricourt (1954). That the theory leaks a bit has also been pointed out from time to time (e.g., Gage, 1985; Diffloth, 1989), specifically regarding the motivation for certain forms with historical nasal-final or 'open' syllables to turn up in the sắc-nặng category. In this regard the Bolyu data are interesting, since they parallel the Vietic patterns and on many of the same etyma, for example:

Open Syllables with B꜓ and VN sắc tones

pju꜓ 'six' VN sáu M phaw[5] Ar pəraw[ʔ], Pk p[h]law[3]
tsu꜓ 'dog' VN chó Arem aca:[ʔ] Thv cɔ:[3]
ɬai꜓ 'fruit' MidVN blái VN trái Ar ulɛ[ʔ] Ml ple:[3]

Nasal-final Syllables with B꜓ and VN sắc tones

sa:m꜓ 'blood' Arem at[h]æ:m[ʔ], Sach,Ruc asa:m[3], Pk sam[3]

sa:m˧˥	'eight'	VN tám, Arem t^{h}æ:m?, Pk sam^3 (but M sam^5, tham^5, where tone5 usually =VN *nặng/ngã*)
ljim˧˥	'lick'	VN liếm, Thv halɛ:m^3
pu:n˧˥	'four'	VN bốn, M pon^3, Arem puon?, SR po:n^3
ɕən˧˥	'nine'	VN chín, Arem ci:n?, Pk ci:n^3
tɕən˧˥	'ripe'	VN chín, Arem ci:n?, Pk ci:n^3, Thv ci:n^1

The lower tone sets are less well represented, but a few examples have also turned up in which *sắc* or *nặng*-type tones appear on open or nasal final syllables.

'Open' Syllables with B˧˩˥ and VN *nặng* tones, e.g.:

ju˧˩˥	'to fear'	VN sợ
pu˧˩˥	'penis'	M pu^4; po^3 kha^1
ma˧˩˥	'mother'	VN mẹ, M me^4, S-Ruc miɛ^4, Thv mə:^{4}, P me:^{4}

Nasal-final Syllables with B.˧˩˥ and V *nặng* tones, e.g.:

ŋəm˧˩˥ 'hold in mouth' VN ngậm

Predictably, there are also some flip-flops in which B˧˩˥ correlates with VN *sắc* (or other Vietic lgs. tone 3) and B˧˥ correlates with VN *nặng* (or other Vietic tone 4), as in the following two cases, respectively:

(mɔ˧˥) lja:ŋ˧˩˥	'eagle'	Ar kəlæ:ŋ?, S kəla:ŋ^3, SL kla:ŋ^3
jam˧˥	'cry'	Ar ajiem?, Sach, Ruc jaam^4, M ɲam^5, (M tone 5 regularly corresponding with VN *nặng/ngã*)

The distribution of B ˧˥ and ˧˩˥ tones in 'open' and nasal (as well as regular stopped) syllables invites the inevitable observation that the same laryngeal effects reported (e.g. Ferlus, 1991) for the Vietic languages, especially Arem as well as Sach, Ruc, etc. or the 'creaky voice' across Austroasiatic suggested by Diffloth (1989) may also stand behind the evolution of tone in Bolyu.

Of all the tone parallels between Bolyu and Vietic forms, box III above is the most consistent. Why should this be so? Some possibilities come to mind:

1. The high tone sets (I and III) tend perhaps to be statistically more common in general.

2. Arem, Sach, Ruc, etc., perhaps reflect a model in which category III-IV constitutes something like the first step towards differentiating certain laryngeal forms from all other word types. If we assume that category I-II in some evolutionary sense 'feeds' III-IV by ceding -h to its repertory, as in Pong (and Mường in the low set) as well as exporting all voiceless stops to that category for Bolyu and Việt-Mường, it is not surprising to be able to find a rather sizeable collection of items that share some kind of constrictive feature in their rimes. Put

another way, the radical laryngeal stricture of III-IV (as in Arem)—Pied Piper-like—attracted at various times and in various ways other rime types into its domain, where they were reinforced with (and sometimes replaced by) compatible prosodic trappings.

Tone in Bolyu and its implications for understanding prosodic developments more broadly in Mon-Khmer and Austroasiatic remains a tantalizing question. One which will continue to attract interest as research goes on.

