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A first approach to the prosodic system of Laze:  
fieldwork data and cross-language perspectives

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**An itinerary for rapid reading:** The gist of the information concerning Laze can be obtained by reading the abstract, sections 1, 2 and 3, and the conclusions in section 5, i.e. skipping section 4 (related phenomena of tonal change) and section 6 (parallel with the Na language).

**Abstract:** This is a preliminary study of the tone system of the Laze language as spoken in the township of Xiangjiao, Muli county, Sichuan (四川省木里县项脚乡). Its tonal system is here described as being structured in terms of H(igh), M(id) and L(ow) levels, like that of the closely related languages Naxi and Na. There exist four lexical tones for Laze monosyllables; in theory, this could yield as many as sixteen tone patterns over disyllables, but only six are observed. The present research aims to bring out the synchronic principles which perpetuate this restriction over lexical tonal patterns: the tonal changes that occur in the creation of disyllabic entities. Special attention is paid to the tonal changes observed in compounds and in object + verb constructions. It appears that not all synchronic processes of tonal change can be explained as the reduction of ‘illicit’ patterns to ‘licit’ ones: for instance, L + L combinations undergo a change (to [H.H] or [L.H]) in various cases, despite the fact that [L.L] is a licit pattern for disyllables.

The Laze data are here presented in cross-language perspective, with extensive developments about the Na language (a.k.a. “Eastern dialect of Naxi”) as spoken in the plain of Yongning.

## 1. Introduction. Laze tonology: complexities in an ‘easy’ tone system

This is a preliminary study of the tone system of Laze, a language of Sichuan which is very close to Naxi and Na. In coming to terms with these related languages, I was fortunate to begin by studying a variety that has a simple tone system: Naxi as spoken close to the city of Lijiang (Yunnan), which has L(ow), M(id) and H(igh) syllabic tones, plus some phenomena of tonal reassociation (Michaud 2006; Michaud & He Xueguang 2007). Then the investigation was extended to Na, spoken at the Yunnan-Sichuan border, which has a much more complex system (some preliminary results are set out in section 6). Laze is intermediate between the two in terms of tonal complexity, hence the title of this introduction – an allusion to Newman’s work on “Hausa tonology: Complexities in an ‘easy’ tone language” (Newman 1995).

There exist four lexical tones in Laze monosyllables (for predicates: H, M, L and MH; for nouns: H, M, L and a ‘floating H’, about which more below). In theory, this could yield as many as sixteen tonal patterns over disyllables, but only six are observed. The present research aims to bring out the synchronic principles that perpetuate this restriction over lexical tonal patterns: the tonal changes that occur in the creation of disyllabic entities. Special attention is paid to the tonal changes observed in compounds and in object + verb constructions. To preview the results, it will appear that the synchronic processes of tonal change in Laze cannot be straightforwardly explained as the reduction of ‘illicit’ patterns to ‘licit’ ones.

Concerning the general scientific background, the reader is referred to two other presentations at this Seminar: (i) the article about Shixing (Chirkova and Michaud) recalls some of the advances made in recent years in the recognition and analysis of level-tone systems in Tibeto-Burman languages; (ii) J. Evans’s study of “Restricted tone systems in Sichuan and beyond” places these developments in perspective.

### ***1.1. The Laze language: geographical coordinates and dialectal context***

“Laze”, [la˥ze˨˥], is the autonym of a small population inhabiting the township of Xiangjiao, Muli county, Sichuan (四川省木里县项脚乡). Their language is sometimes referred to as Shuitian (水田话), e.g. in the monograph of the prefecture realised by the local authorities (木里藏族自治县志编撰委员会 1995). However, it is quite a different language from the Yi language likewise labelled as Shuitian (水田话), which has been described by 朱文旭 & 张静 2005. The autonym of the latter language is mu<sup>33</sup>hi<sup>44</sup>su<sup>33</sup> (*ibid.*), and its speakers inhabit the counties of Mianning (冕宁) and Xide (西德).

An outline of the Laze language written by Huang Bufan is forthcoming (Huang 2008)<sup>1</sup>. It is based on Pr. Huang's fieldwork in 1988; she recorded 2,000 words and some simple sentences (see note to p. 1 of the article). In the article, she observes: “木里水田话是一种什么语言，属于哪个支系，以前未见有过报导。” Indeed, no detailed linguistic comparison had ever been conducted before Huang 2008; however, in their monograph about the history of the Naxi people, the Naxi scholars Guo Dalie and He Zhiwu mention the Laze people as having moved over to Muli from neighbouring Yanbian towards the end of the 19<sup>th</sup> century:

自称 la<sup>33</sup> ze<sup>33</sup> (拉热)，他称为水田，居住在四川省木里藏族自治县项脚、博瓦、白碉等地。据 1982 年调查，项脚有 63 户，385 人。据说拉热人搬到这里才 6 代人，来得最早的一个叫胡[7]家斯塔，有朝、杨、韩、田四家，原来住在盐边线山后拉沙田，该处原系中所土千户驻地。盐源（包括盐边）纳日话中称中所为 la<sup>33</sup> ze<sup>33</sup>，拉热人可能因地名而得名。拉热语言和习俗与纳日人差异不大，信达巴教（东巴教异名），有口诵经。拉热人现已改称蒙古族。(郭大烈 & 和志武 1994:6-7)

In her forthcoming article, Pr. Huang Bufan compares some 1,400 words between Laze and the Naxi dialect of Yanyuan (盐源左所地区的纳西语), on the basis of data that she has herself collected. She finds less than 30% of cognate words; comparing this figure with the proportion of over 40% of cognate words reported by 盖兴之 & 姜竹仪 1990 between Naxi and the variety of Yi spoken in Xide 喜德, Pr. Huang concludes that the hypothesis of a special proximity between Laze and Naxi cannot be considered as demonstrated: “我们不能简单地将水田话归入纳西语，它与纳西语究竟是什么关系，在藏缅语中处于什么地位，还值得我们各个层面（包括语音、语法）再深入研究探讨” (last sentence of article). While a discussion of this issue falls outside the scope of the present paper, my impression is nonetheless that Laze is very close to Na/Naxi. Comparison will have to be based on more than one dialect of Na/Naxi (for instance: among the words listed as non-cognate between Laze and Naxi by Pr. Huang, the words for ‘head, 头’, ‘good, 好’ are very similar to the terms in Yongning Na), and on regular correspondences rather than on surface similarities.

Table 1 proposes a summary of ethnonyms and language names, in order to clarify the use of terms in what follows. For the sake of ease of cross-reference across publications, both a phonetic and a phonemic notation are proposed for autonyms: for instance, Laze is phonemically /<sup>M</sup> la.ze/; the word does not carry any tones of its own, and surfaces with a default M(id) tone on both of its syllables. The phonetic transcription [la-zeɪ] brings out

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<sup>1</sup> Many thanks to Jackson Sun for sending me a preprint version of the article (on Nov. 12<sup>th</sup>, 2008).

more clearly the identity with the notation  $la^{33}ze^{33}$  adopted by Guo Dalie and He Zhiwu (*ibid.*).

**Table 1. Laze, Naxi, Na: a summary of ethnonyms and language names**

name used in present article	/phonemic/ and [phonetic] transcription of autonym	equivalent in Chinese characters	alternative names (not used here)	PRC ethnic classification	dialect classification by 和即仁 & 姜竹仪 1985
Laze	/ <sup>M</sup> la.ze/ [laɫzeɫ]	拉热	Shuitian 水田	Mongolian	(not mentioned)
Naxi	/ <sup>L</sup> na <sup>M</sup> hi/ [naɫçiɫ]	纳西		Naxi	Western Naxi (纳西语西部方言)
Na	/ <sup>L</sup> M na/ [naɫɫ]	纳	Mosuo 摩梭	Naxi	Eastern Naxi (纳西语西东部方言)

In what follows, the Na and Naxi data mentioned for comparison with Laze are from my own fieldwork: the variety of Naxi is that of the village of Wenhua (丽江古城区文化行政村冷不罗自然村; see Michailovsky & Michaud 2006), and the variety of Na is that spoken in the plain of Yongning (Tibetan *Thar lam*; see “Michaud accepted” in the list of references; Chinese coordinates: 丽江市宁蒗彝族自治县永宁乡平静村).

## ***1.2. About the data presented here. Present stage of the study***

The present study is based on 5 weeks of fieldwork in March and April 2008 in the town of Muli, with one language consultant from the township of Xiangjiao, in her mid-fifties at the time of the recording. A short stay in the village of Xiangjiao allowed for the verification of some hypotheses and the recording of data from two male speakers (one of the same generation as the main consultant, the other one generation younger).

The results presented here are preliminary. A second stay is planned in the near future.

The notations used in the present article are phonemic, but it should be noted that the analysis is not finalised. Detailed comparison with the analysis proposed by Huang (2008) has not been conducted yet. Here are some remarks:

- about rhymes: there exist several syllabic consonants in Laze, such as /ɣ/ and /ɹ/; the rhyme /uw/ has a fricative allophone after fricative and affricate initials, e.g. /tsuw/ is realised [tsɿ], as in Naxi and Na. Laze has a diphthongised rhyme /ie/, distinct from /i/ and /e/. This rhyme is not a sequence of /i/ plus /e/; there is no argument for a glide-plus-vowel notation, such as /je/.

- about initials: the alveolo-palatal affricates are analysed as phonetically palatalised velars: [tçi], [tçy], [tçə], [tçɤ] are analysed phonemically as /ki/, /ky/, /kja/, /kjɤ/, where the palatalising element is the vowel /i/ or /y/, or a palatal glide; this solution is the same as the one adopted for Naxi by Michailovsky & Michaud 2006. As for retroflex consonants, it

remains uncertain at present whether the retroflex nasals of Laze are phonemic or simply allophonic. The provisional notation is phonetic, e.g. ‘milk’ is transcribed as /ŋæ/.

### *1.3. Some preliminary definitions*

In the field of prosodic studies, there still exist widely diverging sets of definitions concerning basic notions such as tone, intonation, and prosody. To take an example, John Goldsmith, one of the founding fathers of current models of tones in Sub-Saharan languages (Goldsmith 1976), paradoxically proposed an extension of these tonal model to English (see “English as a tonal language”, Goldsmith 1981). He proposes the following definitions in his introductory classes on linguistics:

“Pitch: the linguistic side of fundamental frequency ( $F_0$ ).

