

## THE DUOXU LANGUAGE AND THE ERSU-LIZU-DUOXU RELATIONSHIP\*

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Duoxu is a terminally endangered and virtually undescribed Tibeto-Burman language, spoken in the historically multi-ethnic and multi-lingual Miǎnníng county in Sichuān province in the People's Republic of China. Until recently, Duoxu was known only through a 740-word vocabulary list in the Sino-Tibetan vocabularies *Xīfān Yìyǔ* [Tibetan-Chinese bilingual glossary], recorded in Chinese and Tibetan transcriptions in the 18th century, and a grammatical sketch (Huáng & Yǐn 2012). Researchers who have worked on the language (Nishida 1973, Sūn 1982, Huáng & Yǐn 2012) have expressed different views about the features and the genetic position of Duoxu, variously viewing it as (1) closely related to Lolo-Burmese languages (Nishida 1973), (2) closely related to Ersu and Lizu, two neighboring languages that are currently classified as members of the Qiangic subgroup of the Tibeto-Burman language family (Sūn 1982), or (3) distantly related to those two languages and to Qiangic languages at large (Huáng & Yǐn 2012).

The Duoxu language is critically endangered and urgently requires documentation. It is of great value for our understanding of the linguistic diversity of the region, and of its linguistic history. It is also of great value as a modern reflection of a language that was recorded in the 18th century. This paper makes significant contribution in all these areas. Based on new fieldwork with all remaining elderly Duoxu speakers, this study provides newly collected data and new analysis. It compares the newly collected data with the 18th-century attestations of Duoxu as well as with its two putative sister languages Ersu and Lizu. The conclusion of the study is that Duoxu is closely related to Ersu and Lizu, with superficial differences attributed to long-standing and on-going contact influence from Southwestern Mandarin.

Duoxu, phonetics, phonology, phonetic variation, language attrition, language contact, Southwestern Mandarin, Ersu, Lizu

### 1. Introduction

Duoxu (/do<sup>44</sup>-ɕu<sup>44</sup>/, Duōxù 多续 or Duōxū 多须 in Mandarin) is a little-known and virtually undescribed Tibeto-Burman language, spoken in Miǎnníng county (冕宁县). This county is located in the Liángshān Yí Autonomous Prefecture (凉山彝族自治州) in Sichuān province in the People's Republic of China.

Miǎnníng is historically a multi-ethnic region. The Qīng edition of *Miǎnníng Xiànzhi* 《冕宁县志》 [Annals of Miǎnníng County], edited in the Xiánfēng 咸

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丰 reign period (1851-1861), mentions several local indigenous groups, all of which continue to live in the area to date:

(1) the so-called “Western Barbarians” (Xīfān 西番). This group includes the present-day Duoxu and Lizu people<sup>1</sup>

(2) two branches of the so-called “Eastern Barbarians” (Yí 夷): (a) *luǒluó* (猓), which corresponds to the modern Yi (彝) group, and (b) *mósuān* (摩梭), or the modern Nàmùzī (纳木兹) group.

The Duoxu ethnic group currently counts approximately 2,000 people. They essentially live in the administrative seat of Miǎnníng county and the villages around it, as well as in six outlying townships of that county, namely Hòushān (后山), Fùxīng (复兴), Hui’ān (惠安), Hāhā (哈哈), Línlǐ (林里), and Shābā zhèn (沙坝镇) (Wáng 2010: 6).

The language of the group is severely moribund. It is currently spoken by no more than 9 individuals, all in their 70s and 80s. Although the Duoxu language has been repeatedly surveyed in the past sixty years, very little data from those surveys has been released, and only one grammatical sketch of Duoxu has been published to date (Huáng & Yīn 2012). An important source of information on the language (and until recently the *only* source) is a 740-word vocabulary list in the Sino-Tibetan vocabularies *Xīfān Yīyǔ* 《西番译语》 [Tibetan-Chinese bilingual glossary] (hereafter XFYY), recorded in Chinese and Tibetan transcriptions in the Qiánlóng 乾隆 reign (1736-1796) of the Qīng dynasty (see Nishida 1973; Niè & Sūn 2010). Researchers who have worked on Duoxu, on the basis of secondary sources (Nishida 1973, 1976) or on the basis of firsthand fieldwork data (Sūn 1982; Huáng & Yīn 2012), have expressed different views about the features and the genetic position of Duoxu.

Based on his work on the Duoxu vocabularies recorded in XFYY, Nishida Tatsuo 西田龍雄 (1973, 1976) argues for a close link between Duoxu (which he calls Tosu) and Lolo-Burmese languages on the one hand, and between Duoxu and Tangut on the other hand, proposing a separate Tangut-Duoxu subgroup within Lolo-Burmese.

Sūn Hóngkāi 孙宏开 considers Duoxu to be one of the three dialects of the Ersu language (*ěrsūyǔ* 尔苏语), a language he sees as a member of the Qiangic subgroup of the Tibeto-Burman language family (e.g. Sūn 2001).<sup>2</sup> In this conception:

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<sup>1</sup> The Lizu (*lǐrú* 里汝) people (or the Lüzu, *lǚsū* 吕苏, people, as they are also known) are locally known in Miǎnníng as Mièlà ([口+灭]腊) or Mǐlā (米拉) people. A close historical relationship between the Duoxu and the Lizu groups can be noted. The two groups have been close neighbors in Miǎnníng for several centuries. In addition, a large number of the Duoxu people from the Níngyuán Dàqiáo (宁源大桥), Cáogǔ (曹古), Tuōwū (拖乌), Yíhǎi (彝海), and Yèlè (冶勒) townships in Miǎnníng moved to the Lizu-speaking areas in Kǎlā township (卡拉乡) of the neighbouring Mùlǐ county at the turn of the 20<sup>th</sup> century (Wáng 2010: 6). In Kǎlā, they have been culturally and linguistically assimilated by the local Lizu speakers.

<sup>2</sup> Sūn Hóngkāi mentions Duoxu in several publications on the Ersu language and on the Qiangic subgroup at large. He also published two short vocabulary lists. A 14-item word list is provided in the 1982 article “Ērsū (Duōxù) huà jiǎnjiè 尔苏(多续)话简介” [An outline of Ersu (Duoxu)] in order to demonstrate a close relationship between Duoxu and Ersu (p. 242). A 30-item word list is provided in Nishida and Sūn (1990: 17). Following Sūn (2001), current

- (1) Duoxu is the central dialect of the Ersu language
- (2) Lizu is the western dialect of the Ersu language<sup>3</sup>
- (3) Ersu proper is the eastern dialect of the Ersu language<sup>4</sup>

Sūn notes that the three languages are not mutually intelligible and share only 50% cognacy (Nishida & Sūn 1990: 15).<sup>5</sup> At the same time, Sūn stresses that salient structural similarities between the three varieties in all linguistic sub-systems leave no doubt that the three stand in a dialectal relationship to each other (Sūn 1982: 241).

This view has recently been challenged by Huáng Bùfán 黄布凡 and Yīn Wèibīn 尹薇彬 (Huáng & Yīn 2012). Based on the data collected in the early 1980s, complemented by a more recent fieldtrip in 2012, they argue that Duoxu is not a dialect of Ersu, but an independent Tibeto-Burman language. Furthermore, in their view, Duoxu does not belong to the Qiangic subgroup, and its relationship to other languages (i.e. its putative sister languages Ersu and Lizu, and neighboring languages such as Yi) requires further investigation. This conclusion rests on the following observations:

(1) A low percentage of cognate sets in Duoxu and Ersu (39.3% of 783 basic words), and in Duoxu and Lizu (42% of 794 basic words). Huáng and Yīn stress the fact that they use the term ‘cognate’ in a loose sense, that is, the cognate vocabulary has not been established on the basis of regular sound correspondences, but rather on the overall similarity between the compared words. In their analysis, the fact that Duoxu and Ersu, and Duoxu and Lizu, respectively, share less than 50% of cognates argues strongly against considering these languages to be dialects of one and the same language. Huáng & Yīn provide a list of 300 basic words collected in their fieldwork as an appendix to their article. Unfortunately, they do not provide the corresponding Ersu and Lizu forms on which they base their cognacy judgments.

(2) Morphosyntactic differences between the three languages. Huáng & Yīn argue that the Duoxu language is of the analytic type, hence similar to Yi languages, whereas Ersu and Qiangic languages in general are of the agglutinative type. They also point out that unlike Qiangic languages, Duoxu does not have

classifications of Tibeto-Burman languages of China list the Ersu language as a member of the Qiangic subgroup (cf. Bradley 1997:36-37).

<sup>3</sup> Lizu (/<sup>EP</sup>li-zu hǔ/ 里汝语 *lǐrúyǔ* or /<sup>EP</sup>ly-zu hǔ/ 吕苏语 *lǚsūyǔ*) is spoken in Miǎnníng, Mùlǐ (木里), and Jiǔlóng (九龙) counties. Tone notation in Lizu is provided in superscript letters to the left of the lexical word. Lizu combines lexical tone on monosyllabic words and a hybrid system of tone and stress on polysyllabic words and compounds (see Chirkova and Chen 2013 for a detailed discussion). The following abbreviations for tone and tonal patterns are used: “F” stands for falling tone, “R” for rising tone, “EP” for “equally prominent pattern”, “LP” for “left-prominent pattern”, and “RP” stands for “right-prominent pattern”.

<sup>4</sup> Ersu (/ǝ-ǝ́ xò/, 尔苏语 *ěrsūyǔ*) is spoken in Gānlùò (甘洛), Yuèxī (越西), Shímíán (石棉), Hànyuán (汉源), and Jiǔlóng counties. Ersu is a register tone language with two registers: High and Low. In Ersu transcriptions, high- and low-register tones are marked with tone diacritics (“á”, and “à”, respectively).

<sup>5</sup> This estimation is based on a list of basic vocabulary of ca. 1,700 words (Sūn Hóngkāi p.c., 2008).

directional prefixes, which in those languages often have aspectual meanings and functions. They note, for instance, that unlike Ersu, the perfective aspect in Duoxu is essentially expressed by function words.

(3) Different migration histories and different ethnic identities of the Duoxu, Ersu, and Lizu groups (this conclusion is based on the ethnographic work by Lóng 2007 [1991]).<sup>6</sup>

The two competing hypotheses regarding the relationship of Duoxu to Ersu and Lizu (Sūn 1982; Huáng & Yǐn 2012) will be discussed below in the light of new data and findings.

The work reported in this study is part of an ongoing documentation of Duoxu in the framework of the project “Ersu and Xumi: Comparative and Cross-Varietal Documentation of Highly Endangered Languages of South-West China” (2013-2016), supported by the Endangered Languages Documentation Programme (ELDP). The linguistic fieldwork, on which this analysis is based, was conducted in April-May 2013 in the administrative seat of Miǎnníng county and in the neighboring villages of Héshàng (河上) and Wǔsù (伍宿). The participation of native Duoxu and Ersu ethnographers and historians in the project, Yuán Xiǎowén 袁晓文, Hán Zhèngkāng 韩正康, and Wáng Déhé 王德和, made fieldwork possible with all nine remaining speakers of this language. Of these speakers, six are female and three are male. At the time of fieldwork, the youngest speaker was 67 years old, the oldest speaker was 83 years old, and the majority of speakers were in their 70s. Most elderly speakers are of Héshàng and Wǔsù villages (three and four speakers, respectively); in addition, one speaker originally comes from Hāhā township. Most speakers are illiterate, working all their lives as farmers in their native villages. Two speakers are retired elementary school teachers and one is a retired local government official.

All Duoxu language consultants are fully competent in the local variety of Southwestern Mandarin (hereafter SW Mandarin), which is their dominant daily language. Seven of the nine speakers also have some knowledge of Nuosu Yi (another important linguistic neighbor of Duoxu), ranging from poor to fair.

Given that Duoxu is not spoken regularly, even in families that have more than one member with some knowledge of Duoxu, none of our consultants were fully competent speakers of the language. Only a few were able to have a fluent conversation in Duoxu, most speakers were hesitant about the correctness of forms they produced, and they often produced competing forms. In fact, the degree of inter-speaker and intra-speaker variation was so considerable that virtually each and every speaker could be considered as having a lexically and phonetically distinct variety. Although this presented a considerable challenge for word elicitation and phonetic-phonological analysis, it also provided insights into ongoing sound change. Overall, the observed variation patterns were clearly symptomatic of an advanced state of language attrition in Duoxu. I use this term to refer to the process of language shift in bilinguals due to the extensive use of

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<sup>6</sup> The question of the ethnic identity of the Duoxu Tibetans is too complex a matter to go into in detail within the scope of this article. Important recent publications on this topic include Yuán (2010, 2011, 2012), Wáng (2010), and Wū Dá (2010).

the dominant language (in this case, SW Mandarin) and the reduced use of the minority language (Duoxu) in daily life over an extensive time-span. Language attrition is one of the natural outcomes of language contact situations in general and it is also very much part of language dynamism and variability in the historically multi-lingual region where Duoxu is spoken. Therefore, developments attested in this language potentially have a diagnostic significance as a window on the recent histories of local languages. Duoxu is all the more important in this respect, as it has earlier attestations dating from the 18th century, thus providing a diachronic dimension essential to elucidate the dynamics of sound change in this multi-ethnic and multi-lingual area.

Taking advantage of these opportunities, this study focuses on sound change in progress across the group of remaining Duoxu speakers as well as on diachronic change between two stages of Duoxu: (1) modern, as attested in recent fieldwork, and (2) 18th century, as recorded in XFYY. Based on the insights gained in this process, it also re-examines the relationship between Duoxu and its two putative sister languages, Ersu and Lizu. I argue that Duoxu is closely related to Ersu and Lizu, and that Duoxu's superficial differences from Ersu and Lizu can be mostly accounted for by the high degree of SW Mandarin influence.

The article is structured as follows. Section 2 describes inter- and intra-speaker variation, as observed in recent fieldwork with all remaining Duoxu speakers. This section also provides a phonemic analysis of the most conservative form of Duoxu attested among them. Section 3 compares newly collected synchronic Duoxu data with earlier attestations of Duoxu dating from the 18th century. The comparison is based on a list of 300 basic words derived from the original 740-word list in XFYY (quoted from Nishida 1973:118–160), compared with their modern equivalents. The two stages of the language are still recognizably quite similar, whereas patterns of correspondences between them are parallel to synchronic variation in Modern Duoxu. A similarity in the patterns of variation and change at both stages suggests a similarity in the driving force behind them, which is likely to be long-standing contact influence from SW Mandarin. Section 4 extends the comparison on the basis of the same vocabulary list to Ersu and Lizu. The goal of this comparison is to evaluate the competing hypotheses regarding the relationship of Duoxu to these two languages (Sūn 1982; Huáng & Yīn 2012). This section also provides morphological analysis on some of the recorded vocabulary in order to assess morphosyntactic properties and compare them across languages. The concluding section (5) summarizes the essential findings and outlines directions for future research. The appendix to the article provides a comparative list of 300 basic words in Modern Duoxu, XFYY Duoxu, Ersu, and Lizu. The goal of the list is twofold: to make the present argument transparent, and to publish new fieldwork data on Duoxu so as to encourage research on this language and to contribute to its preservation.

## **2. Modern Duoxu: Synchronic inter- and intra-speaker variation**

Important challenges for descriptive and comparative analyses of Duoxu are variation and variability, as also noted in previous work on this language (Huáng & Yīn 2012: 51–52). The patterns of phonetic variation among the surveyed

Duoxu speakers, as attested in recent fieldwork, are consistent with what is known about sound change in languages undergoing attrition (e.g. Andersen 1982: 95; Campbell & Muntzel 1989; Schmid et al. 2004; Stanford & Preston 2009; Schmid 2011). These include:

(1) reduction of the overall number of phonological distinctions, with a concomitant loss of those distinctions that do not exist in the contact language (and that for that reason, have lower frequency of use),

(2) retention of those distinctions that also exist in the contact language (and that have higher frequency of use),

(3) amplification of features present in Duoxu, but absent in Mandarin. Amplification is described in Campbell & Muntzel (1989: 187–190) as a tendency for those features that are marked or “exotic” from the point of view of the dominant language not to be completely mastered by the speakers. As a result, not knowing exactly where these “exotic” features belong, speakers employ them with great frequency and in ways inappropriate for the healthy version of the same language.

Based on the overall number of consistent phonological distinctions that individual Duoxu speakers make in their speech, it is possible to divide all surveyed Duoxu speakers into three groups, more precisely:

(1) speakers who consistently make the largest overall number of phonological distinctions, also including those that do not exist in SW Mandarin. I take this group to be representative of a more conservative stage of the language (hereafter, conservative group)

(2) speakers who only make phonological distinctions that exist in SW Mandarin (hereafter, convergence group)

(3) speakers for whom the reduction of the overall number of phonological distinctions is not yet complete and who employ some distinctions that do not exist in SW Mandarin in ways inappropriate for the more conservative variety of Duoxu (hereafter, the transitional group)

This section outlines the phonological system of the variety of the conservative group, against which the synchronic phonetic variation among the surveyed Duoxu speakers is to be understood. It is based on the speech of the 83-year old speaker, Mr. Wǔ Róngfù 伍荣富. It is probably no coincidence that his speech is the most “intact” of all surveyed speakers: he is one of the oldest members of the group, he spent all his life as a farmer in his village, never travelled far or took jobs outside of the village, and he is married to another fluent Duoxu speaker from the same village, even though the couple does not use Duoxu any longer in daily life. The sound system of this speaker is summarized below.<sup>7</sup> (Whenever possible, illustrative examples are cited from the vocabulary list in the appendix, the number of the word in the list is indicated in round brackets to the right of the word.)

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<sup>7</sup> A detailed phonetic-phonological sketch of Duoxu, accompanied by sound files, is in preparation.

