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# JSEALS

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Each paper is reviewed by at least two scholars, usually a member of the Advisory Board and one or more independent readers. Reviewers are volunteers, and we are grateful for their assistance in ensuring the quality of this publication. As an additional service we also admit data papers, reports and notes, subject to an internal review process.

JSEALS is published annually. Papers should be submitted to the Managing Editor, electronically ([paul.sidwell@anu.edu.au](mailto:paul.sidwell@anu.edu.au) or [paulsidwell@yahoo.com](mailto:paulsidwell@yahoo.com)) by December 31st for inclusion in the follow year's issue.

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# Editorial

Welcome to JSEALS Volume 3. Readers will immediately notice that this issue is slimmer than previous volumes, in fact it has been split into two issues, with the second slated to appear later in 2010.

Since the launch of JSEALS in 2008, the intention has been to ensure predictable timely publication, based on manageable deadlines. Naturally there were teething problems with the first issues, in particular the challenging task of cajoling reviewers into keeping to agreed return dates, and keeping track of the progress of manuscripts as new submissions would begin to come in before the existing backlog had been cleared. Hopefully this problem is now satisfactorily solved.

From the start it has been my ambitious (if practically impossible) target to publish the journal before or no later than each year's annual SEALS meeting. I am pleased to say that this year we have managed to it, albeit by a cunning slight of hand. After consulting with members of the Editorial Advisory Board, the decision was taken to split the journal into Volumes 3.1 and 3.2. The practical effect is that where both authors and reviewers have provided their inputs in a timely fashion, the work can proceed to publication without waiting for the outcome of others' labours.

This is not to say that a procedural ideal has been achieved. As I write, some very efficient authors are still waiting on the output of tardy reviewers, and some authors have indicated that it may take a year or more to comply with the suggestions of very efficient (exuberant?) reviewers. But the good news is that a major bottleneck in the production sequence has been relieved to some extent.

You will also note some editorial improvements, reflecting our ongoing program of improving standards. As of Volume 3, all papers carry dates received and approved. And looking forward, Volume 4 papers will include short abstracts and keywords - the later based on the keywords index used in the online Southeast Asian Linguistics Archive ([sealang.net/sala](http://sealang.net/sala)).

Finally, I would like to thank Marc Brunelle (University of Ottawa), Assisting Editor for Volume 3. Marc took responsibility for managing the review process for half of the papers submitted, making a tremendous contribution in ensuring the timeliness of reviews and helping authors to improve their work. I commend his professionalism.

Paul Sidwell (Managing Editor)  
May 2010

# PHONOLOGICAL INNOVATION AMONG HMONG DIALECTS OF WENSHAN<sup>1</sup>

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## 0 Abstract

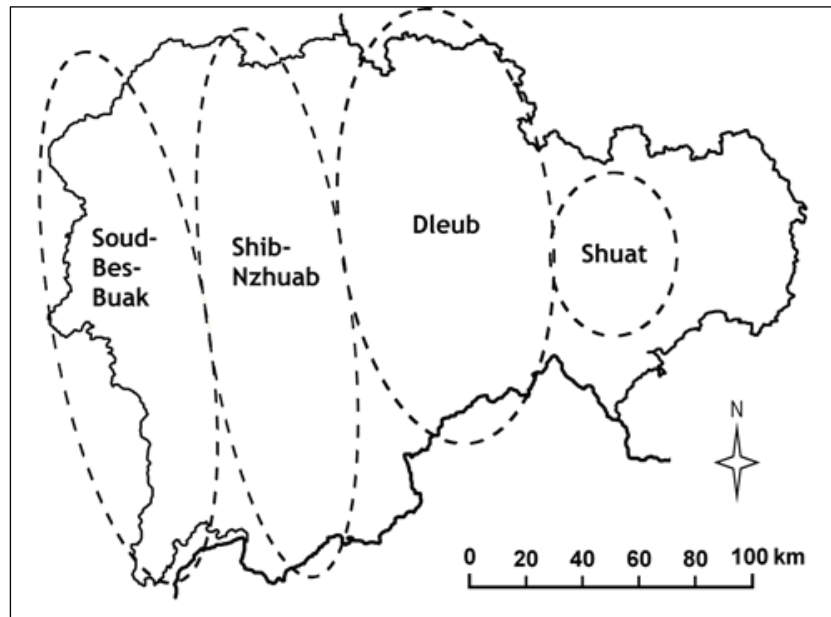
Wenshan prefecture in Yunnan, China, is home to at least nine different branches of the Hmong people, each with its own speech variety exhibiting its own particular linguistic features. While the phonological differences between the White Hmong and the Blue/Green Hmong of South East Asia are well documented, the linguistic features of the additional five or so different Hmong speech varieties found in Wenshan have not been systematically described or compared. This paper describes and compares the phonologies and diachronic developments of seven branches of Hmong who live in Wenshan, viz. *Hmongb Shib*, *Hmongb Bes*, *Hmongb Buak*, *Hmongb Soud*, *Hmongb Shuat*, *Hmongb Dleub* and *Hmongb Nzhuab*, working primarily from Wang Fushi's (1994) reconstruction of Proto-Miao. The authors tentatively suggest that these seven speech varieties can be grouped into four distinct dialect clusters based on common diachronic phonological innovations. This paper is an initial presentation of recent fieldwork data collected as part of an ongoing, Yunnan-wide investigation into Core Farwestern Hmongic, with the goal of elucidating the relationships between these under-researched Hmong varieties.

## 1 Introduction

This study presents recent data collected as part of an ongoing investigation into Core Farwestern Hmongic in south-west China. In it, the authors explore key phonological differences between seven different Hmong (Miao) dialects in Wenshan prefecture, Yunnan province. We use Wang Fushi's (1994) reconstruction of Proto-Miao as a basis for making these comparisons. We do not intend it as an attempt to reconstruct Core Farwestern Hmongic. Rather, we hope to clarify the relationship between these varieties based upon shared innovations after the Proto-Miao stage.

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<sup>1</sup> The authors are indebted to Royce Flaming and Xiong Lanping 熊兰平 for their assistance in the elicitation and transcription of the data presented in this paper. Without their help, this research would have been impossible. We are also grateful to Diana Cohen for her ongoing advice and to Cathryn Yang and Sue Hasselbring for their constructive and invaluable comments on this paper.



**Figure 1:** *Proposed Hmong dialect clusters in Wenshan prefecture*



**Figure 2:** *Location of Wenshan prefecture*

We conclude that the dialects examined in this study can be broadly divided into four distinct dialect clusters: 1. *Hmongb Shib<sup>2</sup> and Nzhuab*; 2. *Hmongb Soud, Bes, and Buak*; 3.

<sup>2</sup> In this paper, words in Miao orthography are italicised. We use the standard orthography for the Chuan-Qian-Dian dialect of Miao in China. It is used for the publication of Miao dictionaries, textbooks and other works within China. This orthography differs significantly from the Romanised Popular Alphabet (RPA) that is used outside of China. Key differences include a different set of word-final consonants to represent tone categories, a final *-n* or *-ng* to represent nasalisation (instead of the repeated vowels such as *-oo* used in RPA), and the use of Chinese

*Hmongb Dleub*; and 4. *Hmongb Shuat*. These dialect groupings are based primarily upon shared tone mergers, in addition to shared developments in the Proto-Miao bilabial stop and retroflex obstruent series of complex initials. A visual representation of our proposed groupings is given in Figure 1. We also note that there is some phonemic and phonetic variation within each dialect of Hmong in Wenshan, and that *Hmongb Nzhuab* exhibits particularly non-uniform internal diachronic development.

### 1.1 Geographical setting

Wenshan prefecture is situated in the south-eastern corner of Yunnan province, south-west China. It consists of rugged, limestone mountain terrain, ranging in elevation from 107m to 2,991m above sea level (Wang & Johnson 2008:19). Figure 2 shows its location in south-east Asia.

### 1.2 The Hmong of Wenshan.

Wenshan prefecture is home to at least nine different Hmongic groups<sup>3</sup>, all classified within China as “Miao nationality”<sup>4</sup>, with a combined population of around 432,000 (2006 figures, Wang 2008:6), second in number only to the Zhuang nationality. All of these Hmongic groups have an autonym in the form of ‘Hmong + modifier’. The modifier can refer to the location where the particular ethnic sub-group originated, to a geographical feature, to a clothing style or to a common ancestor. Each group has its own style of traditional dress, usually worn only by the women.<sup>5</sup> This paper examines the linguistic features of seven of these groups, listed in (1).

#### (1) Varieties of Wenshan Hmong considered in this paper

Autonym	English translation of autonym	Chinese exonym	English translation of Chinese exonym
<i>Hmongb Shuat</i>	Sinicised Hmong	Piān Miáo 偏苗	Lop-sided Miao
<i>Hmongb Dleub</i>	White Hmong	Bái Miáo 白苗	White Miao
<i>Hmongb Soud</i>	-	Huā Miáo 花苗	Flowery Miao
<i>Hmongb Bes</i>	-	Huā Miáo 花苗	Flowery Miao
<i>Hmongb Buak</i>	-	Huā Miáo 花苗	Flowery Miao
<i>Hmongb Shib</i>	-	Qīng Miáo 青苗	Green/Blue Miao
<i>Hmongb Nzhuab</i>	Green Hmong	Lǜ Miáo 绿苗 <i>or</i> Qīng Miáo 青苗	Green Miao <i>or</i> Green/Blue Miao

*pinyin* graphemes *j-*, *q-*, *x-* for [tɕ], [tɕʰ], [ç] (instead of RPA’s *c-*, *ch-*, *xy-*) and *z-*, *c-*, *s-* for [ts], [tsʰ], [s] (instead of RPA’s *tx-*, *txh-*, *x-*).

<sup>3</sup> Wang (2008:6-7) lists eight groups, omitting *Hmongb Ndrous*.

<sup>4</sup> The official Miao nationality 苗族 embraces many ethno-linguistic groups, most of whom speak Hmongic languages. In China, the term “Miao” does not possess the negative connotations that are associated with it in other South-East Asian countries. Of the many ethnolinguistic groups classified as Miao in China, only those who speak varieties of Core Farwestern Hmong call themselves “Hmong”; thus, “Miao” is a more widely-embracing term than “Hmong”.

<sup>5</sup> Nowadays, few women still wear the traditional dress associated with their particular branch of Hmong, although they do wear Hmong-style clothing which is distinct from that of other nationalities in China. See Castro (2009a, b) for a description of recent changes in Miao fashion in Wenshan prefecture.

The authors know of at least two other Hmong sub-groups in Wenshan: *Hmongb Lab* (“Red Hmong”) and *Hmongb Ndrous* (“Flowery Hmong”). *Hmongb Lab* live in Funing county<sup>6</sup> and no longer speak their own language.<sup>7</sup> *Hmongb Ndrous* exist in very small numbers in Wenshan county, but due to time restraints and lack of accurate information, we were unable to collect any *Hmongb Ndrous* data during the course of our research.

Figure 3 shows the approximate locations of the eight principle Hmongic groups in Wenshan. Their locations are not restricted to the areas shown on the map. Around 38% of the Hmong in Wenshan are *Hmongb Dleub*, and they can be found living in almost all areas of the prefecture (Wang 2008:6-7). A quick comparison with Figure 1 (above) reveals how our proposed dialect groupings roughly coincide with the geographical locations of each dialect. Interestingly, these groupings also correlate with their Chinese exonyms, given in (1) above.

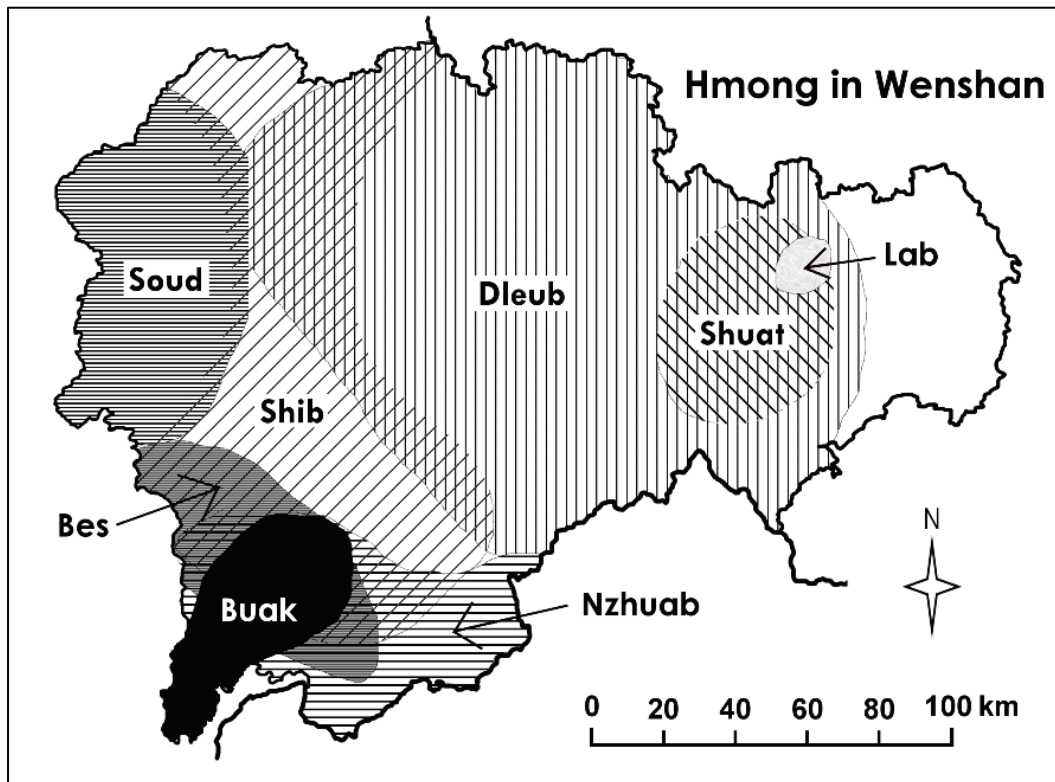


Figure 3: *Hmongic groups in Wenshan*<sup>8</sup>

<sup>6</sup> See Figure 4 for the location of the various counties within Wenshan prefecture.

<sup>7</sup> Personal communication with Miao officials in the Funing County Minority and Religious Affairs Bureau, 19 March 2009.

<sup>8</sup> Shaded areas show where the highest concentrations of each branch of Hmong are located. The map does not include *Hmongb Ndrous*, as their exact location within Wenshan county is still unclear.



### 1.3 Linguistic classification of Wenshan Hmong dialects

Chinese linguists divide Miao languages within China into three broad “dialects”, or language groups: Chuan-Qian-Dian, Qiandong and Xiangxi. Chuan-Qian-Dian<sup>9</sup> Miao, also known as Western Miao, is spoken in western Guizhou, Yunnan, Sichuan and Guangxi provinces, Qiandong Miao is spoken in eastern Guizhou province and Xiangxi Miao is spoken in western Hunan province (Wang 1983:3).

Wang (2008:170) classifies the Hmong dialects of Wenshan as part of the first “vernacular”<sup>10</sup> of the Chuan-Qian-Dian sub-dialect of the Chuan-Qian-Dian dialect of Miao. Li Yunbing, in his brief phonological study of *Hmongb Shuat* in Funing county, Wenshan prefecture, suggests that this variety is not part of the first vernacular – rather, it falls into a sub-group of its own which he calls the “fourth vernacular”. He suggests that it is closer to the third vernacular than to the first and second vernaculars (Li 1995:47).

Michael Johnson (1998:4) refers to the entire Chuan-Qian-Dian dialect cluster as “Western Hmongic”, and the first vernacular of the Chuan-Qian-Dian sub-dialect as “Core Farwestern Hmongic”. In this paper, we shall follow Johnson in using the term “Core Farwestern Hmongic” rather than “first vernacular” to refer to this dialect group in general. We refer specifically to the Core Farwestern Hmongic varieties spoken in Wenshan prefecture as “Wenshan Hmong”.

Outside of Core Farwestern Hmongic, only one other Miao variety is spoken in Yunnan province: *A Hmao*, or “Big Flowery Miao”. This is classified as a separate sub-dialect within Chuan-Qian-Dian and is spoken in Kunming and Chuxiong prefectures (Wang 1983). *A Hmao* should not be confused with *Hmongb Soud*, *Bes* and *Buak* which are collectively referred to as “Flowery Miao” by the Han Chinese in Wenshan.

Herbert Purnell (1970) was the first person to attempt a full reconstruction of Proto-Miao-Yao.<sup>11</sup> Two more reconstructions, making use of a fuller body of data, first of Proto-Miao and then of Proto-Miao-Yao were made firstly by Wang Fushi (1994) and then by Wang Fushi and Mao Zongwu (1995). Wang’s (1994) reconstruction of Proto-Miao posits 130 onsets (or “initials”) and 30 rhymes (or “finals”). Because of this large number of proto onsets, it does not seem to constitute an attempt at reconstructing a natural language. However, the reconstruction is extremely useful as a basis for comparing the phonologies of present-day Hmongic languages. Michael Johnson (2002) embarked upon a reconstruction of Proto-Far-Western Hmongic but his full reconstruction was never published.

<sup>9</sup> Chuan 川 refers to Sichuan province 四川省, Qian 黔 refers to Guizhou province 贵州省 and Dian 滇 refers to Yunnan province 云南省, thus “Chuan-Qian-Dian dialect” literally refers to the Miao dialect spoken in these three provinces.

<sup>10</sup> “Vernacular” is a translation of the Chinese term “tǔyǔ 土语” which, in this case, is used to mean “sub-sub-dialect”.

<sup>11</sup> Some scholars refer instead to “Proto-Hmong-Mien”. Practically speaking, the terms “Proto-Hmong-Mien” and “Proto-Miao-Yao” are interchangeable (as are “Proto-Hmong” and “Proto-Miao”), both referring to a reconstruction of the ancestor of all present-day Hmongic and Mienic languages. However, the authors prefer the terms “Proto-Miao-Yao” and “Proto-Miao”, because the terms “Miao” and “Yao” are more fully embracing than the terms “Hmong” and “Mien”, which are autonoms used only by a limited sub-set of Miao and Yao speaking peoples.

### 1.4 Phonology of Core Farwestern Hmongic

The variety of Core Farwestern Hmongic which has been chosen as a basis for the Standard Western Miao orthography in China is located in Dananshan, Yanzikou township, Bijie municipality, Guizhou province 贵州省毕节市燕子口镇大南山. We shall refer to this particular variety hereafter as “Standard Western Miao.”<sup>12</sup> Of the varieties included in Wang’s (1994) data for his reconstruction of Proto-Miao, Standard Western Miao is the closest to the various Hmong varieties spoken in Wenshan prefecture.

Wang (1983:16-23) provides a summary of the phonology of Standard Western Miao. Xiong and Cohen (2005:8-13) give a detailed pronunciation guide to “Chuan-Qian-Dian Miao”, based on a variety of *Hmongb Nzhuab* (or “Green Hmong”) spoken in Hekou county, Honghe prefecture, south-eastern Yunnan.<sup>13</sup> Phonological sketches of other varieties of Core Farwestern Hmongic have been made by various scholars, including Heimbach (1980:xii-xiv) and Ratliff (1992:8-13) for “Hmong Daw” (or “White Hmong”, as spoken in northern Thailand and Laos), Lyman (1979:7-10) for “Mong Njua” (or “Green Hmong”, as spoken in northern Thailand), and Mortensen (2004a) for “Mong Leng” (as spoken in northern Laos). The latter two varieties—Mong Njua and Mong Leng—are generally believed to be alternative names for the same lect (Mortensen 2004:1).

In all varieties of Core Farwestern Hmongic, syllable structure is the same: onset + rhyme + tone. The onset comprises either a single consonant (which could be prenasalised) or a consonant cluster. The rhyme comprises a single vowel, a diphthong or a nasalised vowel, sometimes realised with a final nasal closure (Heimbach 1980:xiii). Finally, the syllable takes on one of seven or eight (depending on the dialect) lexical tones. Thus the syllable structure could be described thus: C(C)V(V)T (T=tone).

#### 1.4.1 Onsets

A full list of onsets which appear in known Core Farwestern Hmong varieties is given in (2). Wang (1983:16) describes 56 onsets for Standard Western Miao (SWM). Xian Songkui, in his comprehensive dictionary of Standard Western Miao, also lists 56 onsets (Xian 2000:7). Both of these descriptions include /w/, which is only used in modern Chinese loans.

Xiong and Cohen (2005:9) list 58 onsets for *Hmongb Nzhuab*, supplementing the 56 onsets given by Wang and Xian with two more: the prenasalised lateral affricates /<sup>n</sup>tʰ/ and /<sup>m</sup>tʰ/. Both Mortensen (2004a:3) and Macken (2002:201) note the same pair of onsets in Mong Leng or “Green Hmong”.

Lyman (1979:7-8) gives 57 onsets for Mong Njua (also “Green Hmong”), omitting /w/ but adding the nasal-lateral complex initial /ml/ and the glottal stop /ʔ/. Ratliff (1992:9), quoting Jarkey (1985a), gives a total of 58 onsets for White Hmong. She omits /w/ and adds the nasal-lateral clusters /ml/ and /m̥l/, as well as the glottal stop /ʔ/.

<sup>12</sup> This variety of Miao is significantly different from White Hmong and Blue or Green Hmong as spoken outside of China, although they all belong to Core Farwestern Hmongic. The standard orthography for Chuan-Qian-Dian Miao in China is based upon Standard Western Miao.

<sup>13</sup> Our data shows that this pronunciation closely matches the pronunciation of *Hmongb Nzhuab* speakers in Maguan county.

## (2) Onsets in Core Farwestern Hmongic varieties

IPA	SWM	IPA	SWM	IPA	SWM	IPA	SWM	IPA	SWM	IPA	SWM	IPA	SWM
p	<i>b</i>	t	<i>d</i>					t̚	<i>dr</i>	k	<i>g</i>	q	<i>gh</i>
p <sup>h</sup>	<i>p</i>	t <sup>h</sup>	<i>t</i>					t <sup>h</sup>	<i>tr</i>	k <sup>h</sup>	<i>k</i>	q <sup>h</sup>	<i>kh</i>
<sup>m</sup> p	<i>nb</i>	<sup>n</sup> t	<i>nd</i>					<sup>n</sup> t̚	<i>ndr</i>	<sup>ɲ</sup> k	<i>ng</i>	<sup>n</sup> q	<i>nggh</i>
<sup>m</sup> p <sup>h</sup>	<i>np</i>	<sup>n</sup> t <sup>h</sup>	<i>nt</i>					<sup>n</sup> t <sup>h</sup>	<i>ntr</i>	<sup>ɲ</sup> k <sup>h</sup>	<i>nk</i>	<sup>n</sup> q <sup>h</sup>	<i>nkgh</i>
m	<i>m</i>	n	<i>n</i>	ɲ	<i>ny</i>					ŋ	<i>ngg</i>		
<u>m</u>	<i>hm</i>	<u>n</u>	<i>hn</i>	<u>ɲ</u>	<i>hny</i>								
f	<i>f</i>	s	<i>s</i>	ɕ	<i>x</i>	ɬ	<i>hl</i>	ʂ	<i>sh</i>			h	<i>h</i>
v	<i>v</i>			ʐ	<i>y</i>	l	<i>l</i>	ʐ	<i>r</i>			w	<i>w</i>
pl	<i>bl</i>	ts	<i>z</i>	tɕ	<i>j</i>	tɬ	<i>dl</i>	tʂ	<i>zh</i>				
p <sup>h</sup> l	<i>pl</i>	ts <sup>h</sup>	<i>c</i>	tɕ <sup>h</sup>	<i>q</i>	tɬ <sup>h</sup>	<i>tl</i>	tʂ <sup>h</sup>	<i>ch</i>				
<sup>m</sup> pl	<i>nbl</i>	<sup>n</sup> ts	<i>nz</i>	<sup>n</sup> tɕ	<i>nj</i>	<sup>n</sup> tɬ	<i>ndl</i>	<sup>n</sup> tʂ	<i>nzh</i>				
<sup>m</sup> p <sup>h</sup> l	<i>npl</i>	<sup>n</sup> ts <sup>h</sup>	<i>nc</i>	<sup>n</sup> tɕ <sup>h</sup>	<i>nq</i>	<sup>n</sup> tɬ <sup>h</sup>	<i>ntl</i>	<sup>n</sup> tʂ <sup>h</sup>	<i>nch</i>				
ml	-												
<u>ml</u>	-											ʔ	-

## 1.4.2 Rhymes

A full list of possible rhymes in Core Farwestern Hmongic, omitting rhymes which occur only in modern Chinese loan words, is given in (3). Wang (1983:18) lists 13 rhymes for Standard Western Miao, plus an extra ten that occur exclusively in modern loans from Chinese into Hmong. Xian (2000:8) also lists 13 rhymes for historically Hmong words, with a further 16 that occur in Chinese loans. The six additional rhymes may be due to a proliferation of modern Chinese loan words into Standard Western Miao in recent years.

## (3) Rhymes in Core Farwestern Hmongic

IPA	SWM	IPA	SWM	IPA	SWM
i ~ ɿ ~ ʮ <sup>14</sup>	<i>i</i>			ɰ ~ ɯ	<i>u</i>
		ĩ ~ ỹ ~ ɰ <sup>ɔ</sup>	-		
e	<i>e</i>			u ~ o ~ ɔ	<i>o</i>
eŋ ~ ẽ	<i>en</i>			oŋ ~ õ	<i>ong</i>
		a ~ ɑ	<i>a</i>		
		aŋ ~ ǣ	<i>ang</i>		
ai	<i>ai</i>			ou ~ ɔu	<i>ou</i>
aɯ ~ əɯ ~ əɰ	<i>eu</i>				
au ~ ɑu	<i>ao</i>			ua ~ ya	<i>ua</i>

<sup>14</sup> In this paper we use the symbols [ɿ] and [ʮ] to represent the unrounded alveolar apical vowel [ɿ] and the unrounded rhotacised (or retroflex) apical vowel [ʮ] respectively, following the convention of linguists in China.

Lyman (1979:9), Mortensen (2004a:3) and Ratliff (1992:10) all list only 13 rhymes in their descriptions of Hmong varieties found outside of China. Heimbach (1980:xiv) gives 14 rhymes, adding a high, central, nasalised final [ɿ̃] or [ɿ̃̃]. Lyman (1979:9) also includes the nasal final [ɿ̃<sup>n</sup>], which would appear to be the equivalent of Heimbach's [ɿ̃]. He notes that this rhyme is “an extra-systematic phoneme, only occurring in the word *hvwj* ‘terribly, awfully’.”

#### 1.4.3 Tone

Both Wang (1983) and Xian (2000) identify eight lexical tones for Standard Western Miao, distinguished by initial pitch, final pitch and contour. Breathiness is also a crucial feature of tone in many Core Farwestern Hmongic varieties, because two different tone categories sometimes have an identical pitch contour yet are distinguished from each other by the presence or absence of breathiness.<sup>15</sup> Examples of the same eight lexical tones found in *Hmongb Nzhuab*, as described by Xiong and Cohen (2005), are given in (4). The specific number of lexical tones in different varieties of Hmong varies somewhat due to tone splits and mergers. The pitch, contour and voice quality of the lexical tones also varies from dialect to dialect.

#### (4) Tones in Standard Western Miao

PM tone	PM onset	Tone category	Tone number	Tone letter (SWM)	Example			
					English	PM	SWM	IPA ( <i>Nzhuab</i> )
*A	voiceless	A1	1	-b	‘skirt’	*tin	<i>dab</i>	[ta <sup>43</sup> ]
	voiced	A2	2	-x	‘flat’	*din	<i>dax</i>	[ta <sup>31</sup> ]
*B	voiceless	B1	3	-d	‘borrow’	*qa	<i>ghed</i>	[qeɪ <sup>55</sup> ]
	voiced	B2	4	-l	‘short’	*ga	<i>ghel</i>	[qeɪ <sup>11</sup> ]
*C	voiceless	C1	5	-t	‘sleep’	*pu	<i>but</i>	[pʰ <sup>44</sup> ]
	voiced	C2	6	-s	‘shoulder’	*bu	<i>bus</i>	[pʰ <sup>24</sup> ]
*D	voiceless	D1	7	-k	‘comb’	*ɲtʂa	<i>nzhik</i>	[ntʂ <sup>33</sup> ]
	voiced	D2	8	-f	‘spicy’	*mbdza	<i>nzhif</i>	[ntʂ <sup>13</sup> ]

Wang Fushi (1994:2) proposes four Proto-Miao (PM) tones, \*A, \*B, \*C and \*D, which in most varieties of Miao then split off into eight contrastive tones depending on whether the onset of the Proto-Miao form was fully voiced or not. This voiced onset induced tone split has been proposed for numerous other languages in the same geographical region, for example Taic and Sinitic languages.<sup>16</sup>

<sup>15</sup> Furthermore, creakiness or glottal constriction is often identified as a feature of tone D2. See, for example, Heimbach (1980:xiv,xxiii), Ratliff (1992:12) and Xiong & Cohen (2005:12). In our data we have not marked creaky voice because its presence or absence often varies between speakers of the same dialect and it is never critical in distinguishing between tone categories in Wenshan Hmong.

<sup>16</sup> Li Fang-Kuei (1977) proposes this for Taic languages. Examples include White Tai (Tai Khaw), Black Tai (Tai Dam) and Shan (Hudak 2008:9,12,15). Pulleyblank (1978) and others propose this for Late Middle Chinese. See a full discussion by Michaud (2009). The Proto-Tones \*A, \*B, \*C and \*D correspond to the *píng* 平, *shǎng* 上, *qù* 去 and *rù* 入 tones in Middle Chinese,

Following convention (Ratliff 1992:22), we shall refer to the tone category series which occurs on PM \*voiceless initials as A1, B1, C1 and D1, and the series occurring on PM \*voiced initials as A2, B2, C2 and D2. Chinese linguists use the numbers 1 through 8 to refer to these tone categories. The standard orthography employs “tone letters” which are written at the end of each syllable to denote the tone category.

### **1.5 Previous research on Hmong dialect variation**

Little comparative work has been done on different varieties of Core Farwestern Hmongic. Wang Fushi’s (1994, 1995) historical reconstructions take into account only one dialect of Core Farwestern Hmongic (viz. Standard Western Miao as spoken in Guizhou). Niederer’s (1998) comprehensive corpus of data includes very few varieties of Core Farwestern Hmongic, none of which are spoken in Wenshan prefecture.

By far the greatest contribution in this area was made by Michael Johnson. In his paper, ‘Farwestern Hmongic’ (1998), he describes phonemic and phonetic features of numerous varieties of Hmong in Guizhou and Yunnan provinces. His data, however, has never been published, and his descriptions lack specific examples.

Wang (2008:170-173) describes some key phonological differences between the Hmong dialects of Wenshan, but again with few examples and no attempt at dialect grouping. Li (1995) wrote a basic phonology of one variety of *Hmongb Shuat* from Wenshan. The other Wenshan Hmong varieties have never been described in detail. Our current research partially addresses this lack of linguistic description.

## **2 Methodology**

In gathering the data for this paper, the authors visited sixteen villages in Wenshan prefecture, covering seven varieties of Hmong. Details for each data point are given in (5) and their precise locations are indicated on the map in Figure 4 below. We anticipated some variation within each of these Hmong dialects due to contact both with other languages (Wenshan prefecture is home to numerous nationalities including Zhuang, Yi, Yao, Dai and Han) and with other varieties of Hmong. Therefore we tried to collect data in at least two locations for each branch of Hmong. Because *Hmongb Dleub* comprise such a high percentage of the Hmong population within Wenshan, we visited a total of four *Hmongb Dleub* villages.

The differences in pronunciation within each branch of Wenshan Hmong proved to be minimal. Thus, in this paper, we generally present data from only one representative location for each branch of Hmong. These locations are marked by an asterisk in (5). *Hmongb Nzhuab*, however, exhibits significant internal variation, so we include data from both data points, one to the east of the *Nzhuab* area, “*East Nzhuab*”, and one to the west, “*West Nzhuab*”.

In most locations, we collected a 447-item word list. The word list included words from the Swadesh 100- and 200- word lists (Swadesh 1952), as well as the 300 words used by Michael Johnson (1998) for his research. Additional glosses were specifically chosen to elicit all of the onsets and rhymes that previous research indicated might occur.

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the former three occurring only on unchecked syllables and the latter \*D occurring only on checked syllables.

## (5) Data points for word list collection

Data point ref. #	Branch of Hmong	Location within Wenshan prefecture
01*	<i>Shuat</i> *	Yangliujing, Guangnan county 广南县杨柳井乡
02	<i>Shuat</i>	Guyang, Funing county 富宁县木央镇
03*	<i>Dleub</i> *	Zhulin, Guangnan county 广南县珠琳镇
04	<i>Dleub</i>	Badaoshao, Qiubei county 丘北县八道哨乡
05	<i>Dleub</i>	Guyang, Funing county 富宁县木央镇
06	<i>Dleub</i>	Babu, Malipo county 麻栗坡县八布乡
07*	<i>Soud</i> *	Nijiao, Qiubei county 丘北县腻脚乡
08	<i>Soud</i>	Pingyuan, Yanshan county 砚山县平远镇
09*	<i>Bes</i> *	Jiahanqing, Maguan county 马关县夹寒箐镇
10	<i>Bes</i>	Bazhai, Maguan county 马关县八寨镇
11*	<i>Buak</i> *	Gulinqing, Maguan county 马关县古林箐乡
12	<i>Buak</i>	Gumu, Wenshan county 文山县古木镇
13*	<i>Shib</i> *	Xingjie, Xichou county 西畴县西畴县兴街镇
14	<i>Shib</i>	Zhuilijie, Wenshan county 文山县追栗街镇
15*	<i>Nzhuab</i> * ( <i>E Nzhuab</i> )	Babu, Malipo county 麻栗坡县八布乡
16*	<i>Nzhuab</i> * ( <i>W Nzhuab</i> )	Jiahanqing, Maguan county 马关县夹寒箐镇

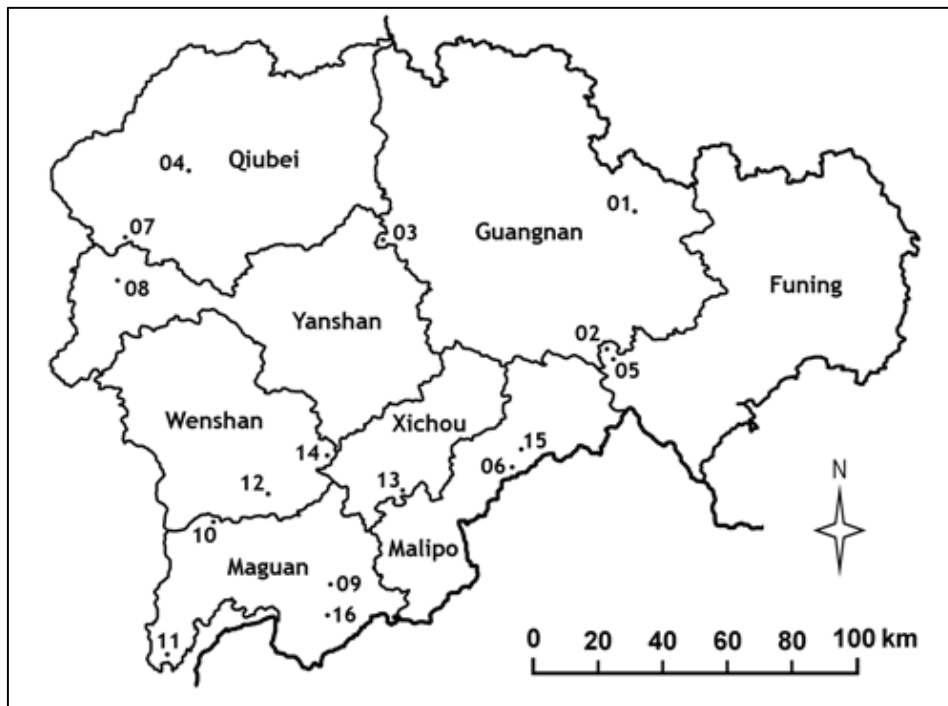


Figure 4: Location of data points in Wenshan prefecture

In each village we worked with a group of three speakers of the language who were recommended by the village leaders. These speakers were mostly between 40 and 60 years of age. One of them was selected on the basis of clarity of speech and “standardness” of

language.<sup>17</sup> While all three speakers would work together to select the correct lexical item, only the voice of the selected speaker was used when transcribing and recording the items. We transcribed the word lists phonetically using IPA. At each data point, the first 24 words elicited provided an overview of the tonal system – three words for each of the eight tone categories in Standard Western Miao. Words in the rest of the word list were then regularly compared with these 24 words to ensure that the tones were transcribed accurately.

We did not collect a full word list from data point #10. This is because upon arrival, we discovered that although it was originally a *Hmongb Bes* village, other varieties of Hmong had moved in over recent decades, resulting in only one or two residents who could still speak anything resembling *Hmongb Bes*.

### 3 Phonological innovations

We now present and discuss data illustrating the phonological differences between the various dialects of Wenshan Hmong. The data tables referred to in this section are contained in Appendix A. In the tables, we generally only give the cognate forms of the target Proto-Miao words, omitting non-cognate elements of words which are multisyllabic in modern Hmong. Any non-cognate forms are shown in italics.

Throughout this paper, tones are transcribed using Chao's (1930) pitch scale of 1 to 5, with 5 indicating highest pitch and 1 indicating lowest pitch. The same pitch number repeated indicates a level tone and different pitch numbers in succession indicate rising or falling contour. Transcription is narrow and includes some redundant phonetic information, such as [ɿ] and [ɿ̃], which are allophones of /i/ in most varieties, or [c] which is an allophone of /k/ in most varieties.<sup>18</sup>

#### 3.1 Comparison of tones

Tables 1 and 2 present words in Wenshan Hmong which bear each of the eight Proto-Miao tone categories. We have chosen words in which most or all of the elicited forms are cognates. For each tone category, we have selected at least three examples that show the consistency within each dialect of the realisation of that Proto-Miao tone category. The double lines delineate the words which fall into the same modern tone category in each variety. Some words now bear a different tone category from Proto-Miao. In the tables, words are arranged in an order which most effectively highlights changes in tone category. Thus, where a change in tone category occurs, it is usually clearly marked by the delineation of the double lines. Occasionally, it was impossible to put all the examples with a change in tone category next to each other. In these cases, the words are shown enclosed in parentheses.

A summary of the phonetic realisations of PM tones in Wenshan Hmong dialects is given in (6). Tone mergers, indicated by the shaded boxes, have clearly occurred in all varieties other than *Shuat* and *West Nzhuab*. We shall consider these tone mergers in turn. Firstly, however, note that we do not posit a merger of B1 and C1, despite the fact that Table 1 shows several Proto-Miao \*B1 words moving into tone category C1 in various Wenshan Hmong varieties. This is because we do not have enough examples to posit a

<sup>17</sup> We always asked local bystanders which speaker they felt spoke in a way that was most characteristic of their particular variety of Hmong.

<sup>18</sup> As we are not native speakers of these languages, our data inevitably contains errors in both phonetic perception and transcription. The authors hope to publish the full data set electronically and we welcome corrections to our data.

regular, conditioned tone merger. The vast majority of tone B1 words in all varieties retain the same tone category as in Proto-Miao.

(6) Phonetic realisation of PM tones in Wenshan Hmong varieties

Tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
A1	55	53	43	43	32	54	55	54
A2	41	42	41	31	31	42	42	42
B1	53	34	55	55	55	35	35	35
C1	44	44	44	24	44	44	44	44
D1	33	33	33	33	33	33	33	33
B2	ᵛᵛ		ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ
C2	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ	ᵛᵛ
D2	21	21	212	212	213	21	21	22

3.1.1 Hmongb Soud, Bes and Buak tone mergers

The data in Table 2 show that *Soud* and *Bes* share a partial merger of \*C2 and \*D2. The table includes all the examples of this merger that we could find. Although instances of this merger are not numerous, they are significant because tones C2 and D2 both occur relatively infrequently in modern Hmong varieties.<sup>19</sup> It is clear that the same words in both *Soud* and *Bes* undergo this change. Thus we indicate this partial tone merger in (6) above. Because C2 and D2 occur so infrequently, we do not have enough examples in our data to posit the conditioning environment(s) that influenced this tone merger.

