CHAPTER 1

INTRODUCTION

1.0 Introduction

The basic purpose of this thesis is to provide a reconstruction of Proto Northern Burmic and to describe the phonological relationships between the Northern Burmic languages. This work is relevant as a thorough analysis of this language family has not yet been conducted. This analysis relies primarily on data from six Northern Burmic languages, with the additional resource of Written Burmese.

In chapter 1, the background information on the languages under study and the basic approach of the thesis are described, chapter 2 gives a description of the lang-uages. The reconstruction is provided in chapter 3. A description of Proto Northern Burmic and a discussion of the phonological relationships between the Northern Burmic languages is given in chapter 4. Reconstructed vocabulary is entailed in chapter 5.

This chapter provides background information for this thesis such as a description of the Northern Burmic peoples, linguistic classification, literature review, historical reconstruction methodology, a brief statement of purpose, as well as sources for the linguistic data.

1.1 Northern Burmic Historical, Cultural and Geographic Background

The term *Northern Burmic* (Shafer 1966) is used in this thesis to refer to the grouping of Achang, Bela, Lashi, Maru, Phon, and Zaiwa. The primary data for this thesis is from speakers in the Kachin State in NE Myanmar (Burma) near the border of Yunnan, China (see section 1.7 for discussion of data). It must be stressed that this is by no means the only area in which these

languages are spoken as these language groups straddle the rugged mountain peaks between China and Myanmar.

Northern Burmic speakers are part of the Kachin Nation in Burma. The term Kachin can at times be confusing as it is used to refer both to a language group (Kachin is the Burmese word for Jingpho language speakers), and a larger grouping of peoples who share a similar historical and cultural identity. This term will be used in the latter sense in this thesis and will refer to the lingua franca used by Northern Burmic peoples as Jingpho (also spelled Jinghpaw).

Kachin peoples are said to have descended from a common ancestry. It is believed that the Kachin peoples were displaced from their original homeland on the Tibetan Plateau and migrated southeast settling in the mountainous border regions of China, Myanmar, and India. Johnstone (1993) reports 625,000 Kachin living in Myanmar, 20,000 (Diehl 1993) in China and 7,200 in India (Grimes 1996). Little is known of the early culture of the Kachin peoples although they have a long history as warriors. Kachin men are often identified by the long swords they wear. Kachin culture is historically centered around Myitkyina, and expanded by displacing and subjugating Shan peoples as far Northward as Putao.

The Kachin people live in a terrain of rugged mountains and valleys that extend from the Himalayas. Most of the mountains and alternating valleys run in a roughly North-South direction. The topography of the Kachin area varies from the very mountainous area of the North and East, to considerably smaller mountains and broader valleys in the South and West. The Irrawaddy river and its tributaries: the Tanai, Mogaung, Taping, and Shweli provide the primary drainage in this region.

This region is generally covered by a semi-tropical monsoon forest with dense undergrowth. There are varieties of bamboo, cane, and tuberous plants which grow wild. Different types of wildlife are in the Kachin area including fowl, squirrel, pigs, deer, leopards, tigers, bears, snakes, and occasionally, elephants in the lowlands (Tegenfeldt 1974:9).

The majority of Kachin peoples are agriculturists. They practice wet rice farming on terraced slopes. Water buffaloes are used to plow and till the soil. There is some slash and burn

agriculture. Here the crops are more varied including corn, millet, potatoes and soybeans. The practice of slash and burn agriculture is becoming more rare as farmers run out of suitable land. Other occupations include hunting and fishing, some mining, government service, spinning and weaving, and trade.

Kachin settlement is generally in mountain villages. Early settlement in these areas served for defensive purposes. The village is governed by a chief and elders. The chief has ownership over the land, and influence over nearly every aspect of life in the village. The chief allots land for housing and farming with the council of his elders. A man becomes a chief through inheritance; he is usually the youngest son of a previous chief.

Descent is patrilineal, with settlement taking place patrilocially. Within the family, the older sons are expected to leave home and succeed on their own, while the youngest son succeeds his father. Physical property, aside from land and house, is equally divided among the sons. Inheritance is only to the sons since the daughters are provided for by the families into which they marry.

An individual clan divides broader Kachin society in two basic categories, those clans who give brides, and those clans who receive brides. The most important influence in Kachin society is the clan. Each clan traces its descent from one of the sons of Wahkyet Wa, the forerunner of all the Kachin clans. In some cases where a clan grows sufficiently in numbers and prestige, it may be divided into smaller clans. This division permits intermarriage (which would have been prohibited prior to the division) within the original clan (Tegenfeldt 1974:24). Marriage is mostly arranged, although a form of bride stealing is often practiced.[1]

Differing customs are present among the major clans. These groups roughly correspond to distinctive language groups among the Kachin. The differences are most obvious in the dress of the women, but extend to other areas as well (Tegenfeldt 1974:28). Religiously, the Kachin peoples are mixed. There is often an overlay of syncretistic beliefs in spirits called nats mixed together with

[1] Often this bride stealing, or kidnapping, is part of an arranged marriage.

Buddhist, animist, or Christian beliefs. A considerable number of Kachins have converted to Christianity since 1900.

Figure 1. Southeast Asia.

Figure 2. Area of Map 1 insert. Northern Myanmar.

1.2 Linguistic Classification of Northern

Burmic Languages

Few places in the world are as linguistically diverse as Southeast Asia. Here, the confluence of the three major language families of Austro-Asiatic, Austro-Tai and Sino-Tibetan paints a colorful picture. Within this picture, Sino-Tibetan includes Sinitic, or Chinese languages, and Tibeto-Karen (Benedict 1972). Tibeto-Karen is then subdivided into Karen[2] and Tibeto-Burman.

The classification of Northern Burmic languages has been variously portrayed by different linguists, with many linguists using Shafer's (1966) classification shown as follows:

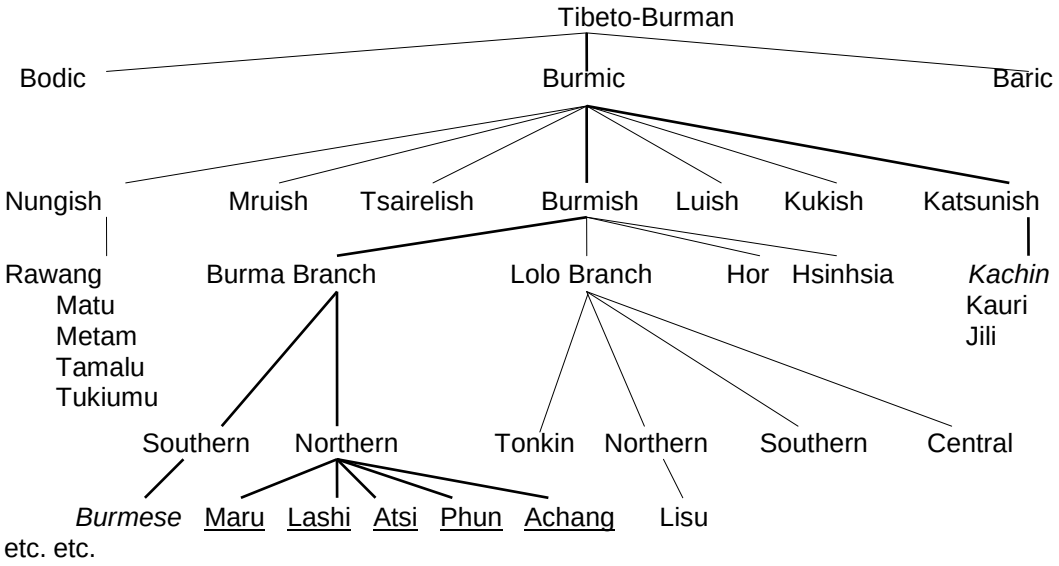

Figure 3. Shafer's (1966) classification of Tibeto-Burman.

Shafer's classification is somewhat unusual in its inclusion of Phon (Phun) in the subgrouping of the Northern Burma branch.[3]

[2] It must be mentioned that the relationship of Karen to Tibeto-Burman is somewhat unclear at present with some linguists (Benedict 1972) classifying Karen as a sister node to Tibeto-Burman (TB) and others classifying Karen as a daughter node to Tibeto-Burman (Delancy 1990). Benedict's classification of Karen outside of TB is based largely on the reconstructed three tone system and the typology of Karen as an SVO language as opposed to the prototypical TB typology of SOV. It is entirely possible that Karen has been influenced by Mon sentence structure (Fraser Bennett personal communication).

[3] Most of the classifications use the name Atsi for Zaiwa and Kachin for Jingpho.

Another classification of Tibeto-Burman developed by Benedict (1972) is shown in figure 4:

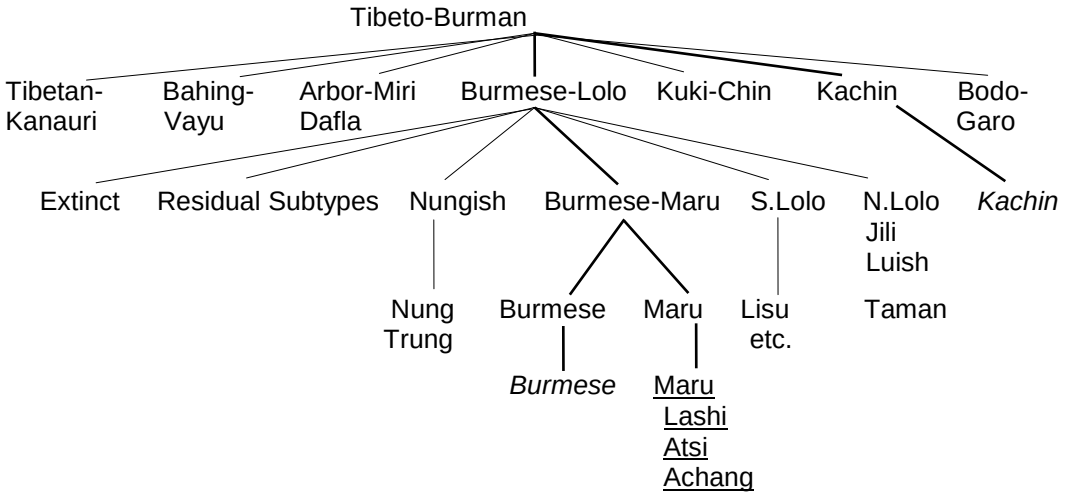

Figure 4. Benedict's (1972) classification of Tibeto-Burman.

Egerod (1974) portrays the constituency of the Burma Branch somewhat differently, depicted in figure 5:

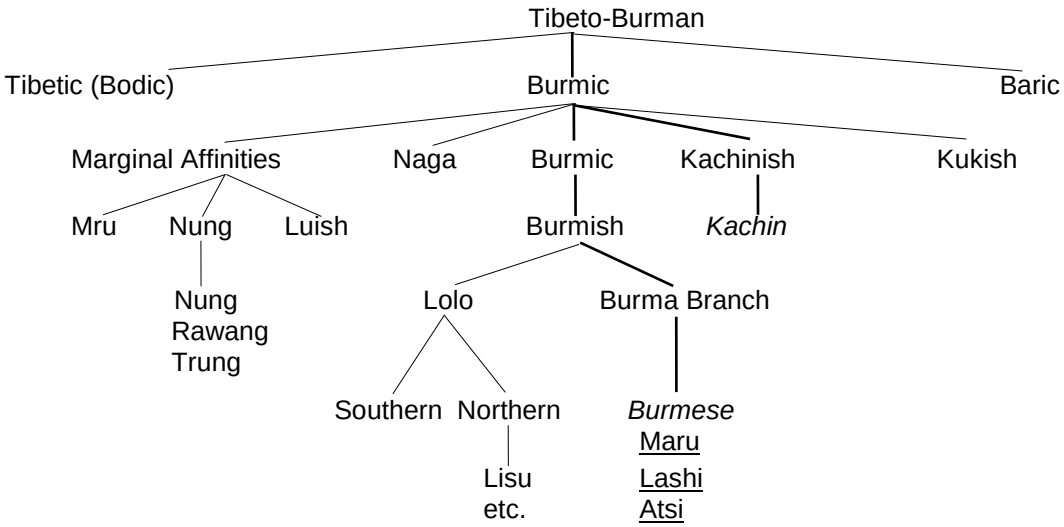

Figure 5. Egerod's (1974) classification of Tibeto-Burman.

It is interesting that Egerod classifies Burmese together with Maru, Lashi, and Atsi under the Burma branch; this grouping is not shared by most linguists.

Ruhlen's (1987) classification is as follows:

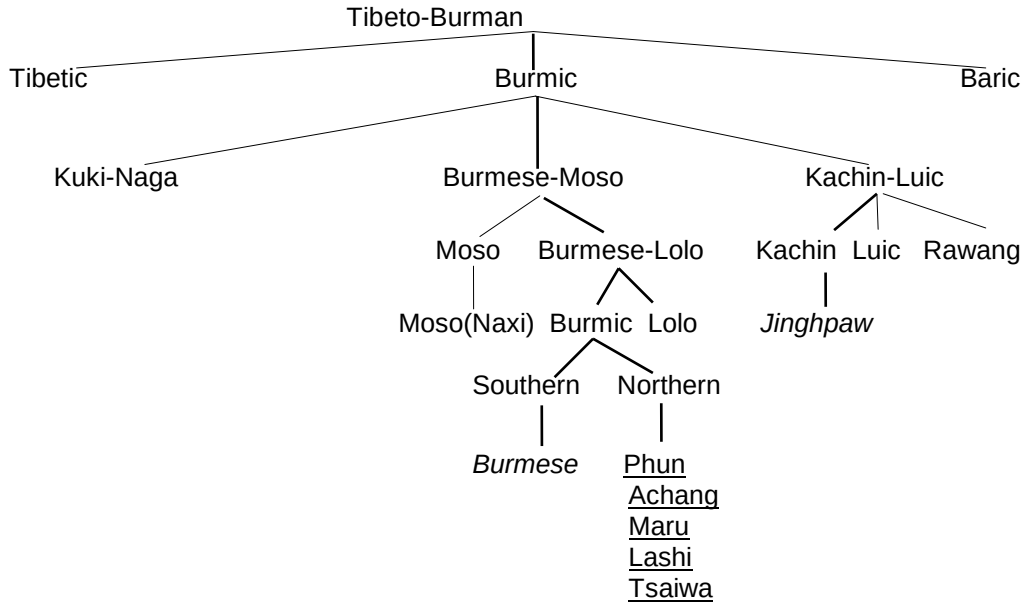

Figure 6. Ruhlen's (1987) classification of Tibeto-Burman.

Ruhlen's classification is similar to Shafer's by its inclusion of Phon (Phun). Another classification proposed by Dai Qingxia (1993) is as follows:

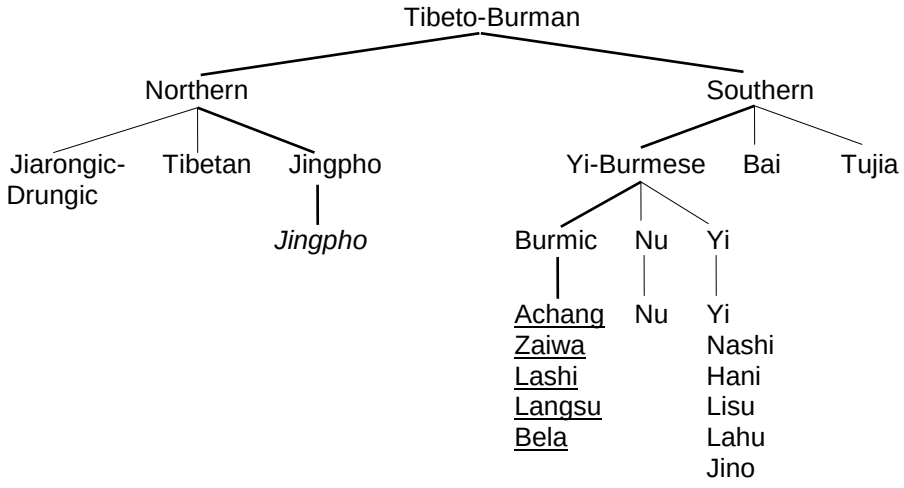

Figure 7. Dai Qingxia's (1993) classification of Tibeto-Burman.

Dai Qingxia also includes Bela under his Burmic classification and uses the Chinese name Langsu for Maru.

All of these classifications group Lashi, Maru and Zaiwa under a single node in Tibeto-Burman. Only Egerod fails to include Achang in this group. Egerod posits Burmese in the same node as these languages, while Shafer, Benedict, and Ruhlen place Burmese on a sister node. Shafer and Ruhlen include Phon in the family along with Achang, Lashi, Maru and Zaiwa, while Dai includes Bela. All of the linguistic classifications agree that Jingpho is somewhat distantly related to these languages.

This thesis will consider all of these languages and their relationships to provide a refined stammbaum diagram in chapter 4, following a reconstruction of Proto Northern Burmic in chapter 3.

1.3 Literature Review

Although Benedict (1972) touches upon Maru in the *Conspectus*, the most thorough reconstructions of the Northern Burmic languages are by Burling (1967) and Bradley (1979). Both of these reconstructions use Maru and Zaiwa data, but are geared toward a reconstruction of the larger family of Proto-Lolo. Burling's work includes Spoken Burmese, Zaiwa (Atsi), Maru, Lisu, Lahu, Hani, and Akha. Burling's reconstruction is shown in figure 8:

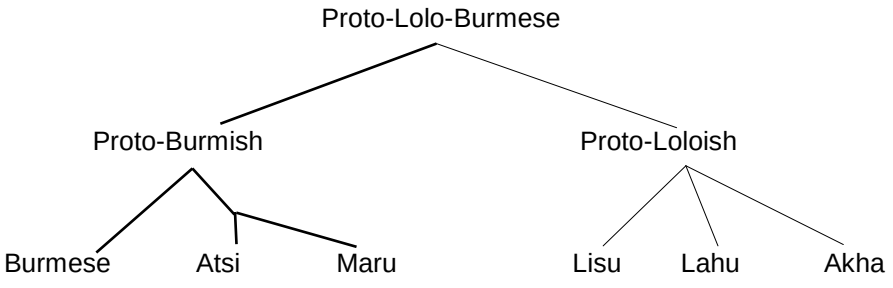

Figure 8. Burling's (1967) reconstruction of Proto-Lolo-Burmese.

One of the greatest weaknesses of Burling's reconstruction is the use of Spoken Burmese as opposed to Written Burmese, as Written Burmese provides a window to historical forms dating back to the twelfth century, while Spoken Burmese has sharply diverged (see section 2.1.1.8) from these earlier written forms. This weakness and Burling's neglect of Lolo and Lashi data are noted by Matisoff (1968) in his review of Burling's (1967) reconstruction.

Bradley's Proto-Loloish is a more thorough treatment of the reconstruction of Proto-Lolo. Bradley considers a broader range of languages as well as written and inscriptional forms of Burmese. Bradley's approach is illustrated in figure 9:

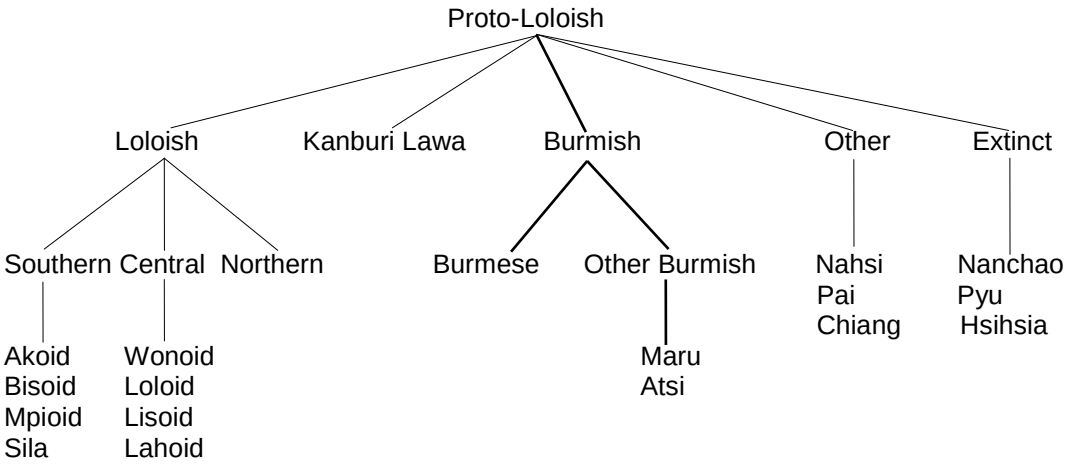

Figure 9. Bradley's (1979) reconstruction of Proto-Loloish.

Although these two studies relate to the current thesis, they are broader in scope, reconstructing a larger and more diverse grouping of languages. The purpose and scope of this investigation focuses more narrowly on Northern Burmic languages.

1.4 Overview of the Comparative Method

The *comparative method* is used to recover earlier linguistic forms as well as establishing genetic affinity among languages. Application of the comparative method to related languages yields an earlier, possibly non-extant parent language, called a *proto language*. The proto language

is derived by observing systematic correspondences in its related descendant languages. These systematic correspondences are derived by observing patterns in cognates. Once observed, the correspondences are captured by phonological rules. These phonological rules express the historical development of the proto language into its descendant languages. The phonological rules state the phonological difference between the descendant language and the proto language and provide an index for how the descendant language has diverged. In general, phonological divergence increases with the number of rules.

As some languages may appear to be related based on a few lexical items, it is necessary to rely on a large corpus of data. Some similarities may arise by chance such as the Korean word [tu] "two" and the English word [tu] "two" which have separate origins but would appear to be related at first glance. Borrowing may also give two languages the appearance of being related. Consider the following examples:

English	French
veal	veal
beef	boeuf
pork	porc

(adapted from Hock 1991)

These examples show French words which were incorporated into English following the Norman conquest of England. Since borrowing tends to take place within limited domains, it is necessary to compare cognates over a broad semantic range indicative of the entire vocabulary of the languages under comparison.

A successful comparative reconstruction provides a glimpse of the proto language and is used to establish language families and relationships between these languages.

1.5 Tibeto-Burman Reconstruction

Tibeto-Burman reconstruction[4] differs from other comparative reconstruction in the reconstruction of roots, and the development of tone. Most scholars conceive Tibeto-Burman roots as being monosyllabic (Matisoff 1973). Thus, the domain of focus is the syllable. Like many languages, Tibeto-Burman syllables exhibit the effect of immediate constituency (Selkirk 1982), such that the *nucleus* and *coda* bear a strong affinity and as such are analyzed as a single unit called the *rhyme*. Although the onset may affect rhymes and tones, the effect is not as strong, allowing the onset to be analyzed separately. Tones in Tibeto-Burman languages, like Sino-Tibetan languages may have originated through a process called *tonogenesis* (Matisoff 1973). Tonogenesis takes place when a language that previously had no tonal contrast acquires a tonal contrast subsequent to a loss in initial and/or final consonants. Examples of this are Tibetan and Vietnamese (Haudricourt 1954), which were at one time toneless, but the modern spoken languages are tonal.

1.6 Source of Linguistic Data

Part of the linguistic data presented in this thesis is from Wannemacher (1995) for Achang, Bhamo Jingpho, Lashi, Maru, and Zaiwa. His phonological sketches of these languages are used heavily in chapter 2. Edmondson (1992) provided recorded Bela data and helped in the tonal analysis. The Burmese data are a combination of material from Matisoff (1976), Bradley (1979) and Bennett (1995). The Phon data are from Henderson's (1986) summary of Luce's data.

1.7 Purpose of Thesis

The purpose of this thesis is to describe the phonological properties of the Northern Burmic language family and reconstruct Proto Northern Burmic based on data from Achang, Bela, Lashi,

Maru, Phon, Zaiwa, and Written Burmese. The reconstruct-ion of Proto Northern Burmic and the rules used to derive the descendant languages will be used to provide a detailed subgrouping of Northern Burmic languages.

[4] The standard reference work for Tibeto-Burman and Sino-Tibetan reconstruction is Benedict's (1972) *Sino-Tibetan: A Conspectus*. Although this work does not define a systematic approach or methodology for Tibeto-Burman reconstruction, it nevertheless provides an overview of the Tibeto-Burman picture and examples of reconstructed roots.

CHAPTER 2

OVERVIEW OF THE KACHIN LANGUAGE PICTURE

2.0 Introduction

In this chapter, we will consider general characteristics of the languages under investigation. These languages are grouped in two categories: Non-Northern Burmic languages such as Burmese and Jingpho, and Northern Burmic languages. The purpose of this chapter is to provide the reader with an overview of these languages before the phonological reconstruction in chapter 3.

2.1 Non-Northern Burmic Languages

The non-Northern Burmic languages considered here include Burmese and Jingpho. Burmese, on Shafer's (1966) Southern Burmic branch is closely related to Northern Burmic languages such as Achang, Bela, Lashi, Maru, Phon, and Zaiwa. The separation of Southern and Northern Burmic will be briefly considered in section 4.2.4. As the Stammbaum diagrams in section 1.7 indicate, Jingpho's exclusion from North-ern Burmic languages is not controversial and will not be considered in this thesis.[5] Jingpho, a trade language among the Kachin peoples, is considered in order to eliminate borrowed words from the Northern Burmic vocabulary.

2.1.1 Burmese

This section considers basic traits of Burmese such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. Additionally, attention will be given to the transcription of Written Burmese and Modern Spoken Burmese and the historical sound changes encapsulated in the difference between these two forms of Burmese. The transcription of Written Burmese and the historical development of sound changes are relevant to the reconstruction of Proto Northern Burmic as the Northern Burmic languages are closely related to Burmese and

[5] For a detailed discussion of the historical context of Jingpho see Burling (1971).

may have undergone similar phonological processes. Burmese is used throughout this thesis as an index for comparison.

2.1.1.1 General

The most recent population statistic cited by Grimes (1996) puts the number of Burmese speakers in the world at 31 million. These speakers are principally from Myanmar, but also include speakers located in Bangladesh, USA, Macao, Malaysia, and Thailand. The Burmese data used in this thesis is from multiple sources. The primary source is from Bennett (1995), while secondary sources include Matisoff (1976), Bradley (1979), and Wheatley (1990).

2.1.1.2 Syllable Structure

There are two main types of syllables in Burmese, major syllables and minor[6], or reduced, syllables. In a reduced syllable there is no medial consonant, coda, or tonal contrasts, and the vowel is reduced to a mid central lax vowel [ə]. These syllables are bound to a major syllable, usually occurring singly, although they can sometimes occur in pairs. Minor syllables are always followed by a major syllable. Minor syllables are historically related to full syllables, but have lost features through various phonological processes (Wheatley 1990).

In a major syllable there are five components: the initial consonant or onset (C_1), a medial glide (G), a vowel V_1 or diphthong $V_1(V_2)$, a final or coda (C_2), and tone T. Among these only C_1, V_1, and T are obligatory. Thus the syllable structure appears as follows:

$$C_1(G)V_1(V_2)(C_2)T$$

Symbols enclosed by parentheses are optional elements, while those elements without parentheses are required.

[6] This major-minor syllable pattern in Burmese is not typical of Tibeto-Burman languages is believed to have been inherited from Mon-Khmer languages (Wheatley 1990).

2.1.1.3 Consonants

The inventory of consonants is shown in table 1, which shows the segments by manner of articulation in the left column, and place of articulation in the top row:

TABLE 1

BURMESE CONSONANT INVENTORY

	LAB	DTL	ALV	PAL	VLR	GLT
Plosive vl asp	p^h		t^h	c^h	k^h	
vl	p		t	c	k	ʔ
vd asp	{hb}		{hd}		{hg}	
vd	b		d		g	
Fricative vl asp			(s^h)			
vl		(θ)	s			h
vd			(z)			
Nasal vl	hm		hn	hɲ	hŋ	
vd	m		n	ɲ	ŋ	
Lateral vl			hl			
vd			l			
Approximant vl	hw		{hr}	hj		
vd	w		{r}	j		

Segments enclosed in {braces} are present only in Written Burmese, while those segments shown in (parentheses) are present only in Modern Spoken Burmese; all other segments are present in both spoken and written forms. Voiceless aspirated plosives and fricatives are written as [-^{h}] for comparative purposes, while all other aspirated segments are written in the more traditional manner as [h-].[7]

[7] The presence of a dash [-] indicates that there may be several segments that occupy this place, thus, [-^{h}] represents: p^h t^h c^h k^h and s^h in Written Burmese.

2.1.1.4 Vowels

The inventory of vowels is shown in table 2 which maps the segments by rel-ative height on the left column and place on the top row:

TABLE 2

BURMESE VOWEL INVENTORY

		Front	Central	Back
High	tense	i		u
	lax	[ɪ]		[ʊ]
Mid	tense	e	[ə]	(o)
	lax	[ɛ]		
Low			a	[ɔ]

Segments enclosed in [brackets] are phonetic only, while those segments shown in (parentheses) are present in only in Modern Spoken Burmese; all other segments are present in both spoken and written forms.

2.1.1.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are observed in the data: [p^hj pj k^hj k^hjw kj kjw gj hmj mj hlj hj p^hr pr k^hr kr mr hmr ŋr p^hw pw t^hw tw k^hw kw kr w mrw mw nw ŋw hrw rw sw c^hw cw jw]. All vowels are allowed in the V_1 position. The diphthongs (V_1V_2) are restricted to [ei ai au ui ou]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.1.1.6 Suprasegmental Considerations

There are three contrastive tones in Burmese in non-stopped[8] syllables: creaky, level, and heavy (or breathy).[9] There is only one tone in stopped syllables, which is referred to as a "killed tone." Although Burmese does not have contrastive tense-lax voice quality, it does have the characteristic of sharp, rapid, glottal closure at the coda which is somewhat tense.[10]

2.1.1.7 Transliteration

Nearly sixty percent[11] of the population of Myanmar speak Burmese as their native language. The Modern Burmese spoken by these people, however, is in most cases[12] radically different than that recorded in the Burmese script. For example the word for "chicken" today is pronounced [cɛʔ] while the orthography reflects the older pro-nunciation of [krak], while the word "louse" which is pronounced today as [θã], was formerly [san:].[13]

The Burmese script has complex, sociolinguistically rich history. The Burmese script developed after the defeat of the Mons in A.D. 1057. This script was an adaptation of the Mon script to the spoken Burmese of the time. The Mon script, in turn, was adapted from the Brahmi script of India.

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[8] A stopped syllable is a syllable with a stop in the coda (C_2) position. The stopped verses non-stopped syllable distinction is an important distinction in Tibeto-Burman languages.

[9] Tonal categories are identical for Written and Spoken Burmese.

[10] Jerry Edmondson, personal communication.

[11] The Ethnologue (Grimes 1996) lists 58.41% of the population comprising 21,553,000 native speakers. Additionally there are 3 million second language speakers (Voegelin and Voegelin 1977) The World Almanac (1995) lists the total worldwide number of speakers including second language speakers at 31 million.

[12] The Burmese Dialects of Arakanese and Tavoyan are reputed to be somewhat more con-servative than central Burmese (Wheatley 1990).

[13] While Written Burmese is shown in a phonetic format, this does not imply that the exact pronunciation is known; rather this form is used for general comparison only.

Pali, being the language of the Buddhist scriptures influenced Burmese vocabulary and literary styles. Pali vocabulary is used for religious, scientific, linguistic, and medical terminology. Pali is also used for adapting foreign words much like Latin and Greek are used in European languages. For instance, the Burmese word for "spaceship" is [ʔa.ka.θa**:**jin] which is a compound from the Pali word ĀKĀSA "space, expanse," rendered [ʔa.ka.θa**:**] in spoken Burmese, and the Pali word YĀNA "vehicle" rendered [jin] in Burmese (Wheatley 1990). In written communication, words borrowed from Pali are easily distinguishable from native Burmese words as a different script for borrowed words.

Such borrowed words while interesting historically, will be omitted from consideration in the historical reconstruction of Proto Northern Burmic as Pali belongs to the Indo-European language family.

By considering the difference between the transliteration of Modern Spoken Burmese and that of Written Burmese, it is possible to determine the historical sound changes between the Written and Spoken language.

Burmese transliteration has a long history. Even today new transliterations (or romanizations) are evident. The latest change in place names took place after 1988. Other than the change in the country name from Burma to Myanmar, most of these changes are phonetically more similar to spoken Burmese (Turner 1994). Some of these name changes are as follows:

Old Name	New Name
Akyab	**Sittwe**
Bassein	**Psth**ein
Maymyo	**Pyin Oo Lwin**
M**ou**lm**e**in	M**awl**am**y**in**e**
M**yohaung**	M**rauk-U**
Pagan	**B**agan
Pegu	**Bago**
P**rome**	P**yi**
Rangoon	**Y**angon
Irrawaddy R.	**Ayeyar**wady R.
Sal**wee**n R.	**Than**l**wi**n R.
Sitt**a**ng R.	Sitt**ou**ng R.

The transliteration system used here is primarily from Matisoff (1976), with some details from Bradley (1979, 1995). Additional sources include Roop (1972) and Okell (1971, 1994).

2.1.1.7.1 Written Burmese Transcription

The following charts summarize the transliteration of Written Burmese used in this document. The chart of onsets has a row of Written Burmese characters (entitled "Burmese"), with another row directly beneath (entitled "Written Tran") containing the transcriptional equivalent for each of the Written Burmese characters. The following tabulated data are broken into categories of onsets, onsets with vocalic and tonal infor-mation, medials, vowels and tones, stop codas and nasal codas.

2.1.1.7.1.1 Onsets

The onset transcription for Written Burmese is as follows:

Burmese:	ပ	ဗ	တ	ဒ	က	ဂ	စ	အ
Written Tran:	p	b	t	d	k	g	c	ʔ
Burmese:	ဖ	ဘ	ထ	ဓ	ခ	ဃ	ဆ	
Written Tran:	p^h	hb	t^h	hd	k^h	hg	c^h	
Burmese:	မ	န	င	ည	လ	ယ	ရ	ဝ
Written Tran:	m	n	ŋ	ɲ	l	j	r	w
Burmese:	မှ	နှ	ငှ	ညှ	လှ	ယှ	ရှ	ဝှ
Written Tran:	hm	hn	hŋ	hɲ	hl	hj	hr	hw
Burmese:	ဇ	သ	ဟ					
Written Tran:	j	s	h					

Note [နှ] may be written as [န] and onsets may be written as subscripts [ှ] in borrowed words. Aspiration [ʰ] may be written as [-] depending on the context.