Tone: the analysis of pitch into discrete units (both in temporal and frequency dimensions).” (Slide 10 of Powerpoint presentation of undergraduate course, dated 2004, available from <http://humanities.uchicago.edu/faculty/goldsmith/Intro2/> )

$F_0$  is an acoustic parameter, measured in Hertz. It is highly surprising that pitch should be defined as its “linguistic side”: the received definition of pitch is that it is the perceptual counterpart to  $F_0$ . Likewise, defining tone as “the analysis of pitch into discrete units” deviates from the functional definition of tone as a part of the system of contrasts of a language. It also overlooks the diversity of tonal systems: not all tones are defined in terms of pitch, as emphasised by Rose 1982:48. Nonetheless, the American tradition illustrated by Goldsmith’s definitions remains influential. In recent research, Larry Hyman uses the term “non-tonal” to mean “realised by parameters other than  $F_0$ ” (Hyman & Monaka 2008; see discussion in Michaud 2008). The American usage of the term ‘tone’ explains why Pike found it necessary to use the word ‘toneme’, to bring out the parallel with phonemes, which, like tone, have a lexically distinctive role (Pike 1948:4).

The term ‘tone’ will be used here in the traditional, functional sense of ‘lexically distinctive tone’ (as in the study of Shixing by Chirkova and Michaud, this conference), corresponding to Pike’s ‘toneme’. In Laze, some lexical items are characterised by a simple tone: H(igh), M(id) or L(ow), others by a complex tone such as MH. The terms ‘tonal level’ and (more simply) ‘level’ will be used interchangeably to refer to the three pitch levels that are relevant in Laze (as in Naxi and Na), namely H, M and L. To exemplify the distinction between (lexical) tones and (phonetic) levels, one could transcribe tonal levels between square brackets (as in broad phonetic notation), and tones between slashes, as in phonemic notations. Thus, tone /MH/ consists of a sequence of two tonal levels, [M] and [H]. (In cases where there is no ambiguity, the brackets/slashes will be dispensed with.)

A minor drawback of this use of terms is that it is potentially at odds with terms such as ‘tone-bearing-unit’ (TBU), in which ‘tone’ usually refers to a [tonal level] rather than to an entire /tone/. The term ‘TBU’ is simply avoided here so as to steer clear of this potential difficulty.

The Chao tone-letters are used below for phonetic notations: ˩ for H(igh), ˨ for M(id), ˩˨ for L(ow)-to-M, etc. For instance, ‘pig’ is transcribed phonetically as [wɣ˩], phonologically as /<sup>L</sup>wɣ/. There exist some non-trivial correspondences between the two levels, as will appear below.

In Laze, a syllable can carry at most two tone levels. It is therefore possible to posit a moraic structure – each syllable rhyme containing two moras. Thus, the tone of the verb ‘bite’ could be represented in either of two ways:



While the notion of mora is potentially applicable to Laze, for all intents and purposes it appears sufficient to refer to the syllable (more precisely the syllable rhyme). The simple representation on the right-hand side is therefore preferred here. The essential facts are:

All syllable rhymes (vowels and syllabic consonants) are equal in terms of the tone levels they can bear, i.e. there is no contrast between ‘heavy’ and ‘light’ rhymes in Laze.

On the surface, each rhyme carries at least one level (H, M or L), and at most two levels, namely the sequence MH. At the surface level, there are no toneless syllables.

No sequences other than MH are ever observed on a single syllable/rhyme/vowel.

The association of tone levels to units containing two syllables and more is indicated typographically by means of a dot materialising syllable boundaries (following common practice, e.g. Girón Higueta & Wetzels 2007:133). Thus, indicating that a disyllable has a [M.H] pattern means M on first syllable, H on second syllable.

The notion of ‘phonological word’ is used rather loosely to refer to the domain of tone, covering such syntactically different entities as a disyllabic lexical word, a compound noun, or a predicate made up of an object noun plus a verb. Laze does not offer the segmental evidence for this level found in languages such as Shixing (Chirkova and Michaud, this

seminar): tonal change is the only phonological change which takes place when a disyllabic or polysyllabic entity ('phonological word') is created out of several distinct morphemes.

## 2. Lexical tones of monosyllables

Laze is phonologically monosyllabic, though it has a strong tendency towards disyllabicity in the lexicon. This is similar to numerous languages of East and Southeast Asia, including Shixing (see Chirkova & Michaud, this seminar, p. 3). It therefore seems advisable to approach the tonal system by studying monosyllables.

Pr. Huang Bufan (Huang 2008) reports four tones for monosyllables: high-rising, 35; high-falling, 53; mid, 33; and low-falling, 31. While the latter two straightforwardly correspond to M and L in my data, the other two do not correspond to my notations. For instance, some items that have tone 53 in her data (i.e. a H-to-M tone, not found in my data) correspond to items with tone MH in my data, i.e. <sup>35</sup> in Chao tone-letters (e.g. 'to laugh': /ə<sup>53</sup>/ in Huang's data, /<sup>MH</sup>ɑ/ in mine), others to tone H in my data (e.g. 'name; to be called', /<sup>H</sup>hĩ/ in my data, /hĩ<sup>53</sup>/ in hers). Detailed comparison with her data and analyses [which only came to my notice on Nov. 12<sup>th</sup>, 2008, through a preprint sent to me by Jackson Sun] must be postponed until a later publication.

### 2.1. *The four classes of predicates in Laze*

The tonal classes of predicates (verbs and adjectives) in Laze are very straightforward: there are four classes, realised in isolation as [H], [M], [L] and [MH]. Table 2 presents examples, a proposal for analysis, and manipulations over verbs:

- adding after a verb the syllable /bi/, to indicate immediate future (glossed in Table 2 as 'IMMFUT');
- adding, before the verb, the negation, /mɣ/, or the prohibitive ('negative imperative') /t<sup>h</sup>a/;
- reduplicating the verb;
- placing the verb in the frame /la/ + PRED + /ŋa/, conveying perfect tense/aspect, and in the frame /dɯ/ + PRED + /ɹ/, meaning '...a little', e.g. 'eat' > 'eat a little', 'watch' > 'take a look' (glossed below simply as '...a little').

The position of the verb in the sequence of syllables is indicated by underlining the corresponding tone(s).



**Table 2. Data concerning the four classes of monosyllabic verbs and adjectives: behaviour in different environments.**

realisation in isolation	[H]	[M]	[L]	[MH]
analysis	H	M	L	MH
examples	/ts <sup>h</sup> ɣ/ ‘lend’; /gy/ ‘fly’; /bɣ/ ‘bald, 秃’; /wɣ/ ‘correct, 准’	/k <sup>h</sup> i/ ‘sell’; /zɯ/ ‘buy’; /dze/ ‘eat’; /tæ/ ‘pull’; /zɯ/ ‘heavy’	/dɯ/ ‘beat, strike’; /lɔ/ ‘watch’; /sɣ/ ‘drink’; /ha/ ‘deep’	/t <sup>h</sup> æ+ɿ/ ‘bite’; /t <sup>h</sup> s <sup>h</sup> ɯ+ɿ/ ‘lose’; /pɣ+ɿ/ ‘wear, 戴’; /tɿ/ ‘wrinkled, 皱’ /t <sup>h</sup> a/ ‘sharp, 锋利’
IMM. FUT	<u>H</u> .H	<u>M</u> .M	<u>L</u> .L	<u>M</u> .H
example	[ts <sup>h</sup> ɣɿ biɿ]	[k <sup>h</sup> i+ biɿ]	[dɯɿ biɿ]	[t <sup>h</sup> æ+ biɿ]
REDUPLIC.	H.H	M.M	H.L	M.MH
example	[ts <sup>h</sup> ɣɿ ts <sup>h</sup> ɣɿ]	[k <sup>h</sup> i+ k <sup>h</sup> i+]	[dɯɿ dɯɿ]	[t <sup>h</sup> æ+ t <sup>h</sup> æ+]
PROH	H. <u>H</u>	M. <u>M</u>	H. <u>H</u>	M. <u>MH</u>
example	[t <sup>h</sup> aɿ ts <sup>h</sup> ɣɿ]	[t <sup>h</sup> a+ k <sup>h</sup> i+]	[t <sup>h</sup> aɿ dɯɿ]	[t <sup>h</sup> a+ t <sup>h</sup> æ+]
NEG	H.H	M.M	H.H	M.H
example	[mɣɿ ts <sup>h</sup> ɣɿ]	[mɣ+ k <sup>h</sup> i+]	[mɣɿ dɯɿ]	[mɣ+ t <sup>h</sup> æɿ]
PRF	H. <u>H</u> .L	M. <u>M</u> .H	H. <u>L</u> .H	M. <u>MH</u> .L
example	[laɿ ts <sup>h</sup> ɣɿ ŋaɿ]	[la+ k <sup>h</sup> i+ ŋaɿ]	[laɿ dɯɿ ŋaɿ]	[la+ t <sup>h</sup> æ+ ŋaɿ]
‘...a little’	H.H.H	M.M.M	H. <u>H</u> .M	M. <u>M</u> .H
example	[dɯɿ ts <sup>h</sup> ɣɿ ɿɿ]	[dɯ+ dze+ ɿɿ]	[dɯɿ dɯɿ ɿɿ]	[dɯ+ t <sup>h</sup> æ+ ɿɿ]

### 2.1.1. Immediate future: type 1 of tonal assignment

The case of the immediate future is the simplest. The construction consists in adding the verb /bi/ ‘go’ after a verb; the tone of the resulting phonological word obtains by one-to-one association of the levels making up the tone of the verb to the syllables of the resulting expression, followed by an extension of the last level to any remaining syllables. For convenience, this mode of tone assignment will be referred to as ‘type 1’.

### 2.1.2. Negative: type 1, plus change of /L.L/ to /H.H/

When a predicate is preceded by the negation, /mɣ/, the tone of the resulting phonological word appears to obtain as in type 1: by one-to-one association of the levels making up the tone of the predicate to the syllables of the resulting expression, followed by an extension of the last level to any remaining syllables. For instance, the process whereby /<sup>h</sup>gy/ ‘fly’ yields [mɣɿ gyɿ] can be described as the association of the lexical H tone to the first syllable, /mɣ/, and its extension to the second syllable; the MH tone yields M.H, by the same process. However, the L tone yields H.H; this cannot be accounted for by the process hypothesised

above, whereby one would expect L.L. The creation of H.H sequences from various combinations is pervasive in Laze; this observation is taken up again in section 5.1.