Furthermore, *Buak* exhibits a ninth tone: identical in pitch to D1 but breathy, like C2.<sup>20</sup> Words bearing this ninth tone have developed on a subset of words from Proto-Miao tone categories \*C2 and \*D2. The set of words given in (7) confirm that this tone is distinct from tones C2, D1 and D2.

(7) Minimal pairs confirming ninth tone category in *Hmongb Buak*

English	SWM tone (PM tone category)	<i>Buak</i>
‘to see’	-f(*D2)	po <sup>33</sup> (Tone 9)
‘grandmother’	-s(*C2)	po <sup>22</sup>
‘to cover’	-k(*D1)	po <sup>33</sup>
‘matter’	-f(*D2)	noŋ <sup>213</sup>

<sup>19</sup> In our data corpus, only 9.4% of words bear tone C2 and 4.3% of words bear tone D2. By way of comparison, 24.4% bear tone A1, 17.0% bear tone B1 and 16.5% bear tone C1.

<sup>20</sup> Johnson (1998:25) also notes the development of a ninth lexical tone for Black Hmong varieties (known variously as *Hmongb Dlob* or *Hmongb Buak*) in Jinping county (in Honghe prefecture, about 100km west of Maguan county), as well as some varieties of Hmong further north in Sichuan and Guizhou provinces, but he does not give specific examples.



Strikingly, the same words that move from \*D2 to C2 in *Soud* and *Bes* are a subset of the words that form *Buak*'s later innovation of a ninth tone category. Words bearing the ninth tone comprise these \*D2 words that moved to C2 in *Soud* and *Bes*, plus some additional Proto-Miao \*C2 words. We therefore posit that the partial merger of \*D2 and \*C2 was shared by *Soud*, *Bes* and *Buak*, and that the development of *Buak*'s additional tone category is a later innovation. (8) below illustrates this hypothesis. *Buak*'s additional category is likely related to the earlier \*D2/\*C2 merger, as all the words that take part in that merger are also part of *Buak*'s new tone.

(8) Possible development of ninth tone in *Hmongb Buak*

Time 1 Proto-Miao	Time 2 Proto- <i>Soud-Bes-Buak</i>	Time 3 <i>Buak</i>
*D2	212	212
*C2	2̣̣̣	3̣̣̣
		2̣̣̣

The common \*C2/\*D2 tone merger in *Soud*, *Bes* and *Buak* is evidence for grouping these three speech varieties into the same dialect cluster.

3.1.2 *Hmongb Shib and Nzhuab tone merger*

A comparison of Tables 1 and 2 reveals mergers in *Shib* and *East Nzhuab*. Tone B2, usually a low level breathy tone, has become higher in pitch and merged with C2, a mid-level breathy tone. Examples are given in (9) below. Thus *Shib* and *East Nzhuab* have a reduced total of only seven lexical tones, in common with varieties of Green Hmong documented elsewhere (Johnson 1998:31, Lyman 1979:10, Mortensen 2004a:4, 2004b:3.3).<sup>21</sup> This shared \*B2/\*C2 tone merger is important evidence for grouping *Shib* and *East Nzhuab* together in a dialect cluster.

(9) Minimal pairs showing tone merger in *Hmongb Shib* and *East Nzhuab*

English	PM	Tone <sup>22</sup>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
'fire'	*deu	B2	tə̃ <sup>33</sup>	tə̃ <sup>33</sup>	tə̃ <sup>22</sup>
'to explode'	*deu	C2	tə̃ <sup>33</sup>	tə̃ <sup>33</sup>	tə̃ <sup>33</sup>
'how?'	-	B2	tɕaŋ <sup>33</sup>	tɕaŋ <sup>33</sup>	tɕaŋ <sup>22</sup>
'root'	*dzoŋ	C2	tɕaŋ <sup>33</sup>	tɕaŋ <sup>33</sup>	tɕaŋ <sup>33</sup>

Interestingly, *West Nzhuab* retains all eight tone categories. This phenomenon is also observed by Xiong and Cohen (2005:11-12) in *Hmongb Nzhuab* in Hekou county, to the west of Maguan where we gathered our *West Nzhuab* data, and by Johnson (1998:32) in *Hmongb Lens* (another "Green Hmong" group) in NW Vietnam.

3.1.3 *Hmongb Dleub tone merger*

<sup>21</sup> *Hmongb Nzhuab* data recently collected in northern Thailand also exhibits this B2/C2 tone merger.

<sup>22</sup> Tones given here are modern Wenshan Hmong tone categories.

In *Dleub*, Proto-Miao tones \*B2 and \*D1 have merged and now have the same phonetic realisation. B2, usually a mid-level breathy tone, has lost its breathiness and merged with D1, a mid-level non-breathy tone. Examples are given in (10) below. As with *Shib* and *East Nzhuab*, this merger results in a total of seven lexical tones. This appears to be common to all varieties of White Hmong (Ratliff 1992:11, Mortensen 2004b:3.3).

(10) Minimal pairs showing tone merger in *Hmongb Dleub*

English	PM	Tone	<i>Dleub</i>	<i>Soud</i>	<i>Shib</i>
‘thorn’	*bo	B2	pau <sup>33</sup>	po <sup>21</sup>	po <sup>33</sup>
‘to cover’	-	D1	pau <sup>33</sup>	po <sup>33</sup>	po <sup>33</sup>
‘fire’	*deu	B2	təu <sup>33</sup>	təu <sup>21</sup>	təu <sup>33</sup>
‘to light’	*teu	D1	təu <sup>33</sup>	təu <sup>33</sup>	təu <sup>33</sup>

### 3.1.4 Summary of tonal differences

The tonal systems of Wenshan Hmong varieties are summarised in (11). Tone mergers are shaded in grey. *Soud*, *Bes* and *Buak* clearly fall into a distinct group of their own. They all share a partial merger of \*C2 and \*D2. In *Buak*, a new phonemic tone has developed, embracing some words which were originally \*C2 and some which were originally \*D2. Furthermore, in *Soud*, *Bes* and *Buak*, tone A1, the high level tone in other varieties, is mid-falling, and B1 is high level. This results in *Soud*, *Bes* and *Buak* sounding very different from the other Wenshan Hmong dialects, made more prominent by the fact that A1 is the most commonly occurring tone category in Core Farwestern Hmongic, accounting for 24.4% of all words in our data.

*Shib* and *East Nzhuab* have both undergone a \*B2/\*C2 merger, and *Dleub* has undergone a \*B2/\*D1 merger. *Shuat* and *West Nzhuab* have retained the Proto-Miao tone categories most faithfully. If we were to take only the tonal systems into account, we would logically group these two varieties together in the same dialect cluster. However, key phonological differences described in the next section indicate that *West Nzhuab* is far closer to the other Wenshan Hmong varieties than it is to *Shuat*. In terms of tone system, *West Nzhuab* is the most conservative speech variety among the non-*Shuat* dialects.

(11) Descriptive summary of Wenshan Hmong tonal systems

Tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
A1	High level	High falling	Mid level-falling <sup>23</sup>			High level <sup>24</sup>		
A2	Mid, sharp falling							
B1	High falling	Rising	High level			Rising		
C1	Mid-high level			Mid rising	Mid-high level			
D1	Mid level	Mid level	Mid level			Mid level		
B2	Low level		Low falling			Mid level	Low level	
C2	Mid level	Low level	Low level	Low level	Mid level		Mid level	
D2	Low falling			Low falling-rising <sup>25</sup>			Low falling	

3.2 Comparison of onsets

The Hmong varieties of Wenshan have a large number of onsets and we do not have space in this paper to examine all of them. We concentrate only on those onsets which are particularly innovative. In the data tables, divisions between onsets and rhymes that are being discussed in this and the following sections are indicated by double lines. Words which do not exhibit the expected onset or rhyme are enclosed in parentheses.

<sup>23</sup> This is essentially a mid level tone with a slight fall in pitch at the end. It contrasts very clearly with A2 which is consistently realised as a sharp, falling tone (sometimes culminating in a glottal stop) in all dialects.

<sup>24</sup> Although we have transcribed tone A1 as 54 in our *Shib* and *West Nzhuab* data, it is essentially a high level tone with a very slight fall in pitch at the end.

<sup>25</sup> In the Romanised Popular Alphabet used by overseas Hmong communities, D2 is represented by two letters: *-m* and *-d*. The former is realised as a low, falling contour, and the latter is a syntactical variant of the same tone, realised as a low, falling-rising contour. Ratliff (1992:112ff) describes this phenomenon in detail. Mortensen (2004a:4) notes the same feature in Mong Leng. Unfortunately, the word list collected by the authors was not specifically designed to reveal such features of tonal morphology. Thus we are not able to ascertain whether there are two phonetic realisations of D2 in all varieties of Wenshan Hmong. In single syllable words, D2 is realised more regularly as a falling-rising contour in *Soud*, *Bes* and *Buak*, thus we have consistently transcribed it as 212 or 213 in this data. This does not mean, however, that D2 is never realised as 212 or 213 in the other varieties, nor does it mean that it is never realised as 21 in *Soud*, *Bes* and *Buak*. A detailed analysis of tone sandhi in Wenshan Hmong varieties is beyond the scope of this paper.

### 3.2.1 Palatalised obstruents in Hmongb Shuat

*Shuat* is the only Wenshan Hmong variety which possesses a series of palatalised obstruents: /fʰ/, /vʲ/, /pʲ/, /pʰʲ/ and /mpʲ/. These complement the palatalised nasal onsets /mʲ/ and /ŋʲ/ discussed in section 3.2.2 below.

Table 3 presents data illustrating the correspondences between Proto-Miao and modern Wenshan Hmong labio-dental and retroflex or postalveolar fricatives. These correspondences are summarised in (12). In general it appears that PM \*fɿ-, \*ɿ- → /s/ in all varieties except *Shuat*, which has preserved the contrast between these two Proto-Miao initials, viz. \*fɿ- → /fʰ/, \*ɿ- → /s/. In the case of *shit* ‘play’, which was not reconstructed by Wang (1994) but which indicates a PM \*fɿ- initial, the [fʰ] onset appears to have been conditioned by the front, high vowel final, losing its palatalisation.

#### (12) Correspondences between PM and modern labio-dental and retroflex fricatives

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
ʔ	f	f	f	f	f	f	f	f
*fɿ-	fʰ (f)	ʃ	ʂ	ʃ	ʃ	ʂ	ʂ	ʂ
*ɿ-	ʃ							
*ʔv-, *v-	v	v	v	v	v	v	v	v
*ʔvɿ-, *vɿ-	v, vʲ	ʒ	ʐ	ʒ	ʒ	ʐ	ʐ	ʐ

The initial /f/ occurs in all varieties of Wenshan Hmong, but the Proto-Miao form for this onset was not reconstructed by Wang (1994) or Wang & Mao (1995).<sup>26</sup> However, /f/ and /fʰ/ are contrastive in *Shuat*, demonstrated by the minimal pair ‘to divide’ [fei<sup>55</sup>] and \*fɿsin<sup>A</sup> ‘liver’ [fʰei<sup>55</sup>].

In most varieties of Wenshan Hmong, PM \*ʔvɿ-, \*vɿ- → /z/. In *Shuat*, PM \*ʔvɿ-, \*vɿ- → [vʲ], with the exception of two words: \*vɿza<sup>B</sup> ‘urine’ → [vɿ<sup>22</sup>] and \*ʔvɿzæ<sup>A</sup> ‘stone’ → [ve<sup>55</sup>]. In the former case, it seems that /vʲ/ has been retained but has been conditioned by the final /i/ (= [ɿ]), resulting in a loss of palatalisation and the peculiar voiced fricative syllabic final.<sup>27</sup> In the latter case, \*ʔvɿzæ<sup>A</sup> ‘stone’ → [ve<sup>55</sup>], there is no obvious explanation for the lack of palatalisation on the initial [v], seeing as the word \*ʔvɿzæ<sup>C</sup> ‘near’, whose Proto-Miao form differs only in tone, has become [vʲe<sup>44</sup>] with the expected palatalised onset. As with their voiceless counterparts, /v/ and /vʲ/ are contrastive in *Shuat*, demonstrated by the minimal pair \*veŋ<sup>A</sup> ‘garden’ [vaŋ<sup>41</sup>] and \*vzɔŋ<sup>A</sup> ‘dragon’ [vʲaŋ<sup>41</sup>].

In a similar way to the fricative onsets, palatalisation also occurs on bilabial stop onsets in *Shuat*, thus preserving the distinction between the PM forms \*pts-, \*ptɿ-, \*phtɿh-, \*mptɿ-, \*mbdz- and the PM forms \*tɿ-, \*dz-, \*tɿh-, \*ŋtɿ-, \*ŋdz-, which have merged in other Wenshan Hmong varieties. Tables 4-6 present data evidencing this development and the correspondences are summarised in (13).

<sup>26</sup> The reflex of Wang’s PM \*f- is /h/ in modern Wenshan Hmong varieties, for example \*foi<sup>B</sup> ‘head’ → [hɔu<sup>44</sup>] (*Dleub*), [hɔu<sup>44</sup>] (*Shuat*), etc. The PM form for the modern /f/ onset is therefore unclear.

<sup>27</sup> Examples of similar conditioning can be found in the words \*ptɿsa<sup>A</sup> ‘five’ → [pɿ<sup>55</sup>] and \*mbdzɿ<sup>D</sup> ‘peppery’ → [mpɿ<sup>22</sup>] (see Tables 4 and 6).

## (13) Correspondences between PM and modern bilabial stop and retroflex affricates

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
*p-, *b-	p	p	p	p	p	p	p	p
*pts- / e_, o_	p <sup>j</sup> , p							
*ptɕ-	tɕ	tɕ	tɕ	tɕ	tɕ	tɕ	tɕ	tɕ
*tɕ-, *dz-		tɕ						
*pts- / i_, a_, ai_	ts	ts	ts	ts	ts	ts	ts	ts
*ts-, *dz-								
*ph-	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>
*phtɕh-	p <sup>jh</sup>	tɕ <sup>h</sup>	tɕ <sup>h</sup>	tɕ <sup>h</sup>	tɕ <sup>h</sup>	tɕ <sup>h</sup>	tɕ <sup>h</sup>	tɕ <sup>h</sup>
*tɕh-	tɕ <sup>h</sup>							
*mp-, *mb-	mp	mp	mp	mp	mp	mp	mp	mp
*mpts-	mp <sup>j</sup>							
*mptɕ-, *mbdz-	mp	ntɕ	ntɕ	ntɕ	ntɕ	ntɕ	ntɕ	ntɕ
*ntɕ-, *ndz-	ntɕ							

The diachronic developments which have resulted in the palatalised stop series in *Shuat* can be expressed in the following way:

- PM \*ptɕ- → /p<sup>j</sup>/, /p/; PM \*tɕ-, \*dz- → /tɕ/ (*Shuat*); PM \*ptɕ-, \*tɕ-, \*dz- → /tɕ/ (all other varieties)
- PM \*phtɕh- → /p<sup>jh</sup>/; PM \*tɕh- → /tɕ<sup>h</sup>/ (*Shuat*); PM \*phtɕh-, \*tɕh- → /tɕ<sup>h</sup>/ (all other varieties)
- PM \*mptɕ-, \*mbdz- → /mp<sup>j</sup>/, /mp/; PM \*ntɕ-, \*ndz- → /ntɕ/ (*Shuat*); PM \*mptɕ-, \*mbdz-, \*ntɕ-, \*ndz- → /ntɕ/ (all other varieties)
- PM \*ts-, \*dz- → /ts/ (all varieties); PM \*pts- → /p/ / \_e, o (all varieties except for *Shuat*, see below); \*pts- → /ts/ / elsewhere, merging with \*ts-, \*dz- (all varieties, as noted for Standard Western Miao by Wang 1994:11).

There are no examples of the prenasalised, aspirated affricate /mp<sup>jh</sup>/ in our word list. PM onsets \*pts- and \*mpts- are sometimes realised as /p<sup>j</sup>/ and /mp<sup>j</sup>/ respectively in *Shuat* although there is no clear regularity in this. For example, \*ptsæ<sup>A</sup> ‘three’ → [p<sup>j</sup>e<sup>55</sup>] and \*mptsæ<sup>C</sup> ‘name’ → [mp<sup>j</sup>e<sup>44</sup>]. On the other hand, \*ptsæ<sup>A</sup> ‘we’ → [pe<sup>55</sup>] and \*mptson<sup>C</sup> ‘snow’ → [mpo<sup>44</sup>].

Johnson (2002:39) presents data showing a similar development of palatalised obstruents in other varieties of Core Farwestern Hmongic. He posits Proto-Far-Western Hmongic PFW onsets \*tɕ-, \*p- and \*p<sup>j</sup>- and a merger of \*tɕ- and \*p<sup>j</sup>- in Hmong Daw (*Hmongb Dleub*) and Mong Ntsua (*Hmongb Nzhuab*). He also proposes partial mergers of

PFW \*p- and \*pj- in “Han Miao” (or “Sinicised Miao”) dialects, including *Hmongb Shuat* (Johnson 2002:43-45).<sup>28</sup>

These phonological developments indicate that despite the tonal similarity between *West Nzhuab* and *Shuat*, they cannot be grouped together in the same dialect cluster. Rather, *West Nzhuab* must be grouped with the other Wenshan Hmong varieties due to their common merger of PM \*pt̚s- and PM \*t̚s-, \*dz̚-. The tonal developments discussed in 3.1 (above) presumably occurred in selected western Wenshan Hmong varieties after this merger. *West Nzhuab*’s geographical distance from *Shuat* adds weight to this hypothesis.

### 3.2.2 Nasal onsets

Tables 7-9 present data illustrating reflexes of PM \*nasal onsets in Wenshan Hmong varieties. A summary of the onset correspondences is given in (14).

Voiced and voiceless nasals have merged in *Shib* and *East Nzhuab*: PM \*ʔm-, \*m-, \*m̥-, \*m̥s- → /m/; PM \*ʔn-, \*n-, \*mn-, \*ʔŋ-, \*ŋ-, \*mz̚-, \*ŋ̥-, \*m̥ŋ̥- → /n/; PM \*ʔŋ-, \*ŋ-, \*ŋ̥-, → /ŋ/. *West Nzhuab*, along with all other varieties of Wenshan Hmong, has preserved voiceless nasals.

In most varieties, PM \*mz̚- → /n/, merging with PM \*ʔn-, \*n-, \*mn-, \*ʔŋ-, \*ŋ-. However, PM \*mz̚- is preserved in the form of /m̥<sup>j</sup>/ in *Shuat* and /mn̄/ in *Dleub*. The latter onset, /mn̄/, exists only in the word \*mz̥ŋ̥<sup>c</sup> ‘to listen’. It is equivalent to /ml/ which Ratliff (1992) includes in her phonology of White Hmong. There are no examples of a voiceless equivalent in our data.<sup>29</sup>

*Shuat* has the voiceless palatalised bilabial nasal /m̥<sup>j</sup>/, which appears to be a reflex of an onset not reconstructed by Wang (1994) or Wang & Mao (1995), as neither of them include the vocabulary item *hmangt* ‘wolf’ [m̥<sup>j</sup>an̄<sup>44</sup>] (*Shuat*) in their data sets. One would assume that this Proto-Miao initial is the voiceless equivalent of \*mz̚-, which is realised as /m̥<sup>j</sup>/ in *Shuat* (see Table 8). Oddly, though, PM \*m̥s- → /m̥/ in *Shuat*, not the expected /m̥<sup>j</sup>/, and a Proto-Miao onset \*m̥z̚- seems unlikely.

In terms of nasal onsets, *Shuat* is the most conservative, preserving the most number of distinctions between Proto-Miao initials, followed by *Dleub*. *Shib* and *East Nzhuab* are the most innovative, with the loss of all voiceless nasals — further evidence for grouping *Shib* and *East Nzhuab* together.

<sup>28</sup> Johnson (2002:43-45) includes data from a location he labels “Babao” which exhibits the same palatalised obstruent series as our *Hmongb Shuat* data. Although he does not specify the location of this lect, his appellation suggests that the data was gathered from a *Hmongb Shuat* area in Babao township, Guangnan county, Wenshan prefecture, slightly south of our data point #01.

<sup>29</sup> Heimbach’s (1980) dictionary of White Hmong (*Hmongb Dleub*) includes only two examples of /hml/, the onomatopoeias *hmlos* ‘to dent, smash in’ and *hmlos hmlent* ‘to dent’.

(14) Correspondences between PM and modern nasal onsets

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
*ʔm-, *m-	m	m	m	m	m			m
- ( <i>hmangt</i> 'wolf')	m <sup>j</sup>	m̥	–	–	m̥	m	m	–
*m̥-, *m̥s-	m̥		m̥	m̥				m̥
*ʔn-, *n-, *mn-, *ʔn̥-, *n̥-	n	n	n	n	n	n	n	n
*mz-	m <sup>j</sup>	m̥n̄						
*n̥-, *m̥n̥-	n̥	n̥	n̥	n̥	n̥			n̥
*ʔn̥-, *n̥-	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ
*n̥-	ɲ̥	ɲ̥	ɲ̥	ɲ̥	ɲ̥			ɲ̥
*ɲ-	ɲ	ɲ	NB	ɲ	ɲ	N	N	ɲ

3.2.3 Lateral affricates and velar stops

The development of the lateral affricate series in Wenshan Hmong is illustrated by data given in Tables 10 and 11, and the related correspondences are shown in (15).

(15) Correspondences between PM and modern lateral affricate /tʃ/ series

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
*ql-, *Gl-, *q̥l-	ʔl	ʔd	tʃ	tʃ	ʔl	tʃ	tʃ	ʔd
*qlw-, *Glw-					k, c			
*c-, *j-, *k-	k, c	k, c	k, c	k, c		k, c	k, c	k
-	ʔl̥	ʔt <sup>h</sup>	tʃ <sup>h</sup>	tʃ <sup>h</sup>	ʔt <sup>h</sup>	tʃ <sup>h</sup>	tʃ <sup>h</sup>	ʔt <sup>h</sup>
*Nql-, *Ngl-	nt, mpl?		nt, n̥t̥	nt̥		nt̥	nt̥	nt, n̥t̥
*Nglw-, *nt-	nt	nt	nt	nt	nt	nt	nt	nt

The /tʃ/ onset is found in all varieties although it has differing phonetic realisations: [tʃ] in *Soud*, *Bes*, *Shib* and *East Nzhuab*; [ʔd] in *Dleub* and *West Nzhuab*; and [ʔl] in *Shuat* and *Buak*. In most dialects, \*Glw, \*qlw → /tʃ/, merging with \*ql, \*Gl and \*q̥l. However, in

*Buak*, \*glw, \*qlw → /k/<sup>30</sup>, merging with \*c, \*j, \*k, \*g. For example, \*ka<sup>B</sup> ‘soup’ (which now bears tone C1 in most varieties) and \*qlwau<sup>C</sup> ‘to pass’ are both pronounced [kua<sup>44</sup>] in *Buak*. In other Wenshan Hmong varieties, \*qlwau<sup>C</sup> ‘to pass’ is pronounced the same as \*q[au<sup>C</sup> ‘to tear’, viz. [tʰua<sup>44</sup>] or the equivalent. This unique development of \*glw and \*qlw sets *Buak* apart from all other varieties of Wenshan Hmong. Although *Buak*’s tonal system suggests it can be broadly grouped with *Soud* and *Bes*, its velar stop series has undergone slightly different diachronic development from both of them.

The same unique lateral affricate/velar stop development in *Buak* is not evident in the prenasalised equivalents of these onset series. Data in Table 11 show that in all varieties, \*Nglw → /nt/, merging with \*nt. In *Buak* and *Dleub*, \*Ngl, \*Nql also merge with \*nt. For *Shuat*, *Soud* and *West Nzhuab*, we have two examples of \*Nql, \*Ngl → /nt/, \*Nglu<sup>B</sup> ‘to flow’ and \*Nqlæn<sup>B</sup> ‘shallow’. However, the word \*Nglou<sup>C</sup> ‘ragged’ exhibits unexpected initials in these lects: /mpl/ in *Shuat*; and /ɲt/ in *Soud* and *West Nzhuab*. It is possible that these are not cognates, although a shared rhyme and tone category indicate otherwise. *Shib*, *East Nzhuab* and *Bes* are the only dialects in which \*Nql, \*Ngl, \*Nglw → /ntʰ/. None of the other varieties have a /ntʰ/ onset.

Neither Wang (1994) nor Wang & Mao (1995) reconstruct the aspirated equivalents of the lateral affricate onsets /tʰ/ and /ntʰ/. In the data we collected, we have two instances of /tʰʰ/, *tlout* ‘to pass’ (not a cognate of \*qlwau<sup>C</sup> ‘to pass’ mentioned earlier) and *tlat* ‘to jump’, and no instances of /ntʰʰ/<sup>31</sup>.

### 3.2.4 Retroflex stop and affricate onsets

Table 12 presents data illustrating modern Wenshan Hmong reflexes of Proto-Miao retroflex stops and affricates, and a summary of these correspondences is given in (16).

(16) Correspondences between PM and modern retroflex obstruents

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
*d-, *t̥-, *d̥l-	tʃ	t	t̥ <sup>32</sup>	t̥	tʃ	tʃ	tʃ	t
*tʃ-, *dz-		tʃ	tʃ	tʃ				tʃ
*tʰ-	tʃʰ	tʰ	t̥ <sup>h</sup>	t̥ <sup>h</sup>	tʃʰ	tʃʰ	tʃʰ	tʰ
*tʃʰ-		tʃʰ	tʃʰ	tʃʰ				tʃʰ

*Shuat*, *Buak*, *Shib* and *East Nzhuab* have undergone a merger of PM \*d-, \*t̥-, \*d̥l- with \*tʃ-, \*dz-, resulting in the loss of the retroflex stop /t/ series. For example, \*deu<sup>C</sup>

<sup>30</sup> In most varieties, /k/ is realised as either [c] or [k], [c] occurring only before high, front vowels. The word \*keŋ<sup>A</sup> ‘insect’ [caŋ<sup>55</sup>] (*Shuat*), realised with an initial [c] in several dialects, is a notable exception.

<sup>31</sup> Xiong and Cohen (2005:312) indicate that /ntʰʰ/ does occur in *West Nzhuab*, in the rare words *ntlaok* ‘to put a ring or hoop around something to hold it together’ and *ntlix ntluaux* (onomatopoeia) ‘the sound one’s boots make when walking through mud’.

<sup>32</sup> In many dialects of Core Farwestern Hmong, the retroflex stop is articulated with a slight amount of audible, often voiced, air friction after release and before vocalisation of the rhyme. We have represented this with the [ɽ] or [ɽ̥] symbol. Jarkey (1985a, in Ratliff 1992:9) represents this with the voiceless coronal trill symbol [ɽ̥]. To the authors of this paper, though, the extra friction sounded more like a briefly articulated retroflex approximant or flap. The precise pronunciation of the /t/ series varies from speaker to speaker.



‘chopsticks’ and \*dʒeu<sup>C</sup> ‘few’ are both pronounced as [tʂəu̯<sup>33</sup>] or equivalent in these dialects, whereas ‘chopsticks’ is pronounced with an initial retroflex stop, viz. [tʂəu̯<sup>33</sup>] or equivalent, in *Dleub*, *Soud*, *Bes* and *West Nzhuab*. *Shuat*’s loss of the retroflex stop series is balanced by the gain of a palatalised stop series, resulting in a similar number of overall onsets as other Wenshan Hmong varieties.

We notice, then, that *East Nzhuab* has undergone the same series of simplifying innovations as *Shib*—merging of tones \*B2 and \*C2, merging of voiced and voiceless nasals, merging of retroflex stops and affricates—whereas none of these have occurred in *West Nzhuab*.

As with *West Nzhuab*, the varieties of Green Hmong described by Lyman (1979) and Mortensen (2004a) retain the phonemic distinction between the retroflex stop series and the retroflex affricate series. In the latter variety, however, “retroflex stops” are realised as retroflex affricates, and “retroflex affricates” are realised as postalveolar affricates. Mortensen (2004a:2) goes on to comment: “The retroflex affricates of Mong Leng correspond to retroflex plosives in Hmong Daw. For many speakers, the retroflex affricates have merged with the postalveolar affricates.” That the merging of these two onset series should occur for speakers of the same “dialect” indicates that this innovation should not be used as a deciding factor in determining dialect boundaries.

### 3.3 Comparison of rhymes

Considerable variation in the realisation of PM rhymes in our data makes it difficult to pick out defining contrastive features. We therefore only highlight the few innovations that seem consistent across the data. In most cases, one or two exceptions to the patterns described here can be found in our data.

#### 3.3.1 /au/, /o/ and /oŋ/ rhymes

The development of the /au/, /o/ and /oŋ/ rhymes in Wenshan Hmong is illustrated by data given in Table 13 and summarised in (17).

(17) Correspondences between PM and modern /au/, /o/ and /oŋ/ rhymes

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
*au, *ɔn, *ɔŋ	au	au	au	au	au	au	ɑ	au
*o								
*on	o	o	o	u	o	o	o	u
*ən		oŋ̄m						
*uŋ, *əŋ	oŋ	oŋ̄m	oŋ	oŋ	oŋ	oŋ	oŋ̄m	oŋ

*Shuat* and *Dleub* both show a development of /au/ and /o/ that is slightly different from the other varieties. In all varieties, PM \*au, \*ɔn, \*ɔŋ → /au/ and PM \*on → /o/. In *Shuat* and *Dleub*, PM \*o has merged with the former whereas in other varieties it has merged with the latter. For example, \*vzɔn<sup>B</sup> ‘village’ → [ʒau<sup>33</sup>] (*Dleub*), [zəu<sup>33</sup>] (*Shib*) and \*vzɔ<sup>C</sup> ‘strength’ → [ʒəu<sup>22</sup>] (*Dleub*), [zɔ<sup>33</sup>] (*Shib*). Both words have a final /au/ in *Shuat* and *Dleub*, whereas they have contrastive /au/ and /o/ finals in the other dialects.

In addition, *Dleub* is the only variety to retain a nasal coda on its reflex of the Proto-Miao rhyme \*ən, thus: PM \*uŋ, \*əŋ, \*ən → /oŋ/ (*Dleub*); PM \*uŋ, \*əŋ → /oŋ/, PM \*ən →

/o/ (all other varieties). For example, \*n̄ən<sup>B</sup> ‘intestines’ → [n̄oŋm<sup>34</sup>] in *Dleub*, retaining the nasal quality of the coda.

PM rhymes \*a, \*æ, \*ei, \*in, \*æn have slightly different reflexes depending on their environments. There are several mergers conditioned by palatal and uvular onsets. Development of these PM rhymes following palatal and uvular onsets are illustrated in Tables 14 and 15 respectively. We also give examples of these rhymes in other environments in order to highlight the conditioned mergers.

Firstly, we note that in general, PM \*a → /i/, \*æ → /e/, \*ei → /ai/ and \*in, \*æn → /a/. There is one exception: in an innovation not seen elsewhere, *Soud* has undergone the merger \*ei, \*in, \*æn → /a/. Thus *Soud* does not have an /ai/ rhyme, resulting in one fewer rhyme than other Hmong dialects. For example, \*tin<sup>A</sup> ‘skirt’ → [ta<sup>33</sup>] (*Soud*) and \*tei<sup>D</sup> ‘to grip’ → [ta<sup>43</sup>] (*Soud*). In non-*Soud* varieties, ‘skirt’ has a final /a/ and ‘to grip’ has a final /ai/.

Correspondences between these PM rhymes and modern Wenshan Hmong reflexes following palatal onsets and in other environments are shown in (18). Data illustrating these correspondences are given in Table 14. In all varieties of Wenshan Hmong apart from *Shuat*, \*æ → [i] / palatal \_\_, merging with /i/. *Shuat*, however, preserves /e/ following palatal initials. Furthermore, in *Shuat*, PM \*in, \*æn → [ei] / palatal \_\_, merging with *Shuat*'s /ei/ rhyme (which, confusingly, corresponds to /ai/ in other varieties). In other environments, \*in, \*æn → /ai/, in common with other varieties of Wenshan Hmong (in which *Shuat*'s /ai/ corresponds to /a/).

(18) Correspondences between PM and modern /i/, /e/, /ai/ and /a/ rhymes following palatals

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>E Nzhuab</i>	<i>W Nzhuab</i>
*æ	e	ei	ei	ei	ei	e	ei	e
*æ / palatal _								
*a	i	i	i	i	i	i	i	i
*a / palatal _								
*in, *æn	ai							
*in, *æn / palatal _		ie		a	a	a	a	a
*ei	ei		a					
*ei / palatal _		ai		ai	ai	ai	ai	ai

Correspondences between the same set of PM rhymes and modern reflexes following uvular onsets are shown in (19). Data illustrating these correspondences are given in Table 15. In all varieties apart from *Buak*, \*a → [e] or [ei] / uvular \_\_, merging with /e/. In *Buak*, \*a → [ai] before uvulars, merging with /ai/.

In *Shib*, *Nzhuab*, *Bes* and *Buak*, \*æ → [ai] / uvular \_\_, merging with /ai/. *Dleub*, *Soud* and *Shuat*, on the other hand, preserve /e/ following uvular initials. There is one exception to this rule: \*Nqhæ<sup>D</sup> ‘thirsty’, in which the final /e/ is preserved in all varieties apart from *Buak* [Nq<sup>h</sup>ai<sup>33</sup>] and *Shuat* [Nq<sup>h</sup>i<sup>33</sup>]. Thus *Buak* exhibits the general rule: \*a, \*æ → /ai/ before uvulars.

(19) Correspondences between PM and modern /i/, /e/, /ai/ and /a/ rhymes following uvulars

Proto-Miao	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
*a	i	i	i	i	i	i	i	i
*a / q <sub>-</sub> , Nq <sub>-</sub>	e	ei	ei	ei	ai	e	ei	e
*æ	i				ei			
*æ / q <sup>h</sup> <sub>-</sub>	e	ai	a	ai	ai	ai	ai	ai
*æ / q <sub>-</sub> , Nq <sub>-</sub>	e			ai	ai	ai	ai	ai
*ei	ei	ai	a	ai	ai	ai	ai	ai
*ei / q <sub>-</sub> , Nq <sub>-</sub>	ei, ai			ai, a	ai, a	ai, a	ai, a	ai, a
*in	ai	ie	a	a	a	a	a	a
*in / q <sup>h</sup> <sub>-</sub>				a	a	a	a	a

In most cases, \*ei → /ai/. However there are three instances in which \*ei → /a/ in *Shib*, *East Nzhuab*, *Bes*, *Buak* and *Shuat*: \*NGei<sup>A</sup> ‘meat’, \*qei<sup>A</sup> ‘chicken’ and \*hei<sup>D</sup> ‘to ladle’. In all cases, the vowel has either lowered or its [i] off-glide has been lost. This is possibly due to conditioning brought on by a uvular or glottal onset. The words \*Gei<sup>A</sup> ‘slanted’ and \*NGei<sup>D</sup> ‘narrow’, however, do not display similar conditioning, with the exception of the former word in *Buak*. *Dleub*, *Soud* and *West Nzhuab* are the only varieties to preserve the same reflex of PM \*ei in all environments.

Overall, it appears that *Dleub* is the most conservative in faithfully preserving these Proto-Miao rhymes in different environments, with only two onset-induced conditioned mergers, \*æ → /i/ before palatals and \*a → /e/ before uvulars.

#### 4 Conclusions

In conclusion, the authors tentatively suggest that the Hmong dialects of Wenshan can be divided into four distinct clusters based on the shared phonological innovations described in this paper. These clusters are illustrated in Figure 5.

The principle shared phonological innovations can be described thus:

1. *Hmongb Shib* and *East Nzhuab*. They have both undergone a B2/C2 tone merger. They have both lost the voiceless nasal onset series /m̥/, /n̥/ and /p̥/, which have merged with their voiced counterparts.
2. *Hmong Soud*, *Bes* and *Buak*. They have all undergone a partial merger of tones D2 and C2. Within this grouping, *Buak* is the most distinctive phonologically, with a ninth lexical tone and a slightly different development of the /tʰ/ and /k/ onsets. *Soud* is the only variety in which PM \*ai → /a/, resulting in one fewer rhyme.
3. *Hmongb Dleub*. This variety has undergone a B2/D1 tone merger. Unlike *Shib* and *East Nzhuab*, *Dleub* does not retain /ntʰ/. It is the only variety apart from *Shuat* to preserve a separate reflex of PM \*mz<sub>-</sub>, viz. /mn/. Also like *Shuat*, *Dleub* has undergone the rhyme merger PM \*o, \*au, \*ɔn, \*ɔŋ → /au/.
4. *Hmongb Shuat*. This is the only variety to have developed a series of palatalised onsets /p<sup>j</sup>/, /p<sup>h</sup><sup>j</sup>/, /mp<sup>j</sup>/, /f<sup>j</sup>/ and /v<sup>j</sup>/ from Proto-Miao bilabial stop and affricate

consonant clusters. It has also preserved  $*mz_$  in the form of  $/m^j/$ , and it has a voiceless equivalent,  $/m^j/$ , presumably a reflex of a hitherto unreconstructed PM onset. Like *Dleub*, *Shuat* is characterised by PM  $*o \rightarrow /au/$ . Because of this, one could say that *Shuat* is phonologically closer to *Dleub* than to any of the other Wenshan Hmong varieties.

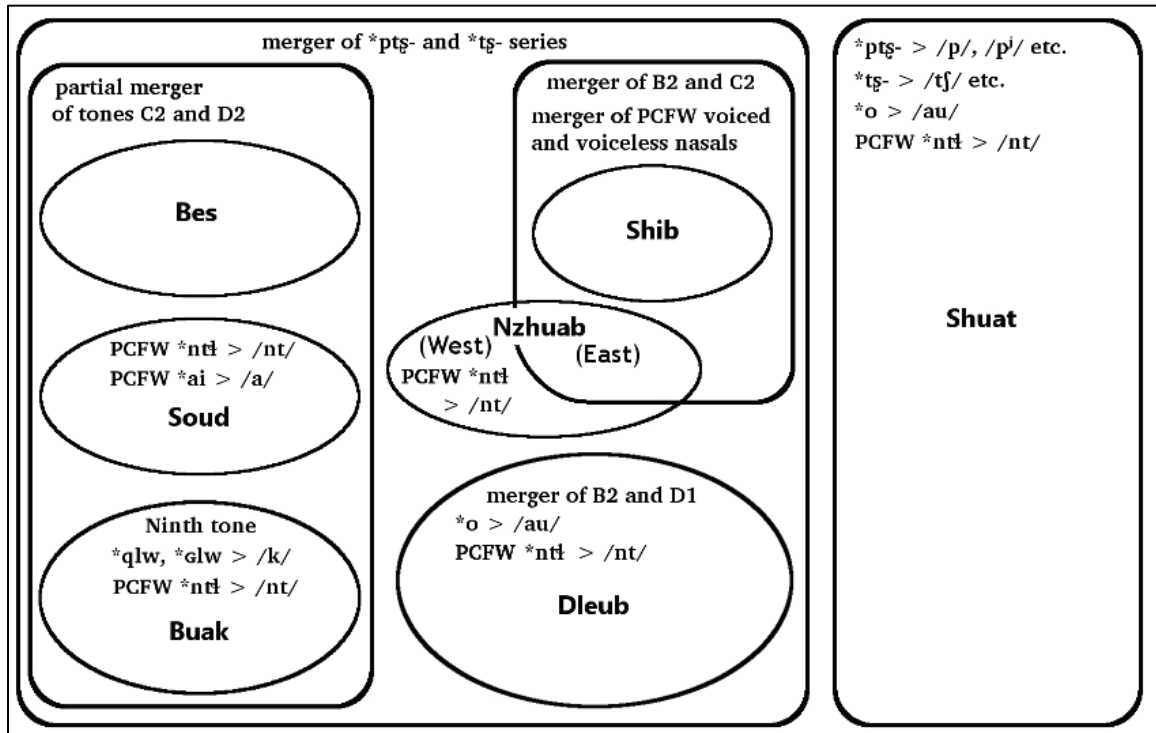


Figure 5: Suggested grouping of Wenshan Hmong varieties<sup>33</sup>

The positioning of *West Nzhuab* within these groupings is problematic. *West Nzhuab*'s phonemic set is the closest to Standard Western Miao, most faithfully preserving all eight Proto-Miao tone categories and retaining voiceless nasal onsets. It has not developed the palatalised obstruent series seen in *Shuat*, nor has it undergone the same  $*o \rightarrow /au/$  vowel merger as *Dleub* and *Shuat*. Purely on the basis of shared phonological innovations, then, *West Nzhuab* doesn't belong to any of these clusters, although it could be said to be closest to the *Soud-Bes-Buak* cluster. Other factors however, including phonetic realisation of tone categories, lexical similarity<sup>34</sup> and a common autonym,

<sup>33</sup> This diagram is designed not only to show shared phonological innovations, but also to roughly visualise the geographical and phonological proximity of the various dialects to each other. Unless otherwise indicated, proto forms refer to Proto-Miao. PCFW = Proto Core-Far-Western Hmong, posited here in order to simplify the diagram.