2.1.1.7.1.2 Onset-Vowel-Tones

In some cases, the onset in Written Burmese also carries vocalic and tonal information, these cases are shown as follows:

Burmese:	ဣ	ဥ	ဥ
Written Tran:	ʔi	ʔu	ʔu
Tone:	level		creaky

2.1.1.7.1.3 Medials

The transcription of Written Burmese medials is shown as follows:

Burmese:	ျ	ြ	ွ
Written Tran:	j	r	w

2.1.1.7.1.4 Vowel-Tones

Tonal information is most commonly encoded with vocalic information in Written Burmese. The transcription of this information is as follows:

Burmese:	ေ◌့	ေ◌့်	◌ိ	◌ိုဲ့	creaky tone (ʔ)
Burmese:	ေ◌	ေ◌်	◌ီ	◌ိုဲ	level tone ( )
Burmese:	ေ◌း	ေ◌ာ	◌ီး	◌ိုဲး	heavy tone (ː)
Written Tran:	-e	-au	-i	-ui	
Burmese:	◌ိ	◌ံ့	◌		creaky tone (ʔ)
Burmese:	◌ိုဲ	◌ိုဲ◌်	◌ာ		level tone ( )
Burmese:	◌ိုဲး	◌ံ	◌ား		heavy tone (ː)
Written Tran:	-u	-ai	-a		

Note [◌ာ] may be written as [◌ါ], [◌ိ] may be written as [◌ီ], and [◌ိုဲ] may be written as [◌ို] depending on the context.

2.1.1.7.1.5 Codas-Stops

The transcription of stopped codas and tone in Written Burmese is as follows:

Burmese:	◌ပ်	◌တ်	◌စ်	◌က်
Written Tran:	-p	-t	-c	-k
Tone:	killed tone			

2.1.1.7.1.6 Codas-Nasals

The transcription of nasal codas and tones in Written Burmese is as follows:

Burmese:	◌ံ့	◌န့်	◌ည့်/◌ဉ့်	◌င့်	creaky tone
Burmese:	◌ံ/ ◌ ·	◌န်	◌ည်/◌ဉ်	◌င်/ ◌ ်	level tone
Burmese:	◌ံး	◌န်း	◌ည်း/◌ဉ်း	◌င်း	heavy tone
Written Tran:	-m	-n	-ɲ	-ŋ	

2.1.1.7.2 Modern Spoken Burmese Transcription

The following charts summarize the Transliteration of Modern Spoken Burmese used in this document. The chart of onsets has a row of Written Burmese characters (entitled "Burmese"), with another row directly beneath (entitled "Spoken Tran") containing the transcriptional equivalent approximating the sound(s) used in Modern Spoken (Rangoon) Burmese for each of the Written Burmese characters. The following tabulated data are broken into categories of onsets, onsets with vocalic and tonal infor-mation, medials, vowels and tones, stop codas and nasal codas.

2.1.1.7.2.1 Onsets

The onset transcription for Modern Spoken Burmese is as follows:

Burmese:	ပ	ဗ	တ	ဒ	က	ဂ	စ	အ
Spoken Tran:	p	b	t	d	k	g	s	ʔ
Burmese:	ဖ	ဘ	ထ	ဓ	ခ	ဃ	ဆ	
Spoken Tran:	p^h	b	t^h	d	k^h	g	s^h	
Burmese:	မ	န	ဂ	ည	လ	ယ	ရ	ဝ
Spoken Tran:	m	n	ŋ	ɲ	l	j	j	w
Burmese:	မှ	နှ	ငှ	ညှ	လှ	ယှ	ရှ	ဝှ
Spoken Tran:	hm	hn	hŋ	hɲ	hl	hj	hj	hw
Burmese:	ဇ	သ	ဟ					
Spoken Tran:	z	θ	h					

2.1.1.7.2.2 Onset-Vowel-Tones

In some cases, the onset in Written Burmese also carries vocalic and tonal information, these cases are as follows:

Burmese:	ဣ	ဥ	ဉ
Spoken Tran:	ʔi	ʔu	ʔu
Tone:	level		creaky

2.1.1.7.2.3 Medials

The transcription of Modern Spoken Burmese medials is as follows:

Burmese:	ျ	ြ	ွ
Spoken Tran:	j	j	w

2.1.1.7.2.4 Vowel-Tones

Tonal information is most commonly encoded with vocalic information in Written Burmese. The transcription of this information into Modern Spoken Burmese is as follows:

Burmese:	◌့	◌့်	◌ိ	◌ို	creaky tone (ʔ)
Burmese:	◌	◌််	◌ီ	◌ိုဲ	level tone ( )
Burmese:	◌း	◌ော	◌ီး	◌ိုး	heavy tone (:)
Spoken Tran:	-ei	-o	-i	-ou	
Burmese:	◌ိ	◌ံ့	◌		creaky tone (ʔ)
Burmese:	◌ိဳ	◌ောင်	◌ော		level tone ( )
Burmese:	◌ိုး	◌ံး	◌ေား		heavy tone (:)
Spoken Tran:	-u	e	-a		

2.1.1.7.2.5 Codas-Stops

The transcription of Written Burmese stopped codas and tone into Modern Spoken Burmese is as follows:

Burmese:	ဝ်	တ်	စ်	က်
Spoken Tran:	-ʔ	-ʔ	-ʔ	-ʔ
Tone:	killed tone			

Note that all of the final stops become the glottal stop in Modern spoken Burmese.

2.1.1.7.2.6 Codas-Nasals

The transcription of Written Burmese nasal codas and tone into Modern Spoken Burmese is as follows:

Burmese:	-မ့်	-န့်	-ည့်/-ဉ့်	-င့်	creaky tone
Burmese:	-မ်/ -ံ	-န်	-ည်/-ဉ်	-င်/ -ိဳ	level tone
Burmese:	-မ်း	-န်း	-ည်း/-ဉ်း	-င်း	heavy tone
Written Tran:	-∀	-∀	-∀	-∀	

Note that all of the final nasals are lost and the preceding vowel becomes nasalized in Modern Spoken Burmese.

2.1.1.8 Diachronic Changes

As noted in the section 2.1.1.7, there has been a considerable amount of phonological changes in Burmese. In this section we will consider how Modern Spoken Burmese contrasts with Written Burmese. Since Written Burmese dates to the twelfth century, this will section will provide a brief account for the phonological changes in Burmese over the last 700 years. This diachronic phonology of Burmese is a useful index by which to gauge changes in the Northern Burmic languages under study. Much of the following analysis relies on the description provided by Matisoff (1976).

2.1.1.8.1 Initials

Initial consonants have in some cases lost features, such as the initial aspirated voiced stops losing their aspiration:

2.1 hb, hd, hg > b, d, g /#_____

In other cases, initial consonants have merged completely with other consonants as the following rules illustrate (note the numbering of these rules does not imply order):

2.2 c, c^h > s, s^h /#_____
2.3 j > z /#_____
2.4 s > θ /#_____

The merger of the voiceless alveolar fricative and the voiceless dental fricative occured prior to the voiceless palatal merger with the voiceless alveolar fricative.

2.1.1.8.2 Medials

Medial consonants have undergone the merger of the retroflex with the palatal, as the following rule illustrates:

2.5 r > j /#_____

2.1.1.8.3 Vowels

Vowels in open syllables have gone through various changes. One change is a lengthening of the mid tense front vowel to the diphthong /ei/:

2.6 e > ei /C_____#

The diphthong /au/ becomes the mid tense back vowel in an open syllable:

2.7 au > o /C_____#

The diphthong /ui/ becomes the diphthong /ou/ in an open syllable:

2.8 ui > ou /C_____#

The diphthong /ai/ becomes the mid tense front vowel in an open syllable:

2.9 ai > e /C_____#

In closed syllables several changes take place which affect the vowels. It must be noted that these rules apply before those rules that affect the final consonants. The process whereby a low central vowel becomes a high tense vowel before a palatal final is described in rule 2.10:

2.10 a > i /_____ c, ɲ - may be nasalized, may be e,ei before ɲ.

Note that /i/ in rule 2.10 may be realized phonetically as [ɪ].

The low central vowel becomes a mid tense front vowel before a velar stop:

2.11 a > e /_____ k

Note that /e/ in rule 2.11 may be realized phonetically as [ɛ].

The bilabial medial and the low central vowel coalesce to become the high tense back vowel before labial and alveolar stops and nasals:

2.12 wa > u /_____ p, t, m, n

Note that /u/ in rule 2.12 may be realized phonetically as [ʊ].

The low central vowel becomes the mid tense front vowel following the bilabial medial and before the velar stop:

2.13 a > e /w_____ k

Note that /e/ in rule 2.13 may be realized phonetically as [ɛ].

The low central vowel becomes the high tense front vowel following the bilabial medial and before the velar nasal:

2.14 a > i /w_____ɲ

Note that /i/ in rule 2.14 may be realized phonetically as [ɪ].

The diphthong /ui/ becomes the diphthong /ai/ before the velar stop and nasal:

2.15 ui > ai /_____ k, ŋ

The high tense back vowel becomes the diphthong /ou/ before the labial and alveolar stops and nasals:

2.16 u > ou /_____p, t, m, n

The high tense front vowel becomes the diphthong /ei/ before the labial and alveolar stops and nasals:

2.17 i > ei /_____p, t, m, n

2.1.1.8.4 Finals

Final plosives have merged with the glottal stop:

2.18 p, t, k, c > ʔ /_____#

Final nasals are lost leaving only a trace of nasalization on the preceding vowel as shown follows:

2.19 Vm, Vn, Vɲ, Vŋ > V̰ /_____#

The closed syllable vowel changes must have occurred prior to the neutralization of the final consonants. This appears to have caused some instability in the final consonants leading to a loss of contrast, with the bilabial, alveolar, palatal, and velar stops unconditionally merging into the glottal stop, while the nasal series were lost and left only a nasalized trace on the nuclei[14]. The initial and medial changes do not appear to have influenced vowel quality. With few exceptions, the vowel changes show a high degree of symmetry, conditioned primarily by the place of articulation of the final.

[14] The effects of immediate constituency (Selkirk 1982) is observed in the nucleus and coda relationships in Burmese.

Additionally, Matisoff (1976) notes that a principal difference between Old Burmese and Middle Burmese is the merger of the Old Burmese medial /-l-/ and Middle Burmese /-j-/ after velars, and /-r-/ after labials.

2.1.2 Jingpho

This section covering Jingpho considers basic traits such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. Additionally, section 2.1.2.7 considers borrowed words in Northern Burmic languages. The main use of Jingpho in this thesis is to determine which words in the Northern Burmic inventory may have been borrowed from this source to insure a faithful reconstruction of Proto Northern Burmic.

2.1.2.1 General

There are 652,000 Jingpho speakers in Myanmar, China, and India. The vast majority of these speakers are in the Kachin State, Myanmar.[15] Jingpho is used as a lingua franca among the Achang, Bela, Lashi, Maru, Phon, and Zaiwa. Dialects noted by Wannemacher (1995) include, Bhamo[16], Dulong, Gauri, Htingnai, Hkahku, and Singhpaw. The Bhamo Jingpho dialect will be considered here.

2.1.2.2 Syllable Structure

A schematic syllable structure of Bhamo Jingpho is composed of an initial consonant C_1 a medial glide (G), which is either the alveolar /r/ or the palatal approximant /j/, a vowel V_1 or vowel diphthong $V_1(V_2)$. The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

[15] Grimes (1996) notes 625,000 in Myanmar, 20,000 in China, and 7,200 in India.

[16] Bhamo Jingpho is nearly identical to Myitkyina Jingpho.

C_1 (G) V_1 (V_2)(C_2)T

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position (C_2), is limited to nasals or voiceless stops. The vowel may be a simple vowel V_1 or a diphthong $V_1(V_2)$, all vowels are allowed in the V_1 position, while (V_2) is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: C, CV, CVV, CVC, CGV, CGVC, CGVV. Since the syllable initial glottal stop is present phonetically but not phonemically, it is also possible to posit onsetless syllable types such as V, VV, and VC.

2.1.2.3 Consonants

The inventory of Bhamo Jingpho consonants is shown in table 3:

TABLE 3

BHAMO CONSONANT INVENTORY

	LAB	ALV	ALP	VLR	GLT
Plosive vl asp	p^h	t^h		k^h	
vl unasp	p	t		k	ʔ
vd	b	d		g	
Affricate vl unasp		ts			
vd		dz	dʒ		
Fricative vl		s	ʃ		
vd		[z]			
Nasal	m	n		ŋ	
Lateral		l			
Approximant	w	r	j		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.

2.1.2.4 Vowels

The inventory of vowels is shown in table 4:

TABLE 4

BHAMO VOWEL INVENTORY

		Front	Central	Back
High	tense	i	[ɨ]	u
	lax	[ɪ]		[ʊ]
Mid	tense	[e]	ə	[o]
	lax	ɛ		
Low			a	ɔ

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.

2.1.2.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [pj p^hj t^hj kj gj k^hj mj nj rj br pr p^hr gr k^hr]. All vowels are allowed in the V_1 position. The diphthongs (V_1V_2) are restricted to [au ai ui ɔi]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.1.2.6 Suprasegmental Considerations

There are four contrastive tones in non-stopped syllables (53, 55, 31, 33) and three tones in stopped syllables (53, 31, 33). Tones in reduced syllables appear to assimilate to the height of the following syllable. Jingpho has tense-lax voice contrast.

2.1.2.7 Borrowing

In order to sift language data for borrowing, it is necessary to compare non-related trade languages. After comparing Bhamo Jingpho to the Northern Burmic languages, there appears to be

limited borrowing from Bhamo Jingpho in Northern Burmic languages. Where Written Burmese appears to have cognates with Bhamo Jingpho it is assumed that these words in Northern Burmic have descended from Proto Burmic (from which Proto Northern Burmic is derived). Thus, where there is a Written Burmese cognate correlating with Northern Burmese words, the Northern Burmese words are used to reconstruct Proto Northern Burmese.

Among the Northern Burmic languages, Zaiwa has the most borrowed words from Bhamo Jingpho: 30 of 399 (8%) on the word list are borrowed. Phon has 13 borrowed words out of 273 (5%), of this, 9 (3%) are from Bhamo Jingpho and 4 (2%) are identified in Henderson (1986) as deriving from Shan. Maru has 16 borrowed words from Bhamo Jingpho out of 392 (4%). Achang and Lashi have relatively few borrowed words from Bhamo Jingpho: 13 of 404 (3%), and 13 of 406 (3%) words are borrowed respectively. Bela has the lowest percentage of borrowed words from Bhamo Jingpho with 4 of 197 (2%).

The primary domain of borrowed terms are from words for items such as fruit, nuts, liquor. These items that are undoubtedly traded in the area and where a common vocabulary would conceivably develop. These words account for 36% of all borrowed words. Once these borrowed words are screened out of the correspondences, there appears to be no systematic phonological relationship between Bhamo Jingpho and Northern Burmic languages.[17]

2.2 Northern Burmic Languages

This section provides a brief description of Northern Burmic (Shafer 1966) languages. These languages include Achang, Lashi, Maru, Phon, and Zaiwa. Bela is also included here as it is part of Dai's (1993) grouping under Burmic languages.

[17] This is consistent with the prevailing scholarship noted in section 1.7, and Burlings (1971) analysis.

2.2.1 Achang

This section considers basic aspects of Achang such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. Much of the analysis and data presented here is from Wannemacher (1995).[18]

2.2.1.1 General

Achang is spoken by about 29,400 speakers (Grimes 1996:539) primarily in the Yunnan province of China along the border of Myanmar. There are also a few speakers in Myanmar. Achang is an official minority language in China.

2.2.1.2 Syllable Structure

A schematic syllable structure of Achang is composed of an initial consonant C_1 a medial glide (G), which is always the palatal approximant /j/, a vowel (V_1) or vowel diphthong ($V_1(V_2)$). The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

$$C_1\,(G)(V_1\,(V_2))(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position (C_2), is limited to nasals or voiceless stops.[19] The vowel may be a simple vowel (V_1) or a diphthong ($V_1(V_2)$), all vowels are allowed in the (V_1) position, while (V_2) is restricted to [i u a e]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: C, CV, CVV, CVC, CVVC, CGV, CGVC, CGVV. Since the syllable initial glottal stop is present phonetically but not phonemic-ally, it is also possible to

[18] The two Achang speakers, Mrs. Ruth in her 60s and Mrs. Wilai in her 40s, are both from Phimau. At the time of the elicitation, Mrs. Ruth had been in Thailand for 14 years and Mrs. Wilai for 8 years. Both speakers use Achang at home, and also speak Jingpho and Burmese.

[19] Wannemacher (1995) notes the presence of final clusters in syllables such as [laŋk^{42}] 'winnow' and [n̰amp^{42}] 'when (?)' , these syllables are regarded as stopped with nasalized vowels in the present analysis.

posit onsetless syllable types such as V and VC. Consonantal syllable types are rare and restricted to syllabic nasals: /n̩/ "fish," and /ŋ̩.juk/ "five people."

2.2.1.3 Consonants

The inventory of consonants is shown in table 5:

TABLE 5

ACHANG CONSONANT INVENTORY

	LAB	ALV	ALP	VLR	GLT
Plosive vl asp	p^h	t^h		k^h	
vl unasp	p	t		k	ʔ
vd	[b]	[d]		[g]	
Affricate vl asp		ts^h	$tʃ^h$		
vl unasp		ts			
vd		[dz]	[dʒ]		
Fricative vl		s	ʃ	[x]	h
Nasal	m	n		ŋ	
Lateral		l			
Approximant	w		j		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.[20]

[20] This analysis differs from Wannemacher's (1995) as the voiced stop series is considered to be phonetic, and Wannemacher considers this set phonemic.

2.2.1.4 Vowels

The inventory of vowels is shown in table 6:

TABLE 6

ACHANG VOWEL INVENTORY

		Front	Central	Back
High	tense	i	ɨ	u
	lax	[ɪ]		[ʊ]
Mid	tense	e	[ə]	o
	lax	[ɛ]		
Low		[æ]	a	[ɔ]

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.

2.2.1.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [t^hj dj k^hj gj hj dʒj $tʃ^h$j mj nj ŋj lj]. All vowels are allowed in the V_1 position. The diphthongs (V_1V_2) are restricted to [au ai ei ui ua ɨu æu uɔ ie ue]. There are rare cases of the following diphthongs: [ao oa oi uɛ uə]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.2.1.6 Suprasegmental Considerations

Achang has three tones in syllables with open and nasal codas. These tones are phonemically [55 33 31]. Stopped syllables have a single non-contrastive tone. Reduced syllables tend to assimilate to the tone of the following syllable.

Achang has a tense-lax voice contrast. Some vowels have a creaky quality preceding a glottal stop. This appears to be an assimilatory process and is not contrast-ive. Tense voice occurs with all syllable types, vowels, diphthongs, tones, and finals.

2.2.2 Bela

This section introduces basic aspects of Bela such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. The Bela data presented here are from Edmondson (1992).[21]

2.2.2.1 General

The Ethnologue records 2,000 to 3,000 Bela speakers in Luxi (Edmondson 1992), Yunnan Province, Dehong Prefecture, Luxi County, Santaishan Township, and Yingjang and Lianghe Counties. It may also be spoken in Myanmar. The Bela regard themselves as somewhat distinctive from Zaiwa and Jingpho and have different traditions.

2.2.2.2 Syllable Structure

A schematic syllable structure of Bela is composed of an initial consonant C_1, a medial glide (G), which is limited to the approximants [j w], a vowel V_1 or vowel diphthong $V_1(V_2)$. The coda is composed of a consonant (C_2). The final element is the tone, which is a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

$$C_1\,(G)V_1\,(V_2)(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position (C_2), is limited to nasals or voiceless stops. The vowel may be a simple vowel V_1 or a diphthong $V_1(V_2)$, all

[21] The speaker is a man of about 30 years old from Sun Xhise. The data was collected in Sichuan Province, China. In addition to Bela, this man speaks Zaiwa, Jingpho and Mandarin. Bela is primarily spoken in the domain of the home.

vowels are allowed in the V_1 position, while (V_2) is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: CV, CVV, CVC, CVVC, CGV, CGVC, CGVV and CGVVC. Since the syllable initial glottal stop is present phonetically but not phonemically, it is also possible to posit onsetless syllable types such as V, VC, VV and VVC.

2.2.2.3 Consonants

The inventory of consonants is shown in table 7:

TABLE 7

BELA CONSONANT INVENTORY

	LAB	LBD	ALV	ALP	PAL	VLR	GLT
Plosive vl asp	p^h		t^h			k^h	
vl unasp	p		t			k	ʔ
Affricate vl asp			ts^h	$tʃ^h$			
vl unasp			ts	tʃ			
Fricative vl		f	s	ʃ		x	
vd		v				ɣ	
Nasal	m		n			ŋ	
Lateral			l				
Approximant	w				j		

Note that the Bela consonant inventory differs from other Northern Burmic languages in its exclusion of voiced stops. The voiceless quality of these segments is consistent with the Computerized Extraction of Components of Intonation in Language (CECIL) analysis. Voicing contrast in several Northern Burmic languages is slight at best.

2.2.2.4 Vowels

The inventory of vowels is shown in table 8:

TABLE 8

BELA VOWEL INVENTORY

		Front	Central	Back
High	tense	i	[ɨ]	u
	lax	[ɪ]		
Mid	tense	e	ə	[o]
	lax	[ɛ]		
Low		[æ]	a	ɔ

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic. The low front vowel [æ] is rare.

2.2.2.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [p^hj k^hj kj mj nj sj]; potential Cw clusters are interpreted as Cu. All vowels are allowed in the V_1 position. The diphthongs (V_1V_2) are restricted to [ui ua ue ai au]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.2.2.6 Suprasegmental Considerations

Bela has three tones in syllables with open and nasal codas. These tones are phonemically represented as a high falling /53/, a mid level tone /33/ and a falling-rising tone /323/. For notational simplicity, the falling-rising tone is represented as /23/ in this analysis. Stopped syllables have only one falling tone which may be realized as a high falling tone [53] or a relatively lower tone [42] depending on the voicing of the syllable and the initial consonant. Reduced syllables tend to assimilate to the tone of the following syllable.

Bela has tense-lax voice contrast. This distinction is apparent in the contrasts between causative and non-causative verbs. These are minimal pairs which are differentiated only by the contrast of tense verses lax voicing.[22] All vowels and diph-thongs can carry tense voice.

2.2.3 Lashi

This section of Lashi considers basic aspects such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. Much of the analysis and data are from Wannemacher (1995).[23]

2.2.3.1 General

Lashi (Leqi) is spoken primarily in the Kachin state of Myanmar with about 9,800 (Diehl 1993) speakers across the border in the Yunnan province of China. There are about 55,500 speakers (Grimes 1996:720) total.

2.2.3.2 Syllable Structure

A schematic syllable structure of Lashi is composed of an initial consonant C_1 a medial glide (G), which is always the palatal approximant /j/, a vowel (V_1) or vowel diphthong ($V_1(V_2)$). The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

$$C_1\,(G)(V_1\,(V_2))(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position

[22] It bears noting that in some cases the causative constructions have different tones than the non-causative forms in addition to voice quality, and it appears that the former causative prefix [s-] affects not only the voice quality, but also the tonal contour in these cases.

[23] The speaker is Mr. Kho, a 33 year old. Mr Kho has a ninth grade education and four years of Bible school. He was born in Dingdaung in the Jahpui area. He was living in Waimo at the time of the elicitation. He also speaks Jinghpaw and Burmese. Both father and mother spoke Lashi and it is the language spoken at home.

(C_2), is limited to nasals or voiceless stops.[24] The vowel may be a simple vowel (V_1) or a diphthong ($V_1(V_2)$), all vowels are allowed in the (V_1) position, while (V_2) is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: C, CV, CVV, CVC, CVVC, CGV, CGVC, CGVV. Since the syllable initial glottal stop is present phonetically but not phonemically, it is also possible to posit onsetless syllable types such as V and VC. Consonantal syllable types are rare and restricted to syllabic nasals: /n̩/ "okay," /m̩.jok/ "five people."

2.2.3.3 Consonants

The inventory of consonants is shown in table 9:

TABLE 9

LASHI CONSONANT INVENTORY

	LAB	LBD	ALV	ALP	VLR	GLT
Plosive vl asp	p^h		t^h		k^h	
vl unasp	p		t		k	ʔ
vd	[b]		[d]		[g]	
Affricate vl asp			ts^h	$tʃ^h$		
vl unasp			ts	tʃ		
vd			[dz]	[dʒ]		
Fricative vl		f	s	ʃ		h
vd					ɣ	
Nasal	m		n		ŋ	
Lateral			l			
Approximant	w		r	j		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.[25] The segments, /ɣ/, /r/, and /f/ are rare.

[24] Wannemacher (1995) notes the presence of final clusters in syllables such as [jaŋk^{53}] 'tail' and [gaŋk^{52}] 'shin' , these syllables are regarded as stopped with nasalized vowels in the present analysis.

[25] This analysis differs from Wannemacher's (1995) as the voiced stop series is considered to be phonetic, and Wannemacher considers this set phonemic.

2.2.3.4 Vowels

The inventory of vowels is shown in table 10:

TABLE 10

LASHI VOWEL INVENTORY

		Front unround	Front round	Central	Back
High	tense	i		ɨ	u
	lax	[ɪ]			
Mid	tense	e	[ø]	[ə]	o
	lax	[ɛ]			
Low		[æ]		a	[ɔ]

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic. The front rounded vowel seems to be an allophone of the front, mid unrounded vowel.

2.2.3.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [p^hj bj k^hj gj mj nj]. All vowels are allowed in the V_1 position. The phonemic diphthongs (V_1V_2) are restricted to /oi au ai ue ei/.[26] Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.2.3.6 Suprasegmental Considerations

Lashi has four tones: 53, 44, 31, 22 in non-stopped syllables. These tones occur in open and nasal final syllables. There are two tones in stopped syllables. Tone in reduced syllables is non-contrastive and tends to assimilate to the tone of the following syllable.

[26] Phonetic Diphthongs: [oi au ai ue uɛ ei].

Lashi has tense-lax voice contrast. Some vowels have creaky voice quality preceding a glottal stop. This is an assimilatory process and not contrastive. Tense voice occurs with all syllable types, vowels, diphthongs, tones and finals.

2.2.4 Maru

This section considers basic aspects of Maru such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. Much of the analysis and data are from Wannemacher (1995).[27]

2.2.4.1 General

Maru (Lange, or Langsu) is a language of 98,700 speakers (Grimes 1996:720) in the Kachin State of Myanmar; there are about 5,000 speakers (Diehl 1993) of this language in the Yunnan Province of China.

2.2.4.2 Syllable Structure

A schematic syllable structure of Maru is composed of an initial consonant C_1 a medial glide (G), which is always the palatal approximant /j/, a vowel V_1 or vowel diphthong $V_1(V_2)$. The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

$$C_1\,(G)\;V_1\,(V_2)(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position (C_2), is limited to nasals or voiceless stops[28]. The vowel may be a simple vowel V_1 or a diphthong

[27] The data was collected from Mrs. Dauyang, approximately 60 years old, Mrs. Dauyang lived in Sumprabum. She also speaks Jingpho.

[28] Wannemacher (1995) notes the presence of a final cluster in [saŋk^{53}] 'rainbow', this syllable is regarded as stopped with a nasalized vowel in the present analysis.

$V_1(V_2)$, all vowels are allowed in the V_1 position, while (V_2) is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: CV, CVV, CVC, CVVC, CGV, CGVC, CGVV. Since the syllable initial glottal stop is present phonetically but not phonemically, it is also possible to posit onsetless syllable types such as V, VV, VC and VVC.

2.2.4.3 Consonants

The inventory of consonants is shown in table 11:

TABLE 11

MARU CONSONANT INVENTORY

	LAB	LBD	ALV	ALP	VLR	GLT
Plosive vl asp	p^h		t^h		k^h	
vl unasp	p		t		k	ʔ
vd	[b]		[d]		[g]	
Affricate vl asp			ts^h	$tʃ^h$		
vl unasp			ts			
vd			[dz]	dʒ		
Fricative vl		f	s	ʃ	x	h
vd		[v]		[ʒ]	ɣ	
Nasal	m		n		ŋ	
Lateral			l			
Approximant	w		r	j		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.[29]

The following consonants are rare in the data: [ʒ x f]. /x/ may be an allophonic variant, but it occurs only twice in the data so no conclusive statement can be made.

[29] This analysis differs from Wannemacher's (1995) as the voiced stop series is considered to be phonetic, and Wannemacher considers this set phonemic.

2.2.4.4 Vowels

The inventory of vowels is shown in table 12:

TABLE 12

MARU VOWEL INVENTORY

		Front unround	Front round	Central	Back
High	tense	i			u
	lax	[ɪ]			
Mid	tense	e	ø	[ə]	o
	lax	[ɛ]			
Low		[æ]		a	[ɔ]

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.

2.2.4.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [p^hj bj k^hj ʃj mj nj]. All vowels are allowed in the V_1 position. The phonemic diphthongs (V_1V_2) are restricted to [au æu ai øi oi]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.2.4.6 Suprasegmental Considerations

Maru has three tones in non-stopped syllables: 44, 41, 22. Stopped syllables have a single phonemic tone which may be realized as either a high or low tone depending on the initial consonant. Tone in reduced syllables is non-contrastive and tends to assimilate to the tone of the following syllable.

Maru has a tense-lax voice contrast. Some vowels have a creaky quality preceding a glottal stop; this is an assimilatory process and not contrastive. Tense voice occurs with all syllable types, vowels, diphthongs, tones and finals.

2.2.5 Phon

This section covers basic aspects of Phon such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations.

The Phon data presented here is from Henderson (1986). The data was gathered by Gordon Luce and Ba Shin in 1962.[30] My transcription convention differs in some respects to those of Luce and Ba Shin as shown follows:

Luce's Transcription	Present Analysis
[y]	[j]
[ʀ]	[r]
[c,c^{h}]	[tʃ,tʃ^{h}]

2.2.5.1 General

Phon also called (Hpon, Phun, Megyaw and Samong) is a relatively small language group in Myanmar. The Ethnologue (Grimes 1996) reports 1,700 based on a 1983 estimate. There is little data on this language. Wurm (1996) notes this language as moribund meaning there are only a handful of mostly older speakers.[31]

In *Ethnic Groups of Mainland Southeast Asia* (Lebar 1964) the Phon are described as:

> A small group of shifting agriculturists of mixed cultural and linguistic affiliations living on the Irriwaddy between Bhamo and Sinbo in northern Burma, at about 24 degrees and 30 minutes N. Scott and Hardiman (1900) report two divisions, based on dialect variations: the Hpon Hpye or Mong Ti Hpons, and the Hpon Samong or Mong Wan Hpons. Their fields, located on the hills, are moved from time to time. They do some fishing and also work in the timber industry. They are reported to be rapidly becoming similar in culture and language to the Shans who surround them on all sides, and most of them are nominally Buddhist. Leach tentatively classifies Hpon as basically a Maru dialect, but with Burmese influence. Shafer places Hpon, along with Maru, Lashi, Achang, and Atsi, within a Burmic division of Sino-Tibetan. Less than 1,000 surviving Hpon speakers in 1931.

[30] The data were collected in October of 1962 from two of the Megyaw Phon headmen at Sinbo. The first speaker was a 59-year-old male. He lived in Kok-ma village on the east bank of the Irrawaddy at the top end of the gorge until he was 40 or 50. He was living at Man-le Village at the time of the elicitation. The second informant was a man aged 45 who was born at Nan-he village also on the east bank, 3 miles NNW of Kok-ma. He lived here until he was 39 and was residing at Ye-na Pinlon village at the time Luce and Shin met him (Henderson 1986).

[31] It is interesting that similar reports were given by Scott and Hardiman (1900), thus, it may be that reports of the demise of the Phon language may be greatly exaggerated.

Luce and Ba Shin's word list and earlier sources such as Scott (1900) indicate that extensive borrowing of Shan vocabulary is evident in Phon.

2.2.5.2 Syllable Structure

A schematic syllable structure of Phon is composed of an initial consonant (C_1) a medial Glide (G), which may be the labial, alveolar, or alveopalatal affricate /w r j/, a vowel (V_1) or vowel diphthong ($V_1(V_2)$). The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol (T) here. Thus the syllable structure appears as follows:

$$C_1\,(G)(V_1\,(V_2))(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position C_2, is limited to nasals or voiceless stops. The vowel may be a simple vowel (V_1) or a diphthong ($V_1(V_2)$), all vowels are allowed in the V_1 position, while V_2 is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: C, CV, CVV, CVC, CVVC, CGV, CGVC, CGVV, CGVVC. Since the syllable initial glottal stop is present phonetically but not phonemically, it is also possible to posit onsetless syllable types such as V, VC and VVC.[32] Consonantal syllable types are rare and restricted to syllabic nasals such as [n̩.zɛʔ.ŋ̩] "difficult" and [ŋ̩.dzaʔ] "grandmother."

[32] There do not appear to be VV syllable type possibilities among Luce and Ba Shin's data.

2.2.5.3 Consonants

The inventory of consonants is shown in table 13:

TABLE 13

PHON CONSONANT INVENTORY

	LAB	LBD	DTL	ALV	ALP	PAL	VLR	GLT
Plosive vl asp	p^h			t^h			k^h	
vl unasp	p			t			k	ʔ
vd	[b]							
Affricate vl asp					$tʃ^h$			
vl unasp				ts	tʃ			
vd				dz	dʒ			
Fricative vl asp				s^h				
vl unasp		f	θ	s	ʃ		x	h
vd		v		z				
Nasal vl				hn				
vd	m			n		ɲ	ŋ	
Lateral				l				
Approximant	w			r		j		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.

The following segments are rare in Luce and Ba Shin's data: [b f θ v hn].

Luce and Ba Shin note a considerable amount of phonetic variation as shown in the following list:

Regular Variation			Rare Variation	
xw~k^hw	s~ʃ	s~ts	l~n	ɲ~z
hw~xw	s~s^h	s~dz	ɲ~n	ŋj~ɲ
x~k^h	s^h~ʃ	ts~z		

2.2.5.4 Vowels

The inventory of vowels is shown in table 14:

TABLE 14

PHON VOWEL INVENTORY

		Front	Central	Back	
				unround	round
High	tense	i	[ɨ]	[ɯ]	u
	lax	[ɪ]			[ʊ]
Mid	tense	e	ə	[ɤ]	o
	lax	[ɛ]			
Low		[æ]	a		ɔ

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic. The vowels [æ ɨ ɯ] occur only rarely in the data.

2.2.5.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [tw t^hw c^hw k^hw s^hw ʃw xw ŋw lw vw pj p^hj mj xɾ k^hɾ]. All vowels are allowed in the V_1 position. The diphthongs (V_1V_2) are restricted to [au ai ui ɔi]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.2.5.6 Suprasegmental Considerations

There are two contrastive tones noted by Luce, one is a high level tone and the other is a low falling tone. Although the precise value of these tones is not presented in Henderson's (1986) treatment of Luce's data, the values of [55] for the high level tone, and [31] for the low falling tone are used in this analysis. There is no mention of contrastive voice quality in Luce's data.