### 2.1.3. Reduplication: type 2 of tonal assignment, plus change of /L.L/ to /H.L/

The tones on reduplicated verbs can be interpreted in several ways. If it is hypothesised that the tone is fully reduplicated, it must be postulated (i) that the MH + MH sequence simplifies to M + MH, and (ii) that the L + L sequence dissimilates to H + L. I prefer another option, which consists in hypothesising that the tone of the verb docks onto the second syllable of the reduplicated expression and that the first syllable copies its first level, i.e. L before L, M before M or MH, and H before H. This will be referred to hereafter as ‘type 2’ of tonal assignment. Under this second option, as under the first, an additional process must be posited to explain why L reduplicates to H + L rather than L + L. This issue will be taken up again in section 5.1.

The tonal behaviour of morphemes such as the negation, /mɣ/, and the prohibitive, /t<sup>h</sup>a/, is more complex. These cases are here dealt with separately.

### 2.1.4. Prohibitive: type 2, plus change of /L.L/ to /H.H/

The surface patterns for the prohibitive are the same as for the negation, except for MH, which yields M + MH. Despite this surface similarity, the tone assignment process appears to be altogether different. As a working hypothesis, it appears that the predicate’s tone associates to the predicate itself – hence a surface tone that is identical to its underlying tone – and that the prohibitive morpheme /t<sup>h</sup>a/ then copies the tonal level closest to it, i.e. simply H and M before H and M respectively, and M before MH. This corresponds to ‘type 2’ of tonal association, as characterised in section 2.1.3. As in the case of the negation, one would expect L before L, but the expression surfaces as H.H; again, this will be discussed in section 5.1.

### 2.1.5. Perfect

In the perfect, the entire lexical tone of the verb associates to the verb itself; the behaviour of the preceding syllable is the same as in reduplication, i.e. /la/ receives the same level as the first syllable of reduplicated expressions (2.1.3): H before H or L; M before M or MH. As for the last syllable, /ŋa/, it carries L after H, and H after M or L.

**To sum up**, it appears that there are restrictions on the copy of the L tone to adjacent morphemes. While L can spread to a following morpheme (2.1.1), it cannot spread to its left. The result is H.L in reduplication and in the perfect and H.H in negative and prohibitive constructions. What makes the difference between these two subsets needs to be clarified: H.H appears to correspond to cases where a phonological word is created by association of a verb with a preceding morpheme.

## 2.2. The four classes of nouns in Laze

### 2.2.1. Three tones, or four?

Monosyllabic nouns pronounced in isolation have one of three tones: H(igh), M(id), or L(ow). There exist minimal sets, such as /<sup>H</sup>y/ ‘sheath, 刀鞘’, /<sup>M</sup>y/ ‘sheep’, /<sup>L</sup>y/ ‘monkey’.<sup>2</sup> However, the behaviour of monosyllabic nouns in morphological derivations provides a hint that there exist two distinct tones that neutralise to M in isolation. Table 3 shows how, when the feminine suffix /mie/ is added after a M-tone noun, some words yield M.H, other M.M. (Data for the H and L tones are also provided.) This shows that the three-way of distinction of H, M and L is insufficient to account for the facts.

**Table 3. Examples of Laze monosyllabic nouns followed by the feminine suffix /mie/, bringing out four classes of lexical tones. The pound symbol (#) refers to the boundary of the word: see text.**

tone in isolation	analysis	result of suffix-ation	examples	disyllables with same tone pattern
[H]	/H/	[H.H]	/ <sup>H</sup> by/ ‘yak’ > [by̯ mie̯]	[zæ̯ mie̯] ‘pillar’; [dɣ̯ mie̯] ‘stomach’; [zy̯ mie̯] ‘bucket, 桶’
[M]	/M/	[M.M]	/u/ ‘bear’ > [u̯ mie̯]; /y/ ‘sheep’ > [y̯ mie̯]; /la/ ‘tiger’ > [la̯ mie̯]; /dɣwæ/ ‘fox’ > [dɣwæ̯ mie̯]; /bæ/ ‘duck’ > [bæ̯ mie̯]	[zæ̯ mie̯] ‘mattress’; [ɲi̯ mie̯] ‘sun’; [ɬie̯ mie̯] ‘moon’; [p <sup>h</sup> y̯ mie̯] ‘face’; [gu̯ mie̯] ‘little sister’; [k <sup>h</sup> y̯ mie̯] ‘friend’; [y̯ mie̯] ‘pot, pan’; [ly̯ mie̯] ‘axe’; [sɯ̯ mie̯] ‘pou’; [lo̯ mie̯] ‘marmot’; [pɣ̯ mie̯] ‘frog’
[M]	/#H/	[M.H]	/ <sup>#H</sup> læ/ ‘chicken’ > [læ̯ mie̯]; / <sup>#H</sup> k <sup>h</sup> u/ ‘dog’ > [k <sup>h</sup> u̯ mie̯]	[tse̯ mie̯] ‘lighter’
[L]	/L/	[L.L]	/ <sup>L</sup> wɣ/ ‘pig’ > [wɣ̯ mie̯]	[zɯ̯ mie̯] ‘river’; [hi̯ mie̯] ‘tongue’; [ɲi̯ mie̯] ‘heart’; [ha̯ mie̯] ‘belly’; [tɬ̯ mie̯] ‘comb’

The word for ‘dog’, [k<sup>h</sup>u̯], yields [k<sup>h</sup>u̯ mie̯] ‘she-dog, bitch’, with H tone on the second syllable, not the expected [k<sup>h</sup>u̯ mie̯] (all-M). The word for ‘chicken’ has the same

<sup>2</sup> One single word, /<sup>H</sup>tɬ<sup>h</sup>a/ ‘stag’, appears to have an out-of-the-way behaviour in some contexts, where it surfaces with a rising contour. At one stage, it seemed as if the word for ‘stag’ were /<sup>MH</sup>tɬ<sup>h</sup>æ/, with a MH lexical pattern, making up a minimal pair with /<sup>H</sup>tɬ<sup>h</sup>æ/ ‘thread’. This would make this word a *hapax*: the only example of the MH tonal category in the vocabulary list collected so far. However, it is highly likely that this is simply a case of hypercorrection: the speaker, being aware that the two words refer to different things, offers a different pronunciation for two words which are in fact homophonous. (Similar effects are observed in Shixing by Chirkova et al., this seminar.) My best guess at present is that the lexical pattern of ‘stag’ is simply H. Verifications will be made during the second field trip.

behaviour: [læ˥], [læ˥mie˧]. On the other hand, the words [u˥] ‘bear’, [la˥] ‘tiger’ and [y˥] ‘sheep’ yield the expected M.M.

**The proposed analysis is the following:**

The nouns which yield M.M when combined with the suffix /mie/ have a M tone. Those which yield M.H have a lexical H tone which has a special characteristic: the H tone associates after the morpheme boundary, i.e. on the syllable which follows the end of the morpheme. (This H is thus “floating.”) The H tone on /mie/ in /k<sup>h</sup>u˥mie˧/ ‘she-dog’ is analysed as the realisation of this H tone. When ‘dog’ is said in isolation, this H tone does not surface, for want of a following syllable to which it could attach. Using the pound sign, #, to refer to the boundary of the word, this H tone is transcribed as #H.

**Additional information on /mie/-suffixation:**

(i) ‘Dog’, ‘bear’, ‘sheep’, ‘tiger’, ‘cow’, ‘chicken’, ‘pig’ are often used as monosyllables, so that addition of the female suffix can be regarded as a synchronic process. In this light, it is likely that the different behaviour of ‘dog’ and ‘chicken’, on the one hand (M.H), ‘bear’, ‘sheep’, ‘tiger’ on the other (M.M), is not a historical remnant, but constitutes evidence of a synchronic contrast between two tonal classes.

(ii) In the lexical items in the right-hand column of Table 3, the suffix /mie/ has become associated with the root, to the point that the suffixed form has come to refer to females and males indifferently. Thus, ‘frog’ is now disyllabic, /pɣ˥mie˧/. In theory it is possible to extract the lexical root /<sup>M</sup>pɣ/, and to refer to ‘toad’ as /pɣ˥p<sup>h</sup>ɣ˧/, by addition of the male suffix; but this word is not actually used, and it would not be easy for speakers to identify, so that in synchrony the word ‘frog’ should be acknowledged as disyllabic. The word /lo˥mie˧/, ‘Russian marmot, *arctomys bobac*’ [exact definition to be verified], is another case in point: the suffix is so closely integrated with the root that additional suffixes have to be added to the disyllabic word in order to specify ‘male’ or ‘female’, viz. /lo˥mie˧p<sup>h</sup>ɣ˧/ for ‘male marmot’. The morphological analysis of some of the items remains speculative, e.g. for /ha˥mie˧/ ‘stomach’. From the tonal pattern of these disyllables, a plausible hypothesis about the lexical tone of the monosyllabic root can be proposed. For instance, /<sup>M</sup>ɰie/ ‘moon’ and /<sup>M</sup>ɰi/ ‘sun’ can be extracted from the disyllables /ɰie˥mie˧/ ‘moon’ and /ɰi˥mie˧/ ‘sun’, respectively; the tone pattern of the disyllable suggest that the monosyllabic roots have /M/ tone.

(iii) As in Naxi and Na, the feminine suffix is also used with the meaning ‘large, big’. This can be analysed as a case of one morpheme with several uses (the interpretation favoured here), or as two homophonous morphemes. As an indicator of gender, /mie/ ‘female’ contrasts with /<sup>H</sup>p<sup>h</sup>ɣ/ ‘male’. As an indicator of size, /mie/ contrasts with /ze/ (literally ‘boy’), i.e. making metonymical use of the mother-vs.-child contrast in size and power.