<sup>34</sup> A detailed discussion of lexicon would constitute an entirely separate study. Briefly, UPGMA clustering analysis carried out by the authors on historical cognate percentages indicate that *West Nzhuab* falls into the same cluster as *Shib* and *East Nzhuab*. Some examples of lexical items shared by *West Nzhuab* and *Shib-East Nzhuab*, but not by *Soud-Bes-Buak* are 'bed' *zangx* (*Soud-Bes-Buak*: *qeut*), 'to hide' *raik* (*Soud-Bes-Buak*: *nzheuk*), 'to lead' *jaox* (*Soud-Bes-Buak*: *xik*), 'to search' *ntrad* (*Soud-Bes-Buak*: *zhaod*) and 'to sing' *hok, hak* (*Soud-Bes-Buak*: *tangf*).

indicate that it belongs with *Shib* and *East Nzhuab* and that it is simply a particularly conservative speech variety within this cluster.

It should be noted that in addition to the phonological differences described in this paper, Wenshan Hmong dialects also vary slightly in the phonetic realisation of their onsets and rhymes. A summary of the key pronunciation differences between the dialects is given in Appendix B.

### 5 Shortcomings of this study and recommendations for further research

Any study of this kind is only as good as the data upon which it is based. We are fairly confident of the accuracy of the phonetic transcription of the data that we collected, although we welcome corrections and suggestions for improvement to our data once it has been published in its entirety.

However, as with any unwritten language, there are numerous variations in the way that Wenshan Hmong is spoken, depending not only upon ethnic identity (branch of Hmong), but also upon individual speaker, geography, contact with other Hmong varieties and contact with other languages such as Chinese and Zhuang. Therefore we cannot guarantee that the phonological innovations highlighted in this paper are typical across each entire sub-branch of Hmong that is considered. Indeed, because we generally collected data in more than one location for each ethnic sub-group, we know that small amounts of phonemic variation do occur *within* each group. To offer some brief examples, our data indicates that:

- the retroflex affricate and fricative series (/tʂ/, /ʂ/ etc.) have merged with the alveolar affricate and fricative series (/ts/, /s/ etc.) in *Shib* and *Buak* in Wenshan county, in common with local varieties of South-Western Mandarin;
- *Dleub* in Malipo county has lost the /mn/ onset;
- *Dleub* in Malipo and Funing counties consistently realises /i/ as [i] following alveolar sibilants, *Dleub* in Qiubei consistently realises it as [ɿ], and *Dleub* in Guangan appears to have contrasting /i/ and /ɿ/ onsets in the very same environments.

Detailed analysis and discussion of this internal variation and the factors causing it are beyond the scope of this paper. It would make a valuable follow-up study, potentially throwing much light upon contact-induced phonemic and phonetic change in Hmong varieties of China.

Furthermore, in the course of gathering our data, we noticed that there was some variation between older and younger speakers in terms of pronunciation. In cases of significant disparity, we chose to record and transcribe the older speakers, in the hope that their pronunciation was more conservative, thus retaining more distinctives of their particular variety of Hmong. A comparative study of the differences in Hmong spoken by older and younger generations would be invaluable in furthering our understanding of how unwritten language varieties change over time.

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## Appendix A Data tables

Table 1: Tones A1, A2, B1, B2 and C1

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
‘skirt’	<i>dab</i>	*tin	A1	tai <sup>55</sup>	tie <sup>53</sup>	ta <sup>43</sup>	ta <sup>43</sup>	ta <sup>32</sup>	ta <sup>54</sup>	ta <sup>55</sup>	ta <sup>54</sup>
‘wet’	<i>ndob</i>	*nton	A1	nto <sup>55</sup>	nto <sup>53</sup>	nto <sup>43</sup>	ntu <sup>43</sup>	nto <sup>32</sup>	nto <sup>54</sup>	nto <sup>55</sup>	ntu <sup>54</sup>
‘chicken’	<i>ghaib</i>	*qei	A1	qai <sup>55</sup>	qai <sup>53</sup>	qa <sup>43</sup>	qa <sup>43</sup>	qa <sup>32</sup>	qa <sup>54</sup>	qa <sup>55</sup>	qai <sup>54</sup>
‘flat’	<i>dax</i>	*din	A2	tai <sup>41</sup>	tie <sup>42</sup>	ta <sup>41</sup>	ta <sup>31</sup>	ta <sup>31</sup>	ta <sup>42</sup>	ta <sup>42</sup>	ta <sup>42</sup>
‘sky’	<i>ndox</i>	*nglwon	A2	nto <sup>41</sup>	nto <sup>42</sup>	nto <sup>41</sup>	ntu <sup>31</sup>	nto <sup>31</sup>	nto <sup>42</sup>	nto <sup>42</sup>	ntu <sup>42</sup>
‘slanted’	<i>ghaix</i>	*gei	A2	qei <sup>41</sup>	qai <sup>42</sup>	qa <sup>41</sup>	-	qa <sup>31</sup>	qai <sup>42</sup>	qai <sup>42</sup>	qai <sup>42</sup>
‘to borrow’	<i>ghed</i>	*qa	B1	<i>tsei</i> <sup>33</sup>	qei <sup>34</sup>	qei <sup>55</sup>	qei <sup>55</sup>	<i>tsai</i> <sup>33</sup>	qe <sup>35</sup>	qei <sup>35</sup>	<i>tsai</i> <sup>33</sup>
‘full’	<i>bod</i>	*ptson	B1	po <sup>53</sup>	po <sup>34</sup>	po <sup>55</sup>	pu <sup>55</sup>	po <sup>55</sup>	po <sup>35</sup>	po <sup>35</sup>	pu <sup>35</sup>
‘book’	<i>ndeud</i>	*nteu	B1	ntəu <sup>53</sup>	ntəu <sup>34</sup>	ntəu <sup>55</sup>	ntəu <sup>55</sup>	ntie <sup>55</sup>	ntəu <sup>35</sup>	ntəu <sup>35</sup>	ntəu <sup>35</sup>
‘tail’	<i>dud</i>	*tu	B1	(tə <sup>44</sup> )	(tə <sup>44</sup> )	tə <sup>55</sup>	tə <sup>24</sup>	tə <sup>44</sup>	tə <sup>35</sup>	tə <sup>35</sup>	tə <sup>35</sup>
‘skin’	<i>deud</i>	*teu	B1	təu <sup>53</sup>	təu <sup>34</sup>	təu <sup>44</sup>	təu <sup>24</sup>	tie <sup>44</sup>	təu <sup>35</sup>	təu <sup>35</sup>	təu <sup>35</sup>
‘short (length)’	<i>lot</i>	*ʔlon	B1	lo <sup>53</sup>	lo <sup>34</sup>	lo <sup>44</sup>	lu <sup>24</sup>	lo <sup>44</sup>	lu <sup>44</sup>	lo <sup>44</sup>	lu <sup>44</sup>
‘soup’	<i>guat</i>	*ka	B1	ka <sup>53</sup>	kua <sup>44</sup>	kua <sup>44</sup>	kua <sup>24</sup>	kua <sup>44</sup>	kua <sup>44</sup>	kua <sup>44</sup>	kua <sup>44</sup>
‘snow’	<i>nbot</i>	*mptson	C1	mpo <sup>44</sup>	mpo <sup>44</sup>	mpo <sup>44</sup>	mpu <sup>24</sup>	mpo <sup>44</sup>	mpo <sup>44</sup>	mpo <sup>44</sup>	mpu <sup>44</sup>
‘to sleep’	<i>but</i>	*pu	C1	pə <sup>44</sup>	pə <sup>44</sup>	po <sup>44</sup>	pə <sup>24</sup>	pə <sup>44</sup>	pə <sup>44</sup>	pə <sup>44</sup>	pə <sup>44</sup>
‘egg’	<i>ghait</i>	*qwjæ	C1	qe <sup>44</sup>	qei <sup>44</sup>	qei <sup>44</sup>	qai <sup>24</sup>	qai <sup>44</sup>	qai <sup>44</sup>	qai <sup>44</sup>	qai <sup>44</sup>
‘short (height)’	<i>ghel</i>	*ga	B2	qe <sup>22</sup>	qei <sup>33</sup>	qei <sup>21</sup>	qei <sup>21</sup>	qai <sup>21</sup>	qe <sup>33</sup>	qei <sup>33</sup>	qe <sup>22</sup>
‘thorn’	<i>bol</i>	*bo	B2	paɯ <sup>22</sup>	pau <sup>33</sup>	po <sup>21</sup>	pu <sup>21</sup>	po <sup>21</sup>	poɯ <sup>33</sup>	pau <sup>33</sup>	<i>mu</i> <sup>35</sup>
‘fire’	<i>deul</i>	*deu	B2	təu <sup>22</sup>	təu <sup>33</sup>	təu <sup>21</sup>	təu <sup>21</sup>	tie <sup>21</sup>	təu <sup>33</sup>	təu <sup>33</sup>	təu <sup>22</sup>
‘how?’	<i>jangl</i>	-	-	tɕaŋ <sup>22</sup>	tɕa <sup>33</sup>	tɕaŋ <sup>21</sup>	(tɕaŋ <sup>22</sup> )	<i>ntsɿ</i> <sup>44</sup>	tɕaŋ <sup>33</sup>	tɕaŋ <sup>33</sup>	tɕaŋ <sup>22</sup>



**Table 2:** Tones D1, D2 and C2

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘to hit’	<i>ndouk</i>	*ntə	D1	ntau <sup>33</sup>	ntou <sup>33</sup>	ntou <sup>33</sup>	ntou <sup>33</sup>	ntəu <sup>33</sup>	ntou <sup>33</sup>	ntau <sup>33</sup>	ntou <sup>33</sup>
‘to cover’	<i>bok</i>	-	-	qau <sup>33</sup>	pau <sup>33</sup>	po <sup>33</sup>	pu <sup>33</sup>	po <sup>33</sup>	po <sup>33</sup>	po <sup>33</sup>	pu <sup>33</sup>
‘to light’	<i>deuk</i>	*teu	D1	təu <sup>33</sup>	təu <sup>33</sup>	təu <sup>33</sup>	ci <sup>43</sup>	(tie <sup>32</sup> )	təu <sup>33</sup>	təu <sup>33</sup>	təu <sup>33</sup>
‘bear’	<i>dlaik</i>	*qlei	D1	ʔlai <sup>33</sup>	ʔdai <sup>33</sup>	tʃai <sup>33</sup>	tʃai <sup>33</sup>	ʔlai <sup>33</sup>	tʃai <sup>33</sup>	tʃai <sup>33</sup>	ʔdai <sup>33</sup>
‘ten’	<i>gouf</i>	*jə	D2	kau <sup>21</sup>	kou <sup>21</sup>	kou <sup>212</sup>	kou <sup>212</sup>	kəu <sup>213</sup>	kou <sup>21</sup>	kau <sup>21</sup>	kou <sup>22</sup>
‘narrow’	<i>nghaif</i>	*Ngei	D2	ŋqai <sup>21</sup>	ŋqai <sup>21</sup>	ŋqa <sup>212</sup>	ŋqai <sup>212</sup>	ŋqai <sup>213</sup>	ŋqai <sup>21</sup>	ŋqai <sup>21</sup>	ŋqai <sup>22</sup>
‘whip’	<i>nbleuf</i>	*mbleu	D2	mpləu <sup>21</sup>	mpləu <sup>21</sup>	mpləu <sup>212</sup>	mpləu <sup>212</sup>	mplie <sup>213</sup>	mpləu <sup>21</sup>	mpləu <sup>21</sup>	mpləu <sup>22</sup>
‘matter’	<i>nof</i>	*ŋon	D2	plau <sup>55</sup>	plou <sup>53</sup>	no <sup>212</sup>	plou <sup>43</sup>	noŋ <sup>213</sup>	(ny <sup>33</sup> )	plou <sup>55</sup>	plou <sup>54</sup>
‘to see’	<i>bof</i>	*bo	D2	pau <sup>21</sup>	pau <sup>21</sup>	po <sup>212</sup>	pu <sup>212</sup>	po <sup>33</sup>	po <sup>21</sup>	po <sup>21</sup>	pu <sup>22</sup>
‘peppery’	<i>nzhif</i>	*mbdza	D2	mpɔ̄ <sup>21</sup>	ntɕi <sup>21</sup>	ntɕi <sup>22</sup>	ntɕi <sup>22</sup>	ntɕi <sup>33</sup>	ntɕi <sup>21</sup>	ntɕi <sup>21</sup>	ntɕi <sup>22</sup>
‘eight’	<i>yif</i>	*za	D2	zi <sup>21</sup>	zi <sup>21</sup>	zi <sup>22</sup>	zi <sup>22</sup>	zi <sup>33</sup>	zie <sup>21</sup>	zi <sup>21</sup>	zi <sup>22</sup>
‘sticky rice’	<i>nblouf</i>	*mblə	D2	mplau <sup>21</sup>	mplou <sup>21</sup>	mplou <sup>22</sup>	mplou <sup>22</sup>	mpləu <sup>33</sup>	mplou <sup>21</sup>	mplau <sup>21</sup>	mplou <sup>22</sup>
‘tongue’	<i>nblais</i>	*mblei	D2	mplai <sup>21</sup>	mplai <sup>22</sup>	mpla <sup>22</sup>	mplai <sup>22</sup>	mplai <sup>33</sup>	mplai <sup>33</sup>	mplai <sup>33</sup>	mplai <sup>33</sup>
‘shoulder’	<i>bus</i>	*bu	C2	pə <sup>21</sup>	pə <sup>22</sup>	-	-	pə <sup>33</sup>	-	pə <sup>33</sup>	-
‘fist’	<i>ndris</i>	-	-	(ntɕi <sup>22</sup> )	ŋi <sup>22</sup>	ŋi <sup>22</sup>	(ŋi <sup>24</sup> )	ntɕi <sup>33</sup>	ntɕi <sup>33</sup>	ntɕi <sup>33</sup>	ŋi <sup>33</sup>
‘child’	<i>nyuas</i>	-	-	(ŋa <sup>22</sup> )	(ŋua <sup>21</sup> )	ŋua <sup>22</sup>	ŋua <sup>22</sup>	ŋua <sup>33</sup>	ŋua <sup>33</sup>	ŋua <sup>33</sup>	ŋua <sup>33</sup>
‘to explode’	<i>deus</i>	*deu	C2	təu <sup>33</sup>	təu <sup>22</sup>	təu <sup>22</sup>	təu <sup>22</sup>	tiē <sup>22</sup>	təu <sup>33</sup>	təu <sup>33</sup>	təu <sup>33</sup>
‘grandmother’	<i>bos</i>	-	-	(pau <sup>41</sup> )	pau <sup>22</sup>	po <sup>22</sup>	pu <sup>22</sup>	po <sup>22</sup>	po <sup>33</sup>	(po <sup>42</sup> )	pu <sup>33</sup>
‘bird’	<i>nongs</i>	*nuŋ	C2	noŋ <sup>33</sup>	noŋm <sup>22</sup>	noŋ <sup>22</sup>	noŋ <sup>22</sup>	noŋ <sup>22</sup>	noŋ <sup>33</sup>	noŋm <sup>33</sup>	noŋ <sup>33</sup>
‘root’	<i>jangs</i>	PMY *dzon <sup>35</sup>	PMY C2 <sup>35</sup>	tɕaŋ <sup>33</sup>	tɕa <sup>22</sup>	tɕaŋ <sup>22</sup>	tɕaŋ <sup>22</sup>	tɕaŋ <sup>22</sup>	tɕaŋ <sup>33</sup>	tɕaŋ <sup>33</sup>	tɕaŋ <sup>33</sup>

<sup>35</sup> Proto-Miao-Yao (Wang & Mao 1995). Wang (1994:92) PM = \*dzon<sup>A2</sup> but all of the reflexes in Wenshan Miao varieties retain tone category C2.

**Table 3:** Fricatives \*fʂ-, \*ʂ-, \*ʎv-, \*v-, \*ʎvz-, \*vz-

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
‘to divide’	<i>faib</i>	-	-	fei <sup>55</sup>	fai <sup>53</sup>	fa <sup>43</sup>	fa <sup>43</sup>	fai <sup>32</sup>	fai <sup>54</sup>	fai <sup>55</sup>	fai <sup>54</sup>
‘ladle’	<i>fub</i>	-	-	fɰ <sup>55</sup>	ʎdie <sup>34</sup>	fɰ <sup>43</sup>	fɰ <sup>43</sup>	tʃiɛ <sup>22</sup>	fɰ <sup>54</sup>	fɰ <sup>55</sup>	ʎda <sup>35</sup>
‘play’	<i>shit</i>	-	-	fi <sup>44</sup>	ʃɿ <sup>44</sup>	ʂɿ <sup>44</sup>	ʃɿ <sup>24</sup>	ʃɿ <sup>44</sup>	ʂɿ <sup>44</sup>	ʂɿ <sup>44</sup>	ʂɿ <sup>44</sup>
‘sound’	<i>shuab</i>	*fʂou	A1	ʃa <sup>55</sup>	ʃua <sup>53</sup>	ʂua <sup>43</sup>	ʃua <sup>43</sup>	ʃua <sup>32</sup>	ʂua <sup>54</sup>	ʂua <sup>55</sup>	ʃua <sup>54</sup>
‘liver’	<i>shab</i>	*fʂin	A1	ʃei <sup>55</sup>	ʃie <sup>53</sup>	ʂa <sup>43</sup>	ʃa <sup>43</sup>	ʃa <sup>32</sup>	ʂa <sup>54</sup>	ʂa <sup>55</sup>	ʃa <sup>54</sup>
‘wormwood’	<i>shod</i>	*fʂon	B1	ʃo <sup>53</sup>	ʃo <sup>34</sup>	ʂo <sup>55</sup>	ʃu <sup>55</sup>	ʃo <sup>55</sup>	ʂo <sup>35</sup>	ʂo <sup>35</sup>	ʃu <sup>35</sup>
‘to write’	<i>shout</i>	*fʂoi	C1	ʃou <sup>44</sup>	ntsua <sup>34</sup>	nzua <sup>55</sup>	ʃou <sup>24</sup>	ntsua <sup>55</sup>	ʂou <sup>44</sup>	ʂou <sup>44</sup>	ntsua <sup>35</sup>
‘sand’	<i>shuab</i>	-	-	ʃa <sup>55</sup>	ʃua <sup>53</sup>	ʂua <sup>43</sup>	ʃua <sup>43</sup>	ʃua <sup>32</sup>	ʂua <sup>54</sup>	ʂua <sup>55</sup>	ʃua <sup>54</sup>
‘ripe’	<i>shad</i>	*ʂaen	B1	ʃai <sup>53</sup>	ʃie <sup>34</sup>	ʂa <sup>55</sup>	ʃa <sup>55</sup>	ʃa <sup>55</sup>	ʂa <sup>35</sup>	ʂa <sup>35</sup>	ʃa <sup>35</sup>
‘hot’	<i>shod</i>	*ʂo	B1	ʃau <sup>53</sup>	ʃau <sup>34</sup>	ʂo <sup>55</sup>	ʃu <sup>55</sup>	ʃo <sup>55</sup>	ʂo <sup>35</sup>	ʂo <sup>35</sup>	ʃu <sup>35</sup>
‘lunch’	<i>shot</i>	*ʂon	C1	ʃo <sup>44</sup>	ʃo <sup>44</sup>	ʂo <sup>44</sup>	ʃu <sup>24</sup>	ʃo <sup>44</sup>	ʂo <sup>44</sup>	ʂo <sup>44</sup>	ʃu <sup>44</sup>
‘son-in-law’	<i>voud</i>	*ʎvou	B1	vou <sup>53</sup>	vou <sup>34</sup>	vou <sup>55</sup>	vou <sup>55</sup>	vəɰ <sup>55</sup>	vou <sup>35</sup>	vau <sup>35</sup>	vou <sup>35</sup>
‘winnowing tray’	<i>vangb</i>	*ʎveŋ	A1	van <sup>55</sup>	vã <sup>53</sup>	van <sup>43</sup>	van <sup>43</sup>	van <sup>32</sup>	van <sup>54</sup>	van <sup>55</sup>	van <sup>54</sup>
‘garden’	<i>vangx</i>	*veŋ	A2	van <sup>41</sup>	vã <sup>42</sup>	van <sup>41</sup>	van <sup>31</sup>	van <sup>31</sup>	van <sup>42</sup>	van <sup>42</sup>	van <sup>42</sup>
‘stone’	<i>reb</i>	*ʎvzæ <sup>36</sup>	A1	ve <sup>55</sup>	ʒei <sup>53</sup>	ʒei <sup>43</sup>	ʒei <sup>43</sup>	ʒei <sup>32</sup>	ʒe <sup>42</sup>	ʒei <sup>55</sup>	ʒe <sup>54</sup>
‘urine’	<i>ril</i>	*vza	B2	vɿ <sup>22</sup>	ʒɿ <sup>33</sup>	ʒɿ <sup>21</sup>	ʒɿ <sup>21</sup>	ʒɿ <sup>21</sup>	ʒɿ <sup>33</sup>	ʒɿ <sup>33</sup>	ʒɿ <sup>22</sup>
‘near’	<i>ret</i>	*ʎvzæ <sup>36</sup>	C1	v <sup>44</sup> e	ʒei <sup>44</sup>	ʒei <sup>44</sup>	ti <sup>24</sup>	ʒei <sup>44</sup>	ʒe <sup>44</sup>	ʒei <sup>44</sup>	ʒe <sup>44</sup>
‘dragon’	<i>rangx</i>	*vzɔŋ	A2	v <sup>41</sup> aŋ	ʒã <sup>42</sup>	ʒaŋ <sup>41</sup>	ʒaŋ <sup>31</sup>	ʒaŋ <sup>31</sup>	ʒaŋ <sup>42</sup>	ʒaŋ <sup>42</sup>	ʒaŋ <sup>42</sup>
‘to hide (sth.)’	<i>raik</i>	*ʎvzɛi	D1	v <sup>33</sup> ei	ʒai <sup>33</sup>	ntsəɰ <sup>33</sup>	ntsəɰ <sup>33</sup>	ntɕie <sup>33</sup>	ʒai <sup>33</sup>	ʒai <sup>33</sup>	ʒai <sup>33</sup>
‘vegetable’	<i>roub</i>	*ʎvzɔi	A1	v <sup>55</sup> ou	ʒou <sup>53</sup>	ʒou <sup>43</sup>	ʒou <sup>43</sup>	ʒəɰ <sup>32</sup>	ʒou <sup>54</sup>	ʒau <sup>55</sup>	ʒou <sup>54</sup>
‘forest’	<i>rongd</i>	*ʎvzɔŋ	B1	v <sup>53</sup> oŋ	ʒoŋm <sup>34</sup>	ʒoŋ <sup>55</sup>	ʒoŋ <sup>55</sup>	ʒoŋ <sup>55</sup>	ʒoŋ <sup>35</sup>	ʒoŋm <sup>35</sup>	ʒoŋ <sup>35</sup>
‘nest’	<i>rel</i>	*vzæ	B2	v <sup>22</sup> e	ʒei <sup>33</sup>	ʒei <sup>21</sup>	ʒei <sup>21</sup>	ʒei <sup>21</sup>	ʒe <sup>33</sup>	ʒei <sup>33</sup>	ʒe <sup>22</sup>
‘strength’	<i>ros</i>	*vzɔ	C2	v <sup>33</sup> au	ʒau <sup>22</sup>	ʒɔ <sup>22</sup>	ʒu <sup>23</sup>	ʒɔ <sup>22</sup>	ʒɔ <sup>33</sup>	ʒɔ <sup>33</sup>	ʒu <sup>33</sup>

<sup>36</sup> Wang & Mao (1995) reconstruct different Proto-Miao-Yao (PMY) forms for these two words: ‘stone’ PMY = \*ŋklau<sup>A</sup>; ‘near’ PMY = \*ŋklə<sup>C</sup>.

**Table 4:** Unaspirated bilabial stops and affricates \*p-, \*b-, \*pts-, \*ptʂ-, \*bdz-, \*tʂ-, \*dz- PM \*pts- words are shaded. Note that there are no examples of \*bdz- in our word list.

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
‘to fall’	<i>bongb</i>	*pəŋ	A1	poŋ <sup>55</sup>	poŋm <sup>53</sup>	poŋ <sup>43</sup>	poŋ <sup>43</sup>	poŋ <sup>32</sup>	poŋ <sup>54</sup>	poŋm <sup>55</sup>	poŋ <sup>54</sup>
‘hundred’	<i>buat</i>	*pa	C1	pa <sup>44</sup>	pua <sup>44</sup>	pua <sup>44</sup>	pua <sup>24</sup>	pua <sup>44</sup>	pua <sup>33</sup>	pua <sup>44</sup>	pua <sup>44</sup>
‘flower’	<i>bangx</i>	*beŋ	A2	paŋ <sup>41</sup>	pã <sup>42</sup>	paŋ <sup>41</sup>	paŋ <sup>31</sup>	paŋ <sup>31</sup>	paŋ <sup>42</sup>	paŋ <sup>42</sup>	paŋ <sup>42</sup>
‘to embrace’	<i>buas</i>	*bɔu	C2	pã <sup>33</sup>	puɔ <sup>22</sup>	puɔ <sup>22</sup>	puɔ <sup>23</sup>	puɔ <sup>22</sup>	puɔ <sup>33</sup>	puɔ <sup>33</sup>	puɔ <sup>33</sup>
‘full’	<i>bod</i>	*ptson	B1	po <sup>53</sup>	po <sup>34</sup>	po <sup>55</sup>	pu <sup>55</sup>	po <sup>55</sup>	po <sup>35</sup>	po <sup>35</sup>	pu <sup>35</sup>
‘we’	<i>beb</i>	*ptsæ <sup>37</sup>	A1	pe <sup>55</sup>	pei <sup>53</sup>	pei <sup>43</sup>	pei <sup>43</sup>	pei <sup>32</sup>	pe <sup>54</sup>	pei <sup>55</sup>	pe <sup>54</sup>
‘three’	<i>beb</i>	*ptsæ <sup>37</sup>	A1	pʰe <sup>55</sup>	pei <sup>53</sup>	pei <sup>43</sup>	pei <sup>43</sup>	pei <sup>32</sup>	pe <sup>54</sup>	pei <sup>55</sup>	pe <sup>54</sup>
‘house’	<i>zhed</i>	*ptʂæ	B1	pʰe <sup>53</sup>	tʂei <sup>34</sup>	tʂei <sup>55</sup>	tʂei <sup>55</sup>	tʂei <sup>55</sup>	tʂe <sup>35</sup>	tʂei <sup>35</sup>	tʂe <sup>35</sup>
‘dark’	<i>zhouk</i>	*ptʂə	D1	pʰau <sup>33</sup>	tʂou <sup>33</sup>	tʂou <sup>33</sup>	tʂou <sup>33</sup>	tʂə <sup>33</sup>	tʂou <sup>33</sup>	tʰo <sup>55</sup>	tʂou <sup>33</sup>
‘five’	<i>zhib</i>	*ptʂa	A1	pʂ <sup>55</sup>	tʂɿ <sup>53</sup>	tʂɿ <sup>43</sup>	tʂɿ <sup>43</sup>	tʂɿ <sup>32</sup>	tʂɿ <sup>54</sup>	tʂɿ <sup>55</sup>	tʂɿ <sup>54</sup>
‘gall bladder’	<i>zhib</i>	*tʂi	A1	tʂɿ <sup>55</sup>	tʂɿ <sup>53</sup>	tʂɿ <sup>43</sup>	tʂɿ <sup>33</sup>	tʂɿ <sup>32</sup>	tʂɿ <sup>54</sup>	tʂɿ <sup>55</sup>	tʂɿ <sup>54</sup>
‘to let go’	<i>zhaot</i>	*tʂon	C1	tʂau <sup>44</sup>	tʂau <sup>44</sup>	tʂau <sup>44</sup>	tʂau <sup>24</sup>	tʂau <sup>44</sup>	tʂau <sup>44</sup>	tʂa <sup>44</sup>	tʂau <sup>44</sup>
‘bland’	<i>zhuas</i>	*dzɔ	C2	tʂa <sup>33</sup>	tʂuɔ <sup>22</sup>	tʂuɔ <sup>22</sup>	tʂuɔ <sup>22</sup>	tʂuɔ <sup>22</sup>	tʂuɔ <sup>33</sup>	tʂuɔ <sup>33</sup>	tʂuɔ <sup>33</sup>
‘few’	<i>zheus</i>	*dzɛu	C2	tʂə <sup>33</sup>	tʂə <sup>22</sup>	tʂə <sup>22</sup>	tʂə <sup>22</sup>	tʂiɛ <sup>22</sup>	tʂə <sup>33</sup>	tʂə <sup>33</sup>	tʂə <sup>33</sup>
‘fruit’	<i>zid</i>	*ptsi	B1	tsi <sup>53</sup>	tsi <sup>34</sup>	tsɿ <sup>55</sup>	tsɿ <sup>55</sup>	tsɿ <sup>55</sup>	tsɿ <sup>35</sup>	tsɿ <sup>35</sup>	tsɿ <sup>35</sup>
‘father’	<i>zid</i>	*ptsa	B1	tsi <sup>53</sup>	tsi <sup>34</sup>	tʂa <sup>55</sup>	tʂai <sup>24</sup>	tsɿ <sup>44</sup>	tsɿ <sup>35</sup>	tsɿ <sup>35</sup>	tʂai <sup>35</sup>

<sup>37</sup> Wang & Mao (1995) reconstruct different Proto-Miao-Yao (PMY) forms for these two words: ‘we’ PMY = \*pwtʂæu<sup>A</sup>; ‘three’ PMY = \*pwtʂui<sup>A</sup>.

**Table 5:** Aspirated bilabial and retroflex stops and affricates \*ph-, \*phtsh-, \*tsh-

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
'classifier for 'blankets'	<i>paob</i>	*phɔn	A1	p <sup>h</sup> au <sup>55</sup>	p <sup>h</sup> au <sup>53</sup>	p <sup>h</sup> au <sup>43</sup>	p <sup>h</sup> au <sup>43</sup>	p <sup>h</sup> au <sup>32</sup>	p <sup>h</sup> au <sup>54</sup>	<i>tʃaj</i> <sup>21</sup>	p <sup>h</sup> au <sup>54</sup>
'to split'	<i>puat</i>	*phau	C1	p <sup>h</sup> a <sup>44</sup>	p <sup>h</sup> ua <sup>44</sup>	p <sup>h</sup> ua <sup>44</sup>	p <sup>h</sup> ua <sup>24</sup>	p <sup>h</sup> ua <sup>44</sup>	p <sup>h</sup> ua <sup>44</sup>	p <sup>h</sup> ua <sup>44</sup>	p <sup>h</sup> ua <sup>44</sup>
'to blow'	<i>chuab</i>	*phtshɔu	A1	p <sup>h</sup> a <sup>55</sup>	tʃ <sup>h</sup> ua <sup>53</sup>	tʃ <sup>h</sup> ua <sup>43</sup>	tʃ <sup>h</sup> ua <sup>43</sup>	tʃ <sup>h</sup> ua <sup>32</sup>	tʃ <sup>h</sup> ua <sup>54</sup>	tʃ <sup>h</sup> ua <sup>55</sup>	tʃ <sup>h</sup> ua <sup>54</sup>
'to play (flute)'	<i>chod</i>	*phtsho	B1	p <sup>h</sup> au <sup>53</sup>	tʃ <sup>h</sup> au <sup>34</sup>	tʃ <sup>h</sup> o <sup>55</sup>	tʃ <sup>h</sup> u <sup>55</sup>	tʃ <sup>h</sup> o <sup>45</sup>	tʃ <sup>h</sup> u <sup>35</sup>	tʃ <sup>h</sup> o <sup>35</sup>	tʃ <sup>h</sup> u <sup>35</sup>
'new'	<i>chab</i>	*tshin	A1	tʃ <sup>h</sup> ai <sup>55</sup>	tʃ <sup>h</sup> ie <sup>53</sup>	tʃ <sup>h</sup> a <sup>43</sup>	tʃ <sup>h</sup> a <sup>43</sup>	tʃ <sup>h</sup> a <sup>32</sup>	tʃ <sup>h</sup> a <sup>54</sup>	tʃ <sup>h</sup> a <sup>55</sup>	tʃ <sup>h</sup> a <sup>54</sup>
'ashes'	<i>choud</i>	*tshoi	B1	tʃ <sup>h</sup> ou <sup>53</sup>	tʃ <sup>h</sup> ou <sup>34</sup>	tʃ <sup>h</sup> ou <sup>55</sup>	tʃ <sup>h</sup> ou <sup>55</sup>	tʃ <sup>h</sup> ə <sup>55</sup>	tʃ <sup>h</sup> ou <sup>35</sup>	tʃ <sup>h</sup> au <sup>35</sup>	tʃ <sup>h</sup> ou <sup>35</sup>

**Table 6:** Pre-nasalised bilabial and affricate onsets \*mp-, \*mpts-, \*mptʃ-, \*mbdz-, \*ntʃ-  
Note that there were no examples of \*mb- or \*ntʃ- in our word list.

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East Nzhuab</i>	<i>West Nzhuab</i>
'pig'	<i>nbuat</i>	*mpa	C1	mpa <sup>44</sup>	mpua <sup>44</sup>	mpua <sup>44</sup>	mpua <sup>24</sup>	mpua <sup>44</sup>	mpua <sup>44</sup>	mpua <sup>44</sup>	mpua <sup>44</sup>
'boiling'	<i>nbout</i>	*mpou	C1	mpɔu <sup>44</sup>	mpou <sup>44</sup>	mpou <sup>44</sup>	mpou <sup>24</sup>	mpə <sup>44</sup>	mpou <sup>44</sup>	mpau <sup>44</sup>	mpou <sup>44</sup>
'snow'	<i>nbot</i>	*mptson	C1	mpo <sup>44</sup>	mpo <sup>44</sup>	mpo <sup>44</sup>	mpu <sup>24</sup>	mpo <sup>44</sup>	mpo <sup>44</sup>	mpo <sup>44</sup>	mpu <sup>44</sup>
'name'	<i>nbet</i>	*mptsæ <sup>38</sup>	C1	mp <sup>j</sup> e <sup>44</sup>	mpei <sup>44</sup>	mpei <sup>44</sup>	mpei <sup>24</sup>	mpei <sup>44</sup>	mpe <sup>44</sup>	mpei <sup>44</sup>	mpe <sup>44</sup>
'green'	<i>nzhuab</i>	*mptʃɔu	A1	mp <sup>j</sup> a <sup>55</sup>	ntʃua <sup>53</sup>	ntʃua <sup>43</sup>	ntʃua <sup>43</sup>	ntʃua <sup>32</sup>	ntʃua <sup>54</sup>	ntʃua <sup>55</sup>	ntʃua <sup>54</sup>
'ear'	<i>nzhex</i>	*mbdzæ <sup>38</sup>	A2	mp <sup>j</sup> i <sup>41</sup>	ntʃei <sup>42</sup>	ntʃei <sup>41</sup>	ntʃei <sup>31</sup>	ntʃei <sup>31</sup>	ntʃe <sup>42</sup>	ntʃei <sup>42</sup>	ntʃe <sup>42</sup>
'fish'	<i>nzhel</i>	*mbdzæ <sup>38</sup>	B2	mp <sup>j</sup> e <sup>22</sup>	ntʃei <sup>33</sup>	ntʃei <sup>21</sup>	ntʃei <sup>21</sup>	ntʃei <sup>21</sup>	ntʃe <sup>33</sup>	ntʃei <sup>33</sup>	ntʃe <sup>22</sup>
'peppery'	<i>nzhif</i>	*mbdzə	D2	mp <sup>ʒ</sup> <sup>21</sup>	ntʃ <sup>ʃ</sup> <sup>21</sup>	ntʃ <sup>ʃ</sup> <sup>22</sup>	ntʃ <sup>ʃ</sup> <sup>22</sup>	ntʃ <sup>ʃ</sup> <sup>22</sup>	ntʃ <sup>ʃ</sup> <sup>21</sup>	ntʃ <sup>ʃ</sup> <sup>21</sup>	ntʃ <sup>ʃ</sup> <sup>22</sup>
'nose'	<i>nzhus</i>	*mbdzɔ	C2	mp <sup>ɰ</sup> <sup>33</sup>	ntʃ <sup>ɰ</sup> <sup>22</sup>	ntʃ <sup>ɰ</sup> <sup>22</sup>	ntʃ <sup>ɰ</sup> <sup>22</sup>	ntʃ <sup>ɰ</sup> <sup>22</sup>	ntʃ <sup>ɰ</sup> <sup>33</sup>	ntʃ <sup>ɰ</sup> <sup>33</sup>	ntʃ <sup>ɰ</sup> <sup>33</sup>
'salt'	<i>nzhed</i>	*ntʃæ	B1	ntʃe <sup>53</sup>	ntʃei <sup>34</sup>	ntʃei <sup>55</sup>	ntʃei <sup>55</sup>	ntʃei <sup>55</sup>	ntʃe <sup>35</sup>	ntʃei <sup>35</sup>	ntʃe <sup>35</sup>
'sharp, pointy'	<i>nzhēt</i>	*ntʃæ	C1	ntʃe <sup>44</sup>	ntʃei <sup>44</sup>	ntʃei <sup>44</sup>	ntʃei <sup>24</sup>	ntʃei <sup>44</sup>	ntʃe <sup>44</sup>	ntʃei <sup>44</sup>	ntʃe <sup>44</sup>
'to comb'	<i>nzhik</i>	*ntʃa	D1	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>	ntʃ <sup>ʃ</sup> <sup>33</sup>
'to measure'	<i>nzhual</i>	-	-	ntʃa <sup>22</sup>	ntʃua <sup>33</sup>	ntʃua <sup>21</sup>	ntʃua <sup>212</sup>	ntʃua <sup>21</sup>	ntʃua <sup>33</sup>	ntʃua <sup>33</sup>	ntʃua <sup>22</sup>

<sup>38</sup> Wang & Mao (1995) reconstruct different Proto-Miao-Yao (PMY) finals for these three words: 'name' PMY = \*mpwtsæu<sup>C</sup>; 'ear' PMY = \*mbdzai<sup>A</sup>; 'fish' PMY = \*mbdzau<sup>B</sup>.