2.2.6 Zaiwa

This section introduces basic aspects of Zaiwa such as the syllable structure, consonant and vowel inventories, distribution, and suprasegmental considerations. Much of the analysis and data are from Wannemacher (1995).[33]

2.2.6.1 General

Zaiwa (Atsi) is a language of 70,000 speakers (Grimes 1996:565) in the Yunnan Province of Southern China; additionally, there are 13,200 speakers of Zaiwa in the Kachin State of Myanmar.

2.2.6.2 Syllable Structure

A schematic syllable structure of Zaiwa is composed of an initial consonant C_1 a medial glide (G), which is always the palatal approximant /j/, a vowel V_1 or vowel diphthong $V_1(V_2)$. The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

$$C_1\,(G)\;V_1\,(V_2)(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position (C_2), is limited to nasals or voiceless stops. The vowel may be a simple vowel V_1 or a diphthong $V_1(V_2)$, all vowels are allowed in the V_1 position, while (V_2) is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Syllable types in the data include: CV, CVV, CVC, CVVC, CGV, CGVC, CGVV. Since the syllable initial glottal stop is present phonetically but not phonem-ically, it is also possible to posit onsetless syllable types such as V, VV, VC and VVC.

[33] The Zaiwa data are from three speakers who resided in the Kengtung area.

2.2.6.3 Consonants

The inventory of consonants is shown in table 15:

TABLE 15

ZAIWA CONSONANT INVENTORY

	LAB	ALV	ALP	VLR	GLT
Plosive vl asp	p^h	t^h		k^h	
vl unasp	p	t		k	ʔ
vd	[b]	[d]		[g]	
Affricate vl asp		ts^h	$tʃ^h$		
vl unasp		ts	tʃ		
vd		[dz]	[dʒ]		
Fricative vl		s	ʃ		h
vd	[$β^w$]				
Nasal	m	n		ŋ	
Lateral		l			
Approximant	w	r	j		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic.[34]

2.2.6.4 Vowels

The inventory of vowels is shown in table 16:

TABLE 16

ZAIWA VOWEL INVENTORY

	Front	Central	Back	
			unround	round
High tense	i	[ɨ]	[ɯ]	u
lax	[ɪ]			[ʊ]
Mid tense	e	[ə]		
lax	[ɛ]			
Low	[æ]	a		ɔ

[34] This analysis differs from Wannemacher's (1995) as the voiced stop series is considered to be phonetic, and Wannemacher considers this set phonemic.

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic. The vowels [æ ɨ ɯ] occur only rarely in the data.

2.2.6.5 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are observed in the data: [p^hj pj bj k^hj kj gj mj ŋj]. There is one case of the cluster [k^hr]. All vowels are allowed in the V_1 position. The phonemic diphthongs (V_1V_2) are restricted to [au ai ui ɔi]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k ʔ m n ŋ].

2.2.6.6 Suprasegmental Considerations

Zaiwa has three phonemic tones in non-stopped syllables. These are a high falling tone (53), a high-mid level tone (44) and a mid falling tone (31). Stopped syllables have one non-contrastive tone. Reduced syllables do not carry contrastive tone, they assimilate to the tone of the following syllable.

Zaiwa has a tense-lax voice contrast. Tense voice occurs with all tones in open, stopped, and nasal final syllables.

CHAPTER 3
RECONSTRUCTION

3.0 Introduction

Having provided the introductory information in chapter 1 and given a brief description of the languages in chapter 2, we are now ready to embark on the main task of this thesis: the reconstruction of Proto Northern Burmic. This chapter covers phonological correspondences for Northern Burmic languages. Specific methodology used in reconstruction is considered in section 3.1. The following remainder of this chapter provides reconstructions of Proto Northern Burmic segments and tones. Group-ings of the Northern Burmic languages based on the phonological rules derived in the current chapter will be provided in chapter 4.

3.1 General

This reconstruction is conducted on the assumption that phonological rules for contemporary languages reflect the historical development of these languages[35]. This notion was first made explicit by King (1969).

The primary data for the Northern Burmic languages is from a list of 406 words developed by the Summer Institute of Linguistics (SIL) specifically for Southeast Asia (see section 5.3 for an example of the word list). This word list covers several semantic domains with linguistic terms appropriate to Southeast Asia. These words are in domains such as nature, plants, food, animals, body parts, human relationships, home, numbers, dimensions, physical descriptions, taste, question words, and various verbs. Data for Achang, Bhamo Jingpho, Written Burmese, Lashi, Maru, and Zaiwa, were derived from these lists. Additional data for Burmese came from published sources.[36]

[35] It should be noted that there are scholars who disagree with this view such as Vennemann (1972).

[36] Namely, Matisoff (1976) and Bradley (1989).

Data for Bela and Phon came from other sources[37] and have fewer correspondences to the basic 406 word list.

The word lists for each language were then tabulated so data for all the languages could be compared. Then potential borrowed terms were screened out using the Bhamo Jingpho data. Once these terms were eliminated, reconstruction could begin. For example, the following list shows some of the words compared. The top row shows the reference number, and languages:

TABLE 17

WORD COGNATES

No	Achang	Bela	Lashi	Maru	Phon	Zaiwa	Burmese	Bhamo
001	mau^{34}k^{h}o^{32}ŋ	mau^{52}	mau^{3}k^{h}o^{31}ŋ	mo^{35}ʔgau^{51}ŋ	mūˀtāŋ	mau^{3}k^{h}u^{53}ŋ	kauŋːkaŋ	lə^{2}mu^{31}
002	pui^{31}	pui^{33}	be^{51}	ba^{31}	-	bui^{32}	poŋː	ʤa^{21}n
025	-	-	ba^{23}ŋlai^{32}	ba^{3}ŋlai^{32}	-	ba^{3}ŋlai^{31}	paŋlai	pạ^{32}ŋlai^{21}
052	kə^{3}du^{31}ŋ	-	la^{32}bæ^{31}mgæ^{21}m	lə^{2}pę^{42}tsạ^{31}ŋ	-	lə^{2}ba^{53}nbɔ^{21}	lakpampaŋ	ɡəduŋp^{h}un
055	kạ^{3}nị^{3}	-	ga^{3}ni^{31}	kạ^{3}nị^{3}	-	ja^{32}p^{h}je^{3}n	hbinː	kạnị
058	sa^{3}ŋp^{h}ɔ^{3}ʃi^{5}	-	sa^{54}ŋp^{h}ɔ^{3}ʔʃi^{4}	sa^{52}ŋp^{h}ɔ^{32}ʃi^{3}	-	se^{4}ŋp^{h}ɔ^{54}ʃi^{31}	saˀdaˀhbauːsiː	saŋp^{h}ɔsi
084	lai^{3}njæu^{3}	liŋ^{3}jąw^{23}	lai^{3}njæ^{323}u	lə^{3}ʔnjæu^{3}	chaúŋ	njæu^{3}	krauŋ	lətnjæu

From this list, syllables and word forms that bore a striking similarity to Bhamo Jingpho without any apparent related form in Burmese are considered to be borrowed. Thus, word forms highlighted such as "kapok" (052) in Achang, "opium" (055) in Achang, Lashi, and Maru, "papaya" (058) in Achang, Lashi, Maru, and Zaiwa, and "cat" (084) in Achang, Bela, Lashi, Maru, and Zaiwa are discarded to eliminate potential borrowed terms. Note that although Lashi, Maru, and Zaiwa bear a remarkable affinity to Bhamo Jingpho the in cognate for "sea" (025, leading one to suspect that they are borrowed); since these cognates are also quite similar to Written Burmese, however, they are considered Northern Burmic cognates.

Once the data are free of borrowed items, it is then compared on a syllable by syllable basis, as shown in table 18:

[37] Data for Bela came from Edmondson (1996), and Phon data are from Henderson (1986).

TABLE 18

BURMIC SYLLABLE COGNATES

Ref	Achang	Bela	Lashi	Maru	Phon	Zaiwa	Burmese
001A	mau^{34}	mau^{52}	mau^{33}	moʔ^{35}	mū	mau^{33}	mui:
001B	k^{h}oŋ^{32}	-	k^{h}oŋ^{31}	ɡauŋ^{51}	-	k^{h}uŋ^{53}	kauŋ:
002A	pui^{31}	pui^{33}	be^{51}	ba^{31}	-	bui^{32}	poŋ:
052A	-	-	la^{32}	lə^{22}	-	lə^{22}	lak
052B	-	-	bam^{31}	pẹ^{42}	-	ban^{53}	poŋ
055A	-	-	-	-	-	p^{h}jen^{33}	hbin^{ʔ}

The data for these syllable cognates was input into a program called Corresponder, written by Stuart Milliken. A slightly modified version of this program provided correspondences for onsets, rhymes and tones. The tabulated output for the Northern Burmic languages[38], appears in table 19:

TABLE 19

CORRESPONDER OUTPUT

Ref	Onsets						Rhymes						Tones					
	A	B	L	M	P	Z	A	B	L	M	P	Z	A	B	L	M	P	Z
001A	m	m	m	m	m	m	au	au	au	oʔ	u	au	34	52	33	33	31	33
001B	k^{h}	-	k^{h}	ɡ	-	k^{h}	oŋ	-	oŋ	auŋ	-	uŋ	32	-	31	51	-	53
002A	p	p	b	b	-	b	ui	ui	e	a	-	ui	31	33	51	31	-	32
052A	-	-	l	l	-	l	-	-	a	e	-	e	-	-	32	22	-	22
052B	-	-	b	p	-	b	-	-	am	ẹ	-	an	-	-	31	42	-	53
055A	-	-	-	-	-	p^{h}j	-	-	-	-	-	en	-	-	-	-	-	33

Using this data, systematic correspondences are compared, and phonological rules may be derived to reconstruct Proto Northern Burmic.

Burmese is used as a window to help resolve conflicts where the data from Northern Burmic languages alone is insufficient to lead to a clearly reconstructed form.

[38] Written Burmese forms are not shown here due to space limitations, these forms were, however, used in the analysis.

3.2 Initial Consonants

Initial consonants in Northern Burmic languages show a high degree of sim-ilarity, much more so than the rhymes which are far more affected by phonological processes. Clusters occur with plosives, affricates, and nasals in the first consonant position followed by the alveopalatal approximant [j]. The inclusion of the medial with the onset is consistent with the reconstructions by Burling (1967) and Bradley (1979). The close relationship between these two elements is apparent in Achang where a labial initial changes to an alveolar initial when followed by the alveopalatal approximant.

3.2.1 Tense Voice

Tense lax voice contrast is common in Tibeto-Burman languages. Tense voice is produced by a relatively (as opposed to lax or modal voice) greater tension in the vocal folds and a constricted glottis. This tension produces sounds with a relatively higher pitch. This contrast in voice quality is commonly expressed in causative verses non-causative verb forms in Tibeto-Burman languages. This tense lax voice contrast is present in Achang, Bela, Lashi, Maru, and Zaiwa. Luce does not note this distinction in Phon. Burmese does not have this contrast.[39]

There are two main theories to account for the origin of tense voice.[40] The first is that it is a development from final stops, and the second is that tense voice is a remnant of an earlier prefix. The first theory proposed by the Hu Tan and Dai Qingxia (1964), explains how laryngeal tension in anticipation of a final stop gradually replaces the stop entirely while retaining tense phonation on the preceding vowel.

The second theory describes how laryngeal tension, associated with prefixes in the proto language, is mapped onto the following syllable. The prefix later decays leaving tension on the

[39] Burmese does have creaky phonation, but there is no clear correlation between this and tense phonation.

[40] It should be mentioned that there are other less theories like that proposed by Yang Huandian (reported by Wannemacher 1996) in which he concludes that Naxi, a Tibeto-Burman language, has the tense-lax contrast in the Proto language and also argues that this feature was present in Proto-Tibeto-Burman. Furthermore, Maddieson and Ladefoged

following syllable. This is the basic approach of Burling (1967:7) when he proposes a set of pre-glottalized initial stops and nasals for Proto-Tibeto-Burman which, "…are voiceless and unaspirated, but most strikingly they are always followed by a vowel with glottal constriction."

David Bradley (1979) makes a somewhat fuller set of initials in his reconstruct-ion of Proto-Loloish, correlating correlates Loloish languages with the prefixes noted by Matisoff (1969, 1972) and Benedict (1972).

In the analysis of Northern Burmic data, there is no clear mechanism to account for tense voice quality from the loss of final stops. This is true as there are many cases of tense voice quality in cognates where there is no evidence that a syllable ever had a final stop. There are equally tense and lax syllables where final stops are present. In cases where final stops appear to be lost, there is no greater occurrence of tense syllables than in other environments. Thus, it is safe to assume that tense voice quality is not from final stops in Northern Burmic languages.

In terms of a prefixal system to account for tense phonation in Northern Burmic languages, the Burmese data would appear to be the most hopeful source. These data, however, do not appear to give strong evidence to account for tense phonation. There are, however, a few cases where tense syllables in Northern Burmic languages have a Written Burmese cognate with a weak syllable such as [ʔa]. The following argument could be proposed to account for these data:

Tense syllables come into existence when a weak syllable decays and leaves a laryngealized trace on the following syllable as in the following example:

Ref	**Burmese**	**Maru**
090	ʔa.mri**:**	m̰i^{43}

In Maru, the weak syllable attested to in Written Burmese [ʔa] has decayed, leaving only the glottalized component on the following syllable [m̰i^{43}]. Assuming that Burmese reveals the older form, this loss has resulted in tense voice in Maru.

This derivation would look as follows:

(1985) claim that the tense/lax voice contrast for Jinghpaw and Wa is due to initial consonant voicing changes while the tense/lax contrast for Hani and Yi is from loss of final consonants.

3.1 *ʔa.mri proto
mr̥i glottalization
m̥i loss of alveolar approximant medial

To fully account for the tense voicing we posit a preceding syllable in the form of (V) since the vowel quality of a decayed syllable cannot be reasonably deduced. Note that although the glottal stop promotes glottalization of the following syllable, it is not necessary to shown since it is a phonetic element. Thus, this form is as follows:

3.2 V.mri

For notational simplicity we will use the glottalized initial to depict a preceding weak syllable. Thus, the reconstructed form would be:

3.3 *ˀmri

Glottalization will be represented here with a superscripted glottal stop before the glottalized segment.[41] Unfortunately, there is very limited data to suggest the derivation shown in 3.3. Actually there are many more counter examples, where the prefix is present in Burmese and no trace of tense phonation is noted in the Northern Burmic cognates. This leads to the conclusion that tense phonation in Northern Burmic languages must have derived from a non-extant prefixal system which was in place prior to the codification of Written Burmese. Thus, a set of preglottalized series of initial consonants may be posited for Proto Northern Burmic which point toward an earlier stage when this prefixal system was in place.

3.2.2 Plosives

Plosives are prevalent throughout the data. Burmese has voiced, aspirated and voiceless initials. Bela and Phon have only voiceless and voiceless aspirated initials plosives. Achang, Lashi,

[41] Bradley represents glottalization as [ʔ-], while Burling uses [-ˀ]. Bradley's representation schematically portrays glottalization as a feature derived from preceding syllables, but is somewhat cumbersome since it leads to confusion between the glottal stop and glottalization. Burling's represen-tation sees glottalization as a feature of the initial, but schematically represents it as following the segment. Thus, the current representation [ˀ-] schematically portrays glottalization as a feature preceding the segment and leaves no confusion between the glottal stop and glottalization.

Maru, and Zaiwa have voiceless aspirated and voiced initials, with voiceless unaspirated initials appearing only in syllables with tense voicing. This distribution, as well as cross-linguistic tendencies lead us to predict the set of plain stops where we have voiced stops and posit a general rule that plain stops are voiced in the initial position.

TABLE 20

NORTHERN BURMIC ASPIRATED PLOSIVES

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
pʰ	-	-	pʰ	pʰ	-	pʰ	ə	-	-	øi	u	-	wai	070A
pʰ	-	pʰ	pʰ	-	pʰ	hb	ɔ	-	ɔʔ	ɔ	-	ɔ	au	058B
pʰ	pʰ	pʰ	pʰ	pj	pʰ	pr	ə	ə	ə	ət	a	ət	a	117A
b	-	pʰ	pʰ	pʰ	-	pʰ	a	-	oʔ	ɔ	a	-	aʔ	172B
tʰ	-	tʰ	tʰ	tʰ	tʰ	tʰ	uŋ	-	oŋ	aun	ɔŋ	uŋ	auŋ	305A
tʰ	-	tʰ	tʰ	tʰ	tʰ	tʰ	ɨu	-	u	au	uʔ	u	u	345A
tʰ	tʰ	tʰ	tʰ	-	tʰ	-	uʔ	au	uʔ	uk	-	ɔʔ	-	019B
kʰ	kʰ	kʰ	kʰ	kʰ	kʰ	kʰw	ui	ui	ue	a	ui	ui	e	081A
kʰ	kʰ	kʰ	kʰ	-	kʰ	kʰ	uam	am	æm	am	-	um	a	187A
kʰ	kʰ	kʰ	kʰ	kʰ	kʰ	kʰ	ɔ	a	ɔ	o	a	ɔ	a	376A

As table 20 illustrates, all of the languages have aspirated stop correspondences. Thus, the Proto language possesses the aspirated stop series [pʰ tʰ kʰ].

TABLE 21

NORTHERN BURMIC VOICELESS PLOSIVES

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
b	p	b	b	-	b	-	ui	ui	ø	a	-	ui	-	019A
b	-	b	b	p	b	p	ə	-	ə	ə	a	u	a	128A
b	-	b	b	p	-	p	u	-	ɔ	o	a	-	a	346A
d	t	d	d	-	d	-	au	au	au	uk	-	au	-	139B
d	t	d	d	t	-	t	ai	a	ai	e	oʔ	-	ac	322A
d	-	d	d	t	d	t	uŋ	-	oŋ	auŋ	ɔŋ	uŋ	auŋ	095A
g	k	g	g	-	g	k	au	au	au	ok	-	au	ui	330A
g	-	g	g	k	g	k	i	-	e	ai	ɔŋ	e	auŋ	398A

In terms of the voiceless plosive series shown in table 21, Written Burmese, Bela and Phon have voiceless unaspirated stops where the other Northern Burmic languages generally have the voiced stop series. Since there is no conditioning environment to produce the voiceless initial, and it

is more phonetically plausible to assume that voicing from the nucleus has spread to the initial, these stops were probably voiceless in the Proto language. The choice of voiceless over voiced stops for the Proto language does not reduce the stop inventory, but rather provides for plain stops in the inventory as opposed to voiced. Another reason to support the choice of plain stops is based on cross-linguistic tendencies favoring an inventory containing voiceless stops over voiced stops, coupled with the fact that the voicing of stops in these languages as measured on CECIL is very brief.[42]

For Achang, Lashi, Maru, and Zaiwa we posit the following rules which show that a voiceless segment becomes voiced before a vowel:

3.4 *p > b/#_____V
3.5 *t > d/#_____V
3.6 *k > g/#_____V

These rules can be generalized into a syllable initial stop voicing rule:

3.7 $$*\begin{bmatrix} +CONS \\ -CONT \\ -VC \end{bmatrix} > \begin{bmatrix} +VC \end{bmatrix} /\#\_\_\_\_\_V$$

TABLE 22

NORTHERN BURMIC GLOTTAL STOP

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ʔ	ʔ	ʔ	ʔ	ʔ	-	ʔ	a	a	a	a	a	-	ə	046A
ʔ	-	ʔ	ʔ	-	ʔ	-	am	-	æm	e	-	am	-	135A
ʔ	-	ʔ	ʔ	ʔ	-	ʔ	au	-	au	ok	o	-	ui	205A

The glottal stop correspondences shown in table 22 are unambiguous. It is important to note that the glottal stop is not a phonemic element in the Northern Burmic initial consonant inventory, as it is purely a phonetic manifestation in the Northern Burmic languages when there is no initial consonant.

[42] After a quick glance at a few words in Bela and Zaiwa, the duration of voicing in these segments is in the 8

TABLE 23

NORTHERN BURMIC GLOTTALIZED PLOSIVES

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ʔt	p	b	-	-	-	-	i	i	i	-	-	-	-	022A
ʔp	p	ʔp	ʔp	p	b	p	u	a	u	o	a	ɔ	ui	106A
ʔt	-	d	ʔt	-	ʔt	-	ɔ	-	ɔ	oʔ	-	ɔ	-	253A
ʔt	-	ʔt	ʔt	-	d	-	ao	-	au	au	-	au	-	104A
ʔk	-	g	ʔk	k^h	ʔk	k^h	uk	-	ok	auʔ	ue	uʔ	auk	040A
ʔk	-	ʔk	ʔk	k	g	-	ok	-	u	u	ə	ɔp	-	104B

As table 23 illustrates, there is variation in the glottalized stop series. In Henderson (1986), Luce did not include glottalization as a feature of Phon, and in Burmese there is not a systematic correlation between tense or lax phonation and tones, segments or prefixes. In these cases, the Phon and Written Burmese data are not considered representative of the Proto Northern Burmic glottalized series. Although there are no Bela correspondences in the data above, there are cases of glottalized voiceless unaspirated labial plosives such as: [pḁm[23]] 'mountain,' and [pe̥ʔ[23]] 'fight.'

TABLE 24

NORTHERN BURMIC ASPIRATED PLOSIVE CLUSTERS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
t^hj	p^hj	p^hj	p^hj	-	p^hj	p	ɔ	a	ɔ	o	-	ɔ	ui	112A
t^hj	p^hj	p^hj	p^hj	p^hj	p^hj	p^hr	ɨu	u	u	u	uʔ	u	u	363A
tj	-	bj	pj	p^hj	bj	p^hr	u	-	u	u	uʔ	u	u	079A
k^hj	k^h	k^hj	k^h	k^h	k^hj	k^hr	ei	i	e	it	i	i	e	157A
k^hj	k^hj	k^hj	k^hj	-	k^hj	k^hj	æu	u	au	oʔ	-	ui	ui	089A
k^hj	k^hj	k^hj	k^hj	k	k^hj	k^hr	uk	aup	ok	æuk	ɔŋ	uʔ	auk	327A

Voiceless aspirated stop clusters are shown in table 24. In some cases (079A, 327A) aspiration and/or voicelessness have been lost. In other cases, the alveopalatal approximant has been replaced by the high front vowel in the rhyme (157A).

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to 10 millisecond range prior to vocalic onset.

In Achang, the bilabial stop has become an alveolar stop before an alveopalatal approximant:

3.8 $p^h > t^h/\_\_\_\_j$

TABLE 25

NORTHERN BURMIC PLOSIVE CLUSTERS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
dj	p	bj	bj	-	-	-	ɛn	ui	eŋ	ɪn	-	-	-	181A
dj	pj	bj	bj	-	bj	pj	ɔ	a	ɔ	ɔ	-	ɔ	a	115A
dj	pj	bj	bj	-	bj	-	u	u	u	u	-	u	-	171A
dj	-	bj	bj	pj	b	pr	eŋ	-	əŋ	aŋ	aiŋ	iŋ	uiŋ	354A
gj	kj	gj	gj	-	gj	kr	ɔ	a	ɔ	o	-	ɔ	a	222B
gj	kj	gj	gj	-	-	kj	ɔ	a	ɔ	o	-	-	aʔ	283A
gj	-	gj	gj	-	gj	kr	uk	-	ok	æuʔ	-	uʔ	auk	259A

Plosive clusters with the alveopalatal approximant are shown in table 25. Note that all of the clusters have voiced initials except for Written Burmese, Bela, and Phon. The underlying cluster is a voiceless initial followed by an alveopalatal approximant. Also, the Written Burmese medial [r] is represented by [j] in all of the Northern Burmic languages, as it is in Modern Spoken Burmese. Phon's alveopalatal approximant clusters are limited to labial onsets.

In Achang, the bilabial stop has become an alveolar stop before an alveopalatal approximant:

3.9 $b > d/\_\_\_\_j$

The following rules for Achang, Lashi, Maru, and Zaiwa illustrate how specific syllable initial voiceless stops are become voiced before an alveolar approximant[43] (note the similarity between these rules and those in 3.4-3.6):

3.10 $*p > b/\#\_\_\_\_\_j$
3.11 $*t > d/\#\_\_\_\_\_j$
3.12 $*k > g/\#\_\_\_\_\_j$

[43] Note that although the data used in this thesis does not overtly support the inclusion of rule 3.11, it can be deduced from symmetry with rule 3.5 as a probable rule in these languages.

These rules can be generalized into a syllable initial stop voicing rule (this rule is nearly identical to rule 3.7):

3.13 $$*\begin{bmatrix} +CONS \\ -CONT \\ -VC \end{bmatrix} > [+VC]/\_\_\_\_\_\ j$$

TABLE 26

NORTHERN BURMIC GLOTTALIZED PLOSIVE CLUSTERS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ʔpj	-	bj	ʔpj	p^hj	bj	p^hr	u	-	u	u	uʔ	u	u	079A
ʔkj	ʔkj	ʔkj	ʔkj	-	ʔkj	k^hr	aŋ	aŋ	aŋ	a	-	aŋ	aŋ	114A
ʔkj	-	ʔkj	ʔkj	x	ʔkj	k^hr	uk	-	oʔ	auʔ	oʔ	uʔ	auk	380A

Glottalized plosive clusters are shown in table 26. There are correlations between Achang, Lashi, Maru, and Zaiwa, but not among Phon and Written Burmese. Bela has no occurrences of [ʔpj] in these data.

3.2.3 Affricates

Like plosives, affricates are phonetically realized in Achang, Lashi, Maru, and Zaiwa as aspirated or voiced in the initial position. There are a few voiceless affricates in the data, but these only occur as initials in syllables with tense voicing (see section 3.2.1). Bela and Phon have voiceless aspirated and voiceless unaspirated plosives in the initial position, while Written Burmese allows aspirated, voiced and voiceless plosives in syllable initial position. Although it is tempting to say that the underlying phonemic forms are aspirated and voiced, cross-linguistic tendencies lead us to predict the set of plain stops where we have voiced stops and posit a general rule that states that plain stops become voiced in the initial position.

TABLE 27

NORTHERN BURMIC ASPIRATED AFFRICATES

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ts^h	ts^h	ts^h	ts^h	s^h	ts^h	c^h	am	i	æm	e	ɛ	am	am	122A
ts^h	-	ts^h	ts^h	-	-	c^h	aŋ	-	aŋ	a	-	-	aŋ	091A
ts^h	-	ts^h	ts^h	-	ts^h	c^h	ɨu	-	u	au	-	u	u	347A
$tʃ^h$	$tʃ^h$	$tʃ^h$	$tʃ^h$	ʃ	$tʃ^h$	-	aŋ	aŋ	aŋ	a	o	aŋ	-	064A
$tʃ^h$	$tʃ^h$	$tʃ^h$	$tʃ^h$	ʃ	$tʃ^h$	c^h	ei	ə	e	it	i	i	e	265B
$tʃ^h$	$tʃ^h$	$tʃ^h$	$tʃ^h$	ʃ	$tʃ^h$	-	ei	ə	e	it	e	i	-	292A

Aspirated affricates are shown in table 27. Written Burmese has aspirated palatal stop where the Northern Burmic languages most commonly have either an alveolar or an alveopalatal aspirated affricate. In Phon, the aspirated alveopalatal affricate is represented by the alveopalatal sibilant, while the aspirated alveolar affricate is represented by the aspirated alveolar sibilant.

Rule 3.14 expresses the cluster simplification process evident in Phon, where the aspirated alveolar affricate becomes an aspirated alveolar sibilant:

3.14 $*ts^h > s^h/\#\_\_\_\_\_$

Rule 3.14 in Phon is roughly equivalent to rule 3.15, except for the aspirated alveopalatal affricate which has become an unaspirated alveopalatal sibilant:

3.15 $*tʃ^h > ʃ/\#\_\_\_\_\_$

TABLE 28

NORTHERN BURMIC VOICELESS AFFRICATES

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
dz	ts	dʒ	-	-	dz	c^h	ɔ	ai	oŋ	-	-	ɛ	i	026A
dz	ts	dz	dz	-	dz	-	oŋ	aŋ	oŋ	auŋ	-	uŋ	-	271A
dʒ	-	dʒ	dʒ	s^h	dʒ	-	ɛt	-	e	it	i	ɪt	-	394A

Voiced affricates are shown in table 28. In Phon the affricate has merged with the aspirated alveolar sibilant. In Lashi, there appears to be some free variation between the alveolar and the alveopalatal affricate, which is expressed in the equation 3.16:

3.16 dz~dʒ/#_____

In the stop series we noted that voiced stops are underlyingly voiceless. Bela maintains this voiceless quality. In the affricate series there is a similar process where the voiced features of the nucleus spread to the initial consonant which is underlyingly voiceless. This is illustrated by rule 3.17 for Achang, Lashi, Maru, and Zaiwa:

3.17 *ts > dz/#_____V

Although there is only one example in the data of an alveopalatal affricate cognate set, we reconstruct the voiceless alveopalatal affricate based on this data. Thus rule 3.18 applies to Achang, Lashi, Maru, and Zaiwa:

3.18 *tʃ > dʒ/#_____V

In Phon, the merger of the voiced affricate with the alveolar aspirated sibilant is supported by a few examples:

3.19 *tʃ > s^h/#_____

3.2.4 Fricatives

Sibilants are prevalent throughout the Northern Burmic languages. The reconstruction of sibilants are fairly straightforward, except for the merger of the alveopalatal with the alveolar in Phon. Glottal fricatives are less prevalent, but easily reconstructed. Very rare, are the occurrences of fricative clusters. These clusters are somewhat ambiguous and pose a challenge in reconstruction.

TABLE 29

NORTHERN BURMIC SIBILANTS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
s	-	s	s	-	s	s	aik	-	ək	ak	-	ɪk	ac	368B
s	s	s	s	ʃ	s	s	ɔm	am	ɛm	am	aŋ	um	um	324A
ʃ	-	ʃ	ʃ	ʃ	ʃ	s	ɔ	-	u	ɔ	a	ɔ	a	161A
ʃ	ʃ	ʃ	ʃ	ʃ	ʃ	s	æn	aun	en	ɪn	ɛɪ	ɪn	an	110A
ʃ	ʃ	ʃ	ʃ	ʃ	ʃ	s	ok	au	ioʔ	aut	oʔ	uʔ	auk	232A

The sibilant series are represented in table 29. Note that the alveolar sibilant [s] has merged with the alveopalatal sibilant [ʃ] in Phon. The Northern Burmic languages make a distinction between the alveolar and the alveopalatal sibilants in forms represented by the alveolar sibilant [s] in Written Burmese.

Rule 3.20, expresses the merger of the alveolar sibilant with the alveopalatal sibilant in Phon:

3.20 *s > ʃ/#_____

TABLE 30

NORTHERN BURMIC GLOTTAL FRICATIVE

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
h	-	h	h	-	h	h	am	-	am	e	-	am	an	238A
h	-	h	-	h	-	-	ai	-	ɛ	-	aiŋ	-	-	360A
h	-	h̯	-	-	h	-	ui	-	ei	-	-	ui	-	031B

Glottal fricative correspondences are shown in table 30. The reconstruction of this segment in Proto Northern Burmic is unambiguous with the exception of Bela, where this segment is not present.

TABLE 31

NORTHERN BURMIC FRICATIVE CLUSTERS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
xj	x	ʃ	x	ʃ	h	hrw	en	aŋ	əŋ	aŋ	aiŋ	ɯŋ	e	032A
xj	x	ʃj	x	xr	h	hr	eŋ	aŋ	əŋ	aŋ	aiŋ	ɯŋ	aŋ	341A
xj	-	ʃ	-	j	ʃ	r	ɔ	-	o	-	aʔ	ɔ	a	332A
xj	ʃ	ʃ	ʃ	ʃ	ʃ	-	ɛ	ɛt	et	øʔ	iʔ	ɪt	-	329A

Fricative clusters are shown in table 31. Considering the Written Burmese, it appears like the cluster [hr] is reinterpreted in many different ways depending on the Language. Noting that [r] in Written Burmese is usually interpreted as [j] in Northern Burmic languages (note the exception in Phon), it is not difficult to see that a cluster is the probable reconstruction of these data. The real question is, what is the first consonant of the cluster? In the first two examples, Zaiwa and Written Burmese have the laryngeal glide [h], while Achang, Bela, Maru, and one example in Phon have [x]. Lashi tends to interpret this as the alveopalatal sibilant [ʃ] as does Phon in one case. Since the velar voiceless fricative [x] is not reconstructable for Proto Northern Burmic, clusters with this segment are most likely a reflex. Based on the correlation between Zaiwa, and Written Burmese, this cluster seems best reconstructed as [hj]. The last two examples are less clear. Achang maintains the cluster [xj], while the other languages generally have the alveopalatal sibilant. Since Achang maintains the alveopalatal sibilant (shown in table 29), in similar environments, it is more likely that the value shown in Achang is more conservative, and we posit [hj] for these data as well.

In Achang the glottal fricative cluster has become the velar fricative cluster:

3.21 *hj > xj/#_____

In Bela and Maru, the glottal fricative cluster has become the velar fricative:

3.22 *hj > x/#_____

In Zaiwa, the cluster is simplified by eliminating the alveopalatal approximant as expressed in rule 3.23:

3.23 *hj > h/#_____

In Lashi and Phon, and in some cases in Bela, Maru, and Zaiwa the glottal fricative cluster has become the alveopalatal fricative:

3.24 *hj > ʃ/#_____

3.2.5 Nasals

Alveolar and bilabial nasal initials are prevalent throughout the Northern Burmic languages, while velar nasals are somewhat less prevalent. The basic set of nasals is readily reconstructable, while the glottalized and cluster sets are only slightly more complicated.

TABLE 32

NORTHERN BURMIC NASALS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
m	m	m	m	m	m	m	au	au	au	oʔ	u	au	ui	001A
m	m	m	m	m	m	m	ɔʔ	a	ɔʔ	oʔ	ʊʔ	ɔʔ	ak	263A
m	-	m	m	m	m	hm	au	-	au	ok	u	ai	ui	050A
n	n	n	n	n	n	hn	uk	auʔ	oʔ	auʔ	okʔ	uʔ	auk	121B
n	n	n	n	n	n	n	ɔʔ	aʔ	ɔʔ	oʔ	uʔ	ɔʔ	ak	362A
n	n	n	n	n	n	n	ɛ	e	e	e	ɛ	e	i	364A
ŋ	-	ŋ	ŋ	ŋ	ŋ	ŋ	au	-	au	oʔ	u	au	ui	226A
ŋ	ŋ	ŋ	ŋ	ŋj	-	ŋ	i	ai	e	ai	i	-	ai	340A
n	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	-	ə	ə	o	a	ɔt	a	101A

The nasal series is shown in table 32. This series is unambiguous. Aspirated nasals in Written Burmese are uniformly unaspirated in Northern Burmic languages.

