Lizu

Katia Chirkova
Centre de Recherches Linguistiques sur l'Asie Orientale, Centre National de la Recherche Scientifique, Paris, France
katia.chirkova@gmail.com

Yiya Chen
Leiden University Centre for Linguistics, Leiden, the Netherlands
yiya.chen@hum.leidenuniv.nl

The Lizu (or Lüzu) language (/[EP]li-zu-hu/ or /[EP]ly-zu-hu/) is spoken by approximately 7000 people who reside along the banks of the Yalong (雅砻) or Nyag chu River in three counties in Sichuan Province (四川省) in the People's Republic of China: (i) Muli Tibetan Autonomous County 木里藏族自治县 (Written Tibetan, hereafter WT, *smi li rang skyong rdzong*), (ii) Jiulong county (九龙县 *brgyad zur*), (iii) Mianning county (冕宁县) (Wang 2010: 3).[1] Lizu is currently considered as the western dialect of the Ersu 尔苏 language (Sun 1982, 1983), which is in turn classified as a member of the Qiangic subgroup of the Tibeto-Burman language family (for more details, see Bradley 1997: 36–37; Sun 2001; Chirkova 2012).

Muli, where Lizu is spoken, is a multi-ethnic and multi-lingual county, and Lizu has been historically influenced by many languages: Mandarin Chinese, Tibetan, Pumi (普米), Namuzi (纳木兹), and Nuosu (Ngwi or Yi 彝). Older speakers (typically over the age of sixty) are mostly trilingual (Lizu, Mandarin, Pumi). Occasionally, some even have a good command of the local variety of (Kham) Tibetan. Over the last three decades, most Lizu speakers have been bilingual using (Southwest) Mandarin in daily life. The current trend for the school-going generation is to become practically monolingual in Mandarin. Lizu is essentially used as the primary language of oral communication in family and community events. It does not have its own writing system.

To date, little descriptive work on Lizu has been done (but see Sun 1983 on Ersu with focus on a variety spoken in Ganluo county (甘洛县); Huang & Renzeng 1991 on Lüsu 吕苏 [l̪ʉ^{55}z̪ʉ^{53}], a variety spoken in Muli county, which is slightly different from the one discussed in this paper). The present description is based on the first author's fieldwork. The word list and the text provided with this paper were read by a sixty-two-year-old male native speaker of Lizu, who was born and raised in Muli county (Manao village 玛瑙村, Kala Township 卡拉乡).

Consonants

Lizu has a complex consonant system. There is a general three-way contrast in stops and affricates: voiceless aspirated, voiceless unaspirated, and voiced. Velar and uvular

[1] In transcriptions of Lizu words '-' stands for morpheme boundary and '=' stands for clitic boundary. See section 'Word-level tone patterns' for the adopted system of tone notation (the superscript letters and numbers in transcriptions).

doi:10.1017/S0025100312000242

stops contrast before /o/, e.g. /^{R}ko/ ‘to beg’ vs. /^{F}qo/ ‘hole, pit’. Elsewhere, they are in complementary distribution. Uvular stops are found before back non-high vowels and velar stops are more freely distributed, e.g. /^{EP}kæ-kæ/ ‘to fight’ vs. /^{F}qɐ/ ‘steelyard’.

	Bilabial	Alveolar	Post-alveolar	Alveolo-palatal	Velar	Uvular	Glottal
Plosive	p pʰ b	t tʰ d			k kʰ g	q qʰ	ʔ
Affricate		ts tsʰ dz	tʃ tʃʰ dʒ	tɕ tɕʰ dʑ			
Nasal	m	n		ɲ	ŋ		
Fricative		s z	ʃ ʒ	ɕ ʑ	x ɣ		h
Approximant	w	ɹ		j			
Lateral		l					
Lateral fricative		ɬ					

p	^{EP}pe-pe	‘patch’	ʃ	^{F}ʃe	‘blood’
pʰ	^{RP}mi-pʰe	‘salary’	ʒ	^{F}ʒe	‘four’
b	^{RP}be-be	‘to crawl’	tɕ	^{F}tɕe	‘hair’
m	^{F}me	‘fire’	tɕʰ	^{F}tɕʰe	‘dog’
w	^{F}wo	‘pig’	dʑ	^{F}dʑe	‘bridge’
t	^{F}te	‘one’	ɲ	^{R}ɲe	‘house’
tʰ	^{F}tʰe	‘he, she, it’	ɕ	^{F}ɕe	‘three’
d	^{F}de	‘jackal’	ʑ	^{LP}(de-)ʑe	‘to use’
ts	^{F}tse	‘hemp’	j	^{F}je	‘tobacco’
tsʰ	^{F}tsʰe	‘to cough’	k	^{EP}kæ-kæ	‘to fight’
dz	^{RP}(kʰe-)dze	‘enough’[2]	kʰ	^{F}kʰæ	‘food’
n	^{F}ne	‘you, thou’	g	^{R}gæ	‘to like’
ɹ	^{F}ɹæ	‘yak’	ŋ	^{F}ŋe	‘cabbage’
s	^{EP}sə-sə	‘to wage war’	x	^{F}xe	‘to hatch’
z	^{F}zə	‘son’	ɣ	^{R}ɣe	‘Anemone tomentosa’
l	^{F}lɐ	‘musk deer’[3]	q	^{F}qo	‘hole, pit’
ɬ	^{F}ɬɐ	‘flute’	qʰ	^{RP}(de-)qʰɐ	‘bitter’[4]
tʃ	^{LP}(de-)tʃe	‘sour’	ʔ	^{LP}ʔoɐ	‘goose; swan’
tʃʰ	^{LP}(de-)tʃʰe	‘sweet’	h	^{F}he	‘bamboo’
dʒ	^{R}dʒe	‘water’			

Velar fricatives show a two-way contrast between voiceless and voiced, as illustrated in /^{R}ɣe/ ‘anemone tomentosa’ vs. /^{F}xe/ ‘to hatch’. The voiced velar fricative has a uvular allophone occurring before /ɐ/ and /wɐ/, e.g. /^{F}ɣɐ/ [^{F}ʁɐ] ‘needle’, /^{R}ɣwɐ/ [^{R}ʁuɐ] ‘to thunder’.