(iv) Lastly, one exception to the patterns in Table 3 was observed: the word for ‘mare, 母马’ is /lo˥mie˧/ (L.L), which is unexpected since ‘horse’ is /<sup>M</sup>lo/, not /<sup>L</sup>lo/. Such apparent exceptions suggest that other processes have been at play: perhaps a third element went into the composition of this word at an earlier stage, resulting in a change of the tone. The same lexical item is also irregular in Shixing and in Na. In Shixing, /<sup>L</sup>rõ/ ‘horse’ (very probably cognate to Laze /lo/) yields /<sup>HL</sup>rõ.mi/ ‘mare’, instead of the expected /<sup>L</sup>rõ.mi/ (E. Chirkova, p.c.). In Na, /<sup>#H</sup>zwæ/ ‘horse’ yields /zwæ˧mi˥/ ‘mare’. The reasons for the exception in Shixing and Na are to this day no less unclear than for Laze.

### 2.2.2. A list of examples

Table 4 classifies by tone some monosyllabic nouns found in the 2,000-item word-list collected in the Spring of 2008. Chinese glosses are provided for words that are ambiguous (e.g. ‘hair, 头发’) or uncommon (e.g. ‘awl, 锥子’ or ‘naked oats, 莜麦’).

**Table 4. Examples illustrating the tonal categories of monosyllabic nouns in Laze.**

Tone	Examples
H	/fi/ ‘rain’; /k <sup>h</sup> ɔ/ ‘hole’; /dy/ ‘earth’; /hæ/ ‘gold’; /ʃu/ ‘iron’; /ts <sup>h</sup> u/ ‘shoulder blade’ [exact meaning to be confirmed]; /hy/ ‘wart, mole’; /tu/ ‘rib’; /k <sup>h</sup> u/ ‘nest’; /tʃ <sup>h</sup> æ/ ‘thread’; /gu/ ‘granary’; /sa/ ‘scales, 称’; /dʒu/ ‘money’; /tʃu/ ‘awl, 锥子’; /dʒwɣ/ ‘harrow, 耙’; /k <sup>h</sup> ɣ/ ‘basket, 背篓’, /mu/ ‘winnowing tool, 簸箕’; /y/ ‘sheath, 刀鞘’; /hĩ/ ‘name’; /dzy/ ‘wasp’; /zæ/ ‘leopard’; /p <sup>h</sup> a/ ‘wolf’; /by/ ‘yak’; /hwɣ/ ‘mouse’; /k <sup>h</sup> ɔ/ ‘horn’; /k <sup>h</sup> i/ ‘husked rice’; /ʃu/ ‘naked oats, 莜麦’; /ny/ ‘soy beans, 黄豆’
#H	/læ/ ‘chicken’; /k <sup>h</sup> u/ ‘dog’
M	/dʒwæ/ ‘fox’; /bæ/ ‘duck’; /u/ ‘bear’; /y/ ‘sheep’; /la/ ‘tiger’; /vi/ ‘cow’
L	/sa/ ‘breath, vapour’; /dʒi/ ‘lake’; /zy/ ‘powder’; /lqe/ ‘ash’; /mi/ ‘sore, ulcer, 疮’; /ts <sup>h</sup> y/ ‘lung’; /tʃy/ ‘sweat’; /ny/ ‘drivel, 鼻涕’; /bæ/ ‘pus, 脓’; /hæ/ ‘Chinese, Han’; /my/ ‘daughter’; /zy/ ‘flour’; /zɔ/ ‘alcohol, wine’; /lie/ ‘tea’; /sa/ ‘hemp, cannabis’; /gɣ/ ‘glass bottle, glass container’; /u/ ‘needle’; /dzy/ ‘chisel, 凿子’; /dzi/ ‘rope’; /kɔ/ ‘handle’; /tʃie/ ‘bow, 弓’; /dɣ/ ‘poison’; /ɲi/ ‘demon’; /wɣ/ ‘pig’; /ts <sup>h</sup> u/ ‘goat, 山羊’; /y/ ‘monkey’; /væ/ ‘water buffalo, 水牛’; /ky/ ‘kernel, 果核’; /mæ/ ‘bamboo’; /gy/ ‘Sichuan pepper, 花椒’; /læ/ ‘seed, 种子’

The realisation that nouns that have M tone in isolation actually belong in two separate classes came late in the course of the first field trip (March-April 2008), explaining – though it does not excuse it – the regrettable fact that the items which were pooled together in a “M” tonal class have not yet been fully sorted out into the two distinct classes whose difference is becoming apparent: M on the one hand, floating H (#H) on the other. The box below contains the items for which it is at present uncertain in which of the two they belong. During the next field trip, tests will be devised to tell them apart.

/hĩ/ ‘human being, person’; /ze/ ‘son’; /mu/ ‘sky’; /tsi/ ‘star’, homophone ‘gall-bladder’; /vie/ ‘snow’; /dzy/ ‘hail’, homophone ‘bridge’; /my/ ‘fire’; /li/ ‘field’; /tʃu/ ‘earth’; /ɲy/ ‘silver’; /ts<sup>h</sup>e/ ‘salt’; /ɲæ/ ‘milk’; /su/ ‘meat’; /si/ ‘liver’, homophone ‘wood’; /k<sup>h</sup>æ/ ‘faeces’; /dzi/ ‘urine’; /jɣ/ ‘tobacco’; /bi/ ‘pen, paddock’; /kɔ/ ‘bed’, homophone ‘handle’; /k<sup>h</sup>ɔ/ ‘sound’; /gy/ ‘bee’; /hy/ ‘garlic’; /zu/ ‘grass’

### 3. From monosyllables to disyllables: pressure towards the multiplication of tone patterns, counteracted by forces of integration?

From monosyllables to disyllables, the number of possible tone patterns increases, in principle, by squaring. Disyllabification thus entails pressure towards the multiplication of tone patterns. In Naxi, the H, M, L contrast on monosyllables yields  $3^2 = 9$  combinations on disyllables: H.H, H.M, H.L, M.H, M.M, M.L, L.H, L.M, L.L. In Naxi, nothing appears to restrain the tonal effects of disyllabification. For Laze, the same principle would yield  $4^2 = 16$  possibilities on disyllables; for Na (described in section 6),  $5^2 = 25$ . Only a few of these combinations are in fact observed: 6 (not 16) in Laze, 11 (not 25) in Na. The pressure towards the multiplication of tone patterns – dramatically increasing the number of possible patterns at the level of the lexical word – is partly counteracted by forces which tend to fuse the two parts of disyllabic words. There is abundant cross-language evidence for these forces, both concerning segmental phonemes and lexically distinctive ‘suprasegmentals’ such as stress and tone. On a prosodic plane, it is known that the greater integration of a given prosodic unit tends to be reflected in a reduction of the number of ups and downs within that unit. In American English, the pattern which obtains by such integration has been referred to as the ‘hat-pattern’ (Maeda 1976, Vaissière 1995). In tonal terms, various processes can be expected, all tending towards the integration of the word. Across languages, single-peak shapes are preferred, i.e. H.L.H is a less satisfactory tonal profile for a word than H.H.L. The most extreme manifestation of the tendency towards integration would consist in the deletion of the tone of one of the two morphemes that go to make the new disyllabic word: under such a scenario, the number of tones over monosyllables and over disyllables (or indeed polysyllables) would be the same. Shixing (Chirkova et al., this conference) is a case in point. In Laze, the situation is not so clear-cut: the system is intermediate between syllabic tone and word-tone.

#### *3.1. An inventory of disyllables in Laze*

Six tonal patterns are observed over Laze disyllables. Table 5 provides examples. A thick horizontal line separates tones also attested on monosyllables from the others: H.H, M.M, L.L and M.H can transparently be analysed as equivalent to the H, M, L and MH tones of monosyllables, respectively.

**Table 5. Examples of the six tonal patterns of Laze disyllabic nouns.**

┘┘	/sy.zy/ ‘forest’; /k <sup>h</sup> æ.lu/ ‘canal’; /zɯ.k <sup>h</sup> ɔ/ ‘spring’; /u.fy/ ‘brains’; /u.k <sup>h</sup> y/ ‘hair, 头发’; /lɔ.pa/ ‘braid’; /du.kɔ/ ‘hump’; /ɖy.mie/ ‘stomach’
┘┘	/ŋi.mie/ ‘sun’; /ɬie.mie/ ‘moon’; /p <sup>h</sup> v.hæ/ ‘dust’; /fi.dzi/ ‘charcoal’; /ʃwɣ.ʃwɣ/ ‘relative, 亲戚’; /da.pɣ/ ‘priest (of local religion)’
┘┘	/ŋie.p <sup>h</sup> y/ ‘ice’; /zɯ.tse/ ‘mountain’; /læ.k <sup>h</sup> ɔ/ ‘cave’; /zɯ.mie/ ‘river’; /bu.tu/ ‘dike’; /gɟæ.k <sup>h</sup> æ/ ‘mud’; /y.ɖy/ ‘grave, tomb’
┘┘	/mu.k <sup>h</sup> y/ ‘smoke’; /i.ts <sup>h</sup> i/ ‘water’; /læ.gv/ ‘path’; /u.tu/ ‘head’; /tu.kɣ/ ‘forehead’; /mie.ly/ ‘eye’; /njɣ.gɣ/ ‘nose’; /ɬie.tu/ ‘ear’
┘┘	/ki.su/ ‘cloud’; /ŋwa.tu/ ‘knee’; /hi.zæ/ ‘tendon of the tongue’; /ni.k <sup>h</sup> ɣ/ ‘lips’; /ʃa.tu/ ‘bone’; /ts <sup>h</sup> u.mie/ ‘daughter-in-law’; /da.pu/ ‘host, 主人’; /sy.dy/ ‘incense’; /ki.k <sup>h</sup> ɔ/ ‘saddle’; /mæ.dy/ ‘branch to whip animals, 用来打牲畜的木条’; /kja.su/ ‘tool’; /tse.hi/ ‘key’
┘┘	/ka.p <sup>h</sup> æ/ ‘bone of the knee’; /a.py/ ‘breast’; /k <sup>h</sup> jɣ.py/ ‘navel’; /ts <sup>h</sup> u.mie/ ‘spine, backbone’; /ki.ki/ ‘elder sister’; /zu.ʃ <sup>h</sup> ɿ/ ‘orphan’; /zɯ.ŋi/ ‘soup’; /da.na/ ‘morning’

### 3.2. Relating disyllables (predicates and nouns) to monosyllables

Numerous combinations of two tones other than H yield H + H. This appears to be an important process in the lexical integration of disyllables in Laze: this tonal change signals that the two monosyllables are fused into one single unit. For instance, ‘dog’ is /<sup>M</sup> k<sup>h</sup>u/, ‘to beat’ is /<sup>L</sup> ɖu/; their combination should yield M.L; but when the speaker says it at one go, rather than as the simple juxtaposition of the two words, it is realised H.H. The same tonal phenomenon is observed for nouns: examples are provided after Table 6 below.