TABLE 33

NORTHERN BURMIC GLOTTALIZED NASALS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ˀn	-	ˀn	ˀn	-	ˀn	hn	uət	-	oiʔ	at	-	ʊt	ut	130A
ˀn	n	ˀn	ˀn	-	ˀn	n	ɔt	au	oiʔ	aiʔ	-	ʊt	a	136A
ˀn	-	ˀn	-	-	ˀn	-	amp	-	æp	-	-	am	-	402B
ˀn	ˀn	ˀn	ˀn	n	n	hn	ɔ	ɔ̃	ũ	o	aʔ	ɔ	a	127A
ˀŋ	ˀŋ	ˀŋ	ˀŋ	ŋ	ˀŋ	hŋ	ɔʔ	ɔʔ	ɔʔ	ɔʔ	a	ɔʔ	ak	093A

Glottalized nasal correspondences are shown in table 33. There are no apparent glottalized correspondences for bilabial nasals in the Northern Burmic data. There is a solid correlation of alveolar and velar glottalized nasals for Achang, Bela, Lashi, Maru, and Zaiwa.

TABLE 34

NORTHERN BURMIC NASAL CLUSTERS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
nj	mj	mj	mj	mj	mj	mj	uk	auʔ	ok	æuʔ	aiŋ	uʔ	auk	076B
nj	mj	mj	mj	-	mj	mj	ɔʔ	aʔ	ɔʔ	ɔʔ	-	ɔʔ	ak	120A
nj	nj	nj	nj	-	nj	-	æu	au	æu	æu	-	æu	-	084B
nj	ˀnj	nj	ˀnj	-	nj	nj	æu	uŋ	au	oʔ	-	ui	ui	365A

Nasal clusters are shown in table 34. In Achang, the bilabial nasal has merged with the alveolar nasal in the before an alveopalatal approximant. The palatal nasal in Written Burmese is represented by the alveolar nasal and alveopalatal approximant cluster in the Northern Burmic languages.

For Achang, the bilabial nasal assimilates to the alveolar nasal before an alveopalatal approximant:

3.25 *m > n/#_____j

TABLE 35

NORTHERN BURMIC GLOTTALIZED NASAL CLUSTERS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ˀnj	m	m	ˀm	m	m	m	iʔ	i	e	i	i	i	aʔ	177A
ˀnj	ˀmj	ˀmj	ˀmj	-	ˀmj	m	aŋ	u	ãŋ	a	-	aŋ	a	343A
ˀnj	-	ˀmj	ˀm	-	ˀm	m	ek	-	ɛʔ	it	-	i	e	253B
ˀnj	ˀn	ˀnj	ˀn	-	ˀnj	hn	ɛ	aut	ẽʔ	aiʔ	-	ɪt	ac	328A
ˀnj	ˀnj	ˀnj	ˀnj	-	nj	hŋ	æu	auŋ	au	oʔ	-	ui	ui	149A

Glottalized nasal clusters in table 35 show the same tendencies as the plain series in table 34. The bilabial nasals in Achang have merged with the alveolar nasals before the alveopalatal approximant (consistent with rule 3.25). The Written Burmese palatal nasal is represented by the cluster of an alveolar nasal and an alveopalatal approximant. Achang, Lashi, Maru, and Zaiwa all correspond well in terms of glottalized sets. In some cases the alveopalatal approximant has merged with the high front vowel of the rhyme (177A, 253B).

3.2.6 Laterals

Laterals are prevalent in the Northern Burmic data and are easily reconstructable as the tables 36 and 37 show.

TABLE 36

NORTHERN BURMIC LATERALS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
l	l	l	l	l	l	kl	uk	au	ok	au	oʔ	uʔ	auk	029A
l	ˀl	ˀl	l	l	l	l	ɔʔ	a	ɔʔ	oʔ	ʊʔ	ɔʔ	ak	145A
l	l	l	l	l	l	-	ui	ui	ɨ	öi	i	ui	-	088A
l	l	l	-	l	l	l	am	am	ɛm	-	aŋ	um	um	141B

Unambiguous lateral correspondences are shown in table 36. Clusters in the Northern Burmic languages are simpler than the Burmese cluster shown in example 029A.

TABLE 37

NORTHERN BURMIC GLOTTALIZED LATERALS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ˀl	-	ˀl	ˀl	-	ˀl	-	aŋ	-	aŋ	a	-	aŋ	-	102A
ˀl	-	ˀl	ˀl	-	ˀl	-	ap	-	æp	eʔ	-	ap	-	304A
-	-	ˀl	ˀl	l	ˀl	hl	-	-	eʔ	a	iʔ	ai	e	185A
ˀl	ˀl	l	ˀl	l	l	l	a	e	a	o	a	ə	aʔ	003A

Glottalized laterals in table 37 are evident in Achang, Bela, Lashi, Maru, and Phon. The aspirated lateral [hl] in Burmese corresponds to an unaspirated and generally, glottalized lateral in the Northern Burmic languages.[44]

3.2.7 Approximants

There is general agreement in the Northern Burmic languages in approximant correspondences as the data in tables 38 and 39 illustrate.

TABLE 38

NORTHERN BURMIC APPROXIMANTS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
w	v	w	w	w	v	w	ɛ	e	e	a	e	e	e	358A
w	v	w	v	w	w	w	uʔ	a	uʔ	ɔʔ	ʊʔ	aʔ	ak	085A
w	w	w	v	w	w	rw	ʊ	a	ə	o	a	a	a	183A
j	j	j	-	j	j	j	aŋ	oŋ	aŋ	-	o	aŋ	aŋ	116A
ʔj	j	j	j	-	j	-	ɔ	ɛ	ɔ	o	-	ɔ	-	260B
j	-	j	-	j	j	j	ɔ	-	ɔ	-	a	ɔ	a	266A

The approximant series is shown in table 38. The correspondences between the alveopalatal approximant are unambiguous. The bilabial approximant has some variation in Bela, Maru, and Zaiwa between the labiodental fricative and the bilabial approximant:

3.26 *w~v/#_____

TABLE 39

NORTHERN BURMIC GLOTTALIZED APPROXIMANTS

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ʔj	-	j	ʔj	-	ʔj	-	ɛn	-	ok	am	-	aŋ	-	176A
ʔj	ʔj	ʔj	ʔj	ʔ	ʔj	ʔ	en	am	ɛm	am	aiŋ	um	im	186A

[44] Although there are some correspondences between aspirated laterals and nasals in Written Burmese and glottalized laterals and nasals in Northern Burmic languages, there are exceptions to this with many correlations between plain nasals and laterals and glottalized counterparts in the Northern Burmic languages. Thus, no clear correspondence exists between aspiration in Written Burmese and glottalization in Northern Burmic languages.

The glottalized approximant series is shown in table 39. There are consistent correspondences between Achang, Bela, Lashi, Maru, and Zaiwa.

3.3 Rhymes

Having completed the reconstruction of initial consonants, we now consider the reconstruction of the nucleus and coda of the syllable, namely the rhyme. The first area of investigation will be *open rhymes* (rhymes with either an empty or nasal coda), followed by the analysis of rhymes with stops in the codas, called *stopped rhymes*.

3.3.1 Open Rhymes

The following rhymes are reconstructed where the coda position (C_2) is empty and the rhyme is composed entirely of vocalic segments. The first series we will reconstruct are the simple vowels, followed by diphthongs.

TABLE 40

NORTHERN BURMIC HIGH FRONT VOWEL

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
nj	m	m	m	m	m	m	i	i	ɪ	i	i	i	i	212A
ʃ	-	ʃ	ʃ	ʃ	ʃ	s	i	-	i	i	i	i	i	045A
n	-	n	n	-	-	-	i	-	i	i	-	-	-	055B
j	-	j	ɣ	-	β^w	-	i	-	i	i	-	i	-	338B
dʒ	ts	-	-	s	dʒ	-	i	i	-	-	i	i	-	125B

Unambiguous cases where the Proto rhyme *i is reconstructed are shown in table 40.

TABLE 41

NORTHERN BURMIC MID FRONT VOWEL

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
kʰj	kʰ	kʰj	kʰ	kʰ	kʰj	kʰr	ei	i	e	it	i	i	e	157A
j	-	j	ʔ	-	ʔ	-	ei	-	e	it	-	i	-	168A
dʒ	-	g	g	-	g	-	ei	-	e	it	-	i	-	190A
j	-	j	-	ɹ	-	r	ei	-	e	-	i	-	e	163A
dj	-	bj	pj	p	b	p	e	-	e	it	e	i	e	288A
ʃ	-	ʃ	ʃ	ʃ	ʃ	s	ei	-	e	it	i	i	e	269A
nj	m	mj	-	ɲ	m	-	ei	i	e	-	i	i	-	325A

The Proto rhyme *e is shown in table 41. Achang generally has the rhyme [ei]. In Bela, vowel quality may be the result of the alveopalatal approximant coalescing with the vowel [e] and raising it to [i], as examples 157, 325, and other examples in the data indicate. Lashi and Written Burmese are uniform in preserving the Proto vowel. Maru, Phon, and Zaiwa generally have undergone a merger of *e > i.

In Achang the mid front vowel becomes a diphthong in an open syllable (this is similar to Modern Spoken Burmese) as shown in rule 3.27:

3.27 *e > ei

In Bela, Maru, Phon, and Zaiwa, the vowel is raised from mid vowel to a high vowel as illustrated in rule 3.28:

3.28 *e > i

Rule 3.29 shows the epenthesis of the alveolar stop in Maru following the high front vowel:

3.29 *ϕ > t/i_____

Where "ϕ" is null or empty.

TABLE 42

NORTHERN BURMIC LOW CENTRAL VOWEL

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ʔ	ʔ	ʔ	-	-	ʔ	ʔ	a	a	a	-	-	a	ac	179A
ʔ	ʔ	ʔ	ʔ	ʔ	-	ʔ	a	a	a	a	a	-	ə	046A
dj	pj	bj	bj	-	bj	pj	ɔ	a	ɔ	ɔ	-	ɔ	a	115A
gj	kj	gj	gj	-	gj	kr	ɔ	a	ɔ	o	-	ɔ	a	222B
dz	t	dz	dz	s	dz	c	ɔ	a	ɔ	o	a	ɔ	a	227A
k^h	k^h	k^h	k^h	k^h	k^h	k^h	ɔ	a	ɔ	o	a	ɔ	a	376A
nj	mj	mj	mj	-	mj	mj	ɔ	a	o	ɔ	-	ɔ	a	334A
ts^h	t^h	ts^h	ts^h	sh	ts^h	c^h	ɔ	a	o	o	a	ɔ	a	071A

As table 42 illustrates, the Northern Burmic languages are quite uniform in preserving Proto *a when the onset is the glottal stop. However, when the onset varies from this value, Achang, Lashi, Maru, and Zaiwa represent this vowel with [ɔ] which varies with [o] in Lashi and Maru. Bela, Phon, and Written Burmese have retained the Proto vowel.

Lashi and Maru allow free variation between the mid back vowel and the low back vowel:

3.30 *o~ɔ

Achang, Lashi, Maru, and Zaiwa have undergone an alternation in which the central vowel undergoes backing to become a back vowel shown in rule 3.31:

3.31 *a > ɔ/C____#

TABLE 43

NORTHERN BURMIC HIGH BACK VOWEL

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
-	-	p^hj	p^hj	p^hj	p^hj	-	-	-	u	u	u	u	-	065C
t^h	-	t^h	t^h	t^h	t^h	t^h	ɨu	-	u	au	uʔ	u	u	345A
ts^h	-	ts^h	ts^h	-	ts^h	c^h	ɨu	-	u	au	-	u	u	347A
t^hj	p^hj	p^hj	p^hj	p^hj	p^hj	p^hr	ɨu	u	u	u	uʔ	u	u	363A
dz	-	dz	dz	sh	dz	c^h	u	-	u	au	u	u	u	041A
ʔ	w	w	ʔ	-	ʔ	ʔ	u	u	u	au	-	u	u	144A
d	-	d	d	t	d	t	u	-	u	au	u	u	u	301A
tj	-	bj	pj	p^hj	bj	p^hr	u	-	u	u	uʔ	u	u	079A
dj	pj	bj	bj	-	bj	l	u	u	u	u	-	u	u	171A

Proto *u is shown in table 43. The Proto quality is preserved in Bela, Lashi, Phon, Zaiwa, and Written Burmese. The final stops in Phon appear to be epenthesized stops. Achang has a split between the Proto vowel and the diphthong [ɨu] following an aspirated stop. Maru generally has a merger where *u > au, except following an alveopalatal approximant.

Rule 3.32 shows the alternation in Achang where high back vowel becomes a diphthong following an aspirated segment:

3.32 *u > ɨu/[ASP]_____

In Maru the high back vowel becomes a diphthong, except for when the vowel follows an alveolar approximant (in this case the original quality of [u] is retained), this is shown in rule 3.33:

3.33 *u > au

In Phon, there is variation between an empty coda and one filled with a glottal stop as illustrated by rule:

3.34 *u > uʔ

TABLE 44

NORTHERN BURMIC MID BACK VOWEL

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
m	m	m	m	m	m	m	au	au	au	oʔ	u	au	ui	001A
k^h	k^h	k^h	k^h	k^h	k^h	k^h	au	au	au	oʔ	u	au	ui	214A
ŋ	-	ŋ	ŋ	ŋ	ŋ	ŋ	au	-	au	oʔ	u	au	ui	226A
ts	-	dz	dz	s^h	dz	-	au	-	au	oʔ	o	au	-	236B
k^h	-	k^h	k^h	k^h	k^h	k^h	au	-	au	oʔ	o	au	ui	321A
ʔ	-	ʔ	ʔ	ʔ	-	ʔ	au	-	au	ok	o	-	ui	205A
g	k	g	g	-	g	k	au	au	au	ok	-	au	ui	330A
$tʃ^h$	-	$tʃ^h$	$tʃ^h$	ʃ	$tʃ^h$	-	au	-	au	uk	u	ui	-	053B
d	t	d	d	-	d	-	au	au	au	uk	-	au	-	139B
$tʃ^h$	-	$tʃ^h$	$tʃ^h$	-	$tʃ^h$	c^h	au	-	au	uk	-	ui	ui	178A
k^hj	k^hj	k^hj	k^hj	-	k^hj	k^hj	æu	u	au	oʔ	-	ui	ui	089A
^{ʔ}nj	^{ʔ}nj	^{ʔ}nj	^{ʔ}nj	-	nj	ɦɲ	æu	auŋ	au	oʔ	-	ui	ui	149A
ŋj	^{ʔ}nj	nj	^{ʔ}nj	-	nj	nj	æu	uŋ	au	oʔ	-	ui	ui	365A

Correspondences for the Proto rhyme *o are shown in table 44. The analysis here follows Bradley's (1979) where he notes that the Written Burmese correspondence for this Proto vowel is [ui], and Burling's argument that Proto *o corresponds to [au/ui] in Zaiwa. Note that the split in Zaiwa is conditioned by alveopalatal initials, causing *o > ui. Achang and Lashi uniformly have [au] with the former having the value [æu] following the alveopalatal approximant. Bela generally has this same value, but shows a propensity toward epenthesizing a final nasal following a nasal initial and some variation following an alveopalatal approximant. Maru and Phon preserve the Proto vowel in some cases. Maru has a tendency to epenthesize a final consonant (Burling 1967), and both languages show a tendency to raise the vowel.

Thus, for Achang, Bela, and Lashi, we have the following rule where the Proto mid back vowel becomes a diphthong:

3.35 *o > au

In Zaiwa, rule 3.35 applies, except when the initial is an alveopalatal, then rule 3.36 applies where the value of the diphthong is different:

3.36 *o > ui/[ALP]_____

Rule 3.37 expresses the free variation in Maru and Phon between the mid and high back vowel:

3.37 *o~u

Maru has some variation between the velar stop and the glottal stop syllable final:

3.38 *k~ʔ/_____#

TABLE 45

NORTHERN BURMIC DIPHTHONG [ai]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
-	-	l	l	-	l	l	-	-	ai	ai	-	ai	ai	025B
-	t	d	-	t^hw	d	-	-	ai	ai	-	ai	ai	-	078A

As seen in table 45, the Proto rhyme *ai is present in only a few cases in the Northern Burmic languages, but is very uniform.

TABLE 46

NORTHERN BURMIC DIPHTHONG [au]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
nj	ɲj	nj	nj	-	nj	-	æu	au	æu	æu	-	æu	-	084B

The Proto rhyme *au shown in table 46 is interesting. These data occur in only one case, but note that where Achang, Bela, and Lashi have *o > au in table 44 (with the same onset) Zaiwa has the rhyme [ui] and Maru has [oʔ]. Thus, this rhyme is posited on the basis of this rather scant evidence where Maru and Zaiwa have preserved this value.

TABLE 47

NORTHERN BURMIC DIPHTHONG [ui]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ŋ	n	ŋ	ŋ	-	ŋ	ŋw	ui	ui	-	oi	-	un	e	033A
p	p	b	b	-	b	-	ui	ui	e	a	-	ui	-	002A
s	s	s	s	ʃ	s	sw	ui	ui	oi	a	ui	ui	e	164A
l	l	l	l	l	l	-	ui	ui	ɨ	öi	i	ui	-	088B
dz	t	ts	dz	-	dz	cw	ui	ui	ɨ	öi	-	ui	a	133A
d	-	d	d	-	d	-	ui	-	ɨ	öi	-	ui	-	289A
dz	-	dz	dz	-	dz	-	ui	-	ɨ	öi	-	ui	-	310B
dz	-	dz	-	s^h	-	cw	ui	-	ɨ	-	ui	-	ai	092A
k^h	k^h	k^h	k^h	k^h	k^h	k^hw	ui	ui	ue	a	ui	ui	e	081A

The Proto rhyme *ui is shown in table 47. This rhyme is preserved with little variation in Achang, Bela, Phon, and Zaiwa. Lashi generally has the value [ɨ] while Maru has the value [oi]. In these cases, Written Burmese has no real regular correspondences in the rhymes, but if we look at the onsets, it is noted that the medial [w] is present in every example. There are two different possible interpretations for this cluster. The first follows written Burmese and posits the medial [w] for Proto Northern Burmic and then attempt to discern the vocalic property following the medial. The second interpretation is the cluster *ui which is evident in most of the Northern Burmic languages and not attempt to modify the Proto Northern Burmic syllable template. Since the latter seems to pose the fewest problems, this seems the most acceptable solution.

In Lashi, the Proto diphthong merges into the high central vowel:

3.39 *ui > ɨ

In Maru, the Proto diphthong merges into the low central vowel or a diphthong with the first vocalic quality being somewhat lower than that of the Proto diphthong:

3.40 *ui > a, or oi

TABLE 48

NORTHERN BURMIC REDUCED VOWEL

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
l	-	l	l	-	l	-	ə	-	ə	ə	-	ə	-	059A
m	-	m	m	m	m	-	ə	-	ə	ə	ə	ə	-	061A
n	-	n	n	-	-	-	ə	-	ə	ə	-	-	-	113A

The reduced vowel [ə] is evident in several examples in the Northern Burmic languages and Written Burmese (although no Written Burmese examples are shown in these data). This vowel however, is the product of syllabic processes of what was presumably a different vocalic quality in

the Proto language. This vowel is regarded as a phonetic value in the proto language and not a phonemic element.

3.3.2 Nasal Rhymes

The following Rhymes are reconstructed where the coda position (C_2) is filled by a nasal.

TABLE 49

NORTHERN BURMIC RHYME [am]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ts^h	ts^h	ts^h	ts^h	s^h	ts^h	c^h	am	i	æm	e	ɛ	am	am	122A
n	-	n	n	-	n	n	am	-	am	ɛ	-	am	am	160A
l	-	l	l	l	l	hl	am	-	æm	e	ɛ	am	am	220A
j	-	j	ɣ	ɹ	$β^w$	r	am	-	æm	e	eɪ	am	am	379A

In the examples in table 49, *am is preserved in Achang, Lashi (with the [æm] variant), Zaiwa, and Burmese. In Maru and Phon, *am > e~ɛ with the loss of the final consonant. The Bela data are sparse, but [i] is the most common reflex.

In Maru and Phon, the rhyme [am] becomes the mid front vowel:

3.41 *am > e

In Bela, there is limited data, but it appears that the rhyme [am] becomes the high front vowel:

3.42 *am > i

TABLE 50

NORTHERN BURMIC RHYME [an]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
dz	-	ts	dz	-	dz	-	an	-	ain	ɪn	-	an	-	018A
p	pj	b	p	p	b	p	an	e	ain	en	ɛ	an	an	044A
n	-	n	n	-	n	-	an	-	aɪ	ɪn	-	an	-	268A

In table 50, the first three examples represent Proto *an. Achang, Zaiwa, and Written Burmese all have this rhyme. Lashi has undergone the alternation *a > ai/__n, in some cases the nasal final has been lost. Maru generally has [ɪn] for its reflex, but also has [en] and even [an] with no apparent conditioning environment. The Bela and Phon data are very limited for this Proto form.

In Bela and Phon the rhyme [an] becomes a mid front vowel:

3.43 *an > e

In Lashi the Proto rhyme the low central vowel becomes a diphthong before an alveolar nasal:

3.44 *a > ai/_____n

In Maru the low central vowel becomes a high front vowel before an alveolar nasal:

3.45 *a > i/_____n

TABLE 51

NORTHERN BURMIC RHYME [aŋ]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
l	l	l	-	-	l	k^hl	aŋ	aŋ	aŋ	-	-	aŋ	auŋ	024A
t^h	p	bj	-	p	b	-	aŋ	aŋ	aŋ	-	aŋ	aŋ	-	078B
ts^h	-	ts^h	ts^h	-	-	c^h	aŋ	-	aŋ	a	-	-	aŋ	091A
-	-	k^h	k^h	-	k^h	kj	-	-	aŋ	aŋ	-	aŋ	auŋ	105A
j	j	j	-	j	j	j	aŋ	oŋ	aŋ	-	o	aŋ	aŋ	116A
w	-	w	w	vɹ	-	w	aŋ	-	aŋ	a	o	-	aŋ	277A
t^h	-	t^h	t^h	t^h	t^h	t^h	aŋ	-	aŋ	a	o	aŋ	aŋ	211A

There is a staggering quantity of [aŋ] rhymes in the Northern Burmic languages. It may be the case that other nasal rhymes have assimilated to the velar place of articulation. We will focus on a few representative examples. In the preceding examples *aŋ is evident in Achang, Bela (except for a few cases of [oŋ] which do not follow a regular pattern), Lashi, Zaiwa, and Written Burmese.

Note that the Written Burmese rhyme [auŋ] has merged into [aŋ] in most of these languages. Maru generally has the vowel [a], while Phon has [o].

In Maru the Proto rhyme [aŋ] becomes the low central vowel:

3.46 *aŋ > a

In Phon the Proto rhyme [aŋ] becomes the mid back vowel:

3.47 *aŋ > o

TABLE 52

NORTHERN BURMIC RHYME [um]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
b	p	b	b	-	b	-	uɔm	am	ɛm	am	-	um	-	035A
l	l	l	-	l	l	l	am	am	ɛm	-	aŋ	um	um	141B
k^h	k^h	k^h	k^h	-	k^h	k^h	uam	am	æm	am	-	um	a	187A
ts^h	-	ts^h	ts^h	ʃ	ts^h	c^h	ɔm	-	æm	am	aŋ	um	um	207A
-	-	-	s	-	-	pr	-	-	-	am	-	-	um	243A
s	s	s	s	ʃ	s	s	ɔm	am	ɛm	am	aŋ	um	um	324A
d	-	-	-	-	-	t	uam	-	-	-	-	-	um	385A
j	-	j	ɣ	-	v	-	ɔm	-	ɛm	am	-	um	-	391A

In Zaiwa, *um roughly correlates to Written Burmese [um]. There is a lot of scatter in Achang, with diphthong rhymes like [uɔm], and [uam], and simple vowel rhymes such as [ɔm], and [am]. In Bela, *um has merged with [am]. In Lashi there is both [ɛm] and [æm]. While Maru has [am] and Phon [aŋ].

Achang shows considerable free variation before a bilabial nasal:

3.48 uɔ~ua~ɔ~a/_____m

In Achang the high back vowel becomes a low back vowel before a bilabial nasal:

3.49 *u > ɔ/_____m

In Bela, Maru, and Phon the high back vowel becomes a low central vowel before a bilabial nasal:

3.50 *u > a/_____m

In Lashi, the preceding rule applies following an aspirated segment, and the high back vowel becomes a mid front vowel elsewhere:

3.51 *u > e/_____m

In Phon a bilabial nasal syllable final becomes a velar nasal (note this rule must apply after rule 3.50):

3.52 *m > ŋ/_____#

TABLE 53

NORTHERN BURMIC RHYME [un]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ʔ	-	-	ʔ	ʔ	ʔ	ʔ	un	-	-	ʊn	ʊn	ʊn	un	061A

The Proto rhyme *un is preserved best in Zaiwa, but it does not seem to have regular correspondences. Fortunately there is one cognate set that provides evidence of *un (which varies with [ʊn]) across the languages under investigation (with the exception of Bela and Lashi, which do not have data for this example). Although the data are admittedly scant, it is sufficient to posit this Proto rhyme.

TABLE 54

NORTHERN BURMIC RHYME [auŋ]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
k^h	-	k^h	g	t	k^h	-	oŋ	-	oŋ	auŋ	an	uŋ	-	001B
d	-	d	d	t	d	t	uŋ	-	oŋ	auŋ	ɔŋ	uŋ	auŋ	095A
t^h	-	t^h	t^h	-	t^h	t	uŋ	-	uŋ	auŋ	-	uŋ	auŋ	146B
-	-	k^hj	k^hj	x	k^hɹ	k^hj	-	-	oŋ	æuŋ	ɔŋ	uŋ	auŋ	236A
dz	ts	dz	dz	-	dz	-	oŋ	aŋ	oŋ	auŋ	-	uŋ	-	271A
-	-	g	k	-	-	-	-	-	oŋ	auŋ	-	-	-	356A
-	-	l	l	-	-	l	-	-	oŋ	auŋ	-	-	auŋ	382B

Maru preserves the rhyme [auŋ] from Written Burmese. The Lashi rhyme [oŋ] agrees with Bradley (1979) and Matisoff's (1976) interpretation, as do Phon and Achang to a lesser extent. Achang also has the rhyme [uŋ] which is evident in Zaiwa.

In Achang, the high back vowel appears to vary with the mid back vowel before a velar nasal:

3.53 u~o/_____ŋ

In Zaiwa, and Achang the Proto diphthong [au] becomes the high back vowel before a velar nasal:

3.54 *au > u/_____ŋ

In Phon, the Proto diphthong [au] becomes the low back vowel before a velar nasal:

3.55 *au > ɔ/_____ŋ

In Bela, the Proto diphthong [au] becomes the low central vowel before a velar nasal:

3.56 *au > a/_____ŋ

TABLE 55

NORTHERN BURMIC RHYME [uiŋ]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
k	-	g	g	k^h	k	k	ɔ	-	oŋ	ɔŋ	o	ɔʔ	uiŋ	039B
-	-	k^hj	k^hj	-	-	k^hj	-	-	oŋ	æuŋ	-	-	uiŋ	147B
dj	-	bj	bj	pj	b	pr	eŋ	-	əŋ	aŋ	aiŋ	iŋ	uiŋ	354A

The Proto rhyme *uiŋ in Written Burmese is represented as [oŋ] in Lashi, [auŋ] in Maru, probably best as [aiŋ] in Phon, and [oŋ] in Achang (dismissing the effects of the alveopalatal approximant).

In Achang, and Lashi, the Proto diphthong [ui] becomes the mid low vowel before a velar nasal:

3.57 *ui > o/_____ŋ

In Maru, the Proto diphthong [ui] becomes the diphthong [au] before a velar nasal:

3.58 *ui > au/_____ŋ

3.3.3 Stopped Rhymes

The following Rhymes are reconstructed where the coda position (C_2) is filled by a voiceless plosive.

TABLE 56

NORTHERN BURMIC RHYME [ip]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
j	-	j	-	-	v	r	æt	-	øp	-	-	ʊp	ip	011A
ʃ	-	ʃ	ʃ	-	ʃ	s	ɛt	-	iʔ	ap	-	ɪt	ip	231A
ʔj	ʔj	j	ʔj	ʔ	ʔj	ʔ	ɛt	æp	øp	ap	aiʔ	up	ip	261A

The Written Burmese rhyme [ip] has as first appearance unusual correspond-ences in the Northern Burmic languages. However, upon closer inspection, it seems some of the high front vocalic features have formed an alveopalatal approximant in the onset in these languages. Achang seems to have lost the bilabial plosive in favor of an alveolar with [et] or [æt]. Bela has [æp], Lashi [øp], Maru [ap], Phon [aiʔ], and Zaiwa [up]. Notice how Phon is similar to spoken Burmese [ʔeiʔ].

In Achang, the high front vowel lowers to the mid front vowel before a bilabial stop:

3.59 *i > e/_____p

Also in Achang, the bilabial stop becomes an alveolar stop syllable final:

3.60 *p > t/_____#

In Bela and Maru, the high front vowel becomes a low central vowel before a bilabial stop:

3.61 *i > a/_____p

In Lashi, the high front unround vowel becomes a mid front round before a bilabial stop:

3.62 *i > ø/_____p

In Phon, the high front vowel becomes a diphthong before a bilabial stop:

3.63 *i > ai/_____p

In Zaiwa, the high front vowel becomes a high back vowel before a bilabial stop:

3.64 *i > ai/_____p

TABLE 57

NORTHERN BURMIC RHYME [ap]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
-	-	l	-	-	l	hlj	-	-	æp	-	-	ap	ap	009A
n	n	n	n	-	n	n	ap	e	æp	ɛʔ	-	ap	ak	014A
ŋ	n	ŋ	ŋ	-	-	-	ap	eʔ	æp	eʔ	-	-	-	201A
j	-	-	j	ɹ	j	r	ap	-	-	eʔ	eʔ	ap	ap	272A
l	-	l	l	-	l	-	ap	-	æp	eʔ	-	ap	-	304A

The most abundant stopped and nasal rhymes in the data are those with the mid low vowel [a]. Nearly every Northern Burmic language has these rhymes. If we consider the preceding data, Achang, Lashi, Zaiwa, and Written Burmese have the rhyme [ap], while Bela, Maru, and Phon have lost this vowel quality with *a > e/__p. Some time after this, the labial plosive final went to a glottal stop or was lost entirely. The Proto rhyme for these examples is *ap.

In Bela, Maru, and Phon, the low mid vowel becomes a mid front vowel before a bilabial stop:

3.65 *a > e/_____p

In Bela, Maru, and Phon, the bilabial stop becomes a glottal stop syllable final:

3.66 *p > ʔ/_____#

TABLE 58

NORTHERN BURMIC RHYME [at]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ŋ	-	ŋ	-	-	ŋ	-	at	-	ait	-	-	at	-	083A
b	-	-	b	-	-	-	at	-	-	eʔ	-	-	-	295A
k^h	-	k^h	-	-	k^h	-	at	-	aiʔ	-	-	at	-	314B
s	^{ʔ}s	^{ʔ}s	^{ʔ}s	ʃ	s	s	at	eʔ	aiʔ	eʔ	iʔ	at	at	315A

This data are a similar to that of the [ap] rhymes. Achang, Zaiwa, and Written Burmese display the Proto rhyme *at, while Bela and Maru have lost the vocalic quality with *a > e/__t, and the stop place has gone to a glottal. Phon has undergone the same process, but the vowel has been raised by the voiceless alveolar fricative. Lashi is a little different with the vowel going to [ai], with the final stop being retained in the first example, but changing into the glottal in the others.

In Bela, Maru, and Phon, the low central vowel becomes the mid front vowel before an alveolar stop:

3.67 *a > e/_____t

In Lashi, the low central vowel becomes a diphthong before an alveolar stop:

3.68 *a > ai/_____t

In Phon, the low central vowel becomes the high front vowel before an alveolar stop:

3.69 *a > i/_____t

In Bela, Lashi, Maru, and Phon, the alveolar stop becomes a glottal stop syllable final (note rule 3.70 takes place following rules 3.67-3.69):

3.70 *t > ʔ/_____#

TABLE 59

NORTHERN BURMIC RHYME [ak]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
ŋ	-	ŋ	ŋ	ŋ	ŋ	hŋ	ɔʔ	-	ɔ	oʔ	uʔ	ɔ	ak	057A
gj	k	gj	ɣ	-	β^{w}	kr	ɔʔ	ɔʔ	ɔʔ	ɔʔ	-	ɔʔ	ak	099A
l	^{ʔ}l	^{ʔ}l	l	l	l	l	ɔʔ	a	ɔʔ	oʔ	ʊʔ	ɔʔ	ak	145A
j	-	j	ɣ	r	w	r	ɔʔ	-	ɔʔ	oʔ	ʊʔ	ɔʔ	ak	196B
s	-	s	s	-	s	s	ɔʔ	-	ɔʔ	ɔʔ	-	ɔʔ	ak	239A
dj	-	j	j	-	j	hj	ɔʔ	-	ɔʔ	ɔʔ	-	ɔʔ	ak	242A
m	m	m	m	m	m	m	ɔʔ	a	ɔʔ	oʔ	ʊʔ	ɔʔ	ak	263A
l	-	l	l	l	l	l	ɔʔ	-	ɔʔ	oʔ	ʊʔ	ɔʔ	ak	355A
n	n	n	n	n	n	n	ɔʔ	aʔ	ɔʔ	oʔ	uʔ	ɔʔ	ak	362A

This data illustrates the regular correspondences between Written Burmese and the Northern Burmic cognates. With only a little free variation in Maru between the mid back vowel [o] and the low back vowel [ɔ], Achang, Lashi, Maru, and Zaiwa all have the reflex [ɔʔ] for Proto *ak. Phon has in its place [uʔ] with the free variation between [u] and [ʊ]. Bela has [a] in most cases.

In Maru, rule 3.29 established the free variation between o~ɔ for open syllables, table 59 shows how this rule applies to stopped syllables as well. Similarly rule 3.30 (*a > ɔ/C___) applies to the stopped syllables for Achang, Lashi, Maru, and Zaiwa.