There are four nasals /m n ɲ ŋ/. We only found contrast between /n/ and /ɲ/ before /e æ o/. /ŋ/ is the only syllabic consonant in Lizu, but with a very restricted distribution. It occurs only after the voiceless velar plosive /k/ and in very few words, e.g. /^{F}kŋ/ ‘seven’.

One interesting phenomenon is the nasalization of glottal-initial words, which appears to be an areal feature in a number of Ngwi languages of Southwest China, such as Lahu (Matisoff

[2] The word for ‘enough’ is provided here in phonemic transcription. The phonetic realization of the directional prefix /kʰe/ ‘inward’ in this word is [kʰə], due to assimilation, which is, however, not systematic.

[3] This word is a loan from WT *gla ba* ‘musk deer’.

[4] The word for ‘bitter’ is provided here in phonemic transcription. The phonetic realization of the directional prefix /de/ ‘upward’ in this word is [dɐ], due to assimilation, which is, however, not systematic.

1973: 20–21, 1975; Sprigg 1987), and Lisu (Bradley 1989). Nasalization applies without exception, e.g. /^{F}he/ [^{F}hẽ] 'bamboo', /^{F}hu/ [^{F}hũ] 'language', /^{LP}ʔoʋ/ [^{LP}ʔõwʋ̃] 'goose; swan', /^{EP}ʔiæ/ [^{EP}ʔĩjæ̃] 'duck'. When preceding /ʋ/, /ɹæ/, and /ɹə/, the /h/-initial is realized as voiced, e.g. /^{R}hʋ/ [^{R}ɦ̃ʋ̃] 'five', /^{R}hɹʋ/ [^{R}ɦ̃ɹ̃ʋ̃] 'to obtain', /^{R}hɹə/ [^{R}ɦ̃ɹ̃ə̃] 'mushroom'. Perceptually, it has more and longer frication, and the following vowel is less nasalized.

The approximant /j/ occurs mostly before front vowels with the sole exception of the back vowel /o/ (e.g. /^{F}jo/ 'self'). The phonetic realization of /j/ varies according to the height of the vowel: the higher the vowel, the stronger the frication. This surface contrast is illustrated in /^{F}ji/ 'to go' vs. /^{LP}jæ-he/ 'last year'.

/w/ occurs only before /æ ʋ o u/. In most cases, /w/ is realized as a voiced bilabial continuant, much like the English /w/, e.g. /^{EP}wæɹæ/ 'cloth' (but see its realization before the vowel /u/ in the section 'Vowels'). /ɹ/ only occurs before /æ/, /ə/, and /wæ/, e.g. /^{F}ɹæ/ 'yak', /^{R}ɹə/ 'to laugh', /^{R}ɹwæ/ 'chicken'.

Consonant clusters

Consonant clusters are a prominent feature of the Lizu language. Most consonant clusters involve bilabials and laterals.

Clusters with approximants

The approximants /j/ and /w/ occur in the second position in consonant clusters, where they may be realized as secondary labialization or palatalization of the first position consonant.

/j/ occurs after bilabial plosives and laterals. After bilabial plosives, /j/ occurs before /e/ (/^{RP}bje-bje/ 'thick, coarse') and /æ/ (/^{R}mjæ/ 'face'). The presence of /j/ is particularly clear in the contrast beween /be/ (/^{RP}be-be/ 'to crawl') and /bje/ (/^{RP}bje-bje/ 'thick, coarse'). After laterals, /j/ is attested before /e/ and /o/, e.g. /^{R}lje/ 'good' (compare /^{R}le/ 'old'), /^{F}ɬje/ 'stinging nettle' (compare /(^{R}tʃ^{h}e) ^{RP}ɬe-ɬe/ 'to winnow (rice)'), /^{EP}k^{h}oljo/ 'amulet box' (compare /^{RP}k^{h}e-lo/ 'to wait'), /^{RP}me-ɬjo/ 'lightning' (complare /^{R}ɬo/ 'water spirit').

/w/ occurs after postalveolars, velars, uvulars, velar and glottal fricatives, and /ɹ/, e.g. /^{R}tʃwʋ/ 'wasp', /^{R}ʃwʋ/ 'mosquito', /^{RP}qwʋ-qwʋ/ 'hard', /^{R}xwʋ/ 'bird', /^{LP}ɹwæ-ɹwæ/ 'noisy', /^{EP}hwæ-se/ 'maple (Acer spp.)', /^{R}ɣwʋ/ 'to thunder'.

Clusters with /ɹ/ are mostly restricted to bilabials and glottal fricatives before /æ/ and /ə/, e.g. /^{R}bɹæ/ 'thick rope', /^{R}mɹæ/ 'tasty', /^{R}hɹʋ/ 'to obtain', /^{LP}pɹə-pɹə/ 'grain', /^{EP}bɹə-bɹə/ 'tasteless, weak', /^{EP}kɹəwʋ/ 'spider'.

Clusters with fricatives

After bilabials /b p/, /ʑ z ɕ ʃ/ are allowed. For /b/-initial clusters, front vowels seem to license /ʑ/ (as in /^{R}bʑi/ 'barnyard grass', /^{F}bʑe/ 'to fly; pleasant'), and /z/ is only followed by /ʋ/ (as in /^{EP}ɲibzʋ/ 'green'). /p/ co-occurs with both /ɕ/ and /ʑ/, as in /^{F}pɕi/ 'to throw', /^{F}pɕæ/ 'to sweep', /^{RP}de-pʑæ/ 'to hang', /^{R}pʑe/ 'to run'. For /p/-initial clusters, in addition to /ɕ/ and /ʑ/, we also observe /ʃ/, as in /^{F}pʃə/ 'Tibetan'. Finally, /pts^{h}/, is observed before low vowels, e.g. /^{RP}k^{h}e-pts^{h}æ/ 'to taste'.

Prenasalized clusters

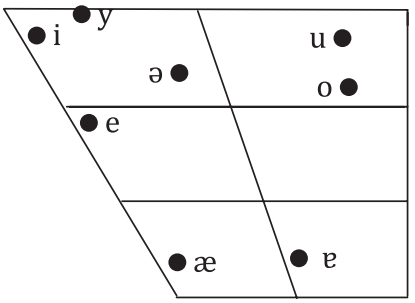
Prenasalization in Lizu is contrastive and occurs not only before voiced stops and affricates but also before voiceless aspirated ones. The place of articulation is homorganic with that of the obstruent in the cluster. Therefore, we use 'N' to stand for the homorganic nasal in prenasalized clusters. Compare the contrast between plain onsets in the words /^{F}ge/ 'wolf' and /^{R}tʃ^{h}æ/ 'ghost' vs. prenasalized velar onsets in the words /^{F}Nge/ 'nine' and /^{R}Ntʃ^{h}æ/ 'skirt'.