In most cases, the speaker remains aware of the tonal identity of the two morphemes that go to compose a [H.H] disyllabic unit, and does not incline to accept the notion that this unit is realised as [H.H]. As in Shixing (Chirkova and Michaud, this seminar), when the consultant repeats the disyllable at a slow, deliberate pace, there is a pervasive tendency to hypercorrection – saying the morphemes one by one, and falling back on the lexical tones of these individual morphemes.

Table 6 provides a summary of cases of tonal change in combinations that have been observed so far. It is incomplete: the numerous empty boxes correspond to combinations which will require further analysis. The tone patterns with tonal change will be referred to as ‘sandhi patterns’.

**Table 6. A summary of cases where the tone pattern of a disyllabic unit is not the concatenation of those of its constituting elements. Rows: first component of disyllable, columns: second component. Empty boxes = combinations awaiting further analysis.**

	H	M	L	MH
H				
M	[H.H]		[H.H]	[H.H]
L		[L.L]	[L.H]	
MH				

Here are some examples arranged by the tones of their constituting morphemes.

M + H > H.H :

- (i) [ts<sup>h</sup>eɫ] ‘salt’ + [suɫ] ‘good’ > [ts<sup>h</sup>eɫ suɫ] ‘[pleasantly] salty’
- (ii) [muɫ] ‘sky’ + [dyɫ] ‘earth’ > [muɫ dyɫ] ‘universe’
- (iii) [æɫ] ‘copper’ + [p<sup>h</sup>ɣɫ] ‘white’ > [æɫ p<sup>h</sup>ɣɫ] ‘brass’
- (iv) [ʂuɫ] ‘meat’ + [p<sup>h</sup>ɣɫ] ‘white’ > [ʂuɫ p<sup>h</sup>ɣɫ] ‘fat meat’
- (v) [k<sup>h</sup>æɫ] ‘faeces’ + [k<sup>h</sup>ɔɫ] ‘hole’ > [k<sup>h</sup>æɫ k<sup>h</sup>ɔɫ] ‘anus’

M + MH > H.H: [ʂuɫ] ‘meat’ + [naɫ] ‘black’ > [ʂuɫnaɫ] ‘lean meat’

M + L > H.H :

- (i) [mɣɫ] ‘fire’ + [kwɣ] (?) > [mɣɫ kwɣɫ] ‘to warm oneself at the fireside’
- (ii) (example cited above) [k<sup>h</sup>uɫ] ‘dog’ + [ɖuɫ] ‘strike’ > [k<sup>h</sup>uɫ ɖuɫ]
- (iii) [siɫ] ‘wood’ + [paɫ] ‘carry on one’s back’ > [siɫ paɫ] ‘carry wood’
- (iv) [dziɫ] ‘urine’ + [hæɫ] (?eject) > [dziɫ hæɫ] ‘urinate’
- (v) [k<sup>h</sup>æɫ] ‘faeces’ + [hæɫ] (as in iv) > [k<sup>h</sup>æɫ hæɫ] ‘defecate’
- (vi) [tʂuɫ] ‘earth’ + [gɣɫ] ‘jar, bottle’ > [tʂuɫ gɣɫ] ‘earthen jar’

L + M > L.L : [saɫ] ‘air, vapour’ + [seɫ] (?go) > [saɫ seɫ] ‘to breathe’

Beyond disyllables, comparable phenomena are observed over compounds made up of words which are themselves made up of more than one syllable. For instance, [aɫuɫ] ‘house, home’ + [hĩɫ] ‘person, man’ > [aɫuɫ hĩɫ] ‘relatives, people of the family’, with the same tonal change on the second word as if the first word were a monosyllable with H tone. This is taken as evidence that the word [aɫuɫ] ‘house, home’ is phonologically characterised by a simple /H/ tone, and that the resulting compound, too, simply has a H tone: /<sup>H</sup>a.u./ + /<sup>M</sup>hĩ/ > /<sup>H</sup>a.u.hĩ/.

The tonal change reflects the semantic integration of the disyllabic expression. An activity such as carrying wood (example iii of the ‘M+L>HH’ pattern) is part of the routine operations of daily life – a ready-made predicate, rather than a new association of an object



and a verb. So is, in fact, ‘beating [the] dog’: local dogs receive little in the way of obedience training, and as a result, when left to their own devices they will chase poultry, steal into the kitchen, nibble children’s calves... and common practice in such cases consists in kicking them or hitting them with a broom. This contrasts with ‘beating a goat’, or ‘beating a pig’, which are unusual (and shocking) actions. In the latter two cases, the tonal sequence remains unchanged, L+L (/ts<sup>h</sup>uɿ ɬuɿ/, /wɣɿ ɬuɿ/), instead of the H.H pattern that would be adopted if these were set phrases.

For obvious reasons, all the nouns and predicates whose meaning is remote from that of their constituent morphemes bear a sandhi pattern. For instance, ‘to marry’ (probably a recent word in Laze, as in Na and Naxi) is [zɿuɿ ʂɿ] (analysed as /<sup>H</sup>zɿu.ʂɿ/), literally ‘drink wine’, i.e. using a salient dimension of the wedding ceremony as a name for the entire ritual; this disyllabic verb phrase has a tone pattern that differs from that of its constituents: /<sup>M</sup>zɿu/ ‘wine’, /<sup>L</sup>ʂɿ/ ‘drink’.

### ***3.3. Three remaining issues***

Three issues will be mentioned here: exceptions; words whose analysis into morphemes is not clear; and an uncertainty about the analysis of one of the tone patterns of disyllables.

One single exception was observed: the word for ‘mare’ is [lɔɿ mieɿ], whereas one would expect M tone, on the basis of the monosyllabic word for ‘horse’, /<sup>M</sup>lɔɿ/; moreover, the word ‘mare’ does not behave as expected in the construction of predicates: ‘to beat a mare’ is [lɔɿ mieɿ ɬuɿ], with M tone on all three syllables, an otherwise unattested tonal change. This calls for further analysis.

As for words whose analysis into morphemes is not clear, the difficulty of the analysis is a consequence of the freedom that disyllabic words can gain. Examples include ‘spark’, /mɿɿ zæɿ/: the first element is /<sup>M</sup>mɿɿ/, ‘fire’; the second syllable has not been identified yet; it may be another noun, or a predicate, whose tone may be any of /L/, /H/ or /MH/, since the combinations of /M/ with any of these tones all yield /H/.

Lastly, one remaining issue is whether the pattern transcribed as /HL/ over disyllables may not in fact be /HM/: since there is no contrast between /HL/ and /HM/ over disyllabic expressions, the falling contour transcribed as H.L can be considered to constitute the neutralisation of /HL/ and /HM/, but it would nonetheless be desirable to obtain phonological evidence of its identity. The notation as /HL/ is provisionally retained, on the basis of auditory impressions.

## 4. Related phenomena of tonal change in Laze

This section presents other phenomena of tonal change that appear to be related with those reported in section 3. They are presented separately at the present stage; the next step will consist in integrating them with those in section 3.

### 4.1. Numerals plus classifier

Laze numerals from 1 to 10 are monosyllabic and appear to fall into one of three tonal classes: H, L, and M (i.e. no MH numerals were found). Four tonal classes of classifiers are observed, corresponding to the four classes of nouns and predicates: H, L, M, and MH.

There are thus  $3 \times 4 = 12$  theoretically possible tonal combinations for the association of a numeral with a classifier. In fact, only six patterns are observed on the resulting disyllabic combinations; these are the same six patterns as found over disyllabic nouns:

- the four patterns H.H, M.M, L.L, M.H, analysed as /H/, /M/, /L/ and /MH/, i.e. the four tones found on monosyllables; and
- L.H and H.L.

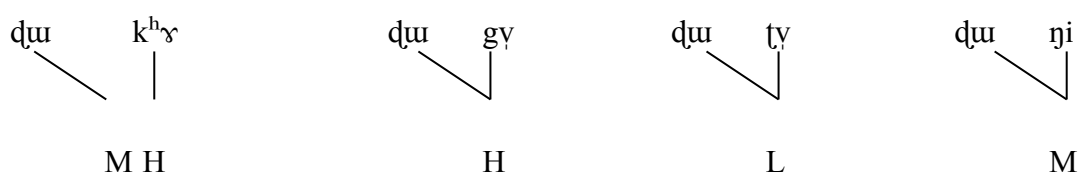
Table 7 summarises the results. The classifier /<sup>H</sup> gɥ/ is used for people (among others); /<sup>M</sup> ŋi/ means ‘day’; /<sup>L</sup> tɥ/ means ‘jiao (1/10<sup>th</sup> of the monetary unit)’; /<sup>MH</sup> k<sup>h</sup>ɣ/ means ‘basket, crate’.

**Table 7. Tone patterns over numeral + classifier sequences.**

	classifier	gɥ	ŋi	tɥ	k <sup>h</sup> ɣ
numeral	tone	H	M	L	MH
1, 2, 4, 5, 7, 9	M	H.H	M.M	L.L	M.H
3, 10	H	H.H	H.L	H.H	H.L
6, 8	L	L.L	L.L	L.L	L.H

An important point is that the changes do not simply consist in filtering the combinations which would result in patterns other than the above six. H+L could yield H.L, and L+H could yield L.H, since these two patterns do exist over disyllables; yet both of these combinations get modified. The rules underlying the changes have not been brought out yet. At present, this is what can be said:

Numerals 1, 2, 4, 5, 7, 9 appear to be toneless; the disyllabic combination serves as the domain for the tone of the classifier:



As for numerals 3 and 10, they are analysed as carrying H tone; at present, the tone patterns that obtain appear inexplicable – e.g. why H + MH would yield H.L. This issue has to be left open at present. A possible direction for research is that H + MH contravenes the rule whereby the tone pattern of a phonological word in Laze (as also in Na) cannot contain two levels separated by a lower level (i.e. no H.L.H, H.M.H, H.L.M, M.L.H etc). The H + MH sequence would thus be simplified to H + M, by deletion of the offending final H; hence the identity of the output with that of H + a simple M. The reason why the output is H.L and not H.M would be because HM is disallowed in Laze – said differently, /HM/ and /HL/ neutralise to /HL/. Again, at present this is mere speculation. Discussion of the patterns after the numerals 6 and 8, presumed to carry L tone, must also be deferred until a later study.