The consonant inventory of Duoxu consists of 37 consonants, listed in Table 1 (marginal segments are put in parentheses, “N” stands for a nasal that is homorganic to the following consonant).

	<i>Bilabial</i>	<i>Labiodental</i>	<i>Alveolar</i>	<i>Postalveolar</i>	<i>Alveolopalatal</i>	<i>Velar</i>
Plosive	p p <sup>h</sup> b (Nb)		t t <sup>h</sup> d (Nd)			k k <sup>h</sup> g (Ng)
Affricate			ts ts <sup>h</sup> dz	tʃ tʃ <sup>h</sup> dʒ	tɕ tɕ <sup>h</sup> dʑ	
Nasal	m		n		ɲ	ŋ
Fricative		f	s z	ʃ ʒ	ç ʝ	x ɣ
Approximant	w				j	
Lateral			l			

Table 1. Consonant phonemes of Duoxu

/w/ is realized as [v] before /e, u/ (e.g. /we<sup>34</sup>/ [ve<sup>34</sup>] ‘to wear (282)’, /wu<sup>44</sup>/ [vu<sup>44</sup>] ‘to buy; to be narrow (39)’), and as [w] before the remaining vowels (e.g. /wa<sup>53</sup>/ [wa<sup>53</sup>] ‘rain (12)’, /wo<sup>53</sup>/ [wo<sup>53</sup>] ‘chicken, hen (213)’).

/f/ only occurs before /e/, /a/, and /u/ (e.g. /fe<sup>32</sup>-əɻ<sup>34</sup>/ ‘pus (123)’, /fa<sup>34</sup>/ ‘to bury’, /fu<sup>32</sup>tʃ<sup>h</sup>u<sup>53</sup>/ ‘to be dry’).

/ɣ/ only occurs before /e, a/, in the latter environment, it is realized as [ʁ] (e.g. /ɣe<sup>44</sup>/ [ʁe<sup>44</sup>] ‘to be thick, coarse’, /ɣa<sup>32</sup>/ [ʁa<sup>32</sup>] ‘needle’).

Duoxu marginally distinguishes between plain voiced and prenasalized voiced stops (alternatively, the two are in free variation, see below). Contrastive prenasalized stops are restricted to a handful of words, e.g. /go<sup>32</sup>/ ‘to be cold (47)’ or /ŋgo<sup>32</sup>/ ‘to hold, to grasp’.

The approximant /j/ can occur in the second position in consonant clusters, where it may be realized as secondary palatalization of the first position consonant. It has a restricted distribution, occurring only after labial stops, /d/, and /l/ (e.g. /bje<sup>44</sup>ka<sup>44</sup>/ ‘to be soft (40)’, /dje<sup>32</sup>-dje<sup>44</sup>/ ‘flower (189)’, /lje<sup>44</sup>/ ‘fertilizer, manure’).

The vowel system comprises 6 phonemes, including /i, e, a, u, ʏ, o/ (e.g. /k<sup>h</sup>i<sup>32</sup>-k<sup>h</sup>i<sup>44</sup>/ ‘to shout, to yell’, /k<sup>h</sup>e<sup>44</sup>, k<sup>h</sup>e<sup>53</sup>ji<sup>32</sup>/ ‘dog (214)’, /k<sup>h</sup>a<sup>53</sup>/ ‘big; to close (door)’, /k<sup>h</sup>u<sup>53</sup>/ ‘year (43)’, /k<sup>h</sup>ʏ<sup>53</sup>/ ‘above, up (180)’, /k<sup>h</sup>o<sup>53</sup>/ ‘to give (277)’). Additionally, Duoxu has one rhotic vowel, /əɻ/, which only occurs in isolation (e.g. /əɻ<sup>32</sup>dʒa<sup>44</sup>/ ‘dragon (208)’).

After sibilants, /i/ is realized as a fricative vowel, homorganic to the preceding consonant onset (e.g. /zi<sup>53</sup>/ [zʑ<sup>53</sup>] ‘urine (122)’).

Duoxu does not have phonemic nasal vowels and nasal codas (with the only exception of -ŋ, in the word /xuŋ<sup>44</sup>/ ‘to want’). In loanwords from SW Mandarin, the original nasal coda in word-final position is regularly lost without compensation (e.g. /lje<sup>32</sup>to<sup>53</sup>/ ‘sickle’, from *liándāo* 镰刀, SW Mandarin /nian<sup>21</sup>tao<sup>44</sup>/; /ja<sup>32</sup>ju<sup>53</sup>/ ‘potato’, from *yángyù* 洋芋, SW Mandarin /ian<sup>21</sup>y<sup>213</sup>/).<sup>8</sup>

<sup>8</sup> Illustrative examples in Chinese characters are accompanied by Standard Mandarin transcriptions in the *pīnyīn* system of transcription to the left of the form, and by SW Mandarin transcriptions in IPA to the right of the form. SW Mandarin forms are based on Lǐ (2010, p.c.).

The syllabic structure is (C1)(C2)V, where C1 can be any consonant phoneme in Table 1, C2 can only be /j/, V is a vowel nucleus, and brackets indicate optional constituents. Duoxu has four contrastive tones on monosyllabic words. In the five-scale pitch system developed by Chao (1930), these tones may be annotated as 53, 44, 34, and 32. Examples include /wu<sup>53</sup>/ ‘wine, beer (155)’, /wu<sup>44</sup>/ ‘water (21)’, /we<sup>34</sup>/ ‘to wear (282)’, /wu<sup>32</sup>/ ‘to be narrow (39)’; /la<sup>53</sup>ba<sup>32</sup>/ ‘radish, turnip’, /la<sup>44</sup>ma<sup>44</sup>/ ‘lama (66)’, /la<sup>34</sup>/ ‘god (171)’, /la<sup>32</sup>/ ‘lightning (7); tiger (206)’.

In contrast to the phonemic inventory of the conservative group of speakers, that of the convergence group is already identical to that of SW Mandarin. The phonological system of SW Mandarin is provided here for comparison (as well as as a guide to the SW Mandarin readings of the Chinese transcriptions of Duoxu in XFY in section 3). In the absence of a detailed description of the SW Mandarin variety of Miǎnníng, the phonological system below is based on the SW Mandarin dialect of the neighboring Mùlǐ county, as described in Lǐ (2010: 117–119). Note that this variety, which is in contact with local non-Sinitic languages, has a larger number of phonological distinctions than other SW Mandarin dialects. More importantly, in view of the present discussion, it marginally maintains a distinction between /n/ and /l/. This dialect has 23 consonant phonemes, listed in Table 2. (Note also that initials conventionally notated as /tʂ, tʂ<sup>h</sup>, ʂ, ʐ/ are in fact, apical post-alveolar initials, as they are also in Standard Mandarin, Lee & Zee 2003: 110.)

	<i>Bilabial</i>	<i>Labiodental</i>	<i>Alveolar</i>	<i>Postalveolar</i>	<i>Alveolopalatal</i>	<i>Velar</i>
Plosive	p p <sup>h</sup>		t t <sup>h</sup>			k k <sup>h</sup>
Affricate			ts ts <sup>h</sup>	tʂ tʂ <sup>h</sup>	tɕ tɕ <sup>h</sup>	
Nasal	m		n		ɲ	ŋ
Fricative		f	s	ʂ	ʐ	x
Lateral			l			

Table 2: Consonant phonemes of SW Mandarin (the dialect of Mùlǐ), based on Lǐ (2010:117-118)

The vowel system is more complex than that of Duoxu. In open syllables, this SW Mandarin dialect has 8 vowel phonemes (/i, y, e, ε, ə, u, o, a/). After sibilants, /i/ is realized as a fricative vowel (e.g. *sì* 四 /si<sup>213</sup>/ [sʐ<sup>213</sup>] ‘four’). When occurring before another vowel, /i, y, u/ are considered as glides. /ε/ only occurs after /i, y/ and before an alveolar nasal coda (e.g. *qiān* 千 /tɕ<sup>h</sup>iɛn<sup>44</sup>/ ‘thousand’). Diphthongs in open syllables include /ai, ei, əu, ao/ (e.g. *kāi* 开 /k<sup>h</sup>ai<sup>44</sup>/ ‘to open’, *bèi* 贝 /pei<sup>213</sup>/ ‘shell, cowrie’, *zhōu* 周 /tʂəu<sup>44</sup>/ ‘circuit, cycle’, *gāo* 高 /kao<sup>44</sup>/ ‘to be tall, high’). /i, y, e, a, ε/ occur before an alveolar nasal coda (e.g. *jīn* 金 /tɕin<sup>44</sup>/ ‘gold’, *jūn* 军 /tɕyn<sup>44</sup>/ ‘army, military’, *zhēn* 真 /tʂɛn<sup>44</sup>/ ‘to be true’, *gān* 干 /kan<sup>44</sup>/ ‘to be dry’, *qiān* 千 /tɕ<sup>h</sup>iɛn<sup>44</sup>/ ‘thousand’). /a, o/ occur before a velar nasal coda (e.g. *gāng* 缸 /kaŋ<sup>44</sup>/ ‘jar, vat’, *zhōng* 中 /tʂoŋ<sup>44</sup>/ ‘middle, in’). In addition, this variety of SW Mandarin has the rhotic vowel /ə/, which mostly occurs in isolation (as in *ěr* 耳 /ə<sup>53</sup>/ ‘ear’). In addition, the suffix /ə/ 儿 can be added to a few nouns, fusing with the preceding final (as in /pei<sup>213</sup>çiə<sup>44</sup>/ 背心儿 ‘vest’, /lao<sup>53</sup>məɻ<sup>44</sup>/ 老妈儿 ‘old woman’, see Lǐ 2010: 119).

The SW Mandarin variety of Mùlǐ has 4 tones, 44, 21, 53, 213 (e.g. *mā* 妈 /ma<sup>44</sup>/ ‘mother, mom’, *má* 麻 /ma<sup>21</sup>/ ‘hemp’, *mǎ* 马 /ma<sup>53</sup>/ ‘horse’, *mà* 骂 /ma<sup>213</sup>/ ‘to scold’). The syllable structure is comparable to that of Duoxu. The major differences between the two languages include marginal prenasalized onsets in Duoxu, different numbers of medial segments (three in SW Mandarin, /i, y, u/, and one in Duoxu, /j/), and the presence of nasal codas in Mandarin vs. their absence in Duoxu.

The extensive inter- and intra-speaker variation, attested among the Duoxu speakers, essentially relates to those phonological distinctions that exist in the conservative variety of Duoxu and do not exist in SW Mandarin, that is:

- (1) a distinction between /n/ and /l/ before all vowels
- (2) a distinction between voiced and voiceless initials
- (3) a distinction between prenasalized voiced and plain voiced initials
- (4) a distinction before low vowels between /ɣ/ ([ʁ]) and /w/
- (5) a distinction between /ʒ/ and /j/.<sup>9</sup>

Here is a detailed overview per distinction and per group of speakers (conservative, convergence, transitional):

(1) Variation between /n/ and /l/ initials. This is one of the characteristic features of SW Mandarin, where Middle Chinese initials 來 l-, 泥 n- and 娘 ɲ- all merge in most dialects (Yuán et al. 2001 [1960]: 29–30). In the dialect under description (Lǐ 2010: 118), most words with the initials /n/ and /l/ in Standard Mandarin have the initial /l/ (e.g. *nà* 那 /la<sup>213</sup>/ ‘that’, *là* 辣 /la<sup>21</sup>/ ‘peppery, spicy, hot’). However, if followed by the medial glides /i, y/, the distinction between /n/ and /l/ is maintained in this variety of SW Mandarin as that between /ɲ/ and /n/, respectively. Examples include: *nián* 年 /ɲian<sup>21</sup>/ ‘year’, *nǚ* 女 /ɲy<sup>53</sup>/ ‘woman’; *liǎn* 脸 /nian<sup>53</sup>/ ‘face’, *lǚ* 铝 /ny<sup>53</sup>/ ‘aluminum’.

While speakers of the conservative group consistently distinguish between /n/ and /l/ (e.g. /ta<sup>44</sup>-ne<sup>44</sup>/ ‘today (49)’ vs. /tɕe<sup>44</sup>le<sup>44</sup>/ ‘ladder (150)’; /no<sup>53</sup>k<sup>h</sup>u<sup>32</sup>/ ‘black’ vs. /lo<sup>53</sup>/ ‘to wait’), numerous examples of inter-speaker variation in /n/ and /l/ initials can be noted among speakers of the convergence and transitional groups as well as within individual speakers of these groups. In relation to the examples above, ‘today’ can be variously realized as [ta<sup>44</sup>-ne<sup>44</sup>] or [ta<sup>44</sup>-le<sup>44</sup>] (and also [nda<sup>44</sup>-le<sup>44</sup>], see below); ‘ladder’ as [tɕe<sup>44</sup>le<sup>44</sup>] or [tɕe<sup>44</sup>ne<sup>44</sup>]; ‘to wait’ as [lo<sup>53</sup>] or [no<sup>53</sup>].

The same variation is observed for the initials /n/ and /l/, where these are followed by the approximant -j-. For the speakers of the convergence and transitional groups, the two have already merged into /ɲ/, whereas the speakers of the conservative groups consistently maintain the distinction. The following two words are contrastive for the speakers of the conservative group, but

<sup>9</sup> More variational patterns can in fact, be observed, for the speakers of the transitional group. Examples include: (1) epenthetic stops between nasals and high vowels (as in ‘sunshine’: [me<sup>32</sup>-tɕ<sup>h</sup>a<sup>44</sup>] vs. [mbe<sup>32</sup>-tɕ<sup>h</sup>a<sup>44</sup>], ‘fire’: [mje<sup>32</sup>] vs. [mbje<sup>32</sup>]), and (2) free variation between [mi] and [ɲi] in some words (as in ‘aunt, wife of mother’s brother’: [a<sup>32</sup>-ɲi<sup>44</sup>] for the speakers of the conservative group, but [a<sup>32</sup>-mi<sup>44</sup>] for the speakers of the transitional group). However, as these variational patterns are more marginal than the patterns outlined in the main text, they are not discussed in detail.

homophonous for the speakers of the convergence group: /lje<sup>44</sup>/ ‘fertilizer, manure’ vs. /je<sup>44</sup>/ ‘year (43)’.

(2) Variation between voiced and voiceless initials. This is again a characteristic feature of modern Mandarin dialects, which have eliminated voicing as a distinctive feature. For example, while speakers of the conservative group minimally distinguish between voiced-voiceless pairs such as /ba<sup>53</sup>/ ‘to be tired’ and /pa<sup>53</sup>/ ‘to arrive (262)’, and /go<sup>32</sup>/ ‘to be cold (47)’ and /ko<sup>32</sup>/ ‘early’; those of the convergence group have already lost the distinction, having replaced voiced initials by their voiceless counterparts. The speakers of the transitional group apply voicing in an inconsistent fashion. For example, the word for ‘hole’ is /ku<sup>32</sup>-ku<sup>44</sup>/ [ku<sup>32</sup>-ku<sup>44</sup>] for the conservative group, but variously [ku<sup>32</sup>-ku<sup>44</sup>] or [gu<sup>32</sup>-gu<sup>44</sup>] for the transitional group.

(3) Variation in the use of prenasalization. The speakers of the conservative group marginally distinguish between plain voiced and prenasalized voiced initials (e.g. /go<sup>32</sup>/ ‘to be cold (47)’ or /ŋgo<sup>32</sup>/ ‘to hold, grasp’). Alternatively, the two are in free variation. Examples include [ba<sup>44</sup>] or [mba<sup>44</sup>] ‘mountain (24)’, [da<sup>53</sup>] or [nda<sup>53</sup>] ‘earth (20)’ (also for the speakers of the conservative group), [dzy<sup>32</sup>-zi<sup>44</sup>] or [ndzy<sup>32</sup>-zi<sup>44</sup>] ‘nephew (28)’, [sa<sup>44</sup>ba<sup>44</sup> = la<sup>44</sup>] or [sa<sup>44</sup>mba<sup>44</sup> = la<sup>44</sup>] ‘to be happy (257)’.

For the speakers of the transitional group, the marginal distinction between plain voiced and prenasalized voiced initials appears to have undergone two additional developments. First, the feature prenasalization is overgeneralized to apply to all voiced initials. For example, ‘to drink (152)’ is [ba<sup>53</sup>] for the speakers of the conservative group and [mba<sup>53</sup>] for the speakers of the transitional group. To take another example, ‘to sing (253)’ is [dza<sup>53</sup>] for the former group and [ndza<sup>53</sup>] for the latter group.

Second, the feature prenasalization is also extended, in an inconsistent fashion, to those initials that are regularly voiceless for the speakers of the conservative group. For example, ‘today (49)’, [ta<sup>44</sup>-ne<sup>44</sup>] for the latter group, can be realized as [nda<sup>44</sup>-le<sup>44</sup>] by the speakers of the transitional group.

(4) Variation between /ɣ/ ([ʝ]) and /w/ before low vowels. /ɣ/ is clearly distinguished from /w/ for the speakers of the conservative group, as in the following minimal pair, /ɣa<sup>53</sup> = la<sup>32</sup>/ ‘have become full’ vs. /wa<sup>53</sup> = la<sup>32</sup>/ ‘have obtained’. The distinction is lost for the speakers of the convergence groups, who substitute the original /ɣ/ with /w/. Take as an example the word ‘needle’, which is /ɣa<sup>32</sup>/ [ʝa<sup>32</sup>] for the speakers of the conservative group, and [wa<sup>32</sup>] for the speakers of the convergence group. Finally, the distinction between /ɣ/ and /w/ before low vowels is marginally maintained in the speech of the speakers of the transitional group. They furthermore tend to overgeneralize /ɣ/ and to apply it in an inconsistent fashion to all words with the initial /w/. For example, ‘road (28)’: [wa<sup>44</sup>-ma<sup>44</sup>] for the speakers of the conservative group, and [ʝa<sup>44</sup>-ma<sup>44</sup>] for the speakers of the transitional group.