Prenasalized clusters can also be observed in disyllabic loanwords from Tibetan and Chinese. This is due to a resyllabification process, whereby the original nasal coda becomes part of the following onset syllable, giving rise to a prenasalized cluster. At the same time, the vowel of the first syllable becomes audibly nasalized. For example, /^{EP}peNbo/ [^{EP}pẽmbo] 'official' from WT *dpon po*, /^{EP}kuNts^{h}e/ 'coffin' [^{EP}kũnts^{h}e] from Southwest Mandarin /kuan^{44}ts^{h}ai^{21}/ 棺材. Interestingly, in those loanwords cases, where the original nasal coda

is followed by a syllable that begins with a vowel or nasal or when it is word final, the original nasal element is in most cases lost altogether, e.g. /^{RP}jɐy/ [^{RP}jɐɥy] ‘potato’ (Southwest Mandarin /iaŋ^{21}y^{213}/ 洋芋), /^{LP}qomɐ/ ‘emperor’ (WT *gong ma*), /^{EP}keʃɐ/ ‘in the street, town’ (Southwest Mandarin /kai^{44} ʂaŋ^{21}/ 街上).

Vowels

The Lizu vowel system comprises eight monophthongs. Diphthongs are only observed in recent loanwords from the local (Southwest) Mandarin dialect (e.g. /^{RP}ʃətsai/ ‘really’, Southwest Mandarin /ʂʅ^{21}tsai^{213}/ 实 在). Note that the actual realization of Lizu vowels is in most cases different from what may be expected from the adopted IPA symbols (see the vowel chart plotted on the relative F1/F2 formant values).



i	^{F}mi	‘monkey’	o	^{F}mo	‘soldier’
e	^{F}me	‘fire’	u	^{F}mu	‘feather, fur’
æ	^{F}mæ	‘female, mother’	y	^{F}dʑy	‘poison’
ɐ	^{RP}(ne-)mɐ	‘to criticize’	ə	^{F}kə	‘eagle’

The most frequent vowels include /e/, /o/, /u/ and /æ/. They appear after almost every initial consonant. The least frequent vowel is /y/, which was found only after the initials /l/, /h/, and alveolopalatals (e.g. /^{LP}de-ly/ ‘white’, /^{F}hy/ ‘back, following’, /^{R}dʑy/ ‘poison’), as well as in loanwords from Mandarin Chinese (e.g. /^{RP}jɐy/ ‘potato’).

/i/ after /b/, /p/ and /l/ is realized as /ji/ (i.e. perceptually with considerable frication) such as in /^{F}bi/ [^{F}bji] ‘bee’, /^{R}li/ [^{R}lji] ‘ashes’. This is in contrast to its realization in /^{F}ɲi/ ‘gold’ or /^{F}mi/ ‘monkey’.

/u/ is a high back but slightly centralized vowel. It is produced with greater lip compression than the Cardinal /u/. The pronounced lip compression leads to some phonetic variation in the realization of the vowel and sometimes even the initial consonant onset. /u/ trills after bilabial and alveolar stop initials and is realized in this environment close to [ʙ̤]. This is a common, conceivably areal phenomenon in many neighboring languages, such as Nuosu (Li & Ma 1983: 52–53, 77), Yongning Na (Yang 2009: 3), or Namuzi (Lama 1994: 52). In contrast to Nuosu, where the trill is produced on only one side of the lips (Bradley 2008), the Lizu trill is produced with both lips vibrating against one another (see Figure 1). The bilabial trill is particularly evident in the minimal contrastive pair /^{F}tu/ [^{F}tʙ̤] ‘bean’ vs. /^{F}to/ [^{F}to] ‘to look’. Compare also the realization of /u/ after a dental stop, /^{F}tu/ [^{F}tʙ̤] ‘bean’, with that after an alveolar affricate, /^{LP}(de-)tsu/ ‘to put on (a hat)’.

/u/ also introduces the allophonic variation of /x/ with [f] (e.g. /^{F}xu/ [^{F}fu] ‘garlic’), and of /w/ with [v] (e.g. /^{LP}wu-li/ [^{LP}vu-li] ‘head’, /^{RP}k^{h}e-wu/ [^{RP}k^{h}e-vu] ‘to buy’).

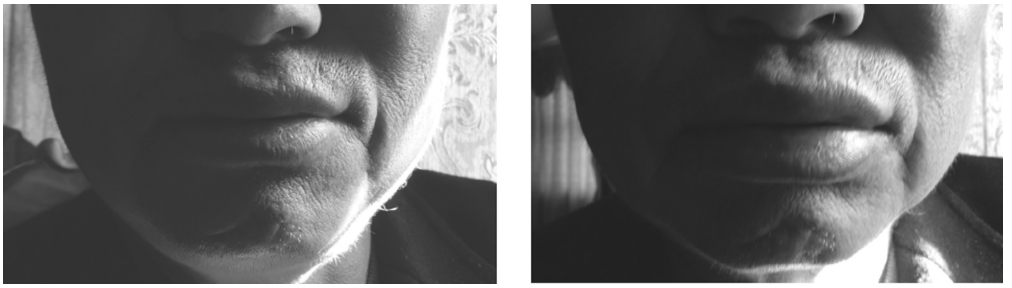


Figure 1 Pronunciation of the word /^{F}tu/ [^{F}tʉ̥] 'bean' photographed at the beginning and end of the vowel production.

The difference between /æ/ and /ɐ/ is, for many non-native ears, rather subtle. Minimal pairs include /^{R}nts^{h}æ/ 'to do, to make' vs. /^{R}nts^{h}ɐ/ 'liver', and /^{RP}ʃæ-ʃæ/ 'to search, to look for' vs. /^{RP}ʃɐ-ʃɐ/ 'long'.