In Phon, the low central vowel becomes a high back vowel before a velar stop:

3.71 *a > u/_____k

In Achang, Bela, Lashi, Maru, Phon, and Zaiwa, the velar stop becomes a glottal stop syllable final:

3.72 *k > ʔ/_____#

TABLE 60

NORTHERN BURMIC RHYME [up]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
$tʃ^{h}$	-	$tʃ^{h}$	$k^{h}j$	xɹ	$k^{h}j$	$k^{h}j$	oap	-	uɛp	æp	aʔ	up	up	200A
^{ʔ}dʒ	-	dʒ	^{ʔ}dʒ	s	$tʃ^{h}$	c	ɔp	-	uɛp	ap	aʔ	up	up	241A
^{ʔ}nj	^{ʔ}nj	nj	^{ʔ}nj	mj	^{ʔ}mj	mr	ɔp	æp	øp	ap	aʔ	up	up	302A
b	-	b	b	-	b	p	uɔp	-	uɛp	ap	-	ʊp	up	378A

Zaiwa preserves *up which varies with [ʊp]. This rhyme correlates with written Burmese [up]. Achang uses the reflex [ɔp], or a diphthong, while Bela and Maru have [ap]. Lashi has the diphthong [uɛp] or [øp], while Phon employs [aʔ]. In Bela, Maru, and Phon, *u > a/__p. Note in Bela, there is some variation between [a]~[æ] in the environment of j__p. In Phon, final *p > ʔ/a__. Lashi and Achang move to more diphthongal type constructions.

In Achang, the high back vowel becomes the low back vowel before a bilabial stop:

3.73 *u > ɔ/_____p

In Bela, Maru, and Phon, the high back vowel becomes the low central vowel before a bilabial stop:

3.74 *u > a/_____p

In Lashi, the high back vowel becomes a diphthong before the bilabial stop:

3.75 *u > ue/_____p

In Phon, the bilabial stop becomes a glottal stop in the syllable final position:

3.76 *p > ʔ/_____#

TABLE 61

NORTHERN BURMIC RHYME [ut]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
-	-	-	s	ʃw	s	s	-	-	-	at	aiʔ	ʊt	ut	290B
ts^h	^{ʔ}ts	^{ʔ}ts	-	ʃw	-	c^h	ɔt	at	oiʔ	-	aiʔ	-	ut	142A
m	-	^{ʔ}m	-	m	m	hm	ɔət	-	oiʔ	-	ui	ə	ut	206A
^{ʔ}n	-	^{ʔ}n	^{ʔ}n	-	^{ʔ}n	hn	uət	-	oiʔ	at	-	ʊt	ut	130A
s	-	s	s	ʃ	s	s	uat	-	oiʔ	ait	aʔ	ʊt	uik	094A
-	-	-	n	-	n	-	-	-	-	ait	-	ʊt	-	240B
$tʃ^h$	-	$tʃ^h$	-	-	$tʃ^h$	-	uat	-	oiʔ	-	-	ut	-	370A

Zaiwa preserves *ut. It freely varies with [ʊt]. This Proto rhyme roughly correlates to written Burmese [ut]. The correspondence in Lashi is the diphthong [oiʔ]. There is no regular

correspondence in Bela. Phon has [aiʔ] and [aʔ], while Maru has [ait] and [at]. The Achang correspondence is most commonly a diphthong ending in [t] like [uat].

Achang exhibits a wide range of free variation before a alveolar stop:

3.77 ua~uə~ɔə/_____t

In Achang, the high back vowel becomes a diphthong before an alveolar stop:

3.78 *u > ua/_____t

Maru and Phon have free variation between the low central vowel and a diphthong before an alveolar stop:

3.79 a~ai/_____t

In Bela, Maru, and Phon, the high back vowel becomes a low central vowel before an alveolar stop:

3.80 *u > a/_____t

In Lashi, the high back vowel becomes a diphthong before an alveolar stop:

3.81 *u > oi/_____t

In Lashi, and Phon, a syllable final alveolar stop becomes a glottal stop (note this rule must follow rules 3.80 and 3.81):

3.82 *t > ʔ/_____#

TABLE 62

NORTHERN BURMIC RHYME [auk]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
n	n	n	n	n	n	hn	uk	auʔ	oʔ	auʔ	okʔ	uʔ	auk	121B
-	j	j	j	j	j	j	-	auʔ	ok	æuʔ	ok	uʔ	auk	169A
ɡj	-	ɡj	ɡj	-	ɡj	kr	uk	-	ok	æuʔ	-	uʔ	auk	259A
t^h	-	t^h	t^h	-	t^h	t^h	uk	-	oʔ	auk	-	uʔ	auk	273A
kj	-	kj	kj	x	kj	k^hr	uk	-	oʔ	auʔ	oʔ	uʔ	auk	380A

The Proto rhyme shown in Written Burmese [auk] is similar to Maru and Bela [auʔ]. The vocalic set in Lashi and Phon of [o] concurs with Bradley (1979) and Matisoff's (1976) interpretation of this vowel, although most of the finals have gone to a glottal stop. Zaiwa and Achang have the high back vowel [u] followed by a [k] coda in Achang and a glottal [ʔ] coda in Zaiwa.

In Achang, and Zaiwa, the Proto diphthong [au] becomes a high back vowel before a velar stop:

3.83 *au > u/_____k

In Lashi, and Phon, the Proto diphthong [au] becomes a mid back vowel before a velar stop:

3.84 *au > o/_____k

In Maru, there is some free variation:

3.85 au~æu/C_____k

In Lashi, Maru, and Phon, a syllable final velar stop varies with the glottal stop (note this rule applies following rule 3.84):

3.86 *k~ʔ/_____#

In Bela and Zaiwa, a syllable final velar stop becomes a glottal stop (this rule follows rule 3.84):

3.87 *k > ʔ/_____#

TABLE 63

NORTHERN BURMIC RHYME [uik]

Onsets							Rhymes							
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No
s	-	s	s	ʃ	s	s	uat	-	oiʔ	ait	aʔ	ʊt	uik	094A
-	-	j	-	-	-	r	-	-	øk	-	-	-	uik	295B
-	-	-	-	-	t^h	t	-	-	-	-	-	ui	uik	295C
-	-	dz	dz	-	-	c	-	-	oŋ	auʔ	-	-	uik	300A

The preceding table 63 gives the complete data for correspondences with the Written Burmese rhyme [uik]. Unfortunately, there are no regular correspondences in the Northern Burmic languages, thus, this rhyme is not considered part the Proto language.

3.4 Tones

Tonal systems in Tibeto-Burman languages are generally three tonal systems in open syllables with a single non-contrastive tone in stopped syllables. This is consistent with both Burling's (1967) and Bradley's (1979) analysis of Loloish languages. Based on this hypothesis, this section will use Written Burmese, which maintains this same tonal system, as the standard for comparing the Northern Burmic languages.

Tones in this chapter have been regularized from the phonetic data presented in chapter 5. For example, a phonetic [32] tone may be rendered as either /31/ or /33/ depending on how it patterns with other examples in a given language.

3.4.1 Open and Nasal Syllables

Level tone in Written Burmese corresponds to level tone in Bela, high tone in Phon, and falling tone in Achang, Maru, and Zaiwa, while this tone corresponds to both high and low falling tones in Lashi.

The following table 64 shows tonal correspondences by language in the first seven columns. Tones for Achang, Bela, Lashi, Maru, and Zaiwa are scaled from "5" for high to "1" for low. Level tones are shown by a single number such as "3," rather than "33." Tones in Phon are represented by "5" for high level. The correspondences for Burmese are for Level tone represented by "L_T." The next seven columns provide the phonetic representations of the respective syllables bearing these tones. The tones are segregated for clarity. The final columns provide the reference number and gloss for each cognate set.

TABLE 64

NORTHERN BURMIC TONE 1

Tones							Syllables							Reference	
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No	Gloss
31	3	53	41	-	31	L_T	dʒə	tsa̤m	dʒɛ	dʒa̤m	-	dum	tim	005A	cloud
31	3	53	41	5	31	L_T	ŋui	nui	ŋ	ŋoi	mjaiŋ	ŋun	ŋwe	033A	silver
31	-	53	41	5	31	L_T	duŋ	-	doŋ	dauŋ	tɔŋ	duŋ	tauŋ	095A	wing
31	3	53	41	-	31	L_T	nji	me	mjū	mo̤i	-	mui	mrwe	102B	snake
3	3	53	41	5	53	L_T	ts^ham	ts^hĩ	ts^hæm	ts^he	s^hɛ	ts^ham	c^ham	122A	hair
3	3	53	-	5	53	L_T	k^hjei	k^hi	k^hje	-	k^hi	k^hji	k^hre	157A	foot
31	-	31	-	5	31	L_T	ŋau	-	ŋau	-	ŋu	ŋau	ŋui	226A	weep
31	-	31	41	5	-	L_T	waŋ	-	waŋ	wa	vo	-	waŋ	277A	enter
31	3	31	-	-	31	L_T	ŋjæu	ŋjṳŋ	njau	-	-	njui	njui	365A	green

Note that the low falling tones are raised in the environment of a voiceless initial consonant in Lashi and Zaiwa, while the Achang tones become strangely level (122A, 157A).

For Lashi and Zaiwa, a low falling tone becomes a high falling tone following a voiceless initial:

3.88 $31 > 53/C_{vl}$_____

Where "C_{vl}" is a voiceless consonant.

For Achang, a low falling tone becomes a mid level tone following a voiceless initial:

3.89 $31 > 3/C_{vl}$_____

Tones in Lashi vary between high falling and low falling with no apparent conditioning environment (cf. 102B with 365A).

Heavy tone in Written Burmese corresponds to falling tone in Phon and Zaiwa, falling and rising tone in Bela, and level (both high and mid) tone in Achang, Lashi, Maru.[45]

The following table 65 shows the tonal correspondences. Tones for Achang, Bela, Lashi, Maru, and Zaiwa are scaled from "5" for high to "1" for low. Level tones are shown by a single

[45] Burlings finds differing tonal contours in Zaiwa (Atsi) based on grammatical considerations, with nouns having a falling contour and verbs a rising contour. These grammatical distinctions do not seem to be present in these data.

number such as "3." Tones in Phon are represented by "31" for low falling tone. Heavy tone in Burmese is represented by "H_T."

TABLE 65

NORTHERN BURMIC TONE 2

Tones							Syllables							Reference	
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No	Gloss
3	52	2	-	31	31	-	lu	la	lo	-	la	lə	-	073B	tiger
5	23	4	4	31	31	H_T	pu̥	pa	pu	pọ	pa	bɔ	pʰa:	106A	frog
3	-	-	-	31	31	H_T	bau	-	-	-	pu	bau	pui:	107A	insect
5	23	4	2	31	31	H_T	ʃæn	ʃʰaun	ʃen	ʃɪn	ʃɛɪ	ʃɪn	san:	110A	louse
3	52	2	2	-	31	H_T	djɔ	pja	bjɔ	bjɔ	-	bjɔ	pja:	115A	bee
3	-	2	2	-	31	-	laŋ	-	laŋ	la	-	laŋ	-	123B	forehead
3	-	2	2	31	31	H_T	wu	-	wɔ	vɔ	wa	wa	wa:	148A	palm
5	23	4	-	-	31	H_T	njæ̱u̥	ŋjauŋ	njạu̥	-	-	njui	ɦɲui:	149A	finger
5	23	4	2	31	31	H_T	sui	sui	soi	sa	ʃui	sui	swe:	164A	blood
3	52	2	4	31	53	H_T	dzɔ	ta	dzɔ	dzo	sa	dzɔ	ca:	227A	eat
5	-	4	-	-	53	H_T	tʰau	-	tʰau	-	-	tʰau	tʰui:	298A	stab
3	-	2	4	31	53	H_T	du	-	du	dau	tu	du	tu:	301A	dig
5	-	4	4	31	53	H_T	tʰuŋ	-	tʰoŋ	tʰaun	tʰɔŋ	tʰuŋ	tʰauŋ:	305A	pound (rice)
5	23	4	4	31	53	H_T	kʰɔ	kʰạ	kʰɔ	kʰo	kʰa	kʰɔ	kʰa:	376A	bitter

Tones in Achang, Lashi, Maru, and Zaiwa are generally raised in a syllable with either tense voice or a voiceless initial consonant (106A, 149A, 298A, 305A, 376A). This rule for Zaiwa has already been stated in 3.88, while for Achang, Lashi, and Maru, a low level tone becomes a high level tone following a voiceless initial consonant or in a tense syllable:

3.90 $LL > HL/C_{vl}\_\_\_\_\_$

Where "LL" is a low level tone, "HL" is a high level tone, and "C_{vl}" is a voiceless consonant.

3.91 $LL > HL/\sigma_t$

Where "LL" is a low level tone, "HL" is a high level tone, and "σ_t " represents a tense syllable.

Achang and Lashi also appear to raise tone following a sibilant (110A, 164A).

3.92 $LL > HL/C_s\_\_\_\_\_$

Where "LL" is a low level tone, "HL" is a high level tone, and "C_s" represents a sibilant.

Although the data are limited, there is some evidence in Zaiwa for a high tone (53) corresponding to *Tone 2 without a conditioning environment (227A, 301A).

Creaky tone in Written Burmese corresponds to falling and rising tone in Bela, and low falling tone in Phon, and level tone in Achang, Lashi, Maru, and Zaiwa.

The following table 66 shows the tonal correspondences. Tones for Achang, Bela, Lashi, Maru, and Zaiwa are scaled from "5" for high to "1" for low. Level tones are shown by a single number such as "3." Tones in Phon are represented by "31" for low falling. The correspondences for Burmese are for creaky tone represented by "C_T."

TABLE 66

NORTHERN BURMIC TONE 3

Tones							Syllables							Reference	
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No	Gloss
5	23	4	4	31	4	C_T	la̤	le̤	la	lo̤	la	lə	la^{ʔ}	003A	moon
5	-	4	4	-	-	-	t^{h}ɔm	-	t^{h}øm	t^{h}am	-	-	-	027A	mud
5	23	4	4	31	4	C_T	nau	nau	nau	noŋ	nu	nau	nui^{ʔ}	087A	milk
-	-	4	4	31	4	-	-	-	t^{h}uŋ	t^{h}auŋ	t^{h}aŋ	t^{h}aŋ	-	158A	heel
5	52	4	4	-	-	C_T	nu	nauŋ	nõŋ	nauŋ	-	-	nu^{ʔ}	180A	younger sibling
5	23	4	4	-	-	C_T	gjɔ	kja̤	gjɔ	gjo	-	-	kja^{ʔ}	283A	fall
5	-	4	4	31	4	C_T	gɔ	-	gɔ	go	ga	gɔ	ka^{ʔ}	312A	dance

It bears noting that the data for this tonal reconstruction is much more limited than for the others tones reconstructed. The sparseness of this data are consistent with Bradley's findings for the reconstruction of this tone in the larger family of Proto-Burmese Lolo.

3.4.2 Stopped Syllables

Killed tone in Written Burmese corresponds to the falling tone in Achang, Bela, Lashi, Maru, Phon, and Zaiwa.

The following table 67 shows the tonal correspondences. Tones for Achang, Bela, Lashi, Maru, and Zaiwa are scaled from "5" for high to "1" for low. Level tones are shown by a single number such as "3." Tones in Phon are represented by "31" for low falling, and "5" for high level. Killed tone in Written Burmese represented by "K_T."

TABLE 67

NORTHERN BURMIC TONE 4

Tones							Syllables							Reference	
A	B	L	M	P	Z	WB	A	B	L	M	P	Z	WB	No	Gloss
-	-	2	2	-	4	K_T	-	-	la	lə	-	lə	lak	052A	kapok
31	53	31	31	5	31	K_T	njuk	mjauʔ	mjok	mjæuʔ	mjaiŋ	mjuʔ	mjauk	076B	monkey
53	53	53	53	31	53	K_T	ŋ̥ʔ	ŋ̥aʔ	ŋ̥ʔ	ŋ̥ʔ	ŋʊʔ	ŋ̥ʔ	hŋak	093A	bird
53	-	53	53	31	5	K_T	suat	-	soiʔ	sait	ʃaʔ	sʊ[t]	suik	094A	bird nest
53	-	53	53	-	5	K_T	nu̥ḁt	-	no̥i̥ʔ	nḁt	-	nʊ̥[t]	hnut	130A	mouth
3	3	4	2	-	4	K_T	ʔa	ʔa	ʔa	jə	-	ʔa	ʔac	179A	elder sibling
53	-	53	53	-	53	K_T	sɔʔ	-	sɔʔ	sɔʔ	-	sɔʔ	sak	239A	breathe
53	-	53	53	-	53	K_T	dʒ̥ɔ̥p	-	dʒuɛp	dʒ̥ḁp	-	tʃʰup	cup	241A	suck
31	-	31	31	-	31	K_T	g̥juk	-	g̥jok	g̥jæuʔ	-	g̥juʔ	krauk	259A	afraid
53	-	53	53	-	53	K_T	tʰuk	-	tʰoʔ	tʰauk	-	tʰuʔ	tʰauk	273A	kneel
53	53	53	53	-	5	K_T	sat	se̥ʔ	sḁi̥ʔ	se̥ʔ	-	sa[t]	sat	315A	kill
31	-	31	31	-	31	K_T	juk	-	jok	jæuʔ	-	juʔ	jauk	322B	one(person)
53	53	53	53	5	53	K_T	kʰjuk	kʰjḁu̥p	kʰjok	kʰjæuk	kɔŋ	kʰjuʔ	kʰrauk	327A	six(people)
53	53	53	53	-	5	K_T	nje̥	nḁu̥t	nj̃eʔ	nḁi̥ʔ	-	nj̥ɻ[t]	hnac	328A	seven(people)
-	-	53	53	31	53	K_T	-	-	tʰɔʔ	tʰoʔ	tuʔ	tʰɔʔ	tʰak	384A	sharp

In several of the Northern Burmic languages, loss of the final stop changes the contour of the tone from a falling tone to a level tone. This is evidenced by examples 052A, and 179A for Achang, Bela, Lashi, Maru, and Zaiwa, and examples 076B, and 327A for Phon.

3.93 $LF > LT/\_\_\_\_\_(C_{2s} \rightarrow \phi)$

Where "LF" is low falling tone, "LT" is level tone, "C_{2s}" is a stopped coda, and "ϕ" is empty.

Tone in Zaiwa does not fall in a few cases, notably when the coda is filled with an alveolar stop (094A, 130A, 315A, 328A).

3.94 $HF > LT/\_\_\_\_\_t$

Where "HF" is high falling tone, "LT" is level tone, and [t] is an alveolar voiceless stop.

As table 67 shows that there are two phonetic falling tones in stopped syllables in Achang, Lashi, Maru and Zaiwa. High falling tone is present in those syllables with tense voice, a voiceless initial, or an initial sibilant. The tone is low falling in all other environments. The following three rules summarize this for Achang, Lashi, Maru, and Zaiwa:

3.95 $LF > HF/C_{vl}\_\_\_\_$

Where "C_{vl}" is a voiceless consonant.

3.96 $LF > HF/\sigma_t$

Where "σ_t" represents a tense syllable.

3.97 $LF > HF/C_s\_\_\_\_\_$

Where "C_s" represents a sibilant.

It must be noted that Bela also has this kind of phonetic contrast, but it was not marked in the data.

There is one non-contrastive tone in stopped syllables in the Northern Burmic languages.

The following table 68 summarizes the tones in Northern Burmic languages:

TABLE 68

NORTHERN BURMIC TONES

PNB Tone	Initial	Achang	Bela	Lashi	Maru	Phon	Zaiwa	WB
*Tone 1	vl, sib, ten	33	33	53 31	41	55	53	Level
	all others	31					31	
*Tone 2	vl, sib, ten	55	52 23	44	44	31	53	Heavy
	all others	33		22	22		31	
*Tone 3	all	55	52 23	44	44	31	44	Creaky
*Tone 4	vl, sib, ten	53	52	53	53	31	53	Killed
	all others	31		31	31		31	

As table 68 shows the tonal contours of Northern Burmic languages and their correspondences to Proto Northern Burmic tones. The second column indicates where

environmental conditioning leads to a tonal reflex in these languages. These reflexes are phonetic realizations of the phonemic values shown beneath in the more general environment. The implications of table 68 will be discussed in more detail in chapter 4.

CHAPTER 4

PROTO NORTHERN BURMIC

4.0 Introduction

Based on the reconstruction in chapter 3, this chapter describes the characteristics of Proto Northern Burmic in much the way that the individual Northern Burmic languages are described in chapter 2. Further, this chapter concludes by describing the relationships between the Northern Burmic languages.

4.1 General

Proto Northern Burmic is reconstructed on the basis of data from Achang, Bela, Lashi, Maru, Phon, Zaiwa, and Written Burmese. The precise relationship between these languages will be discussed in section 4.2.

4.1.1 Syllable Structure

A schematic syllable structure of Proto Northern Burmic is composed of an initial consonant C_1, a medial glide (G), which may be the palatal approximant /j/, a vowel (V_1) or vowel diphthong ($V_1(V_2)$). The coda is composed of a consonant (C_2). The final element is the tone, which is actually a suprasegmental form, represented by the symbol T. Thus the syllable structure appears as follows:

$$C_1\,(G)V_1\,(V_2)(C_2)T$$

Symbols in parentheses are optional elements, while those without parentheses are obligatory. All consonants are allowed in the initial position C_1, while the final consonant position (C_2), is limited to nasals or voiceless stops. The vowel may be a simple vowel V_1 or a diphthong $V_1(V_2)$; all vowels are allowed in the V_1 position, while (V_2) is restricted to [i u]. Tone T is obligatory and maps over vocalic elements and the coda when it is occupied by a nasal.

Reconstructed syllable types include: CV, CVV, CVC, CVVC, CGV, CGVC, CGVV.

4.1.2 Consonants

The inventory of consonants is shown in table 69:

TABLE 69

PROTO NORTHERN BURMIC CONSONANT INVENTORY

	LAB	ALV	ALP	VLR	GLT
Plosive asp	p^h	t^h		k^h	
plain	p	t		k	[ʔ]
glot	^ʔp	^ʔt		^ʔk	
Affricate asp		ts^h	$tʃ^h$		
plain		ts	tʃ		
Fricative		s	ʃ		h
Nasal	m	n		ŋ	
glot		^ʔn		$^ʔŋ$	
Lateral		l			
glot		^ʔl			
Approximant	w		j		
glot			^ʔj		

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic. The consonant inventory conforms to cross-linguistic tendencies by the presence of plain plosives, a nasal set, sibilants, and the glottal fricative.

4.1.3 Vowels

The inventory of vowels is shown in table 70:

TABLE 70

PROTO NORTHERN BURMIC VOWEL INVENTORY

	Front	Central	Back
High	i		u
Mid	e	[ə]	o
Low		a	

Segments enclosed in [brackets] are phonetic while those segments without brackets are phonemic. The vowel system is a symmetric five vowel set.

4.1.4 Distribution

All consonants are allowed in the initial consonant (C_1) position. The following initial clusters (C_1G) are allowed: [p^hj pj ^{ʔ}pj k^hj kj ^{ʔ}kj mj ^{ʔ}mj nj ^{ʔ}nj hj]. All vowels are allowed in the V_1 position. The diphthongs (V_1V_2) are restricted to [ai au ui]. Final consonants (C_2) are restricted to the nasal and voiceless stop series [p t k m n ŋ].

An inventory of Proto Northern Burmic rhymes is shown in table 71:

TABLE 71

PROTO NORTHERN BURMIC RHYMES

Open	-m	-n	-ŋ	-p	-t	-k
i	im	in	iŋ	ip	it	ik
e	em	en	eŋ	-	et	-
a	am	an	aŋ	ap	at	ak
u	um	un	uŋ	up	ut	uk
o	om	on	oŋ	op	ot	ok
iu=ju	jum	jun	juŋ	jup	jut	juk
au	aum	aun	auŋ	aup	aut	auk
ai	-	ain	aiŋ	-	ait	aik
ui	-	-	-	-	-	-

Note that although [ju] is generally not regarded as a diphthong, it is neverthe-less included in table 71 to fill out the paradigm.

4.1.5 Suprasegmental Considerations

The Proto language has three tones in syllables with open and nasal codas. These tones are represented as Tone 1, 2, and 3. The precise value of these tones is unknown. Stopped syllables have a single non-contrastive tone, represented as Tone 4.

The glottal series of initial consonants accounts for the tense-lax voice contrast in the modern day Northern Burmic languages. This series is a trace of earlier prefixes that gave rise to the tense lax voice contrast.

4.2 The Northern Burmic Language Family

In this section, we will consider a number of different metrices based on the data presented in chapter 3 in order to understand the relationships between the North-ern Burmic languages and provide a subgrouping of Northern Burmic. This subgrouping is based purely on phonological considerations and does not account for the lexical or grammatical considerations that a broader classificatory system would entail.

4.2.1 Phonological Rules

The phonological rules expressed in chapter 3 reflect the degree to which the Northern Burmic languages deviate from Proto Northern Burmic. By considering these rules, we gain a clearer picture of the Northern Burmic languages and their relationship to Proto Northern Burmic.

The total number of phonological rules (for a tabulated list of the rules and their applicability to each language see appendix B) proposed for each language are shown in table 72:

TABLE 72

PHONOLOGICAL RULES

Number of Rules	Achang	Bela	Lashi	Maru	Phon	Zaiwa
Total(Ttl)	27	19	23	31	26	19
Unique(Unq)	11	3	5	8	11	5
Sum (Ttl+Unq)	38	22	28	39	37	24

Based on these data, it can be seen that Bela, Lashi, and Zaiwa are the most conservative with the smallest number of both total and unique rules. The most innovative languages are Maru, Achang, and Phon.

The number of phonological rules can also be used to determine the relationships between the individual Northern Burmic languages if we consider the number of shared rules:

	Achang	Lashi	Zaiwa	Maru	Bela
Lashi	14				
Zaiwa	12	11			
Maru	10	12	10		
Bela	4	6	6	13	
Phon	1	5	3	12	11

Figure 10. Northern Burmic Shared Phonological Rules.

There is a high degree of phonological affinity between the pairs of languages with the largest numbers (such as Achang and Lashi), and a relatively low phonological affinity between those pairs with low numbers (such as Achang and Phon).

While figure 10 illustrates the relationships between individual languages, it does little to illustrate an individual languages standing in Northern Burmic, specifically, how central or peripheral the language is within Northern Burmic. In an attempt to establish this, we can look at the average number of shared rules. Such an approach yields the following result:

TABLE 73

AVERAGE OF SHARED RULES

	Achang	Bela	Lashi	Maru	Phon	Zaiwa	Total	Average
Maru	10	13	12	-	12	10	57	11.4
Lashi	14	6	-	12	5	11	48	9.6
Zaiwa	12	6	11	10	3	-	42	8.4
Achang	-	4	14	10	1	12	41	8.2
Bela	4	-	6	13	11	6	40	8.0
Phon	1	11	5	12	-	3	32	6.4

The average number of rules for each language within the Northern Burmic languages are shown in table 73. Therefore, a language such as Maru, which shares a relatively large number of

phonological innovations with its neighbors is a fairly central language within Northern Burmic, while a language such as Phon, which shares relatively few phonological rules with other languages is more peripheral in the Northern Burmic scheme. Maru seems to be the most innovative of the Northern Burmic languages.

4.2.2 Phonological Drift

The process by which languages develop phonological processes in a given direction is called *phonological drift*. Phonological drift provides insight into the direction and nature of phonological change in a language or group of languages. Consideration of such drift allows another metric of classifying languages. Consider the Proto Northern Burmic onset correspondences shown in table 74:

TABLE 74

BURMIC ONSET CORRESPONDENCES

PNB	A	B	L	M	P	Z	WB	SB
pʰ	pʰ	pʰ	pʰ	pʰ	pʰ	pʰ	pʰ	pʰ
tʰ	tʰ	tʰ	tʰ	tʰ	tʰ	tʰ	tʰ	tʰ
kʰ	kʰ	kʰ	kʰ	kʰ	kʰ	kʰ	kʰ	kʰ
p	b	p	b	b	p	b	p	p
t	d	t	d	d	t	d	t	t
k	g	k	g	g	k	g	k	k
ʔ	ʔ	ʔ	ʔ	ʔ	ʔ	ʔ	ʔ	ʔ
ʔp	ʔp	p	ʔp	ʔp	p	-	p	p
ʔt	ʔt	-	ʔt	ʔt	-	ʔt	-	-
ʔk	ʔk	-	ʔk	ʔk	k	ʔk	-	-
pʰj	tʰj	pʰj	pʰj	pʰj	pʰj	pʰj	pʰr/pʰj	pʰj
kʰj	kʰj	kʰj	kʰj	kʰj	kʰ[i]	kʰj	kʰr/kʰj	kʰj
pj	dj	pj	bj	bj	pj	bj	pr/pj	pj
kj	gj	kj	gj	gj	-	gj	kr/kj	kj
ʔpj	ʔpj	-	bj	ʔpj	pʰj	bj	pʰɾ	pʰj
ʔkj	ʔkj	ʔkj	ʔkj	ʔkj	-	ʔkj	kʰɾ	kʰj
tsʰ	tsʰ	tsʰ	tsʰ	tsʰ	sʰ	tsʰ	cʰ	sʰ
tʃʰ	tʃʰ	tʃʰ	tʃʰ	tʃʰ	ʃ	tʃʰ	cʰ	sʰ
ts	dz	ts	dz	dz	-	dz	cʰ	sʰ
tʃ	dʒ	-	dʒ	dʒ	sʰ	dʒ	-	-
s	s	s	s	s	ʃ	s	s	θ
ʃ	ʃ	ʃ	ʃ	ʃ	ʃ	ʃ	s	θ
h	-	h	h	h	h	h	h	h
hj	xj	x	ʃ	x	ʃ	h/ʃ	hr	hj
m	m	m	m	m	m	m	m	m
n	n	n	n	n	n	n	n	n
ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ
ʔn	ʔn	ʔn	ʔn	ʔn	n	ʔn	hn/n	hn/n
ʔŋ	ʔŋ	ʔŋ	ʔŋ	ʔŋ	ŋ	ʔŋ	hŋ	hŋ
mj	nj	mj	mj	mj	mj	mj	mj	mj
nj	nj	nj	nj	nj	nj	nj	nj	nj
ʔmj	ʔnj	ʔmj	ʔmj	ʔmj	m	ʔmj	m	m
ʔnj	ʔnj	ʔnj	ʔnj	ʔnj	-	ʔnj	hn/hɲ	hn/hɲ
l	l	l	l	l	l	l	l	l
ʔl	ʔl	ʔl	ʔl	ʔl	l	ʔl	hl/l	hl/l
w	w	w	w	v	w	w	w	w
j	j	j	j	j	j	j	j	j
ʔj	ʔj	ʔj	ʔj	ʔj	-	ʔj	-	-

In table 74, the shaded areas indicate onsets which have one or more matching onset(s) in another language (which shares the same shading). Proto Northern Burmese and Bela onsets correlate the most closely. With the exception of voicing of initial stops and affricates, Achang,

Lashi, Maru and Zaiwa are nearly identical to the onsets in the Proto language. Phon, and Burmese do not share the glottalized or affricate onset series with Proto Northern Burmese.

Ignoring the relatively superficial distinction in voicing, there are two main groupings in Northern Burmic, the first includes Achang, Bela, Lashi, Maru, and Zaiwa. The second set contains Phon, which has a number of similarities with Written and Spoken Burmese.

The simple vowel correspondences are shown in table 75:

TABLE 75

BURMIC VOWEL CORRESPONDENCES

PNB	A	B	L	M	P	Z	WB	SB
i	i	i	i	i	i	i	i	i
e	ei	i	e	it	i	i	e	e
a	a	a	a	a	a	a	a	a
u	u	u	u	u/au	u/uʔ	u	u	u
o	au	au	au	oʔ	o/u	au/ui	ui	oi
ai	-	ai	ai	ai	ai	ai	ai	e
au	au	au	au	au	au	au	-	-
ui	ui	ui	ɨ	oi	ui	ui	e	ei

Although there is some variation (particularly in Maru, which seems to display intrusive stops), there is general agreement between the Northern Burmic languages and the simple vowels in Proto Northern Burmic.

Burmese displays several features of phonological drift mentioned in section 2.1.1.8. Among these features are the vowels taking on properties of the coda followed by loss of the finals. Many of these processes are displayed to varying degrees in Northern Burmic rhymes.

TABLE 76

BURMIC RHYME CORRESPONDENCES

PNB	A	B	L	M	P	Z	WB	SB
ap	ap	eʔ	ap	eʔ	eʔ	ap	ap	aʔ
at	at	eʔ	aiʔ	eʔ	-	at	at	aʔ
ak	oʔ	oʔ	oʔ	oʔ	uʔ	oʔ	ak	eʔ
am	am	-	am	e	e	am	am	ã
an	an	e	ain	en	e	an	an	ã
aŋ	aŋ	aŋ	aŋ	a	o	aŋ	aŋ	ã
ip	et	ap	op/iʔ	ap	aiʔ	up	ip	eiʔ
im	en	am	em	am	aiŋ	um	im	eĩ
up	op	ap	uep	ap	aʔ	up	up	ouʔ
ut	ot	at	oiʔ	ait	aiʔ	ut	ut	ouʔ
um	om	am	em	am	aŋ	um	um	oũ
un	un	-	-	un	un	un	un	ũ
auk	uk	aup	oʔ/ok	auʔ/auk	oʔ/ok	uʔ	auk	auʔ
auŋ	uŋ	-	oŋ	auŋ	oŋ	uŋ	auŋ	aũ
auŋ	oŋ	aŋ	oŋ	auŋ	oŋ	uŋ	auŋ	aũ
ui/au	au	au	au	uk	u	ui/au	ui/au	ou/o

In table 76, the shaded rhymes are those which have one or more matching rhyme in another language (which also shares the same shading). There are two apparent groupings that emerge from this data. The first set correlating closely with Proto Northern Burmese is composed of Written Burmese and Zaiwa. These two languages are strikingly similar in their rhyme composition. More peripheral to this set are Achang and Lashi. The second set is made up of Bela and Maru, with Phon to a lesser degree. Phon also has some affinity with Lashi. The difference in rendering of [au] and [o] should be somewhat discounted, since both Bradley (1979) and Matisoff (1976) render the [au] of Written Burmese as [o] before a velar nasal [ŋ] or velar stop [k].

Other than Spoken Burmese, considerable rhyme gaps without correspondences in other languages, particularly in Achang, Lashi and Phon. With the exception of a couple of cases in Maru, there are few correlations with Spoken Burmese, leading to the conclusion that in some characteristics Burmese is drifting in a different phonological direction away from most of the Northern Burmic languages. In a gross sense however, Northern Burmic languages are similar to

Burmese (noted in section 2.1.1.8) in that they display characteristics where the nucleus acquires properties of the coda and subsequently looses features of the coda. Generally onsets are more resistant to change than rhymes. Tones also appear to be fairly resistant to change, although they are affected by rhyme changes as well. There does not appear to be significant tonal genetic (Matisoff 1973) information encoded in this data.