**Table 7:** Bilabial nasals \*ʔm-, \*m-, \*m̥-, \*m̥s-

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘ill’	<i>maob</i>	*ʔm̥ɔŋ	A1	mau <sup>55</sup>	m̥au <sup>53</sup>	mau <sup>43</sup>	mau <sup>43</sup>	mau <sup>32</sup>	mau <sup>54</sup>	ma <sup>55</sup>	mau <sup>54</sup>
‘to take’	<i>muab</i>	*ʔm	A1	ma <sup>55</sup>	m̥ua <sup>53</sup>	mu <sup>43</sup>	mu <sup>43</sup>	mu <sup>32</sup>	mu <sup>54</sup>	mu <sup>55</sup>	mu <sup>54</sup>
‘to have’	<i>muax</i>	*mai	A2	ma <sup>41</sup>	m̥ua <sup>42</sup>	mu <sup>41</sup>	mu <sup>31</sup>	mu <sup>31</sup>	mu <sup>42</sup>	mu <sup>42</sup>	mu <sup>42</sup>
‘fine, thin’	<i>maol</i>	*m̥ɔn	B2	m̥aʊ <sup>22</sup>	m̥aʊ <sup>33</sup>	m̥aʊ <sup>21</sup>	m̥aʊ <sup>21</sup>	m̥aʊ <sup>21</sup>	m̥aʊ <sup>33</sup>	m̥ɔ <sup>33</sup>	m̥aʊ <sup>22</sup>
‘wolf’	<i>hmangt</i>	- <sup>39</sup>	-	m̥i <sup>1</sup> aŋ <sup>44</sup>	m̥ã <sup>44</sup>	tʰei <sup>55</sup> z̥i <sup>21</sup>	ts <sup>h</sup> a <sup>31</sup> kəu <sup>55</sup>	m̥aŋ <sup>44</sup>	m̥aŋ <sup>44</sup>	m̥aŋ <sup>33</sup>	ʔdi <sup>35</sup> tɔ̃ <sup>22</sup>
‘night’	<i>hmaot</i>	*m̥ɔn	C1	m̥au <sup>44</sup>	m̥ɔu <sup>44</sup>	m̥au <sup>44</sup>	m̥au <sup>24</sup>	m̥au <sup>44</sup>	m̥au <sup>44</sup>	m̥a <sup>44</sup>	m̥au <sup>44</sup>
‘Hmong’	<i>hmongb</i>	*m̥ɔŋ	A1	m̥oŋ <sup>55</sup>	m̥oŋm̥ <sup>53</sup>	m̥oŋ <sup>43</sup>	m̥oŋ <sup>43</sup>	m̥oŋ <sup>32</sup>	m̥oŋ <sup>54</sup>	m̥oŋm̥ <sup>55</sup>	m̥oŋ <sup>54</sup>
‘vine’	<i>hmangb</i>	*m̥ɔaŋ	A1	m̥aŋ <sup>55</sup>	m̥ã <sup>53</sup>	m̥aŋ <sup>43</sup>	m̥aŋ <sup>43</sup>	m̥aŋ <sup>32</sup>	m̥aŋ <sup>54</sup>	m̥aŋ <sup>55</sup>	m̥aŋ <sup>54</sup>

**Table 8:** Alveolar and retroflex nasals \*ʔn-, \*n-, \*mn-, \*ʔŋ-, \*ŋ-, \*mz-, \*n-, \*m̥n-

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘cold’	<i>naot</i>	*ʔnɔŋ	C1	nau <sup>44</sup>	n̥au <sup>44</sup>	nau <sup>44</sup>	nau <sup>24</sup>	nau <sup>44</sup>	nau <sup>44</sup>	n̥a <sup>44</sup>	nau <sup>44</sup>
‘snake’	<i>nangb</i>	*ʔnɛŋ	A1	naŋ <sup>55</sup>	n̥ã <sup>53</sup>	naŋ <sup>43</sup>	naŋ <sup>43</sup>	naŋ <sup>32</sup>	naŋ <sup>54</sup>	naŋ <sup>55</sup>	naŋ <sup>54</sup>
‘to eat’	<i>naox</i>	*nɔŋ	A2	nau <sup>41</sup>	n̥au <sup>42</sup>	nau <sup>41</sup>	nau <sup>31</sup>	nau <sup>31</sup>	nau <sup>42</sup>	n̥a <sup>42</sup>	nau <sup>42</sup>
‘horse’	<i>nenl</i>	*mnɛn	B2	nɛŋ <sup>22</sup>	nɛŋ <sup>33</sup>	nɛŋ <sup>21</sup>	nɛiŋ <sup>21</sup>	nɛŋ <sup>21</sup>	nɛŋ <sup>33</sup>	nɛŋ <sup>33</sup>	nɛŋ <sup>22</sup>
‘seed’	<i>nongb</i>	*ʔnɔŋ	A1	noŋ <sup>55</sup>	n̥oŋm̥ <sup>53</sup>	noŋ <sup>43</sup>	noŋ <sup>43</sup>	noŋ <sup>32</sup>	noŋ <sup>54</sup>	n̥oŋm̥ <sup>55</sup>	noŋ <sup>54</sup>
‘matter’	<i>nof</i>	*nɔn	D2	plau <sup>55</sup>	plou <sup>53</sup>	no <sup>212</sup>	plou <sup>43</sup>	noŋ <sup>213</sup>	n̥u <sup>33</sup>	plou <sup>55</sup>	plou <sup>54</sup>
‘bird’	<i>nongs</i>	*nuŋ	C2	nɔŋ <sup>33</sup>	n̥oŋm̥ <sup>22</sup>	nɔŋ <sup>22</sup>	nɔŋ <sup>22</sup>	nɔŋ <sup>22</sup>	nɔŋ <sup>33</sup>	n̥oŋm̥ <sup>33</sup>	nɔŋ <sup>33</sup>
‘to listen’	<i>nongs</i>	*mzɔŋ	C2	m̥i <sup>1</sup> ɔŋ <sup>33</sup>	m̥n̥oŋm̥ <sup>22</sup>	nɔŋ <sup>22</sup>	nɔŋ <sup>22</sup>	nɔŋ <sup>22</sup>	nɔŋ <sup>33</sup>	n̥oŋm̥ <sup>33</sup>	nɔŋ <sup>33</sup>
‘sun’	<i>hnongb</i>	*nɔn	A1	no <sup>55</sup>	n̥oŋm̥ <sup>53</sup>	noŋ <sup>43</sup>	noŋ <sup>43</sup>	noŋ <sup>32</sup>	no <sup>54</sup>	no <sup>55</sup>	noŋ <sup>54</sup>
‘to wear’	<i>hnangd</i>	*nɛŋ	B1	naŋ <sup>53</sup>	n̥ã <sup>34</sup>	naŋ <sup>55</sup>	naŋ <sup>55</sup>	naŋ <sup>55</sup>	naŋ <sup>35</sup>	naŋ <sup>35</sup>	naŋ <sup>35</sup>
‘to smell’	<i>hnat</i>	*m̥n̥in	C1	nai <sup>44</sup>	n̥iɛ <sup>44</sup>	na <sup>44</sup>	na <sup>24</sup>	na <sup>44</sup>	na <sup>44</sup>	na <sup>44</sup>	na <sup>44</sup>
‘tooth’	<i>hnab</i>	*m̥n̥in	B1	nai <sup>53</sup>	n̥iɛ <sup>34</sup>	na <sup>55</sup>	na <sup>55</sup>	na <sup>55</sup>	na <sup>35</sup>	na <sup>35</sup>	na <sup>35</sup>

<sup>39</sup> This word was not reconstructed in either Wang (1994) or Wang & Mao (1995). However, the reflex of this supposed Proto-Miao initial in *Shuat*, /m̥i<sup>1</sup>/, suggests a different PM onset not included in Wang’s reconstructions. It would appear to be the voiceless equivalent of \*mz-, which is realised as /m̥i<sup>1</sup>/ in *Shuat* (see Table 8). Oddly, though, PM \*m̥s- → /m̥i<sup>1</sup>/ in *Shuat*, not /m̥i<sup>1</sup>/, and a Proto-Miao onset \*m̥z- seems unlikely.

**Table 9:** Palatal and velar nasals \*ŋn-, \*n-, \*n̄-, \*ŋ-

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East N Zhuab</i>	<i>West N Zhuab</i>
‘at’	<i>nyaob</i>	*ŋn̄.ɔn	A1	ŋau <sup>55</sup>	ŋau <sup>53</sup>	ŋau <sup>43</sup>	ŋau <sup>43</sup>	ŋau <sup>32</sup>	ŋau <sup>54</sup>	ŋa <sup>55</sup>	ŋau <sup>54</sup>
‘daughter-in-law’	<i>nyangb</i>	*ŋn̄.ɛŋ	A1	ŋaŋ <sup>55</sup>	ŋã <sup>53</sup>	ŋaŋ <sup>43</sup>	ŋaŋ <sup>43</sup>	ŋaŋ <sup>32</sup>	ŋaŋ <sup>54</sup>	ŋaŋ <sup>55</sup>	ŋaŋ <sup>54</sup>
‘raw’	<i>nyongl</i>	*n̄auŋ	B2	ŋoŋ <sup>22</sup>	ŋoŋm̄ <sup>33</sup>	ŋo <sup>21</sup>	ŋoŋ <sup>21</sup>	ŋu <sup>21</sup>	ŋoŋ <sup>33</sup>	ŋoŋm̄ <sup>33</sup>	ŋoŋ <sup>22</sup>
‘cow’	<i>nyox</i>	*n̄æn	A2	ŋo <sup>41</sup>	ŋoŋm̄ <sup>42</sup>	ŋo <sup>41</sup>	ŋu <sup>31</sup>	ŋo <sup>31</sup>	ŋo <sup>42</sup>	ŋo <sup>42</sup>	ŋu <sup>42</sup>
‘intestines’	<i>hnyod</i>	*n̄æn	B1	ŋo <sup>53</sup>	ŋoŋm̄ <sup>34</sup>	ŋo <sup>55</sup>	ŋu <sup>55</sup>	ŋu <sup>55</sup>	ŋo <sup>35</sup>	ŋo <sup>35</sup>	ŋu <sup>35</sup>
‘heavy’	<i>hnyangd</i>	*n̄aŋ	B1	ŋaŋ <sup>53</sup>	ŋã <sup>34</sup>	ŋaŋ <sup>55</sup>	ŋaŋ <sup>55</sup>	ŋaŋ <sup>55</sup>	ŋaŋ <sup>35</sup>	ŋaŋ <sup>35</sup>	ŋaŋ <sup>35</sup>
‘goose’	<i>nggol</i>	*ŋon	B2	ŋo <sup>22</sup>	ŋo <sup>33</sup>	ŋkɔ <sup>21</sup>	ŋu <sup>21</sup>	ŋo <sup>21</sup>	ŋo <sup>33</sup>	ŋo <sup>33</sup>	ŋu <sup>22</sup>

**Table 10:** Lateral affricates \*ql-, \*gl-, \*ql̄-, \*qlw-, \*glw- and stops \*k-, \*c-, \*t̄-

English	SWM	PM	PM tone	<i>Shuat</i>	<i>Dleub</i>	<i>Soud</i>	<i>Bes</i>	<i>Buak</i>	<i>Shib</i>	<i>East N Zhuab</i>	<i>West N Zhuab</i>
‘dog’	<i>dled</i>	*qlæ	B1	ŋle <sup>53</sup>	ŋdei <sup>34</sup>	t̄lei <sup>55</sup>	t̄lei <sup>55</sup>	ŋlei <sup>55</sup>	t̄le <sup>35</sup>	t̄lei <sup>35</sup>	ŋde <sup>35</sup>
‘peach’	<i>dhuax</i>	*gla	A2	ŋla <sup>41</sup>	ŋdua <sup>42</sup>	t̄tua <sup>41</sup>	t̄tua <sup>31</sup>	ŋlua <sup>31</sup>	t̄tua <sup>42</sup>	t̄tua <sup>42</sup>	ŋdua <sup>42</sup>
‘ghost’	<i>dlangb</i>	*qlɛŋ	A1	ŋlaŋ <sup>55</sup>	ŋdã <sup>53</sup>	t̄laŋ <sup>43</sup>	t̄laŋ <sup>43</sup>	ŋlaŋ <sup>32</sup>	t̄laŋ <sup>54</sup>	t̄laŋ <sup>55</sup>	ŋdaŋ <sup>54</sup>
‘to tear’	<i>dhuat</i>	*qlau	C1	ŋla <sup>44</sup>	ŋdua <sup>44</sup>	t̄tua <sup>44</sup>	t̄tua <sup>24</sup>	ŋlua <sup>44</sup>	t̄tua <sup>44</sup>	t̄tua <sup>44</sup>	ŋdua <sup>44</sup>
‘to pass’	<i>dhuat</i>	*qlwau	C1	ŋlou <sup>44</sup>	ŋdua <sup>44</sup>	t̄tua <sup>44</sup>	t̄tua <sup>24</sup>	kua <sup>44</sup>	t̄tua <sup>44</sup>	t̄ <sup>h</sup> au <sup>44</sup>	ŋt̄ <sup>h</sup> ou <sup>44</sup>
‘wide’	<i>dlangd</i>	*qlwɛŋ	B1	ŋlaŋ <sup>53</sup>	ŋdã <sup>34</sup>	t̄laŋ <sup>55</sup>	t̄laŋ <sup>55</sup>	kaŋ <sup>55</sup>	t̄laŋ <sup>35</sup>	t̄laŋ <sup>35</sup>	ŋdaŋ <sup>35</sup>
‘yellow’	<i>dlangx</i>	*glwɛŋ	A2	ŋlaŋ <sup>41</sup>	ŋdã <sup>42</sup>	t̄laŋ <sup>41</sup>	t̄laŋ <sup>31</sup>	kaŋ <sup>31</sup>	t̄laŋ <sup>42</sup>	t̄laŋ <sup>42</sup>	ŋdaŋ <sup>42</sup>
‘cucumber’	<i>dlib</i>	*qlwa	A1	ŋli <sup>55</sup>	ŋdi <sup>53</sup>	t̄li <sup>33</sup>	t̄li <sup>43</sup>	ci <sup>32</sup>	t̄li <sup>54</sup>	t̄li <sup>55</sup>	ŋdi <sup>54</sup>
‘far’	<i>dleb</i>	*qlwæ	A1	ŋle <sup>55</sup>	ŋdei <sup>53</sup>	t̄lei <sup>43</sup>	t̄lei <sup>43</sup>	ci <sup>32</sup>	t̄le <sup>54</sup>	t̄lei <sup>55</sup>	ŋde <sup>54</sup>
‘insect’	<i>gangb</i>	*keŋ	A1	kaŋ <sup>55</sup>	cã <sup>53</sup>	kaŋ <sup>43</sup>	kaŋ <sup>43</sup>	kaŋ <sup>32</sup>	kaŋ <sup>54</sup>	kaŋ <sup>55</sup>	kaŋ <sup>54</sup>
‘needle’	<i>gongb</i>	*cuŋ	A1	koŋ <sup>55</sup>	koŋm̄ <sup>53</sup>	koŋ <sup>43</sup>	koŋ <sup>43</sup>	koŋ <sup>32</sup>	koŋ <sup>54</sup>	koŋm̄ <sup>55</sup>	koŋ <sup>54</sup>
‘soup’	<i>guat</i>	*ka	B1	ka <sup>53</sup>	kua <sup>44</sup>	kua <sup>44</sup>	kua <sup>24</sup>	kua <sup>44</sup>	kua <sup>44</sup>	kua <sup>44</sup>	kua <sup>44</sup>
‘I, me’	<i>god</i>	*con	B1	ko <sup>53</sup>	ko <sup>34</sup>	ɔo <sup>55</sup>	ku <sup>55</sup>	ko <sup>32</sup>	ko <sup>35</sup>	ko <sup>35</sup>	ku <sup>35</sup>
‘road’	<i>ged</i>	*kæ	B1	ke <sup>53</sup>	kei <sup>34</sup>	ci <sup>55</sup>	ci <sup>55</sup>	ci <sup>45</sup>	ci <sup>35</sup>	ci <sup>35</sup>	ki <sup>35</sup>
‘to stir-fry’	<i>gib</i>	*ke	A1	ci <sup>55</sup>	ci <sup>53</sup>	ci <sup>43</sup>	ci <sup>43</sup>	ci <sup>32</sup>	ci <sup>54</sup>	ci <sup>55</sup>	ki <sup>54</sup>
‘craftsman’	<i>guk</i>	-	-	kɕ <sup>33</sup>	kɕ <sup>33</sup>	kɕ <sup>33</sup>	kɕ <sup>33</sup>	kɕ <sup>33</sup>	kɕ <sup>33</sup>	kɕ <sup>33</sup>	kɕ <sup>33</sup>
‘ten’	<i>gouf</i>	*jə	D2	kou <sup>21</sup>	kou <sup>21</sup>	kou <sup>212</sup>	kou <sup>212</sup>	kəɕ <sup>213</sup>	kou <sup>21</sup>	kau <sup>21</sup>	kou <sup>22</sup>
‘to pass’	<i>tlout</i>	-	-	ŋlou <sup>44</sup>	ŋt̄ <sup>h</sup> ou <sup>44</sup>	t̄tua <sup>44</sup>	t̄ <sup>h</sup> ou <sup>24</sup>	kua <sup>44</sup>	t̄ <sup>h</sup> ou <sup>44</sup>	t̄ <sup>h</sup> au <sup>44</sup>	ŋt̄ <sup>h</sup> ou <sup>44</sup>
‘to jump’	<i>tlat</i>	-	-	ŋlai <sup>44</sup>	ŋt̄ <sup>h</sup> ie <sup>44</sup>	t̄ <sup>h</sup> a <sup>44</sup>	t̄ <sup>h</sup> a <sup>24</sup>	ŋt̄ <sup>h</sup> a <sup>44</sup>	t̄ <sup>h</sup> a <sup>44</sup>	t̄ <sup>h</sup> a <sup>44</sup>	ŋt̄ <sup>h</sup> a <sup>44</sup>

**Table 11:** Pre-nasalised lateral affricates \*Ngl-, \*Nql-  
Words with PM initial \*nt- are given for comparison.

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘ragged’	<i>ndruas</i>	*Nglou	C2	mpla <sup>33</sup>	ntuq <sup>22</sup>	ŋtjuq <sup>22</sup>	ntfjuq <sup>22</sup>	ɣlu <sup>44</sup>	ntfjuq <sup>33</sup>	ntfjuq <sup>33</sup>	ŋtjuq <sup>33</sup>
‘to flow’	<i>ndul</i>	*Nglu	B2	ntɰ <sup>22</sup>	ntɰ <sup>33</sup>	ntɰ <sup>21</sup>	ntfɰ <sup>21</sup>	ntɰ <sup>21</sup>	ntfɰ <sup>33</sup>	ntfɰ <sup>33</sup>	ntɰ <sup>22</sup>
‘shallow’	<i>ndad</i>	*Nqlin or *Nqlæn <sup>40</sup>	B1 <sup>40</sup>	nej <sup>22</sup>	ntie <sup>34</sup>	nta <sup>55</sup>	ntla <sup>55</sup>	nta <sup>55</sup>	ntla <sup>35</sup>	ntla <sup>35</sup>	nta <sup>35</sup>
‘sky’	<i>ndox</i>	*Nglwon	A2	nto <sup>41</sup>	nto <sup>42</sup>	nto <sup>41</sup>	ntu <sup>31</sup>	nto <sup>31</sup>	nto <sup>42</sup>	nto <sup>42</sup>	ntu <sup>42</sup>
‘to weave’	<i>ndok</i>	*nto	D1	ntau <sup>33</sup>	ntau <sup>33</sup>	nto <sup>33</sup>	ntu <sup>33</sup>	nto <sup>33</sup>	nto <sup>33</sup>	nto <sup>33</sup>	ntu <sup>33</sup>
‘to vomit’	<i>nduad</i>	-	-	nta <sup>53</sup>	ntua <sup>34</sup>	ntua <sup>55</sup>	ntua <sup>55</sup>	ntua <sup>45</sup>	ntua <sup>35</sup>	ntua <sup>35</sup>	ntua <sup>35</sup>
‘wet’	<i>ndob</i>	*nton	A1	nto <sup>55</sup>	nto <sup>53</sup>	nto <sup>43</sup>	ntu <sup>43</sup>	nto <sup>32</sup>	nto <sup>54</sup>	nto <sup>55</sup>	ntu <sup>54</sup>

**Table 12:** Retroflex stops and affricates \*ɖ-, \*tɭ-, \*dl-, \*tɖ-, \*dz-, \*tɰ-, \*tɰh-  
Note that there are no examples of \*tɭ- in our word list.

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘chopsticks’	<i>dreus</i>	*ɖeu	C2	tɰɰ <sup>33</sup>	tɰu <sup>22</sup>	tɰɰ <sup>21,2</sup>	tɰu <sup>22</sup>	tɰie <sup>22</sup>	tɰɰ <sup>33</sup>	tɰɰ <sup>33</sup>	tɰɰ <sup>33</sup>
‘table’	<i>drongx</i>	*ɖuŋ	A2	tɰoŋ <sup>41</sup>	tɰoŋm <sup>42</sup>	tɰoŋ <sup>41</sup>	tɰoŋ <sup>31</sup>	tɰoŋ <sup>31</sup>	tɰoŋ <sup>42</sup>	tɰoŋm <sup>42</sup>	tɰoŋ <sup>42</sup>
‘to laugh’	<i>drok</i>	*tɰo	D1	tɰau <sup>33</sup>	lɰu <sup>22</sup>	tɰo <sup>33</sup>	tɰu <sup>33</sup>	tɰo <sup>33</sup>	tɰo <sup>33</sup>	lɰu <sup>33</sup>	lɰu <sup>33</sup>
‘to burn’	<i>droud</i>	*tɰou	B1	tɰou <sup>53</sup>	tɰou <sup>34</sup>	tɰou <sup>55</sup>	tɰou <sup>55</sup>	tɰɰ <sup>45</sup>	tɰou <sup>35</sup>	tɰau <sup>35</sup>	tɰou <sup>35</sup>
‘oil’	<i>draox</i>	*ɖɰon	A2	tɰau <sup>41</sup>	tɰau <sup>42</sup>	tɰau <sup>41</sup>	tɰau <sup>31</sup>	tɰau <sup>31</sup>	tɰau <sup>42</sup>	tɰa <sup>42</sup>	tɰau <sup>42</sup>
‘smelly’	<i>jut</i>	*tɰsu	C1	tɰɰ <sup>44</sup>	tɰɰ <sup>44</sup>	tɰɰ <sup>44</sup>	tɰɰ <sup>24</sup>	tɰɰ <sup>44</sup>	tɰɰ <sup>44</sup>	tɰɰ <sup>44</sup>	tɰɰ <sup>44</sup>
‘rice steamer’	<i>zhot</i>	*tɰson	C1	tɰo <sup>44</sup>	tɰo <sup>44</sup>	tɰo <sup>44</sup>	tɰu <sup>24</sup>	tɰo <sup>44</sup>	tɰo <sup>44</sup>	tɰo <sup>44</sup>	tɰu <sup>44</sup>
‘bland’	<i>zhuas</i>	*ɖza	C2	tɰa <sup>33</sup>	tɰuq <sup>22</sup>	tɰuq <sup>22</sup>	tɰu <sup>22</sup>	tɰuq <sup>22</sup>	tɰuq <sup>33</sup>	tɰuq <sup>33</sup>	tɰuq <sup>33</sup>
‘few’	<i>zheus</i>	*ɖzeu	C2	tɰɰ <sup>33</sup>	tɰɰ <sup>22</sup>	tɰɰ <sup>22</sup>	tɰɰ <sup>22</sup>	tɰie <sup>22</sup>	tɰɰ <sup>33</sup>	tɰɰ <sup>33</sup>	tɰɰ <sup>33</sup>
‘to insert’	<i>traik</i>	*tɰhei	D1	tɰ <sup>h</sup> ei <sup>33</sup>	tɰ <sup>h</sup> ai <sup>33</sup>	tɰ <sup>h</sup> a <sup>33</sup>	tɰ <sup>h</sup> ai <sup>33</sup>	tɰ <sup>h</sup> ai <sup>33</sup>	tɰ <sup>h</sup> ai <sup>33</sup>	tɰ <sup>h</sup> ai <sup>33</sup>	tɰ <sup>h</sup> ai <sup>33</sup>
‘hungry’	<i>chaib</i>	*tɰshei	A1	tɰ <sup>h</sup> ei <sup>55</sup>	tɰ <sup>h</sup> ai <sup>53</sup>	tɰ <sup>h</sup> a <sup>43</sup>	tɰ <sup>h</sup> ai <sup>43</sup>	tɰ <sup>h</sup> ai <sup>32</sup>	tɰ <sup>h</sup> ai <sup>54</sup>	tɰ <sup>h</sup> ai <sup>55</sup>	tɰ <sup>h</sup> ai <sup>54</sup>
‘new’	<i>chab</i>	*tɰshin	A1	tɰ <sup>h</sup> ai <sup>55</sup>	tɰ <sup>h</sup> ie <sup>53</sup>	tɰ <sup>h</sup> a <sup>43</sup>	tɰ <sup>h</sup> a <sup>43</sup>	tɰ <sup>h</sup> a <sup>32</sup>	tɰ <sup>h</sup> a <sup>54</sup>	tɰ <sup>h</sup> a <sup>55</sup>	tɰ <sup>h</sup> a <sup>54</sup>

<sup>40</sup> Wang (1994) did not reconstruct the Proto-Miao for this word. Based on its reflexes in Wenshan Hmong varieties, the authors propose PM \*Nqlin or PM \*Nqlæn and PM tone B1.

**Table 13:** Finals \*au, \*ɔn, \*ɔŋ, \*o, \*on, \*ən, \*u, \*əŋ

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
'two'	<i>aob</i>	*ʔau	A1	ʔau <sup>55</sup>	ʔau <sup>53</sup>	ʔau <sup>43</sup>	ʔau <sup>43</sup>	ʔau <sup>32</sup>	ʔau <sup>54</sup>	ʔa <sup>55</sup>	ʔau <sup>54</sup>
'to thread'	<i>qaob</i>	*tɕhɔn	A1	tɕ <sup>h</sup> au <sup>55</sup>	tɕ <sup>h</sup> au <sup>53</sup>	tɕ <sup>h</sup> au <sup>43</sup>	tɕ <sup>h</sup> au <sup>43</sup>	tɕ <sup>h</sup> ie <sup>32</sup>	tɕ <sup>h</sup> au <sup>54</sup>	tɕ <sup>h</sup> a <sup>55</sup>	tɕ <sup>h</sup> au <sup>54</sup>
'oil'	<i>draox</i>	*dʎɔn	A2	tʃau <sup>41</sup>	ʈau <sup>42</sup>	tʃau <sup>41</sup>	tʃau <sup>31</sup>	tʃau <sup>31</sup>	tʃau <sup>42</sup>	tʃa <sup>42</sup>	ʈau <sup>42</sup>
'ill'	<i>maob</i>	*ʔmɔŋ	A1	mau <sup>55</sup>	mɔu <sup>53</sup>	mau <sup>43</sup>	mau <sup>43</sup>	mau <sup>32</sup>	mau <sup>54</sup>	ma <sup>55</sup>	mau <sup>54</sup>
'to eat'	<i>naox</i>	*nɔŋ	A2	nau <sup>41</sup>	nau <sup>42</sup>	nau <sup>41</sup>	nau <sup>31</sup>	nau <sup>31</sup>	nau <sup>42</sup>	na <sup>42</sup>	nau <sup>42</sup>
'hillside'	<i>daox</i>	-	-	tau <sup>33</sup>	tau <sup>42</sup>	tau <sup>41</sup>	tau <sup>31</sup>	tau <sup>31</sup>	tau <sup>42</sup>	ta <sup>42</sup>	tau <sup>42</sup>
'strength'	<i>ros</i>	*vzɔ	C2	v <sup>ʃ</sup> au <sup>33</sup>	ʒau <sup>22</sup>	zɔ <sup>22</sup>	ʒu <sup>22</sup>	ʒɔ <sup>22</sup>	zɔ <sup>33</sup>	zɔ <sup>33</sup>	zɯ <sup>33</sup>
'deep'	<i>dob</i>	*to	A1	tau <sup>55</sup>	tau <sup>53</sup>	to <sup>43</sup>	tu <sup>43</sup>	to <sup>32</sup>	to <sup>54</sup>	to <sup>55</sup>	tu <sup>54</sup>
'to see'	<i>bof</i>	*bo	D2	pau <sup>21</sup>	pau <sup>21</sup>	po <sup>212</sup>	pu <sup>212</sup>	po <sup>33</sup>	po <sup>21</sup>	po <sup>21</sup>	pu <sup>22</sup>
'wormwood'	<i>shod</i>	*fɕɔn	B1	f <sup>ʃ</sup> o <sup>53</sup>	ʃo <sup>34</sup>	ʃo <sup>55</sup>	ʃu <sup>55</sup>	ʃo <sup>55</sup>	ʃo <sup>35</sup>	ʃo <sup>35</sup>	ʃu <sup>35</sup>
'horn'	<i>gob</i>	*kon	A1	ko <sup>55</sup>	ko <sup>53</sup>	ko <sup>43</sup>	ku <sup>43</sup>	ko <sup>32</sup>	ko <sup>54</sup>	ko <sup>55</sup>	ku <sup>54</sup>
'black'	<i>dlob</i>	*qlɔn	A1	ʔlo <sup>55</sup>	ʔdo <sup>53</sup>	t <sup>ʃ</sup> o <sup>43</sup>	t <sup>ʃ</sup> u <sup>43</sup>	ʔlo <sup>32</sup>	t <sup>ʃ</sup> o <sup>54</sup>	t <sup>ʃ</sup> o <sup>55</sup>	ʔdu <sup>54</sup>
'intestines'	<i>hnyod</i>	*n <sup>ʃ</sup> ən	B1	n <sup>ʃ</sup> o <sup>53</sup>	n <sup>ʃ</sup> oŋm <sup>34</sup>	n <sup>ʃ</sup> o <sup>55</sup>	n <sup>ʃ</sup> u <sup>55</sup>	n <sup>ʃ</sup> o <sup>55</sup>	n <sup>ʃ</sup> o <sup>35</sup>	n <sup>ʃ</sup> o <sup>35</sup>	n <sup>ʃ</sup> u <sup>35</sup>
'cow'	<i>nyox</i>	*n <sup>ʃ</sup> ən	A2	n <sup>ʃ</sup> o <sup>41</sup>	n <sup>ʃ</sup> oŋm <sup>42</sup>	n <sup>ʃ</sup> o <sup>41</sup>	n <sup>ʃ</sup> u <sup>31</sup>	n <sup>ʃ</sup> o <sup>31</sup>	n <sup>ʃ</sup> o <sup>42</sup>	n <sup>ʃ</sup> o <sup>42</sup>	n <sup>ʃ</sup> u <sup>42</sup>
'needle'	<i>gongb</i>	*cuŋ	A1	koŋ <sup>55</sup>	koŋm <sup>53</sup>	koŋ <sup>43</sup>	koŋ <sup>43</sup>	koŋ <sup>32</sup>	koŋ <sup>54</sup>	koŋm <sup>55</sup>	koŋ <sup>54</sup>
'raw'	<i>nyongl</i>	*n <sup>ʃ</sup> uŋ	B2	n <sup>ʃ</sup> oŋ <sup>22</sup>	n <sup>ʃ</sup> oŋm <sup>33</sup>	(n <sup>ʃ</sup> o <sup>21</sup> )	n <sup>ʃ</sup> oŋ <sup>21</sup>	n <sup>ʃ</sup> oŋ <sup>21</sup>	n <sup>ʃ</sup> oŋ <sup>33</sup>	n <sup>ʃ</sup> oŋm <sup>33</sup>	n <sup>ʃ</sup> oŋ <sup>22</sup>
'to fall'	<i>bongb</i>	*pəŋ	A1	poŋ <sup>55</sup>	poŋm <sup>53</sup>	poŋ <sup>43</sup>	poŋ <sup>43</sup>	poŋ <sup>32</sup>	poŋ <sup>54</sup>	poŋm <sup>55</sup>	poŋ <sup>54</sup>
'Hmong'	<i>hmongb</i>	*m <sup>ʃ</sup> əŋ	A1	m <sup>ʃ</sup> oŋ <sup>55</sup>	m <sup>ʃ</sup> oŋm <sup>53</sup>	m <sup>ʃ</sup> oŋ <sup>43</sup>	m <sup>ʃ</sup> oŋ <sup>43</sup>	m <sup>ʃ</sup> oŋ <sup>32</sup>	m <sup>ʃ</sup> oŋ <sup>54</sup>	m <sup>ʃ</sup> oŋm <sup>55</sup>	m <sup>ʃ</sup> oŋ <sup>54</sup>



**Table 14:** Front vowel finals \*a, \*æ, \*ei, \*in, \*æn before palatals

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘eight’	<i>yif</i>	*za	D2	zi <sup>21</sup>	zi <sup>33</sup>	zi <sup>21</sup>	zi <sup>22</sup>	zi <sup>21</sup>	zi <sup>22</sup>	zi <sup>21</sup>	zi <sup>22</sup>
‘cucumber’	<i>dlib</i>	*qlwa	A1	ʔli <sup>55</sup>	ʔdi <sup>53</sup>	tʃi <sup>33</sup>	tʃi <sup>43</sup>	ci <sup>32</sup>	tʃi <sup>54</sup>	tʃi <sup>55</sup>	ʔdi <sup>54</sup>
‘wing’	<i>dik</i>	*ta	D1	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>
‘buckwheat’	<i>jex</i>	*dzæ	A2	tɕe <sup>41</sup>	tɕi <sup>42</sup>	tɕi <sup>41</sup>	tɕi <sup>31</sup>	tɕi <sup>31</sup>	tɕi <sup>42</sup>	tɕi <sup>42</sup>	tɕi <sup>42</sup>
‘to sweep’	<i>qeb</i>	*tɕhæ	A1	tɕ <sup>h</sup> e <sup>55</sup>	tɕ <sup>h</sup> i <sup>53</sup>	tɕ <sup>h</sup> i <sup>43</sup>	tɕ <sup>h</sup> i <sup>43</sup>	tɕ <sup>h</sup> i <sup>32</sup>	tɕ <sup>h</sup> i <sup>54</sup>	tɕ <sup>h</sup> i <sup>55</sup>	tɕ <sup>h</sup> i <sup>54</sup>
‘road’	<i>ged</i>	*kæ	B1	ke <sup>53</sup>	kei <sup>34</sup>	ci <sup>55</sup>	ci <sup>55</sup>	ci <sup>55</sup>	ci <sup>35</sup>	ci <sup>35</sup>	ki <sup>35</sup>
‘nest’	<i>rel</i>	*vzæ	B2	v <sup>l</sup> ɛ <sup>22</sup>	zei <sup>33</sup>	zei <sup>21</sup>	zei <sup>21</sup>	zei <sup>21</sup>	ze <sup>33</sup>	zei <sup>33</sup>	ze <sup>22</sup>
‘long’	<i>nded</i>	*ntæ	B1	n <sup>l</sup> te <sup>53</sup>	n <sup>l</sup> tei <sup>34</sup>	n <sup>l</sup> tei <sup>55</sup>	n <sup>l</sup> te <sup>55</sup>	n <sup>l</sup> tei <sup>55</sup>	n <sup>l</sup> te <sup>35</sup>	n <sup>l</sup> tei <sup>35</sup>	n <sup>l</sup> te <sup>35</sup>
‘to lick’	<i>yaif</i>	*zei	D2	jei <sup>21</sup>	zai <sup>21</sup>	za <sup>212</sup>	zai <sup>212</sup>	zai <sup>213</sup>	zai <sup>21</sup>	zai <sup>21</sup>	jai <sup>22</sup>
‘to hide’	<i>raik</i>	*ʔvzɛi	D1	v <sup>l</sup> ɛi <sup>33</sup>	ʒai <sup>33</sup>	ntsə <sup>h</sup> <sup>33</sup>	ntsə <sup>h</sup> <sup>33</sup>	ntɕie <sup>33</sup>	zai <sup>33</sup>	zai <sup>33</sup>	zai <sup>33</sup>
‘to mow’	<i>hlaik</i>	*lei	D1	lei <sup>33</sup>	lai <sup>33</sup>	la <sup>33</sup>	lai <sup>33</sup>	lai <sup>33</sup>	lai <sup>33</sup>	lai <sup>33</sup>	lai <sup>33</sup>
‘bear’	<i>dlaik</i>	*qlei	D1	ʔlei <sup>33</sup>	ʔdai <sup>33</sup>	tʃai <sup>33</sup>	tʃai <sup>33</sup>	ʔlai <sup>33</sup>	tʃai <sup>33</sup>	tʃai <sup>33</sup>	ʔdai <sup>33</sup>
‘wok’	<i>yal</i>	*vzin	B2	zei <sup>22</sup>	zie <sup>33</sup>	za <sup>21</sup>	za <sup>21</sup>	za <sup>21</sup>	zə <sup>33</sup>	zə <sup>33</sup>	zə <sup>22</sup>
‘to live’	<i>jax</i>	*dzin	A2	tɕei <sup>41</sup>	tɕie <sup>42</sup>	tɕa <sup>41</sup>	tɕa <sup>31</sup>	tɕa <sup>31</sup>	tɕa <sup>42</sup>	tɕa <sup>42</sup>	tɕa <sup>42</sup>
‘silver’	<i>nyax</i>	*nin	A2	nei <sup>41</sup>	nie <sup>42</sup>	na <sup>41</sup>	na <sup>31</sup>	na <sup>31</sup>	na <sup>42</sup>	na <sup>42</sup>	na <sup>42</sup>
‘skirt’	<i>dab</i>	*tin	A1	tai <sup>55</sup>	tie <sup>53</sup>	ta <sup>43</sup>	ta <sup>43</sup>	ta <sup>32</sup>	ta <sup>54</sup>	ta <sup>55</sup>	ta <sup>54</sup>
‘red’	<i>lab</i>	*ʔlin	A1	lai <sup>55</sup>	lie <sup>53</sup>	la <sup>43</sup>	la <sup>43</sup>	la <sup>32</sup>	la <sup>54</sup>	la <sup>55</sup>	la <sup>54</sup>
‘thin’	<i>nyal</i>	*næn	B2	nei <sup>22</sup>	nie <sup>33</sup>	na <sup>21</sup>	na <sup>21</sup>	na <sup>22</sup>	na <sup>33</sup>	na <sup>33</sup>	na <sup>22</sup>
‘thousand’	<i>cab</i>	*tshæn	A1	ts <sup>h</sup> ai <sup>55</sup>	ts <sup>h</sup> ie <sup>53</sup>	ts <sup>h</sup> a <sup>43</sup>	ts <sup>h</sup> a <sup>43</sup>	ts <sup>h</sup> a <sup>32</sup>	ts <sup>h</sup> ɛŋ <sup>54</sup>	ts <sup>h</sup> ɛŋ <sup>55</sup>	ts <sup>h</sup> a <sup>54</sup>
‘ripe’	<i>shad</i>	*sæn	B1	ʃai <sup>53</sup>	ʃie <sup>34</sup>	ʃa <sup>55</sup>	ʃa <sup>55</sup>	ʃa <sup>45</sup>	ʃa <sup>35</sup>	ʃa <sup>35</sup>	ʃa <sup>35</sup>
‘person’	<i>nens</i>	*næn	A2	moŋ <sup>55</sup>	neŋ <sup>22</sup>	neŋ <sup>43</sup>	neŋ <sup>43</sup>	neŋ <sup>32</sup>	neŋ <sup>33</sup>	neŋ <sup>33</sup>	neŋ <sup>33</sup>