/ə/ co-occurs with a restricted number of consonant onsets (/s z ts ts^{h} dz ʃ ʒ tʃ tʃ^{h} dʒ k k^{h} g/). After an onset, it is realized in two different ways. When following /s z ts ts^{h} dz ʃ ʒ tʃ tʃ^{h} dʒ/, /ə/ is homorganic to the preceding consonant onset. For example, /^{EP}sə-sə/ [^{EP}sz̩-sz̩] 'to wage war', /^{F}zə/ [^{F}zz̩] 'son', /^{F}ts^{h}ə/ [^{F}ts^{h}z̩] 'salt', /^{F}dzə/ [^{F}dzz̩] 'to give birth', /^{F}ʃə/ [^{F}ʃʒ̩] 'meat', /^{R}tʃə/ [^{R}tʃʒ̩] 'star', /^{F}tʃ^{h}ə/ [^{F}tʃ^{h}ʒ̩] 'sedan chair', /^{F}dʒə/ [^{F}dʒʒ̩] 'pan'. When following velar stops, /ə/ is realized close to [ə], as in /^{F}kə/ 'eagle', /^{RP}kə-kə/ 'big'.

Lizu has an additional set of nasalized vowels, which are restricted to (mostly recent) loanwords from Tibetan and Mandarin Chinese, where the donor language has or had a nasal coda (*-m*, *-n*, *-ng*) or a nasalized vowel (see also above on prenasalized clusters). For example, /^{EP}sɛ̃ mu/ [^{EP}sɛ̃ m̩] 'to make smoke offering' (WT *bsang*). This is different from the cases of nasalization conditioned by the glottal initial consonants /h/ and /ʔ/, or the effect of prenasalized cluster (see above). Overall, vowel nasalization in Lizu must be regarded as subphonemic, and only needs to be marked in those cases where it is unpredictable (i.e. in recent loanwords).

Syllable structure

The canonical Lizu syllable minimally consists of an obligatory nucleus and a tone. It may also contain up to three optional elements in the following linear structure: (C1)(C2)(C3)V, where C1 can be nasal, C2 can be any consonant, and C3 can only be one of the following set: -j-, -w-, -ɹ-, -ʐ-, -z-, -ɕ-, -ʃ-; V stands for vowel, and parantheses indicate optional constituents.

(1) V /^{F}æ/ 'I, first person singular pronoun'
(2) CV /^{RP}be-be/ 'to crawl'
(3) CCV /^{RP}bje-bje/ 'thick, coarse'
(4) CCCV /^{R}Nbje/ 'mountain'

Similar to its linguistic neighbors, Lizu is phonologically monosyllabic with a strong tendency towards disyllabicity in its lexicon. Tri-syllabic and tetra-syllabic words are mostly composite, e.g. /^{LP}toNbu mu/ 'nose hair' (< /^{LP}toNbu/ 'nose', /^{F}mu/ 'feather, fur'), /^{RP}sɐlɐ mutsə/ 'wild cat' (< /^{RP}sɐlɐ/ 'forest', /^{RP}mutsə/ 'cat'). There is also a handful of trisyllabic monomorphemic words (both native and loanwords), e.g. /^{EP}ʃɐNbɐlje/ 'buttocks', /^{EP}ɬoNbotʃ^{h}e/ 'elephant' (WT *glang po che*).

In disyllabic composite forms, where the second syllable has zero initial, the two adjacent vowels merge into one vowel or a diphthong, a process that typically results in a long vowel or diphthong. This change characteristically occurs when the perfective marker is added to a verb stem, and when the recipient marker is added to a nominal form. The two markers

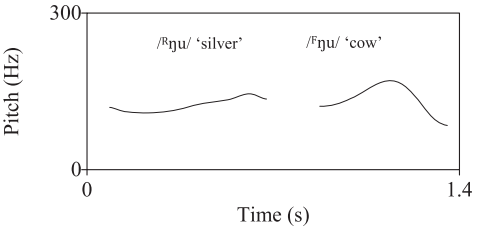


Figure 2 Pitch contours of the rising (R) and falling (F) tones illustrated with /^{R}ŋu/ 'silver' and /^{F}ŋu/ 'cow', respectively.

are homophonous (/æ/) and assimilate to the preceding vowel. For example, compare the realization of the verb /^{RP}de-pʰɐ/ 'to smash' in isolation and when followed by the perfective marker /æ/, i.e. /^{RP}de-pʰɐ=æ/ 'have smashed'. Compare also the realization of the second person singular pronoun 'you, thou' in isolation, /^{F}ne/, and when followed by the recipient marker, i.e. /^{F}ne=æ/ '(e.g. to give) to you'.

Prosodic organization

Similar to many of its linguistic neighbors in the provinces of Sichuan and Yunnan (western Tibeto-Burman languages), Lizu has a sparse or 'culminative' tonal system, in which no more than one pitch pattern is pronounced per word (or longer phonological unit) (see Evans 2008, 2009, for discussion). For multisyllabic words, we also observe prominence difference among the syllables, resembling stress difference in Germanic languages (see below for details). Above the word (i.e. compounds), the tone of the initial word remains and affects the pitch realization of the rest of the constituent. Such a culminative tonal 'spreading' pattern of Lizu bears some resemblance to that described for Tamang (e.g. Mazaudon 2005) and for some Wu dialects of Chinese such as Shanghai Chinese (e.g. Duanmu 1995, 1999; but see Chen 2008). Culminative tonal systems in the languages of Southwest China have been little researched to date (but see J. T.-S. Sun 2005, Ding 2007, Chirkova & Michaud 2009, Greif 2010 for recent studies), and available data allow considerable room for interpretation. For this reason, the following discussion of Lizu prosody is limited to the presentation of observable surface phenomena, as found in a corpus of vocabulary items, sentences (including a number of semi-controlled production studies targeting tones and tone sandhi in different domains), and traditional stories.