In addition, /w/ alternates with /ŋ/ in a handful of words (as in ‘bird’, which is [ŋo<sup>44</sup>-tɕi<sup>44</sup>] for some speakers, but [wo<sup>44</sup>-tɕi<sup>44</sup>] for some other speakers).

(5) Variation between /z/ and /j/. /z/ is again clearly distinguished from /j/ for the speakers of the conservative group. However, the distinction is only

marginally maintained or already lost in the speech of the remaining speakers, who replace the original /ʐ/ with /j/. For example, ‘fool, foolish person; dummy’ is [ʐi<sup>33</sup>ka<sup>53</sup>] for the speakers of the conservative group, and [ji<sup>33</sup>ka<sup>53</sup>] for the speakers of the convergence group.

An additional tendency, restricted to the speakers of the transitional group, consists of elimination from the syllable inventory of certain syllables that do not conform to the phonotactics of SW Mandarin. One example is velar palatalization, as in ‘gallbladder (117)’, which is [ki<sup>34</sup>] for the conservative group and [tʃi<sup>34</sup>] for the transitional group; and ‘teacher (63)’, which is [bi<sup>32</sup>gi<sup>44</sup>ge<sup>32</sup>] for the former group, and [bi<sup>32</sup>dʒi<sup>44</sup>ge<sup>32</sup>] for the latter group. (This word is possibly a loan from Tibetan, Written Tibetan, hereafter WT, *dge rgan*).

To summarize findings in this section, extensive inter- and intra-speaker variation across the three groups of Duoxu speakers (conservative, convergence, transitional) evidences sound change due to language attrition and contact influence of SW Mandarin. Related processes include gradual replacement of those features that do not exist in the contact variety of SW Mandarin with those that exist in that contact variety of SW Mandarin. The survey of all remaining Duoxu speakers, as reported presently, reveals ongoing change from a phonologically more complex variety (the conservative group) to a less complex variety, which is similar to that of the contact variety of SW Mandarin (the speech of the convergence group).

### **3. Diachronic comparison: XFYY and Modern Duoxu, with comparison to features of SW Mandarin**

This section provides a comparison between Modern Duoxu (on the basis of the conservative group) and Duoxu as recorded in XFYY. The goal of the comparison is to establish how much Duoxu has changed since the 18th century, and what specific sound changes have occurred.

The analysis is based on a vocabulary list that is derived from the original 740-word list in XFYY (quoted from Nishida 1973: 118–160). The original list in Nishida (1973) has been shortened (1) to include only lexical words (e.g. ‘sun’, Nishida 1973: 118) and no phrases (such as ‘the sun rises’, ‘the sun sets’, *ibid.*, p. 119); and (2) to include only those words for which a corresponding Modern Duoxu reading could be elicited. By applying the above criteria, the original 740-word list has been reduced to a list of 283 words, which represents a mixture of basic vocabulary (e.g. ‘sun’, ‘wind’, ‘body’, ‘heart’, ‘to eat’, ‘all’) and cultural vocabulary (e.g. ‘teachers’, ‘Buddhist priest’, ‘monastery, temple’). To facilitate statistical analysis of the data, I added to the list 17 basic words to bring the overall number of words to a round 300.<sup>10</sup> The resulting list is provided in the appendix to this article. English glosses and the original Tibetan and Chinese transcriptions are quoted from Nishida (1973: 118–160). Nishida’s

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<sup>10</sup> These words are ‘month’, ‘yesterday’, ‘last year’, ‘intestines, bowels’, ‘gallbladder’, ‘urinary bladder’, ‘sweat’, ‘spittle’, ‘excrement’, ‘urine’, ‘pus’, ‘to drink’, ‘to cry, to weep’, ‘to wear’, ‘to take off’, ‘stupid’, and ‘this’. These 17 words lack a form in the “XFYY” column in the table of comparative vocabulary in the appendix. A dictionary of Duoxu is in preparation, which will include all words recorded for this language.

reconstructions of XFYY Duoxu forms on the basis of their Tibetan and Chinese transcriptions are provided for reference (*ibid.*).<sup>11</sup> In the main text and in the appendix, XFYY entries are quoted in the following order: (1) Tibetan transliteration, (2) Chinese transcription in Chinese characters, (3) Nishida's reconstruction (marked with an asterisk). In the main text, the Chinese transcriptions are accompanied by their SW Mandarin readings (provided to the right of the Chinese character).<sup>12</sup> SW Mandarin readings are based on the vocabulary list of 3,000 items collected for the Chinese dialect of Mùlǐ by Lǐ Lán 李蓝 (p.c.). Tone on Mandarin forms is not indicated, as the issue of tonal correspondences between Mandarin and Duoxu forms is not essential for the present argument.

A comparison of Modern Duoxu with the Duoxu of XFYY reveals that the two stages of the language are still recognizably quite similar. Only 41 words (or 14.5% of 283 words) appear etymologically unrelated between the two varieties. Two points are worth mentioning. First, the changes in the vocabulary clearly reflect the change of cultural influences of the Duoxu, essentially, from Tibetan to predominantly Chinese and Yi. No less than 12 words (or 4%) are cultural words, namely, 'teachers', 'students', 'Buddhist priest', 'monastery, temple', 'key', 'bell', 'conch shell', 'god', 'book', 'ink', 'flower', 'incense'. In all these cases, the original Tibetan loan has been replaced by a Chinese or a Nuosu Yi loan. For example, 'incense (227)' is XFYY sog, 梭 so, \*<sup>-</sup>so. (which is likely a loan from Tibetan, WT *bsang*). In Modern Duoxu, this word has been replaced by a borrowing from Chinese, /ça<sup>32</sup>[-no<sup>53</sup>]/ (*xiāng* 香, SW Mandarin /çiaŋ<sup>44</sup>/). To take another example, the XFYY reading for 'monastery, temple (13)' is dgon pa yag, 公巴压 koŋ pa ja, \*<sup>-</sup>gun <sup>-</sup>pa <sup>-</sup>ya.. (This word is a loan from Tibetan, *dgon pa*; the morpheme /ja<sup>44</sup>/ is a native Duoxu word for 'house'.) Conversely, the Modern Duoxu form for 'temple' is /be<sup>44</sup>ja<sup>44</sup>/, which is a loan from Nuosu Yi, *bbur yi* [bu<sup>33</sup>zi<sup>33</sup>] 'shrine, temple'.<sup>13</sup>

<sup>11</sup> Nishida's reconstructions are cited in the original notation. The following conventions apply (Nishida 1973: 115-116): “—” : high even tone; “ˊ” : rising tone; “ˋ” : low even tone; “ˋˊ” : high falling tone; /-n/ : nasal coda; /-./ (syllable-final dot) : stop coda; /ö/ : [ʎ].

<sup>12</sup> The Chinese transcriptions of the Duoxu vocabularies in XFYY are likely to have been made in a SW Mandarin dialect, as evidenced by some characteristic sound changes. For example, initials /n/ and /l/ are not distinguished in many cases (see examples in this section). To take another example, one of the characteristics of SW Mandarin is that Middle Chinese voiced stops and affricates in the entering tone category developed in this group of dialects into voiceless aspirates. In contrast, in Northern Mandarin dialects, as represented by Standard Chinese, Middle Chinese voiced stops and affricates in the entering tone category developed into voiceless unaspirates. The Chinese transcription of the word 'hail (13)' in the vocabulary list illustrates such a characteristic SW Mandarin development. Based on the Tibetan transcription of this word as /tshu/, and the Modern Duoxu form /ts<sup>h</sup>u<sup>34</sup>/, the Chinese transcription of this form, “族”, is likely to have had the target reading /ts<sup>h</sup>u/ (that is, with a voiceless aspirated initial). This would be a regular SW Mandarin development from the Middle Chinese reading of 族, *dzuwk*, to /ts<sup>h</sup>u<sup>21</sup>/. (To compare, the Standard Chinese reading of this form is *zú* /tsu<sup>35</sup>/).

<sup>13</sup> Nuosu Yi examples are from the online *Nuosu Yi-Chinese-English Glossary* ([http://www.yihanyingcihui.net/?page\\_id=6065&lang=en](http://www.yihanyingcihui.net/?page_id=6065&lang=en)), accessed 26 September 2013.

Correspondences between Modern Duoxu forms and the 18th century Tibetan and Chinese transcriptions of their meaning equivalents in XFYY are generally regular. Consider the following examples. The Tibetan rhyme *-ad* regularly corresponds to Modern Duoxu /e/.<sup>14</sup> Examples include: ‘daytime (58)’ (XFYY *nad rko*, 奈孤 *lai ku*, \**nai* *ku*, Duoxu /*ne*<sup>44</sup>-*gu*<sup>44</sup>/) and ‘white (167)’ (XFYY *wad kyog*, 歪觉 *wai t̥ɕo*, \**wai* *co*.; Duoxu /*we*<sup>44</sup>-*t̥ɕo*<sup>44</sup>/). To take another example, Chinese character 觉 /t̥ɕo/ regularly corresponds to Modern Duoxu /t̥ɕo/. Examples include: ‘to be hard (41)’ (XFYY *khog skyog*, 课觉 *k<sup>h</sup>o t̥ɕo*, \**khö*. *co*.; Duoxu /*k<sup>h</sup>o*<sup>53</sup>-*t̥ɕo*<sup>32</sup>/), ‘between, in the middle (188)’ (XFYY *sku kyog*, 孤觉 *ku t̥ɕo*, \**ku* *co*.; Duoxu /*go*<sup>32</sup>-*t̥ɕo*<sup>44</sup>/), and ‘white’ (as above).

The phonological system does not appear to have changed considerably between XFYY Duoxu (cf. Nishida 1973: 116) and Modern Duoxu, as represented by the speech of the conservative group of speakers. Furthermore, an examination of correspondences between Modern Duoxu and its earlier attestations in XFYY suggests many parallels between synchronic phonetic variation and change (as discussed in section 2) and diachronic change. The following correspondences between Modern Duoxu and XFYY Duoxu are a case in point:

(1) Modern Duoxu forms with the initial /n/ vs. XFYY forms with the initial /l/, or vice versa (the distinction between /n/ and /l/ can be ascertained on the basis of Tibetan transcriptions)

(a) ‘moon (3)’: /*ne*<sup>32</sup>-*ma*<sup>53</sup>/ : XFYY *lam ma*, 良麻 *nian ma*, \**lan* *ma*

(b) ‘south (178)’: /*ne*<sup>32</sup>-*t̥ɕ<sup>h</sup>o*<sup>44</sup>/ : XFYY *lho phyogs*, 鲁鹊 *lu t̥ɕ<sup>h</sup>o* (where the Tibetan transcription represents the standard WT spelling for ‘south’), \**lu* *tsho*.

(c) possibly, also ‘age, year (85)’: /*ne*<sup>44</sup>/ : XFYY *lug*, 遛 *niəu*, \**liu*.

Additional support for the interpretation of the Duoxu form for ‘age, year’ as /lju/ comes from other forms in XFYY, which are transcribed with Tibetan *lug* and the Chinese phonetic 留 /niəu/. These are: (i) ‘to plunder (284)’: XFYY *su lug*, 续骝 *çy niəu*, \**su* *liu*., Modern Duoxu /*[çu*<sup>44</sup>] *lju*<sup>53</sup>/; (ii) ‘to eat, edibles (221)’: XFYY *byi lug*, 唧留 *t̥ɕi niəu*, \**dzi* *liu*., Modern Duoxu /*dzi*<sup>32</sup>-*lju*<sup>32</sup>/.

(d) ‘tiger (206)’: /*la*<sup>32</sup>/ : XFYY *nag phag*, 拏 *la*, \**na*. *pha*.

These correspondence patterns (/n/ to /l/, or vice versa) are parallel to the variation between /n/ and /l/ in Modern Duoxu.

(2) Marginal prenasalization or absence of prenasalization in some Modern Duoxu forms vs. prenasalization on some XFYY forms (as based on their Tibetan transcriptions) (I take the WT *a-chung* in the left-graph position to represent prenasalization of a following stopped consonant, cf. Beyer 1992: 47, fn. 10.)

(a) ‘gate, door (129)’: Duoxu [*dza*<sup>53</sup>(-*pu*<sup>32</sup>)] or [*ndza*<sup>53</sup>(-*pu*<sup>32</sup>)]: XFYY *’jag*, 架 *t̥ɕa*, \**ja*.

(b) ‘mountain (24)’: Duoxu [*ba*<sup>44</sup>] or [*mba*<sup>44</sup>]: XFYY *’pag*, 巴 *pa*, \**pa*.

(c) ‘smoke (16)’ (literally, ‘sky-smoke’): Duoxu /*me*<sup>32</sup>-*k<sup>h</sup>a*<sup>44</sup>/ : XFYY *dme’ khag*, 麦卡 *mei k<sup>h</sup>a*, \**mai* *kha*.

<sup>14</sup> WT *-ad* to modern Tibetan /e/, /ɛ/ (or /ɛʔ/) is a common change in many Tibetan dialects (e.g. Bātāng *’ba’ thang* 巴塘 Tibetan /ɛʔ/, Gésāng 1989: 345; Kami Tibetan /e/, Chirkova in press).

(3) Modern Duoxu /w/ (synchronously in variation with /ɣ/) vs. XFYY forms with the initial /w/ or with velar or glottal fricative initials

(a) Modern Duoxu /w/ : XFYY /w/

(i) ‘rain (12)’: Duoxu /wa<sup>53</sup>-dʒu<sup>32</sup>/ : XFYY wa 'ju, 凹鞠 wa tɕiu, \*<sup>ˉ</sup>wa ˉju

(ii) ‘head (93)’: Duoxu /wu<sup>53</sup>dʒu<sup>32</sup>/ : XFYY wu 'ju, 务鞠 u tɕiu, \*<sup>ˈ</sup>wu ˉju

(iii) ‘wine (155)’: Duoxu /wu<sup>53</sup>/ : XFYY wo, 雾 u, \*<sup>ˈ</sup>wu

(iv) ‘rat (203)’: Duoxu /wu<sup>53</sup>-pu<sup>32</sup>/ : XFYY wu, 务 u, \*<sup>ˈ</sup>wu

(b) Modern Duoxu /w/ : XFYY velar or glottal fricative initials

(i) ‘rich man (83)’: Duoxu /wa<sup>32</sup>ma<sup>44</sup>/ : XFYY hag mag, 哈妈 xa ma, \*<sup>ˉ</sup>ha. ˉma.

(ii) ‘road (28)’: Duoxu /wa<sup>44</sup>-ma<sup>44</sup>/ : XFYY hag mag, 哈马 xa ma, \*<sup>ˉ</sup>ha. ˉma.

(iii) ‘bear (201)’: Duoxu /wa<sup>44</sup>/ : XFYY hag, 哈 xa, \*<sup>ˉ</sup>ha.

The Tibetan and Chinese transcriptions of these three Duoxu forms point to a velar or a glottal fricative initial.<sup>15</sup> The change from a velar or glottal fricative in XFYY Duoxu to /w/ in Modern Duoxu is parallel to the variation and change involving /w/ and /ɣ/ sounds in Modern Duoxu (due to the acoustic similarity of these sounds, cf. Ohala & Lorentz 1977; Ohala 1979).

(c) (sporadically, also) Modern Duoxu /w/ : XFYY nasal initials

‘outside (187)’: Modern Duoxu /wa<sup>32</sup>-p<sup>h</sup>o<sup>53</sup>/ : XFYY no phog, 怒破 lu p<sup>h</sup>o, \*<sup>ˈ</sup>nu ˈpho.

An example of an inverse relationship (Modern Duoxu velar nasal initial : XFYY /w/) can be noted:

‘silver (223)’: Duoxu /ŋo<sup>44</sup>/ : XFYY wo, 物 u, \*<sup>ˈ</sup>wu

This is again parallel to the sporadic alternation involving Modern Duoxu [w] and [ŋ].

The noted changes between Modern Duoxu and XFYY Duoxu parallel the synchronic phonetic variation and change in Modern Duoxu, as discussed in section 2. A similarity in the patterns of variation and change suggests a similarity in the causes for variation and change, which may be attributed, at least in part, to external influence from SW Mandarin (which has been in ever increasing contact with Duoxu over the last two hundred years). This influence is essentially manifested in the reduction of those phonological distinctions that do not exist in Mandarin. As a result, among the two stages of the language (XFYY Duoxu and Modern Duoxu), we again observe change from a phonologically more complex variety (XFYY Duoxu) to a phonologically more reduced variety (Modern Duoxu). In other words, even the conservative variety of Modern Duoxu as attested in recent fieldwork represents a simplified version of XFYY Duoxu, and it is likely to have been considerably remodeled on the basis of SW Mandarin patterns.

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<sup>15</sup> To compare, in the Báimǎ vocabularies of XFYY, the character 哈 /xa/ is used to record a broad range of essentially velar and glottal sounds in the Báimǎ language (e.g. /k-, k<sup>h</sup>-, ɣ-, ŋ-, ŋɣ-, x-, ɣ-, fi-, but also /ʒ-, ndʒ-, ʃ-, ʒ-/ and zero initial) (Chirkova 2007).

#### 4. Cross-language comparison: Duoxu and Ersu & Lizu

This section extends the comparison between the 300 basic words in XFYY Duoxu and Modern Duoxu to the corresponding words in Ersu and Lizu.<sup>16</sup> It uses insights gained in the examination of synchronic variation in Modern Duoxu and diachronic change between XFYY Duoxu and Modern Duoxu to re-examine the relationship between Duoxu and its two putative sister languages, Ersu and Lizu. The discussion essentially relates to the issues of percentages of cognate sets and morphosyntactic differences between the three languages, as raised in Huáng & Yīn (2012).