It bears noting that although Burling (1966) presents a case for the epenthesis of final stops in Maru, there is almost none of this in the data under consideration, and the tonal contours are not inconsistent with the presence of the final stops as they were in Burling's data.

4.2.3 Tones

Proto Northern Burmic has three tones in open and nasal syllables. There is one non-contrastive tone in stopped syllables. This section will consider how the individual languages reflect or deviate from this tonal system.

A summary of table 68 is shown in table 77:

TABLE 77

NORTHERN BURMIC TONES

PNB Tone	WB	Achang	Bela	Lashi	Maru	Phon	Zaiwa
*Tone 1	Level	Falling	Level	H/L Falling	Falling	Level	Low Falling
*Tone 2	Heavy	Low Level	Ris/Fall	Low Level	Low Level	Falling	H/L Falling
*Tone 3	Creaky	High Level	Ris/Fall	High Level	High Level	Falling	Level
*Tone 4	Killed	Falling	Falling	Falling	Falling	Falling	Falling

Maru and Achang along with Written Burmese maintain the three way dis-tinction between tones in open syllables. Bela and Phon only have a loss of contrast between *Tone 2 and *Tone 3. Zaiwa maintains the three way distinction between tones, but the low falling tone has split between the *Tone 1 and *Tone 2 categories. Lashi, has undergone an internal split in *Tone 1.

Achang, Maru, and Written Burmese are the most conservative, preserving the same tones as Proto Northern Burmic. Lashi and Zaiwa, while undergoing tonal splits, still roughly maintain the tonal contrast. Bela and Phon are the most innovative, with a loss of contrast between two of the three tones. The relationship of these languages based on tonal considerations may be represented by isoglosses as in figure 11:

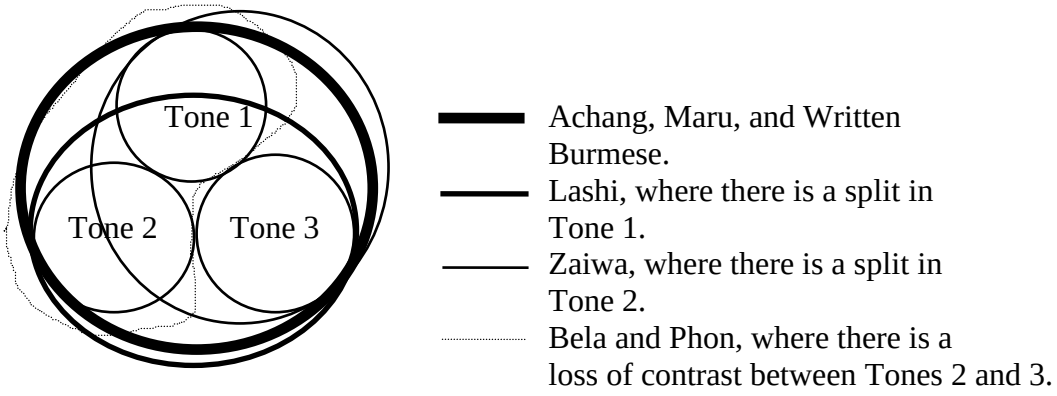

Figure 11. Northern Burmic Tonal Isoglosses.

Where each of the three circles represents a respective tone (as labeled).

4.2.4 Burmese and Northern Burmic

The premise of this thesis is that Burmese is on a separate node from Northern Burmic languages. This section will attempt to answer the question of how closely related Burmese is to the Northern Burmic language family. Shafer's (1966) class-ification posited Burmese on a sister node under Southern Burmic.

The reconstructed forms of Proto Northern Burmic bear a strong likeness to Written Burmese (particularly in the rhyme and tonal correspondences). Some of this is undoubtedly attributed to the role Written Burmese plays in the current reconstruction, as it is used to give clarity in the reconstruction where Northern Burmic cognates do not lead to a clearly reconstructable form. Written Burmese initial consonants deviate the most from Proto Northern Burmic, with 21 of 37

exact correlates and 31 of 37 related correlates. In terms of rhyme correspondences, there is a very close relationship between Written Burmese, Zaiwa, Achang, and, to a lesser degree Lashi and Maru. The tonal categories in Written Burmese correlate with those in Achang and Maru.

Based on the segmental and suprasegmental correspondence between Written Burmese and the modern spoken Northern Burmic languages, Burmese is closely related to the Northern Burmic language family. In fact, the relationship between Written Burmese and Proto Northern Burmic appears to be closer than the relationship between Proto Northern Burmic and Phon in the rhyme and tonal correspondences. Some of this difference in Phon may be attributed to differences in transcription, borrowing from Shan, and/or divergent innovations.

It is interesting to note that the other spoken Northern Burmic languages appear to be more similar to Written Burmese than Spoken Burmese, suggesting an early date for the split of these languages from Proto Northern Burmic.

4.2.5 Northern Burmic Stammbaum

The various Stammbaum diagrams entailing Northern Burmic languages were reviewed in chapter 2, section 1.7. This section will propose a new Stammbaum diagram which attempts to capture some of the analysis presented in this chapter.

Although Stammbaum diagrams are powerful tools to describe the relationships between languages, they present a limited characterization of what is really a much more complicated question of the relationship between two or more languages. The key to constructing a good diagram lies in the ability of the linguist to determine which of the many factors are significant, and which are peripheral. The significant factors are used to delineate the differences between the languages depicted in the diagram. This section uses four metrics already described, namely, phonological rules, onset correspondences, rhyme correspondences, and tones.

In table 72, the number of phonological rules that describe a language's deviation from Proto Northern Burmic and the number of rules unique to that language were totaled to describe the relative conservatism or innovation of a language. This lead to two categories as shown in table 78:

TABLE 78

RELATIVE PHONOLOGICAL CONSERVATISM

Conservative	Innovative
Bela	Achang
Lashi	Maru
Zaiwa	Phon

In section 4.2.2, the onset correspondences were considered (shown in table 74), this lead to two main groups. These groups are shown as follows in table 79:

TABLE 79

RELATIVE ONSET CONSERVATISM

Conservative	Innovative
Achang	Phon
Bela	-
Lashi	-
Maru	-
Zaiwa	-

Simple vowel correspondences were considered in table 75; from table 79, it appears that the Northern Burmic languages are relatively conservative of the vocalic forms in the Proto language. This is summarized table 80:

TABLE 80

RELATIVE VOWEL CONSERVATISM

Conservative	Innovative
Achang	-
Bela	-
Lashi	-
Maru	-
Phon	-
Zaiwa	-

In section 4.2.2, the rhyme correspondences were considered, this lead to two main groups. The first, containing Zaiwa is assumed to be the more conservative as these correspondences are the most similar to those of Proto Northern Burmic listed in table 76. This leads to table 81:

TABLE 81

RELATIVE RHYME CONSERVATISM

Conservative	Innovative
Zaiwa	Bela
Achang	Maru
Lashi	Phon

Likewise, in section 4.2.3, the tonal correspondences to Proto Northern Burmic are considered (table 77). This analysis led to three basic groups, shown in table 82:

TABLE 82

RELATIVE TONAL CONSERVATISM

Conservative	Less Conservative	Innovative
Maru	Lashi	Bela
Achang	Zaiwa	Phon

By assigning a numeric value to the categories, relative weights are assigned to each category to provide a scale by which to measure the relatedness of the languages. By this weighting, a value of "2" is assigned to those languages who display conservative characteristics, a value of "1.5" is assigned where the language is less conservative, and a value of "1" is assigned where the language is innovative. These values are shown in table 83 where: "Rules" stands for the relative phonological conservatism, "Onset" stands for the relative onset conservatism, "Rhyme" stands for the relative rhyme conservatism, and "Tonal" stands for the relative tonal conservatism.

TABLE 83

NORTHERN BURMIC LANGUAGE RELATIONSHIPS

Language	Rules	Onsets	Vowels	Rhymes	Tones	Total
Lashi	2	2	2	2	1.5	9.5
Zaiwa	2	2	2	2	1.5	9.5
Achang	1	2	2	2	2	9
Bela	2	2	2	1	1	8
Maru	1	2	2	1	2	8
Phon	1	1	2	1	1	6

Notice that there are three main groupings from table 83. The first group is most similar to Proto Northern Burmic and is composed of Achang, Lashi, and Zaiwa. The second group contains Bela and Maru. Phon, which is marginal in Northern Burmic, belongs to the third group.

The following Stammbaum diagram is derived from table 83:

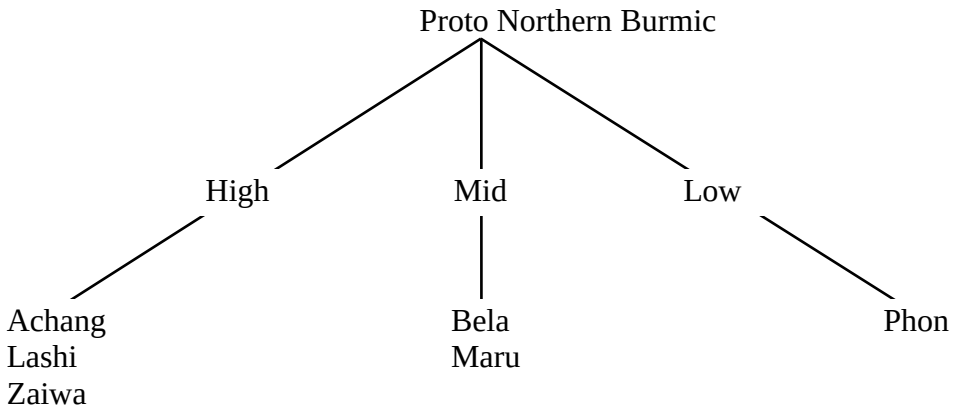

Figure 12. Northern Burmic Language Family.

The grouping of Achang, Lashi, and Zaiwa under the node entitled "High" indicates that these languages have a high degree of correlation with Proto Northern Burmic. The grouping of Bela and Maru under "Mid" have a fair correlation with Proto Northern Burmic, while Phon, shown under "Low" has a low correlation.[46] The peripheral nature of Phon was also noted in figure 10 where shared phonological rules were considered. The place of Phon in this grouping concurs with Davies (1909) observations that Phon is comparable to Achang, Lashi, Maru, and Zaiwa, but somewhat more distantly related to these languages. Luce grouped Phon together with Lashi, Maru, and Zaiwa, while conceding that it is the westernmost member of this grouping (Henderson 1986).

4.2.6 Conclusion

Achang, Lashi, and Zaiwa show a strong relationship to Proto Northern Burmic. Bela and Maru have a slightly weaker relationship to this grouping, while Phon is quite different from Proto Northern Burmic. Further study, including how Phon fits within the context of Proto Burmic and other Tibeto-Burman groupings needs to be conducted to adequately determine whether Phon is a marginal member of Northern Burmic or a member of a separate language family.

Several different stammbaum diagrams have been proposed for Northern Burmic languages (section 1.7). Although each of these diagrams provides insight into the composition of Northern Burmic languages, none of them have presented a description of the relationships between the Northern Burmic languages. Granted, most of the previous scholarship has focused on larger families such as Proto Lolo, or Proto Tibeto Burman, however, it is necessary to refine our understanding of each of the branches of languages in order to provide a more thorough classification scheme.

[46] It should be noted that if Written and Spoken Burmese were compared to these languages, Written Burmese would correlate to the "High" or "Mid" grouping, while Spoken Burmese would correlate to the "Low" grouping.

CHAPTER 5

RECONSTRUCTED VOCABULARY

5.0 Introduction

Based on the reconstruction in chapter 3, this chapter provides reconstructed vocabulary of Proto Northern Burmic.

5.1 General

The following word list is from the basic list of 406 words used by SIL in Mainland Southeast Asia.

5.2 Reconstructed Syllables

Generally, where tense phonation is attested by two or more Northern Burmic cognates, the Proto language is assumed to have a preglottalized initial. In cases where there is some uncertainty as to the reconstruction either based on limited cognates or variation in the cognates, the reconstructed form is shown in {braces}. Where a potential reconstruction is sufficiently ambiguous, no reconstruction is given. Thus, there may be reconstructions without segmental information, or more commonly, reconstructed syllables without tonal information. Some tonal reconstructions show two potential tones such as: /k^{h}auŋ$^{1/2}$/ "sky." This indicates that there is some uncertainty as to whether *Tone 1 or *Tone 2 captures the Proto tone. In some cases, the vowel quality is indiscernible based on the available data; in these cases, the vowel is indicated by /V/. Likewise, where a consonant cannot be differentiated, it is represented by /C/. When a consonant is unknown except for its value of nasality, it is shown by /N/.

The left hand column shows the reconstructed form while the central seven columns show data from Achang, Bela, Lashi, Maru, Phon, Zaiwa, and Written Burmese. The final two columns provide reference information.

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
mo^{1}	mau^{34}	mau^{52}	mau^{3}	moʔ^{35}	mu^{31}	mau^{3}	mui:	001A	sky
{kʰauŋ$^{1/2}$}	kʰoŋ^{32}	-	kʰoŋ^{31}	gauŋ^{51}	-	kʰuŋ^{53}	kauŋ:	001B	sky
pui^{1}	pui^{31}	pui^{3}	be^{51}	ba^{31}	-	bui^{32}	pauŋ:	002A	sun
la^{3}	la̤^{5}	le̤^{23}	la^{5}	lo̤^{43}	la^{31}	lə^{4}	laʔ	003A	moon
{mV^{3}}	mṳ^{5}	mə^{52}	mɔ^{53}	-	-	mɔ^{4}	-	003B	moon
ʔki^{1}	gi^{3}	ki̤^{3}	ki̤^{53}	gi^{52}	-	ki̤^{53}	krai	004A	star
{ʔtsVm^{1}}	dʒə^{32}	tsa̤m^{3}	dʒɛ^{53}	dʒa̤m^{31}	-	dum^{42}	tim	005A	cloud
{ŋan$^{1/2}$}	-	-	ŋãi^{3}	ŋɪn^{42}	-	ŋa̤n^{53}	hnaŋ:	006A	mist
{tsV^{2}}	dʒue^{45}	-	-	tʃʰe^{43}	-	-	-	006B	mist
wa^{1}	-	-	wɔ^{51}	-	waʔ^{55}	-	rwa	007A	rain
{sak^{4}}	sai^{35}	-	səŋ^{43}	saŋk^{53}	sə	-	sak	008A	rainbow
{jaŋ^{1}}	jaŋ^{53}	-	jɔʔ^{31}	ja^{41}	jʊŋ	βʷɔʔ^{32}	-	008B	rainbow
kan^{3}	kan^{2}	-	-	gen^{4}	-	gan^{2}	-	008C	rainbow
ʔlap^{4}	-	-	læp^{53}	-	-	la̤p^{4}	hljap	009A	lightning
{kum^{2}}	-	-	guɛm^{3}	-	-	gum^{53}	krui:	010A	thunder
jip^{4}	jæt^{21}	-	jøp^{3}	-	-	vʊp^{3}	rip	011A	shadow
{pa$^{1/4}$}	-	-	paŋ^{53}	baʔ^{21}	-	-	-	011B	shadow
{mjVN^{3}}	njɛn^{35}	mjan^{23}	mjẽŋ^{5}	mi̤^{5}	meɪ^{31}	mjɪn^{34}	ɲaŋʔ	012A	night
nje	njei^{45}	neʔ^{52}	njẽ^{5}	na^{31}	ni^{31}	ni^{45}	neʔ	013A	day
nap^{4}	nap^{3}	ne^{23}	næp^{32}	nɛʔ^{32}	-	nap^{3}	nak	014A	morning
kja^{1}	-	kaŋ^{3}	gjot^{52}	ga^{31}	-	gjɔ^{4}	-	014B	morning
{kVŋ^{1}}	kuŋ^{51}	kã̤^{52}	goŋ^{51}	gau^{31}	-	guŋ^{53}	-	015A	noon
{jV}	-	jə̤^{23}	jɪn^{53}	jɛʔ^{23}	-	-	ja	016A	yesterday
{ʔan}	-	ʔaŋ^{3}	ʔai^{25}	ʔa^{32}	-	ʔə^{3}	-	016B	yesterday
{ja^{1}}	jɔ^{31}	-	jɔ^{42}	-	-	-	-	017A	tomorrow
{ma}	-	ma^{23}	-	mɔ^{35}	-	ma^{3}	-	017B	tomorrow
{tsan}	dzan^{42}	-	tsa̤in^{4}	dzɪn^{31}	-	dzan^{51}	-	018A	year
pui^{1}	bui^{42}	pui^{3}	bø^{53}	ba^{31}	-	bui^{3}	-	019A	east
{tʰVk^{4}}	tʰuʔ^{54}	tʰau^{52}	tʰuʔ^{52}	tʰuk^{5}	-	tʰɔʔ^{5}	-	019B	east
waŋ^{1}	waŋ^{31}	wãŋ^{3}	waŋ^{31}	wa^{32}	-	waŋ^{31}	-	020A	west
{ʔtsVŋ^{1}}	dzo̤ŋ^{32}	tsaŋ^{3}	tso̤ŋ^{32}	-	-	-	-	021A	north
pi^{1}	ti̤^{32}	pi^{3}	bi^{32}	-	-	-	-	022A	south
{tse^{1}}	dʒei^{42}	-	-	-	cʰi^{55}	dʒam^{31}	re	023A	water
{kit^{4}}	-	ɣi^{3}	ge^{51}	ɣit^{4}	-	ʔṳt^{5}	-	023B	water
{laŋ$^{1/2}$}	laŋ^{32}	laŋ^{52}	la̤ŋ^{31}	-	-	laŋ^{31}	kʰyauŋ:	024A	river
paŋ^{3}	-	-	baŋ^{23}	baŋ^{3}	-	baŋ^{3}	paŋ	025A	sea
lai^{1}	-	-	lai^{32}	lai^{32}	-	lai^{31}	lai	025B	sea
{tsaŋ^{1}}	dzɔ^{45}	tsai^{23}	dʒoŋ^{51}	-	-	dzɛ^{31}	cʰi	026A	earth, soil
mje^{4}	-	mi^{3}	mje̤^{53}	miʔ^{3}	mji^{55}	mɪt^{5}	mre	026B	earth, soil
tʰam^{3}	tʰɔm^{5}	-	tʰøm^{5}	tʰam^{32}	-	-	hrwamʔ	027A	mud
pap^{4}	bɔp^{43}	-	bøp^{21}	bap^{32}	-	bɔ^{3}	-	027B	mud
pʰui^{4}	pʰə^{5}	-	pʰə^{5}	bət^{3}	-	pʰui^{3}	pʰut	028A	dust
lau^{1}	la̤u^{51}	-	lau^{51}	-	-	lau^{53}	-	028B	dust
lauk^{4}	luk^{3}	lauʔ^{23}	lok^{3}	lau^{43}	loʔ^{31}	luʔ^{3}	klauk	029A	stone
{sV}	si^{5}	-	-	-	-	su^{35}	sai:	030A	sand
{ʃa^{1}}	ʃɔ^{31}	ʃa^{3}	tʃʰo^{31}	tʃʰö^{31}	ʃe	-	-	030B	sand
{mui$^{1/2}$}	-	-	mje̤^{43}	ma^{32}	mu	mui^{52}	-	030C	sand
{ʃa}	ʃə^{43}	-	ʃo^{53}	-	-	tʃʰɔ^{32}	tʰumʔ	031A	lime(betel)
hui^{3}	hui^{5}	-	he̤i^{42}	-	-	hui^{3}	-	031B	lime(betel)
{hjVŋ^{1}}	xjen^{3}	xaŋ^{3}	ʃəŋ^{52}	xaŋ^{42}	ʃaiŋ^{55}	hɯŋ^{53}	hrwe	032A	gold
ŋui^{1}	ŋui^{42}	nui^{3}	ŋ^{52}	ŋoi^{42}	-	ŋun^{31}	ŋwe	033A	silver
ʔtak^{4}	tʰjɛʔ^{42}	ta̤ʔ^{52}	dɔʔ^{52}	to̤ʔ^{54}	-	dɔʔ^{5}	-	034A	iron

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
{tsaʔ^{4}}	-	-	dʒɔʔ^{3}	dʒoʔ^{32}	-	-	-	034B	iron
{sam^{1}}	-	-	-	-	se^{55}	ʃam^{54}	sam	034C	iron
pum^{1}	buɔm^{31}	pam^{23}	bɛm^{51}	bam^{31}	-	bum^{31}	-	035A	mountain
luk^{4}	luk^{32}	-	loʔ^{34}	lauk^{32}	-	lʊp^{3}	-	036A	cave
k^{h}juŋ^{1}	k^{h}juŋ^{32}	-	-	-	-	k^{h}juŋ^{53}	-	036B	cave
{ʔau^{4}}	-	-	ʔoʔ^{53}	ʔa̰uk^{5}	-	-	-	036C	cave
{Cam}	-	-	gjɛm^{53}	dʒam^{4}	-	-	-	037A	forest
{k^{h}a^{1}}	k^{h}jam^{41}	-	k^{h}au^{32}	-	-	-	-	037B	forest
{t^{h}a^{2}}	-	-	-	t^{h}a^{4}	-	-	tau:	037B	forest
{saik^{4}}	saiʔ^{5}	sak^{52}	sək^{54}	sak^{5}	ʃaiʔ^{31}	sɪk^{5}	sac	038A	tree
{kam^{1}}	-	k^{h}i^{3}	gam^{31}	ge^{41}	-	gam^{53}	-	038B	tree
kuiŋ^{2}	kə̰^{31}	-	goŋ^{3}	gɔŋ^{31}	k^{h}o^{31}	kɔʔ^{54}	kuiŋ:	039A	branch
ʔkauk^{4}	kṵk^{54}	-	gok^{53}	ka̰uʔ^{54}	k^{h}ue^{55}	kṵʔ^{5}	k^{h}auk	040A	bark
tsu^{2}	dzu^{34}	-	dzu^{4}	dzau^{4}	s^{h}u^{31}	dzu^{31}	c^{h}u:	041A	thorn
{mjVt^{4}}	njɛt^{32}	-	-	-	mjaiʔ^{31}	mɪt^{43}	mrac	042A	root
ki^{2}	-	ki^{52}	gi^{3}	gi^{2}	-	-	-	042B	root
{Cok^{4}}	huʔ^{5}	faʔ^{52}	foʔ^{53}	foʔ^{5}	-	haʔ^{5}	-	043A	leaf
pan^{2}	pan^{34}	pje^{52}	bain^{4}	pḛn^{4}	pɛ^{31}	ban^{32}	pan:	044A	flower
ʃi^{2}	ʃi^{5}	-	ʃi^{4}	ʃi^{43}	ʃi^{31}	ʃi^{31}	si:	045A	fruit
{ʔa}	ʔa^{32}	ʔa	ʔa^{3}	ʔa^{3}	ʔa	-	ʔə	046A	seed
tse^{3}	dʒei^{54}	-	-	dʒḭt^{45}	-	dʒi^{4}	ce^{ʔ}	046B	seed
ʃi^{3}	-	-	ʃi^{5}	-	si^{31}	ʃɪ^{3}	-	046C	seed
mjak^{4}	ma̰n^{25}	mḛ^{23}	mjɔʔ^{3}	mjoʔ^{24}	mjoʔ^{31}	mjɔʔ^{31}	mrak	047A	grass
wa^{2}	wu^{34}	-	wɔ^{3}	vo^{4}	wa^{31}	wa^{31}	wa:	048A	bamboo
{mjVk^{4}}	njiʔ^{4}	-	mjuk^{3}	ma̰k^{42}	maiʔ^{31}	nɪk^{32}	mrac	049A	bamb. shoot
mo^{1}	mau^{31}	-	mau^{31}	mok^{43}	mu^{55}	mai^{3}	hmui	050A	mushroom
{kjem^{1}}	gjɛn^{42}	-	gjɛm^{51}	ɣam^{51}	-	gam^{53}	krim	051A	rattan
{lVk^{4}}	-	-	la^{32}	lə^{2}	-	lə^{2}	lak	052A	kapok
{ʔpam^{1}}	-	-	bæm^{31}	pḛ^{42}	-	ban^{53}	pam	052B	kapok
{p^{h}Vŋ^{3}}	p^{h}ɨŋ^{5}	-	p^{h}əŋ^{45}	p^{h}auŋ^{4}	pjo	p^{h}uŋ^{3}	paŋ	053A	sugar cane
tʃ^{h}o^{1}	tʃ^{h}au^{3}	-	tʃ^{h}au^{31}	tʃ^{h}uk^{52}	ʃu^{55}	tʃ^{h}ui^{53}	-	053B	sugar cane
{tʃ^{h}a^{1}}	tʃ^{h}a^{3}	-	tʃ^{h}a^{54}	-	-	-	-	054A	betel nut
{p^{h}jen}	-	-	-	-	-	p^{h}jɛn^{3}	hbin:	055A	opium
{jek^{4}}	jei^{3}	-	jẽŋ^{4}	ʔḭʔ^{54}	-	ʔi^{5}	rak	056A	liquor
ŋak^{4}	ŋɔʔ^{3}	-	ŋɔ^{3}	ŋoʔ^{3}	ŋuʔ^{31}	ŋɔ^{45}	hŋak	057A	banana
mjauk^{4}	njṵk^{35}	-	mjok^{53}	mjæuʔ^{32}	-	mjuʔ^{53}	-	057B	banana
saŋ^{1}	saŋ^{3}	-	saŋ^{54}	saŋ^{52}	-	seŋ^{4}	saŋ	058A	papaya
p^{h}a^{2}	p^{h}ɔ^{3}	-	p^{h}ɔʔ^{3}	p^{h}ɔ^{32}	-	p^{h}ɔ^{54}	hbau:	058B	papaya
ʔun^{1}	ʔun^{31}	-	-	ʔʊn^{42}	ʔʊn^{31}	ʔʊn^{53}	ʔun:	061A	coconut
{k^{h}Vt^{4}}	k^{h}ə^{3}	-	k^{h}ə^{5}	k^{h}ət^{3}	-	k^{h}ət^{5}	k^{h}a	062A	eggplant
lam^{2}	la̰m^{5}	-	læm^{5}	le^{4}	ɹɛ^{31}	lam^{53}	ram:	062B	eggplant
{mje$^{1/3}$}	mjɛ^{3}	me^{3}	mjeŋ^{32}	mi^{23}	-	mi^{3}	mre	063A	peanut
nauk^{4}	-	nak^{52}	nok^{32}	-	-	nuʔ^{35}	-	063B	peanut
{pV^{2}}	bɛ^{5}	-	-	-	-	-	pai:	063C	peanut
tʃ^{h}aŋ^{2}	tʃ^{h}aŋ^{5}	tʃ^{h}aŋ^{23}	tʃ^{h}aŋ^{54}	tʃ^{h}a^{3}	ʃo^{31}	tʃ^{h}aŋ^{31}	k^{h}jaŋ:	064A	ginger
{kak^{4}}	-	-	gɔʔ^{52}	ko̰ʔ^{54}	kə	-	-	064B	ginger
hu^{3}	hu^{5}	-	h̰ø^{5}	hau^{3}	-	hu^{3}	-	065A	garlic
{sun^{2}}	son^{3}	saun^{23}	soin^{42}	-	ʃwe^{31}	sʊn^{54}	swan	065B	garlic
p^{h}ju^{1}	-	-	p^{h}ju^{21}	p^{h}ju^{51}	p^{h}ju^{55}	p^{h}ju^{51}	-	065C	garlic
{la^{2}}	la^{3}	-	la^{2}	-	-	-	-	066A	red pepper
{p^{h}jak^{4}}	-	-	-	p^{h}jak^{5}	-	p^{h}jik^{5}	-	066B	red pepper
{la^{3}}	la^{3}	-	la^{2}	-	-	lum^{4}	-	067A	corn
{mi}	mi^{5}	-	mũ^{52}	-	-	-	-	067B	corn

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
{kuk^{4}}	guk^{3}	-	kọk^{53}	gauk^{32}	koʔ^{55}	guʔ^{32}	-	068A	paddy rice
{wam^{2}}	wɔm^{3}	-	wøm^{3}	-	-	-	-	069A	cooked rice
{tsV^{1}}	-	-	-	dzo^{31}	-	dzaŋ^{31}	-	069B	cooked rice
{p^{h}ui^{2}}	p^{h}ə^{3}	-	-	p^{h}öi^{32}	p^{h}u	-	p^{h}wai:	070A	rice husk
{ʔkok^{4}}	-	-	kọk^{54}	-	koʔ^{55}	-	-	070B	rice husk
{sVn^{2}}	san^{3}	-	sɨ^{5}	-	ʃeʔ	tʃ^{h}ɪn^{53}	-	070C	rice husk
ts^{h}a^{2}	ts^{h}ɔ^{5}	t^{h}a^{23}	ts^{h}o^{5}	ts^{h}o^{43}	s^{h}a^{31}	ts^{h}ɔ^{31}	c^{h}a:	071A	salt
{kau}	gau^{34}	-	kau^{3}	-	-	-	kauŋ	072A	animal
{ŋjok^{4}}	ŋjæu̯ʔ^{52}	-	ŋjauk^{53}	-	-	-	-	072B	animal
{tsa^{2}}	dʒɔ^{3}	-	dzə^{43}	-	-	-	-	073A	tiger
la^{2}	lu^{3}	la^{52}	lo^{3}	-	la^{31}	lə^{32}	kja:	073B	tiger
{ka^{2}}	-	-	-	k^{h}a^{3}	kə	-	kja:	073C	tiger
{mja^{3}}	-	-	-	mjaŋ^{32}	-	mɔ^{3}	-	073D	tiger
{wam^{1}}	wɔm^{31}	-	wuʔ^{34}	we^{41}	we^{55}	vam^{31}	wam	074A	bear
{tsat^{4}}	ts^{h}at^{53}	-	tsa̯iʔ^{51}	-	chi^{55}	tʃ^{h}ə^{3}	c^{h}at	075A	deer
{lai$^{2/3}$}	lai^{34}	-	la^{3}	-	-	lə^{3}	hlwai:	076A	monkey
mjauk^{4}	njuk^{42}	mjauʔ^{52}	mjok^{32}	mjæuʔ^{31}	mjaiŋ^{55}	mjuʔ^{32}	mjauk	076B	monkey
nak^{4}	-	-	nɔ̃ʔ^{31}	-	-	nɔʔ^{32}	-	077A	gibbon
ʔpju^{1}	tju̯^{3}	-	bju^{3}	pju̯^{52}	p^{h}juʔ^{55}	bju^{53}	p^{h}ruʔ	079A	porcupine
{kjVk^{4}}	gjuʔ^{42}	ɣo^{23}	gɛn^{32}	ɣok^{32}	-	-	krwak	080A	rat
nak^{4}	-	naʔ^{52}	nɔ̃ʔ^{3}	-	-	ŋɔ^{3}	-	080B	rat
k^{h}ui^{2}	k^{h}ui^{45}	k^{h}ui^{23}	k^{h}ue^{32}	k^{h}a^{2}	k^{h}ui^{31}	k^{h}ui^{31}	k^{h}we:	081A	dog
{la^{1}}	-	-	la^{53}	lə	-	-	-	081B	dog
{k^{h}ui^{1}}	-	-	-	-	k^{h}ue^{55}	k^{h}ui^{32}	-	082A	bark
{kjap^{4}}	dʒjæp^{42}	-	gjæp^{3}	ɣeʔ^{3}	-	-	-	082B	bark
ŋat^{4}	ŋat^{31}	-	ŋait^{3}	na^{32}	-	ŋat^{32}	-	083A	bite
wak^{4}	wuʔ^{42}	v^{w}aʔ^{52}	wuʔ^{3}	vɔʔ^{32}	wʊʔ^{31}	waʔ^{31}	wak	085A	pig
nu^{3}	nju^{3}	nau^{52}	nũ^{3}	noŋ^{4}	nu^{31}	nɔ^{3}	nwa:	086A	cow
{tsauŋ^{1}}	-	-	-	dʒauŋ^{51}	-	dʒuŋ^{53}	-	086B	cow
nau^{3}	nau^{5}	nau^{23}	nau^{4}	noŋ^{3}	nu^{31}	nau^{3}	nuiʔ	087A	milk
lui^{2}	lui^{4}	lui^{52}	lɨ^{3}	löi^{3}	li^{31}	lui^{31}	-	088A	buffalo
k^{h}jo^{1}	k^{h}jæu^{3}	k^{h}ju^{3}	k^{h}jau^{323}	k^{h}joʔ^{52}	-	k^{h}jui^{53}	k^{h}jui	089A	buffalo horn
{ʔjak^{4}}	ljạŋk^{53}	-	jạŋk^{53}	-	-	-	-	090A	tail
mi^{2}	-	mi^{52}	me^{3}	mi̯^{43}	mi^{31}	mi^{31}	mri:	090B	tail
ʃV^{3}	-	s^{h}a^{23}	-	ʃɪ^{4}	-	ʃɔ^{43}	-	090C	tail
lui^{2}	lui^{4}	lui^{52}	lɨ^{3}	löi^{3}	li^{31}	lui^{31}	-	088A	buffalo
k^{h}jo^{1}	k^{h}jæu^{3}	k^{h}ju̯^{3}	k^{h}jau^{323}	k^{h}joʔ^{52}	-	k^{h}jui^{53}	k^{h}jui	089A	buffalo horn
{ʔjak^{4}}	ljạŋk^{53}	-	jạŋk^{53}	-	-	-	-	090A	tail
mi^{2}	-	mi^{52}	me^{3}	mi̯^{43}	mi^{31}	mi^{31}	mri:	090B	tail
ʃV^{3}	-	s^{h}a^{23}	-	ʃɪ^{4}	-	ʃɔ^{43}	-	090C	tail
{ts^{h}aŋ$^{1/2}$}	ts^{h}aŋ^{3}	-	ts^{h}aŋ^{2}	ts^{h}a^{53}	-	-	c^{h}aŋ	091A	elephant
tsui^{1}	dzui^{31}	-	dzɨ^{52}	-	s^{h}ui^{55}	-	cwai	092A	eleph. tusk
ʔŋak^{4}	ŋa̯ʔ^{52}	ŋa̯ʔ^{52}	ŋa̯ʔ^{52}	ŋa̯ʔ^{54}	ŋa^{31}	ŋa̯ʔ^{54}	hŋak	093A	bird
suit^{4}	suat^{54}	-	soiʔ^{53}	sait^{54}	ʃaʔ^{31}	sʊt^{5}	suik	094A	bird nest
tauŋ^{1}	duŋ^{31}	-	doŋ^{51}	dauŋ^{41}	tɔŋ^{55}	duŋ^{31}	tauŋ	095A	wing
{mo$^{2/3}$}	mau^{45}	-	mau^{35}	mọk^{5}	mjai	mau^{31}	mwe:	096A	feather
{ʔa}	-	-	ʔa^{3}	-	-	-	ʔə	096B	feather
{taŋ$^{1/2}$}	daŋ^{3}	-	daŋ^{3}	da^{4}	-	daŋ^{53}	pjam	097A	fly
{ʔuk^{4}}	ʔuʔ^{53}	ɣu̯^{23}	wi̯ʔ^{53}	ʔau^{54}	ʔu^{31}	ʔu^{3}	ʔuʔ	098A	egg
kjak^{4}	gjɔʔ^{31}	ɣɔʔ^{23}	gjɔʔ^{32}	ɣɔʔ^{32}	-	βʷɔʔ^{32}	krak	099A	chicken
{pe^{2}}	bɛ^{3}	-	bə^{3}	-	-	-	bai:	100A	duck
ŋa^{3}	ŋ^{43}	ŋə	ŋə^{3}	ŋo^{3}	ŋa^{31}	ŋɔt^{3}	ŋa:	101A	fish
ʔlaŋ^{2}	lạŋ^{3}	-	lạŋ^{34}	lạ^{3}	-	lạŋ^{53}	-	102A	snake