Word-level tonal patterns

Lizu is a tone language. For monosyllabic words, there are two contrastive tones: low rising (R) vs. high falling (F). Contrastive pairs abound: /^{R}ne/ 'two' vs. /^{F}ne/ 'you, thou'; /^{R}ŋu/ 'silver' vs. /^{F}ŋu/ 'cow'; /^{R}tʃə/ 'star' vs. /^{F}tʃə/ 'frost'. See Figure 2 for the contrastive pair /^{R}ŋu/ 'silver' vs. /^{F}ŋu/ 'cow'. In the five-scale pitch system developed by Chao (1930), these tones may be annotated as 23 for the rising tone and 51 for the falling tone. We will, however, refrain ourselves from using this notation as variation abounds in the actual realization of the two lexical tones, and in particular, in the falling tone where the actual f0 fall of the falling tone is not obligatory. This lack of dynamic f0 change has also been observed over the rising tone although not as often as for a falling tone. The extreme cases can be found in a few words, including /^{R}xwɐ/ 'bird' and /^{F}te/ 'one'. Here, both renditions (i.e. one with a clear f0 fall/rise and one without any perceptually salient f0 fall/rise) are equally acceptable for our native language consultants. We think that the rich latitude for variation is probably due to the fact that there are only two tonal contrasts to be made in this language over monosyllabic words.

In disyllabic words, three pitch patterns are observed. No minimal three-way contrast, however, has been attested. The attested binary tonal contrasts yield the following three patterns:

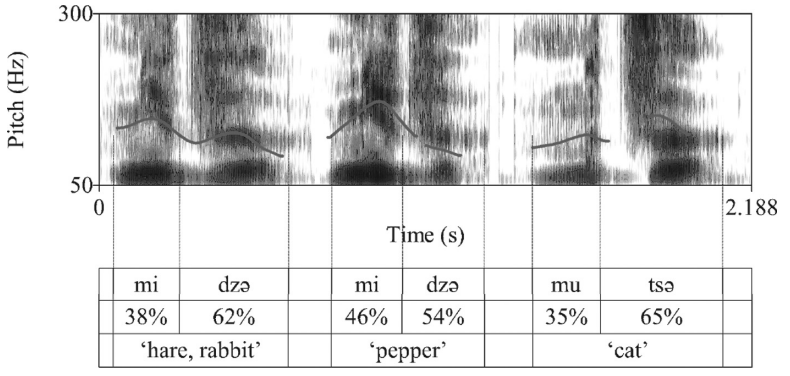


Figure 3 (Colour online) Illustration of the three-way prominence contrast in disyllabic items with /^{LP}midzə/ 'hare', /^{EP}midzə/ 'pepper', and /^{RP}mutsə/ 'cat'. Dotted lines indicate syllable edges. Within a word, the length contrast between the two syllables is indicated via their percentage of duration.

(i) Both syllables sound equally prominent and no special lengthening is observed on either syllable (despite the presence of final lengthening, due to the fact that these words were elicited in isolation as an utterance on its own). There is also no salient rise or fall over either syllable. Rather, it seems to be two mid-level pitch contours with the first slightly higher than the second, which might also show a slight falling pattern. Hereafter, we will refer to this pattern as Equally-Prominent Contour (EP). Examples include /^{EP}midzə/ 'hare', /^{EP}səNge/ 'lion' (WT *seng ge*).

(ii) The duration of the second syllable, despite final lengthening, is relatively shorter and the syllable also sounds less prominent. The high f0 peak is typically realized before the end of the first syllable, where the pitch starts to fall already and continues to fall in the second syllable. Hereafter, we will refer to this pattern as Left-Prominent Contour (LP). Examples include /^{LP}midzə/ 'pepper', /^{LP}melje/ 'place'.

(iii) The duration of the second syllable is relatively longer than that of the first one. Within the first syllable, there is a slightly rising pitch contour. The high f0 peak is realized within the second syllable where there is also a clear fall. The second syllable sounds more prominent. Hereafter, we will refer to this pattern as Right-Prominent Contour (RP). Examples include /^{RP}mutsə/ 'cat', /^{RP}melje/ 'wind'.

The relative difference in syllable length is particularly striking when compared across minimal pairs, such as /^{EP}midzə/ 'hare' vs. /^{LP}midzə/ 'pepper', and /^{LP}melje/ 'place' vs. /^{RP}melje/ 'wind'. A three-way contrast can be observed over the comparison of the words /^{LP}midzə/ 'pepper', /^{EP}midzə/ 'hare', and /^{RP}mutsə/ 'cat' in Figure 3, noting that these three words have comparable segmental composition.

Native speakers of Lizu seem to be very sensitive to the three different prominence patterns, as suggested by a pilot perception experiment. We substituted the segmental composition of 10 triplets (of comparable segments but different prominence patterns) with the same syllable ~~/na/~~ which was resynthesized with the same acoustic parameters (i.e. intensity, duration, and f0) of each corresponding word. Listeners were asked to identify the synthesized word they heard as one out of the three choices. Listeners showed a high degree of consistency in their judgements.

The observed differences are reminiscent of the effect of a stress system in languages such as English (e.g. the contrast in *apex*, *apple*, and *above*). It is worth noting that unlike English, Lizu does not exhibit vowel reduction in non-stressed positions.

In tri- and tetra-syllabic words (both monomorphemic and polymorphemic), we observe again three common patterns, comparable to the ones in disyllabic domains:

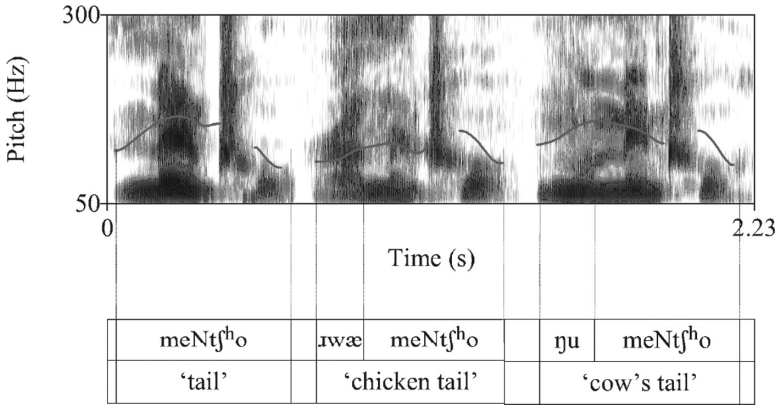


Figure 4 (Colour online) Illustration of tone sandhi changes over compounds. Here, 'tail' with a left-prominence pattern surfaces with different pitch contours when preceded by words with different tonal patterns ('chicken' with a rising tone and 'cow' with a falling tone). Dotted lines indicate word boundaries.