An examination of correspondences between Modern Duoxu, its earlier attestations in XFYY, on the one hand, and Ersu and Lizu, on the other hand, suggest that the three languages have many related words in common. Furthermore, there are regular sound correspondences that exist between them. Two types of correspondences can be distinguished.

(1) Correspondences, involving sounds that are phonetically similar. This category can be illustrated with labial sounds in the three languages, as in Table 3.

<i>Correspondence pattern</i>	<i>Gloss</i>	<i>Duoxu</i>	<i>Ersu</i>	<i>Lizu</i>
p : p : p	‘to arrive (262)’	/pa <sup>53</sup> = la <sup>32</sup> /	/pà = lá/	/ <sup>RP</sup> [de-]pɪæ/
p <sup>h</sup> : p <sup>h</sup> : p <sup>h</sup>	‘to lean on’	/p <sup>h</sup> a <sup>53</sup> - ga <sup>32</sup> /	/p <sup>h</sup> à - əgá/	/ <sup>RP</sup> p <sup>h</sup> æ - gæ/
b : b : b	‘not listen (296)’	/ma <sup>32</sup> = ba <sup>53</sup> ɲa <sup>32</sup> /	/mà = bání/	/ <sup>LP</sup> mæ = bæɲi/
m : m : m	‘many (241)’	/mja <sup>53</sup> /	/mí/ [mjé]	/ <sup>RP</sup> mjæ - mjæ/
w : w : w	‘pig (215)’	/wo <sup>32</sup> /	/vé/	/ <sup>F</sup> wo/

Table 3: Examples of correspondences involving labial initials in Duoxu, Ersu, and Lizu

These correspondence sets also illustrate the vowel correspondence a : a : æ between Duoxu, Ersu, and Lizu, respectively. (The fronting and raising of the vowel in the Ersu form for ‘many’ is due to the assimilatory effect of the medial glide -j-. This glide has distinct historical developments in the three languages, as discussed in Chirkova & Handel 2013b. Correspondence patterns with Duoxu /w/ are complex, as discussed below.)

(2) Correspondences, involving sounds that are not superficially phonetically similar. In the light of the discussion in the preceding sections, some correspondences of this type may be understood as being due to long-standing influence from SW Mandarin on Duoxu. To appreciate this point, one needs to take into account the fact that Ersu and Lizu are more complex than Duoxu in terms of the overall number of phonological distinctions. To take the Miǎnníng variety of Lizu (a close neighbor of Duoxu for several centuries) as an example,

<sup>16</sup> Ersu and Lizu data are from personal fieldwork. Ersu is represented by the variety of Gānlùò county; and Lizu is represented by the variety of Kālā township of Mùlǐ county. See Chirkova et al. (forthcoming) and Chirkova and Chen (2013) for the phonetic-phonological sketches of Ersu and Lizu, respectively.

I consider Ersu and Lizu to be closely related, taking Yu’s (2012) successful reconstruction of the hypothetical parent language of Ersu and Lizu, based on regularly recurring sound correspondences in a large number of cognate sets, as strong evidence of a close relationship between these two languages.

the essential differences of the consonantal system of Duoxu from that of Lizu are in the presence in the system of Lizu of (a) a voiceless lateral fricative ( $\text{ɬ}$ ), (b) contrastive prenasalized voiced and voiceless aspirated stops and affricates, and (c) consonantal clusters with the medial glide  $-w-$  (cf. Yu 2012: 6–8). Correspondences between Duoxu and Ersu & Lizu, which involve sounds that are not superficially phonetically similar and that are likely to reflect external influence from SW Mandarin, essentially relate to those phonological distinctions that exist in Ersu and Lizu, but do not exist in Duoxu and SW Mandarin. Consider the following correspondence sets:

(1) Duoxu  $/l/$  : Ersu & Lizu  $\text{ɬ}$ /

Examples include:

(a) ‘lightning (7)’: Duoxu  $/la^{32}/$  (XFYY *dme lag*, 墨拉 *mei la*, \* $\text{m}^0\text{ö} \text{—}la$ ) : Ersu  $/[m\acute{e}\text{—}]\text{ɬj}^0/$  : Lizu  $/^{RP}[me\text{—}]\text{ɬe}/$

(b) ‘month (45)’: Duoxu  $/lja^{32}/$  : Ersu  $\text{ɬ}^1a/$  : Lizu  $/^F\text{ɬ}^1\text{æ}/$

(c) ‘god (171)’: Duoxu  $/la^{34}/$  ‘god’ : Ersu  $\text{ɬ}^1a/$  : Lizu  $/^F\text{ɬ}^1\text{æ}/$

(d) ‘ladder (150)’: Duoxu  $/t\text{ɕe}^{44}le^{44}/$  (XFYY *dzed le*, 结列 *tɕiɛ niɛ*, \* $\text{d}^1ze$ .  $\text{le}$ ) : Ersu  $\text{ɬ}^1\text{ɬ}^1\text{ɕ}^1/$  : Lizu  $/^{LP}\text{ɬ}^1\text{et}\text{ɕ}^1i/$

This change can be viewed as an instance of the replacement in Duoxu of a segment that does not exist in the phonological system of the dominant contact language SW Mandarin (that is,  $\text{ɬ}$ ), with a segment that exists in the phonological systems of SW Mandarin (that is,  $l$ ).

Following the replacement of  $\text{ɬ}$  by  $l$ , the latter can further merge with  $n$ , as part of the gradual loss of the distinction between  $l$  and  $n$  in Duoxu under the influence of SW Mandarin. This change can be observed in the following words:

(e) ‘moon (3)’:<sup>17</sup> Duoxu  $/\text{jne}^{32}[-ma^{53}]/$  (XFYY *lam ma*, 良麻 *nian ma*, \* $\text{l}^1an$   $\text{ma}$ ) : Ersu  $\text{ɬ}^1a[-p^h\acute{e}]/$  : Lizu  $/^{LP}\text{ɬ}^1\text{æ}[-p^he]/$

<sup>17</sup> An anonymous reviewer of this paper pointed out that the roots for ‘moon’ and ‘month’ should be the same, while they appear to be different in Duoxu (respectively,  $/\text{jne}^{32}[-ma^{53}]/$  and  $/lja^{32}/$ ). In my analysis, these two Duoxu forms do indeed share the same root. Of the two forms,  $/lja^{32}/$  (in ‘month’) is likely to be more conservative (as also suggested by the corresponding Ersu and Lizu forms for ‘month’ and ‘moon’). Conversely,  $/\text{jne}^{32}/$  (in  $/\text{jne}^{32}[-ma^{53}]/$  ‘moon’) represents a development of that more conservative form, conditioned by the medial glide  $/j/$  and the nasal consonant  $/m/$ . Both  $/j/$  and nasals have assimilatory effects on the neighboring vowels. While  $/j/$  generally contributes to the raising of vowels (e.g. Ladefoged & Maddieson 1996: 286–288), nasalization promotes raising of low vowels (see Beddor 1991 for a detailed discussion). Anticipatory nasalization on the vowel preceding  $/m/$  may be an additional factor that has contributed to the change in the initial of this form (from  $/lj/$  to  $/nj/$ ). Overall, medial elements with a high tongue position and nasals are two important factors that promoted raising of low vowels in Duoxu, Ersu, and Lizu (cf. Chirkova & Handel 2013b). Attestations of Duoxu in XFYY are particularly valuable in that they may point to earlier nasal codas or nasalized vowels, which are no longer part of the phonemic inventories of modern Duoxu, Ersu, and Lizu. Take the Chinese character 𠵼  $/tsan/$  as an example. It is used in the transcription of many Duoxu forms in XFYY, including ‘bridge (29)’, ‘daughter (74)’, ‘north (179)’, ‘leaf (195)’, ‘dragon (208)’, and some others. An original nasal coda in these forms would account for the raising of the vowel in the Ersu and Lizu forms (e.g. ‘bridge’, likely a loan from Tibetan, WT *zam*: Duoxu  $/dza^{44}/$ , Ersu  $/\text{ɬ}^1zi/$ , Lizu  $/^F\text{d}ze/$ ). Further research is needed to explore this issue.

(f) ‘south (178)’: Duoxu /je<sup>32</sup>-tɕ<sup>h</sup>o<sup>44</sup>/ (XFYY lho phyogs, 鲁鹊 lu tɕ<sup>h</sup>o, \*lu tsho.) : Ersu /ʎjò-tɕ<sup>h</sup>ó/ : Lizu /<sup>EP</sup>ʎo-meNtɕ<sup>h</sup>e/

(2) Duoxu plain initials : prenasalized initials in Ersu & Lizu

Examples include:

(a) ‘gate, door (129)’: Duoxu [dʒa<sup>53</sup>(-pu<sup>32</sup>)] or [ndʒa<sup>53</sup>(-pu<sup>32</sup>)] (XFYY 'jag, 架 tɕa, \*ja.) : Ersu /Ngà/ : Lizu /<sup>R</sup>Ngæ, <sup>LP</sup>Ngæ-[pu]/

(b) ‘mountain (24)’: Duoxu [ba<sup>44</sup>] or [mba<sup>44</sup>] (XFYY 'pag, 巴 pa, \*pa.) : Ersu /Nbí/ : Lizu /<sup>R</sup>Nbje/

(c) ‘smoke (16)’ (literally, ‘sky-smoke’): Duoxu /me<sup>32</sup>-k<sup>h</sup>a<sup>44</sup>/ (XFYY dme' khag, 麦卡 mei k<sup>h</sup>a, \*mai\_kha.) : Ersu /mè-Nk<sup>h</sup>é/ : Lizu /<sup>RP</sup>me-Nk<sup>h</sup>e/

This change can be viewed as yet another example of the replacement of those segments that do not exist in the contact variety of Duoxu, SW Mandarin, with those segments that exist in that variety. Prenasalization on voiceless initials is likely to have been lost in Duoxu first (as we find no indications of possible prenasalization in the words above in the Tibetan transcriptions in XFYY). Prenasalization on voiced initials is likely to have persisted longer, and it is also marginally attested in Modern Duoxu. This is presumably due to the phonetic affinity between prenasalization and voiced initials (cf. Ohala 1983:194–201).

(3) Multiple correspondences between Duoxu /w/ and various initials in Ersu & Lizu (cf. Nishida 1976: 5). These correspondences are parallel to the variation between /w/ and /ɣ/ in Modern Duoxu (as discussed in section 2), and to that between Modern Duoxu /w/ and various (velar or glottal) initials in XFYY Duoxu (as discussed in section 3).

Examples include:

(a) Duoxu /w/ : Ersu & Lizu /w/

‘head (93)’: Duoxu /wu<sup>53</sup>dʒu<sup>32</sup>/ (XFYY wu 'ju, 务鞠 u tɕiu, \*wu ɿju) : Ersu /ʎlí/ : Lizu /<sup>LP</sup>wuli/

(b) Duoxu /w/ : Ersu & Lizu velar initials (stop, fricative, nasal)

(i) ‘rat (203)’: Duoxu /wu<sup>53</sup>-pu<sup>32</sup>/ (XFYY wu, 务 u, \*wu) : Ersu /gý-p<sup>h</sup>á/ : Lizu /<sup>RP</sup>ɣo-p<sup>h</sup>æ/

(ii) ‘wine (155)’: Duoxu /wu<sup>53</sup>/ (XFYY wo, 雾 u, \*wu) : Ersu /ý/ : Lizu /<sup>R</sup>ɣo/ [<sup>R</sup>ʂo]

(iii) ‘bear (201)’: Duoxu /wa<sup>44</sup>/ (XFYY hag, 哈 xa, \*ha.) : Ersu /xá/ : Lizu /<sup>R</sup>ŋo/

(c) Duoxu /w/ : Ersu & Lizu clusters with /w/

(i) ‘rain (12)’: Duoxu /wa<sup>53</sup>-dʒu<sup>32</sup>/ (XFYY wa 'ju, 凹鞠 wa tɕiu, \*wa ɿju) : Ersu /gwà-zó/ : Lizu /<sup>RP</sup>Ngwæ-ze/

(ii) ‘chicken, hen (213)’: Duoxu /wo<sup>53</sup>/ (XFYY 'od, 饿 o, \*fiö.) : Ersu /ɾá/ : Lizu /<sup>R</sup>ɿwæ/

In sum, correspondences between Duoxu and Ersu & Lizu that involve sounds that are not superficially phonetically similar may at least in part be explained under the assumption of the reduction in Duoxu of those phonological distinctions that do not exist in SW Mandarin and of their replacement with those phonological distinctions that exist in SW Mandarin. This entails that the phonological system of Duoxu was originally more complex than those attested in

XFYY Duoxu or Modern Duoxu, and that it was likely similar to that of Ersu and Lizu.

Recognizing the influence of SW Mandarin on Duoxu allows one to recognize higher percentages of shared vocabulary between Duoxu, Ersu, and Lizu than what was previously reported in the literature (Sūn 1982; Huáng & Yǐn 2012). Under this analysis, only 65 words (or 21.6% of the entire vocabulary list) appear to be etymologically unrelated in the three languages. In addition, 9 words (or 3%) are dissimilar in Duoxu and Ersu, but similar in Duoxu and Lizu. Finally, in 11 cases (3.6%), Duoxu shows a recent development whereby Modern Duoxu has replaced certain forms (that were recorded in XFYY as cognate with Ersu and Lizu) by new words.<sup>18</sup> Therefore, it appears that Duoxu has been growing more distant (at least, lexically) from Ersu and Lizu over the last two hundred years. In sum, over 80% of all words on the list appear to be related in the three languages. These estimates are considerably higher than those in Sūn 1982 (50%) or in Huáng & Yǐn 2012 (40 to 42%).

In addition to evaluating cognacy of lexical items and sound correspondences across the related words, it is also possible to carry out morphosyntactic analysis on some of the recorded vocabulary in order to assess morphosyntactic properties and compare them across languages. The following observations can be made on the basis of the vocabulary list.

First, contra Huáng & Yǐn (2012), it can be noted that Duoxu has directional prefixes. The most frequent directional prefix, which is also reflected in the vocabulary list in this study, is /mi-/. This prefix indicates an upward direction, as in ‘to raise (286)’: Duoxu /mi<sup>32</sup>-tɕ<sup>hi32</sup>/.<sup>19</sup> Additional examples include: /mi<sup>32</sup>-p<sup>h</sup>je<sup>34</sup>/ ‘to spit out’ (from /p<sup>h</sup>je<sup>34</sup>/ ‘to spit’), /mi<sup>32</sup>-k<sup>h</sup>o<sup>53</sup>/ ‘to give out, give in marriage (a daughter)’ (form /k<sup>h</sup>o<sup>53</sup>/ ‘to give (277)’), /mi<sup>32</sup>-ka<sup>44</sup>/ ‘take off (clothes)’ (from /ka<sup>44</sup>/ ‘to take off (283)’). This prefix is also used to denote the perfective aspect, as in the following examples: /mi<sup>32</sup>-tɕ<sup>h</sup>a<sup>53</sup>/ ‘have sold’, /mi<sup>32</sup>-ʒo<sup>32</sup>=la<sup>44</sup>/ ‘have thrown away; have lost’, /mi<sup>32</sup>-tɕ<sup>h</sup>e<sup>32</sup>-tɕ<sup>h</sup>e<sup>44</sup>/ ‘have released’, /mi<sup>32</sup>-tʂa<sup>33</sup>=la<sup>44</sup>/ ‘have repaid (a debt)’ (from /tʂa<sup>34</sup>/ ‘to repay (280)’). Another Duoxu high frequency directional prefix is /ɣ-/, which denotes a downward direction, as in /ɣ<sup>32</sup>-tɕ<sup>hi32</sup>/ ‘to lower (e.g. the head)’, /ɣ<sup>32</sup>-ɲi<sup>32</sup>/ ‘to sit down’. Additional directional prefixes, of lesser frequency, include /dʒi-/ ‘upward’ (as in the verb /dʒi<sup>32</sup>-la<sup>32</sup>/ ‘to enter (266)’ in the vocabulary list, which means ‘to come up’ in Modern Duoxu), and /na-/, which tentatively denotes reciprocal action in some verbs, such as /na<sup>32</sup>-dʒa<sup>32</sup>/ ‘to love’ (from /dʒa<sup>32</sup>/ ‘to like, to love (254)’), and /na<sup>32</sup>-dʒe<sup>34</sup>/ ‘to scold’.

The morpheme /ta/, which is frequently used with verbs in XFYY (as in /pad dag, 擺大 pai ta, \*\_pai `da/ ‘to arrive (262)’ is a durational auxiliary, corresponding to Modern Duoxu /ta/, modern Ersu /ta/, and modern Lizu /tɕa/.

<sup>18</sup> For example, ‘to be soft (40)’ is XFYY ɲi mo, 宜磨 ɲi mo, \*\_ɲi `mo; Ersu /ɲjò-ɲjò/, Lizu /<sup>EP</sup>ɲy-ɲy/, but modern Duoxu /bje<sup>44</sup>ka<sup>44</sup>/. To take another example, ‘to be lazy (91)’ is XFYY mag tho, 马兔 ma t<sup>h</sup>u, \*\_ma. `thu; Ersu /má-tɕó/, Lizu /<sup>RP</sup>mæ-t<sup>h</sup>u/; but modern Duoxu /ge<sup>53</sup>/.

<sup>19</sup> The corresponding forms in Ersu and Lizu are /dɛ-tɕ<sup>h</sup>ɰ/ and /<sup>EP</sup>de-tɕ<sup>h</sup>ə/, respectively. The prefixes /dɛ-/ and /de-/ both mean ‘upward’.

The morpheme /la/, as in the Modern Duoxu and Ersu forms for ‘to arrive’ (/pa<sup>53</sup> = la<sup>32</sup>/ and /pà = lá/, respectively), is likely to be related to the verb ‘to come (260)’ and it indicates completion.