**Table 15:** Front vowel finals \*a, \*æ, \*ei, \*in before uvulars

English	SWM	PM	PM tone	Shuat	Dleub	Soud	Bes	Buak	Shib	East Nzhuab	West Nzhuab
‘cucumber’	<i>dlib</i>	*qlwa	A1	ʔli <sup>55</sup>	ʔdi <sup>53</sup>	tʃi <sup>33</sup>	tʃi <sup>43</sup>	ci <sup>32</sup>	tʃi <sup>54</sup>	tʃi <sup>55</sup>	ʔdi <sup>54</sup>
‘wing’	<i>dik</i>	*ta	D1	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>	ti <sup>33</sup>
‘garlic’	<i>ghex</i>	*ga	A2	qe <sup>41</sup>	qei <sup>42</sup>	qei <sup>41</sup>	qei <sup>31</sup>	qai <sup>31</sup>	qe <sup>42</sup>	qei <sup>42</sup>	qe <sup>42</sup>
‘price’	<i>nghet</i>	*Nqa	C1	Nqe <sup>44</sup>	Nqei <sup>44</sup>	Nqei <sup>44</sup>	Nqei <sup>24</sup>	Nqai <sup>44</sup>	Nqe <sup>44</sup>	Nqei <sup>44</sup>	Nqe <sup>44</sup>
‘salt’	<i>nzhed</i>	*ntʃæ	B1	ntʃe <sup>53</sup>	ntʃei <sup>34</sup>	ntʃei <sup>55</sup>	ntʃei <sup>55</sup>	ntʃei <sup>55</sup>	ntʃe <sup>35</sup>	ntʃei <sup>35</sup>	ntʃe <sup>35</sup>
‘dog’	<i>dled</i>	*qlæ	B1	ʔle <sup>53</sup>	ʔdei <sup>34</sup>	tʃei <sup>55</sup>	tʃei <sup>55</sup>	ʔlei <sup>55</sup>	tʃe <sup>35</sup>	tʃei <sup>35</sup>	ʔde <sup>35</sup>
‘thirsty’	<i>nkhek</i>	*Nqhæ	D1	(Nq <sup>h</sup> i <sup>33</sup> )	Nq <sup>h</sup> ei <sup>33</sup>	Nq <sup>h</sup> ei <sup>33</sup>	Nq <sup>h</sup> ei <sup>33</sup>	Nq <sup>h</sup> ai <sup>33</sup>	Nq <sup>h</sup> e <sup>33</sup>	Nq <sup>h</sup> ei <sup>33</sup>	Nq <sup>h</sup> e <sup>33</sup>
‘egg’	<i>ghet</i>	*qwjæ	C1	qe <sup>44</sup>	qei <sup>44</sup>	qei <sup>44</sup>	qai <sup>24</sup>	qai <sup>44</sup>	qai <sup>44</sup>	qai <sup>44</sup>	qai <sup>44</sup>
‘hook’	<i>nghet</i>	*Nqæ	C1	kɔu <sup>33</sup>	Nqei <sup>44</sup>	Nqei <sup>44</sup>	Nqai <sup>24</sup>	Nqai <sup>44</sup>	Nqai <sup>44</sup>	Nqai <sup>44</sup>	Nqai <sup>44</sup>
‘tongue’	<i>nblais</i>	*mblei	D2	mplei <sup>21</sup>	mplai <sup>22</sup>	mpla <sup>22</sup>	mplai <sup>22</sup>	mplai <sup>22</sup>	mplai <sup>33</sup>	mplai <sup>33</sup>	mplai <sup>33</sup>
‘bear’	<i>dlaik</i>	*qlei	D1	ʔlei <sup>33</sup>	ʔdai <sup>33</sup>	tʃa <sup>33</sup>	tʃai <sup>33</sup>	ʔlai <sup>33</sup>	tʃai <sup>33</sup>	tʃai <sup>33</sup>	ʔdai <sup>33</sup>
‘hungry’	<i>chaib</i>	*tʃʃei	A1	tʃ <sup>h</sup> ei <sup>55</sup>	tʃ <sup>h</sup> ai <sup>53</sup>	tʃ <sup>h</sup> a <sup>43</sup>	tʃ <sup>h</sup> ai <sup>43</sup>	tʃ <sup>h</sup> ai <sup>32</sup>	tʃ <sup>h</sup> ai <sup>54</sup>	tʃ <sup>h</sup> ai <sup>55</sup>	tʃ <sup>h</sup> ai <sup>54</sup>
‘narrow’	<i>nghaif</i>	*Ngei <sup>41</sup>	D2	Nqei <sup>21</sup>	Nqai <sup>21</sup>	Nqa <sup>212</sup>	Nqai <sup>212</sup>	Nqai <sup>213</sup>	Nqai <sup>21</sup>	Nqai <sup>21</sup>	Nqai <sup>22</sup>
‘slanted’	<i>ghaix</i>	*gei	A2	qei <sup>41</sup>	qai <sup>42</sup>	qa <sup>41</sup>	qai <sup>31</sup>	qa <sup>31</sup>	qai <sup>42</sup>	qai <sup>42</sup>	qai <sup>42</sup>
‘meat’	<i>nghaix</i>	*Ngei <sup>41</sup>	A2	Nqai <sup>41</sup>	Nqai <sup>42</sup>	Nqa <sup>41</sup>	Nqa <sup>31</sup>	Nqa <sup>31</sup>	Nqa <sup>42</sup>	Nqa <sup>42</sup>	Nqai <sup>42</sup>
‘chicken’	<i>ghaib</i>	*qei	A1	qai <sup>55</sup>	qai <sup>53</sup>	qa <sup>43</sup>	qa <sup>43</sup>	qa <sup>32</sup>	qa <sup>54</sup>	qa <sup>55</sup>	qai <sup>54</sup>
‘to ladle’	<i>haik</i>	*hei	D1	hai <sup>33</sup>	ħai <sup>33</sup>	ħa <sup>33</sup>	ħa <sup>33</sup>	ħa <sup>33</sup>	ħa <sup>33</sup>	ħa <sup>33</sup>	ħai <sup>33</sup>
‘new’	<i>chab</i>	*tʃʃin	A1	tʃ <sup>h</sup> ai <sup>55</sup>	tʃ <sup>h</sup> ie <sup>53</sup>	tʃ <sup>h</sup> a <sup>43</sup>	tʃ <sup>h</sup> a <sup>43</sup>	tʃ <sup>h</sup> a <sup>32</sup>	tʃ <sup>h</sup> a <sup>54</sup>	tʃ <sup>h</sup> a <sup>55</sup>	tʃ <sup>h</sup> a <sup>54</sup>
‘mother’	<i>naf</i>	*mnin	D2	nai <sup>22</sup>	nie <sup>21</sup>	na <sup>212</sup>	na <sup>212</sup>	na <sup>213</sup>	nā <sup>21</sup>	na <sup>21</sup>	na <sup>22</sup>
‘skirt’	<i>dab</i>	*tin	A1	tai <sup>55</sup>	tiε <sup>53</sup>	ta <sup>43</sup>	ta <sup>43</sup>	ta <sup>32</sup>	ta <sup>54</sup>	ta <sup>55</sup>	ta <sup>54</sup>
‘level’	<i>dax</i>	*din	A2	tai <sup>41</sup>	tiε <sup>42</sup>	ta <sup>41</sup>	ta <sup>31</sup>	ta <sup>31</sup>	ta <sup>42</sup>	ta <sup>42</sup>	ta <sup>42</sup>
‘ginger’	<i>khad</i>	*qhwjin	B1	q <sup>h</sup> ai <sup>53</sup>	q <sup>h</sup> ie <sup>34</sup>	q <sup>h</sup> a <sup>55</sup>	q <sup>h</sup> a <sup>55</sup>	q <sup>h</sup> a <sup>45</sup>	q <sup>h</sup> a <sup>35</sup>	q <sup>h</sup> a <sup>35</sup>	q <sup>h</sup> a <sup>35</sup>

<sup>41</sup> Wang & Mao (1995) reconstruct different Proto-Miao-Yao (PMY) forms for these two words: ‘narrow’ PMY = \*Nge:p<sup>D</sup>; ‘meat’ PMY = \*NGwei<sup>A</sup>.

**Appendix B Pronunciation differences among Wenshan Hmong varieties**

The authors believe that phonological differences are far more significant than phonetic differences when trying to define dialect boundaries. However, we also found some interesting innovations in the phonetic realisations of some onsets and rhymes across the dialects. The following table summarises these differences. Phonetic deviations from Standard Western Miao are shaded in grey. Examples of these onsets and rhymes can be found in the data tables throughout this paper.

<b>SWM</b>	<b><i>Shuat</i></b>	<b><i>Dleub</i></b>	<b><i>Soud</i></b>	<b><i>Bes</i></b>	<b><i>Buak</i></b>	<b><i>Shib</i></b>	<b><i>East Nzhuab</i></b>	<b><i>West Nzhuab</i></b>
<i>dl</i>	ɣl	ɣd	tɬ	tɬ	ɣl	tɬ	tɬ	ɣd
<i>tl</i>	ɣl̥	ɣtʰ	tɬʰ	tɬʰ	ɣtʰ	tɬʰ	tɬʰ	ɣtʰ
<i>a</i>	ai	iɛ	a	a	a	a	a	a
<i>ao</i>	au	au	au	au	au	au	ɑ	au
<i>ou</i>	ɔu	ou	ou	ou	əɸ	ou	au	ou
<i>ang</i>	aŋ	ã, aŋ, a	aŋ	aŋ	aŋ	aŋ	aŋ	aŋ
<i>ua</i>	a	ua	ua	ua	ua	ua	ua	ua
<i>i / s, z__</i>	i	i, ɣ	ɣ	ɣ	ɣ	ɣ	ɣ	ɣ
<i>i / ʃ, ʒ__</i>	ɣ, ɣ	i, ɣ, ɣ	ɣ, ɣ	ɣ, ɣ	ɣ, ɣ	ɣ, ɣ	ɣ, ɣ	ɣ, ɣ
<i>eu</i>	əɸ	əɸ	əɸ	əɸ	iɛ	əɸ	əɸ	əɸ
<i>oŋ</i>	oŋ	oŋ̄m	oŋ	oŋ	oŋ	oŋ	oŋ̄m	oŋ

# LANGUAGE REPLACEMENT AND THE SPREAD OF TIBETO-BURMAN

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## 1. Introduction

There has been a long-standing tradition in historical linguistics to seek internal explanations for linguistic change whenever possible, and to acknowledge contact as a cause of language change only when there is overt evidence in the form of evidently borrowed forms or constructions. In recent years we have begun to pay more attention to the ways in which contact and “interrupted transmission” (in the sense of McWhorter 2007) can radically affect the structure of a language, involving creolization processes as well as more familiar substratum and borrowing effects. It has long been clear that this is a central part of the history of Sinitic; in this paper I will argue that is more widely applicable to the expansion of Tibeto-Burman, and is an essential concept for explaining the striking variation in morphological complexity which we find across the family.

## 2. Opaque and Transparent Morphological Structures in Tibeto-Burman

A major problem in comparative Tibeto-Burman is the wide divergence in morphological structure and typology which we find across the family. At one extreme, as in Kiranti, rGyalrong, and Kham, we find elaborate morphological structure in the verb, involving prefixes as well as suffixes, fused and portmanteau morphs, irregular morphophonemic alternations, verb agreement, transitivity indexing, including morphological reflexive and applicative constructions, inverse marking, directional marking, and more, organized into reasonably tight paradigms. At the other extreme, as in Lolo-Burmese, Bodo-Garo, Tani, and the Naga languages, we find loosely-organized, non-paradigmatic structure in the verb, consisting essentially of a large and miscellaneous collection of serialized verbs, auxiliaries, and particles in various stages of grammaticalization. These always include a large proportion of recently-grammaticalized and quite transparent constructions, which can be flung together relatively unsystematically to create a verbal construction. The first system is more familiar and easy to understand from the perspective of Indo-European studies, or North American or most African systems, but is quite remote from what we are accustomed to in Southeast Asia; the latter structure is more ordinary and familiar from a Southeast Asian perspective, but is much more difficult to describe in traditional grammatical terms. Although the question is still a matter of controversy, I will assume in this paper that the highly grammaticalized structure represents the older state of Tibeto-Burman, and that the creoloid pattern is innovative. I will argue that a major cause for this change in the branches where it has occurred involves language replacement or interrupted

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transmission, as a result of an older-type Tibeto-Burman language being adopted by speakers of other languages.

We can exemplify these two types with some examples from rGyalrong, a Qiangic language group of Sichuan, and the Bodo-Garo branch in Assam. Purely in terms of possible number of morphemes per word, the rGyalrong and Boro verbs are arguably similarly complex. But in terms of grammatical structure they are entirely different: rGyalrong has a tightly-organized, highly grammaticalized paradigmatic verbal structure, while Boro, like the Lolo-Burmese or Naga languages, has a very loosely-organized, unstructured string of verbal modifying elements.

Consider these forms from Japhug rGyalrong (Jacques 2008):

- 1) yu-ja-su-ye  
Cislocative-Aorist/3→3-Causative-come  
's/he invited her'
- 2) a-yu-thu-tu-khɿm  
Irrealis-Cislocative-Perfective:downstream-2-give  
'You will give it to me.'

The significant aspects of the rGyalrong morphology are: 1) it is strongly paradigmatic: each of the affixes in these examples occupies a specific slot in which it alternates with other affixes of the same category; 2) the ordering is fixed and grammatical, best described in terms of position classes, a verb template, or some such 3) much of it is fusional, e.g. in example (1) one prefix, *ja-*, indicates both aspect and person agreement, and participates in the inverse system; in example (2) one prefix, *thu-*, marks both aspect and directional orientation; 4) it includes argument indexation and other affixes whose meaning is purely syntactic, such as inverse, 3→3, etc; and 5) it involves both prefixes and suffixes.

At the other pole, exemplified by Bodo-Garo and Lolo-Burmese, we find strictly agglutinative (or even, in some of the Loloish languages, somewhat isolating) morphology, predominantly or exclusively suffixal, completely transparent and regular, essentially involving a large, ill-defined and semi-open set of postverbal elements, many easily identifiable as recently grammaticalized verbs, marking a broad and amorphous set of aspectual, modal, and adverbial concepts, with no agreement, and transitivity essentially irrelevant. Consider an illustrative Boro example:

- 3) dán-so-hwi-zwb-phin-lia-mwn  
cut-bisecting-at.a.distance-exhaustive-again-no.longer-past  
'no longer intend to cut all into two pieces horizontally someplace else again'

Here we have seven morphemes in one form (although there is more room for debate about whether to consider the Boro example a single word than there probably is in rGyalrong). Let us first note that, while our rGyalrong examples are from natural text, this Boro example is constructed; it is not common to find a verb with more than three, or occasionally four, morphemes in natural speech. On the other hand, if we want to construct

artificial examples, there is hardly any limit to what we can build. The late Sachin Chandra Basumatary, a Boro teacher and poet, used to use the example:<sup>42</sup>

- 4) minigaglabphlanlailaibaiswlan  
 ‘sometimes find ourselves just bursting out laughing uncontrollably together’  
 (approximately)

to illustrate the combinatorial potential of the verbal elements in Boro. This form consists of eight or ten morphemes (depending on how we count the instances of two different types of reduplication): *mini* ‘laugh’; *gaglab*, an emphatic partial reduplication of *glab*, an adverbial suffix specific to *mini* meaning ‘out loud, boisterously’; *phlan*, an adverbial suffix indicating that the action was performed contrary to the actor’s inclination or intention, *lai* ‘together, reciprocal’, here reduplicated, indicating that the actor was laughing along with someone else; and *bai* perfect aspect. (The last two syllables are not, strictly speaking, verbal elements: *sw* is a contrastive particle which can attach to any constituent of a sentence, and *lan* is a conflation of *lwi*, which marks an utterance as friendly discourse with someone familiar, and the 1<sup>st</sup> person pronoun *an*; this syllable could likewise cliticize to any constituent, not only to the verb). Examples like these will be very familiar to students of Lolo-Burmese languages, except that the general practice for those languages is to write the (mostly) postverbal elements as separate words rather than suffixes.

In contrast to rGyalrong, the Boro examples have the following characteristics: 1) the morphemes are not strictly paradigmatic: *-lia* in the first example is in a paradigmatic relationship with two other negative suffixes, otherwise none of the morphemes can be so described, i.e. none occupies a definable position slot in which it contrasts only with other grammatical affixes of the same category; 2) the ordering is more semantic than grammatical; while *-so* in the first example would always immediately follow the lexical verb, and *-lia-mwn*, in that order, could only be final, the other morphemes could occur in any order; 3) nothing is fusional, each morpheme carries a discrete meaning; 4) the most abstract meanings involved here are the aspectual implication of *-lia* and the counterfactuality provided by *-mwn* – there are no morphemes of purely syntactic function, and 5) the morphology is exclusively suffixal. (The Boro verb has a single productive prefix, the prohibitive *da-*, which is also, not coincidentally, the only element of the productive verbal morphology of Proto-Tibeto-Burman provenance).

The examples from both languages include morphemes which would require considerable explanation to clearly define. But in rGyalrong, this explication will involve a description of the grammar of the language, and in particular the complex system of transitivity, argument indexation, and hierarchical relations of person which are reflected in agreement and inverse marking. In Boro, each morpheme can, to a great extent, be explained in its own terms, and the most elaborate explanations will be of highly lexical concepts such as *-so*, which here describes cutting a long object into pieces horizontally, i.e. orthogonally to its length, as cutting a stick or log into shorter lengths, or *hwi*, which as a lexical verb means ‘to go somewhere to give someone something’, and as a verb suffix means ‘do in some place other than the current or last contextually-established location’. Overall, the rGyalrong verb is a tightly-constructed grammatical form, while the Boro verb is a loosely-concatenated string of semi-bound elements.

<sup>42</sup> I am indebted for this example to Bihung Brahma.

There has been much discussion in the literature of the question of which of these two types better represents the original structure of Proto-Tibeto-Burman. I and others (particularly George van Driem) have argued that the close correspondences among the paradigms of the languages and branches of the first type can be explained only if they are cognate, and that the distribution of these paradigms across the family requires that we reconstruct them for Proto-Tibeto-Burman rather than any more recent level (Henderson 1957, Bauman 1975, 1979, DeLancey 1989, van Driem 1993, 1999, Sun 1995, Watters 2002). In addition we may note that this kind of highly abstract grammatical morphology takes time to develop. In contrast, the kind of grammar that we see in Boro can develop very quickly, and in many instances, including Bodo-Garo and Lolo-Burmese, demonstrably has.

But my purpose in this paper is not to address this controversy directly (see DeLancey 1989, 2008, to appear a, b; for the opposing view, see LaPolla 2001, 2003), but to explore the implications of the assumption that the structure we find in Bodo-Garo and Lolo-Burmese represents secondary simplification. Each hypothesis, mine or LaPolla's, requires some account of where the innovative pattern comes from. LaPolla needs to address the question, how did grammar such as we find in rGyalrong or Kiranti develop. I, on the other hand, have the much easier task of explaining what happened to that grammar in branches like Bodo-Garo and Lolo-Burmese. I think there are two complementary lines of explanation which must be invoked here, one internal and one external. The internal explanation involves a persistent tendency in Tibeto-Burman and other languages of similar typology to evolve new finite structures out of nominalized clause constructions, since nominalized verbs tend to lack much of the morphology (especially tense and agreement) which is found in finite forms (DeLancey 2008, to appear b). In this paper I will discuss the external explanation: the fact that the expansion of Tibeto-Burman into new territory has always involved the adoption of Tibeto-Burman speech by other language communities, a process which typically results in significant morphosyntactic simplification.

## 2. Creolization in Sinitic

It is hardly a novel observation to point out that prehistoric and historic language contact have played a large role in the formation of the Chinese languages (see Terrien de la Couperie 1887, Hashimoto 1976a, b, Ballard 1984, La Polla 2001, Ansaldo and Matthews 2001, Blench 2008, *inter alia*):

The movement of the Chinese has almost never been to an area where there were no people. Splitting of the language by migration almost always involved language contact, either with non-Chinese languages or other Chinese dialects, and very often in government-sponsored migrations there was purposeful mixing of peoples. What we now think of as the Han Chinese have from very early on continually absorbed other peoples into the race. (LaPolla 2001)

Sinitic is typologically a Mainland Southeast Asian family. The dramatic typological divergence, most conspicuously the word order realignment, between Sinitic and Tibeto-Burman reflects a massive reorganization of an originally Tibeto-Burman grammar. This must have been a result of intense contact with Tai and other languages which Sinitic encountered when it migrated eastward into China. The original formation of Chinese

resulted through contact between invaders, identified with the Chou dynasty, speaking a SOV Tibeto-Burman-type language, and the indigenous SVO language of the Shang (Benedict 1972, Nishida 1976, see also van Driem 1997, 2008). The substantial vocabulary shared by Sinitic, Tai, and Vietnamese, as well as the astonishing degree of phonological and syntactic convergence among these languages, points to a period of intense contact along and south of the Yangzi (Ballard 1984), involving Blench's (2009ms) "Southern Yunnan Interaction Sphere".

The morphosyntactic profile which Sinitic shares with Kadai, Hmong-Mien, and the Mon-Khmer languages of Vietnam and Cambodia is strikingly similar to the so-called creole prototype,<sup>43</sup> and the conclusion is inescapable that the basic grammar of Proto-Sinitic was formed in the mouths of non-native speakers as it became used as a state language, prestige language, and/or lingua franca. We can refer to this process as "creolization", with the understanding that this is not meant to imply that there was ever a pidgin stage in the history of Sinitic, but rather to refer to the radical restructuring of a language used in an intense contact situation in the direction of a creoloid prototype, as discussed by McWhorter (2007) or Ansaldo and Matthews (2007). There is no need to imagine that the history of Sinitic (or, for example, Tai, Hmong-Mien, or Vietnamese) involved an actual "true" creole stage; presumably throughout the transmission of Sinitic down to the present there have always been native speakers of the language (Ansaldo and Matthews 2001). But the formation of Proto-Sinitic and its creoloid grammar must have involved a period during which a large number of its active users were not native speakers – this is why languages simplify under contact. There must, in other words, have been one or more episodes of McWhorter's "interrupted transmission" in the history of Sinitic. In this paper I will argue that the same is true for other branches of Tibeto-Burman, in particular Bodo-Garo and Lolo-Burmese.

### 3. Simplification Through Contact in Bodo-Konyak-Jinghpaw

Let us look at the problem at a lower level. It is generally agreed (see e.g. Bradley 1997, LaPolla 2001, Thurgood 2003) that Jinghpaw, spoken in northern Burma and Yunnan, the Konyak or Northern Naga languages of northwestern Burma and Nagaland, and the Bodo-Garo languages of Assam and adjoining territories, constitute a genetic subunit within TB, and are one another's closest relatives within the family (Burling 1983, 2003). For purposes of our problem this unit is something of a microcosm of Tibeto-Burman, since the more conservative varieties of Jinghpaw and conservative Konyak languages show a system of verb agreement which is demonstrably old, and the Bodo-Garo languages are characteristic of the simplified type. In fact, we can see the phenomenon within Jinghpaw itself. Certain varieties of Jinghpaw, most notoriously the Singpho language of Assam, also lack the agreement system, thus presenting us with the same problem that we have with Tibeto-Burman as a whole, instantiated at a very shallow time depth of only a few centuries.

Argument indexation is manifested in two constructions in Jinghpaw. First, the sentence-final particle *ai* takes prefixes which agree with 1<sup>st</sup> and 2<sup>nd</sup> person subjects:

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<sup>43</sup> I first heard this observation in the 1970's, and should probably credit David Strecker, Brenda Johns, and/or Charles Li in personal communication as my original source(s) for it.



- 5) nga MaNang            hpe kayat ya    ngng-ai  
 1SG MaNang            OBJ beat give 1<sup>st</sup>-FINAL  
 ‘I beat Manang.’
- 6) nang MaNang            hpe kayat ya    nd-ai  
 2SG MaNang            OBJ beat give 2<sup>nd</sup>-FINAL  
 ‘You beat MaNang.’

Second, tense/aspect and several other categories are primarily expressed by a set of postverbal morphemes, each consisting of a single consonant, which combine with agreement morphemes to create a CVC syllable, which Dai and Diehl (2003) have called the “sentence-final word” (SFW):

- 7) ngai shanhhte    hpe    ndai jaw    n-i? ai  
 1SG 3PL OBJ this    give ASPECT-1<sup>st</sup> FINAL  
 ‘I gave them this.’
- 8) nang shanhhte    hpe    ndai jaw    n-it ai  
 2SG 3PL OBJ this    give ASPECT-2<sup>nd</sup>  
 ‘You gave them this.’
- 9) shi shanhhte    hpe    ndai jaw    n-u? ai  
 3SG 3PL OBJ this    give ASPECT-3<sup>rd</sup>  
 ‘S/he gave them this.’

Plurality is expressed by a morpheme *ma-* prefixed to the SFW: *ma-n-i?*, *ma-n-it*, *ma-n-u?*. This is demonstrably of Proto-Tibeto-Burman provenience (Matisoff 2003:601). The morphemes which constitute the initials of the SFW’s are originally grammaticalized auxiliary verbs, but now a distinct syntactic category shared by Jinghpaw, Konyak, and Northern Chin (DeLancey to appear a).

There are two varieties of Jinghpaw in which this system is absent: the so-called Valley Jinghpaw used as a lingua franca in northern Burma, and the Singpho language of Assam. It is very likely that these are secondary developments, and the more complex system is older. We know on historical grounds that the entry of Singpho into Assam is quite recent, taking place over the last few centuries (see e.g. S. Baruah 1985:376, T. Baruah 1977, and Leach 1954). The Jinghpaw system is, to say the least, rather complex and opaque to be such a recent development as that. In any case we find cognate systems in several Konyak languages such as Nocte (Das Gupta 1972, DeLancey to appear) and Tangsa (Das Gupta 1980, Morey to appear). To give just one piece of evidence, both Jinghpaw and Nocte show an alternation between nasal and stop forms of the personal endings:

- 10) Jinghpaw and Nocte 1<sup>st</sup> person agreement suffixes  
 Jinghpaw    -ing    -i? < \*-ik  
 Nocte            <sup>1</sup>Λŋ    Λk

The exact function of this opposition is not entirely clear, but it seems to roughly correlate in both languages with a distinction between imperfective/continuous and perfective/inceptive forms. This and other comparative evidence show that the Jinghpaw agreement system antedates the divergence of the various Jinghpaw dialects. So at the Jinghpaw level we must ask the same question about Singpho and Valley Jinghpaw as we do at the Tibeto-Burman level about branches like Bodo-Garo and Kiranti, and will ask below about Bodo-Garo and Lolo-Burmese: what happened to the morphological system? As we have noted, one common historical reason for overall simplification in a linguistic system is creolization, i.e. reversion toward a creoloid structure as a result of language contact. When a language, for any of various reasons, is transmitted through a generation of speakers which includes many who learned it as adults as a second language, it often loses the kinds of features which are difficult for second-language learners to acquire, including complex morphological systems. McWhorter has suggested that this is the only means by which a language ever undergoes systemic simplification:

[I]n the uninterrupted transmission of a human language, radical loss of complexity throughout the grammar is neither normal, occasional, nor rare, but *impossible*. The natural state of human language is one saddled with accreted complexity unnecessary to communication. Wherever this complexity is radically abbreviated overall rather than in scattered, local fashion, this is not just sometimes, but *always* caused by a sociohistorical situation in which non-native acquisition of the language was widespread enough that grammar was transmitted to new generations in a significantly simplified form. (McWhorter 2007:4-5, emphasis original).

It may be that McWhorter's claim is too sweeping, though it is a useful working hypothesis. But in any case, it is undoubtedly relevant to the Singpho case, as we know that the advent of Singpho in Assam did involve the conquest and even enslavement, in some manner or other, of substantial local populations, and further, that Singpho has and continues to expand in the area through language shift of communities that formerly spoke other languages (see Leach 1954). Proper mastery of the SFW's would be a considerable challenge for a second language learner of Jinghpaw, and we would expect them to disappear immediately in the grammars of communities for whom it was an adopted language.

The same can be said of the other simplified dialect of Jinghpaw, what is sometimes called "Valley" Jinghpaw (LaRaw Maran, personal communication). This is the so-called Kachin language which is used as a lingua franca in many parts of northern Burma (see Leach 1954). It is essentially the language described above, but without the sentence-final words (though sometimes retaining the *ai*, apparently). In its origin, this is Jinghpaw as spoken by non-Jinghpaw Kachins and others to communicate across language lines, although there are now communities for whom it is a first language. We cannot avoid seeing the connection between these two features, one grammatical and one sociolinguistic: branches of the original speech community retain more of the older, complex grammar, while branches representing communities which adopted the language have shed most or all of it.

#### 4. The Prehistory of Bodo-Garo

Now let us turn to Bodo-Garo. Bodo-Garo is a tightly-knit unit of about a dozen languages spoken in Northeast India. Though we speak of it as a branch, and the various languages are not mutually intelligible, the differences among Boro, Dimasa, Rabha, Atong, Garo and the rest are less than the divergence among the various forms of speech which we speak of as “dialects” of Tibetan (Tournadre 2008). This quite homogenous branch is spoken throughout the length and breadth of the Brahmaputra Valley and adjoining territory. For the last 1,000 years or more it has been losing ground to Assamese and Bengali, so it is certain that its original geographical spread was even larger. This is a very extensive distribution for a Tibeto-Burman unit, especially since the homogeneity of the branch implies a relatively shallow time depth. The only units of comparable divergence which cover a comparable amount of territory are Tibetan and Lolo-Burmese, both of which occupied the larger part of their present range through imperial expansion within historic times.

We described above the striking grammatical regularity and transparency of Boro, which is typical of the entire branch. The verb in Bodo-Garo is strictly agglutinative. There is nothing inflectional, no portmanteau or fused morphemes, no morphophonemic alternations beyond simple tone adjustment rules. There is almost nothing that could be considered to have undergone any significant phonological reduction. Much of the verbal morphology is still transparently traceable to its source. Consider another example:

- 12) zá-khaŋ-zwb-dwŋ-mwn  
eat-finish-end-ASPECT-PAST  
‘finished eating up all (the food)’

Here *khaŋ* and *zwb* still occur as lexical verbs (‘to bring to completion’ and ‘to come to an end’, respectively), *dwŋ* is transparently a grammaticalization of the existential copula *doŋ*, and *mwn* may be derived from the highly grammaticalized lexical verb *mwn* ‘get’. There is nothing opaque here, and nothing very old. A grammaticalized function for *doŋ* and *mwn* can be reconstructed as far back as Proto-Bodo-Garo (Wood 2009), and the former is certainly a reflex of PTB \**duŋ* ‘sit’ (Matisoff 2003:587), which has grammaticalized (apparently independently) into an existential copula, and often then to an aspect marker, in several branches of the family (cp. Tani *duŋ*, Tibetan ‘*dug*). But the only truly ancient verbal morphology in Bodo-Garo is the prohibitive prefix *da-*, and a handful of fossilized causatives which still show the Proto-Sino-Tibetan causative prefix \**s-* (Joseph 2008). Everything in the suffixal verb morphology Bodo-Garo evidently developed either in Proto-Bodo-Garo or after that in the individual languages.

As in a number of other Tibeto-Burman languages we find that the postverbal elements can be broadly divided into two categories: an inner set, closer to the lexical verb, which have lexical-type semantics and often can also occur as independent lexical verbs, and an outer set with more abstract, “bleached”, grammatical meanings and no direct correspondence to independent verbs (Matisoff 1991, Vittrant 2004).

- 13a) gau-zwŋ-gau bu-thar-lai-phin-dwŋ-mwn  
self-with-self beat-completely-reciprocal-again-ASPECT-PAST  
‘They were killing each other again.’

- 13b) gau-zw̃ŋ-gau bu-thar-**phin-lai**-dw̃ŋ-mwn  
 self-with-self beat-completely-**again-reciprocal**-ASPECT-PAST  
 ‘idem.’

The last two morphemes in this string are tense/aspect markers. They can occur only where they do: *dw̃ŋ* must follow any and all adverbial suffixes, while *mwn* must follow any other tense/aspect suffixes. The others have more lexical meanings and, significantly, their order is not fixed: all of them follow the lexical verb and precede tense/aspect marking, but the order of the adverbial suffixes is freely variable (with certain semantically-grounded restrictions). There are no “slots”, no fixed grammatical order template, no structured, paradigmatic morphology such as we find in Jinghpaw.

There can be no doubt that Proto-Bodo-Garo, at some point, underwent a stage, and probably a quite extended stage, of interrupted transmission in McWhorter’s sense. The details of the linguistic history of Assam are very difficult to ascertain, but the broad outlines are clear. Proto-Bodo-Garo, and perhaps other TB languages, entered the mid-Valley prior to or early in the first millennium BCE. By the time of the Kāmārūpa kingdom of the 4<sup>th</sup>-6<sup>th</sup> centuries CE, and probably many centuries earlier than that, Bodo-Garo must have been the dominant language in the region. But when Bodo-Garo speakers first entered the region it was hardly deserted. There was already a substantial population, presumably speaking Austroasiatic languages of which the Khasi languages of Meghalaya are the survivors. In this situation Bodo-Garo could have achieved the dominance and geographical spread which it did only through adoption by the population already present. I have argued elsewhere (DeLancey 2009) that Proto-Bodo-Garo originated as a lingua franca, used as a second language for communication by the varied speech communities up and down the Brahmaputra Valley which were subject to the Prāgjyotisha-Kāmārūpa state (the ideal geopolitical context for the development of a vehicular language, according to Calvet 1981), and that it was this function that it spread over its attested range, and in this process that it lost its original morphological structure. Regardless of the exact historical narrative, it is most likely that in the prehistory of Bodo-Garo we are looking at an example of interrupted transmission. Once again, though on a deeper scale than with our Jinghpaw varieties, we cannot avoid seeing a connection between the sociolinguistic history of the branch and its linguistic development. Once again we find radical simplification of a language – in this case Proto-Bodo-Garo – in a context in which we have solid historical grounds for concluding that the language was subject to interrupted transmission, that is, underwent drastic simplification in the mouths of second-language speakers.

## 5. Lolo-Burmese

There are other Tibeto-Burman branches and individual languages which present a similar profile to Bodo-Garo. Two conspicuous cases are Sinitic, which we have discussed above, and Lolo-Burmese, and in both cases there is compelling reason to posit an interrupted transmission scenario in their development.

The Lolo-Burmese languages are the most resolutely “Sinospheric” languages, to use Matisoff’s term, in the family, which is to say they have many Chinese-like features of grammar and phonology. This is necessarily a reflection of language contact, and contact sufficient to bring about such systemic change must involve bilingualism (LaPolla 2001). In fact it must involve the adoption of L-B languages, and probably of Proto-Lolo-Burmese

or some precursor of it, by Chinese-speaking populations. Any such event in the history of the language is likely to result in morphological attrition, and the grammar of the L-B languages, like that of Bodo-Garo, is all fresh and new. The cloud of variously-grammaticalizing verbs which we see around the Lahu verb (Matisoff 1969, 1991), or the undisciplined set of serialized verbs and particles in Burmese (Vittrant 2004) is very reminiscent, in its semantic heterogeneity and lack of categorial boundaries, of the “adverbial suffix” category in Bodo-Garo.

We are still far from a consensus on the internal classification of Tibeto-Burman, but a number of scholars see the Qiangic branch as the closest relative of Lolo-Burmese, constituting with it an Eastern branch of the family (Bradley 1997, van Driem 2001). The Qiangic languages preserve a great deal of ancient verb morphology; the rGyalrong languages which we discussed above are the most morphologically complex, so much so that some authors treat rGyalrong as a sister rather than a subbranch of Qiangic, but even on this hypothesis an extensive morphological paradigm must be reconstructed for the verb of Qiangic “proper” (LaPolla 2003b, Evans 2004). In contrast, though with the aid of Written Burmese a few fragments of older verb morphology can be reconstructed for PLB (Thurgood 1981), most of the morphological structure which is preserved in Qiangic is completely lost in Lolo-Burmese. Thus, just as in the case of Bodo-Garo, we know that PLB must have undergone some dramatic morphological simplification after its split from Proto-Eastern-TB. As in the case of Bodo-Garo, the explanation for this systemic change evidently involves intense language contact with resulting creolization. And, as in the case of Bodo-Garo, we have some ground to postulate that Proto-Lolo-Burmese may have undergone its most serious creolization during a time when it was used as a lingua franca, probably in one or a succession of multiethnic states.

In thinking about the origin and subsequent divergence of a proto-language, we have to keep in mind that these two historical phases may be separated by considerable time. For example, the late Latin which is the direct ancestor of the modern Romance languages is separated by more than a millennium from the early Latin which first separated from Proto-Italic (Kortlandt 1990). The divergence of the Lolo-Burmese languages could easily be accommodated within a time depth of 1,000-1,500 years, which is consistent with the conservatism of Written Burmese. But what we can interpret from Chinese sources concerning the ethnic history of the Yunnan region suggests the presence of distinct groups identifiable as Loloish or Lolo-Burmese considerably earlier than this, including a Han dynasty record of “Bailang” songs in what seems to be a Loloish language (Coblin 1979). Thus we should imagine a presence of Proto-Lolo-Burmese over several centuries prior to its divergence into the modern languages, the latter event perhaps corresponding, at least chronologically, with the ascendancy and collapse of the Loloish Nanzhao state in the 8<sup>th</sup> and 9<sup>th</sup> centuries.

We have some idea of the history of Burmese from the time that its speakers conquered the Mon-speaking population of lower Burma and learned to write. The Mranma who first moved into Lower Burma in the 9<sup>th</sup> century would have spoken a language not too far removed from Proto-Burmish. They came from the marches of Nanzhao and their appearance in Burma was in some way connected with an invading force from Nanzhao (Luce 1969, 1985). We have little direct information about the linguistic history of any Lolo-Burmese languages earlier than that, although Chinese sources such as the *Man Shu* give us Chinese names for many ethnic groups, some of which can be identified with contemporary Loloish-speaking groups. The dominant

elements of the Nanzhao state, once imagined to have been Tai, were Yi (Lolo) and Bai (Blackmore 1960, 1967, Backus 1981). At that time the various Loloish languages can hardly have been very differentiated; as suggested above, we are probably not far from Proto-Loloish, in the sense of the language which differentiated into the modern languages. Nanzhao is of interest to us as a multiethnic and polyglot nation, with a great many disparate groups, including Tanguts, Tais, Chinese, and others, apparently subject to rule by speakers of some late, already differentiated version of PLB. This is the perfect context for the development of a creoloid lingua franca. However, as noted above, while the splitting up of Lolo-Burmese could well date to this time, the original formation of PLB must be older. But Nanzhao was not the first significant state in the area; nor was the Shu Han state of the Three Kingdoms era (3<sup>rd</sup> century CE). The political and demographic history of southwest China implies that there must have been at least one widely-used lingua franca at least as early as Han, and quite likely earlier than that. Shu Han was nominally a Chinese state, but this does not entail that Chinese would automatically have been the prevailing lingua franca, any more than Indic would have been in Kamarupa. Although the idea may not be provable, it is very tempting, given the inferred existence of a lingua franca and the creoloid structure of Lolo-Burmese, to posit a history for the branch very parallel to that of Bodo-Garo.