(i) The Equally-Prominent Contour. All syllables within a domain are relatively equal in terms of duration and prominence. The pitch contour over the tonal domain remains mid or high level until the last syllable where there is a clear falling pattern. Examples include /^{EP}ʃeNbelje/ 'buttocks', /^{EP}tɐNtsʰə pimæ/ 'lizard'.

(ii) The Left-Prominent Contour. The first syllable within the domain tends to be longer and sounds more prominent. There is a rising contour, the peak of which varies slightly depending on the length of the word. For a three-syllable word, the peak is typically realized at the beginning of the second (following) syllable, while for a four-syllable word, the peak is further delayed within the second syllable, after which there is a clear falling contour till the end of the word. Examples include /^{LP}tɕjɐNtʃʰokʰɐ/ 'north' (WT *byang phyogs*), /^{LP}ɲimæ mitɕo/ 'sunflower'.

(iii) The Right-Prominent Contour. The last syllable within the domain sounds more prominent, although lengthening was not consistently observed. This is probably due to the fact that utterance-final syllables usually undergo robust lengthening. The f0 peak is realized within the last syllable and the preceding syllables show a mid-level f0 contour. Examples include /^{RP}ɲilɐgu/ 'daytime', /^{RP}jeçy kælæ/ 'bat'.

Tonal patterns of compounds

In compounds, lexical tones undergo sandhi changes, where only the tonal contour of the initial word is retained and realized over the whole compound domain. Given that disyllabic compounds are by and large lexicalized, in this overview, we will essentially focus upon tri- and tetra-syllabic compounds. When a compound is composed of a monosyllabic word followed by a disyllabic word, we observe two tonal patterns, namely, the Equally-Prominent Contour and the Right-Prominent Contour. For example, a compound beginning with a monosyllabic word that has a falling tone, e.g. /^{F}ŋu/ 'cow', typically has the Equally-Prominent Pattern, as in the compound /^{EP}ŋu meNtʃʰo/ 'cow's tail' (< /^{LP}meNtʃʰo/ 'tail'). On the other hand, a compound beginning with a monosyllabic word that has a rising tone, e.g. /^{R}ɹwæ/ 'chicken', typically has the Right-Prominent Contour, as in the compound /^{RP}ɹwæ meNtʃʰo/ 'chicken tail'. This is illustrated in Figure 4. Within each compound, the f0 contour of the word 'tail' is different from that of that word in isolation. In other words, the tonal contour over the whole compound is here regarded as determined by the f0 contour of the initial word in isolation. Note, however, that the durational difference observed over the lexical items does not seem to hold at the compound level.

If the initial word of a compound is disyllabic, we observe three contours. Again, the resulting contours are determined by the tonal contour of the initial disyllabic item, which, we know has three possible realizations. Here the tonal contours of these items are comparable to the three different contours we observed in the disyllabic lexical items (i.e. the Equally-, Left-, and Right-Prominent Contours). The following examples illustrate:

/^{EP}səNge/ 'lion' + /^{LP}meNtʃʰo/ 'tail' > /^{EP}səNge meNtʃʰo/ 'lion's tail'
/^{LP}to-Nbu/ 'nose' + /^{LP}wu-li/ 'head' > /^{LP}to-Nbu wu-li/ 'tip of the nose'
/^{RP}mutsə/ 'cat' + /^{LP}Ndo-qo/ 'eye' > /^{RP}mutsə Ndo-qo/ 'cat's eye'

Lizu function words and discourse particles (e.g. the genitive particle /i/, the focus particle /le/ in the recorded passage) are never pronounced in isolation. Their surface tone realization depends on the tone of the preceding (host) lexical word (similar to tone sandhi in compounds).

Transcription of recorded passage 'North Wind and the Sun'

The original recording (made with a solid-state recorder Fostex FR-2 and a Beyerdynamic M88 N microphone) has been made available to *JIPA* along with this analysis. The acoustic analysis of the recording was made using Praat (Boersma & Weenink 2009). In the transcription, only lexical items are marked for tone, whereas function words are not.

Semi-narrow phonetic transcription

^{LP}tɕjɐNtʃʰokʰɐ-pʰo = i ^{RP}melje læ ^{LP}ɲimæ | ^{RP}tʰe-dze ^{RP}ne-tʰe | ^{EP}te-tɕʰo = le tɕiəʊ ^{RP}tʰe-dze ^{RP}ne-tʰe | ^{RP}ɹəzɐ ^{RP}kʰe-tɕi-tɕi = æ ‖ ^{RP}ɹəzɐ ^{RP}kʰe-tɕi-tɕi = æ kʰæ le | ^{LP}se-te | ^{R}mo ^{LP}ɹəpʰæ ^{RP}fu-fu-su = i | ^{F}tsʰo ^{F}te ^{F}dʒo | ^{F}tʰe tɕiəʊ ^{LP}gæmi ^{RP}jæ-ʑy ^{RP}te-pʑæ ^{RP}de-vu tɕæ ‖ ^{LP}gæmi ^{RP}jæ-ʑy ^{RP}te-pʑæ ^{RP}de-vu tɕæ kʰæ le | ^{LP}se-te ^{EP}ku-tʰe ^{RP}gæmi = bi ^{F}ʃæ ^{RP}tʰe-qʰwɐ le | ^{F}tɕʰi ^{RP}ɹəzɐ ^{RP}jæ-kʰwæ ^{R}ʑi dʑi ‖ ^{RP}tʰe-tɕʰo = ne ^{EP}ku-tʰe ^{LP}tɕjɐNtʃʰokʰɐ | ^{EP}ku-tʰe ^{LP}tɕjɐNtʃʰokʰɐ-pʰo ^{RP}melje = bi ^{RP}Ndʑi-Ndʑi = æ le ^{RP}tɕʰi = ke ^{EP}te-mɹə = le ^{RP}te = i ^{LP}hudʑæ ‖ ^{RP}tʰe-tɕʰo = ne ^{RP}melje ^{RP}de-mɹə ^{RP}de-su = æ kʰæ le | ^{RP}melje ^{RP}jæ-læ ^{RP}jæ-kʰwæ | ^{F}tʰe ^{F}tsʰo = bi ^{RP}jæ-læ ^{RP}de-ku-ku | ^{RP}jæ-læ ^{RP}jæ-kʰwæ | ^{RP}jæ-læ ^{RP}de-ku-ku su ne | tɕiəʊ ^{LP}gæmi = pʑæ ^{RP}tʰe-qʰwɐ ^{LP}mæ = pʰæ ‖ ^{RP}tʰe-tɕʰo = ne tɕiəʊ ^{LP}metsʰæ = bi ^{RP}ne-læ | ^{LP}metsʰæ = bi ^{RP}ne-læ ^{RP}de-su = æ | ^{LP}metsʰæ ^{RP}jæ-kə mu ^{EP}te-kʰo = sæ kʰæ le | ^{F}tʰe ^{F}tsʰo = bi ^{LP}de-tsʰæ læ | ^{LP}gæmi = bi ^{LP}jæ-ʃə mu ^{RP}tʰe-qʰwɐ ^{RP}de-su ne | tɕiəʊ ^{LP}metsʰæ = bi ^{RP}tʰe-qʰwæ = æ dʑi ‖