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Bolyu abbreviations:

Ar	=	Arem
B, Bol	=	Bolyu
Ch	=	Chinese
GU	=	Gutob (Munda)
M	=	Muong
MK	=	Mon-Khmer
Ml	=	Malieng
P	=	Pong

P.Wa	=	Proto Wa
PK	=	Pakatan
R	=	Rengao
Sam	=	Samtao
SR, S-Ruc	=	Sach-Ruc
SV	=	Sino-Vietnamese
Thv	=	Thavung
V, VN	=	Vietnamese

Appendix 1: The Bolyu people

The population figures for the Bolyu of Longlin County are 486 (in 1964), 650 (in 1982), and 736 (in 1987). Ni (1990:232) gives the combined Bolyu popuations as 845, including 80 in Xilin County. The Bolyu are called Buyang by the local Zhuang and Lai by the Han (Chinese) dwellers of Longlin. Lai is the name by which they have been known in published work up to now. We have, following their wishes, elected to use their autonym, Bolyu, in this work and hope that this practice will continue. According to the *Guangxi Tongzhi* (Gazeteer of Guangxi Province), there were about 70 years ago four nationalities found in Xilong (today split into two counties Longlin and Xilin): Zhuang, Nung, Bolyu (Lai), and Yi (Lolo). About 60% of the Bolyu have the surname Wei. Other family names are Wang, Guo, Lu, Zeng, and Hu. The Bolyu live in scattered settlements with other groups and have no separate villages. Local records indicate that they live principally at places called Xinhe, Xinhua, Changmo, Shechang, and Zhelang.

The Bolyu (Lai) have long been recognized as one of the aboriginal peoples of China, as reflected in reports such as Schotter (1909:320):

> Dans le parler populaire on dit que les Yao-jen ont été les premiers habitants sur Kouy-Tcheou; même souvent on dit que ce sont les Laï or Lai tse. Il y aurait eu autrefois un royaume de Laï-tse au Kouy-tcheou; un Laïtse-kouĕ. C'est sans doute le même mot par lequel sont indiqués les Ly nommés plus haut par P. Duhalde sous ce nom Laï on retrouve des aborigènes dans les autre provincees. Ainsi dans un article Kiao-tcheou (Revue française 1898) on lit "Les Laï dans Chantong est un peuple autochtone, non-chinois..."

The Bolyu live a rather marginal existence because—like the Gelao of Longlin—they must often marry members of other nationalities, since there are only a small number of surnames among the Bolyu and thus only a small pool of marriageable partners. The effect of this rule is to weaken further the language, since Bolyu like Gelao is often not transmitted to the next generation. The children of these marriages speak Han and perhaps another minority language, but not the language of the smaller group. Indeed, our two Moji Gelao assistants from Longlin said that their mother was a Bolyu, but that they themselves speak their father's language because there were several other Gelao speakers in their village and they received only limited knowledge of Bolyu from their mother.

Mr. Lu, the major source of information for this study, had no wife, since in the Miao village where he lived Miao women cannot marry outside their own ethnic group. These factors reveal the precarious social position of the Bolyu in this multi-ethnic and multi-lingual community on the eastern reaches of the Guizhou-Yunnan Plateau. As a consequence, the Bolyu language is in acute jeopardy of extinction.

Appendix 2: Notes on phonological segments

A preliminary overview of Bolyu consonant and vowel segments includes the following facts:

Initial consonants include the following:

p	t		k	q	ʔ
ph	th		kh	qh	
mb	nd				
m	n		ŋ		
	l				
w		ʔj j			
	s ɬ	ɕ			h
v			ɣ		
	ts	tɕ			
	tsh	tɕh			
pj	tj		kj		
phj	thj				
mbj					
mj					
	ɬj			hj	
vj			ɣj		
	lj				
			kw		
		tɕɣ	kɣ		
			khɣ		
vɣ				hɣ	

Final consonants are these:

p	t	k
m	n	ŋ

Our data include several examples of velarized initials, i.e. /hɣ khɣ kɣ vɣ tɕɣ/. The initial /j/ has a lot of friction and is often phonetically [ʑ]. Vocabulary borrowed from Han that have aspirated initial stops often have become voiced stops (mb- nd-) or unaspirated stops in Bolyu. The uvular series *q, qh* are also interesting as elements reflective more of Kadai than Mon-Khmer languages.