The three languages have agentive and patient nominalizers with the same meaning and of comparable form. The agent nominalizer can be illustrated with the form for ‘thief (87)’, which is Duoxu /mu<sup>44</sup>-ɕu<sup>32</sup>/, Ersu /Np<sup>h</sup>ò-ɕý/, and Lizu /<sup>EP</sup>pʃe-su/. The morphemes /ɕu/, /ɕý/, and /su/, respectively are agent nominalizers meaning ‘person, man’, whereas the preceding verbal root means ‘to steal’. The same agent nominalizer can also be seen in the autonyms of the groups, respectively, /do<sup>44</sup>-ɕu<sup>44</sup>/, /lɕ-ɕý/ [ɕ-ɕý], and /<sup>EP</sup>li-zu/. The patient nominalizer can be illustrated with the form ‘things to eat, edibles (221)’, which is Duoxu /dʒi<sup>32</sup>-lju<sup>32</sup>/, Ersu /dzɕ-lí/, Lizu /<sup>RP</sup>dʒə-lje/. The morphemes /lju/, /li/, and /lje/ are patientive nominalizers in the three languages, and the preceding verbal root means ‘to eat’.

The three languages share similar classifier systems with identical cognate classifier forms, such as /pu/ ‘item’ (as in ‘gate, door (129)’): Duoxu /dʒa<sup>53</sup>-pu<sup>32</sup>/, Lizu /<sup>LP</sup>Ngæ-pu/) or /ka/ (or /ga/), classifier for elongated objects (as in ‘(one) river (cf. 27)’, Duoxu /wu<sup>44</sup>-ga<sup>32</sup>/, Ersu /ɕzó tá-ká/, Lizu /<sup>RP</sup>dʒe te-kæ/, where Ersu /ta/ and Lizu /te/ both mean ‘one’).

In sum, Duoxu, Ersu, and Lizu share considerable percentages of related words, they are likely to originally have had comparable phonemic inventories, they have a similar morphosyntactic structure, and they have related function words and classifiers. It is therefore reasonable to assume that Duoxu is in fact closely related to Ersu & Lizu. The superficial differences between Duoxu and Ersu & Lizu can be attributed to long-standing and on-going contact influence from SW Mandarin.

## 5. Discussion and conclusion

This study presented new fieldwork data and new analysis of the critically endangered and virtually undescribed Duoxu language. It compared the newly collected data with earlier attestations of Duoxu in XFYY, dating from the 18th century, as well as with the two putative sister languages of Duoxu, Ersu, and Lizu. Parallels were found between variation and change across time (the two stages of Duoxu) and across languages (Duoxu vs. Ersu & Lizu). These were identified as being due to long-standing influence from SW Mandarin. Related changes mostly manifested themselves in the reduction of those (original) phonological distinctions that do not exist in the contact language of Duoxu, SW Mandarin. Assuming that the phonemic inventory of Duoxu was originally comparable to that of Ersu and Lizu, a comparison across time and across languages (as in sections 2-4) allows us to tentatively reconstruct the following course of sound change in Duoxu under the contact influence of SW Mandarin:

(1) (before the stage recorded in XFYY) the replacement of the lateral fricative /ɬ/ with the lateral approximant /l/

(2) (before the stage recorded in XFYY) the replacement of prenasalized voiceless aspirated stops and affricates with plain voiceless aspirated stops and affricates

(3) (before the stage recorded in XFYY) the replacement of clusters with -w- with /w/

(4) (before the stage recorded in XFYY and the stage recorded in XFYY ) the replacement of some velar and/or glottal stops and fricatives with /w/

(5) (the stage recorded in XFYY until present) the replacement of prenasalized voiced stops and affricates with plain voiced stops and affricates

(6) (presently) the replacement of /ɣ/ with /w/ and of /ʒ/ with /j/

(7) (presently) the replacement of voiced stops and affricates with voiceless stops and affricates.

It is noteworthy that most changes (1-7) appear to have developed incrementally over a relatively long period of time. This is consistent with findings in bilingual speakers of other endangered languages (such as Washo [Yu 2008] or Northern Paiute [Babel 2009]) that categorical changes (such a replacement of one segment with another) are preceded by a series of gradient phonetic changes without neutralizing phonological contrasts. The pace of change has clearly accelerated in Modern Duoxu, due to a break-down in language transmission and the dramatically reduced number of speakers. Hence the urgency of its documentation and study.

Understanding diachronic change in Duoxu as being constrained by interference from SW Mandarin allows one to recognize more shared lexical items between Duoxu, Ersu, and Lizu than what was previously reported in the literature. While higher percentages of related words suggest that the three languages are closer than previously argued, these higher percentages do not necessarily entail that the three languages have an especially close relationship. Obviously, the high percentages need to be coupled with detailed cognate sets and diagnostic evidence (such as shared innovative changes between the three languages and paradigm-like sets of cognate words and/or morphological markers) (cf. Nichols 1996, LaPolla 2013). Work in this direction is in progress as part of an ongoing historical-comparative study of Ersu, Lizu, and Duoxu (collectively ELD) (Chirkova & Handel 2013a, 2013b; Chirkova & Handel ms.).

This study seeks to improve on Dominic Yu's (2012) solid reconstruction of a recent common ancestor of Ersu and Lizu, by adducing Duoxu data and providing reconstructed sounds that are consistent with phonetically-motivated sound change. One recent finding can be noted as suggestive of an especially close relationship between Ersu, Lizu, and Duoxu: the voiceless nasal correspondence pattern that can set Ersu, Lizu, and Duoxu apart from other languages in the region. More specifically, voiceless nasals (\* $\text{m̥}$  \* $\text{n̥}$  \* $\text{ŋ̥}$ ) are posited in the recent common ancestor of Ersu, Lizu, and Duoxu (Proto-ELD) on the basis of cognate sets like the following for 'bamboo' (Chirkova & Handel 2013a, ms.):

'bamboo (192)': Ersu /xì/, Lizu /<sup>F</sup>hẽ/, Duoxu /mi<sup>44</sup>/ (suggesting the Proto-ELD initial / $\text{m̥}$ /)

This ELD correspondence pattern correlates highly with various kinds of nasals within Tibeto-Burman, most notably with \*sN clusters that are known to develop into voiceless nasals in some TB languages. To take the word 'bamboo' as an example, the corresponding Proto-Tibeto-Burman form is \*s-m(y)ik 'bamboo sprout', and that in Written Burmese is /hmyi?/ 'bamboo shoot'.

Taking a greater degree of manner agreement in nasal-initial cognates between languages to reflect a close historical relationship, the voiceless nasal correspondence pattern in the ELD cluster suggests that the three languages are closely related to each other. This corroborates Sūn's view of a close relationship between Ersu, Lizu, and Duoxu. However, if mutual intelligibility is taken as the main criterion, Ersu, Lizu, and Duoxu need to be seen as separate languages, and not as dialects of one Ersu language (cf. Yu 2012: 1). Naturally, much more work is required to establish beyond doubt a close relationship between Ersu, Lizu, & Duoxu, and their position within the broader Tibeto-Burman family.

From a broader perspective, Duoxu provides a window on contact-induced change in the historically multi-ethnic region that is Western Sichuān and Southwest China in general, where language attrition and contact-induced change are an integral part of the larger picture of linguistic dynamism and variability. Documenting and understanding the precise features and the mechanism of loss and change in multilingual communities have significance for linguistic comparison and for our understanding of the recent histories of the local languages. The need to document and understand the features and the mechanism of loss and change in multilingual communities also highlights the interest and importance of variationist research of these languages involving multiple speakers (cf. Stanford & Preston 2009). As a bonus, an increased complexity of investigation provides more versatile and rich documentation data, which are essential for an adequate analysis and preservation of endangered languages, such as Duoxu.

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**Appendix: Duoxu-Ersu-Lizu basic vocabulary list with transcriptions from Duoxu vocabularies as recorded in Xīfān Yīyǔ (Nishida 1973: 118-160)**

The following English-Duoxu-Ersu-Lizu vocabulary list with transcriptions from Duoxu vocabularies in *Xīfān Yìyǔ* (hereafter XFYY) comprises 300 words. *Xīfān Yìyǔ* data—Tibetan and Chinese transcriptions (in simplified characters), Duoxu reconstructions, and English glosses—are all quoted from Nishida (1973: 118–160). Duoxu, Ersu, and Lizu data are from my personal fieldwork. Ersu data are based on the variety of Gānlò (甘洛) county; Lizu data on the variety of Kālā (卡拉) township of Mùlǐ (木里) county. See Chirkova et al. (forthcoming) and Chirkova & Chen (2013) for phonetic-phonological sketches of Ersu and Lizu, respectively. In the transcriptions of words, ‘-’ stands for morpheme boundary and ‘=’ stands for clitic boundary. Morphemes that are non-cognate across the languages are put in square brackets.

Written Tibetan (WT) forms for Tibetan loans in Duoxu, Ersu, and Lizu are provided in footnotes, unless the standard WT spelling is already part of the XFYY Tibetan transcriptions of the words in question.

Shaded cells in the column “Gloss” indicate that Duoxu form is not cognate to the Ersu and/or Lizu forms. Shaded cells in the column “XFYY” indicate that modern Duoxu form is not etymologically related to the XFYY form.

No	Gloss	XFYY	Duoxu	Ersu	Lizu
1	heaven <sup>20</sup>	drmi', 墨, *`möö	[na <sup>32</sup> k <sup>h</sup> a <sup>44</sup> -]me <sup>32</sup>	mè[-tsó]	<sup>RP</sup> [neNk <sup>h</sup> e]me
2	sun	ne ma, 乃麻, *`nai 'ma	ne <sup>44</sup> -ma <sup>44</sup>	njò-má	<sup>LP</sup> ni-ma
3	moon	lam ma, 良麻, *`lan 'ma	ne <sup>32</sup> [-ma <sup>53</sup> ]	lá[-p <sup>h</sup> é]	<sup>LP</sup> læ[-p <sup>h</sup> e]
4	star	kir, 更, *`kōN	ki <sup>34</sup>	[tʃ]	<sup>R</sup> tʃə
5	cloud	jag, 甲, *`ja.	tʃa <sup>34</sup>	tsé	<sup>R</sup> tʃe
6	thunder	dme 'jiq, 墨吉, *`mō 'ji.	me <sup>32</sup> -dzi <sup>32</sup>	mè-dzʒ	<sup>RP</sup> me-dʒe
7	lightning	dme laq, 墨拉, *`mō -la.	la <sup>32</sup>	[mé-]ʃjó	<sup>RP</sup> [me-]ʃe
8	frost	keg, 隔, *`kō.	ke <sup>34</sup>	[tʃʒ-]tʃó	<sup>R</sup> tʃə
9	snow	we, 噎, *`we	je <sup>32</sup>	ʒ	<sup>F</sup> ji
10	fog <sup>21</sup>	nu mo, 喏模, *`no 'mo	tʃa <sup>34</sup>	[tʃ]	<sup>R</sup> tʃə
11	dew	ni hin, 呢恨, *`ni `hōN	[ke <sup>32</sup> -]ʃo <sup>53</sup> , ni <sup>32</sup> - xi <sup>53</sup>	ʃy[-xé]	<sup>EP</sup> ʃu[-hē]
12	rain	wa 'ju, 凹鞠, *`wa -ju <sup>22</sup>	wa <sup>53</sup> -dzu <sup>32</sup>	gwà-zó	<sup>RP</sup> Ngwæ-ze
13	hail	tshu, 族, *`tsu	ts <sup>h</sup> u <sup>34</sup>	Ntʃ <sup>h</sup> y	<sup>F</sup> Ntʃ <sup>h</sup> u
14	wind	dme' li, 墨利, *`möö `li	me <sup>32</sup> -le <sup>44</sup>	mé-lʒ [mé- ǝ]	<sup>RP</sup> me-lje
15	rainbow <sup>23</sup>	lam rtog wo khe, 良多乌 刻, *`lan -to. -wu `khō	ljaŋ <sup>32</sup> do <sup>44</sup> wu <sup>53</sup> k <sup>h</sup> e <sup>32</sup> ka <sup>34</sup> ǝ <sup>34</sup>	mé-k <sup>h</sup> wá	<sup>RP</sup> me-Nq <sup>h</sup> e
16	smoke	dme' khag, 麦卡, *`mai kha.	me <sup>32</sup> -k <sup>h</sup> a <sup>44</sup>	mè-Nk <sup>h</sup> é	<sup>RP</sup> me-Nk <sup>h</sup> e
17	the sky is cleared	dme bde', 墨德, *`mō `döö	me <sup>32</sup> -dje <sup>44</sup>	mè-Ndé	<sup>LP</sup> me [ne- ]Nde
18	the sky is cloudy	dme zhag, 墨呀, *`mō - ya	me <sup>32</sup> -ja <sup>53</sup>	mè-ŋá	<sup>LP</sup> me [ne-]ŋe
19	(there is) rain	wa ju lag, 凹鞠拉, *`wa -ju -la.	wa <sup>53</sup> -dzu <sup>32</sup> la <sup>44</sup>	gwà-zó	<sup>RP</sup> Ngwæ-ze
20	earth	stag, 大, *`ta.	da <sup>53</sup> or nda <sup>53</sup>	[mé-]ljé	<sup>LP</sup> [me-]lje
21	water	wid, 威, *`wi	wu <sup>44</sup>	dzò	<sup>R</sup> dʒe
22	fire	mid, 祕, *`mi.	mje <sup>32</sup>	mè	<sup>F</sup> me
23	stone	lo po, 路补, *`lu _pu	lju <sup>53</sup> [-bu]	lʒ[-k <sup>h</sup> wá] [ǝ-k <sup>h</sup> wá]	<sup>LP</sup> lo[-bu]
24	mountain	'pag, 巴, *`pa.	ba <sup>44</sup> or Nba <sup>44</sup>	Nbí	<sup>R</sup> Nbje
25	sand <sup>24</sup>	mu shog, 模说, *`mo - sho.	[lju <sup>53</sup> ] ʃo <sup>32</sup> -da <sup>43</sup>	ʃáʃʒ	<sup>RP</sup> ʃo-lo
26	wall	lo tuq, 罗都, *`lo -tu.	dza <sup>32</sup> xa <sup>53</sup>	rɛNbá	<sup>LP</sup> lodʒe
27	river <sup>25</sup>	'ud shag, 威呷, *`wi -śa.	wu <sup>44</sup> [-ga <sup>32</sup> ]	dzò	<sup>F</sup> dʒe

<sup>20</sup> The word for 'sky', /me/, appears in many composite words, e.g. 'wind', 'rainbow', 'smoke'. The first two syllables in the Ersu and Lizu forms for 'sky' are loans from Tibetan, *gnam kha* [zheng] 'sky, heavens'.

<sup>21</sup> All three languages substitute 'fog' for 'cloud'.

<sup>22</sup> This expression means 'to rain'; the noun 'rain' is Duoxu /wa<sup>53</sup>/, Ersu /gwà/, Lizu /<sup>R</sup>Ngwæ/.

<sup>23</sup> The last two syllables in the Duoxu form are loan from SW Mandarin, 虹 /kaŋ<sup>213</sup>/ followed by the suffix 儿 /ǝ/.

<sup>24</sup> This Ersu form is a loan from SW Mandarin *shāzi* 沙子 /ʃa<sup>44</sup>tsə<sup>53</sup>/ 'sand'. The Duoxu and Lizu forms tentatively consist of the roots 'sand' and 'soil, earth'.

<sup>25</sup> The morpheme /ga<sup>32</sup>/ in the Duoxu form is a classifier for elongated objects, see also 'ditch (42)' below.