Interlinear morphemic gloss

Abbreviations used in the gloss below follow the Leipzig Glossing Rules (LGR, http://www.eva.mpg.de/lingua/resources/glossing-rules.php). Non-standard abbreviations (those not included in the LGR) are: ANM=animate, CMPR=comparative, CONJ=conjunction.

^{LP}tɕjɐNtʃʰokʰɐ-pʰo = i	^{RP}melje	læ	^{LP}ɲimæ |	^{RP}tʰe-dze	^{RP}ne-tʰe |	
north-side = GEN	wind	CONJ	sun	that-DU	two-that	

^{EP}te-tɕʰo = le	tɕiəʊ	^{RP}tʰe-dze	^{RP}ne-tʰe |	^{RP}ɹəzɐ	
one-moment = TOP	just	that-DU	two-that	strength	

^{RP}kʰe-tɕi-tɕi = æ ‖	^{RP}ɹəzɐ	^{RP}kʰe-tɕi-tɕi = æ	kʰæ
inward-compare-compare = PFV	strength	inward-compare-compare = PFV	time

le | [LP]se-te | [R]mo [LP]ɹəp^{h}æ [RP]fu-fu-su = i | [F]ts^{h}o [F]te [F]dʒo |
TOP who-one again road walk-walk = GEN person one exist.ANM

310

[F]t^{h}e tɕiəʊ [LP]gæmi [RP]jæ-ʑy [RP]te-pʑæ [RP]de-vu tɕæ ||
that just clothes CMPR-thick one-item upward-wear DUR

311

[LP]gæmi [RP]jæ-ʑy [RP]te-pʑæ [RP]de-vu tɕæ k^{h}æ le |
clothes CMPR-thick one-item upward-wear DUR time TOP

312

[LP]se-te [EP]ku-t^{h}e [RP]gæmi = bi [F]ʃæ [RP]t^{h}e-q^{h}wɐ le | [F]tɕ^{h}i
who-one this-? clothes = DEF first outward-take.off TOP he.GEN

313

[RP]ɹəzɐ [RP]jæ-k^{h}wæ [R]ʑi dʑi || [RP]t^{h}e-tɕ^{h}o = ne [EP]ku-t^{h}e [LP]tɕjɐNtʃ^{h}ok^{h}ɐ |
strength CMPR-large COP say that-moment = FOC this-? north

314

[EP]ku-t^{h}e [LP]tɕjɐNtʃ^{h}ok^{h}ɐ-p^{h}o [RP]melje = bi [RP]NdʑiNdʑi = æ le [RP]tɕ^{h}i = ke
this-? north-side wind = DEF think-think = PFV TOP he.GEN = LOC

315

[EP]te-mɹə = le [RP]te = i [LP]hudʑæ || [P]t^{h}e-tɕ^{h}o = ne [RP]melje [RP]de-mɹə
one-blow = TOP take = GEN be.about.to that-moment = FOC wind upward-blow

316

[RP]de-su = æ k^{h}æ le | [RP]melje [RP]jæ-læ [RP]jæ-k^{h}wæ |
upward-cause = PFV time TOP wind CMPR-come CMPR-large

317

[F]t^{h}e [F]ts^{h}o = bi [RP]jæ-læ [RP]de-ku-ku | [RP]jæ-læ [RP]jæ-k^{h}wæ |
that person = DEF CMPR-come upward-wrap-wrap CMPR-come CMPR-large

318

[RP]jæ-læ [RP]de-ku-ku su ne | tɕiəʊ [LP]gæmi = pʑæ [RP]t^{h}e-q^{h}wɐ
CMPR-come upward-wrap-wrap cause TOP just clothes = item outward-take.off

319

[LP]mæ = p^{h}æ || [RP]t^{h}e-tɕ^{h}o = ne tɕiəʊ [LP]mets^{h}æ = bi [RP]ne-læ |
NEG = be.able that-moment = FOC just sunshine = DEF downward-come

320

[LP]mets^{h}æ = bi [RP]ne-læ [RP]de-su = æ | [LP]mets^{h}æ [RP]jæ-kə
sunshine = DEF downward-come upward-cause = PFV sunshine CMPR-big

322
321

mu [EP]te-k^{h}o = sæ k^{h}æ le | [F]t^{h}e [F]ts^{h}o = bi [LP]de-ts^{h}æ læ |
make one-warm = DUR time TOP that person = DEF upward-hot CONJ

^{LP}gæmi = bi	^{LP}jæ-ʃə	mu	^{RP}tʰe-qʰwɐ	^{RP}de-su	ne |	
clothes = DEF	CMPR-quick	make	outward-take.off	upward-cause	FOC	

323

tɕiəʊ	^{LP}metsʰæ = bi	^{RP}tʰe-qʰwæ = æ	dʑi ‖	
just	sunshine = DEF	outward-win = PFV	say	

324

Acknowledgments

325 326 327 328 329 330 331 332 333 334

We would like to thank our principal language consultant, Mr. Wang Xuecai 王学才, for his patience and his enthusiasm for the project. We are grateful to Jackson T.-S. Sun, Alexis Michaud, the anonymous reviewers of this journal, and the journal's Editor, Adrian Simpson, for helpful comments and suggestions. We gratefully acknowledge the financial support of the Agence Nationale de la Recherche (France) as part of the research project 'What defines Qiang-ness? Towards a phylogenetic assessment of the Southern Qiangic languages of Muli' (ANR-07-JCJC-0063) to Katia Chirkova. Yiya Chen is currently supported by the Netherlands Organization for Scientific Research (NWO-VIDI 016084338) and the European Research Council (ERC-Starting Independent Researcher Grant, 206198).