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
{mui^{1}}	nji^{31}	me^{3}	mjũ^{41}	mo̤i̤^{32}	-	mui^{31}	mrwe	102B	snake
{tsV^{3}}	-	-	dʒɛ^{5}	-	-	dzuŋ^{3}	-	103A	house lizard
{mV^{1}}	man^{31}	-	-	-	mi^{31}	-	mi^{ʔ}	105A	crocodile
{pa^{2}}	pṳ^{5}	pa^{23}	pu^{5}	po̤^{3}	pa^{31}	bɔ^{31}	p^{h}a:	106A	frog
pau^{2}	bau^{3}	-	-	-	pu^{31}	bau^{31}	pui:	107A	insect
^{ʔ}mja^{3}	nja̤^{42}	-	mjɛ^{3}	-	-	mja̤^{4}	-	108A	spider
{kaŋ$^{2/3}$}	-	koŋ^{52}	gaŋ^{32}	ga^{32}	-	gɔŋ^{32}	-	108B	spider
{sut^{4}}	sot^{5}	-	-	sait^{5}	-	sʊt^{5}	-	109A	spider web
{jem}	-	-	jɛm^{3}	-	-	-	ʔim	109B	spider web
{ʃVn^{2}}	ʃæn^{5}	ʃaun^{23}	ʃen^{5}	ʃɪn^{2}	ʃɛɪ^{31}	ʃɪn^{31}	san:	110A	louse
tsaŋ$^{2/3}$	dʒaŋ^{3}	-	-	dʒa̤^{32}	-	dʒaŋ^{32}	-	111A	termite
{kan}	guan^{5}	-	k^{h}jæm$^{5}_{2}$	ka̤n^{3}	-	gɔn^{21}	k^{h}ra^{ʔ}	111B	termite
p^{h}ja^{1}	t^{h}jɔ^{42}	p^{h}ja^{3}	p^{h}jɔ^{42}	p^{h}jo^{31}	-	p^{h}jɔ^{53}	pui:	112A	cockroach
{nV^{2}}	nə^{3}	-	nə^{32}	nə^{2}	-	-	-	113A	snail
{paC^{4}}	bap^{31}	-	bait^{32}	beʔ^{21}	-	-	pak	113B	snail
^{ʔ}kjaŋ^{1}	kja̤ŋ^{3}	kja̤ŋ^{3}	kja̤ŋ^{52}	gja̤^{21}	-	kja̤ŋ^{53}	k^{h}raŋ	114A	mosquito
pja^{2}	djɔ^{3}	pja^{52}	bjɔ^{3}	bjɔ^{2}	-	bjɔ^{31}	pja:	115A	bee
jaŋ^{1}	jaŋ^{3}	joŋ	jaŋ^{3}	-	jo^{55}	jaŋ^{32}	jaŋ	116A	fly(insect)
k^{h}uŋ^{2}	k^{h}uŋ^{5}	-	k^{h}oŋ^{5}	-	kə	k^{h}uŋ^{31}	-	116B	fly(insect)
{p^{h}at^{4}}	p^{h}ə^{3}	p^{h}ə^{3}	p^{h}ə^{53}	p^{h}ət^{32}	-	p^{h}ət^{5}	-	117A	butterfly
{lam$^{1/2}$}	djam^{3}	lẽ^{3}	læm^{21}	le^{31}	-	la̤m^{53}	lip	117B	butterfly
{p^{h}ja^{4}}	-	-	-	-	pja^{55}	-	pra	117B	butterfly
{kVŋ$^{1/2}$}	guŋ^{31}	-	goŋ^{52}	-	-	-	kaŋ:	118A	scorpion
ko^{3}	gau^{5}	-	gau^{5}	-	ko^{31}	-	-	118B	scorpion
{kauk^{4}}	-	-	-	-	-	gɔk^{4}	kauk	118C	scorpion
{ʔut^{3}}	ʔut^{5}	ʔu^{3}	wə^{5}	ʔau^{2}	-	ʔʊt^{32}	-	119A	head
{^{ʔ}lVm}	lɔm^{53}	lam^{52}	lø̤m^{51}	-	-	lṳm^{31}	-	119B	head
mjak^{4}	njɔʔ^{43}	mjaʔ^{23}	mjɔ̃ʔ^{4}	mjɔʔ^{3}	-	mjɔʔ^{32}	mjak	120A	face
na^{1}	nɔ̤^{31}	-	nɔ̃^{3}	nɔ^{31}	-	-	hna	120B	face
{ʔu^{2}}	ʔu^{45}	ʔu	wə^{5}	ʔau^{3}	ʔo^{31}	ʔu^{34}	ʔu:	121A	brain
nauk^{4}	nuk^{42}	nauʔ^{23}	noʔ^{51}	nauʔ^{42}	nokʔ^{31}	nuʔ^{5}	hnauk	121B	brain
ts^{h}am^{1}	ts^{h}am^{3}	ts^{h}ĩ^{3}	ts^{h}æm^{53}	ts^{h}e^{41}	s^{h}ɛ^{55}	ts^{h}am^{53}	c^{h}am	122A	hair
{ŋa}	ŋa^{3}	-	ŋə^{3}	ŋa^{3}	-	ŋɔt^{3}	na^{ʔ}	123A	forehead
laŋ^{2}	laŋ^{3}	-	laŋ^{3}	la^{2}	-	laŋ^{31}	k^{h}auŋ:	123B	forehead
{mV^{3}}	mi^{32}	mauŋ^{23}	mɨ^{3}	-	-	mau^{3}	-	124A	eyebrow
mjak^{4}	njɔʔ^{3}	mja^{23}	mjɔ̃ʔ^{4}	mjɔʔ^{32}	juʔ^{31}	mjɔʔ^{32}	mjak	125A	eye
tsi^{3}	dʒi^{43}	tsi^{23}	-	-	si^{31}	dʒi^{3}	-	125B	eye
^{ʔ}kuk^{4}	kṳk^{54}	-	gok^{53}	-	-	kṳʔ^{5}	k^{h}wam	126A	eyelid
^{ʔ}na^{1}	nɔ̤^{3}	nã^{3}	nũ^{3}	no̤^{41}	naʔ^{55}	nɔ^{53}	hna	127A	nose
{pa^{3}}	bə^{4}	-	bə^{3}	bə^{32}	pa^{31}	bu^{3}	pa:	128A	cheek
{lVt^{4}}	lɔt^{43}	-	loiʔ^{32}	-	-	-	-	128B	cheek
na^{3}	nɔ^{3}	ne^{3}	nai^{3}	no^{3}	na^{31}	nɔ^{3}	na:	129A	ear
k^{h}jap^{4}	-	kjɛ^{23}	k^{h}jæp^{53}	-	-	k^{h}jæp^{5}	-	129B	ear
^{ʔ}nut^{4}	nṳa̤t^{54}	-	no̤iʔ^{52}	na̤t^{54}	-	nṳt^{5}	hnut	130A	mouth
ʃa^{1}	-	ʃ^{h}a^{52}	-	ʃɔ^{51}	-	ʃɔ^{53}	-	131A	tongue
ja^{1}	djɔ̤^{3}	-	jɔ^{43}	-	jaʔ^{55}	-	-	131B	tongue
{kV^{4}}	-	kiʔ^{23}	gain^{53}	k^{h}ət^{3}	-	kan^{31}	-	132A	saliva
{tsui^{4}}	dʒei^{5}	-	-	-	t^{h}wi	-	swe:	132A	saliva
{tsui$^{1/2}$}	dzui^{31}	tui^{3}	tsɨ̤^{52}	dzöi^{31}	sɛ	dzui^{31}	swa:	133A	tooth
{njeŋ^{1}}	njeŋ^{31}	-	-	njɛn^{31}	-	-	-	134A	gums
ʔam^{3}	ʔam^{3}	-	ʔæm^{3}	ʔe^{32}	-	ʔam^{5}	-	135A	chin
{tʃ^{h}am$^{2/3}$}	tʃ^{h}am^{5}	-	tʃ^{h}æm^{4}	-	-	t^{h}aŋ^{53}	ce^{ʔ}	135B	chin

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
ʔnut^{4}	nn̥t^{54}	nau^{52}	nn̥iʔ^{53}	nn̥iʔ^{54}	-	nn̥t^{5}	na:	136A	beard
{mV^{4}}	mi^{42}	mjɛ^{52}	mɨ^{32}	mo̥k^{4}	-	mui^{31}	mut	136B	beard
{jVt^{4}}	juk^{43}	-	gjɛt^{4}	-	-	-	rit	137A	shave(beard)
naŋ^{2}	noŋ^{5}	-	noŋ^{45}	-	-	-	nauk	138A	back
{k^{h}Vŋ^{1}}	k^{h}oŋ^{3}	-	k^{h}oŋ^{31}	-	t^{h}aŋ	k^{h}uŋ^{53}	kjauk	138B	back
{wVm$^{2/3}$}	wom^{3}	xuĩ^{3}	wɛm^{3}	-	-	βʷam^{3}	wam:	139A	abdomen
to^{2}	dau^{3}	tau^{52}	dau^{32}	duk^{32}	-	dau^{31}	-	139B	abdomen
tʃ^{h}ak^{4}	tʃ^{h}ɔʔ^{54}	-	tʃ^{h}ɔʔ^{53}	tʃ^{h}oʔ^{54}	s^{h}ɛʔ^{31}	tʃ^{h}ɔʔ^{54}	k^{h}jak	140A	navel
ʔnak^{4}	nn̥ik^{54}	nak^{52}	nək^{54}	-	-	nɨk^{5}	hna^{ʔ}	141A	heart
lum^{2}	lam^{32}	lam^{52}	lɛm^{2}	-	laŋ^{31}	lum^{31}	lum:	141B	heart
ʔtsut^{4}	ts^{h}ɔt^{53}	tsn̥aʔ^{52}	tsn̥iʔ^{53}	-	ʃwaiʔ^{31}	-	c^{h}ut	142A	lungs
saŋ^{2}	tjɛn^{5}	saŋ^{23}	səŋ^{5}	saŋ^{32}	ʃaiŋ^{31}	sin^{42}	saŋ:	143A	liver
{u^{1}}	ʔu^{3}	wu^{3}	wu^{4}	ʔau^{31}	-	ʔu^{51}	ʔu	144A	intestines
lak^{4}	lɔʔ^{42}	la̱^{52}	la̱ʔ^{3}	loʔ^{32}	lʊʔ^{31}	lɔʔ^{32}	lak	145A	hand
{mVN^{3}}	man^{5}	-	moi^{45}	mn̥it^{5}	-	mun^{34}	-	146A	elbow
{t^{h}auŋ}	t^{h}uŋ^{5}	-	t^{h}uŋ^{53}	t^{h}auŋ^{2}	-	t^{h}uŋ^{4}	tauŋ	146B	elbow
{kue^{1}}	gue^{3}	-	gue^{53}	-	-	-	-	146C	elbow
{tʃ^{h}ap^{4}}	-	-	tʃ^{h}æp^{53}	tʃ^{h}ɛʔ^{43}	-	-	-	147A	armpit
{k^{h}uiŋ}	-	-	k^{h}joŋ^{4}	k^{h}jæuŋ^{42}	-	-	k^{h}juiŋ:	147B	armpit
wa^{2}	wu^{3}	-	wɔ^{3}	vɔ^{2}	wa^{31}	wa^{31}	wa:	148A	palm
ʔnjo^{2}	njæu̱^{5}	njn̥auŋ^{23}	njn̥au̱^{5}	njo̱ʔ^{5}	-	njui^{31}	hɲui:	149A	finger
saŋ^{2}	sai^{5}	saŋ^{23}	səŋ^{4}	saŋ^{43}	ʃaiŋ^{31}	siŋ^{31}	saŋ:	150A	nail
tʃ^{h}auŋ	tʃ^{h}oʔ^{53}	-	tʃ^{h}oŋ^{53}	-	-	tʃ^{h}ə^{5}	c^{h}auŋ^{ʔ}	151A	buttocks
taŋ^{3}	daŋ^{5}	toŋ^{23}	daŋ^{5}	-	-	daŋ^{32}	-	153A	thigh
pau	bau^{5}	pau^{52}	bau^{4}	bauŋ^{31}	-	bau^{3}	pauŋ	153B	thigh
{pV^{3}}	p^{h}ə^{5}	-	bue^{53}	pn̥at^{5}	-	-	pu^{ʔ}	154A	knee
luk^{4}	luk^{54}	-	loʔ^{32}	lauʔ^{3}	-	-	-	154B	knee
{tʃ^{h}ap^{4}}	tʃ^{h}ap^{54}	-	-	-	chiʔ^{55}	-	c^{h}ac	154C	knee
puʔ^{4}	pu̱ʔ^{54}	-	buʔ^{53}	bau^{3}	-	bu^{3}	-	155A	calf
ʔmjaŋ^{3}	njn̥aŋ^{5}	-	-	ma̱^{4}	-	mjn̥aŋ^{32}	-	156A	shin
ʔkaŋ	ka̱ŋ^{3}	-	gaŋk^{52}	ka̱u̱ŋ^{4}	-	-	-	156B	shin
k^{h}je^{1}	k^{h}jei^{3}	k^{h}i^{3}	k^{h}je^{53}	k^{h}it^{53}	k^{h}i^{55}	k^{h}ji^{53}	k^{h}re	157A	foot
t^{h}aŋ^{3}	-	-	t^{h}uŋ^{4}	t^{h}auŋ^{32}	t^{h}aŋ^{31}	t^{h}aŋ^{43}	-	158A	heel
{ʃe^{1}}	ʃe^{3}	ʃ^{h}u	ʃe^{54}	ʃɪ^{43}	-	ʃə^{43}	-	159A	bone
{jau}	jæu^{3}	-	jau^{41}	ɣok^{3}	ɹu^{31}	wi̱^{32}	rui:	159B	bone
{nam$^{1/2}$}	nam^{31}	-	nam^{31}	nɛ^{3}	-	nam^{32}	nam	160A	rib
tʃ^{h}am^{1}	-	-	tʃ^{h}am^{54}	tʃ^{h}e^{42}	-	tʃ^{h}am^{32}	-	160B	rib
ʃa^{2}	ʃɔ^{5}	-	ʃu^{5}	ʃɔ^{32}	ʃa^{31}	ʃɔ^{31}	sa:	161A	flesh
{ts^{h}V^{1}}	ts^{h}ɨu^{3}	-	ts^{h}u^{32}	ts^{h}au^{31}	ʃaiŋ^{55}	-	c^{h}i	162A	fat
je^{1}	jei^{31}	-	je^{51}	-	ɹi	-	re	163A	skin
sui^{2}	sui^{5}	sui^{23}	soi^{5}	sa^{2}	ʃui^{31}	sui^{42}	swe:	164A	blood
{pau^{1}}	-	pau^{52}	bje^{31}	bau^{31}	-	bui^{32}	-	165A	sweat
{kje^{2}}	gjɛ^{3}	kjɛ^{3}	kju̱^{5}	gjö^{2}	xwai	-	k^{h}jwe:	165B	sweat
{CVk^{4}}	-	-	fueʔ^{53}	fak^{5}	-	-	-	166A	pus
k^{h}je^{2}	k^{h}jei^{5}	-	k^{h}ei^{5}	k^{h}iʔ^{54}	-	k^{h}i^{31}	k^{h}je:	167A	excrement
ʔje^{3}	je̱i̱^{5}	-	je̱^{5}	ʔi̱t^{5}	-	ʔi^{3}	-	168A	urine
{ʃe^{2}}	-	-	-	-	s^{h}i^{31}	ʃi^{53}	se:	168B	urine
jauk^{4}	-	jauʔ^{52}	jok^{3}	jæuʔ^{32}	jok^{55}	juʔ^{4}	jauk	169A	man
{kai}	-	kai^{52}	ge^{51}	gai^{31}	-	ge^{31}	kja:	169B	man
{mji}	mɛ^{31}	mɛ^{3}	me^{4}	mjɪ^{2}	mi^{55}	mi^{3}	mjui:	170A	woman
{je$^{2/3}$}	-	ɣɛ^{52}	je^{4}	ɣe^{2}	-	βʷe^{31}	-	170B	woman
pju^{1}	dju^{31}	pju^{3}	bju^{51}	bju^{31}	-	bju^{31}	lu	171A	person
{ʔa}	ʔa^{3}	ʔa	ʔa^{3}	jɪp^{2}	ʔə	-	-	172A	father

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
{pʰa}	ba^{5}	va^{3}	pʰoʔ^{53}	pʰɔ^{43}	pʰa	-	pʰaʔ	172B	father
{ʔa}	ʔuŋ^{3}	ʔa	ʔa^{3}	-	ʔə	-	-	173A	mother
{jVp}	wɛ^{31}	-	jɐ̯ʔ^{53}	jɪp^{2}	ji^{31}	-	-	173B	mother
{NV^{3}}	-	-	noŋ	mi̯^{43}	-	-	miʔ	173C	mother
{ʃaŋ^{2}}	ʃaŋ^{3}	-	-	-	sə	ʃaŋ^{53}	sa:	174A	child
{tsV^{3}}	-	-	dzu^{4}	dzo^{32}	-	dʒə^{3}	-	174B	child
{lV^{2}}	lə^{3}	-	-	-	-	-	le:	174C	child
mak^{4}	mɔʔ^{43}	-	mɔʔ^{4}	-	moʔ^{31}	-	mak	175A	son-in-law
{ʔo^{1}}	-	-	-	ʔok^{42}	-	ʔa̯u̯^{53}	-	175B	son-in-law
{ˀjV^{3}}	jɐ̯n^{4}	-	jok^{3}	ja̯m^{32}	-	ja̯ŋ^{3}	-	176A	husband
{saŋ^{1}}	sain^{43}	-	-	saŋ^{21}	-	-	-	176B	husband
{lVŋ^{1}}	-	loŋ^{3}	-	-	lo^{55}	laŋ^{53}	laŋ:	176C	husband
{pʰauʔ^{4}}	pʰɔʔ^{31}	-	-	pʰo^{3}	-	-	-	176D	husband
{ˀmV^{3}}	nji̯ʔ^{34}	mi^{52}	me^{4}	mi̯^{4}	mi^{55}	mi^{31}	maˀ	177A	wife
tʃʰo^{2}	tʃʰau^{5}	-	tʃʰau^{54}	tʃʰuk^{53}	-	tʃʰui^{32}	cʰui:	178A	widow
ma^{3}	mu^{5}	-	mɔ̃^{4}	mɔ^{4}	mai^{31}	mɔ^{3}	ma	178B	widow
{ʔa}	ʔa^{3}	ʔa^{3}	ʔa^{4}	jə^{2}	-	ʔa^{45}	ʔac	179A	elder sibling
maŋ^{2}	maŋ^{3}	-	maŋ^{4}	ma^{2}	mo^{31}	maŋ^{53}	maˀ	179B	elder sibling
nauŋ^{3}	nu^{5}	nauŋ^{52}	nõŋ^{5}	nauŋ^{32}	-	-	nuˀ	180A	younger sib.
pjen^{1}	djɛn^{31}	pui^{3}	bjeŋ^{53}	bjɪn^{21}	-	-	-	181A	friend
tʃʰaŋ^{3}	tʃʰaŋ^{5}	-	tʃʰaŋ^{5}	tʃʰa^{2}	-	dzum^{3}	cʰwe	181B	friend
{ˀmjaŋ^{1}}	nji̯eŋ^{31}	maŋ^{23}	mjəŋ^{31}	ma̯ŋ^{31}	maiŋ^{55}	mji̯ŋ^{31}	maŋ	182A	name
wa^{2}	wʊ^{3}	wa^{23}	wə^{4}	vo^{2}	wa^{55}	wa^{31}	rwa	183A	village
{kʰauŋ}	kʰau^{3}	-	ɡoŋ^{51}	kʰauŋ^{2}	kʰə	-	-	183B	village
kʰja	-	kʰja^{52}	kʰjɔ^{4}	kʰjɔ^{51}	kʰə	kʰjɔ^{53}	-	184A	road, path
{lV^{2}}	lu̯^{3}	-	-	-	ɹi^{31}	-	lam:	184B	road, path
{ˀlVC^{1}}	-	-	le̯ʔ^{54}	la̯^{31}	liʔ^{55}	la̯i̯^{53}	hle	185A	boat
{CV^{3}}	-	-	-	ɣit^{2}	-	wi^{3}	ʔə	185B	boat
ˀjum^{1}	je̯n^{3}	ja̯m^{23}	jɐ̯m^{4}	ja̯m^{31}	ʔaiŋ^{55}	ʔju̯m^{53}	ʔim	186A	house
{kʰVm^{2}}	kʰuam^{5}	kʰam^{23}	kʰæm^{4}	kʰam^{3}	-	kʰum^{31}	kʰa:	187A	door
{taŋ$^{1/2}$}	-	-	duaŋ^{31}	-	-	dɔŋ^{31}	taŋ:	188B	window
{pauk^{4}}	baiʔ^{41}	-	-	-	-	-	pauk	188C	window
kʰauŋ^{1}	kʰoŋ^{3}	-	kʰoŋ^{42}	kʰauŋ^{31}	kʰauŋ^{55}	kʰuŋ^{53}	kʰaŋ	189A	roof
{ke}	dʒei^{31}	-	ge^{5}	git^{3}	-	gi^{43}	-	190A	under house
{tsʰV^{1}}	dʒə̯^{3}	tsʰiˀ	-	-	tʰo^{55}	tsʰə^{54}	-	191A	wall of house
tʰan^{1}	tʰan^{3}	-	tʰãɪ^{52}	tʰɪn^{41}	-	tʃʰə^{4}	-	192A	mat
{pʰja^{1}}	-	-	-	-	-	pʰjɔ^{53}	pʰja	192B	mat
{ʔu^{3}}	ʔu^{5}	-	wə^{5}	ʔau^{2}	ʔaiʔ^{31}	ʔu^{3}	ʔum:	193A	pillow
kʰauk^{4}	kʰɨʔ^{53}	-	kʰoʔ^{53}	kʰau^{3}	-	kʰuʔ^{54}	kʰauŋ:	193B	pillow
mai^{1}	mi^{31}	-	me̯i̯^{51}	mai^{32}	-	-	-	194A	blanket
{pʰok^{4}}	-	-	-	pʰoʔ^{4}	-	pʰə^{3}	-	194B	blanket
{tsaŋ^{1}}	-	-	-	-	-	dʒɔŋ^{34}	cauŋ	194C	blanket
pu^{2}	-	pu̯^{52}	-	bau^{2}	-	bu^{31}	-	195A	clothing
{kan^{2}}	-	ɣaʔ^{52}	ɡain^{3}	gɪn^{4}	-	kan^{32}	kam:	196A	weave(cloth)
jak^{4}	jɔʔ^{31}	-	jo̯ʔ^{3}	ɣoʔ^{32}	rʊʔ^{31}	wɔʔ^{3}	rak	196B	weave(cloth)
{tsʰo}	tsʰau^{5}	-	tʃu̯ɐ̯m^{41}	tsʰoʔ^{54}	ʃo^{31}	-	cʰui:	197A	dye(cloth)
{lu}	lu̯^{5}	-	lo^{4}	-	-	-	lum	198A	sarong
{ˀkaŋ^{1}}	-	-	-	ka̯ŋ^{32}	-	-	kʰjaŋ	198B	sarong
kʰjap^{4}	kʰjaʔ^{53}	-	kʰjaʔ^{53}	-	-	kʰap^{32}	-	199A	trousers
{Cʰup^{4}}	tʃʰoap^{51}	-	tʃʰuɛp^{53}	kʰjæp^{5}	xɹaʔ^{31}	kʰjup^{54}	kʰjup	200A	sew
ˀnap^{4}	ŋa̯p^{54}	neʔ^{52}	ŋæ̃p^{53}	ŋe̯ʔ^{54}	-	ʔa̯p^{5}	ʔap	201A	needle
{ˀtV^{3}}	tje̯^{5}	tu̯i̯^{23}	-	-	-	da^{3}	-	202A	comb
pje^{2}	-	-	bi^{5}	bje^{32}	pʰje^{31}	-	hbi:	202A	comb

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
lak^{4}	lɔʔ^{32}	-	lo̱ʔ^{3}	loʔ^{32}	-	lɔʔ^{32}	lak	203A	ring
{pVn$^{2/3}$}	-	-	bain^{4}	pe̱n^{2}	-	-	-	203B	ring
kjap^{4}	kjɔ̱p^{53}	-	-	-	-	dʒɔp^{54}	cwap	203C	ring
{ʔo^{2}}	ʔau^{5}	-	ʔau^{5}	ʔo̱k^{54}	ʔo^{55}	-	ʔui:	205A	cooking pot
{mut^{4}}	mɔət^{41}	-	mo̱i̱ʔ^{3}	-	mui^{31}	mə^{3}	hmut	206A	ladle
{ts^{h}am^{1}}	ts^{h}ɔm^{3}	-	ts^{h}æm^{43}	ts^{h}am^{41}	-	ts^{h}um^{53}	c^{h}um	207A	mortar
{tʃ^{h}Vŋ^{3}}	t^{h}uŋ^{5}	-	tʃ^{h}aŋ^{45}	tʃ^{h}a^{32}	ci^{55}	t^{h}uŋ^{34}	-	208A	pestle
{kje^{1}}	kje̱i̱^{3}	-	ge^{31}	-	-	gi^{53}	kjaŋ	208B	pestle
{mVt^{4}}	mɔt^{42}	-	moiʔ^{3}	-	-	-	-	209A	spoon
{tsa$^{2/3}$}	-	-	dzɔ^{3}	-	-	dʒɔ^{53}	-	209B	spoon
pan^{1}	ban^{31}	-	bãı^{51}	ban^{31}	-	-	pan:	210A	plate
{tsaŋ^{1}}	-	-	-	dzo^{32}	-	dzaŋ^{31}	ʔaŋ	210B	plate
t^{h}aŋ^{2}	t^{h}aŋ^{5}	-	t^{h}aŋ^{4}	t^{h}a^{32}	t^{h}o^{31}	t^{h}aŋ^{31}	t^{h}aŋ:	211A	firewood
mi^{2}	ŋji^{3}	mi^{52}	mɪ^{4}	mi^{43}	mi^{31}	mi̱^{31}	mi:	212A	fire
{k^{h}V^{4}}	-	-	-	k^{h}jum^{43}	-	-	k^{h}ap	213A	ashes
jap^{4}	jap^{42}	-	jæp^{3}	-	-	vap^{5}	-	213b	ashes
k^{h}o^{2}	k^{h}au^{5}	k^{h}au^{23}	k^{h}au^{5}	k^{h}oʔ^{54}	k^{h}u^{31}	k^{h}au^{31}	k^{h}ui:	214B	smoke
{p^{h}a}	p^{h}ə^{3}	-	-	-	-	bjɔ^{3}	p^{h}a^{ʔ}	215A	candle
tsaŋ^{1}	-	-	dzəŋ^{51}	tsa̱ŋ^{41}	-	dziŋ^{53}	-	215B	candle
{jauŋ^{2}}	jæuŋ^{5}	-	-	-	-	-	jauŋ:	215C	candle
maŋ^{3}	maŋ^{5}	-	maŋ^{34}	ma^{343}	mɔŋ^{31}	-	-	217A	gong
{lai$^{2/3}$}	djei^{3}	-	le^{3}	la^{3}	-	lai^{3}	le:	218A	crossbow
mja^{2}	njɔ̃^{3}	-	mjɔ̃^{3}	mi^{3}	mja^{31}	mjɔ^{31}	hmra:	219A	arrow
^{ʔ}lam^{1}	la̱m^{3}	-	læm^{3}	le^{32}	lɛ^{55}	la̱m^{53}	hlam	220A	spear
ʃam^{2}	ʃam^{3}	ʃ^{h}i̱^{23}	ʃæm^{3}	ʃjɛ^{3}	-	ʃam^{53}	-	221A	knife
hjau^{3}	hjæu^{5}	kja̱^{52}	ʃau^{5}	-	-	wɔ^{4}	-	222A	hear
{kja}	gjɔ^{41}	kja	gjɔ^{31}	gjo^{5}	-	gjɔ^{53}	kra:	222B	hear
{nam}	nam^{31}	-	næm^{31}	ŋje^{3}	nɛ^{55}	hɔm^{53}	nam^{ʔ}:	223A	smell
mjaŋ^{1}	ŋjaŋ^{31}	mja̱ŋ^{52}	mjaŋ^{31}	mja^{4}	mjo^{55}	mjaŋ^{31}	mraŋ	224A	see
mjak^{4}	ŋjɔʔ^{43}	-	mjɔʔ^{3}	mjɔʔ^{32}	-	mjɔʔ^{3}	hmit	225A	wink
{lup^{3}}	-	-	-	lap^{32}	-	lʊp^{3}	-	225B	wink
ŋo^{1}	ŋau^{31}	-	ŋau^{31}	ŋoʔ^{32}	ŋu^{55}	ŋau^{32}	ŋui	226A	weep
tsa^{2}	dzɔ^{3}	ta^{52}	dzɔ^{3}	dzo^{4}	sa^{31}	dzɔ^{53}	ca:	227A	eat
^{ʔ}mjo^{1}	njæ̱u̱^{3}	mju̱ŋ^{3}	mjau^{53}	mjuʔ^{3}	-	mjui^{32}	mjui	228A	swallow
{jVt^{4}}	juat^{42}	-	joiʔ^{2}	v^{w}e^{34}	-	-	-	229A	hungry
{mVt^{4}}	-	-	-	mö̱ʔ^{54}	mjeʔ^{31}	mʊt^{32}	mwat	229B	hungry
ki^{1}	-	-	gi^{3}	k^{h}i̱^{54}	-	gi^{31}	-	230A	full, satisfied
{ʃip^{4}}	ʃɛt^{53}	-	ʃiʔ^{31}	ʃap^{53}	-	ʃɪt^{5}	sip	231A	thirsty
ʃauk^{4}	ʃok^{52}	ʃau^{23}	ʃioʔ^{31}	ʃaut^{53}	ʃoʔ^{31}	ʃuʔ^{5}	sauk	232A	drink
{jet^{4}}	jɛt^{31}	-	jeʔ^{3}	ʒit^{35}	ze^{31}	-	jac	233A	drunk
{tuk^{4}}	duk^{42}	-	dok^{3}	daut^{42}	-	-	-	234A	vomit
{pV^{3}}	-	-	bi^{45}	-	-	be^{32}	-	235A	spit
{pjV^{4}}	djɛ^{5}	-	pja̱ʔ^{53}	p^{h}ö^{5}	-	-	prac	235B	spit
k^{h}jauŋ^{3}	-	-	k^{h}joŋ^{5}	k^{h}jæuŋ^{3}	xɔŋ^{31}	k^{h}ɹuŋ^{3}	k^{h}jauŋ:	236A	cough
{tsau}	tsa̱u̱^{5}	-	dzau^{53}	dzoʔ^{54}	s^{h}o^{31}	dzau^{32}	-	236B	cough
{tse^{1}}	dʒei^{3}	-	dʒe^{43}	-	-	-	-	237A	sneeze
{tʃ^{h}a^{3}}	-	-	-	tʃ^{h}ɔ^{3}	-	tʃ^{h}ɪ^{32}	-	237C	sneeze
ham^{2}	ham^{5}	-	ham^{4}	he^{4}	-	ham^{21}	han:	238A	yawn
sak^{4}	sɔʔ^{53}	-	sɔʔ^{53}	sɔʔ^{54}	-	sɔʔ^{54}	sak	239A	breathe
ʃe^{1}	ʃɛ^{31}	-	ʃɛ^{31}	ʃɛ^{31}	ʃeɪ	ʃe^{31}	-	239B	breathe
^{ʔ}nut^{4}	-	-	-	na̱i̱t^{54}	-	nʊ̱t^{5}	-	240B	whistle
^{ʔ}tsup^{4}	dʒɔ̱p^{53}	-	dʒuɛp^{42}	dʒa̱p^{54}	saʔ^{31}	tʃ^{h}up^{43}	cup	241A	suck
jak^{4}	djɔʔ^{31}	-	jɔ̱ʔ^{32}	jɔʔ^{32}	-	jɔʔ^{32}	hjak	242A	lick