28	road	hag mag, 哈马, * <sup>-</sup> ha. ma.	wa <sup>44</sup> [-ma <sup>44</sup> ]	ʈʂ[-p <sup>h</sup> á]	LP ɹə[-p <sup>h</sup> æ]
29	bridge	rcag, 咱 * <sup>1</sup> tsa.	dza <sup>44</sup>	dʒí	F dʒe
30	to be far	a ra me', 啊墨, * <sup>-</sup> fa `möö	wa <sup>44</sup> -xe <sup>53</sup>	ʈʂ-ʂé	RP ɹə-ʃe
31	to be near	a ni, 阿呢, * <sup>-</sup> fa 'ni	wa <sup>44</sup> -ne <sup>32</sup>	ʈʂ-ní	RP ɹə-ni
32	to be long	he, 黑, * <sup>-</sup> he	xe <sup>34</sup>	sé	RP ]e-ʃe
33	to be short	skyen rtse, 见节, * <sup>-</sup> cen 'tse	tçe <sup>53</sup> -tçe <sup>32</sup>	dʒò-dʒó	RP de-de
34	to be deep	na, 那, * <sup>-</sup> na.	no <sup>34</sup>	ənjó	F ne [F <sup>n</sup> ne]
35	to be shallow	tag tshi, 大嗟, * <sup>-</sup> ta. -tse	ba <sup>32</sup>	bʒ-bʒ	EP Ndzi-Ndze
36	to be high	smo, 摸, * <sup>-</sup> mo	mo <sup>44</sup>	Nbó	RP Nbɹə-Nbɹə
37	to be low	yag mo, 压磨, * <sup>-</sup> ya. 'mo	ja <sup>32</sup> -mo <sup>53</sup> or ja <sup>32</sup> -mo <sup>53</sup>	ní-ní	EP ni-nje
38	to be wide	hyed, 歇, * <sup>-</sup> še.	gi <sup>44</sup> [la <sup>44</sup> ]	fí	EP dzi[le]
39	to be narrow	zhog, 汝, * <sup>-</sup> zhu.	wu <sup>32</sup>	zè-zé	EP zu-zu
40	to be soft	ni mo, 宜磨, * <sup>-</sup> ni 'mo	bje <sup>44</sup> ka <sup>44</sup>	njò-njó	EP ny-ny
41	to be hard	khog skyog, 课觉, * <sup>-</sup> khö. 'co.	k <sup>h</sup> o <sup>53</sup> -tço <sup>32</sup>	ká-ká-pí	RP qwe-qwe
42	ditch	pog shag, 薄呷, * <sup>-</sup> po. - śa.	bo <sup>32</sup> [-ga <sup>32</sup> ]	bó	LP [dʒe-]bo
43	year	khyud shed, 去设, * <sup>-</sup> chu. `shö	k <sup>h</sup> u <sup>53</sup> , je <sup>44</sup>	[bý-][t <sup>h</sup> é	EP [dʒu]t <sup>h</sup> e
44	day	ne mag, 乃麻, * <sup>-</sup> nai 'ma.	ne <sup>44</sup>	njó	F ne
45	month		lja <sup>32</sup>	łá	F łæ
46	to be hot	phyag, 擦, * <sup>-</sup> tsha.	tç <sup>h</sup> a <sup>44</sup>	tç <sup>h</sup> á	LP [de-]tç <sup>h</sup> æ
47	to be cold	go, 果, * <sup>-</sup> go	go <sup>32</sup>	Np <sup>h</sup> í	RP [de-]Np <sup>h</sup> je
48	to be cool	pel, 别, * <sup>-</sup> pe	wa <sup>44</sup> fo <sup>44</sup>	Nbiśá	EP Nbjɛʃwɛ
49	today	dag ne, 达乃, * <sup>-</sup> da. nai	ta <sup>44</sup> -ne <sup>44</sup>	tá-njó	RP tɛ-je
50	yesterday		ja <sup>32</sup> -ne <sup>44</sup>	já-njó	EP jæ-pe
51	tomorrow	sho wo, 庶无, * <sup>-</sup> shu 'wu	ʃ <sup>h</sup> o <sup>53</sup> -ne <sup>44</sup>	śó-njó	EP so-pe
52	this year	phyen ni, 前呢, * <sup>-</sup> tshen 'ñi	ts <sup>h</sup> e <sup>32</sup> -je <sup>44</sup> or tç <sup>h</sup> i <sup>32</sup> -je <sup>44</sup>	tç <sup>h</sup> é-xí	RP ts <sup>h</sup> e-hě
53	last year		ja <sup>32</sup> -ne <sup>44</sup>	já-xí	LP jæ-hě
54	next year	sho ni, 庶呢, * <sup>-</sup> shu 'ni	ʃ <sup>h</sup> o <sup>53</sup> -ne <sup>44</sup>	śó-xí	EP so-hě
55	formerly	yag yid, 呀依, * <sup>-</sup> ya. -yi.	ja <sup>34</sup> -ne <sup>32</sup> xe <sup>53</sup> - je <sup>32</sup>	já-xí śó-xí	EP jæ-ji-k <sup>h</sup> æ
56	at present	a min, 阿密, * <sup>-</sup> a `mi	a <sup>53</sup> -mi <sup>32</sup>	t <sup>h</sup> é-já-xá	EP æ-mi
57	afterwards	khyi nur, 其怒, * <sup>-</sup> chi `nu	ja <sup>53</sup> -no <sup>32</sup>	t <sup>h</sup> é = jí tɕàŋá	EP so-ndzi-so LP gəno
58	daytime	nad rko, 奈孤 * <sup>-</sup> nai -ku	ne <sup>44</sup> -gu <sup>44</sup>	mé-łágú	RP ni-legu
59	morning	man lcag, 蛮榨, * <sup>-</sup> man `tša.	[ta <sup>32</sup> -]fo <sup>53</sup>	Ntç <sup>h</sup> ó	R <sup>n</sup> Ntç <sup>h</sup> o
60	evening <sup>26</sup>	dme' khag do, 默卡度, * <sup>-</sup> mö kha. `du	ma <sup>32</sup> -xa <sup>44</sup> du <sup>44</sup>	Nk <sup>h</sup> wá	F Nk <sup>h</sup> o
61	officials <sup>27</sup>	tsog mo, 坐幕, * <sup>-</sup> tso. `mu	dzo <sup>32</sup> mo <sup>44</sup>	Ndʒòmó	EP peNbo

<sup>26</sup> The modern Duoxu and the XFYF forms literally mean 'the sky has darkened'.

62	headman <sup>28</sup>	shu khag, 畜卡, * <sup>h</sup> śu kha.	ts <sup>h</sup> o <sup>44</sup> -k <sup>h</sup> a <sup>53</sup>	şý-k <sup>h</sup> wá	LP wuli-mu-su
63	teachers <sup>29</sup>	slob dpon, 唎白, * <sub>so</sub> . ́pai	bi <sup>32</sup> gi <sup>44</sup> ge <sup>32</sup>	şòəpú	EP sɒpu
64	students	gra pa, 伢把, * <sub>dža</sub> pa <sup>30</sup>	dzi <sup>44</sup> dzi <sup>44</sup> -so <sup>32</sup> - çu <sup>44</sup>	[tápá	EP sojo
65	Buddhist priest	dge 'dun, 杰渡, * <sup>h</sup> ge `du <sup>31</sup>	p <sup>h</sup> a <sup>32</sup> pi <sup>44</sup>	şápá	EP ʃepæ
66	Lamas	bla ma, 喇嘛, * <sub>la</sub> ma	la <sup>44</sup> ma <sup>44</sup>	lámá	LP læmæ
67	clever	tsog ched, 凿车, * <sup>h</sup> tso. - tšhö.	[ts <sup>h</sup> o <sup>44</sup> -]tʃ <sup>h</sup> e <sup>53</sup>	[jà-]Nt <sup>h</sup> é	R Nt <sup>h</sup> e
68	stupid		[ts <sup>h</sup> o <sup>44</sup> -]tʃa <sup>44</sup>	ká[-p <sup>h</sup> á]	LP diNbæ
69	grandfather	ho po, 阿补, * <sub>a</sub> pu	a <sup>44</sup> -pu <sup>44</sup>	á-pý	EP æ-pu
70	father's younger brother	a pa tsi, 阿把际, * <sub>a</sub> pa ́tši	a <sup>44</sup> -ba <sup>44</sup> [go <sup>32</sup> - tʃi <sup>44</sup> ]	à-njó	LP æ-bje
71	father's elder brother	a pa khag, 阿把卡, * <sub>a</sub> pa kha.	a <sup>44</sup> -ba <sup>44</sup> -k <sup>h</sup> a <sup>53</sup>	á-k <sup>h</sup> wá	EP æ-bæ EPjæ- k <sup>h</sup> wæ
72	father	a pag, 阿巴, * <sub>a</sub> pa	a <sup>44</sup> -ba <sup>44</sup>	á-bá	EP æ-bæ
73	mother	a ma, 阿妈, * <sub>a</sub> ma	a <sup>44</sup> -ma <sup>44</sup>	á-má	EP æ-mæ
74	daughter	bza min, 咱米, * <sup>h</sup> dza mi	za <sup>44</sup> -mi <sup>44</sup>	zì-jí	EP zɛ-je
75	son	tshi lag, 慈那, * <sup>h</sup> tshi `na.	[ji <sup>32</sup> dza <sup>44</sup> ,] zi <sup>32</sup>	ízá, zž	F zə
76	elder brother	a yag, 阿叶, * <sub>fi</sub> ya.	a <sup>44</sup> -ja <sup>44</sup>	vé-nwá	EP æ-jæ
77	younger brother	yid no, 依糯, * <sub>yi</sub> . `no	ji <sup>44</sup> -no <sup>44</sup>	ní-nwá	LP jɛnɛ
78	nephew, niece	kyu tsi, 局即, * <sup>h</sup> cu ́tši	dzu <sup>32</sup> -zi <sup>44</sup>	[zž-]Ndžý	RP Ndžy-je
79	grandchild	dbyib gto', 喬渡, * <sub>yi</sub> . `tuu	ji <sup>44</sup> t <sup>h</sup> u <sup>44</sup>	lép <sup>h</sup> ý	LP let <sup>h</sup> u
80	man	sag tsi, 撒即, * <sub>sa</sub> . ́tši	sa <sup>53</sup> dzi <sup>32</sup>	lèlè-zž	EP æ-bæ-zə
81	woman	mi tsi nag, 密兹那 * <sub>mi</sub> -tši `na.	mi <sup>53</sup> zo <sup>32</sup> , a <sup>44</sup> - ma <sup>44</sup> za <sup>44</sup> -mi <sup>44</sup>	xê-má	EP æ-mæ EPzɛ- je
82	wife	a tsi mo, 阿兹暮, * <sub>fi</sub> - tši `mu	ja <sup>32</sup> ju <sup>44</sup> ma <sup>53</sup>	zž-mó	LP dʒæ-mæ
83	rich man	hag mag, 哈妈, * <sub>ha</sub> . - ma.	wa <sup>32</sup> ma <sup>44</sup>	dzímó	LP zæpu[-su]
84	poor man	phyog po, 错铺, * <sup>h</sup> tsho. `phu	ts <sup>h</sup> o <sup>44</sup> -p <sup>h</sup> u <sup>44</sup>	şý-p <sup>h</sup> ý	EP ts <sup>h</sup> o-p <sup>h</sup> u

<sup>27</sup> The Duoxu and the Ersu forms are reportedly loans from Nuosu Yi (but I have not been able to find the Nuosu Yi donor word); whereas the Lizu form is a loan from Tibetan, WT *dpon po*.

<sup>28</sup> In the modern Duoxu form, the XFYY form *shu*, /çu/, is replaced by the synonymous form /ts<sup>h</sup>o<sup>44</sup>/ 'person, man'. The Lizu form is literally, 'one who acts as a head'.

<sup>29</sup> The modern Duoxu form is likely to be a Tibetan loan, WT *dge rgan* 'teacher, master'. The Ersu and Lizu forms are loans from Tibetan, WT *slob dpon* 'teacher'.

<sup>30</sup> The XFYY form and the modern Ersu forms are loans from Tibetan, WT *grwa pa* 'student, disciple'; the Lizu form is a loan from a different Tibetan form, WT *slob pa* 'student, pupil, disciple'; whereas the modern Duoxu form is a native compound, literally, 'one who studies'.

<sup>31</sup> The XFYY form (WT *dge 'dun*) has been replaced in modern Duoxu by a loan from the Namuzi language, /p<sup>h</sup>a<sup>55</sup>pʒə<sup>33</sup>/ (the Namuzi form is from Wáng Déhé, p.c.). The Ersu and Lizu forms are the native form for 'ritual priest'.

85	age, year	lug, 遛, *`liu.	ne <sup>44</sup> , k <sup>h</sup> u <sup>53</sup>	lɛ [ɛ]	F <sub>ye</sub> , EP dzu-tʃ <sup>h</sup> e
86	old man	mo yag, 暮押, *`mu ʔya	ts <sup>h</sup> o <sup>44</sup> -mu <sup>53</sup> [-ka <sup>32</sup> ]	ts <sup>h</sup> ò-mó	EP ts <sup>h</sup> o-mo
87	thief	mu su, 波畜, *`po ʔsu	mu <sup>44</sup> -ɕu <sup>32</sup>	Np <sup>h</sup> ò-sý	EP pʃe-su
88	brother	a yag yid no, 阿吡依糯, *`fia ʔya. ʔyi. ʔno	a <sup>44</sup> -ja <sup>44</sup> ji <sup>32</sup> -no <sup>32</sup>	ní-nwá vé-nwá	EP ʔe-ni, EP muNp <sup>h</sup> æ
89	friend	ni phog, 蚁破, *`ni ʔpho.	jo <sup>32</sup> p <sup>h</sup> o <sup>44</sup>	Ndzó	RNdzo
90	to be shrewd	blag dgo [dog], 腊夺, *`la. ʔdo	ko <sup>32</sup> tʃa <sup>53</sup>	jà-tçó	RNp <sup>h</sup> o
91	to be lazy	mag tho, 马兔, *`ma. ʔthu	ge <sup>53</sup>	má-tçó	RP mæ-t <sup>h</sup> u
92	body	kin mag, 更马, *`kõn ma.	ge <sup>53</sup> ma <sup>32</sup>	gámá	LP gemæ lepu
93	head	wu ʔju, 务鞠, *`wu ʔju	wu <sup>53</sup> dzu <sup>32</sup>	ʋlí	LP wuli
94	hair of the head	dzag, 杂, *`dza.	tʃa <sup>34</sup>	tʃí	F <sub>tçe</sub>
95	eye	mig si, 迷思, *`mi. ʔsi	mi <sup>53</sup> si <sup>32</sup>	déký	R <sub>mjæ</sub> , LP Ndogo
96	eyebrow	mig dmui, 迷目, *`mi. ʔmuu	mi <sup>53</sup> -mu <sup>32</sup>	dó-má-Ndží	RP Ndo-tçe-mu
97	ear	yag yid, 哑依, *`ya. ʔyi.	ne <sup>34</sup> -pu <sup>32</sup>	ná-ký	RP ne-pi
98	nose	yag ko, 哑孤, *`ya. ʔku	na <sup>32</sup> -ku <sup>53</sup>	sý-Nbý	LP to-Nbu
99	mouth	khag pi, 卡比, *`kha. pi	k <sup>h</sup> a <sup>44</sup> pi <sup>44</sup>	sý-Np <sup>h</sup> wá	EP to-Np <sup>h</sup> a
100	lip	min phi, 面皮, *`mɛn ʔphi	k <sup>h</sup> a <sup>44</sup> pi <sup>44</sup>	sý-pí	RP jebe Ndžape
101	tooth	se mag, 谢马, *`se ma.	ɕe <sup>53</sup> -ma <sup>32</sup>	sž-má	RP xu-mæ
102	breast of a woman	dpe' pe, 别别, *`pee ʔpe	bi <sup>32</sup> -bi <sup>44</sup>	njó-njó	LP dʒæ-je
103	hand	log kog, 锣锅, *`lo. ʔko	lo <sup>32</sup> -ko <sup>53</sup>	lé, lé-p <sup>h</sup> é	F <sub>le</sub> , EP lo-p <sup>h</sup> o
104	belly	gto' ʔphag, 度怕, *`tuu ʔpha.	do <sup>44</sup> -p <sup>h</sup> a <sup>44</sup>	jí-p <sup>h</sup> á	RP ji-p <sup>h</sup> æ, LP dzy-p <sup>h</sup> æ
105	heart	ni ma, 业妈, *`ne ʔma	ne <sup>32</sup> -ma <sup>53</sup>	sž-ní	RP te-mi
106	foot	rko gtug, 穀独, *`ku ʔtu.	gu <sup>53</sup> du <sup>32</sup>	ɔ-p <sup>h</sup> é	LP dʒə-dʒə
107	breath	sog, 率, *`shai	so <sup>32</sup>	sé	F <sub>se</sub>
108	a boil	rkog, 故, *`ku.	gu <sup>53</sup>	mjá-ɾž	RP mɪə-ɪə
109	tongue	ar hu, 噎哺, *`we pu	je <sup>53</sup> pu <sup>32</sup>	sžpž	EP tepi
110	sinews	ku, 鼓, *`ku	dza <sup>34</sup>	ɾɻ	H <sub>tæ</sub>
111	face	min phog, 命坡, *`mɪn ʔpho.	mje <sup>44</sup> -ma <sup>44</sup> , pje <sup>44</sup> -ma <sup>44</sup>	mjá	R <sub>mjæ</sub> , LP mjæ-pʃə
112	breast, chest	'gog pe, 鹅别, *`yö. ʔpe	ɕe <sup>53</sup> k <sup>h</sup> a <sup>32</sup>	ɾó-ní-mà	EP ɾæk <sup>h</sup> o
113	fingers	log ni, 落宜, *`lo. ʔni	lo <sup>44</sup> -ni <sup>44</sup> [-p <sup>h</sup> a <sup>44</sup> ]	lé-sý [= ka]	LP le-tu
114	liver	se hu, 谢哺, *`se pu	ɕe <sup>53</sup> -p <sup>h</sup> u <sup>32</sup>	Ntʃ <sup>h</sup> á	R <sub>Ntʃ<sup>h</sup>e</sub>
115	lungs	tshe hu, 择哺, *`tsö pu	ts <sup>h</sup> e <sup>34</sup> [-pu <sup>32</sup> ]	ts <sup>h</sup> ú	F <sub>Ntʃ<sup>h</sup>u</sub>
116	intestines, bowels		ve <sup>53</sup> -ni <sup>32</sup>	vé-njó	RP ʔe-ni
117	gallbladder		ki <sup>34</sup>	ɾò	R <sub>t</sub> ɔ