The basic vowels of Bolyu are the following:

i		u
e		o
a	ə	ɔ

In addition to the regular length vowels above, at least a:, ə:, and u: also appear as long varieties. Bolyu has even been reported to have a three-fold vowel length contrast (Liang Min,1984). However, there seems to be only limited support for such. It is true that *ma:t* ^{31} 'socks' is much longer than *mat* ^{31} 'eye' and that *mat* ^{33} 'fire' appears to lie midway in length. That is, five repetitions of the word *ma:t* ^{31} 'socks' had a mean value of 135 msec (see below). The contrasting vowel in multiple utterances of *mat* ^{33} 'fire' had a mean of 105 msec. The shortest vowel was in *mat* ^{31} 'eye', five utterances of which had a mean length of only 70 msec. The item for 'eye' is also difficult to distinguish from 'face' *mat* ^{53}, which has comparable length but a more level tone; also 'fire' *mat* ^{33} is difficult to distinguish from *mat* ^{31} 'field' (and note in passing that *mat* ^{33} is unusual in permitting a final stop with a 33 tone). In any case, there are only very few vocabulary items with this degree of purported length difference. They usually involve Han loan words. In many disyllabic words the first vowel shows reduction to [ə]. All of which means that the matter of vowel length in Bolyu remains to be further documented and refined.

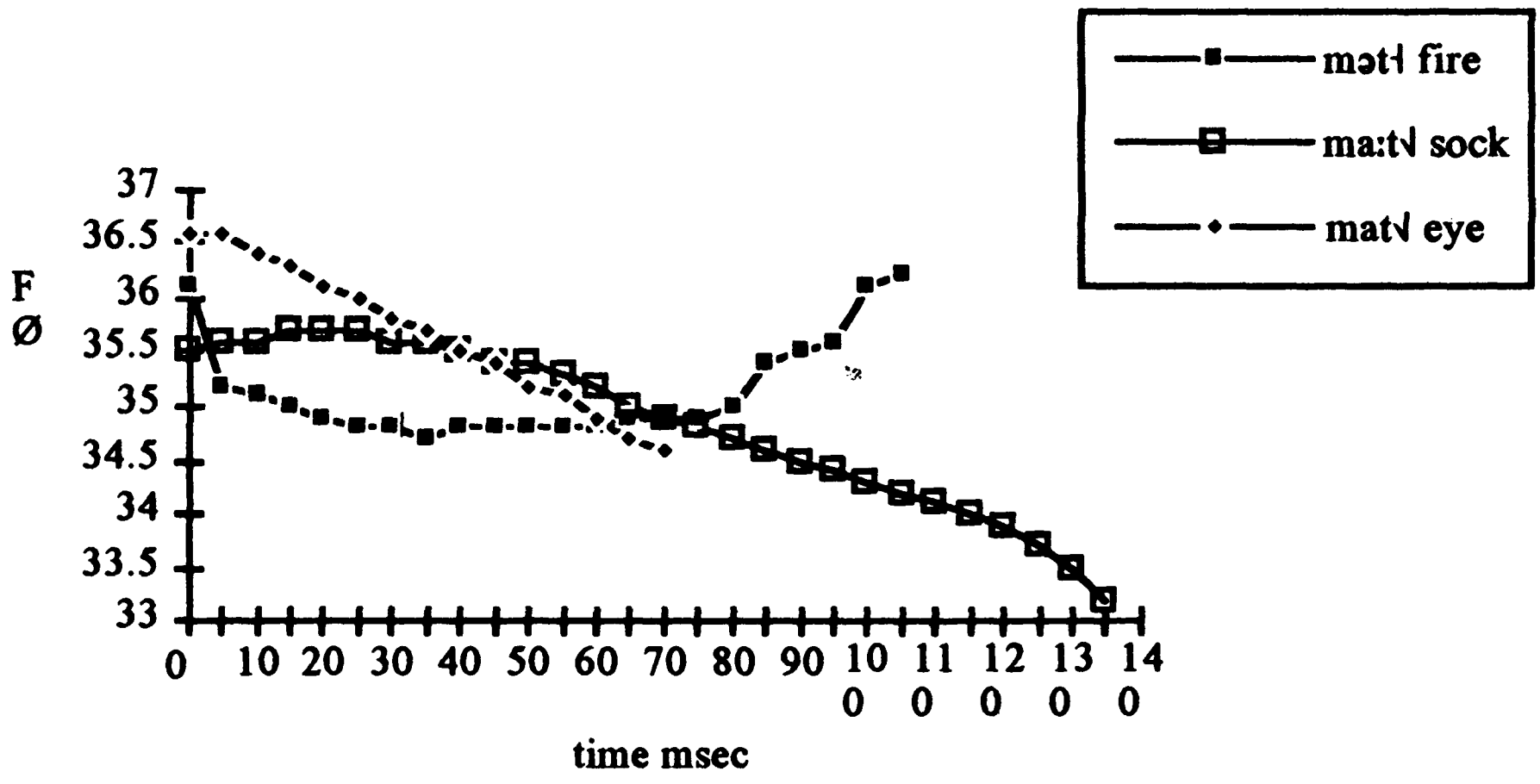

Figure 8: Bolyu vowel length

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