Once the tonal pattern of the numeral + classifier sequence is determined (by the above regularities), its association to a noun takes place without any further tonal modifications. Taking the (M-tone) classifier /i/ as an example, its association with the numeral ‘one’ yields, by the above regularities, [ɖuɪ iɪ], a pattern which remains unchanged irrespective of the noun to which it associates: e.g. [zeɪ] ‘boy, son’ > [zeɪ ɖuɪ iɪ] ‘a son’; [mɥɪ] ‘girl, daughter’ > [mɥɪ ɖuɪ iɪ] ‘a girl’; [əɪ ɣɪ] ‘uncle’ > [əɪ ɣɪ ɖuɪ iɪ] ‘an uncle’.

#### ***4.2. Coordinative compounds (copulative compounds)***

Due to the limited number of examples, generalisations about the tone patterns of coordinative compounds can hardly be proposed at present. The patterns that were observed are:

M + L > H.H: [zeɪ] ‘son’ + [mɥɪ] ‘daughter’ > [zeɪ mɥɪ] ‘children’ (same pattern as for compounds and predicates)

M.H + M.M > M.M.H.H: [aɪ ɣɪ] ‘elder sister’ + [guɪ mieɪ] ‘little sister’ > [aɪ ɣɪ guɪ mieɪ] ‘sisters’

L.H + M.M > M.M.H.H: [maɪ mɥɪ] ‘elder brother’ + [guɪ zuɪ] ‘little brother’ > [maɪ mɥɪ guɪ zuɪ]

M.M + M.M: no tonal change: [iɪ ɣɪ] ‘grandson’ + [iɪ mieɪ] ‘granddaughter’ > [iɪ ɣɪ iɪ mieɪ] ‘grandchildren’; same for ‘little brothers and little sisters’, [guɪ zuɪ guɪ mieɪ], and ‘father and mother’, [əɪ daɪ əɪ mieɪ]

M.M + H.H: no tonal change: ‘uncles (older than father, or younger than father), 舅舅与叔叔’, [əɪ buɪ əɪ paɪ]

### ***4.3. Tonal adaptation: Evidence from loanwords***

From the above observations about the existence of only six tonal patterns over disyllabic nouns in Laze, it can be predicted that Chinese loanwords which are now integrated into Laze vocabulary will have one of these six tonal patterns, to the exclusion of any other. This prediction appears to be borne out. Further investigation into this issue will require a better knowledge of the local variety of Chinese, so that the process of borrowing can be studied in light of the structure of the donor dialect.

## **5. Provisional conclusions**

### ***5.1. Avoidance of the proliferation of tonal patterns for disyllables in Laze***

In word-tone systems (e.g. Shixing, presented at this conference, or Tamang: Mazaudon & Michaud in press), the number of tones on mono- and disyllables is the same. Laze is intermediate between word-tone and syllabic tone: it has four tones on monosyllables and six on disyllables. An aim of the present research consisted in bringing out the synchronic principles which perpetuate this restriction over lexical tonal patterns. It appears that the synchronic processes of tonal change cannot be straightforwardly explained as the reduction of ‘illicit’ patterns to ‘licit’ ones: for instance, L + L combinations undergo a change (to [H.H] or [L.H]) in various cases, despite the fact that [L.L], analysed as the realisation of a L tone, is a licit pattern for disyllables in Laze. Recall from section 2.1 that L-tone predicates preceded by the negation or the prohibitive yield H.H, not L.L ([dɯŋ] ‘strike’ > [mɤŋ] dɯŋ] ‘not strike’, [tʰa] dɯŋ] ‘Do not strike!’). Other combinations surface as L.H, e.g. [lie] ‘tea’, [ɕy] ‘drink’, [lie] ɕy] ‘drink tea’ [data to be further verified]. Overall, the tonal changes summarised in Table 6 create a relatively high proportion of H-tone words, and a relatively low proportion of L-tone words. While there exist H.H sequences that result simply from the succession of two lexical H tones, the H tone over words of two or three syllables is often the result of tonal change, and could potentially be used as a cue to their semantic integration. Further research is required to clarify the situation.

### ***5.2. A cross-language outlook: Laze, Naxi, Na***

It is well known that tonal systems of related languages/dialects can have large differences on the surface which result from relatively minor differences in the underlying synchronic regularities. Laze, Naxi and Na appear to be a case in point: many words are transparent cognate in these three language varieties; prosodically, the rules are fairly different. Table 8 is an attempt at a summarising statement.

**Table 8. An attempt at a summarising statement concerning salient prosodic properties of Naxi, Laze and Na.**

	Naxi	Laze	Na
HH sequences	allowed	allowed – and indeed highly frequent	<b>prohibited:</b> H can only be followed by L
phonological-word-initial H	allowed		<b>prohibited:</b> only M or L in initial position
all-L phonological words	allowed	allowed, but relatively infrequent	<b>prohibited.</b> Strategy: addition of post-lexical final M tone.

Na data are set out in section 6, with a view to comparison of the prosodic systems of Laze and Na, which are close in several respects. The comparison essentially bears on Laze and Na, because Naxi, though closely related to these two varieties, does not have phenomena of tonal change similar to those found in Laze and Na.

## 6. Comparative perspectives: Laze and Na

### *6.1. Comparison of the predicates of Laze with those of Na*

The predicates of Laze and those of Na shed light on one another. Na also has the same four tones for monosyllabic predicates as Laze: H, M, L and MH. The data are arranged in an order comparable to the one adopted for Laze, so that Table 9 can be compared with Table 2 above.

**Table 9. The four basic tonal classes of predicates in Na, and their behaviour in several contexts.**

realisation in isolation	[M]	[M]	[LM]	[MH]
proposed analysis	H	M	L	MH
examples	/dzɯ/ ‘eat’; /i/ ‘do’; /tʂ <sup>h</sup> æ/ ‘wash’; /hu/ ‘wait’; /si/ ‘walk’; /zɯ/ ‘heavy’	/li/ ‘watch’; /hwæ/ ‘buy’; /tʂ/ ‘pull’; /bi/ ‘go’; /ki/ ‘give’; /tʂ <sup>h</sup> wæ/ ‘rot’; /ʂæ/ ‘long’	/dzi/ ‘cut’; /bæ/ ‘sweep’; /tʂi/ ‘write’; /ts <sup>h</sup> ɯ/ ‘arrive’; /zɿ/ ‘bring’; /dzɯ/ ‘sit’; /ha/ ‘deep’	/la/ ‘strike’; /t <sup>h</sup> æ/ ‘bite’; /tʂ <sup>h</sup> i/ ‘lose’; /hĩ/ ‘stand, 站’; /mi/ ‘push’; /t <sup>h</sup> ɑ/ ‘sharp, 锋利’
REDUPLIC.	M.M	M.L	M.H	L.MH
example	[dzɯ <sup>+</sup> dzɯ <sup>+</sup> ]	[li <sup>+</sup> li <sup>+</sup> ]	[dzi <sup>+</sup> dzi <sup>+</sup> ]	[la <sup>+</sup> la <sup>+</sup> ]
PROH	M. <u>H</u>	M. <u>M</u>	M. <u>L</u>	M. <u>MH</u>
example	[t <sup>h</sup> ɑ <sup>+</sup> dzɯ <sup>+</sup> ]	[t <sup>h</sup> ɑ <sup>+</sup> li <sup>+</sup> ]	[t <sup>h</sup> ɑ <sup>+</sup> dʒɯ <sup>+</sup> ]	[t <sup>h</sup> ɑ <sup>+</sup> t <sup>h</sup> æ <sup>+</sup> ]
NEG	M.H	M.M	M.L	M.MH
example	[mɣ <sup>+</sup> dzɯ <sup>+</sup> ]	[mɣ <sup>+</sup> li <sup>+</sup> ]	[mɣ <sup>+</sup> dzi <sup>+</sup> ]	[mɣ <sup>+</sup> t <sup>h</sup> æ <sup>+</sup> ]
PRF	M.H.L	M.M.M	M.L.L	M.M.H
example	[lɐ <sup>+</sup> dzɯ <sup>+</sup> zɐ <sup>+</sup> ]	[lɐ <sup>+</sup> li <sup>+</sup> zɐ <sup>+</sup> ]	[lɐ <sup>+</sup> dzi <sup>+</sup> zɐ <sup>+</sup> ]	[lɐ <sup>+</sup> t <sup>h</sup> æ <sup>+</sup> zɐ <sup>+</sup> ]

The tone patterns in reduplication in Na are included so as to present a set of data which is directly comparable across the two languages, but since these patterns are far from transparent, they will not be discussed here. As for the negation, in Laze, when a predicate is preceded by the negation, the tone associates left-to-right over the two-syllable entity; in Na, the tone attaches to the verb, whereas the negation receives M, by default (same for the prohibitive as for the negation). In the perfect (PRF), the first morpheme, /lɐ/, receives M by default, whereas the third appears to form a tonal unit (‘prosodic word?’) with the verb: the tone of the verb unfolds over both syllables, so that /MH/ yields M.H, M and L yield M.M and L.L, respectively (the last syllable copying the tone that precedes); as for H.L, it results from a pervasive regularity in Na whereby a H tone can only be followed by L.

In addition to the four tones H, M, L and MH, the verb ‘sell’, /tʂ<sup>h</sup>i/, is an exceptional case within the M category, behaving like H in certain contexts; two exceptional cases with the L category have also been observed, ‘drink’ /t<sup>h</sup>ɯ/ and ‘speak’ /zɰɣ/, behaving unlike other L-tone verbs in some of the contexts.

In Na, unlike in Laze, the sequence LM can appear on a monosyllable.

## 6.2. Comparison of the tones of nouns in Laze and Na

In the analysis of Laze nouns, a floating H tone was postulated: a tone that associates after the noun to which it is lexically associated (§2.2.1). One could in principle consider other options for modelling, such as analysing this tone as MH (a tone for which there is evidence from predicates, as was seen in section 2.1) and accounting for its surface realisation as [M] (not [MH]) in isolation by a post-lexical rule that prohibits phrase-initial contours.