References

335

336 Boersma, Paul & David Weenink. 2009. Praat: Doing phonetics by computer. http://www.praat.org/.
337 Bradley, David. 1989. Nasality as a prosody in Loloish. In David Bradley, Eugénie J. A. Henderson &
338 Martine Mazaudon (eds.), *Prosodic analysis and Asian linguistics: To honour R.K. Sprigg*, 143–155.
339 Canberra: Department of Linguistics, Research School of Pacific Studies, the Australian National
340 University.
341 Bradley, David. 1997. Tibeto-Burman languages and classification. In David Bradley (ed.), *Tibeto-Burman*
342 *languages of the Himalayas* (Papers in Southeast Asian Linguistics 14), 1–71. Canberra: Department
343 of Linguistics, Research School of Pacific and Asian Studies, Australian National University.
344 Bradley, David. 2008. Labiovelars in Adur. Presented at the Workshop on Tibeto-Burman Languages of
345 Sichuan, Academia Sinica, Taipei, 21–22 November 2008.
346 Chao, Yuen Ren. 1930. ə sɪstəm əv "toun-lɛtəz". *Le Maître Phonetique* 30, 24–27.
347 Chen, Yiya. 2008. Revisiting the phonetics and phonology of Shanghai tone sandhi. *The Fourth Conference*
348 *on Speech Prosody*, 253–256. Campinas, Brazil: University of Campinas, Speech Prosody Studies
349 Group.
350 Chirkova, Katia. 2012. The Qiangic subgroup from an areal perspective: A case study of languages of
351 Muli. *Language and Linguistics* 13(1), 133–170.
352 Chirkova, Katia & Alexis Michaud. 2009. Approaching the prosodic system of Shixing. *Language and*
353 *Linguistics* 10(3), 539–568.
354 Ding, Picus. 2007. The use of perception tests in studying the tonal system of Prinmi dialects: A speaker-
355 centered approach to descriptive linguistics. *Language Documentation and Conservation* 1(2), 154–
356 181.
357 Duanmu, San. 1995. Metrical and tonal phonology of compounds in two Chinese dialects. *Language* 71,
358 225–259.
359 Duanmu, San. 1999. Metrical structure and tone: Evidence from Mandarin and Shanghai. *Journal of East*
360 *Asian Linguistics* 8, 1–38.
361 Evans, Jonathan. 2008. 'African' tone in the Sinosphere. *Language and Linguistics* 9(3), 463–490.
362 Evans, Jonathan. 2009. Types of tone culminativity in languages of Sichuan and elsewhere. Ms., Institute
363 of Linguistics, Academia Sinica. [Available at http://www.ling.sinica.edu.tw/eip/FILES/publish/
364 2009.4.30.2 4511354.9165533.pdf, accessed 29 February 2012.]
365 Greif, Markus. 2010. Tones and intonation in Pumi – a first survey. *Language Typology and Universals*
366 63(3), 221–251.

Huang, Bufan & Renzeng Wangmu. 1991. Lüsuyu [The Lüsu language]. In Dai Qingxia, Huang Bufan, Fu Ailan, Renzeng Wangmu & Liu Juhuang (eds.), *Zang-Mianyu shiwu zhong/Fifteen Tibeto-Burman languages*, 132–152. Beijing: Beijing Yanshan Chubanshe.

Lama, Ciwo. 1994. Namuyiyu zhishu yanjiu [On the genetic affiliation of the Namuyi language]. *Minzu Yuwen* [Minority Languages of China] 1, 50–60.

Li, Min & Ma Ming. 1983. *Liangshan Yiyu yuyin gailun* [Introduction to the phonetics of the Yi language of Liangshan Prefecture]. Chengdu: Sichuan Nationalities Press.

Matisoff, James A. 1973. *A grammar of Lahu*. Berkeley & Los Angeles, CA: University of California Press.

Matisoff, James A. 1975. Rhinoglottophilia: The mysterious connection between nasality and glottality. In Charles A. Ferguson, Larry M. Hyman & John J. Ohala (eds.), *Nasálfest: Papers from a symposium on nasals and nasalization*, 265–287. Stanford, CA: Language Universals Project.

Mazaudon, Martine. 2005. On tone in Tamang and neighbouring languages: Synchrony and diachrony. In Satoki Kaji (ed.), *Symposium Cross-linguistic Studies of Tonal Phenomena*, 79–96. Tokyo: Tokyo University of Foreign Studies, Institute for the Study of Languages and Cultures of Asia and Africa.

Sprigg, Richard Keith. 1987. "Rhinoglottophilia" re-visited: Observations on "the mysterious connection between nasality and glottality". *Linguistics of the Tibeto-Burman Area* 10(1), 44–62.

Sun, Hongkai. 1982. Ersu (Duoxu) hua jianjie [An outline of Ersu (Duoxu)]. *Yuyan Yanjiu* [Linguistic Study] 2, 241–264.

Sun, Hongkai. 1983. Liujiang liuyu de minzu yuyan ji qi xishu fenlei [Minority languages of the Six River Valley and their genetic classification]. *Minzu Xuebao* [Scholarly Journal of Nationalities] 3, 99–274.

Sun, Hongkai. 2001. Lun Zang-Mian yuzu zhong de Qiang yuzhi yuyan [On the Qiangic branch of the Tibeto-Burman language family]. *Language and Linguistics* 2(1), 157–181.

Sun, Jackson T.-S. 2005. Jiarong yuzu yuyan de yingao: Liang ge ge'an yanjiu [On pitch in the rGyalrongic languages: Two case studies]. *Yuyan Yanjiu* [Studies in Language and Linguistics] 25(1), 50–59.

Wang, Dehe, 2010. *Ersu zangzu wenhua yanjiu* [Study of Ersu Tibetan culture]. Chengdu: Sichuan University Press.

Yang, Zhenhong. 2009. An overview of the Mosuo language. *Linguistics of the Tibeto-Burman Area* 32(2), 1–43.