118	urinary bladder		bu <sup>32</sup> -ɕu <sup>53</sup> -ɕu <sup>32</sup>	bè-ʂù-ʂú	<sup>EP</sup> be-su-su
119	sweat <sup>32</sup>		ku <sup>34</sup> -ə <sup>34</sup>	ttý	<sup>F</sup> tʂu, <sup>EP</sup> tʂu-ɹæ
120	spittle		ts <sup>h</sup> e <sup>32</sup> -k <sup>h</sup> a <sup>53</sup>	ts <sup>h</sup> éká	<sup>EP</sup> ts <sup>h</sup> eqe
121	excrement		ts <sup>h</sup> i <sup>44</sup>	ətʂò	<sup>R</sup> ʂe
122	urine		zi <sup>53</sup>	Nbà	<sup>R</sup> Nbɹæ
123	pus		fe <sup>32</sup> -ə <sup>34</sup>	pé-ɹé	<sup>EP</sup> pu-ɹæ
124	bones	yu ko, 玉古, * yò ku	ju <sup>53</sup> ku <sup>32</sup>	rʂkʷ	<sup>RP</sup> ɹəqo
125	hair of the body	dmu', 谋, * 'muu	mu <sup>34</sup>	mà	<sup>H</sup> mu
126	blood	sho, 输, *-shu	ʂu <sup>44</sup>	sò	<sup>H</sup> ʂe
127	house	yag, 压, *-ya.	ja <sup>44</sup>	jí	<sup>R</sup> ne
128	pillar	byed pag, 接扒, *-dze - pa.	dze <sup>44</sup> p <sup>h</sup> a <sup>44</sup>	dʒáp <sup>h</sup> á	<sup>EP</sup> dzæp <sup>h</sup> ɹæ
129	gate, door	'jag, 架, * ja.	dza <sup>53</sup> [-pu <sup>32</sup> ]	Ngà	<sup>R</sup> Ngæ, <sup>LP</sup> Ngæ-[pu]
130	monastery, temple <sup>33</sup>	dgon pa yag, 公巴压, *-gun -pa -ya.	be <sup>44</sup> ja <sup>44</sup>	míjǐ, gòNbà-jǐ	<sup>EP</sup> goNbæ
131	window	go dpa', 顾罗, * gu `paa	za <sup>44</sup> pu <sup>44</sup>	Ndàrǎ	<sup>EP</sup> xwewu-Ngæ
132	bowl	jag, 酢, * dʒa.	k <sup>h</sup> u <sup>53</sup>	zwáó	<sup>LP</sup> d <sup>h</sup> wæle
133	plate	shag mag, 呷妈, *-sa. - ma.	ga <sup>44</sup> ma <sup>44</sup>	k <sup>h</sup> ýlá	<sup>EP</sup> Ngeme
134	wine cup <sup>34</sup>	bcud[ŋ] tsi, 钟子, *-tʂuN -tsi	[wu <sup>53</sup> ] tʂu <sup>44</sup> [-tʂu <sup>44</sup> ]	[ý-]tʂá	<sup>EP</sup> [ku]tʂu
135	tou, a unit of dry measure	'ag, 呷, *-sa.	ka <sup>32</sup>	pwá	<sup>F</sup> pə
136	basin <sup>35</sup>	log ma, 罗吗, * lo. -ma	k <sup>h</sup> u <sup>53</sup>	tɕòp <sup>h</sup> á	<sup>RP</sup> lome
137	cooking pot	rke, 隔, * kò	ge <sup>32</sup>	dʒò	<sup>F</sup> dʒə
138	ladle	yug mag, 油妈, * 'yu. - ma.	tɕ <sup>h</sup> e <sup>34</sup> -ə <sup>34</sup> , jo <sup>32</sup> ma <sup>44</sup>	zýmá	<sup>RP</sup> jy dmæ
139	table <sup>36</sup>	cog tsi, 桌子, *-tʂo. -tsi	tʂo <sup>44</sup> tʂi <sup>32</sup> , la <sup>32</sup> tɕe <sup>53</sup> -pu	tʂótsé	<sup>LP</sup> dədʒe
140	lock	kho 'ag, 库呷, * khu - sa.	k <sup>h</sup> u <sup>34</sup> [-ga <sup>43</sup> ]	Nk <sup>h</sup> ý	<sup>R</sup> Nk <sup>h</sup> o
141	key <sup>37</sup>	kho yes, 库夜, * khu `ye	jo <sup>34</sup> [i <sup>32</sup> [-pu <sup>32</sup> ]	Nk <sup>h</sup> ý-ətʂʂ	<sup>LP</sup> k <sup>h</sup> oje
142	knife	me thog, 卖妥, * mai tho.	me <sup>53</sup> t <sup>h</sup> o <sup>32</sup>	bátʂá	<sup>LP</sup> Nboto
143	boat	ku, 沽, *-ku	gu <sup>32</sup>	əgú	<sup>F</sup> gu
144	bell	dri 'u, 止巫, * dʒi -fu <sup>38</sup>	ts <sup>h</sup> o <sup>44</sup> lo <sup>44</sup> [-pu <sup>32</sup> ]	Nts <sup>h</sup> ʒlò	<sup>EP</sup> Nt <sup>h</sup> olo

<sup>32</sup> The Duoxu form is a fusion of the root for 'sweat' (/ku/) and the root for 'liquid' (/ə/) (cf. 'pus' below).

<sup>33</sup> The XFYY, modern Ersu and Lizu forms are loans from Tibetan, WT *dgon pa*. The modern Duoxu and one of the Ersu forms are loans from Nuosu, *bbur yi*, [bʷ<sup>33</sup>zi<sup>33</sup>], 'shrine, temple'.

<sup>34</sup> The forms in the three languages are all loans from Mandarin, *zhōng 盅*, SW Mandarin /tʂoŋ<sup>44</sup>/.

<sup>35</sup> The Duoxu form means 'bowl, basin'; the Ersu form is a loan from SW Mandarin, *jiǎopénr* 脚盆儿 /tɕo<sup>21</sup>p<sup>h</sup>əɹ<sup>21</sup>/; the Lizu form means 'washbasin'.

<sup>36</sup> The modern Duoxu form is a loan from Mandarin, *zhuōzi* 桌子, SW Mandarin /tʂo<sup>21</sup>tsə<sup>53</sup>/, cf. WT *cog tse*.

<sup>37</sup> This word is a recent loan from Mandarin, *yàoshi* 钥匙, SW Mandarin /jo<sup>21</sup>ʂə<sup>44</sup>/, followed by the Duoxu classifier /pu/ 'item'.

145	drum	byed po, 借补, *`dze. pu	dze <sup>44</sup>	Nd̥zà	<sup>RP</sup> Nd̥ze
146	rope	po aq, 补呷, *pu -sa.	pu <sup>44</sup> [-ka <sup>32</sup> ]	pə [p̥z̥z̥]	<sup>RP</sup> pu[-gæ]
147	saddle	a phod, 阿迫, *-a`pho	ya <sup>53</sup> [tʰa <sup>32</sup> ]	[Nbó-]zá	<sup>LP</sup> zæ[-p̥ə]
148	trumpet shell, conch shell	lug dpe', 晋[留]白, *liu. `pai	t̥ <sup>h</sup> u <sup>53</sup> p <sup>h</sup> e <sup>53</sup>	l̥z̥bé [ə'bé]	<sup>EP</sup> libu
149	lamp	mar mi, 妈蜜, *-ma `mi <sup>39</sup>	ma <sup>32</sup> mi <sup>44</sup>	téNd̥zá	<sup>RP</sup> mæmi
150	ladder	dzed le, 结列, *`dze. `le	t̥e <sup>44</sup> le <sup>44</sup>	ɦ́t̥s̥z̥	<sup>LP</sup> t̥et̥ci
151	to eat	khag, 卡, *kha. <sup>40</sup>	dzi <sup>32</sup> , ba <sup>53</sup>	d̥z̥z̥	<sup>R</sup> d̥z̥ə
152	to drink		ba <sup>53</sup> , tʰa <sup>34</sup>	t̥s̥ <sup>h</sup> é	<sup>F</sup> t̥e <sup>h</sup> e
153	cooked rice <sup>41</sup>	bzhin, 啫, *zhō	ʒo <sup>34</sup>	zámá	<sup>F</sup> k <sup>h</sup> æ
154	rice	ched, 车, *-tshō.	tʰe <sup>53</sup>	Nts <sup>h</sup> è	<sup>R</sup> Ntʰe
155	wine	wo, 雾, *wu	wu <sup>53</sup>	ý	<sup>R</sup> yo
156	tea	ja, 扎, *-d̥za	d̥zi <sup>34</sup> [ə <sup>34</sup> ]	d̥zà	<sup>F</sup> d̥z̥æ
157	honey	pi hen, 必亨, *pi -hōN	bi <sup>32</sup> -ə <sup>44</sup>	b̥z̥-ré	<sup>LP</sup> bi-bi-ræ
158	meat	she, 施, *-shi	ʃe <sup>44</sup>	s̥z̥	<sup>F</sup> ə
159	oil	'dzu ci, 余汁, *'yu -t̥si	zi <sup>44</sup> [-ə <sup>44</sup> ]	z̥ý	<sup>F</sup> zu
160	salt	tshi', 栖, *-tshii	t̥ʰi <sup>44</sup>	t̥s̥ <sup>h</sup> z̥	<sup>F</sup> t̥s̥ə
161	to be sweet	then, 甜, *-then	tʰe <sup>44</sup> -t̥o <sup>44</sup>	[d̥è-]ts <sup>h</sup> ó	<sup>LP</sup> [de-]tʰe
162	to be bitter	kh'a, 卡, *khaa	k <sup>h</sup> a <sup>44</sup>	t̥s̥ <sup>h</sup> z̥	<sup>RP</sup> [de-]q <sup>h</sup> e
163	clothing	pe cho, 白侧, *pai`tshō	be <sup>32</sup> t̥e <sup>h</sup> e <sup>44</sup>	Ngámé	<sup>LP</sup> gæmi
164	hat	dmug, 磨, *mo.	mu <sup>53</sup>	Nb̥v̥	<sup>R</sup> Nbo
165	hemp	tsi, 兹, *-tsi	tsi <sup>44</sup>	t̥s̥è	<sup>LP</sup> t̥se[-ni]
166	thread	'dze khe, 结刻, *`dze `khō	d̥ze <sup>32</sup> k <sup>h</sup> e <sup>44</sup>	t̥s̥is̥z̥	<sup>RP</sup> miço
167	white	wad kyog, 歪觉, *-wai `co.	ve <sup>44</sup> -t̥o <sup>44</sup>	[d̥é-]l̥z̥ [d̥é- ə]	<sup>LP</sup> [de-]ly
168	blue	dme' ni, 墨泥, *mō`ni	na <sup>32</sup> pu <sup>53</sup> or la <sup>32</sup> pu <sup>53</sup>	l̥z̥Nb̥ý [ə`m̥b̥]	<sup>EP</sup> nibze, <sup>LP</sup> l̥əpu
169	yellow	hin kyog, 亨觉, *-hōN `co.	xe <sup>34</sup> ə <sup>34</sup>	[d̥é-]ʃú	<sup>LP</sup> [de-]ʃu
170	red	huŋ ho, 吽呼, *-hun - hu	no <sup>32</sup> [-xu <sup>53</sup> ]	[d̥é-]ní	<sup>EP</sup> ni[xu]
171	god	chos skyoŋs, 濯雪, *t̥šo `šo <sup>42</sup>	la <sup>34</sup>	l̥à	<sup>F</sup> l̥æ
172	demon, ghost	chag, 岔, `tsha.	tʰa <sup>53</sup>	[t̥ <sup>h</sup> á	<sup>R</sup> t̥ <sup>h</sup> æ
173	book	dpe' cha, 别爹, `pee - t̥ša <sup>43</sup>	d̥zi <sup>44</sup> d̥zi <sup>44</sup>	Nd̥z̥óNd̥z̥z̥	<sup>EP</sup> Nd̥z̥əNd̥zi
174	paper	sho'u, 烧物, *-shau `fu <sup>44</sup>	ʃa <sup>44</sup> wu <sup>44</sup>	ʃwàv̥	<sup>EP</sup> ʃæwu

<sup>38</sup> This form is a loan from Tibetan, WT *dril bu* 'bell'.

<sup>39</sup> This word is a loan from Tibetan, WT *mar me*.

<sup>40</sup> This form is likely to mean 'to bite', Duoxu /k<sup>h</sup>a<sup>32</sup>/, rather than 'to eat'.

<sup>41</sup> The Ersu form is a loan from Tibetan, WT *za ma* 'food'.

<sup>42</sup> WT *chos skyong* 'dharmapala, protective deity'. The modern Duoxu, Ersu, and Lizu forms are all related to WT *lha* 'god, deity'.

<sup>43</sup> WT *dpe cha* 'book, scripture, text'.

<sup>44</sup> WT *shog gu* 'paper'.

175	ink <sup>45</sup>	snag tsha, 撒青, *sa - tshIN	me <sup>34</sup>	mé	
176	east	shar phyogs, 杉鹊, *shan `tsho.	ʃa <sup>44</sup> -tɕ <sup>h</sup> o <sup>44</sup>	ʃà-tɕ <sup>h</sup> ó	<sup>EP</sup> ʃæ-tɕ <sup>h</sup> o
177	west	nub phyogs, 怒鹊, *nu. `tsho.	ɲe <sup>32</sup> -tɕ <sup>h</sup> o <sup>44</sup>	ɲjó-tɕ <sup>h</sup> ó	<sup>RP</sup> no-tɕ <sup>h</sup> o
178	south	lho phyogs, 鲁鹊, *lu `tsho.	ɲe <sup>32</sup> -tɕ <sup>h</sup> o <sup>44</sup>	ɬjó-tɕ <sup>h</sup> ó	<sup>H</sup> lo-meNtɕ <sup>h</sup> e
179	north	byanj phyogs, 咱鹊, *dzan `tsho.	tɕa <sup>32</sup> , ja <sup>32</sup> -tɕ <sup>h</sup> o <sup>44</sup>	tɕá-tɕ <sup>h</sup> ó	<sup>LP</sup> tɕa-Ntɕ <sup>h</sup> o-kæ
180	above, up	thog phyogs, 拖破, *tho. `pho.	k <sup>h</sup> ɣ <sup>53</sup>	tɕ <sup>h</sup> ó[-wó]	<sup>RP</sup> tɕ <sup>h</sup> o[-tɕ <sup>h</sup> o]
181	beneath, down	zhag phyogs, 哇破, *wa. `pho. <sup>46</sup>	k <sup>h</sup> ɣ <sup>32</sup>	tɕàɲá	<sup>LP</sup> tɕɛɲe
182	left	g-yas phyogs, 哑桑破, *ya -san `pho.	jo <sup>53</sup> da <sup>32</sup> -p <sup>h</sup> o <sup>53</sup>	lè = jì = kè = xé	<sup>RP</sup> jete
183	right	g-yon phyogs, 压破, *ya. `pho.	tɕu <sup>32</sup> ta <sup>32</sup> -p <sup>h</sup> o <sup>53</sup>	lɛ̀tɕɿ̀y = kè = xé	<sup>EP</sup> letɕy
184	front	'dun phyogs, 恒破, *hön `pho.	xe <sup>32</sup> -p <sup>h</sup> o <sup>53</sup>	ʃó-p <sup>h</sup> é	<sup>LP</sup> ʃæ-p <sup>h</sup> o
185	back <sup>47</sup>	rgyab phyogs, 怒破, *nu `pho.	[ja <sup>53</sup> -]no <sup>32</sup>	[gámá-]ɲjó	<sup>R</sup> ɲo
186	inside	ko phogs, 各破, *kö `pho.	ko <sup>32</sup> [-p <sup>h</sup> o <sup>53</sup> ]	k <sup>h</sup> é[ = ké]	<sup>EP</sup> k <sup>h</sup> u[-p <sup>h</sup> o]
187	outside	no phog, 怒破, *nu `pho.	wa <sup>32</sup> -p <sup>h</sup> o <sup>53</sup>	ɲjó-p <sup>h</sup> é	<sup>LP</sup> ɲo-p <sup>h</sup> o
188	between, in the middle	sku kyog, 孤觉, *ku _co.	go <sup>32</sup> [-tɕo <sup>44</sup> ]	gú[ɬá]	<sup>LP</sup> gu[lɛ]
189	flower <sup>48</sup>	me tog, 咩朵, *me_to.	dje <sup>32</sup> -dje <sup>44</sup>	ví, mító, xwà	<sup>RP</sup> metɕo, <sup>RP</sup> meto
190	tree	bse', 谢, *see	ɕe <sup>53</sup> -pu <sup>32</sup>	ʃí-pý	<sup>RP</sup> se-pu
191	grass	nog, 懦, *no.	ʒu <sup>53</sup>	əní	<sup>R</sup> ʒu
192	bamboo	mid, 密, *mi.	mi <sup>44</sup>	xì	<sup>F</sup> hě
193	root	dme' tso, 墨助, *möö `tsu	me <sup>32</sup> -tsu <sup>53</sup>	Nbá	<sup>R</sup> Nbrə
194	branch	'a lo, 岬落, *sa `lo	ɕe <sup>53</sup> -ja <sup>32</sup> , ɕe <sup>53</sup> -lo <sup>32</sup>	sí-kálé	<sup>RP</sup> se-qely
195	leaf	bsag[bse'], tsag, 邪咱, *se `tsa.	ɕe <sup>53</sup> -tɕ <sup>h</sup> a <sup>32</sup> -tɕ <sup>h</sup> a <sup>44</sup>	sí-tɕ <sup>h</sup> á	<sup>RP</sup> se-pɕæ
196	fruit <sup>49</sup>	bse' si, 谢思, *see `si	so <sup>32</sup> -wa <sup>44</sup>	sí-ʃé	<sup>RP</sup> se-sə
197	peach	sog wag, 梭哇, *so. -wa.	so <sup>32</sup> -wa <sup>44</sup>	ʃzjá	<sup>LP</sup> ɕeə

<sup>45</sup> The modern Duoxu and Ersu forms appear to be loans from SW Mandarin, /mei<sup>21</sup>/ 墨 'ink'.

<sup>46</sup> The XFYY form rather appears to correspond to Modern Duoxu /wa<sup>32</sup>-p<sup>h</sup>o<sup>53</sup>/ meaning 'outside' (see 187).

<sup>47</sup> The Ersu form literally means 'behind the back, reverse side'.

<sup>48</sup> The Ersu and the Lizu forms /mító/ and <sup>RP</sup>metɕo, <sup>RP</sup>meto/, respectively, are loans from Tibetan, WT *me tog*; the Ersu form /xwà/ is a loan from Mandarin, *huā* 花, SW Mandarin /xua<sup>44</sup>/; and /ví/ is a loan from Nuosu Yi, *vie* [vɛ<sup>33</sup>].

<sup>49</sup> The Duoxu consultants could not recall the generic word for 'fruit', and used the form for 'peach' instead.