Concerning this issue, comparison with Na may be especially useful.

### 6.2.1. The five tones of monosyllabic nouns in Na

Table 10 presents a phonological analysis of the basic tones of Na: those of monosyllabic nouns.

**Table 10. The tones of monosyllabic nouns in Na.**

tonal analysis	example	
M	la	‘tiger’
L	<sup>L</sup> k <sup>h</sup> ɣ	‘dog’
LM	<sup>LM</sup> bu	‘pig’
MH	<sup>MH</sup> hwɣ	‘cat’ [vocative only]
#H	<sup>#H</sup> zɣwæ	‘horse’

The situation in Na is more complex than in Laze. Under the present preliminary analysis of Laze, its monosyllables fall into four categories: H, M, L, and ‘floating’ H, transcribed as #H. Na also has M, L, and a ‘floating’ H, #H, but it does not have any simple H-tone category. In addition, it has two complex tones, LM and MH, which surface as such in isolation (hence [buɫ] ‘pig’, [ɬɣɫ] ‘brains’).

Evidence for the analysis in Table 10 comes from the behaviour of these nouns in morphological derivations and in syntactic constructions. Table 11 provides information on the tones on nouns (i) in isolation, (ii) when followed by the possessive particle /bɣ/ – an elementary type of derivation –, and (iii) when followed by the copula /ŋi/ – thus creating an elementary sentence.

**Table 11. The tonal behaviour of Na monosyllabic nouns in isolation, when followed by the possessive, and when followed by the copula.**

example		tonal analysis	in isolation	+ possessive	+ copula
la	‘tiger’	M	M	M + M	M + L
<sup>L</sup> k <sup>h</sup> ɸ	‘dog’	L	M	L + M	L + LM
<sup>LM</sup> bu	‘pig’	LM	LM	L + M	L + M
<sup>MH</sup> hwɤ	‘cat’	MH	MH	M + H	M + H
<sup>#H</sup> zɸwæ	‘horse’	#H	M	M + M	M + H

**In isolation**, three of the tones, /M/, /L/ and /#H/, neutralise to [M]. It seems clear enough why /M/ surfaces as [M]. As for the /#H/ tone, it cannot manifest itself over a single syllable: this H tone can only associate after the morpheme that lexically carries it. This accounts for its realisation as [M], as in Laze. On the other hand, it is not clear why /L/ surfaces as [M]: this may have to do with the prohibition of all-L phonological words (and *a fortiori* all-L utterances) in Na, but for predicates this is remedied by adding a post-lexical M tone, so that /L/ predicates surface as [LM] in isolation. It is not clear at this stage why /L/ nouns do not likewise surface as [LM].

**When the possessive /bɸ/ is added after the noun**, yielding, e.g., [buɸ bɸɸ] ‘of the pig’, the tone assignment process is simple:

- contours unfold over the two syllables of the resulting combination: LM yields L + M, MH yields M + H
- non-contour tones (M, L and #H) do not affect the second syllable, which surfaces with default [M]; as for the first syllable, M simply yields [M], /L/ simply yields [L], and /#H/ yields [M] for the same reason as in isolation – viz. because the following morpheme cannot host the floating H tone.

This last point offers crucial evidence for the distinction between contours (/LM/ and /MH/) on the one hand and the floating H tone (/#H/) on the other. The possessive cannot host a floating H tone, whereas it can host the second part of a contour: the M part of /LM/, the H part of /MH/.

**When the copula is added, creating a simple sentence**, e.g. [buɸ ɸiɸ] ‘[that] is [a/the] pig’, tonal association takes place as follows: the copula has a lexical /L/ tone; this /L/ tone surfaces as such, on the copula, unless chased away by a tonal level projected by the noun. There are three tones that can project their last level onto the copula, thus chasing away its lexical L tone: the two contours (LM and MH), which unfold over the disyllabic combination, in the same way as when the possessive /bɸ/ is added after a noun; and the



floating H tone, /#H/, which can be hosted by the copula. As for the remaining two tones, /M/ and /L/, they do not affect the copula, which retains its /L/ tone. An added complexity is that the L + L sequence cannot surface as such, due to a general prohibition against all-L phonological words (and *a fortiori* all-L utterances) in Na. The all-L sequence is avoided by post-lexical addition of a final M tone, which modifies L + L to L + LM, e.g. [k<sup>h</sup>v] ɲiɬ] ‘[that] is [a/the] dog’.

**A remark on the analysis method: Do we need to analyse contours into levels?**

As an aside, I would like to emphasise that the present analysis is based on language-internal evidence for the analysis of Laze tones (and of Na tones) into levels. I am fortunate to work both on languages whose tones cannot be analysed into tonal levels (Vietnamese: see Brunelle forthcoming and Michaud 2004, and Tamang: see Mazaudon 1973, Mazaudon & Michaud in press) and on Na, Naxi and Laze, which can serve as textbook examples of level-tone systems. (Some remarks about the typological diversity of tone systems are set out in section 2 of Michaud 2008.) I hope this will allay any suspicion that the present analyses are based on preconceptions about tone systems in general.

**6.2.2. Suffixation: the Na suffix /mi/, corresponding to Laze /mie/**

The Na female suffix /mi/ is cognate with Laze /mie/, studied in section 2.3.1. The behaviour of tones in the process of suffixation by /mi/ resembles what has been described above. The /LM/ tone unfolds over it, yielding [L.M]:

/<sup>LM</sup>æ/ ‘chicken’ > /<sup>LM</sup>æ.mi/ ‘hen, 母鸡’, realised as [æ] miɬ]

/<sup>LM</sup>bu/ ‘pig’ > /<sup>LM</sup>bu.mi/ ‘sow, 母猪’, realised as [bu] miɬ]

In Na as in Laze, a M-tone monosyllable yields a M-tone disyllable (surfacing with [M] on each syllable); and /L/ yields [L.L] (again with post-lexical addition of M to avoid an all-L sequence, hence [L.LM]):

/<sup>L</sup>k<sup>h</sup>v/ ‘dog’ > /<sup>L</sup>k<sup>h</sup>v.mi/ ‘she-dog’, realised as [k<sup>h</sup>v] miɬ]

**On the other hand**, the floating H tone, /#H/, does not associate to the second syllable of the derived disyllable, unlike in Laze: it remains floating in the entire compound, resulting in a two-syllable word with the /#H/ tone. Thus, /<sup>#H</sup>ɲi.mi/ ‘sun’ and /<sup>M</sup>fi.mi/ ‘moon’ are both realised [M.M] in isolation, but when the copula, /<sup>L</sup>ɲi/, is added after them, the former yields [ɲiɬ miɬ ɲiɬ] (the floating H tone landing on the copula, chasing its lexical L tone), the latter [fiɬ miɬ ɲiɬ]. This leads to the question of disyllables, which constitutes the topic of section 6.3.

### 6.3. The tones of disyllables in Na: a static view

In Naxi, the only evidence for processes of lexical integration by assignment of a global tone pattern to a disyllabic word is found in reduplication (Michaud & Vaissière 2007). All nine possible combinations of the basic H, M and L nouns are possible. In Na, on the other hand, there is a complex system of tonal changes in compound nouns, and less than half of the theoretically possible combinations are attested. To start with a static view of attested combinations, Table 12 presents the tonal classes of disyllables in Na. As in the description of the Laze data, the pound sign, #, refers to the boundary of the word. The dollar sign, \$, is explained below, paragraph 6.3.2. The table does not include /LML/, a tone pattern attested by one single word, which will be discussed below.

**Table 12. The tonal classes of disyllables in Na. The thick horizontal line separates the five tonal classes that correspond to those of monosyllables (above the line) from the other five.**

in isolation	tonal analysis	+ copula	+ possessive	example		
				phonology	phonetics in isolation	meaning
[M.M]	M	M.M + L	M.M + M	/ <sup>M</sup> ɬi.mi/	[ɬi↓ mi↓]	‘moon’
[L.LM]	L	L.L + M	L.L + M	/ <sup>L</sup> k <sup>h</sup> ɣ.mi/	[k <sup>h</sup> ɣ↓ mi↓]	‘she-dog, bitch’
[M.M]	#H	M.M + H	M.M + M	/ <sup>#H</sup> ŋi.mi/	[ŋi↓ mi↓]	‘sun’
[M.MH]	MH	M.M + H	M.M + H	/ <sup>MH#</sup> hwɣ.li/	[hwɣ↓ li↓]	‘cat’
[L.M]	LM	L.M + L	L.M + M	/ <sup>LM</sup> bu.mi/	[bu↓ mi↓]	‘sow, female pig’
[M.H]	H\$	M.M + H	M.M + M	/ <sup>H\$</sup> hwɣ.mi/	[hwɣ↓ mi↓]	‘she-cat’
[L.M]	LM + #H	L.M + H	L.M + M	/ <sup>LM+#H</sup> na.hĩ/	[na↓ hĩ↓]	‘Naxi’
[L.MH]	L + MH	L.M + H	L.M + H	/ <sup>L+MH</sup> i.tʂæ/	[i↓ tʂæ↓]	‘waist’
[M.L]	L#	M.L + L	M.L + L	/ <sup>L#</sup> ɤu.dzu/	[ɤu↓ dzu↓]	‘Tibetan’
[M.H]	H#	M.H + L	M.H + L	/ <sup>H#</sup> ɤæ.tɣ/	[ɤæ↓ tɣ↓]	‘neck’

The categories which are also found over monosyllables and those which are not are discussed separately below.

#### 6.3.1. Five categories also found over monosyllables

The first five categories correspond to the five classes of monosyllables. In order to bring out their links with monosyllables, the disyllabic examples in the table are words that can be analysed as consisting of a monosyllabic noun plus suffix.

An important property of the /MH/ tone is that, when lexically associated to a disyllable, it does not unfold over the word, as one might have expected. It yields [M.MH], not [M.H].

The entire contour, /MH/, associates to the last syllable, hence its notation with the pound symbol (#) to its right (hence /<sup>MH#</sup>hwɣ.li/ ‘cat’, not simply /<sup>MH</sup>hwɣ.li/). The H part of the contour lands onto a following syllable, if one is available, e.g. the copula. The first syllable receives a [M] tone; it is as yet uncertain whether this process consists in copying the tone of the second syllable, or in default association of a M tone. These processes yield [hwɣ-li-ŋi], ‘...is [a/the] cat’.