The area in which we are presuming that a creolized Proto-Lolo-Burmese emerged is part of Blench's (2009ms) "Southern Yunnan Interaction Sphere", where he argues that the same glottogenetic process has been going on for millennia. The 9<sup>th</sup> century *Man Shu* or "Book of the Southern Barbarians" (Luce 1961) provides a fuzzy but compelling picture of great ethnic diversity, and makes it reasonably clear that there must have been much the same kinds, and the same prevalence, of ethnic and language shift in the region 1200 years ago as Leach (1954) describes for northern Burma in recent times. Feng and Shryock infer from various comments in the *Man Shu* about the linguistic diversity of the area and differences in physical appearance between the "Black" and "White" barbarians that:

A possible explanation of this situation is that the Black Lolo may originally have been a conquering group of a single racial stock, while the White Lolo were of different stocks which were subjugated and had the language of the conquerors gradually imposed upon them. This process seems still to be going on among the Lolo of Ssuch'uan. (Feng and Shryock 1938:107)

In this perspective, we must assume not merely an episode, but a sustained process of interrupted transmission in the development of modern Lolo, and we have all the reason we could want to imagine this process extending back to the time of Proto-Lolo-Burmese or farther.

## **6. Historical Mechanisms of language replacement**

Renfrew (1988:124-37) suggests three basic models of language replacement: demographic expansion with population replacement, catastrophic societal collapse, and "elite dominance". A basic assumption of this paper is that we can take it for granted that the south and southeast-ward expansion of Tibeto-Burman was not a matter of demographic expansion and replacement. While there must have been actual population movements involved (pace Leach 1954, see Dyen 1956), in the case of Bodo-Garo or Lolo-Burmese we can be certain that the expansion of the branch involved considerable

adoption of the language by other communities. Depending on exactly what it is intended to entail, the rather ill-defined notion of “system collapse” might or might not be relevant to certain events in the history we are interested in, but, at least as outlined by Renfrew, it does not really offer a model of language change. This leaves “elite dominance”, the model in which a small population of immigrants has a sufficiently dominant economic or political status with respect to the larger community that their language comes to be widely adopted.

The stereotypical pattern of elite dominance-driven change is exemplified by the expansion of Burmese over a large, originally Mon-speaking territory over the last thousand years, the kind of story of conquest and domination which we read of in history. But at a more local level, we see more subtle processes:

Historically, Tai and Jinghpaw speaking groups have constantly tended to assimilate their Naga, Maru and Palaung speaking neighbours. This assimilation has not come about as the result of any active policy of conquest, but because, in mixed language areas, the political power has for many centuries been in the hands of either Tai or Jinghpaw speaking aristocrats. Thus to ‘become Tai’ or ‘become Jinghpaw’ has had political and economic advantages. (Leach 1954:47)

Leach shows at length that this is a driving force behind the spread of Jinghpaw in an area which now extends from Yunnan to Assam. It may be the sole driving force, but I suspect that, especially within the core Kachin area of northern Burma, the status of Jinghpaw as a lingua franca is a synchronically independent impetus, however much its lingua franca status may historically owe to the prestige or power of its original speakers.

Something along these lines must be involved in the expansion of Bodo-Garo and Lolo-Burmese. As I have argued above, the spread of Bodo-Garo occurred through its use as a vehicular language throughout the Brahmaputra Valley, and I strongly suspect that there was a similar stage in the history of Lolo-Burmese. The existence of a substantial organized state with a linguistically diverse population in and of itself implies the existence of a lingua franca, and thus the existence of conditions which promote creolization (see Calvet 1981, 1987).

But this still leaves the question of how these languages may have attained this status. We don’t know enough about the history of either region to rule out a Burmese-like episode in either history, but there is no need to posit one in either case. The processes which have resulted in the expansion of Jinghpaw over the last few centuries, which we have been fortunate enough to be able to study in situ in modern times, could easily explain the earlier expansion of its Bodo-Garo sister and Lolo-Burmese cousin and neighbor.

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# PROSODY OF VIETNAMESE FROM AN INTERACTIONAL PERSPECTIVE: Ờ, Ừ AND VÂNG IN BACKCHANNELS AND REQUESTS FOR INFORMATION

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## 0 Abstract

Analysis of everyday telephone conversations within the framework of Conversation Analysis provides evidence that Northern Vietnamese utilises pitch variation to convey communicative functions: the falling/low-level pitch contour is used in backchannel utterances, whereas the final rising/mid-level pitch contour tends to be produced when speakers request information from conversational partners. These intonational patterns were found on target utterances consisting of one word with a lexical low-falling tone (ờ and ừ) as well as with a lexical high-level tone (vâng) (all can be translated as ‘yes’).

## 1 Introduction

Vietnamese tones are characterised not only by pitch and tone register, but also by voice quality (Alves 1997, Nguyễn & Edmondson 1998, Yip 2002, Phạm 2003, Michaud 2004). In phonological terms this involves six contour tones, two tone registers and the interaction between tone and laryngeal features (creaky voice and breathiness). In some investigations duration is also counted as an important feature of Vietnamese tones (Vũ 1982, Alves 1997), but it has been shown that this parameter does not function as a tone perception cue (Brunelle 2009a).

The fact that tone languages, in particular Vietnamese, make extensive use of particles to express grammatical functions often indicates that intonation does not play such an important role in these languages as in non-tonal languages. Over several decades, this issue has been called into question by a number of investigations of Vietnamese intonation, especially the use of pitch contour. From the grammatical point of view, different pitch contours were found to express different sentence types (Thompson 1965, Trần 1967, Đỗ et al. 1998, cf. Nguyễn & Boulakia 1999, for different pitch registers see Hoàng 1985). From the pragmatic point of view, pitch contours have also been investigated in terms of their role in the organisation of speech, e.g. the falling contour signals finality and the rising contour non-finality (Trần 1967, cf. Thompson 1965). Acoustic studies have identified rising F0 and a higher F0 register as prosodic cues for emphasis (Michaud & Vũ 2004), and strong F0 variation as a marker of focus (Jannedy 2007). The speech materials used in these acoustic studies were elicited by means of sentences or short paragraphs read aloud without context or realistic interaction.

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This study contributes to the growing body of research on Vietnamese intonation, using naturally occurring dialogues analysed from an interactional perspective. It aims to find the factors influencing pitch variation in conversation and to investigate whether Vietnamese utilises intonation in the same way as non-tonal languages like English or German to convey communicative functions.

Specifically, this paper investigates utterances comprising the discourse markers *ờ* [ə] and its variant *ừ* [ɯ], and *vâng* [vəŋ] (all meaning ‘yes’) as spoken in everyday telephone calls. Their tonal properties are provided in the following table:

**Table 1:** Tonal properties of investigated tokens

Tokens	Lexical tone	Traditional name of the tone	Stylised tone contour	Pitch register
<i>ờ</i> [ə] / <i>ừ</i> [ɯ]	low-falling	<i>thanh huyền</i>		lower
<i>vâng</i> [vəŋ]	high-level	<i>thanh ngang/không</i>		upper

These three words carry two of the six lexical tones in Vietnamese: *ờ* and *ừ* have a lexical low-falling tone and *vâng* a high-level tone; *ờ* and *ừ* belong to the lower and *vâng* to the upper part of the pitch range, which is referred to here as pitch register. Employing the theoretical framework of Conversation Analysis, this paper provides evidence that Northern Vietnamese uses different pitch contours to convey communicative functions.

## 2 Materials and method

The speech materials are based on 11 telephone calls (approximately 55 minutes) made by 18 Northern Vietnamese participants (11 female, 7 male, aged 19 to 63) to friends, family members and acquaintances. Recordings were made using a DAT recorder and a small microphone glued to the loudspeakers of landline telephones. The participants recorded their conversations by themselves after receiving instructions on how to use the technical equipment. Their consent to take part in the recording was gained orally. The data are of sufficient quality for the analysis of F0 contours even though the voice of the speaker at the other end of the telephone line was not directly recorded. The reason why these materials were chosen is that in telephone conversations only the audio channel is used. We can therefore be sure that no visual feedback is given which might obscure the analysis of the effect of a given utterance.

Affirmative or acknowledgement tokens *ờ*, *ừ* and *vâng* occur during the opening as well as in the body of the telephone calls. Their pitch contours and pitch registers are observed and analysed in two different interactional contexts: (a) backchannel utterances signalling attention of the hearer to the talk of the current speaker, and (b) requests for information from the caller during conversational openings.

The corpus was analysed within the approach of Conversation Analysis (Sacks et al. 1974, Schegloff 2007) according to which utterances in interaction are sequentially organised. Analysis of discourse items in this study is thus based on observations of the next turn. This reveals the orientation of participants to identifiably patterned phenomena, namely the pitch contours found in the above interactional contexts. For more detailed

discussions of the methodology see also Couper-Kuhlen & Selting (1996) and Local & Walker (2005).

All the excerpts presented are transcribed according to the GAT conventions (Selting et al. 1998, see appendix), a transcription system for prosody in conversation analysis. As part of the consent-gaining process, names of the participants were changed or left out during the transcribing process to make the transcripts as unrecognisable as possible (Ten Have 1999: 62). Pitch contours in investigated contexts are illustrated in figures produced in *Praat*, a programme for phonetic analysis (Boersma & Weenink 2009).

### 3 Backchannel utterances

#### 3.1 Background

In the corpus *ờ*, *ừ* and *vâng* occur frequently in backchannel utterances. They belong to a group of words signalling attention such as *mhm*, *right*, *yes*, *exactly*, *I see* etc. – constituting a type of “back-channel-behaviour” scrutinised by Duncan (1974: 166). Also considered as “continuers”, “acknowledgements”, “hearer signals” or “recipency tokens”, these words play an important role in stabilising conversation, i.e. making the conversation work without disruption (Müller 1996, Rath 2001, Henne & Rehbock 2001). They are spoken by hearers signalling their attention to the current talk without taking the turn.<sup>44</sup>

The prosody of backchannels has been investigated for a number of languages. A study of prosodic features in non-lexical utterances by Ward (2004) indicates that backchannels in English are generally produced with a low or flat pitch (see also Mori 2005 for Japanese). In German, *hm* as a speech particle occurs with a number of different intonation patterns; for example, when spoken with a falling pitch, it functions as an acknowledgement (Schmidt 2001). The following analysis of everyday telephone conversations will show that similarly to these languages, backchannels in Vietnamese are produced with a low-level or falling pitch.<sup>45</sup>

#### 3.2 Results

##### 3.2.1 Falling/low-level pitch contour on backchannels carrying a lexical low-falling tone

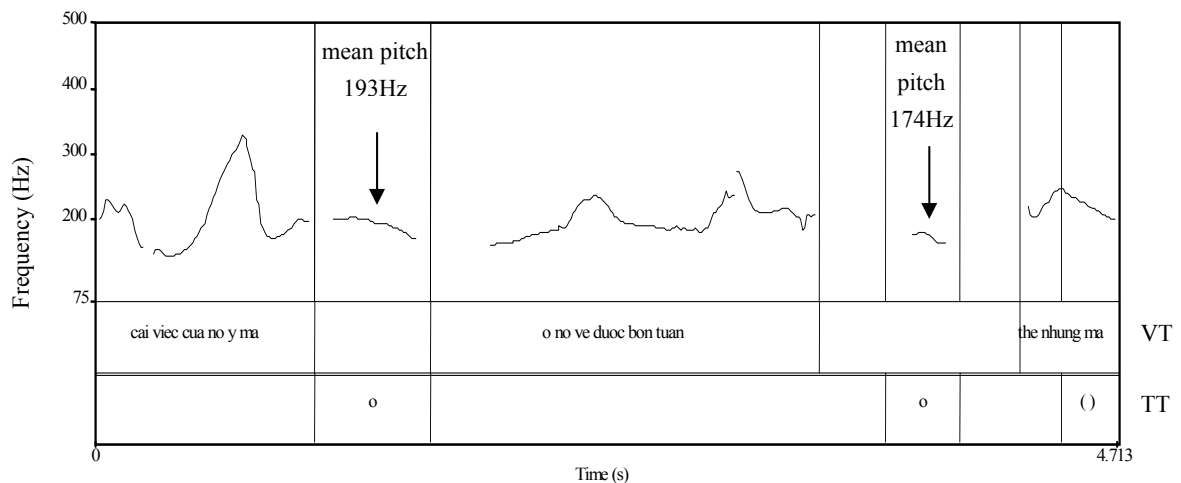
Extract (1) is a conversation between speaker VT and speaker TT talking about VT’s daughter. TT signals that she is paying attention to VT’s talk without taking the turn (line 2 and 4). The pitch contour produced in these two utterances is a falling contour (Fig. 1), which happens to be identical to the citation form of the lexical low-falling tone. The transcription comprises word-for-word and sentence translation (see abbreviations in appendix).

<sup>44</sup> These words can also occur as answer particles following yes/no questions or immediately before hearers take the floor. They are beyond the scope of this study.

<sup>45</sup> In a study based on data from collaborative task-oriented dialogues in American English, Benus et al. found that *mmhm* is prosodically marked by a high pitch (high boundary tone) and intensity with great pitch slope (Benus et al. 2007, cf. Casper 2000 for Dutch in map task dialogues). However, backchannels from this particular type of conversation appear to be different from the ones investigated in the current study. They seem to have a dual function, namely acknowledgement and elicitation of information.

## (1) 13/1 Summer08: VT-TT ((VT &amp; TT are female and school friends, both aged 54))

- ((...))
- 1 VT Ủ nhưng mà nó cứ việc lu BU nó có ở nhà đâu  
Yes but she often work busy she be at home NEG  
*Yes. But she is quite busy and doesn't stay at home.*  
suốt ngày nó đi ờ cái việc của NÓ ý mà  
everyday she go eh Class work of she Ý mà  
*She goes out everyday to do something for her work.*
- 2 TT ờ.  
Yes.
- 3 VT ờ nó về a được bốn tuần  
Yes she come back ah ĐƯỢC four weeks  
*Yes. She comes back for four weeks.*
- 4 TT <<p> ờ. >  
Yes.
- 5 VT thể như[ng mà::  
so but  
*However, ...*



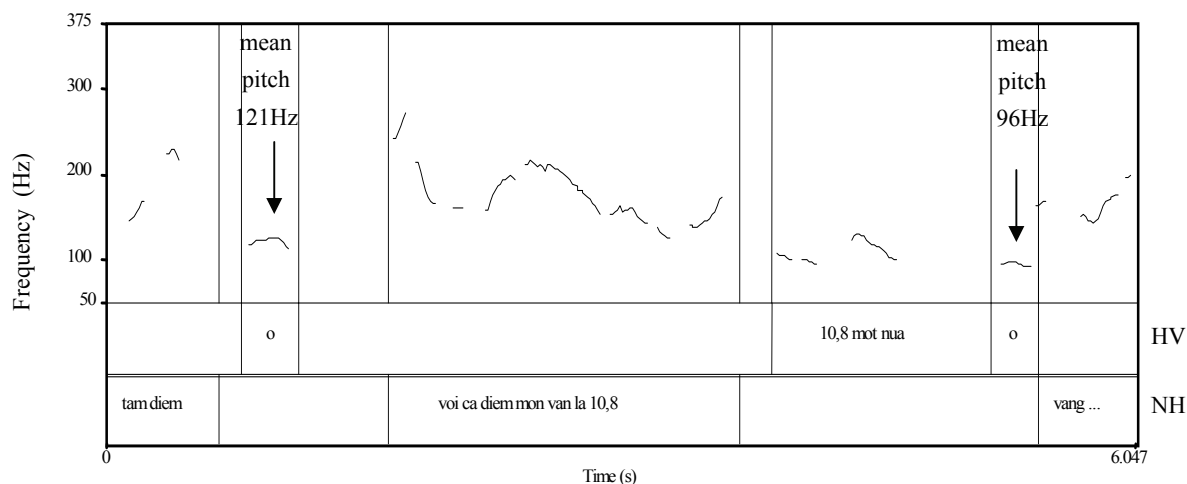
**Fig. 1.** Pitch contour produced on ờ functioning as backchannels by speaker TT (female)

In almost all other conversations, ờ and ừ functioning as backchannels can also be identified with a falling pitch contour which is identical to the lexical low-falling tone, *thanh huyền*. Following is an example in which a *low-level* pitch is used in backchannels (Fig. 2). This contour can also be explained as similar to the tone *thanh huyền*, since this lexical tone in Vietnamese is often produced at the bottom of the speakers' voice range with a low-level pitch, in particular by male speakers.

## (2) 16/1 Summer08: HV-NH ((HV and NH are male. NH is workmate of HV's wife. The daughter of NH and the son of HV have just taken the entrance examination for the same secondary school. NH informs HV about his son's marks))

- ((...))
- 1 NH ↓vâng (-) thì là của HDA là là lớp A16 (-)  
yes so be of whole name of HV's son be be class A16  
*Yes. So the marks of HDA, class A16...*  
bốn năm học sinh giỏi thì họ thường là tám điểm  
four year pupil excellent topic marker they reward be eight points.

- 2 HV <<t> ờ. >  
Yes.
- 3 NH với cả điểm môn văn là 10,8  
and mark subject Literature be 10,8  
and mark for Literature is 10,8.
- 4 HV <<p> 10,8 một nửa <<t, creaky> ờ. >  
10,8 one half yes  
10,8. A half. Yes.
- 5 NH ↓vâng điểm môn văn là 10,8 (.) điểm môn ngoại ngữ là 11,5  
yes mark subject Literature be 10,8 subject foreign language be 11,5  
Yes. Mark for Literature is 10,8. Mark for Foreign Language is 11,5.



**Fig. 2.** Low-level pitch realised on ờ functioning as backchannels spoken by speaker HV (male)

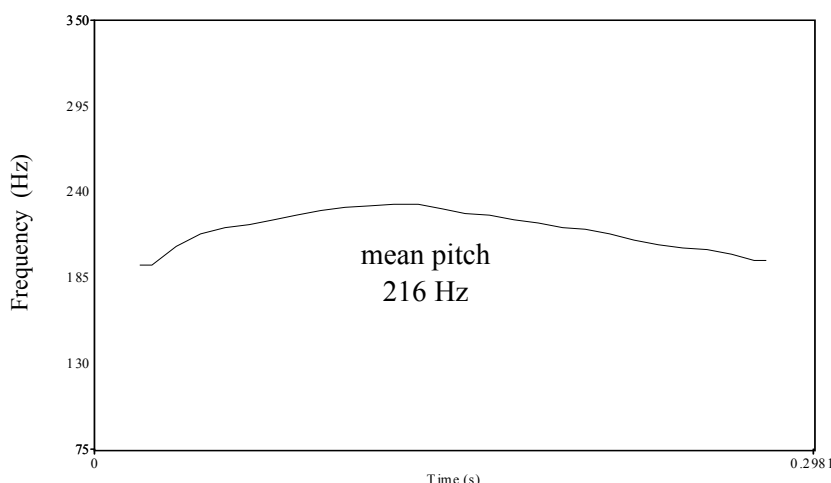
Backchannels in line 2 and 4 are produced with mean pitch of 121Hz and 96Hz, respectively. The second backchannel is spoken with such a low-level pitch contour that the creaky voice of speaker HV is clearly perceivable.

The function of falling and low-level pitch contours as prosodic features of backchannels in Vietnamese will be further supported by cases in which the token *vâng* does not retain the citation form of its lexical high-level tone when spoken in backchannel utterances. This suggests that the intonationally motivated pitch contours identified can override the lexical tone of the token.

### 3.2.2 Falling/low-level pitch contour on the backchannel *vâng* carrying the lexical high-level tone

In Vietnamese *vâng* is used as an affirmative word or as an acknowledgement when addressing elders. The citation form of its lexical high-level tone is illustrated in the following figure:



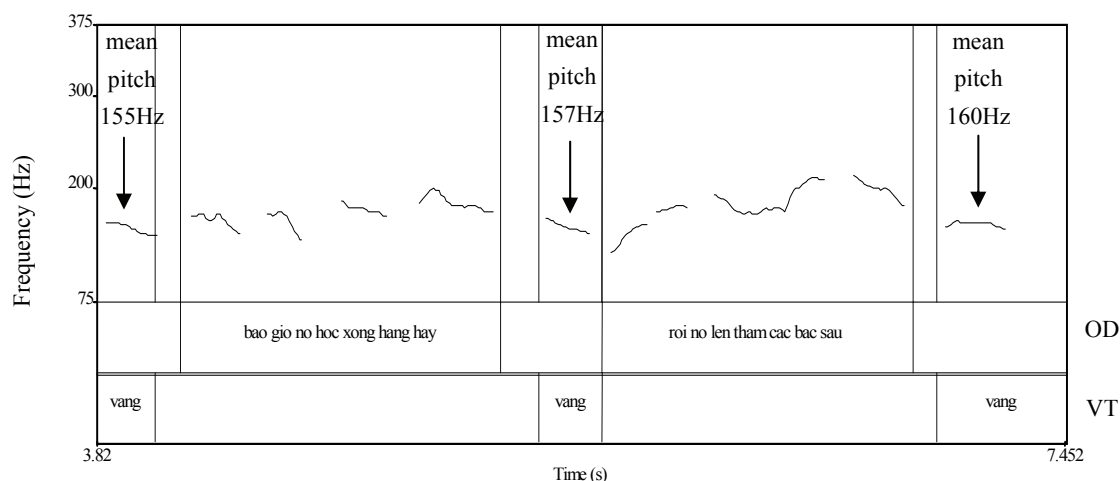


**Fig. 3.** Citation form (high-level) of the word *vâng* embedded in the sentence “I teach the word \_\_ to the child” and spoken by speaker VT (female)

In the corpus this token occurs frequently in backchannel utterances and is spoken with a falling/low-level pitch contour. In other words, producing this form either with a falling pitch contour or in the lower region of the voice range may be used to signal a speaker’s attention to the current talk. Following is an example:

- (3) 10/1 Summer08: VT-TH-OD ((VT and OD are sisters. They talk about VT’s daughter))  
 ((...))  
 1 OD =mừng cho nó  
     glad for she  
     *I’m glad about her.*  
 → 2 VT <<t> vâng.>  
     Yes.  
 3 OD bao giờ nó học xong hẵng hay  
     when she learn finish then be in question  
     *When she finishes learning, then it’ll be in question*  
 → 4 VT <<t> vâng.>  
     Yes.  
 5 OD rồi nó lên thăm các bác sau  
     then she come visit Plural aunt afterwards  
     *that she will then come to visit us.*  
 → 6 VT <<t> vâng->  
     Yes.

Fig. 4 exhibits the pitch contours on *vâng* when produced as backchannels by speaker VT. The first two backchannels have obvious falling pitches, the last one has a low-level pitch (recall that in Fig. 3 the mean pitch of *vâng* in citation form is 214Hz, spoken by the same speaker). In other conversations the same pitch contour on *vâng* is also produced to signal attention to the talk of the current speaker.



**Fig. 4.** Falling/low-level pitch on *vâng* produced as backchannels by speaker VT (female)

The extracts above show that when functioning as backchannels, affirmative or acknowledgement tokens *ờ*, *ừ* and *vâng* are spoken with a falling or low-level pitch. This pitch contour happens to be identical to the lexical tone *thanh huyền* of the tokens *ờ* and *ừ*, and is able to override the lexical high-level tone in *vâng*. To answer the question of whether Northern Vietnamese utilises intonation to convey communicative functions in the same way as non-tonal languages, we will now turn to another context, namely the context of requesting information during telephone openings.

#### 4 Requests for information during the opening in telephone calls

##### 4.1 Background

Openings in telephone calls are discussed in detail in Schegloff's works on American English (1968, 1986). Although cultural variation can play a role in setting up conversations by telephone, four standard opening sequences are suggested: a summons/answer sequence, an identification sequence, a greeting sequence, and exchange of how-are-you sequences (Schegloff 1986, cf. Couper-Kuhlen 2001). In everyday communication between friends, family members, or acquaintances, these sequences can overlap by virtue of intimacy (e.g. identification and greeting sequences). In contrast to face-to-face conversation, telephone calls are commonly made at a distance. Somewhere at the beginning of the call, the caller must, therefore, give the reason why s/he is calling. Schegloff (1986) called this position the *anchor position*, which is also the first topic of the conversation (cf. Sacks 1992).

In everyday telephone conversations, it is sometimes the case that the caller just calls up and asks "Hi, how are you?". If the answerer requests the reason for the call, s/he often gets the answer "No reason, just felt like calling" (Sacks 1992: 74). In other words, intimates, in particular callers, can feel unnatural when asked explicitly for the reason why they are calling. In Vietnamese everyday telephone conversations, instead of formulating explicitly, say, *What happened?* or *Why are you calling?*, Vietnamese answerers tend to use nonverbal means to request the reason for the call. The same way holds for eliciting the identification from conversational partners.

## 4.2 Results

The results reveal a tendency for speakers to use a final rising/mid-level pitch on the acknowledgement/affirmative tokens *ờ*, *ừ* or *vâng* to request information. This pitch contour can be identified in six telephone openings (54.5%), whereas five other telephone openings (45.5%) exhibit a falling pitch contour. In the following, those conversations in which a final rising/mid-level pitch is used are considered as “common cases”, while those in which a falling pitch is used are considered as “deviant cases”. As part of the methodology of Conversation Analysis, so-called deviant case analysis helps reveal the organisation of conversation as well as the identifiably patterned phenomena (Ten Have 1999). For this reason, recipient responses in some telephone openings exhibiting a falling pitch contour will be observed and analysed. The results show that conversational partners orient themselves to the final rising/mid-level pitch contour and respond differently when this pitch contour is not used.

### 4.2.1 Common cases

#### 4.2.1.1 Final rising pitch contour on affirmative/acknowledgement words carrying a lexical low-falling tone

Extract (4) is a typical instance of a standard opening in Vietnamese telephone conversations:

(4) 13/1 Summer08: VT-TT ((VT and TT are school friends, both female, aged 54))

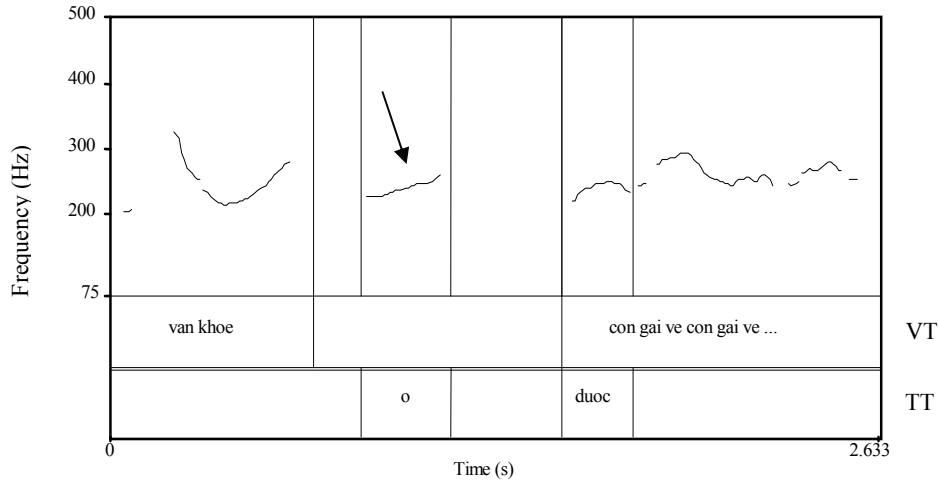
- |   |    |   |
|---|----|---|
| 1 |    | ((phone rings))   |
| 2 | TT | alô<br>Hello?   |
| 3 | VT | (-) H                            à<br>name of TT's daughter Q-Part<br>Are you H?  |
| 4 | TT | (-) <<f> oi-><br>Answer-Vocative<br>Hello?  |
| 5 | VT | (.) T                            à<br>first name of TT Q-Part<br>Are you T?   |
| 6 | TT | ai đây<br>who Part<br>Who's that?   |
| 7 | VT | ↓T                            đây [ăn cơm chưa<br>first name of VT here eat rice yet<br>It's T speaking. Have you had dinner yet?                                 |
| 8 | TT | [à                            ù ăn cơm RỒI<br>I see                            yes eat rice already<br>I see.                            Yes, I've already eaten. |
| 9 | VT | thế à<br>so Q-Part<br>I see.  |

- 10 TT Ừ.  
Yes.
- 11 VT Ờ thế nào dạo này thế nào có gì mới hông  
oh so recently how CÓ what new KHÔNG  
*How have you been recently? Is there anything new with you?*
- 12 TT chẳ có gì mới cả  
Neg have what new at all  
*There's nothing new at all.*
- 13 VT thế à  
*I see.*
- 14 TT ((laugh[s])) mà khỏe không  
you well KHÔNG  
*Are you well?*
- 15 VT [ói giời cười vẫn khỏe::e,  
oh laugh still well  
*Oh you're laughing. I'm well like usual.*
- 16 TT ờ,  
yes  
*I see.*
- 17 (-)
- 18 [được  
good  
*That's good.*
- 19 VT [con gái về con gái về được mấy hôm ↑rồi:::  
daughter come back daughter come back ĐƯỢC some days already  
*My daughter has already been back for some days.*

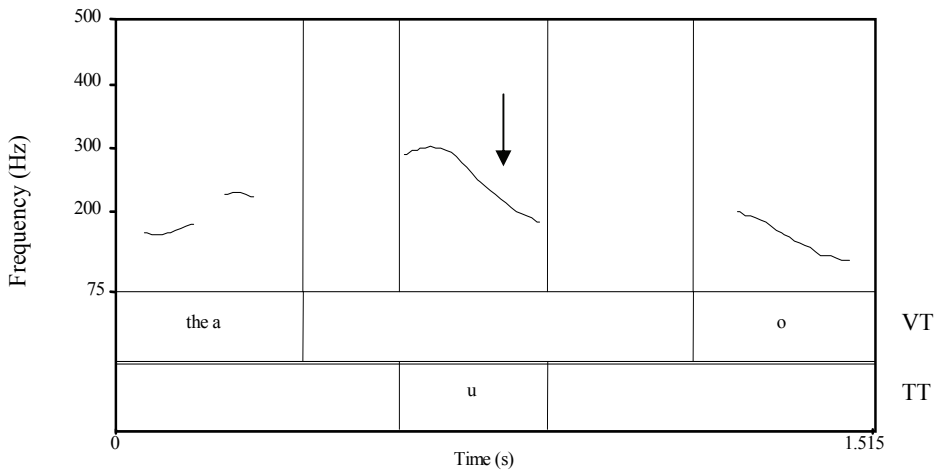
The summon/answer sequences are presented in line 1 and 2, whereby the ringing of the phone is the summons and the answerer speaks first. Then, the participants identify each other by asking and giving an answer (line 3 to 7). One of the most common ways of greeting conversational partners in Vietnamese culture is to ask them “Have you had breakfast/dinner yet?” depending on what time the question is asked (line 7 to 10). Reciprocal how-are-you sequences are expressed from line 11 to 16.

In line 16 speaker TT ends the how-are-you sequences with the acknowledgement token *ờ* produced with a final rising pitch. In the next turn (line 19), after a small pause, speaker VT declares the first topic of the conversation – the reason why she is calling. Fig. 5 illustrates the pitch contour spoken on *ờ* by speaker TT requesting the reason of the call from speaker VT.

Actually, VT could have given the reason of her call after the greeting sequences in line 10. But in this position TT gives an affirmation accompanied by a falling pitch contour (see Fig. 5') which seems to signal to VT that she can expand the opening without the account for her call, but with another sequence, e.g. a how-are-you question. This suggests that the caller tends to orient herself to the final rising pitch movement on the affirmative/acknowledgement token produced by the answerer in order to organise her/his next turn. If this is true, then the word *ờ* spoken with a final rising pitch contour (line 16) does not only do the work of acknowledging information, but it is produced to request the reason for the call.



**Fig. 5.** Pitch contour produced on *o* by speaker TT (female) requesting the reason for the call (line 16)



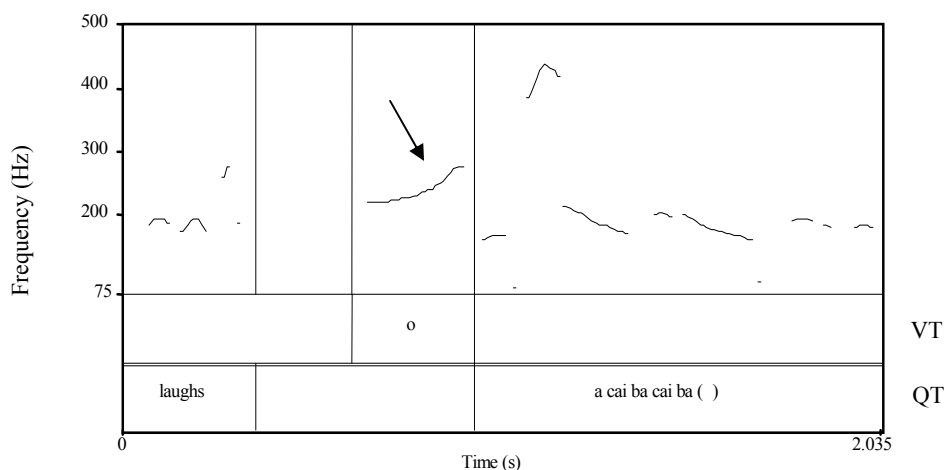
**Fig. 5'.** Pitch contour produced on *u* by speaker TT (female) not requesting information (line 10)

The assumed function of the final rising pitch contour realised on affirmative or acknowledgement tokens as a request for the reason for the call becomes clearer in the following example (extract (5)). Note that there are several cases in the corpus where the first answerer is not the person to whom the caller wants to talk. The caller has to ask to talk with the second answerer.

- (5) 29/1 Summer08: HV-VT-QT ((QT is a friend of HV, VT's husband. He calls and talks first to HV asking to talk with VT. HV tells VT, who is calling. VT, as second answerer, picks up the phone))

- ((...))
- 1 VT anh T à  
form addressing males first name of QT Q-Part  
*Hi T?*
- 2 QT VÂNG mẹ mù T à  
yes man form addressing female friends VT's first name Q-Part  
*Yes. Hi T?*
- 3 VT ↑Ừ có gì đấy  
yes have what Sent Part  
*Yes. What happened?*
- 4 QT (-) ((laughs))
- 5 (.)
- 6 VT <<p> ờ ?>  
*Yes?*
- 7 QT à cái bà cái bà ( ) M nhà chỗ nào nhờ  
so Class woman Class woman first name of a third person house place which Sent Part  
*Mrs. M, where does she live?*

In this example, speaker VT asks explicitly *What happened?* (line 3). But immediately after that the caller just laughs. He gives the reason why he is calling after VT produces the affirmative word *ờ* (line 6) with a final rising pitch contour (Fig. 6).



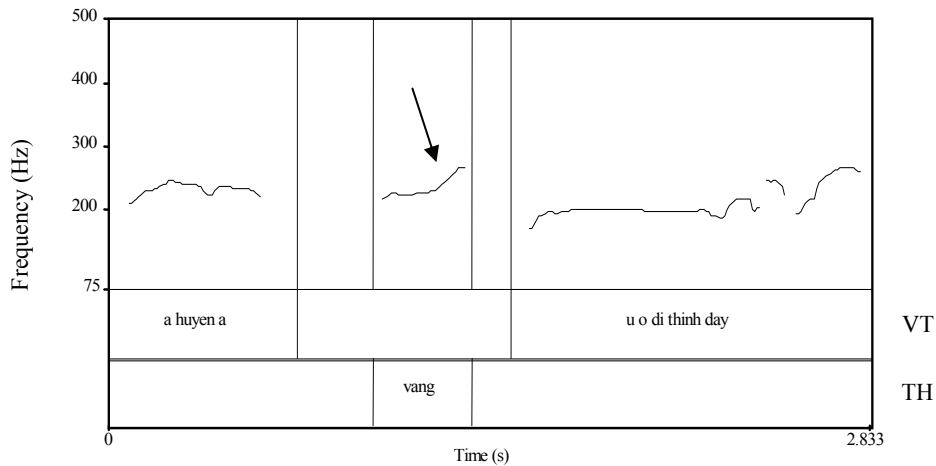
**Fig. 6.** Pitch contour produced on *ờ* by speaker VT (female) requesting the reason for the call

#### 4.2.1.2 Final rising pitch contour on the affirmative token *vâng* carrying a lexical high-level tone

In this corpus only two telephone openings contain this token as affirmation, one exhibits a final rising pitch contour, the other a falling one. The latter will be mentioned below as deviant case. Extract (6) shows that even *vâng* carrying a lexical *high-level* tone can also be produced with a final *rising* pitch contour when functioning as a request for identifying information (Fig. 7):

(6) 10/1 Summer08: VT-TH-OD ((VT and OD are sisters. OD is the mother-in-law of TH. VT calls to talk with OD))

- 1 TH alô  
*Hello?*
- 2 VT à H à  
ah first name of TH Q-Part  
*Are you H?*
- 3 TH vâng?  
*Yes?*
- 4 VT ừ...ừ dì T đây thế nào khỏe không con  
yes aunt first name of VT here how well KHÔNG you  
*Yes, aunt T here. So, are you well?*
- 5 TH à dì à con khỏe ạ  
ah aunt Q-Part I well Part of politeness  
*Ah, hello aunt. I'm well.*



**Fig. 7.** Pitch contour produced on *vâng* by speaker TH (female) requesting identifying information

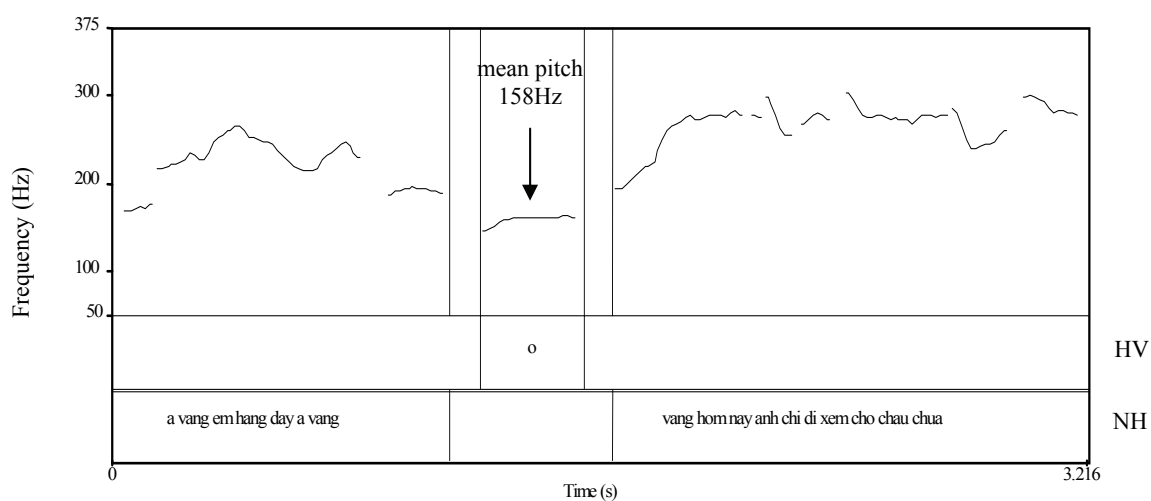
Above, the phonetic realisations on affirmative/acknowledgement tokens have been identified as final rising when doing the work of asking for the identification or, more frequently, for the reason for the call. This corpus provides, however, one case (extract (7)) where the request for the reason for the call can also be expressed by pitch, but differs from other cases discussed above in bearing a final *mid-level* pitch contour.

4.2.1.3 Final mid-level pitch contour on acknowledgement words carrying a lexical low-falling tone

(7) 16/1 Summer08: HV-NH ((HV and NH are male. NH is workmate of HV’s wife. The daughter of NH and the son of HV have just taken the entrance examination for the same secondary school. NH calls to ask about the marks of the children))

- 1 ((phone rings))
- 2 HV alô  
*Hello?*
- 3 NH alô anh V ạ  
hello address form for male first name of HV Part for politeness  
*Hello V?*
- 4 HV ai đấy à H đấy à  
who that ah first name of NH that Q-Part  
*Who's that? Ah, are you H?*
- 5 NH <<t> vâng> em H đây ạ <<t> vâng>  
yes I H here Part for politeness yes  
*Yes. H here. Yes.*
- 6 HV ờ: -  
*Yes?*
- 7 NH <<t> vâng> hôm nay anh chị đi xem cho cháu chưa đi xem:m xem lớp cho cháu  
yes today you your wife go see for child or not go see see class for child  
chưa ạ  
Q-Part Part for politeness  
*Yes. Have you been there and had a look at his class already?*

Fig. 8 shows the final pitch contour realised on the token *ờ* by speaker HV acknowledging the identification from speaker NH.