198	wheat <sup>50</sup>	shag, 沙, * <sup>-</sup> sha.	me <sup>53</sup> dza <sup>32</sup>	sá	<sup>F</sup> ʃæ
199	vegetables	yi nag, 衣纳, * <sup>-</sup> yi`na.	ji <sup>44</sup> na <sup>44</sup>	gópí	<sup>RP</sup> Ngope
200	quadruped	sug dmug, 续牧, * <sup>-</sup> su. `mu.	zu <sup>44</sup> mo <sup>53</sup>	zṽgṽ	<sup>RP</sup> zuŋu
201	bear	hag, 哈, * <sup>-</sup> ha.	wa <sup>44</sup>	xá	<sup>R</sup> ŋo
202	wolf	bted, 得, * <sup>-</sup> tö. <sup>51</sup>	je <sup>32</sup> p <sup>h</sup> u <sup>53</sup>	Ndzz	<sup>F</sup> ge
203	rat	wu, 务, * <sup>-</sup> wu	wu <sup>53</sup> [-pu <sup>32</sup> ]	gṽ[-p <sup>h</sup> á]	<sup>RP</sup> yo[-p <sup>h</sup> æ]
204	hawk	kho, 渴, * <sup>-</sup> khö	k <sup>h</sup> o <sup>34</sup> [-ma <sup>32</sup> ]	əké	<sup>F</sup> kə
205	ox	rgyug, 纽, * <sup>-</sup> ñu.	ɲu <sup>32</sup>	ŋwà	<sup>F</sup> ɲu
206	tiger	nag 'phag, 拏, * <sup>-</sup> na. `pha.	la <sup>32</sup>	lwá[-p <sup>h</sup> wá]	<sup>EP</sup> læ[-p <sup>h</sup> æ]
207	rabbit	thog la, 脱拉, * <sup>-</sup> tho. -la	mi <sup>32</sup> dzi <sup>44</sup>	midzz	<sup>EP</sup> midzə
208	dragon	ri 'byam, 耳咱, * <sup>-</sup> ri `dzan	ə <sup>32</sup> dza <sup>44</sup>	rṽdzé	<sup>LP</sup> rəbze
209	snake	'o 'phag, 卧扒, * <sup>-</sup> fio `pha.	wu <sup>32</sup> -p <sup>h</sup> a <sup>53</sup>	bé-rṽ	<sup>LP</sup> bɹə-rə
210	horse	mog, 摸, * <sup>-</sup> mo.	mo <sup>32</sup>	Nbò	<sup>F</sup> Nbɹə
211	sheep	yog, 哟, * <sup>-</sup> yo.	jo <sup>44</sup>	jò	<sup>R</sup> no
212	ape	dmi', 密, * <sup>-</sup> mii	mi <sup>32</sup>	mí	<sup>F</sup> mi
213	chicken, hen	'od, 饿, * <sup>-</sup> fïö.	wo <sup>53</sup>	rá	<sup>R</sup> rɹwæ
214	dog	khin, 肯, * <sup>-</sup> khön	k <sup>h</sup> e <sup>44</sup> , k <sup>h</sup> e <sup>53</sup> ɲi <sup>32</sup>	l <sup>h</sup> ó	<sup>F</sup> tə <sup>h</sup> e
215	pig	'gog, 鹅, * <sup>-</sup> γö.	wo <sup>32</sup>	vé	<sup>F</sup> wo
216	buffalo	wo gyug, 乌纽, * <sup>-</sup> wu ñu.	wu <sup>53</sup> -ɲu <sup>32</sup>	dzó-ŋwá	<sup>RP</sup> dze-ŋu
217	peacock	rma bya, 妈咱, * <sup>-</sup> ma `dza	ma <sup>53</sup> tsa <sup>32</sup>	mózà	<sup>EP</sup> mæpɹæ
218	domestic goose <sup>52</sup>	'gog wa, 俄哇, * <sup>-</sup> γö. - wa	o <sup>34</sup>	ǎ	<sup>LP</sup> öwə
219	fish <sup>53</sup>	b-yu', 淤, * <sup>-</sup> yuu	zu <sup>44</sup>	zṽ	<sup>R</sup> y
220	to fly	bya lin, 咱衣, * <sup>-</sup> dza -yi.	dza <sup>44</sup> -dza <sup>44</sup>	gwà-gwá	<sup>F</sup> bze
221	to eat, edibles <sup>54</sup>	byi lug, 啣留, * <sup>-</sup> dzi 'liu.	dzi <sup>32</sup> -lju <sup>32</sup>	dzz-lí	<sup>RP</sup> dzə-lje
222	gold	ɲin, 你, * <sup>-</sup> ñi	ɲi <sup>44</sup>	əní	<sup>F</sup> ɲi
223	silver	wo, 物, * <sup>-</sup> wu	ŋo <sup>44</sup>	əŋwá	<sup>R</sup> ɲu
224	copper <sup>55</sup>	ɲog, 虐, * <sup>-</sup> ño.	dzi <sup>44</sup>	ənjò	<sup>F</sup> no
225	iron	shaq, 沙, * <sup>-</sup> sha.	ʃa <sup>44</sup>	sé	<sup>F</sup> ʃe
226	copper coin	p'a byed, 巴灸, * <sup>-</sup> paa `dzi. <sup>56</sup>	ba <sup>44</sup> dze <sup>44</sup>	bádzé	<sup>RP</sup> bædzə
227	incense <sup>57</sup>	sog, 梭, * <sup>-</sup> so.	ɕa <sup>32</sup> [-no <sup>53</sup> ]	ɕá	<sup>EP</sup> sə[-mu]

<sup>50</sup> The Duoxu form stands for both ‘wheat’ and ‘barley’.

<sup>51</sup> This XFYY form possibly refers to the word for ‘dhole’, cf. Kālā Lizu /<sup>F</sup>de/, Ersu /vé/. Our Duoxu consultants could not recall the corresponding Duoxu form.

<sup>52</sup> The Duoxu form is a loan from Mandarin, 鹅, SW Mandarin /o<sup>21</sup>/.

<sup>53</sup> The word for ‘fish’ is a loan from Mandarin, yú 鱼, SW Mandarin /y<sup>21</sup>/, in all three languages.

<sup>54</sup> The provided Duoxu form rather translates ‘things to eat, edibles’, combining the verb ‘to eat’ /dzi<sup>32</sup>/ and the patient nominalizer /lju/. Ersu and Lizu forms have been provided accordingly.

<sup>55</sup> The cognate word for ‘copper’ is found in the word ‘copper pot’, Duoxu /ɲo<sup>44</sup> ge<sup>32</sup>/, cf. Ersu /ɲjò-Ngó/ or /ɲjò-dṽó/, Lizu /<sup>EP</sup>ɲy-Ngo/.

<sup>56</sup> In all three languages, the modern meaning of this word is ‘money’, ‘currency’.

228	one	cig, 几, * ci.	tɕi <sup>44</sup>	té	Fte
229	two	gis, 业, * ne	ɲi <sup>53</sup>	né	Rne
230	three	gsum, 梭, *-so	so <sup>44</sup>	sí	Fce
231	four	wo, 吾, *wu	wu <sup>32</sup>	zò	Fze
232	five	'gog, 我, *no	no <sup>32</sup>	ɲwá	Ffñe
233	six	khun, 空, *-khun	k <sup>h</sup> u <sup>34</sup>	ʈ <sup>h</sup> y	Ft <sup>h</sup> u
234	seven	ner, 念, *nen	ne <sup>34</sup>	sʒí	Ftɲ
235	eight	shed, 歌, *-se.	ɕe <sup>34</sup>	zʒ	Fdze
236	nine	had, 咳, *-hai	Nge <sup>32</sup>	Ngè	FNge
237	ten	tshi, 齐, *tshi	tɕi <sup>h</sup> <sup>44</sup>	tʂ <sup>h</sup> é-tʂ <sup>h</sup> é	RPtɕ <sup>h</sup> e-tɕ <sup>h</sup> e
238	hundred	kyi yag, 计压, *ci-ya.	tɕi <sup>44</sup> -ja <sup>53</sup>	tá-zá	EPte-zæ
239	thousand	kyi gto', 计读, *ci-tuu	tɕi <sup>44</sup> -tu <sup>53</sup>	té-əp'v	EPte-tu
240	ten thousand	kyi med, 计墨, *ci-mö.	tɕi <sup>44</sup> [ <sup>53</sup> ]-me <sup>32</sup>	té- Nbó[nts <sup>h</sup> ó]	EPte-Nbo
241	many	me tag, 咩达, *-me'ta.	mja <sup>53</sup>	mí [mjé]	RPmjæ-mjæ
242	few	hun, 咩, *-hun	no <sup>34</sup>	ní-ní	EPni-ne
243	one catty	cig ke, 计草, *ci.kö	tɕi <sup>44</sup> [ <sup>53</sup> ]-ke <sup>32</sup>	té-tʂé	EPte-qe
244	one tackle	cig log, 计喏, *ci.no.	tɕi <sup>44</sup> -lo <sup>53</sup>	té-ló	EPte-lo
245	one article <sup>58</sup>	cig 'tsham, 计藏, *ci. 'tshan	tɕi <sup>44</sup> [ <sup>53</sup> ]-tɕ <sup>h</sup> a <sup>32</sup>	tá-tʂ <sup>h</sup> á	RPte-pçæ
246	I	ɲag, 阿, *-ɲa.	ɲa <sup>44</sup>	á	Fæ
247	you	no', 那, *naa	no <sup>44</sup>	né	Fne
248	he, she	thed, 特, *thö.	t <sup>h</sup> e <sup>44</sup>	t <sup>h</sup> é	Ft <sup>h</sup> e
249	who	s'e, 色, *sö	se <sup>44</sup> -gu <sup>44</sup>	ʂé-tè	Fse, LPse-te
250	[my]self	[ɲag] yod, [阿]哟, *-ɲa. -yo.	jo <sup>44</sup>	jó	Fjo
251	another	su, 畜, *su	ɕu <sup>44</sup>	ʂý = jí-té	LPkætɕi-bo
252	to dance	khyu khyu, 曲曲, *-chu -chu	tɕ <sup>h</sup> u <sup>44</sup> -tɕ <sup>h</sup> u <sup>44</sup>	ətó-ətó	RP[de-]tso
253	to sing	gyag, 架, *ja.	dza <sup>53</sup>	gá	Fgæ
254	to delight in, to like	'jag, 贾, *ja.	dza <sup>32</sup>	gà	Rgæ
255	to laugh	ha ha, 哈哈, *-ha-ha	xa <sup>32</sup> -xa <sup>53</sup>	rʒ	Rjə
256	to cry, to weep		ɲe <sup>44</sup>	Nbè	Rɲu
257	to be happy	bsam pa khyog, 三巴鹊, *-san-pa`cho. <sup>59</sup>	sa <sup>44</sup> ba <sup>44</sup> [=la <sup>44</sup> ]	sáNba [dè- dzé]	EPsæNbæ [bze]
258	to go	yid, 依, *yi.	ji <sup>44</sup>	ž	Fji
259	to go out	pad, 擺, *pai	pe <sup>44</sup>	ɲé-jí	RPne-ko-ji
260	to come	lag, 拉, *la.	la <sup>32</sup>	là	Rlæ
261	to walk	go 'o, 割过, *-gö`ko	ɕe <sup>44</sup> -ɕe <sup>44</sup>	sž-sž	EPxu-xu
262	to arrive	pad dag, 擺大, *pai`da	pa <sup>53</sup> =la <sup>32</sup>	pà=lá	RP[de-]pɾæ
263	to get	a dag, 凹打, *-fia`da.	wa <sup>53</sup> [=la <sup>32</sup> ]	rà	Rfɿæ
264	to seek	lan khog, 量壳, *lan khö	lja <sup>32</sup> -lja <sup>53</sup>	ətʂá	RPjæ-ʃæ

<sup>57</sup> The modern Duoxu and Ersu forms are loans from Mandarin, *xiāng* 香 'incense', SW Mandarin /ɕiaŋ<sup>44</sup>/. The XFYY and the Lizu forms are likely to be from WT *bsang*.

<sup>58</sup> The provided forms are classifiers for clothes in all three languages.

<sup>59</sup> WT *bsams pa* 'thought, mind'.

265	to rise	wan, 万, *wan	we <sup>53</sup> [= la <sup>32</sup> ]		RP [de-]gu
266	to enter	go lag, 葛拉, *gö-la.	dzi <sup>32</sup> -la <sup>32</sup>	k <sup>h</sup> á-lá	LP k <sup>h</sup> e-li
267	to borrow	yu', 余, *yöö	ji <sup>44</sup>	[k <sup>h</sup> é-]çó	F çe
268	to know	a si[se], 阿色, *-a`so	se <sup>32</sup>	xàšé	LP hüsə
269	to exist	'jog, 觉, *jo.	dzo <sup>44</sup>	dzó	F dzo
270	to be late	dag wag, 打凹, *_da. - wa.	da <sup>44</sup> wa <sup>44</sup>	džéwá	EP džywə
271	to hasten	rko med, 各墨, *kō `mō.	[ja <sup>32</sup> -]ko <sup>44</sup> me <sup>44</sup>	[já-]Ntš <sup>h</sup> é ηò	EP t <sup>h</sup> e-t <sup>h</sup> e R mu
272	to beat	yag, 哑, *ya.	ja <sup>32</sup>	ká	F kə
273	to finish	pe dag, 备打, *pe_da.	pi <sup>53</sup>	[t <sup>h</sup> é-]džý	LP [t <sup>h</sup> e-]dzy
274	all	yod 'ag, 约呷, *yo_`sa.	ja <sup>32</sup> -ka <sup>44</sup>	njò-kwá	RP jə-qwə
275	pitiable	shag dog, 虾多, *-sa. - do.	ça <sup>44</sup> do <sup>44</sup>	šəŋá	EP çəŋə
276	to knee	tug, 覩, *_tu.	[ts <sup>h</sup> u <sup>34</sup> mu <sup>32</sup> ] tu <sup>32</sup>	[pínbí k <sup>h</sup> é- ]əké	EP [puNge k <sup>h</sup> e-]kə
277	to give	khog, 课, *khō	k <sup>h</sup> o <sup>53</sup>	tç <sup>h</sup> í	R k <sup>h</sup> e
278	to be new	she tsog, 设作, *shō `tso.	šo <sup>32</sup> tso <sup>53</sup>	šžtšwá	EP šutse
279	to be old	li dag, 利打, *li_da.	li <sup>53</sup>	p <sup>h</sup> álé	R le
280	to repay	po shag, 薄厦, *po`sa.	tša <sup>34</sup>	[t <sup>h</sup> á-]xwá	RP [t <sup>h</sup> e-]xwə
281	to put on shoes	si wad, 洗歪, *_sí-wai	zi <sup>44</sup> [ka <sup>44</sup> ] we <sup>34</sup>	žž [dè-]žž	LP zə [de-]wu
282	to wear		we <sup>34</sup>	žž	LP [de-]wu
283	to take off		ka <sup>44</sup>	kwá	RP [t <sup>h</sup> e-]qwə
284	to plunder	su lug, 续骝, *su`liu.	[çu <sup>44</sup> ] lju <sup>53</sup>	[t <sup>h</sup> é-]lž [ǝ]	RP [t <sup>h</sup> e-]ly
285	to speak	'geg, 呃, *yö.	ŋe <sup>34</sup> , k <sup>h</sup> a <sup>44</sup> h <sup>o</sup> <sup>44</sup>	k <sup>h</sup> àt <sup>h</sup> ó	EP q <sup>h</sup> et <sup>h</sup> o
286	to raise	chi dag, 起达, *chi`da.	[mi <sup>32</sup> -]tç <sup>h</sup> i <sup>32</sup>	[dé-]ts <sup>h</sup> ž	EP [de-]t <sup>h</sup> ə
287	to write	zhin, 认, *zhön	zi <sup>53</sup>	řó	F řə
288	to be heavy	l'i, 利, *lii	li <sup>34</sup>	əné	F le
289	this		ke <sup>51</sup> -t <sup>h</sup> e <sup>51</sup>	t <sup>h</sup> é-ké	F ko, LP ku-ke
290	that	the', 特, *thöo	jo <sup>44</sup> -t <sup>h</sup> e <sup>32</sup>	á	LP wo-ke
291	skin	ken, 更, *-kön	ge <sup>44</sup> pi <sup>44</sup>	Ndřvpi	EP Ndřrupe
292	to be light	yi chug [tshug], 衣粗, *_yi_tshu.	ji <sup>44</sup> ts <sup>h</sup> o <sup>44</sup>	gó-əgó	EP gu-go
293	to exchange	tog ken, 多更, *-to. - kön	to <sup>44</sup> ke <sup>44</sup>	Ndžž-Ndžž	LP t <sup>h</sup> e-Ngu-Ngu
294	to be thin	dpa', 拔, *paa	ba <sup>32</sup>	bž-bž	EP bi-bje
295	to be thick	kyu, 局, *cu	dzu <sup>34</sup>	bý	F žy
296	not listen	ma pad yag, 马巴呀, *_ma`pa. -ya.	ma <sup>32</sup> = ba <sup>53</sup> na <sup>32</sup>	mà = bání	LP mæ = bæni
297	Tosu <sup>60</sup>	tog so, 多续, *-to.`su	do <sup>44</sup> -çu <sup>44</sup>	lž-šý [ǝ-šý]	EP li-zu or EP ly- zu
298	to send off	dpe' kyi, 白鸡, *pai`ci	pe <sup>32</sup> tçi <sup>53</sup>	[ŋà-]pàtšž	RP [t <sup>h</sup> e-]petçi
299	(Tosu and) China; Chinese	(rtog sug) tse, (多续)姐, *_to`su_tse	dze <sup>32</sup>	Ndžà	F Ndze

<sup>60</sup> Forms in the Ersu and Lizu columns are autonyms of these two ethnic groups; both mean 'white people'.

300	we	a te, 阿得, *ŋa ʼtö	ŋa <sup>53</sup> -de <sup>32</sup>	á-tʃ	<sup>LP</sup> æ-ɾə
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