When subjected to the simple manipulations reported above for monosyllables (addition of the possessive /bɣ/, i.e. derivation, and addition of the copula, i.e. creating a sentence), the five sets of disyllables behave essentially like the monosyllables, as can be verified from a comparison of Tables 11 and 12. There is one complexity, however: /<sup>L</sup>k<sup>h</sup>v.mi/ yields [k<sup>h</sup>v mi-ŋi], i.e. the copula loses its lexical /L/ tone. There is no obvious reason why the /L/ tone of the noun should cause this change: one would have expected a /L.L.L/ sequence, realised as [k<sup>h</sup>v mi-ŋi] (following the addition of a post-lexical [M] to avoid an all-L phonological word).

### 6.3.2. Five categories not found on monosyllables

As for the six remaining tonal classes of disyllables, some can easily be analysed as the concatenation of the tones of two monosyllables. Such is the case of the word for ‘Naxi’, which is a calque from the Naxi language. This may sound rather mind-boggling, but is in fact quite simple. The autonym of the Na is simply /<sup>LM</sup>na/, ‘the Na’, whereas that of the Naxi is disyllabic: /<sup>L</sup>na<sup>M</sup>hi/, where the second syllable means ‘man, person’. This is close enough to allow for a loan-translation into the Na language: to their native word /<sup>LM</sup>na/, they add their own word for ‘man’, /<sup>#H</sup>hĩ/, yielding /<sup>LM+#H</sup>na.hĩ/, a disyllable with a complex tonal pattern, /LM + #H/, i.e. a LM contour plus a floating H tone. The decomposition of examples for the /L + MH/ pattern is less certain, but highly plausible: it is very likely that they result from /L/ + /MH/. Other patterns require more detailed explanations.

The ‘dollar’ sign, \$, stands for the end of the phonological phrase: H\$ refers to a H tone that associates to the last syllable of the phonological phrase. Thus, /<sup>HS</sup>kɣ.ʃi/ ‘flea’ is realised as [kɣ-ʃi] in isolation, where the last syllable of the word is also the last syllable of the phonological phrase; adding the copula after this word yields [kɣ-ʃi-ŋi], i.e. the H tone lands, not on the last syllable of the lexical word, but on the copula, which is the last syllable of the phonological phrase. Examples include: /<sup>HS</sup>mɣ.ɛu/, ‘the heavens above’; /<sup>HS</sup>q<sup>h</sup>v.dzi/ ‘hole, cavity, 窟窿’; /<sup>HS</sup>dzæ.k<sup>h</sup>æ/ ‘mud’; /<sup>HS</sup>kɣ.tʃu/ ‘nail, 指甲’; /<sup>HS</sup>hu.mi/ ‘stomach’; /<sup>HS</sup>ə.da/ ‘father’; /<sup>HS</sup>hwa.q<sup>h</sup>v/ ‘dusk’; /<sup>HS</sup>læ.ɛæ/ ‘raven’; /<sup>HS</sup>hwɣ.p<sup>h</sup>v/ ‘tomcat, 公猫’. This last example is the only one which can easily be analysed as made up of a root + suffix: /<sup>MH</sup>hwɣ/ is ‘cat’, and /p<sup>h</sup>v/ is the suffix for male animals. The root /<sup>MH</sup>hwɣ/

‘cat’ is also found in the disyllabic word for ‘cat’, /<sup>MH#</sup>hwɣ.li/; the process whereby the tone H\$ obtains on ‘tomcat’ has not yet been elucidated.

The tone pattern of words such as [ɕuɫ dzuɫ] ‘Tibetan’ is analysed as a word-final L tone (shorthand notation: L#). Another option would consist in analysing it as a ML contour, associating to syllables left-to-right, yielding a [M.L] pattern on the surface ; but there is no evidence for its analysis as a contour, and no [ML] contour ever appears on a monosyllable, unlike [LM] and [MH]. Examples include /<sup>L#</sup>ŋi.p<sup>h</sup>ɣ/ ‘frost, 霜’; /<sup>L#</sup>gu.bɣ/ ‘temple’; /<sup>L#</sup>ɕu.q<sup>h</sup>wɣ/ ‘head’; /<sup>L#</sup>ɬi.pi/ ‘ear’; /<sup>L#</sup>bi.tɕɣ/ ‘navel, 肚脐’; /<sup>L#</sup>æ.mɣ/ ‘elder brother/sister’; /<sup>L#</sup>p<sup>h</sup>i.li/ ‘butterfly’; /<sup>L#</sup>da.i/ ‘mule’; /<sup>L#</sup>suu.dzu/ ‘tree’.

Parallel to the L# tone, there exists a H# tone, i.e. H tone on the last syllable of the lexical word. Examples include /<sup>H#</sup>mv.ɕi/ ‘spark’; /<sup>H#</sup>njæ.bæ/ ‘tear’; /<sup>H#</sup>ɕæ.tɣ/ ‘neck’; /<sup>H#</sup>zu.mɣ/ ‘child’; /<sup>H#</sup>tɣ.tɣ/ ‘hat’; /<sup>H#</sup>lu.ŋi/ ‘finger’.

Lastly, there is one single lexical item which appears to have a LML scheme: /<sup>LML</sup>bu.ɬa/ ‘boar, male pig’. The idea to posit such a complex contour comes from the fact that this word projects a L tone onto a following possessive particle, /bɣ/. Further analysis of this word may well allow us to dispense with this extra category, and with this cumbersome tonal pattern.

### 6.3.3. A marginal case, which can be interpreted as an eleventh category: /LML/

The word for ‘boar, male pig, 种公猪’ is [buɫ ɬaɫ]. In isolation, it has the same tonal realisation as ‘sow, female pig’, [buɫ miɫ], analysed as having a LM tone: /<sup>LM</sup>bu.mi/. However, addition of the possessive particle /bɣ/ after ‘boar’ yields L.M.L, [buɫ ɬaɫ bɣɫ], instead of the L.M.M pattern that one would expect by analogy with ‘sow’: [buɫ miɫ bɣɫ]. It has been noted in section 2.4.1 that only contour tones (tones consisting of more than one level) can project their last tonal level tone onto the possessive particle; pursuing this line of reasoning, one is led to conclude that the L level on the possessive particle /bɣ/ is due to the presence, on the noun, of a contour tone ending in a final L. This tone would be /LML/, an eleventh pattern for Na disyllables; the word ‘boar, male pig’ would be transcribed as /<sup>LML</sup>bu.ɬa/. This is the only word (out of a word list of some 2,000 items) which has this behaviour (i.e. a *hapax*), which suggests that the facts should be verified closely before putting up an eleventh tonal category. Indeed, there is cross-speaker variation for this item. A younger speaker (F5)<sup>3</sup> has it with a /L + MH/ scheme: /<sup>L+MH</sup>bu.ɬa/, realised [buɫ ɬaɫ] in

<sup>3</sup> Codes are assigned successively to all the language consultants who participate in fieldwork; this is intended to facilitate reference to the recorded data. Following widespread conventions, ‘M’ stands for ‘male’ and ‘F’ for ‘female’. It goes without saying that the use of these labels is purely for the sake of convenience, and by no means reflect a lack of respect for the “human subjects” who participate in this study. The issues which today fall under the label “ethics/ethical guidelines”, and are sometimes treated from a somewhat legalistic

isolation; another speaker (M21), of the same generation as the main consultant (F4), provided another word, [buɿ tʃɿɿ] (phonemic analysis: /<sup>LM</sup>bu.tʃɿɿ/), and refused the word [buɿ ɿɿɿ]. These facts provide evidence for treating speaker F4's word for 'boar' as an exception, provisionally choosing not to set up a /LML/ category on the evidence of that isolated example.

#### ***6.4. How disyllables obtain from monosyllables: Na data***

The data in section 6.3 were presented in a static way, discussing the tone patterns of disyllables without focussing on the processes whereby disyllables were created. Section 6.4 presents the data currently available on how disyllables obtain from monosyllables in Na.

The root /<sup>MH</sup>hwɿ/ 'cat', which can surface as a monosyllabic noun in vocative uses ('Cat! Come here!'), yields some /MH/ disyllables and some /H\$/ disyllables: the usual word for 'cat' (unspecified for gender) is /<sup>MH#</sup>hwɿ.li/; the words for 'she-cat, pussy' and 'he-cat, tomcat' are /<sup>H\$</sup>hwɿ.mi/ and /<sup>H\$</sup>hwɿ.p<sup>h</sup>ɿ/, respectively. It is plausible that the /mi/ suffix and the /li/ component (whose origin is not clear) have different tonal specifications; that one set of suffixes is toneless, whereas another set is specified for tone. As a tentative working hypothesis, the suffix /li/ is considered to be toneless, since it allows the root's MH tone to attach, unmodified, to the second syllable of the compound. By contrast, /mi/ and /p<sup>h</sup>ɿ/ appear to have a tonal specification of their own, which prevents the simple movement of MH onto the second syllable, and forces it to remain on the first syllable. From this position, the MH tone then projects its final level – the H part of the contour – onto the second syllable, chasing away its original tone, as it does when followed by the copula.

The suffix /mi/ also appears as a classifier for animals (e.g. chicken); in that usage, it has a lexical L tone, as evidenced by its behaviour when associated with numerals (e.g. [dɿɿ mi]), 'one' + CLASS). The syllable /li/, which appears in animal names such as /<sup>h</sup>u.li/ 'rabbit' and /<sup>L#</sup>p<sup>h</sup>i.li/ 'butterfly', is not a productive affix anymore, which makes it more difficult to analyse.

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perspective (e.g. the requirement to obtain explicit informed consent from the "subjects"), have long been central among the concerns of linguists doing fieldwork, witness the reflections about the relationship between the investigator and the language consultants – which is so crucial to linguistic fieldwork – set out in Bouquiaux & Thomas (1971), vol. 1, pp. 62-75.

## ***Concluding remark: perspectives for further comparison of Laze, Na and Naxi***

The next stages will consist in working out the correspondences between the tone categories of Laze, Naxi and Na, and reflecting on the historical developments they may have led to the emergence of these systems, in the spirit of panchronic phonology (Hagège & Haudricourt 1978, Mazaudon & Michailovsky 2007).

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