**Fig. 8.** Final mid-level pitch contour produced on *ờ* by speaker HV (male) requesting the reason for the call

Although HV does not produce a final rising pitch contour, but merely a mid-level pitch contour (mean pitch 158 Hz) at the end of the token *ờ* carrying a lexical low-falling tone, NH still gives the reason why he is calling. The utterance of HV in line 6 can also be understood as a request for information (here the reason for the call), since the identification task is done: HV has recognised NH (line 4) and his recognition is confirmed by NH (line 5). In this case, the duration which is longer than in the backchannel context (extract (2), Fig. 2) makes the mid-level pitch contour at the end of the signal clearly



perceivable. This example suggests that callers interpret not only a final rising but also a final mid-level pitch contour on affirmative tokens as a request for the reason for the call.

The question of whether the pitch contour identified (final rising/mid-level) is relevant to requests for information will be addressed in the following section, in which deviant cases are analysed in order to exhibit the orientation of participants to the common pitch contour.

#### 4.2.2 Deviant cases

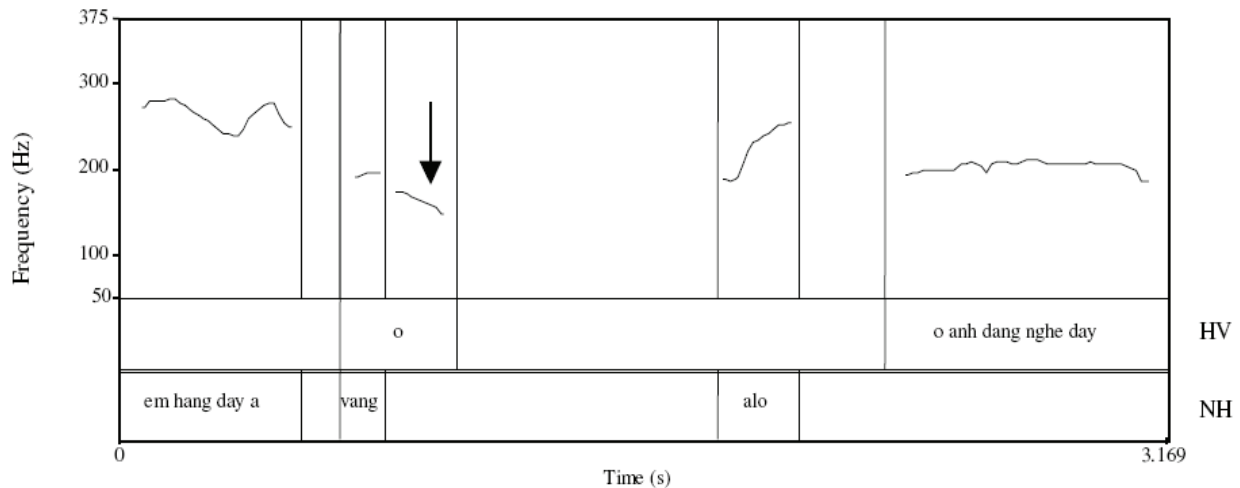
Extract (8) is another call of the same speakers HV and NH (cf. extract (7)):

(8) 30/1 Summer08: HV-NH

- 1 ((phone rings))  
 2 HV alô  
*Hello?*  
 3 NH <<all> <t> (vâng) anh V a  
 yes address form for male first name of HV Part for politeness  
*Yes. Are you V?*  
 4 HV à H à  
 ah first name of NH Q-Part  
*Ah, are you H?*  
 5 NH àm vâng em H đây ạ  
 ahm yes I H here Part for politeness  
*Yes. H here.*  
 → 6 HV [ờ ::.]  
*Yes.*  
 7 NH [<<t> vâng >]  
*Yes.*  
 8 (--)  
 → 9 alô?  
*Hello?*  
 10 HV ờ anh đang nghe đây  
 yes I Cont hear here  
*Yes. I'm listening.*  
 11 NH dạ vâng (.) anh ơi chị T  
 Part for politeness yes you vocative address form for females first name of HV's wife  
 có nhà không ạ  
 at home KHÔNG Part for politeness  
*Yes. V, is T at home*

This extract is similar to extract (7) but only until line 6 where HV's token is produced with a considerable final falling pitch (Fig. 9). After that NH says Hello? again (line 9) signalling that there is something wrong in the conversation. After HV confirms that he is still on the phone and listening, NH gives the reason why he is calling. The response of NH as recipient (line 9) to the turn of HV (line 6) is different from the responses of other recipients in common cases. Although there is an overlap at the very beginning of the two turns, the final falling pitch contour is still perceivable and hence causes the response of NH. This corresponds to the claim that the tone offset is more important for perception

than the tone onset (Brunelle, 2009b). Extract (8) provides an example in which recipients respond differently when the common pitch contour is not used. This indicates that recipient NH orients himself to the final rising or at least mid-level pitch contour on the affirmative token expressing a request for his account for the call during the conversational opening.



**Fig. 9.** Final falling pitch contour as deviant case for requesting the reason for the call by speaker HV (male)

Aside from this example, the corpus provides four other deviant cases. One contains the token *vâng*, on which no clear rising pitch contour is produced to ask for the identification of the caller as in extract (6) above. According to the data, this case can be explained by the self-introduction of the caller in the first identification sequence. Three other telephone openings exhibit no final rising/mid-level pitch contour on the tokens *ờ* and *ừ* used when acknowledging information, e.g. the identification of callers, in the position in which they could be produced to request the reason for the call. One such example is given in (9):

(9) 3/2 Summer08: AK-MT ((AK is male and MT is female, they are co-workers))

- 1 ((phone rings))
- 2 MT alô  
*Hello?*
- 3 AK alô cô T hả  
hello address form for female first name of MT Q-Part  
*Hello T?*
- 4 MT ừ.  
*Yes.*
- 5 AK cô đang đang phun sâu à  
you Cont Cont spray caterpillar Q-Part  
*Are you spraying against the caterpillars?*
- 6 MT (-) ↑không à à cô đang ấy thẻ  
no ah ah I Cont do cards  
*No. I'm dealing with the cards.*  
(.) ((noise in the office))

- 7 AK thẻ gì  
card what  
*What kind of cards?*
- 8 MT ( ) cô phải cắm thẻ  
*I must set up cards*
- 9 AK à thẻ à hôm nay cô mới cắm thẻ à  
oh I see today you new set up cards Q-Part  
*Oh. I see. You go to set up the cards not until today?*
- 10 MT ừ cô đi cắm lại tất cả một loạt luôn  
yes I go set up again all at once  
*Yes. I'm setting up again all (cards) at once.*
- 11 AK à lúa có tốt không  
ah rice plant CÓ good KHÔNG  
*Ah, is it going well with the rice plants?*
- 12 MT lúa á na cũng được  
rice plant Q-Part nah also OK  
*Rice plants? Ah, they are OK.*
- 13 AK à vậy à <<t> vâng> cháu muốn hỏi là:::m ở cái cái thí nghiệm ( )  
oh I see yes I want ask do uh Class Class experiment ( )  
cô bố trí:: nhà chưa  
you arrange room or not  
*Oh. I see. Yes, I'd like to ask about carrying out the experiment ( ). Have you arranged rooms for that yet?*

On the affirmative word of speaker MT in line 4, a final falling pitch contour is produced. After that a relatively long string of sequences are exchanged (lines 5 to 12). Interesting is the turn in which AK gives the reason for his call (line 13): he starts with the phrase “I’d like to ask ...”. In comparison to other cases where callers directly give reasons for the calls after a “prosodic” request, the account for the call by AK is launched first with a fixed phrase functioning as a pre-sequence. Extract (9) as a deviant case suggests that as long as no final rising or mid-level pitch contour is realised on *ờ/ừ* and no explicit questions are asked, there is a relatively wide scope for the exchange of inserted sequences until the place where the reason for the call is given. Furthermore, the way AK explains why he is calling indicates that his explanation has not been directly made relevant by the answerer. Instead it appears to be more of an unconstrained, self-initiated action of accounting for the call.

In everyday telephone calls, it is common that one can explicitly request information from conversational partners or offer them the freedom as to when they give the reason for the call. There is, however, another way for answerers to accelerate this process, that is to use pitch movements on affirmative/acknowledgement words. To make such a request, Vietnamese speakers tend to produce on *ờ/ừ* and *vâng* a final rising or at least mid-level pitch contour. The organisation of requests using this pitch contour is supported by the analysis of deviant cases indicating that recipients do indeed orient themselves to the identified pitch contours.

## 5 Summary and Conclusion

It has been long established for non-tonal languages such as English that different pitch patterns can convey different pragmatic meanings, for example, a falling pitch is normally

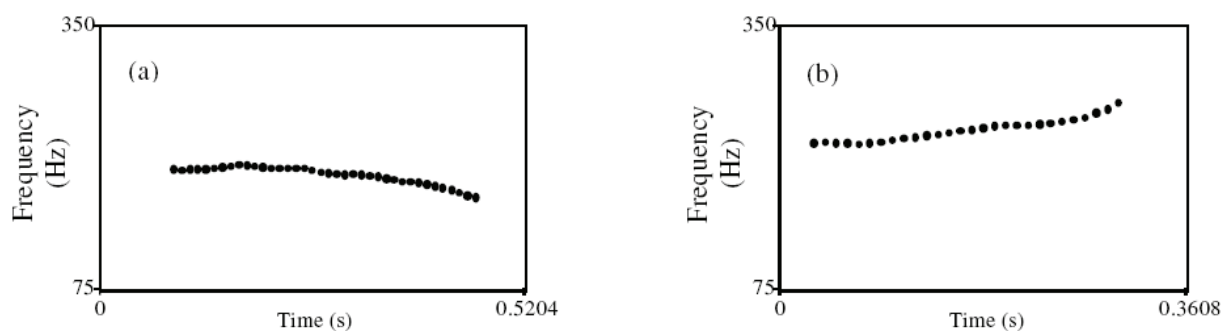
used for replies to questions and a high or rising pitch for utterances with questioning modality (Ladd 1996). The results of this study indicate that Northern Vietnamese also utilises pitch contours in this way. The pitch contours used on the three investigated discourse markers in backchannel utterances and in requests for information during conversational openings are summarised in the following table:

**Table 2:** Tonal properties of *ừ/ờ* and *vâng* and their phonetic realisations in investigated interactional contexts

Tokens	Lexical tone	Stylised tone contour	Pitch register	Pitch contour produced in backchannels	Pitch contour produced in requests for information (e.g. the reason for the call)
<i>ừ/ờ</i>	low-falling	.....	lower	falling/ low-level	final rising/ mid-level
<i>vâng</i>	high-level	.....	upper		

Northern Vietnamese uses intonation on discourse markers to convey communicative meanings: (1) In backchannel utterances, the falling or low-level pitch contour is frequently used on affirmative or acknowledgement tokens *ờ* and *ừ*. This realisation appears to be identical to the lexical tone of these two tokens. What is striking is that the token *vâng* is also produced with a falling or low-level pitch. That is, *vâng* does not retain the lexical component of its high-level tone when produced as a backchannel indicating that in this context the pitch contour overrides the lexical tone. (2) On the same tokens *ờ*, *ừ* and *vâng*, a final rising/mid-level pitch contour tends to be used to request identification and/or the reason for the call during conversational openings.

In short, the three discourse markers investigated are produced with two different pitch contours, depending on their function in the discourse. The two patterns on one discourse item are illustrated in Fig. 10:



**Fig. 10.** Pitch contours spoken on the discourse marker *ờ* by speaker TT (female) in a backchannel utterance (a) and in a request for information during the opening in a telephone call (b)

This study has presented preliminary findings concerning the use of intonational means in Vietnamese conversations. With respect to other languages such as German (Schmidt 2001), English (Ward 2004) or Japanese (Mori 2005), results found in Vietnamese data appear to reflect a general cross-linguistic tendency to produce backchannels in conversation with a low(-falling) or flat pitch. However, further

investigation of similar conversations in different languages is needed. For Vietnamese, it is important to ascertain whether the pitch contours found also occur in other kinds of conversations (e.g. face-to-face talks).

### Acknowledgment

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### Appendix

#### *Transcription conventions*

[	speech overlaps
[	
=	quick and direct connection of new turns or units
(.)	micro pause
(-), (--), (---)	short pause, long pause, longer pause, from approx. 0.25-0.75, to approx. 1 second
:, ::, :::	lengthening, according to duration
((laugh))	description of laughing, explanation of the context or events
((...))	omission in the transcript
( )	incomprehensible passages according to duration
→	investigated line in the transcript
ACCENT	accented token

#### Final pitch movement

?	high rising
,	mid rising
-	level
.	(deep) falling

#### Noticeable pitch skips

↑	up
↓	down

#### Shifted pitch register

<<t>	>	low pitch register
<<h>	>	high pitch register

Loudness and speech tempo

<<f>	>	forte, loud
<<p>	>	piano, quiet
<<all>	>	allegro, fast

**Abbreviations**

(CÓ-)...KHÔNG	yes/no question frame, for example, <i>anh (có) khỏe không?</i> (word-for-word translation: you (are) healthy or not) “How are you?”
Conj	conjunction
Cont	continuous form (like <i>-ing</i> in English)
ĐUỖC	means ‘to obtain’, ‘to reach’
Class	classifier
Imp Part	imperative particle
Neg	negation
Prep	preposition
Q-Part	question particle
Sent Part	sentence particle
Ý (mà)	spoken by the current speaker eliciting acknowledgement/recognition from the hearer

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# ASPECTS OF REDUPLICATION IN KŌHO, A MON-KHMER LANGUAGE<sup>46</sup>

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## 0 Abstract

Reduplication is a widely known and copiously described phenomenon in many Southeast Asian languages. In the literature concerning this complex subject, there is often a lack of consistent terminology or descriptive methodology making comparative analysis difficult. This paper explores one aspect of reduplication in Kōho. It focuses on a set of binomials variously termed ‘expressives’ or ‘adverbials’. These forms resemble the English binomials: willy-nilly (which has a rhyming scheme) and zig-zag (which undergoes ablaut). Some forms have lexical and semantic content in both the base and the reduplicant, while others exhibit forms—especially in the reduplicant—that are simply euphonic.

This paper presents a corpus of Kōho reduplicated forms, describes the phonological changes, and posits a potential methodological framework for analyzing semantic and lexical output of the reduplication.

## 1 Introduction

The Kōho,<sup>47</sup> (ISO 639-3: kpm) who call themselves kon cau, number approximately 100,000 people and inhabit most of Lâm Đông province in highland Việt Nam; several thousand now live overseas in France and the U.S.A. They are one of approximately fifty minority groups living in Việt Nam; these people are also known as montagnards or highlanders. Kōho, along with the Chrau, Mnong, and Stieng languages, comprise the South Bahnaric branch of the Mon-Khmer (Austroasiatic) language family.

Reduplication is a widely known and copiously described phenomenon in many Southeast Asian languages.<sup>48</sup> Previous work in Mon-Khmer languages includes Bahnar (Banker 1964); Chrau (Thomas 1969); Jeh (Gradin 1976); Khmer (Jacob 1968, §46; Jenner 1969); Khmu/Kammu (Svantesson 1983); Kōho (Duong 2003, Nguyễn 1973); Minor

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<sup>47</sup> The ethnonym Kōho [kəhə] is derived from a Cham word that refers collectively to a group of several peoples (Cil, Lát, Mả, Nộp, Riong, Sre, Tring) speaking mutually intelligible dialects in the southern part of the highlands of Việt Nam (Olsen 1968, 1976). Although, Mả is linguistically a Kōho dialect, it is considered by the Mả community and ethnologists to be a separate ethnic group.

<sup>48</sup> In the Southeast Asian Linguistics Society archive <<http://www.sealang.net/sala/>>, nine of the 27 articles on reduplication describe Austroasiatic languages.

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Mlabri (Rischel 1995:92-98); Mnong (Đinh 2007); Ngeq (Smith 1973); Pacoh (Watson 1966); Sedang (Smith 1969); and Vietnamese (Nguyễn 1970).

Some linguists consider reduplication to be a component of affixation, since many of the phonological processes are similar or identical (Prince and Smolensky 2004:40-43). However, lexical, semantic, and syntactic issues often come into play as phonological explanations alone cannot completely account for the data in many languages.

Rischel, in describing Minor Mlabri, notes that

In Mon-Khmer languages it is expected that reduplication may occur as a morphological device in the so-called Expressives, i.e. expressive words which (i) accompany ordinary clause-type predications without being syntactically integrated into the clause structure and which moreover (ii) may have a characteristic phonetic structure giving associations about the action that is being talked about (flop in English is such an expressive word). (1995:92)

## 2 Definitions and Terminology

In the literature concerning binomials in general and reduplication specifically, there is a lack of consistent terminology. This situation makes language-specific and comparative analysis difficult. Some of the terms that have been employed include: bimorphemic compounds (Manley 1972:128); couplets (Evans and Bowen 1962:81, 155; Filbeck 1996); doublets (Bochet and Dournes 1953:xviii); elaboration (Nacaskul 1976); ‘rhymer’ and ‘chimera’ (Jacob 1968:189; Steve O’Harrow, p.c.); expressives (Rischel 1995:92); embroidery and epithets, etc.

The term binomial has been used to indicate several types of compound words. A Sanskrit template is often invoked to classify or sub-divide binomial expressions (samāsa) in Indo-European languages. This template is summarized in (1):

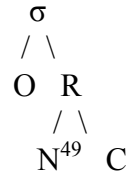
(1)

Type	Description	Examples (from English)
Endocentric (tatpuruṣa)	A + B denotes special kind of B	darkroom, smalltalk
Exocentric (bahuvrīhi)	A + B denotes a special kind of unexpressed semantic head	skinhead, paleface (head: ‘person’)
Copulative (dvandva)	A + B denotes ‘the sum’ of what A and B denote	bittersweet, sleepwalk
Appositional	A and B provide different descriptions for the same referent	actor-director, maid servant

The Sanskrit template in (1) classifies binomials by syntactic or semantic function. To this template, I would add an avyayībhāva category, which describes forms that are indeclinable, functioning (avyaya) as an adverb. The corpus, presented below, was selected from adverbial-like binomials. A full descriptive analysis of Koho binomials would also incorporate this type of template. While the template in (1) is useful for categorizing binomials and related compounds in general, it does not specifically address reduplicated forms. In compiling the material for this study, it was found that the available lexicographic resources could not address the semantic/lexical component of the data. So,

it was decided to examine the phonological or prosodic form of Kōho binomials instead. A relevant descriptive prosodic framework is that of Svantesson (1983:84), based on classic syllable structure, and his work with Kammu/Khmu, a Mon-Khmer language. It is exemplified in (2):

(2)



Where  $\sigma$  = syllable; O = onset; R = rhyme; N = nucleus; C = coda

Note that this schema addresses only main syllables, not presyllables, a common phenomenon in Mon-Khmer languages. In true reduplicated binomials in Kōho, at least from the restricted corpus used in this study, it appears that presyllables are exempted from most phonological or prosodic processes.

Svantesson identifies five types of reduplication (with examples in Kōho from Evans and Bowen 1962), delineated in (3):

(3)

Type of reduplication	Description	Example (in Kōho)
R( $\emptyset$ )	no change	/sum-sum/ 'always, forever'
R(O)	onset-change	/bih-khīh/ 'to be poisonous'
R(P) = [R(N)]	peak-change (=nucleus)	/cək-cək/ 'to gossip'
R(C)	coda-change	/ʔalaʔ-ʔalaj/ 'carelessly'
R(R)	rhyme-change	/crih-cra:j/ 'strange, wonderful'

### 3 Data: corpus of reduplicated forms

The following corpus consists of examples of Kōho reduplicated binomials elicited by Evans and Bowen (1962:149-155). From the eighty-seven 'couplets' (sic) they list, a restricted corpus was compiled by selecting adverbial-like forms (i.e., as delineated in the *avyayībhāva* category described previously). These forms were then classified by Svantesson's typology. The reduplicated form is cited in orthographic<sup>50</sup> then phonemic form, followed by its gloss (as per Evans and Bowen), an example sentence, and their translation. EBnnn indicates the page number of the original citation, and a number in parentheses cites the sentence number on that page (e.g. EB149 (11) refers to sentence 11 on p. 149).

<sup>49</sup> I have substituted N (nucleus) for Svantesson's P (peak).

<sup>50</sup> Evans and Bowen employ a variant of the orthography in use for Kōho during the 1960s and 1970s. <î> or <ê> = /e/, <o> = /a/, <ō> = /ɔ/; otherwise, the segments are equivalent to Vietnamese *quốc ngữ* phones.

### 3.1 R(Ø): No change

- (4) chòp-chòp chor-chor  
 /cha:p-cha:p=char-char/  
 ‘to be quick in movement, light or nimble-footed’  
*Oh ur neh loh broă jak mɔ sorbac ngan, sîn dĩ rùp sả khai goloɦ chòp-chòp chor-chor.*  
 ‘That girl works cleverly and fast, seeing her she is very quick in her movements.’  
 EB149 (11)

Out of the selected ‘adverbial’ examples, the only R(Ø) sentence was (4), which also exemplifies a four-syllable idiomatic expression. Language consultants note that speakers who use these forms demonstrate an elegant manner of expression.

### 3.2 R(O): Change in onset

- (5) bih khih  
 /bih-khìh/  
 ‘to be poisonous’  
*Bês tur hỏ gɔs bih khìh ngan.*  
 ‘That viper is very poisonous.’ EB149 (3)
- (6) oan-jan  
 /ʔwan-jaŋ/  
 ‘to endure wrongfully’  
*Khai pɔdah aň kỏnau phan, aň oan-jan ngan.*  
 ‘He suspected me of stealing things, I endured a lot.’ EB152 (49)

#### 3.2.1 Complex onsets

- (7) gojraň-maň  
 /gɔjraŋ-maŋ/  
 ‘angry’  
*Tài boh gɔs cau đos ioh, gen khai gojraň-maň.*  
 ‘Because someone spoke evil, he was angry.’ EB150 (18)

This base is derived from the verb *jraň* ‘to hate; anger; bear (someone) a grudge’. The prefix *gɔ-* /gɔ-/ passivizes the verb; the reduplicant *maň* /maŋ/ appears to be euphonic with no meaning.<sup>51</sup>

- (8) ioh-rmoh  
 /ʔjəh-rəməh/  
 ‘evil’  
*Muh mat khai ioh-rmoh ngan.*  
 ‘His face is very evil.’ EB151 (28)

<sup>51</sup> Interestingly, a related binomial *gojraň-kowêng* ‘hate, n.’ is attested in Bochet and Dournes dictionary as *kowiň-jirang* (1953:89). This is evidence that Kɔho has reversible binomial compounds.

- (9) lah sorpah  
/lah-sərpah/  
'to revile'  
*Bañ lah sorpah cau.*  
'Don't revile people.' EB151 (30)
- (10) sɔbɔŋ-rɔŋ  
/səbɔŋ-rəŋ/  
'dangerous'  
*Rbàng hỡ neh mor pǎ, sɔbɔŋ-rɔŋ ngan.*  
'That bridge is almost broken, very dangerous.' E154

It is not clear if (7-10) are true reduplicated forms or 'fossilized' compounds with a euphonic component. None of the second elements could be found in the lexicographic resources available.

### 3.3 R(N): Change in nucleus

- (11) cɔk-cɛk  
/cək-cək/  
'to gossip'  
*Mộ ne jak đos cɔk-cɛk ngan.*  
'That lady is very gossipy.' EB150 (12)
- (12) cɔluk-cɔlak  
/cəluk-cəlak/  
'to say or do that which one has no right to, or all wrong'  
*Bañ đos cɔluk-cɔlak behỡ.*  
'Don't talk like that.' EB150 (13)
- (13) hil-hol  
/hil-həl/  
'looking around blankly (as though to find something that disappeared)'  
*Ńchi be loh sîn hil-hol, òbat gỡ gơ ơ?*  
'Why are you looking around blankly, don't you see it?' EB151 (24)
- (14) hwir-hwor  
/hwir-hwər/  
'not clearly'  
*Khai gơ bota duh sǎ oǎ ngan, gen tang gơloh hwir-hwor.*  
'He has a high fever, therefore his eyes are not clear.' EB151 (27)
- (15) lohwit-lohwat  
/ləhwit-ləhwət/  
'unsteady, insecure'  
*Khai loh conong hỡ ò kỡ gen tang gơloh lohwit-lohwat.*  
'He didn't make that chair firm so it is unsteady.' EB151 (34)

- (16) *kwi-kwə*  
 /kwi-kwə/  
 ‘to waver back and forth’  
*Ñchi loh đos **kwi-kwə**? Đos tẻ sòng.*  
 ‘Why do you waver so? Speak the truth.’ EB152 (39)
- (17) *nggu-ngge*  
 /ŋgi-ŋgɛ/  
 ‘to coo’  
*Oh nga git đos **nggu-ngge** rau.*  
 ‘The baby knows how to coo already.’ EB152 (44)
- (18) *wil-wəl*  
 /wil-wəl/  
 ‘to waver, from one side to the other’  
*Bañ đos **wil-wəl**, đos tẻ sòng.*  
 ‘Don’t waver back and forth, speak straight.’ EB155 (87)

There appears to be a pattern of vowel harmony exhibited in the R(N) forms. This phenomenon is not the focus of this study, but should be explored in future research.

### 3.4 R(C): Change in coda

- (19) *alǎ-alai*  
 /ʔalaʔ-ʔalaj/  
 ‘carelessly’  
*Khai loh broǎ đọ **alǎ-alai** ngan.*  
 ‘He did this work very carelessly.’ EB149 (1)
- (20) *lɔngap-lɔngai*  
 /lɔŋap-lɔŋaj/  
 ‘peace, peaceful’ (cf. (29))  
*Khai om tom hiu kỡ hỡ **lɔngap-lɔngai** ngan.*  
 ‘He lives in that sturdy house very peacefully.’ EB151 (36)
- (21) *ngac-ngǎr*  
 /ŋac-ŋar/  
 ‘fervent, zealous’  
*Khai **ngac-ngǎr** ngan tom joh alǎ broǎ.*  
 ‘He is zealous in all his work.’ EB152 (42)
- (22) *sɔrbac-sɔrbǎng*  
 /sɔrbac-sɔrbaŋ/  
 ‘fast’  
*Khai loh broǎ **sɔrbac-sɔrbǎng** ngan.*  
 ‘She works very fast.’ EB154 (72)

- (23) sormah-sormài  
 /sərmah-sərma:j/  
 ‘generous’  
*Khai pà ãn in phan sa, khai sormah-sormài ngan.*  
 ‘She gave me some food, she is very generous.’ EB154 (74)

Any phonological pattern for predicting the reduplicant coda, if any, is complex and will require many more forms to discern what mechanisms are at work.

### 3.5 R(R): Change in rhyme

- (24) bassil-basso  
 /bassil-basso/  
 ‘to be ashamed, bashful, timid’  
*Khai om bở wam muh mat gen bassil-basso ngan.*  
 ‘Her face was dirty so she was very ashamed.’ EB149 (2)
- (25) botat-botròh  
 /bətət-bətrə:h/  
 ‘to reproach, to mock’  
*Ông ne đơs botat-botròh ãn, khai đơs lah ãn jak chàì.*  
 ‘That man reproached me, he said I’m wise (sarcasm).’ EB149 (7)
- (26) gôhôn-gôhàc  
 /gəhɔn-gəha:c/  
 ‘an inward urge to do something’  
*Nisoma ãn gôloh gôhôn-gôhàc tom nùs mơ gôhôn lệt tus tom bôn cau.*  
 ‘Suddenly I had an urge in my heart to go to their village.’ EB150 (17)
- (27) lac-leo  
 /lac-lɛə/  
 ‘deceitful’  
*Khai đơs lac-leo ngan, ò đơs sòng.*  
 ‘He speaks very deceitfully, doesn’t speak the truth.’ EB151 (29)
- (28) ləh-lang  
 /ləh-laŋ/  
 ‘clearly’  
*Khai đơs ləh-lang ngan.*  
 ‘He speaks very clearly.’ EB151 (31)
- (29) longai-longò  
 /ləŋaj-ləŋɔ:/  
 ‘peaceful’ (cf. (20))  
*Khai loh broả neh sir rau, gen tang khai om longai-longò.*  
 ‘He finished his work and so can rest in peace.’ EB151 (35)

- (30) *òsəp-òsə*  
 /ʔa:səp-ʔa:sə/  
 ‘to scorn, look down upon’  
*Bañ sĭn òsəp-òsə dĭ cau koĥom dĭt.*  
 ‘Don’t look down upon children.’ EB152 (51)

The examples (24-30) illustrate change in both nucleus and coda. Again, these patterns are complex: codas are dropped in the reduplicant, nucleus vowels lengthen or shorten, and there is possible vowel harmony in some instances.

#### 4 Conclusion

As can be seen from the examples cited, so-called adverbial-like forms can function as nouns, verbs, adjectives, and adverbs. It appears from this restricted corpus that the lexical or semantic component of *Koĥo* binomials bear little or no effect on the phonological or prosodic shape of the reduplicant.

It has been noted that presyllables (also termed minor syllables), at least in the corpus examined, are exempted from most phonological or prosodic processes. This holds for true reduplicated binomials.

Complex onsets may not actually be reduplicated binomials, but base forms with fossilized second elements, where the meaning has been lost. Lexical research produced no matches for any of the second elements.

Rhyme-changing forms, R(R), present the most challenge for analysis. What are the interactions between the nucleus and the coda? Is there a relationship in generating the reduplicant?

Other questions remain in regard to *Koĥo* reduplication: What triggers onset, nucleus, or coda change? Why? Since reduplication is essentially a copying process—is there vowel harmony operating in *Koĥo* (as been reported in other Mon-Khmer languages)? These questions provide a focus for future research on *Koĥo* binomials.

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# BANGKOK THAI TONES REVISITED

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## 0 Abstract

There is a long tradition of studying Thai tones, beginning with the works of Cornelius Bradley (1909 and 1911) and Daniel Jones (1918, in Henderson 1976). The landmark work in Thai tonal description was done by Abramson in 1962. Both linguists and Thai language teachers alike consider the 1962 description to be the prescriptive standard and norm today. In 2006, Morén and Zsiga provided a description of Thai tones that many scholars in the field consider controversial, as it differs greatly from Abramson 1962. The current study offers a preliminary look at the state of Bangkok tones today as spoken by twenty-five female native speakers from three different age groups: Younger (18-24), Middle (30-40), and Older (50+). The current study shows preliminary evidence toward a change in progress for Bangkok Thai tone production, particularly in tone shapes across the three age groups examined. Younger speakers show a general trend toward a higher tonal onset for the Mid and Low tones, as well as a later pitch change for both the Falling and Rising tones.

## 1 Bangkok Thai

Bangkok Thai, also known as Siamese in the linguistic literature, is a dialect of Thai spoken in the capital of the Kingdom of Thailand. Linguists generally consider Bangkok Thai and Standard Thai, the Kingdom’s official language, to be one and the same. Much like Standard Thai, Bangkok Thai has high social prestige and is often used in mainstream Thai media such as talk shows, game shows, and television dramas. Anivan (1988) found that Bangkok speakers have the most innovative tones, while non-Bangkok speakers are more conservative, using tones that pattern with older Bangkok speakers. Tienmee (1992) reported that non-Bangkok Thai speakers seem to be aiming at Bangkok Thai when speaking Standard Thai. The difference between Bangkok Thai and Standard Thai is most likely one of register rather than dialect.

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### 1.1 Bangkok Thai Tones

There are five lexical tones in Bangkok Thai: High, Mid, Low, Falling, and Rising. High, Mid, and Low tones are traditionally considered to be level or relatively static, while Falling and Rising are contoured. Table 1 illustrates the five lexical tones.

**Table 1** Bangkok Thai Tones

Thai	IPA	Tones	Gloss
คก	k <sup>h</sup> a:	Mid	n. 'type of grass' adj. 'stuck, ajar'
ค้ำ	k <sup>h</sup> á:	High	n. 'commerce' v. 'to sell'
กั้ก	k <sup>h</sup> à:	Low	n. 'galangal root'
คํก	k <sup>h</sup> á:	Falling	n. 'price, cost'
กํก	k <sup>h</sup> á:	Rising	n. 'leg'

Thai has a relatively restricted syllable structure with limited initial consonant clusters, no final consonant clusters, and a small number of allowable coda consonants. Additionally, Thai tones are distributed according to syllable types, distinguishing between open and closed syllables. Only Low, Falling, and High tones occur in closed syllables. Of all the tones, High tone has the lowest functional load in indigenous vocabulary, occurring in two types of syllables.<sup>53</sup>

### 1.2 Previous Descriptions of Thai Tones

A historical cross-section of tonal descriptions shows that Standard Thai tones (and presumably also Bangkok Tones) are, indeed, phonetically changing. Studies from the early twentieth century by Bradley (1909 and 1911) and Jones (1918, in Henderson 1976) described Mid (Middle) and Low (Depressed) as fairly static, though Mid had a slight fall toward the tonal offset.<sup>54</sup> Rising tone was not particularly contoured. High (Circumflex) tone had a slight rise followed by a period of tonal plateau and ended with a sudden fall. Neither of the early studies indicated the age or gender of the speakers, though the speakers were most likely upper class males. Bradley may have recorded himself, as he was a native bilingual speaker of Standard Thai. Figure 1 below illustrates the tones of Siamese as recorded by Bradley (1909).

<sup>53</sup> Syllables ending with nasals or semi vowels are considered to be open syllables in Thai phonology, while those ending with voiceless stops are closed syllables. The High tone is allowed in (1) open syllables with an initial Low consonant and second tone marker and (2) closed syllables with an initial Low consonant and short vowel. See Appendix A for the Thai Tone Box.

<sup>54</sup> Though their recording methodology was surely different from current practices, their descriptions were detailed and thorough. Their observations were so keen as to include some of the earliest notes on the relationship between tone distribution and syllable types.

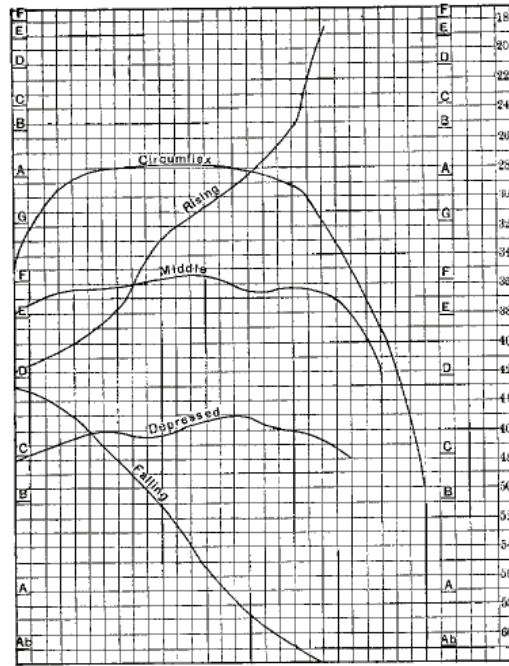


Figure 1 Tones recorded by Bradley (1909:xcvi)

A half-century after Bradley and Jones, Abramson (1962) observed markedly different tones when he recorded two male speakers in their 30s. His results are shown in Figure 2. High and Mid tones remained fairly static and level, with a slight fall during the last ten percent of the tonal duration. Low tone had a gradual fall in F0 values in the first half of the tonal duration but was static for the second half of the duration. Falling and Rising tones are highly contoured. Falling tone was characterized by a slight rise followed by a very short plateau and a relatively sudden fall. Rising tone began with a slight fall and is also followed by a slight contour with a relatively sudden rise.

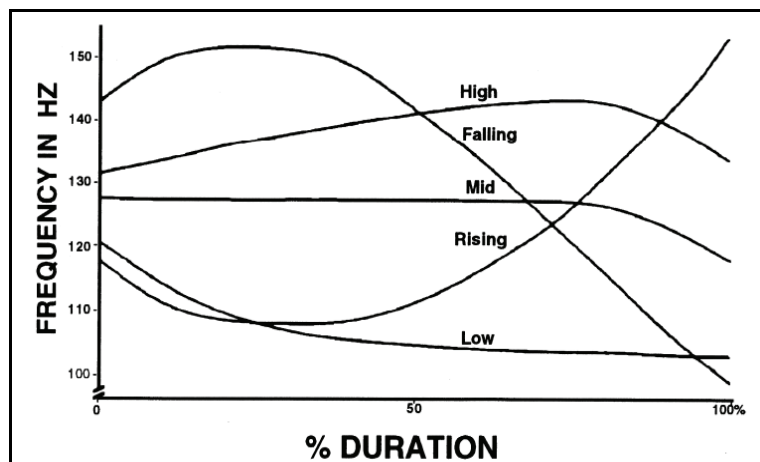
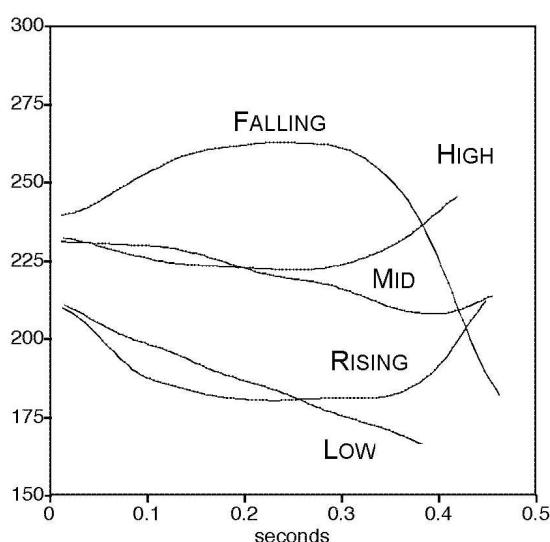


Figure 2 Tones recorded by Abramson (1962)

Gandour et al 1991 was one of the earliest studies that tested multiple speakers, ten younger male speakers and ten older speakers, five males and five. The phonetic characteristics of this study are generally in agreement with Abramson 1962. The study

focused on inter- and intra- speaker variability of the five lexical tones. Gandour et al found that the degree of variability is inversely related to the amount of tonal movement, meaning, tones with greater tonal movements such as Falling and Rising have less variability and tones with less tonal movement such as Mid and Low have more variability (*ibid*:364-5). Interestingly, the study also found variability between younger and older speakers to “be minimal in terms of...production of Thai tones. Despite differences in age, education and socioeconomic status, the pattern of variability across tones in the old group is similar to that of the young group” (*ibid*:370).

The most recent works show, yet again, different phonetic shapes for the five tones. Scholars (Morén and Zsiga 2006 and Teeranon 2007) found that High and Rising tones now have similar concave tone shapes, that is, beginning with a slight fall in F0 values, followed by a plateau and ending with a slight rise.<sup>55</sup> Teeranon (2007) argues that since High tone is now contoured, it should be categorized as such instead of as a ‘level’ or static tone. Falling tone remains remarkably similar to previous descriptions in that it has a slight rise followed by a small plateau and a sudden fall. Like in Abramson’s report, recent studies also describe Falling tone as phonetically higher than the High tone. Morén and Zsiga (2006) and Luksaneeyanawin (1998) show Low tone to be the most phonetically flat (non-contour), characterized by a gradual fall from tonal onset to tonal offset. Figure 3 illustrates the tones from Morén and Zsiga 2006.



**Figure 3** Tones recorded by Morén and Zsiga (2006, as quoted in Zsiga 2007)

Some recent studies done by Thai linguists (i.e., Panroj 1990, Gandour et al 1991, Teeranon 2007, Kantong 2008) have tried to capture the tonal differences between younger and older speakers. The majority of tonal studies do not distinguish different age groups, treating the tones as static across time and different speakers. Nearly a half-century after Abramson’s (1962) description, linguists and Thai language teachers alike still refer to his as the norm for Bangkok Thai speech (Hoonchamlong 2007). Sociolinguistic investigation

<sup>55</sup> Both Morén and Zsiga 2006 and Teeranon 2007 studied female speakers whereas Abramson 1962 studied male speakers. Gandour et al 1991 studied fifteen male and five female speakers. Tonal differences due to sociolinguistic factors (i.e. gender, age, socioeconomic status, sexual orientation, etc.) have yet to be systematically studied in Thai and the author, thus, discusses the results without consideration of gender for practical purposes.

of tones in the varieties of Thai is clearly still in its infancy and no comparative study of all five tones in Bangkok Thai has ever been done.

Studies conducted after Abramsom (1962) involve young female adult speakers, usually in their early to mid 20s. Female Thai speakers have been more accessible than male speakers for linguistic studies because Thai linguists are overwhelmingly female with female students, or were themselves students working with foreign advisors abroad. Thai language teachers both domestically and internationally are also typically female. Works on Thai tones has focused primarily on citation-form pronunciation rather than connected speech, though there has been increased interest in connected speech pronunciation as well as tonal perception experiments (i.e., Tingsabadh and Krisnaphan 1996 and Roengpitya 2000, respectively). There is reason to revisit the citation-form pronunciation of Bangkok Thai tones. Noss (1975) argues convincingly that a thorough understanding of citation-form pronunciations is essential as the groundwork for any tonal study in Thai, whether phonetic or phonological. The current study continues with existing trends in Thai tonal phonetics. Future studies should expand to include male speakers and connected speech pronunciations.

## 2 Current Study

### 2.1 Speakers

Fifteen female native speakers of Bangkok Thai participated in this study. All speakers were born and raised in Bangkok with native Thai-speaking parents. They are current residents of Bangkok and either have never lived outside of Bangkok for more than six consecutive months or have not done so in the past five years. The speakers all reported using Standard/Bangkok Thai as the home language. Every speaker is currently attending university or is a university graduate. Speakers' ages range from 18 to 61 years old. For this study the speakers were divided into three age groups, with five speakers per age group: 18-24 (Younger), 30-40 (Middle), and 50+ (Older).

### 2.2 Recording Procedures

Participants were told that they were helping a foreigner learn Thai and needed to ask the learner to repeat what he or she just said. The goal was to elicit the most careful citation-forms at a moderate speech rate from the participants. Participants read the word list into an external microphone and were recorded directly into Praat. The recordings were made in a quiet office with minimal to no echo, as no sound-treated rooms were available for use at the time of this study. Participants read a twenty-four-word word list twice in the frame sentence, [p<sup>h</sup>û:t' wâ: X ʔi:k' t<sup>h</sup>i: dâ:j māj/mǎj k<sup>h</sup>á] 'can you please say X again?'.<sup>56</sup> The participants were asked to read the word list as naturally as possible at a moderate pace. The word list was typewritten in Thai and numbered from one to twenty-four.

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<sup>56</sup> The following [ʔ] may have raised the F0 values of the tonal offset, though that should not affect the comparative nature of this study as all speakers were recorded using the same frame sentence. The [ʔ] may affect, however, how these results compare with previous studies. But as stated in the Background section, previous studies utilized different recording devices, elicitation methods, and speakers of different age and gender of speakers. All things being equal, the results of this study still show the differences between the tonal offset of the three age groups of female Bangkok Thai speakers.

### 2.3 Language Data

Words on the word list begin with a voiceless consonant and contain the long low front vowel [a:]. When possible, the words are open-syllables. The words are real lexical items in Thai. Initial consonants are organized into five different places of articulation: labial [p,p<sup>h</sup>], alveolar [t,t<sup>h</sup>], palatal [tɕ,tɕ<sup>h</sup>], velar [k,k<sup>h</sup>], and glottal [ʔ,h]. The distribution of the five tones – High, Mid, Low, Falling and Rising – is as even across the places of articulation as possible. There are five words each for Mid, Low, Falling and Rising tones. High tone has a total of four words.<sup>57</sup> As tonal distribution is determined by the consonants and syllable types, three words recorded – 3.[t<sup>h</sup>à:t], 6.[tɕ<sup>h</sup>â:t], and 11.[hà:t] – are closed syllables in order to complete the tonal paradigm.<sup>58</sup> There are a total of 720 tokens (2 x 15 speakers x 24 words) analyzed in this study. Table 2 shows the words and their phonetic distribution.

**Table 2:** Word list

		Tones				
		High	Mid	Low	Falling	Rising
Place of Articulation	Bilabial	9. ป้า /pá:/	1. พา /p <sup>h</sup> a:/	16. ผ่า /p <sup>h</sup> à:/	22. ป้า /pâ:/	14. ผ่า /p <sup>h</sup> â:/
	Alveolar	21. ท้า /t <sup>h</sup> á:/	25. ตา /ta:/	3. ถาด /t <sup>h</sup> à:t/	12. ท้า /t <sup>h</sup> â:/	19. ฐาน /t <sup>h</sup> â:n/
	Alveo-Palatal	4. ช้า /tɕ <sup>h</sup> á:/	20. ชา /tɕ <sup>h</sup> a:/	24. ฉ่า /tɕ <sup>h</sup> à:/	6. ชาดี /tɕ <sup>h</sup> â:t/	23. จ้า /tɕ <sup>h</sup> â:/
	Velar	13. ค้า /k <sup>h</sup> á:/	18. คา /k <sup>h</sup> a:/	8. ข่า /k <sup>h</sup> à:/	2. ค้า /k <sup>h</sup> â:/	10. ข่า /k <sup>h</sup> â:/
	Glottal	n/a	7. อา /ʔa:/	11. หาด /hà:t/	17. อ้า /ʔâ:/	5. หา /hâ:/

### 2.4 Analysis

Recordings were conducted at a 44 kHz sampling rate. Each token was segmented at the vowel onset and offset. The vowel onset is defined in this study as the first high amplitude glottal pulse with an F0 value. In the case of unaspirated stops [p,t,k] and the glottal stop [ʔ], the vowel onset was defined as the fourth high amplitude glottal pulse to allow for the voicing onset. The vowel offset is defined as the second to last high amplitude glottal pulse with an F0 value. Segmented vowel intervals were each cross-checked visually with the spectrogram readings and also with the audio signals. The statistical analysis includes only one token per word in this study. With the exception of Female 14, the second token of each word was analyzed.<sup>59</sup>

<sup>57</sup> High tone is limited in terms of distribution and has a much lower functional load than the other four tones, as it can occur only in two syllable categories. There are no native Thai lexical items that contain a glottal initial consonant, the long vowel [a:], and the High tone.

<sup>58</sup> There are lexical gaps in the Thai tonal paradigm for which the closed syllables [t<sup>h</sup>à:t] and [tɕ<sup>h</sup>â:t] are used. No such open-syllable Thai words exist with initial [t<sup>h</sup>] and [tɕ<sup>h</sup>] with the vowel [a:] that contains the low and falling tones, respectively. The word [hà:t], however, was chosen in place of the open syllable [hâ:], as the latter can be considered vulgar and some participants may not have been comfortable reading the word aloud.

<sup>59</sup> A combination of the first and second utterances was analyzed for Female 14 due to instances of intrusive ambient noise.

Each vowel interval was measured for the F0 values with the aid of a Praat script. Measurements were taken at the vowel onset and at every 10% of the vowel duration thereafter with a total of eleven points along the F0 trajectory. There were a total of 3960 measurements (11 points x 24 words x 15 speakers). The mean F0 value ( $\bar{x}$ ) and standard deviation ( $\sigma$ ) for each speaker were used to determine the z-score of each measurement, where the z-score is the F0 measurement (value) subtracted by  $\bar{x}$  and then divided by  $\sigma$ . The discussion and the illustrative graphs will refer to the z-score as the tonal z-score. Tonal z-scores were then plotted on a graph with the aid of MS Excel where the y-axis represents the total range of tonal z-scores across all speakers and the x-axis represents the percentage of the vowel duration. The tonal z-score range across all speakers was determined to be -2.00 to 2.00 by rounding the highest and lowest z-scores to the nearest integer. As there are traditionally five levels for Thai lexical tones, the range was further divided into fifths for illustrative purposes and for ease of discussion.

### 3 Results

All five tones are phonetically different from those observed by Abramson (1962). The tones of the speakers in this study pattern closer with those of Morén and Zsiga (2006) than with those of Abramson, even for Older speakers. The results of this study point towards on-going phonetic changes of Thai tones in tonal shapes, onsets, and offsets. Of the five tones, the three age groups vary the most in their realization of the High tone. High tone changed from a convex pitch contour to a concave one. Younger speakers also have the highest tonal onset for the Low tone, approximately the same as the High, Mid, and Rising tones. This is in contrast to the patterns found in Older and Middle speakers where the High and Mid tones have an extremely similar onset on the normalized pitch range. The Rising and Low tones in Older and Middle speakers do not share an onset range, unlike those observed by Abramson and Morén and Zsiga. Rising tone has the lowest tonal onset of all the five tones for all age groups. The discussion of the tones will be according to the tonal z-score in the normalized pitch range, as explained in the previous section.

#### 3.1 Older Speakers

Tones for the Older speakers in this study generally do not pattern with the Abramson “model” tones. The Older speakers would have been in their teens during Abramson’s study and, expectedly, do not have the same tones as the speakers from his study who are a generation older. In fact, the Older speakers’ tones in this study pattern more closely with those observed by Morén and Zsiga.

The Falling tone for Older speakers begins approximately at the 85% percentile of the tone range and remains relatively static for approximately 40% of the vowel duration, at which point the pitch falls to the middle of the tone range. The Falling tone is the only tone in this age group that patterns neither with any other tones in the paradigm nor with the Falling tone from previous studies. Older speakers’ average Falling tone in this study is characterized by a short pitch plateau followed by a prolonged fall in pitch for the last 60% of the duration. Falling tone observed by Abramson, however, shows an immediate rise during the first 25% of the duration followed by a gradual fall covering almost the entire pitch range until the tonal offset. Older speakers in this study do not have an immediate increase at the tonal onset and a much less dramatic decrease in pitch toward the tonal offset. Falling tone of Older speakers in this study show much less of a decrease



in pitch toward the tonal offset when compared with the Falling tone observed by Morén and Zsiga, though they do share the initial pitch plateau.

High tone, as noted by Teeranon, is no longer phonetically high, but is realized mostly in the sixtieth and eightieth percentile of the tone range. High tone has a concave tone shape with a slight ‘hook’ in the last 20% of the duration. Additionally, High tone begins slightly above the sixtieth percentile of the tone range and has a very small decrease in pitch during the first 40% of the duration, after which the pitch rises to the seventieth percentile of the tone range and then suddenly dips down in the last 10% of the vowel duration. The small “hook” at the end of the contour matches one observed by Abramson, though the hook found in the Older speakers here begins approximately 5% to 10% later than the one in his study.<sup>60</sup> High tone, in addition to not being particularly “high,” is very similar to the Rising tone, sharing nearly the same tonal contour.

Rising tone is also concave, though it does not have the “hook” before the tonal offset. Rising tone for Older speakers begins at the fortieth percentile of the tone range, then falls to its lowest point by 50% of the duration, followed by a gradual rise to the middle of the tone range for the remaining 50% of the duration. The similarities between High and Rising tone are also evident in Morén and Zsiga 2006, though their two speakers do not have the “hook” in the High tone. Recall, however, that the two speakers recorded by Morén and Zsiga are in their mid-20s and, thus, would not expectedly pattern with the Older Speakers in this study who are approximately one generation older. Rising tone does not share onset pitch range with the Low tone, unlike the pattern observed by Abramson and Morén and Zsiga.

The last two tones—Mid and Low—are nearly parallel though they are in a different pitch range. Mid tone begins at the sixtieth percentile of the tone range and gradually decreases in pitch to slightly below the fortieth percentile. Low tone has a slightly steeper negative slope, beginning approximately at the middle of the tone range, then decreasing to just below the twentieth percentile. Of all the tones, Mid and Low have the most accurate nomenclature, as Low truly is the phonetically lowest tone, and Mid truly remains within the middle of the pitch range. Figure 4 shows the average tones for Older speakers.

### 3.2 *Middle Speakers*

Middle speakers in this study also do not pattern with the Abramson “model” tones. Their tones are aligned closer with the Morén and Zsiga study, as they are fairly close in age with the two speakers recorded. There are some characteristics, however, that set the tones of Middle speakers apart from those of Older speakers and Younger speakers.

Falling tone for Middle speakers is very similar to that of the Older speakers, though the decrease in pitch begins much later at approximately 75% of the tonal duration, whereas Older speakers’ Falling tone shows a decrease beginning at the 40% mark. Additionally, the Falling tone has a less decrease in pitch, from approximately the ninetieth percentile of the tone range to slightly below the sixtieth percentile, while Older speakers show a decrease from the ninetieth percentile to the fiftieth percentile on the tone range.

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<sup>60</sup> As one reviewer noted, the “hook” at the end of the High tone of the Older speakers may be due to the previously reported glottalization of this particular tone in Thai. Whatever the phonetic nature of the “hook” in the High tone, it only occurs in the High tone for Older speakers, and not for the Middle or Younger speakers. This study was not designed to investigate such phenomenon. The phonetic nature of the “hook”, therefore, will not be discussed in detail here.

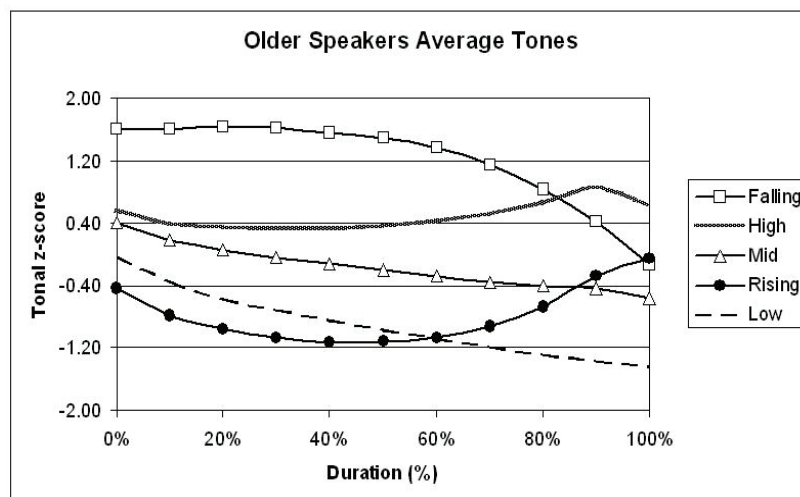


Figure 4: Average Tones for Older Speakers of Bangkok Thai

High and Rising tones are similar in their concave contour, matching that found in the Older speakers as well as the pattern in Morén and Zsiga 2006. The High tone does, however, have a slight “hook” at the tonal offset, though the decrease in pitch is more than the one observed for the High tone of Older speakers. The High tone for Middle speakers is otherwise similar to that of Older speakers, with the tonal onset and the offset at approximately the sixtieth percentile of the pitch range and is, at its lowest point, midway on the tone range by 40% of the tonal duration.

The Rising tone in Middle speakers has a concave shape with both the tonal onset and offset at the fortieth percentile of the tone range, the same as that of Older speakers. The lowest point of the tone is at 50% of the tonal duration and is at the twentieth percentile on the tone range. Middle speakers’ Rising tone does not share a tonal onset range with the Low tone.

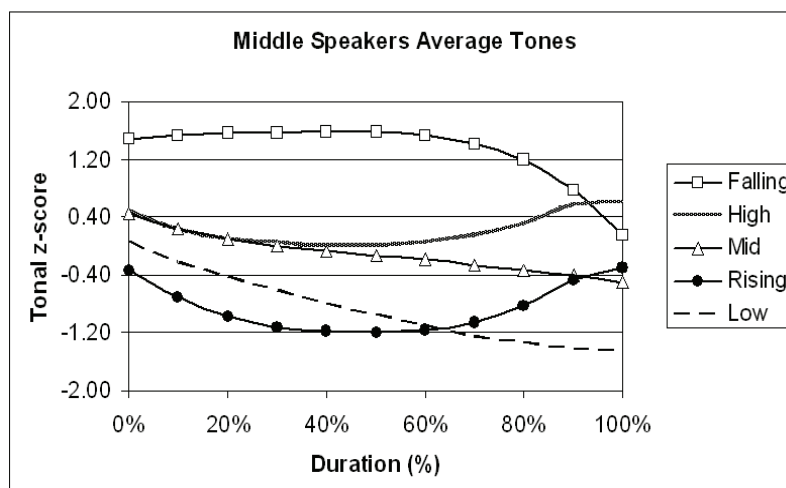
The Mid and Low tones for Middle speakers are similar though not nearly as parallel as for Older speakers. The Mid tone begins at the sixtieth percentile in the tone range and gradually decreases in pitch. The tonal offset is slightly below the fortieth percentile on the tone range. The Low tone begins at the fiftieth percentile of the tone range and has a more negative slope than the Mid tone. The Low tone offset is in the tenth percentile of the tone range. As is the case also for Older speakers, the Low tone for Middle speaker is phonetically the lowest tone, and the Mid tone remains phonetically within the middle of the tone range. Figure 5 shows the average tones for Middle speakers.

### 3.3 Younger Speakers

Younger speakers’ tones differ entirely from the Abramson “model,” resembling more the tones observed by Morén and Zsiga, though there are some distinct differences. The speakers in Morén and Zsiga 2006 are nearly ten years older than most of the Younger speakers in this age group, which may contribute to the differences found when comparing the tones of these two groups.

Falling tone for Younger speakers in this study generally patterns with those of Older and Middle speakers, though with a few differences. The Falling tone begins at the ninetieth percentile of the tone range and remains relatively static until the remaining 30% of the duration, at which point the pitch decreases to the sixtieth percentile. When

compared with the Falling tones of Older and Middle speakers, the Younger speakers in this study have a similar tonal onset with a smaller and shorter pitch fall. This characteristic matches anecdotal observations made by some Older speakers that Younger speakers' tones are 'flat.' The total pitch fall for the Falling tone is slightly over 20% of the total pitch range whereas the pitch fall is over 40% for Older speakers and nearly 30% for Middle speakers. The pitch fall duration is 30% of the total tone duration for Younger and Middle speakers, whereas it is 60% for Older speakers.



**Figure 5:** Average Tones for Middle Speakers of Bangkok Thai

The High tone in Younger speakers has the onset and offset at approximately the sixtieth percentile of the tone range. The lowest point—at slightly above the fortieth percentile—occurs approximately halfway through the tonal duration. Younger speakers have the most concave contour for the High tone of all the speakers in this study, spanning 20% of the entire pitch range. Older speakers' contour spans less than 10% of their pitch range while Middle speakers' contour spans approximate 10%. Unlike the "hook" observed in Older and Middle speakers, the High tone in Younger speakers does not have a "hook" at the tonal offset. The tonal onset of the High tone for Younger speakers is also the lowest of the three groups and is at the sixtieth percentile of the tone range.

Rising tone in Younger speakers is the most interesting tone. First, Younger speakers have phonetically the lowest pitch range for the Rising tone, with the tonal onset slightly at the fortieth percentile of the tone range. The lowest point of this tone is slightly above the tenth percentile at the 60% duration mark. The tone offsets at approximately the thirtieth percentile of the tone range. The pitch for the Rising tone is so low, in fact, that all five speakers in this age group have creaky voice quality in this tone. Older and Middle speakers in this study do not have creaky voice at any point in recording. The Rising tone offset, at the thirtieth percentile of the tone range, is also the lowest of any age group. The tone offset is 20% lower than that for Older and Middle speakers. Additionally, the rise in pitch for this particular tone and age group is 10% of the duration later than for Older and Middle speakers.

The Mid and Low tones for Younger speakers are not parallel. The Mid tone spans slightly over 20% of the tone range, from slightly above the sixtieth percentile to the fortieth percentile, while the Low tone spans 40%, from the sixtieth percentile to the twentieth percentile. The onsets for the Mid and Low tones are the highest in this age

group. The Low tone's onset is at the sixtieth percentile, the same as that of the High tone. The Mid tone offset at the fortieth percentile of the tone range. Figure 6 shows the average tones for the Younger speakers.

### 3.4 Summary of Results

All three age groups in this study differ markedly from the Abramson tonal "model." The oldest speaker in the present study, age 61, would have been just 14 years old during the time of Abramson's 1962 study. It is expected then, that even she would not have the same tones as the speakers recorded in Abramson 1962 who were in their 30s. In a similar vein, Older speakers' tones in this study also do not pattern with the two speakers in Morén and Zsiga's 2006 study who were in their mid- and late-20s.

The Falling and High tones are the most different across age groups. Older speakers' Falling tone has a longer and more dramatic pitch fall spanning 60% of the duration and 40% of the tone range. Middle speakers have a pitch fall of approximately 30% of the duration and tone range. Younger speakers have a pitch fall that also spans also 30% of the duration but only 20% of the tone range.

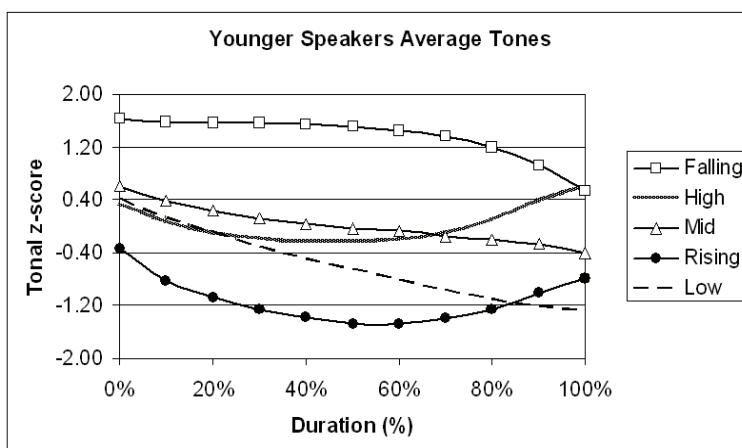


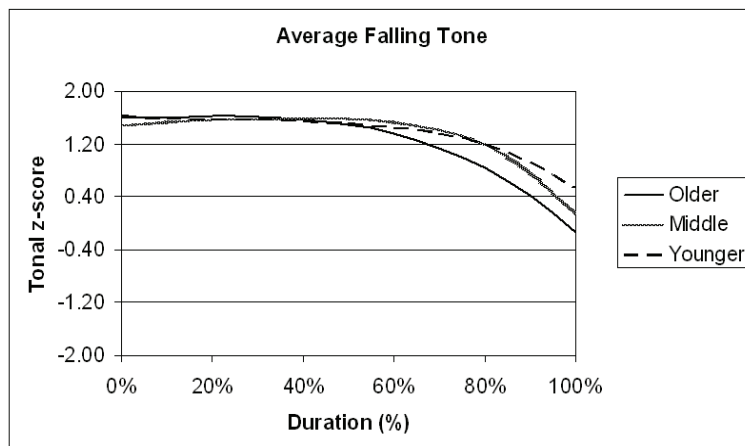
Figure 6: Average Tones for Younger Speakers of Bangkok Thai

The contour of the High tone is concave for all three age groups but in different degrees, with that of the Younger speakers being the most concave, spanning 20% of the entire tone range. Older and Middle speakers additionally have a "hook"—a small increase and decrease in pitch toward the offset—in the High tone, while Younger speakers do not. Middle speakers have a smaller "hook" than Older speakers.

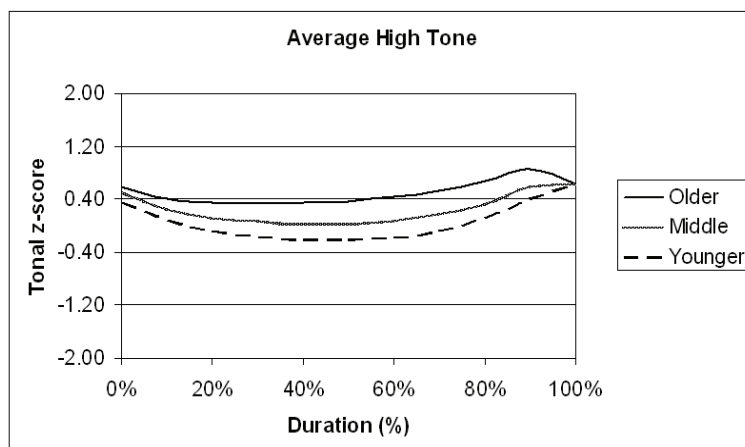
Rising tone is concave for all three age groups. Younger speakers have the longest and largest decrease in pitch, 60% of the duration and approximately 30% of the total tone range. All speakers share approximately the same tonal onset for Rising tone at the fortieth percentile of the tone. Older and Middle speakers have the lowest point of the tone at 50% of the duration whereas Younger speakers have the lowest point at the 60% mark.

The Middle and Low tones are similar in shape across the three age groups. Unlike in other studies, neither the Middle nor the Low tone is contour in shape. The two tones are nearly parallel for the Older speakers, less so for Middle speakers, and are not at all parallel for Younger speakers. The Low tone's offsets are phonetically the lowest point in the tone paradigm for all speakers in this study. The decrease in pitch for the Mid spans

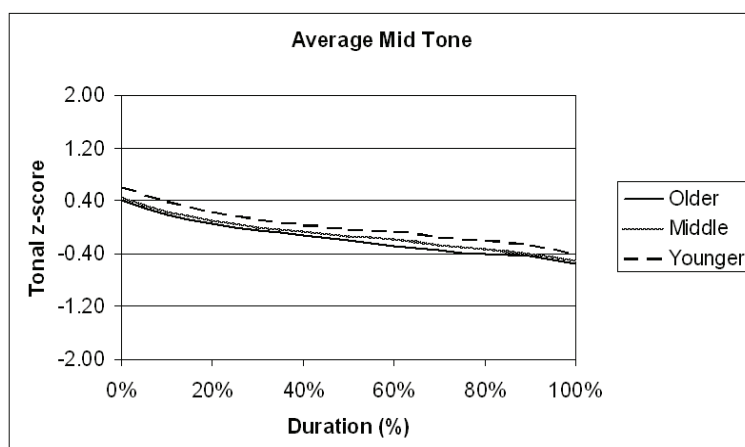
approximately 20% of the tone range for all speakers. The speakers vary, however, in the decrease in pitch for the Low tone. Younger speakers have the largest decrease in pitch for Low tone, at 40% of the tone range, while Older and Middle speakers have a decrease of 30% of the tone range. Figures 7 to 10 show the average of each tone across the three age groups, including the highest and lowest average values (y-error bars).

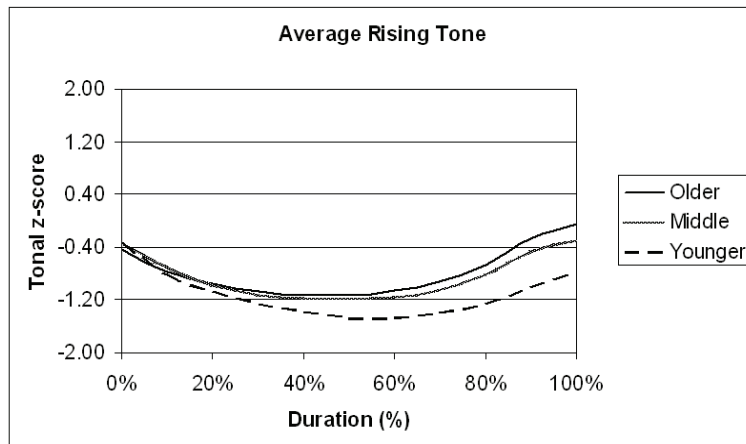
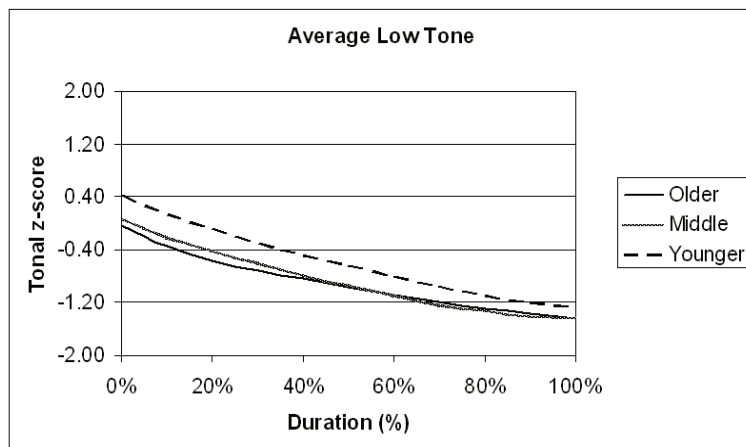


**Figure 7:** Average Falling Tone for All Age Groups



**Figure 8:** Average High Tone for All Age Groups



**Figure 9:** *Average Mid Tone for All Age Groups***Figure 10:** *Average Rising Tone for All Age Groups***Figure 11:** *Average Low Tone for All Age Groups*

#### 4 Discussion

There have been significant observable changes in the phonetic realizations of Thai tones in the past century, beginning with Bradley 1909 and 1911. There were three static tones—High, Mid, and Low—and two contour tones—Falling and Rising—in early reports. The current accepted nomenclature for the Thai tones is still a reflection of this observation made in the early twentieth century. Abramson, in his landmark 1962 study, also reported three relatively static tones—High, Mid, and Low—as well as two contour tones—Falling and Rising. Morén and Zsiga (2006) found, half a century later, that there are only two relatively static tones, Mid and Low, while the High tone has become contoured with a concave shape. The Falling tone in their study, additionally, does not fall until well after 70% of the total tone duration, whereas Abramson observed the Falling to decrease in pitch by 40% of the total duration.

Such differences in phonetic realization may have effects on tonal perception. Teeranon (2007) found that participants in the under-twenty group perceive a concave contour overwhelmingly as the High tone, whereas the over-sixty group perceive a high

level tone to be the High tone. Additionally, the over-sixty group confused the concave High and Rising tone more so than the under-twenty group. The over-sixty group, however, performed better than the under-twenty group when presented with a high level tone with a falling shape as the High tone. The hook observed in this study for the Older and Middle speakers' High tone may, in fact, still serve as a perceptual cue for these two groups of speakers, but not for Younger speakers. Teeranon concluded that "the F0 contours carry enough information for high tone identification ... [the] high tone is most certainly perceived as a contour tone in the under-twenty group than in the over-sixty group" (2007:12).

Results from this study also support the findings of the four perceptual experiments done by Zsiga and Nitisaroj 2007. Participants in their studies misidentified Rising and High when presented with segmented natural speech and synthesized speech. Identification task results are in agreement with the tonal characteristics produced by younger speakers in the current study. For example, stimuli that remain mostly in the middle of the pitch range are most often identified as Mid tone while stimuli with a mid-range onset and a low offset are most often identified as Low tone. Stimuli that have a low mid-point and high offset, meaning they have concave tone contour, are identified either as Rising or High. The differences between Rising and High for listeners seem to be the location of the contour mid-point. Rising has a lower mid-point and lower offset than High. Rising was, in fact, the most problematic tone to perceive, being confused with both Low and High tones across two different experiments. They conclude that Rising "is undergoing diachronic change, becoming more strongly associated with a low pitch target and less strongly associated with a high pitch target, even in citation form" (*ibid*:380). Zsiga and Nitisaroj also found that the location of the pitch peak is an important perceptual cue and that "[t]onal identifications will change if peak alignment is varied, even if overall shape and slope remain constant" (*ibid*:379). In the current study, speakers across the three age groups have varying pitch peaks for the three contour tones Falling, High, and Rising, with Younger speakers having pitch peaks later in the tonal duration than Older and Middle speakers.

The current study shows preliminary evidence toward a change in progress for Bangkok Thai tone production, particularly in tone shapes across the three age groups examined. Younger speakers show a general trend toward a higher tonal onset for the Mid and Low tones as well as a later pitch change for both the Falling and Rising tones. Findings in this study seem to support Zsiga (2007) where speakers identified the Rising tone mainly by the lowest point of the pitch being at the middle of the duration. Additionally, changes in the High tone indicate that speakers, and presumably hearers, favor a contour that reaches "a high pitch target late in the syllable" (Zsiga 2007:1). Results from this study also support the claims by Pittayaporn (2007:1422) as Younger speakers have both contour reduction and peak sliding he predicted. Further, Pittayaporn's predictions agree with anecdotal accounts where older speakers describe the tones of younger speakers as 'flat'.

As this study is meant as a pilot re-investigation of Bangkok Tones, it is nowhere near being comprehensive. Additional data are needed in order to provide a more complete view of current Bangkok Thai tones. Future studies should take into consideration the effects of "classic" sociolinguistic factors such as age, gender, and socio-economic status. Place of residence within Bangkok may also have effects on the phonetic realization of tones since settlement pattern and ethnicity can result in phonetic differences.

An accurate account of Bangkok Tones will be valuable to field linguists, theoretical linguists, and Thai foreign language teachers alike.



**Appendix A: Thai tone box**

		Open Syllables			Closed Syllables	
		A	B	C	DL	DS
Consonant Class	High [k <sup>h</sup> , tɕ <sup>h</sup> , t <sup>h</sup> , p <sup>h</sup> , f, s, h]	Rising	Low	Falling	Low	Low
	Mid [k, tɕ, d, t, b, p, ʔ]	Mid				
	Low [k <sup>h</sup> , tɕ <sup>h</sup> , t <sup>h</sup> , p <sup>h</sup> , f, s, h] [ŋ, n, m, l, r, j, w]		Falling	High	Falling	High

Consonant class reflects historical development of the initial consonants as found in modern Standard Thai, not as reconstructed for proto-Tai. Per Li’s 1977 reconstruction, high consonants are reflexes of proto-voiceless stops/nasals and proto-fricatives. Mid consonants are reflexes of proto-voiceless unaspirated stops and preglottalized stops. Low consonants derive from proto-voiced stops and nasals. Tonal categories A, B, C, and D presented here are also reconstructed by Li (1977) for all proto-Tai languages. Tonal distributions differ for closed syllables, also referred to as “dead” syllables, according to vowel length and are, thus, shown in two different categories: DL (Dead Long) and DS (Dead Short). For more information on the Thai Tone Box, see Brown 1985 or Gedney 1989.

## Appendix B: Speaker Information.

Label	Speaker			Mother		Father	
	Age	Highest Level of Education	Other (L2) Language(s)	Birthplace	Other Language(s)	Birthplace	Other Language(s)
Female1	31	Doctorate	English Japanese	Bangkok	English	Bangkok	English
Female2	24	Bachelors	English	Chachuengsaw	N/A	Ayutthaya	N/A
Female3	31	Doctorate	English French Chinese Japanese	Bangkok	Chinese (L1) English	Bangkok	Chinese (L1) English
Female4	20	High School	English	Bangkok	N/A	Bangkok	Chinese (L1)
Female5	18	High School	English French Chinese	Bangkok	Chinese	Bangkok	Chinese
Female6	18	High School	English French	Sukhothai	Chinese (L1)	Prathumthani	N/A
Female7	61	Masters	English	Lampang	Northern Thai (L1)	Bangkok	English
Female8	32	Masters	N/A	Prajeenburi	N/A	Chachuengsaw	N/A
Female9	21	Bachelors	English German Swedish Spanish	Prathumthani	Chinese	Bangkok	English Chinese
Female10	50	Doctorate	English French Chinese	Bangkok	N/A	Bangkok	N/A
Female11	52	Doctorate	English German	Kamphaengphet	English	Kamphaengphet	English
Female12	56	Doctorate	English Cantonese Japanese	Bangkok	English	Bangkok	English
Female13	61	Masters	English	Bangkok	N/A	Bangkok	N/A
Female14	37	Doctorate	English	Suratthani	English Japanese	Bangkok	English
Female15	35	Doctorate	English	Suratthani	English Japanese	Bangkok	English

Appendix C: Summary of Changes in Tone Shapes across Age Groups

		Older Speakers	Middle Speakers	Younger Speakers
Falling	Onset	90 <sup>th</sup> percentile	90 <sup>th</sup> percentile	90 <sup>th</sup> percentile
	Offset	approximately 50 <sup>th</sup> percentile	slightly above 50 <sup>th</sup> percentile	slightly above 60 <sup>th</sup> percentile
	Shape	<ul style="list-style-type: none"> <li>convex</li> <li>pitch plateau until <b>highest point at 30% of the duration</b></li> <li>pitch decrease begins at <b>50% of the duration</b></li> <li>change in pitch spans <b>40% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>convex</li> <li>small gradual increase from onset to <b>highest point at 50% of the duration</b></li> <li>pitch decrease begins at <b>60% of the duration</b></li> <li>change in pitch spans <b>30% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>convex</li> <li>pitch plateau until <b>highest point at 40% of the duration</b></li> <li>pitch decrease begins at <b>70% of the duration</b></li> <li>change in pitch spans <b>20% of the tone range</b></li> </ul>
High	Onset	slightly above the 60 <sup>th</sup> percentile	approximately at the 60 <sup>th</sup> percentile	slightly below the 60 <sup>th</sup> percentile
	Offset	slightly above the 60 <sup>th</sup> percentile	slightly above the 60 <sup>th</sup> percentile	slightly above the 60 <sup>th</sup> percentile
	Shape	<ul style="list-style-type: none"> <li>concave</li> <li>gradual decrease until the <b>lowest point at 25% of the duration</b></li> <li>small 'hook' during last 10%</li> <li>change in pitch spans <b>10% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>concave</li> <li>gradual decrease until the <b>lowest point at 50% of the duration</b></li> <li>small 'hook' during last 10%</li> <li>change in pitch spans <b>10% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>concave</li> <li>gradual decrease until the <b>lowest point at 50% of the duration</b></li> <li>no 'hook'</li> <li>change in pitch spans <b>20% of the tone range</b></li> </ul>
Mid	Onset	60 <sup>th</sup> percentile	60 <sup>th</sup> percentile	slightly above 60 <sup>th</sup> percentile
	Offset	slightly below 40 <sup>th</sup> percentile	slightly below 40 <sup>th</sup> percentile	40 <sup>th</sup> percentile
	Shape	<ul style="list-style-type: none"> <li>level</li> <li>change in pitch spans <b>20% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>level</li> <li>change in pitch spans <b>20% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>level</li> <li>change in pitch spans <b>30% of the tone range</b></li> </ul>
Low	Onset	50 <sup>th</sup> percentile	50 <sup>th</sup> percentile	60 <sup>th</sup> percentile
	Offset	slightly above 30 <sup>th</sup> percentile	slightly above 30 <sup>th</sup> percentile	20 <sup>th</sup> percentile
	Shape	<ul style="list-style-type: none"> <li>level</li> <li>change in pitch spans <b>30% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>level</li> <li>change in pitch spans <b>30% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>level</li> <li>change in pitch spans <b>40% of the tone range</b></li> </ul>
Rising	Onset	40 <sup>th</sup> percentile	40 <sup>th</sup> percentile	40 <sup>th</sup> percentile
	Offset	50 <sup>th</sup> percentile	slightly above 40 <sup>th</sup> percentile	30 <sup>th</sup> percentile
	Shape	<ul style="list-style-type: none"> <li>concave</li> <li>gradual decline until the <b>lowest point at the 50%</b> of the duration</li> <li>change in pitch spans <b>20% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>concave</li> <li>gradual decrease until <b>lowest point at 50%</b> of the duration</li> <li>change in pitch spans <b>20% of the tone range</b></li> </ul>	<ul style="list-style-type: none"> <li>concave</li> <li>gradual decrease until <b>lowest point at 60%</b> of the duration</li> <li>change in pitch spans <b>30% of the tone range</b></li> </ul>

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