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
ˀji	ji^{31}	ɣi^{23}	ji^{31}	ɣi^{2}	ɹiʔ^{55}	βʷi^{3}	rai	244A	laugh
{ˀtaŋ}	tai^{53}	ti^{23}	daŋ^{2}	-	-	daŋ^{43}	-	245A	speak
{tsau}	-	-	-	dʒau^{2}	-	-	c^{h}ui	245B	speak
ˀtai^{1}	tai^{53}	-	deʔ^{31}	da^{43}	-	tai^{53}	-	246A	tell
kja^{3}	gjɔ^{5}	-	gjɔ^{3}	gjɔ^{32}	-	-	-	246B	tell
{kVt^{4}}	kai^{53}	-	-	geʔ^{42}	-	gə^{3}	-	247A	shout
{hV^{4}}	-	-	-	hok^{54}	-	-	hac	247B	shout
{tu^{2}}	-	-	duɛm^{32}	duk^{5}	t^{h}u^{31}	tau^{31}	-	248A	answer
{teʔ^{4}}	-	-	deʔ^{32}	da^{43}	-	-	-	248B	answer
{p^{h}uk^{4}}	p^{h}uk^{53}	-	-	-	-	-	p^{h}reuˀ	248C	answer
ˀmauk^{4}	-	-	mauʔ^{31}	mok^{54}	-	mau^{52}	-	249A	lie, fib
{tsau}	tsau^{5}	-	dzau^{53}	dzoʔ^{54}	s^{h}o^{31}	dzau^{32}	-	236B	cough
{tse^{1}}	dʒei^{3}	-	dʒe^{43}	-	-	-	-	237A	sneeze
{tʃ^{h}a^{3}}	-	-	-	tʃ^{h}ɔ^{3}	-	tʃ^{h}ɪ^{32}	-	237C	sneeze
ham^{2}	ham^{5}	-	ham^{4}	he^{4}	-	ham^{21}	han:	238A	yawn
sak^{4}	sɔʔ^{53}	-	sɔʔ^{53}	sɔʔ^{54}	-	sɔʔ^{54}	sak	239A	breathe
ʃe^{1}	ʃɛ^{31}	-	ʃɛ^{31}	ʃɛ^{31}	ʃeɪ	ʃe^{31}	-	239B	breathe
ˀnut^{4}	-	-	-	nait^{54}	-	nut^{5}	-	240B	whistle
ˀtsup^{4}	dʒɔp^{53}	-	dʒuɛp^{42}	dʒap^{54}	saʔ^{31}	tʃ^{h}up^{43}	cup	241A	suck
jak^{4}	djɔʔ^{31}	-	jɔʔ^{32}	jɔʔ^{32}	-	jɔʔ^{32}	hjak	242A	lick
ˀji	ji^{31}	ɣi^{23}	ji^{31}	ɣi^{2}	ɹiʔ^{55}	βʷi^{3}	rai	244A	laugh
{ˀtaŋ}	tai^{53}	ti^{23}	daŋ^{2}	-	-	daŋ^{43}	-	245A	speak
{tsau}	-	-	-	dʒau^{2}	-	-	c^{h}ui	245B	speak
ˀtai^{1}	tai^{53}	-	deʔ^{31}	da^{43}	-	tai^{53}	-	246A	tell
kja^{3}	gjɔ^{5}	-	gjɔ^{3}	gjɔ^{32}	-	-	-	246B	tell
{kVt^{4}}	kai^{53}	-	-	geʔ^{42}	-	gə^{3}	-	247A	shout
{hV^{4}}	-	-	-	hok^{54}	-	-	hac	247B	shout
{tu^{2}}	-	-	duɛm^{32}	duk^{5}	t^{h}u^{31}	tau^{31}	-	248A	answer
{teʔ^{4}}	-	-	deʔ^{32}	da^{43}	-	-	-	248B	answer
{p^{h}uk^{4}}	p^{h}uk^{53}	-	-	-	-	-	p^{h}reuˀ	248C	answer
ˀmauk^{4}	-	-	mauʔ^{31}	mok^{54}	-	mau^{52}	-	249A	lie, fib
tʃ^{h}auŋ^{2}	tʃ^{h}uŋ^{5}	-	-	tʃ^{h}æuŋ^{43}	-	-	c^{h}ui	250A	sing
{kjV^{1}}	-	kjeʔ^{3}	k^{h}oi^{43}	-	-	-^{54}	kju	250B	sing
{mVt^{4}}	ŋam^{53}	-	mje^{32}	mit^{3}	-	mɪt^{3}	-	251A	think
{sek^{4}}	sɛʔ^{53}	sjɛ^{23}	sɛʔ^{52}	-	ʃi	se^{53}	siˀ	252A	know
ˀta^{2}	tɔ^{45}	-	dɔ^{34}	toʔ^{5}	-	tɔ^{54}	-	253A	forget
mjet^{4}	njek^{52}	-	mjɛʔ^{52}	mit^{54}	-	mi^{53}	meˀ	253B	forget
{k^{h}jVn^{1}}	k^{h}jɐn^{3}	-	k^{h}je^{43}	k^{h}ɪn^{43}	-	k^{h}ɪn^{42}	k^{h}jai	254A	choose
{ju}	-	-	ju^{31}	ju^{3}	-	-	rwe:	254B	choose
{tset^{4}}	dʒɛt^{54}	-	-	dʒit^{5}	-	-	-	255A	love
{tap^{4}}	dap^{31}	-	-	de^{32}	-	-	-	255B	love
{ʔa}	-	-	ʔa^{2}	-	-	ʔa^{2}	-	256A	hate
{laŋ}	laŋ^{5}	-	laŋ^{3}	la^{25}	-	laŋ^{34}	-	257A	wait
{na}	-	-	-	na^{52}	-	-	ŋamˀ	257B	wait
{sV^{2}}	suan^{3}	-	soe^{3}	-	-	-	-	258A	count
{ŋVp^{4}}	-	ŋwɛʔ^{52}	-	ŋiʔ^{5}	-	ŋap^{54}	-	258B	count
kjauk^{4}	gjuk^{42}	-	gjok^{32}	gjæuʔ^{43}	-	gjuʔ^{32}	krauk	259A	afraid
{ˀnV^{4}}	nai^{53}	nak^{52}	nək^{32}	nak^{54}	-	nɪk^{5}	mjak	260A	angry
ja^{1}	jɔ^{32}	ja^{52}	jɔ^{21}	jo^{35}	-	jɔ^{51}	-	260B	angry
{ˀjVp^{4}}	jet^{53}	jap^{3}	jøp^{42}	jap^{5}	ʔaiʔ^{31}	jup^{5}	ʔip	261A	sleep
{Nja^{1}}	no^{3}	-	njɔ̃^{31}	mjaŋ^{3}	-	-	-	262A	snore
{k^{h}auk^{4}}	k^{h}uŋ^{3}	-	-	-	-	k^{h}ɔk^{32}	hauk	262B	snore
mak^{4}	mɔʔ^{31}	ma^{52}	mɔʔ^{21}	moʔ^{32}	muʔ^{31}	mɔʔ^{52}	mak	263A	dream

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
na^{1}	nɔ^{31}	-	nɔ̃^{31}	no^{23}	naʔ^{55}	nɔ^{31}	na	264A	painful
{mV^{2}}	mɛ^{3}	ma^{3}	mə^{3}	mə^{2}	-	-	-	265A	medicine
tʃ^{h}e^{2}	tʃ^{h}ei^{5}	tʃ^{h}ə^{23}	tʃ^{h}e^{5}	tʃ^{h}it^{54}	ʃiʔ^{31}	tʃ^{h}i^{31}	c^{h}e:	265B	medicine
ja^{2}	jɔ^{3}	-	jɔ^{32}	-	ja^{31}	jɔ^{53}	ja:	266A	itch
kjen^{1}	kjɛn^{3}	-	gjẽŋ^{32}	gɪn^{41}	-	gin^{31}	k^{h}rac	267A	scratch
{nan}	nan^{31}	ne^{23}	nãɪ^{4}	nɪn^{54}	-	nan^{3}	-	268A	shiver
{ʃe^{1}}	ʃei^{3}	-	ʃe^{32}	ʃit^{54}	ʃiʔ^{55}	ʃi^{43}	se	269A	die
{sV^{3}}	si^{3}	-	sə^{3}	səp^{2}	-	ʃə^{4}	-	270A	ghost
pja^{1}	djɔ^{31}	jui^{3}	bju^{31}	bjɔ^{31}	-	bjɔ^{51}	-	270B	ghost
{tsuiŋ$^{1/2}$}	dzoŋ^{3}	tsãŋ^{3}	dzoŋ^{2}	dzauŋ^{3}	-	dzuŋ^{31}	t^{h}uiŋ	271A	sit
jap^{4}	jap^{31}	-	-	jeʔ^{3}	ɹeʔ^{55}	jap^{31}	rap	272A	stand
t^{h}auk^{4}	t^{h}uk^{53}	-	t^{h}oʔ^{53}	t^{h}auk^{54}	-	t^{h}uʔ^{43}	t^{h}auk	273A	kneel
{sV^{2}}	su^{5}	tso^{23}	sɔ^{4}	su^{5}	-	sɔ^{52}	-	274A	walk
tu^{2}	du^{3}	tau^{52}	dɔ^{2}	du^{42}	-	dɔ^{32}	twa:	275A	crawl
{la}	lɔ^{31}	-	lɔ^{31}	lo^{3}	ɹuʔ	le^{43}	la:	276A	come
waŋ^{1}	waŋ^{31}	-	waŋ^{31}	wa^{32}	vɹo^{55}	-	waŋ	277A	enter
{tam}	-	-	døm^{31}	dam^{3}	-	dau	-	278A	return
{ʔtau^{4}}	tau^{5}	-	-	tok^{54}	-	-	-	278B	return
ʔtuan^{2}	duan^{3}	tsan^{23}	duen^{3}	dum^{54}	-	dʒun^{5}	twan:	279A	push
{laŋ$^{2/3}$}	laŋ^{3}	lõ^{52}	laŋ^{2}	-	-	laŋ^{53}	luʔ	280A	pull
{t^{h}VC^{4}}	t^{h}əʔ^{53}	-	t^{h}iʔ^{42}	t^{h}auŋ^{4}	-	-	-	281A	kick
{tu^{1}}	dɨu^{43}	-	-	-	-	dun^{53}	-	282A	throw
{ʔpjap^{4}}	-	-	pjæp^{53}	pjeʔ^{54}	-	-	pjac	282B	throw
kja^{3}	gjɔ^{43}	kja^{23}	gjɔ^{4}	gjo^{5}	-	-	kjaʔ	283A	fall
{k^{h}V^{2}}	-	-	-	k^{h}eʔ^{54}	-	-	k^{h}jwe:	284A	swim
{mju^{2}}	-	-	mjũ^{3}	mjuŋ^{54}	-	-	mjau:	285A	float
mjap^{4}	ŋjɔp^{41}	nap^{52}	mjok^{32}	nap^{4}	-	mjup^{34}	hnac	286A	sink
{wa^{2}}	-	-	-	wa^{54}	-	waŋ^{31}	-	286B	sink
ʔjo	jau^{31}	-	jau^{31}	jok^{5}	-	ʔut^{5}	kjaʔ	287A	flow
{njV^{1}}	-	-	njɛ^{21}	na^{43}	-	mjui^{21}	-	287B	flow
pje^{2}	dje^{3}	-	bje^{3}	pjit^{54}	pe^{31}	bi^{53}	pe:	288A	give
tui^{2}	dui^{5}	-	dɨ^{54}	döi^{5}	-	dui^{53}	-	289A	tie
{pV}	bua^{31}	-	boeʔ^{3}	-	-	-	-	290A	wipe
sut^{4}	-	-	-	sat^{54}	ʃwaiʔ^{31}	sʊt^{54}	sut	290B	wipe
{tsVʔ^{4}}	ts^{h}aʔ^{41}	-	dʒoiʔ^{5}	-	-	-	swe:	291A	rub, scrub
tʃ^{h}e^{2}	tʃ^{h}ei^{5}	tʃ^{h}ə^{23}	tʃ^{h}e^{43}	tʃ^{h}it^{5}	ʃe^{31}	tʃ^{h}i^{53}	-	292A	wash
{kVŋ^{1}}	guŋ^{43}	-	goŋ^{31}	gauŋ^{31}	-	guŋ^{3}	k^{h}jui:	294A	bathe
{pat^{4}}	bat^{31}	-	-	beʔ^{54}	-	-	-	295A	hit
{jVk^{4}}	-	-	jøk^{3}	-	-	-	ruik	295B	hit
{t^{h}uik^{4}}	-	-	-	-	-	t^{h}ui^{53}	tuik	295C	hit
k^{h}aʔ^{4}	k^{h}jam^{54}	-	k^{h}ɔʔ^{52}	k^{h}oʔ^{53}	-	k^{h}ɔʔ^{5}	k^{h}wai:	296A	split
{ts^{h}am^{1}}	ts^{h}am^{3}	xam^{3}	-	-	-	-	c^{h}am	297A	cut(hair)
{ʔnjauC^{4}}	-	-	njæ̃m^{54}	mjæuk^{53}	-	-	hɲap	297B	cut(hair)
t^{h}au^{2}	t^{h}au^{5}	-	t^{h}au^{4}	t^{h}oʔ^{5}	-	t^{h}au^{52}	t^{h}ui:	298A	stab
{lVN$^{1/2}$}	-	lui^{23}	laŋ^{32}	-	-	-	kraɲ	299A	grind
{tsuik^{4}}	-	-	dzoŋ^{4}	dzauʔ^{53}	-	-	cuik	300A	plant
hja^{2}	xjɔ^{5}	-	-	-	-	hɔ^{53}	-	300B	plant
tu^{2}	du^{3}	-	du^{3}	dau^{4}	tu^{31}	du^{53}	tu:	301A	dig
ʔjup^{4}	ŋjɔp^{52}	njæp^{52}	njøp^{53}	njap^{5}	mjaʔ^{31}	mjup^{54}	mrup	302A	burnt(corpse)
{pja$^{1/2}$}	-	-	-	ja^{4}	-	pjaŋ^{53}	pra	303A	winnow(rice)
{ʔlak^{4}}	laŋk^{42}	-	-	-	-	-	hlauŋ:	303B	winnow(rice)
ʔlap^{4}	lap^{42}	-	læp^{32}	leʔ^{54}	-	lap^{54}	-	304A	to dry
t^{h}auŋ^{2}	t^{h}uŋ^{5}	-	t^{h}oŋ^{4}	t^{h}aun^{5}	t^{h}ɔŋ^{31}	t^{h}uŋ^{53}	t^{h}auŋ:	305A	pound(rice)

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
ʔtsauk^{4}	dʒauʔ^{31}	tsa̤ʔ^{52}	dʒaṳʔ^{53}	dzɔ^{32}	-	dzaŋ^{3}	-	306A	cook(rice)
{ʔtsu^{4}}	tsṳʔ^{52}	-	dzu^{32}	dza̤ṳ^{4}	-	dʒɔʔ^{54}	c^{h}u	307A	boil
{ʔŋa^{2}}	ŋæ̤ʔ^{31}	-	ŋe^{4}	ŋa^{45}	-	ɲjɛ̤^{53}	-	308A	burn
{se^{1}}	-	-	sai^{52}	seʔ^{54}	-	sat^{54}	se	309A	extinguish
{mi^{3}}	-	-	-	mi^{4}	-	mi^{3}	-	309B	extinguish
mu^{3}	mu^{5}	-	mɔ^{5}	mau^{25}	-	mu^{5}	hmuʔ	310A	work
{tsui}	dzui^{3}	-	dzɨ^{21}	dzöi^{5}	-	dzui^{53}	-	310B	work
{lu}	li̤ṳ^{3}	li^{23}	lu^{32}	-	-	-	-	311A	play
ka^{3}	gɔ^{5}	-	gɔ^{4}	go^{34}	ga^{31}	gɔ^{3}	kaʔ	312A	dance
{pak^{4}}	baiʔ^{31}	-	bək^{2}	bak^{32}	-	-	pac	313A	shoot
ʃo^{3}	ʃo^{5}	su^{52}	ʃo^{5}	ʃɪ^{54}	c^{h}o	ʃɔ^{3}	-	314A	hunt
k^{h}at^{4}	k^{h}at^{52}	-	k^{h}ai̤ʔ^{51}	-	-	k^{h}at^{54}	-	314B	hunt
ʔsat^{4}	sat^{52}	se̤ʔ^{52}	sai̤ʔ^{42}	se̤ʔ^{54}	ʃiʔ^{55}	sat^{5}	sat	315A	kill
{pjak^{4}}	-	-	-	pje̤ʔ^{54}	-	-	p^{h}jak	315B	kill
{ʔpjap^{4}}	-	pe̤ʔ^{23}	pjæp^{31}	-	-	bjɔʔ^{3}	-	316A	fight
wai^{1}	wi^{31}	ve^{3}	ɣi̤^{31}	wai^{3}	wiʔ^{55}	βʷi^{3}	wai	317A	but
{ʔauŋ^{2}}	ʔuŋ^{5}	ʔaŋ^{3}	ʔõŋ^{54}	ʔaun^{4}	ɹɔŋ^{31}	ʔṳŋ^{53}	rauŋ:	318A	sell
t^{h}ai^{1}	t^{h}aiʔ^{31}	-	t^{h}eʔ^{53}	t^{h}a^{43}	-	t^{h}ai^{54}	p^{h}ai	319A	exchange
{lV^{2}}	-	-	-	-	-	lum^{53}	hlai:	319B	exchange
{tʃ^{h}i$^{2/3}$}	-	-	tʃ^{h}iɛ^{2}	tʃ^{h}i^{4}	-	-	-	320A	pay
{pe^{2}}	djei^{3}	-	-	bi̤ʔ^{54}	-	bi^{53}	pe:	320B	pay
k^{h}o^{2}	k^{h}au^{5}	-	k^{h}au^{3}	k^{h}oʔ^{54}	k^{h}o^{31}	k^{h}au^{52}	k^{h}ui:	321A	steal
{tai^{4}}	dai^{3}	ta^{52}	dai^{3}	de^{3}	toʔ^{31}	-	tac	322A	one(person)
jauk^{4}	juk^{32}	-	jok^{32}	jæuʔ^{42}	-	juʔ^{31}	jauk	322B	one(person)
{ʔVk^{4}}	ʔai^{53}	ji̤^{23}	ʔək^{53}	-	haiʔ^{31}	ʔi^{45}	-	323A	two(ppl)
{sum}	sɔm^{53}	sam^{3}	sɛm^{5}	sam^{42}	ʃaŋ^{31}	sum^{32}	sum:	324A	three(ppl)
mje^{3}	ɲjei^{3}	mi^{52}	mje^{4}	-	ɲi^{31}	mi^{32}	-	325A	four(ppl)
ŋa^{2}	ŋ^{3}	ŋa^{52}	m̩^{3}	ŋɔ^{35}	-	ŋɔ^{32}	ŋa:	326A	five(ppl)
k^{h}jauk^{4}	k^{h}juk^{53}	k^{h}jau$^{5}_{2}$	k^{h}jok^{53}	k^{h}jæuk^{54}	kɔŋ^{55}	k^{h}juʔ^{53}	k^{h}rauk	327A	six(ppl)
{ʔnjVt^{4}}	nje̤^{53}	na̤ṳt^{52}	njẽʔ^{53}	na̤i̤ʔ^{54}	-	nji̤t^{5}	hnac	328A	seven(ppl)
hjet^{4}	xjɛ^{53}	ʃɛt^{52}	ʃet^{53}	ʃöʔ^{5}	ʃiʔ^{31}	ʃɪt^{5}	-	329A	eight(ppl)
{jaŋ}	-	-	-	-	jɔŋ^{55}	-	hrac	329B	eight(ppl)
ko^{2}	gau^{34}	kau^{52}	gau^{3}	gok^{43}	-	gau^{32}	kui:	330A	nine(ppl)
ts^{h}e^{1}	ts^{h}i^{3}	t^{h}ai^{3}	ts^{h}e^{3}	ts^{h}e^{53}	c^{h}wat^{55}	ts^{h}e^{53}	c^{h}ai	331A	ten(ppl)
hja^{1}	xjɔ^{3}	-	ʃo^{42}	-	jaʔ^{55}	ʃɔ^{53}	ra	332A	hundred(ppl)
{heŋ}	-	-	-	-	heŋ^{55}	hiŋ^{45}	-	333A	thousand(ppl)
k^{h}jiŋ	k^{h}jɨŋ^{54}	-	k^{h}jəŋ^{53}	k^{h}iŋ^{54}	-	-	-	333A	thousand(ppl)
{mja}	njɔ^{35}	mja^{52}	mjõ^{35}	mjɔ^{45}	-	mjɔ^{3}	mja:	334A	many(ppl)
{ʃaʔ^{4}}	ʃɔ^{53}	-	ʃɔʔ^{53}	-	-	-	-	334B	many(ppl)
{ŋan}	ŋan^{5}	-	ŋãɪ^{24}	-	-	-	-	335A	all
ʔjam^{3}	jam^{5}	-	jæm^{4}	-	-	ʔa̤m^{31}	ʔə	336A	some
{ʔmau^{2}}	ma̤ṳ^{5}	-	-	mo^{32}	-	-	-	337A	few
{ne^{2}}	-	-	-	-	ne^{31}	-	nai:	337B	few
{tsit^{4}}	-	-	dʒit^{5}	-	-	dʒɪt^{5}	-	337B	few
ka^{3}	gɔ^{5}	-	gɔ^{3}	gauŋ^{3}	-	-	-	338A	half
ji^{3}	ji^{5}	-	ji^{3}	ɣi^{35}	-	βʷi^{4}	-	338B	half
{ʔkV^{2}}	gu^{54}	ko̤^{23}	ge^{3}	ɣi^{35}	c^{h}i^{31}	ko̤^{53}	kri:	339A	big
ŋai^{1}	ŋi^{31}	ŋai^{3}	ŋe^{31}	ŋai^{23}	ŋji^{55}	-	ŋai	340A	small
hjaŋ^{1}	xjeŋ^{3}	xaŋ^{23}	ʃjəŋ^{43}	xaŋ^{3}	xraiŋ^{55}	hɯŋ^{43}	hraŋ	341A	long
{tat^{4}}	-	-	-	-	-	dɔt^{54}	tut	342A	short(length)
{laŋ^{2}}	djuŋ^{3}	laŋ^{23}	ləŋ^{4}	laŋ^{34}	-	-	-	342B	short(length)
ʔmjaŋ^{2}	nja̤ŋ^{3}	mjṳ̃^{3}	mjãŋ^{32}	mja̤^{3}	-	mja̤ŋ^{31}	ma:	343A	tall

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
ʔnjam	njæ̰n^{41}	nja̰p^{52}	nj̃ũ$\tilde{\text{ɛ}}$m^{32}	mja̰m^{5}	-	jṵm^{43}	nimʔ	344A	short(height)
t^{h}u^{1}	t^{h}i̱u^{3}	-	t^{h}u^{32}	t^{h}au^{3}	t^{h}uʔ^{55}	t^{h}u^{43}	t^{h}u	345A	thick
{pa^{2}}	bu^{3}	-	bɔ^{3}	bo^{3}	pa^{31}	-	pa:	346A	thin
ts^{h}u^{1}	ts^{h}i̱u^{3}	-	ts^{h}u^{32}	ts^{h}au^{32}	-	ts^{h}u^{43}	c^{h}u	347A	fat
ki^{3}	gji^{5}	-	gi^{4}	-	-	gi^{43}	-	348A	skinny
lam^{1}	lam^{31}	lẽ^{23}	la̱m^{31}	le^{2}	-	lam^{32}	-	349A	wide, broad
{tsap^{4}}	dzə^{31}	tse̱ʔ^{52}	dʒæ̱p^{53}	-	ʃaŋ^{55}	dʒap^{54}	kjaŋ:	350A	narrow
nak^{4}	nɔʔ^{32}	-	nɔ̃ʔ^{3}	noʔ^{43}	nʊʔ^{31}	nɪk^{32}	nak	351A	deep
{pVk^{4}}	bu^{31}	-	bɔ^{4}	-	-	-	pak	352A	shallow
laŋ^{2}	lai^{5}	laŋ^{23}	ləŋ^{4}	-	laŋ^{31}	liŋ^{32}	lum:	353A	round
{pjVŋ^{2}}	djeŋ^{5}	-	bjəŋ^{4}	bjaŋ^{34}	pjaiŋ^{31}	biŋ^{34}	pruiŋ:	354A	full
lak^{4}	lɔʔ^{43}	-	lɔ̱ʔ^{3}	loʔ^{3}	lʊʔ^{31}	lɔʔ^{3}	lak	355A	right side
ja^{1}	jɔ^{42}	-	ju^{42}	jo^{32}	-	jɔ^{31}	ja	355B	right side
{kauŋ^{3}}	-	-	goŋ^{5}	kauŋ^{3}	-	-	-	356A	left side
{wi^{2}}	wi^{34}	-	-	-	-	-	wai:	356B	left side
{tan$^{2/3}$}	dan^{3}	-	dain^{3}	dɪn^{4}	-	diŋ^{4}	taŋ:	357A	straight
we^{2}	wɛ^{3}	ve^{52}	we^{2}	wa^{34}	we^{31}	ve^{53}	we:	358A	far
{tsaŋ$^{1/2}$}	-	tsõ^{23}	dʒaŋk^{53}	dʒa^{34}	-	dʒa̱ŋ^{53}	raŋ	359A	near
{ni^{2}}	ni^{3}	-	-	-	ne^{31}	-	ni:	359B	near
hai^{1}	hai^{3}	-	hɛ^{3}	-	haiŋ^{55}	-	-	360A	this
tʃ^{h}e^{1}	-	tʃ^{h}e̱^{3}	dzi^{51}	tʃ^{h}e^{41}	-	ʃi^{53}	-	360B	this
{hV^{1}}	hau^{3}	-	hau^{3}	ʔai^{31}	hʊn^{55}	he^{53}	hui	361A	that
nak^{4}	nɔʔ^{31}	naʔ^{52}	nɔ̃ʔ^{3}	noʔ^{21}	nuʔ^{31}	nɔʔ^{3}	nak	362A	black
p^{h}ju^{1}	t^{h}ji̱u^{3}	p^{h}ju^{3}	p^{h}ju^{3}	p^{h}ju^{43}	p^{h}juʔ^{55}	p^{h}ju^{32}	p^{h}ru	363A	white
ne^{1}	nɛ^{31}	nẽ^{3}	ne^{31}	ne^{3}	nɛ^{31}	ne^{32}	ni	364A	red
{njo^{1}}	ŋjæu^{31}	nju̱ŋ^{3}	njau^{31}	nju̱ʔ^{42}	-	nju^{32}	njui	365A	green
pa^{3}	-	pa^{23}	bɔ^{4}	bo^{35}	-	-	-	366A	yellow
tʃ^{h}ak^{4}	tʃ^{h}ɔʔ^{54}	-	tʃ^{h}ɔʔ^{53}	-	-	tʃ^{h}a^{5}	-	367A	dirty
{lVk^{4}}	lauʔ^{31}	lu^{23}	-	la̱k^{53}	-	-	-	367B	dirty
{ʔa}	ʔa^{3}	-	ʔa^{3}	ʔa^{2}	-	ʔə^{3}	ʔə	368A	new
{saik^{4}}	saik^{54}	-	sək^{53}	sak^{5}	-	sɪk^{54}	sac	368B	new
ts^{h}o^{3}	ts^{h}au^{5}	-	ts^{h}au^{3}	ts^{h}oʔ^{54}	-	-	-	369A	old
{tʃ^{h}ut^{4}}	tʃ^{h}uat^{54}	-	tʃ^{h}oiʔ^{53}	-	-	tʃ^{h}ut^{54}	-	370A	dark
{ma$^{1/2}$}	-	-	mau^{2}	-	-	ma^{32}	hmauŋ	370B	dark
{no}	-	-	-	noʔ^{34}	ɲo^{55}	-	-	370C	dark
{paŋ}	baŋ^{31}	-	baŋ^{31}	bo^{34}	-	bɔ^{3}	paʔ	371A	bright
{tu$^{1/2}$}	de^{3}	-	du^{31}	dau^{3}	-	tsu̱ŋ^{53}	tu	372A	same
{ka^{2}}	-	-	gə^{5}	gə^{2}	-	-	kwai:	373A	different
tʃ^{h}o^{1}	tʃ^{h}au^{3}	-	tʃ^{h}au^{31}	tʃ^{h}ok^{54}	ʃwa^{55}	tʃ^{h}ui^{53}	k^{h}jui	374A	sweet
{tsjeN^{1}}	dʒjɛn^{3}	-	dʒeŋ^{32}	dʒɪn^{32}	ʃeɪ^{55}	dʒɪn^{31}	k^{h}jaŋ	375A	sour
k^{h}a^{2}	k^{h}ɔ^{5}	k^{h}a^{23}	k^{h}ɔ^{4}	k^{h}o^{5}	k^{h}a^{31}	k^{h}ɔ^{53}	k^{h}a:	376A	bitter
p^{h}jak^{4}	-	-	p^{h}jək^{53}	jak^{3}	-	p^{h}jɪk^{5}	praŋʔ	377A	spicy
pup^{4}	buɔp^{31}	-	buɛp^{2}	bap^{34}	-	bʊp^{3}	pup	378A	rotten
jam^{2}	jam^{3}	-	jæ̱m^{3}	-	-	-	ram:	379A	swell
ʔkjauk^{4}	kju̱k^{54}	-	kjo̱ʔ^{53}	kja̱u̱ʔ^{53}	xoʔ^{31}	kju̱ʔ^{54}	k^{h}rauk	380A	dry
{tsV^{4}}	dʒuɛʔ^{52}	-	dʒøm^{32}	dʒoʔ^{5}	-	-	cwat	381A	wet
{ŋje^{3}}	ŋɛ^{5}	-	-	-	-	njɛ^{32}	-	382A	hot
{lauŋ$^{1/2}$}	-	-	loŋ^{51}	lauŋ^{3}	-	-	lauŋ	382B	hot
{kjok^{2}}	-	-	-	gjoʔ^{32}	-	gjɔʔ^{31}	-	383A	cold
{tsam^{2}}	dʒam^{3}	-	dʒæm^{54}	-	-	-	-	383A	cold
{t^{h}Vk^{4}}	dzuʔ^{31}	-	t^{h}ɔʔ^{52}	t^{h}oʔ^{54}	tuʔ^{31}	t^{h}ɔʔ^{54}	t^{h}ak	384A	sharp
{tum^{2}}	duam^{3}	-	-	-	-	-	tum:	385A	blunt
{lV^{2}}	-	-	le^{32}	la^{5}	-	lai^{53}	le:	386A	heavy

PNB	A	B	L	M	P	Z	WB	Ref	Gloss
t^han^2	t^han^3	-	$t^h\tilde{a}ɪ^2$	-	-	t^han^{32}	-	387A	hard
{tsut^4}	dʒu̥ḁt^{54}	-	dʒue?^{53}	-	-	-	-	388A	smooth
{jauŋ}	-	-	joŋ^3	jæuŋ^4	-	ɹa^3	ljaŋ	388B	smooth
{mjap^4}	ŋjap^{42}	-	mjæp^3	-	-	-	-	389A	fast
tsa^2	dzɔ^5	ta^{52}	dzɔ^{45}	-	-	-	c^heː	390A	slow
{jV^1}	-	je^3	ɹɛ^{53}	-	-	ju̥^{45}	-	390B	slow
jum^3	jɔm^3	-	jɛm^{23}	ɣam^3	-	vum^3	-	391A	strong
pa^1	bɔ^{31}	-	bɔ^{51}	bo^3	-	bɔ^{31}	-	391B	strong
{ʔnV^2}	nu̥k^{53}	-	nəŋ^2	ne^5	-	nju̥m^{53}	nanː	392A	weak
{mjVŋ^2}	ŋjuŋ^3	-	mjoŋ^3	mjæuŋ^{45}	ŋɔ^{31}	mjuŋ^{53}	mraŋ	393A	tired
{tsVt^4}	dʒɛt^{31}	-	dʒe^{45}	dʒi̥t^{53}	s^hi^{31}	dʒɪt^{32}	-	394A	blind
{la^1}	la^3	-	-	-	-	laŋ^3	prauŋ	396A	bald
{kjet^4}	-	-	gjɛ^{31}	kji̥ɛ̥t^{53}	-	-	-	396B	bald
{ŋat^4}	-	-	-	ŋa^{34}	-	ŋɔt^{32}	-	396C	bald
$tʃ^hen^2$	$tʃ^hjɛn^3$	-	$tʃ^hen^{32}$	dʒɛ̥t^5	-	$tʃ^hɪn^{53}$	-	397A	naked
{kV^2}	gi^{31}	-	ge^{31}	gai^2	kɔŋ^{31}	ge^{31}	kauŋː	398A	good
k^ha^3	k^ha^4	-	k^ha^{24}	$k^hö^5$	-	$k^hət^{43}$	$ka^ʔ$	402A	when?
{ʔnap^4}	nḁmp^{52}	-	næp^{42}	-	-	nḁm^{32}	-	402B	when?
{ma^1}	-	-	mɔ^{21}	-	-	-	hma	403A	where?
{tV}	dje^3	-	-	dau^{51}	-	-	-	403B	where?
hak^4	haŋk^{54}	k^hak^3	haŋ^4	-	-	-	-	404A	who?
{ŋV^4}	-	-	ŋo̥i?^{31}	ŋat^{32}	-	-	-	404B	who?
{$tʃ^hV^1$}	$tʃ^ha^3$	-	$tʃ^hɛ^{53}$	-	-	dʒuŋ^{52}	-	405A	what?
{ha}	-	-	-	-	-	ha^5	hmaː	405B	what?
{ʔnjak^4}	nju̥ʔ^{53}	-	-	-	-	-	$hna^ʔ$	406A	how many?

5.3 Reconstructed Words

Traditional Tibeto-Burman reconstruction focuses syllables as shown in the preceding section 5.2. The supporting Northern Burmic data, however, mainly attests to polysyllabic word forms. This section will reconstruct the word forms as they appear in the majority of Northern Burmic words in the data. This reconstruction will draw upon the reconstructed syllables, and syllables cited in the Northern Burmic word lists. Where there are two competing word forms, they are separated by a comma, with the first form being the most commonly attested form (if any). Syllables are separated by periods. These word forms do not include verbal markers present in Maru, Zaiwa, and Written Burmese verbs.

Proto Northern Burmic	Ref	Gloss
mo^{1}.{k^{h}au$\eta^{1/2}$}	001	sky
pui^{1}	002	sun
la^{3}.{mV^{3}}	003	moon
^{ʔ}ki^{1}	004	star
{^{ʔ}tsVm^{1}}.mo^{1}	005	cloud
{ŋan$^{1/2}$}, {tsV^{2}}	006	mist
wa^{1}	007	rain
{sak^{4}}.{jaŋ^{1}}.kan^{3}	008	rainbow
mo^{1}.^{ʔ}lap^{4}	009	lightning
mo^{1}.{kum^{2}}	010	thunder
jip^{4}.{pa$^{1/4}$}	011	shadow
{mjVN^{3}}	012	night
nje	013	day
nap^{4}.kja^{1}	014	morning
nje.{kVŋ^{1}}	015	noon
nje.{jV}.{ʔan}	016	yesterday
nap^{4}.{ja^{1}}, nap^{4}.{ma}	017	tomorrow
{tsan}	018	year
pui^{1}.{t^{h}Vk^{4}}	019	east
pui^{1}.waŋ^{1}	020	west
mo^{1}.{^{ʔ}tsVŋ^{1}}, {kit^{4}}.{mum}	021	north
mo^{1}.pi^{1}, {kit^{4}}.{paŋ}	022	south
{tse^{1}}, {kit^{4}}	023	water
{tse^{1}}.{laŋ$^{1/2}$}, {kit^{4}}.{laŋ$^{1/2}$}	024	river
paŋ^{3}.lai^{1}	025	sea
mje^{4}.{tsaŋ^{1}}	026	earth or soil
t^{h}am^{3}.pap^{4}	027	mud
p^{h}ui^{4}.lau^{1}	028	dust
lauk^{4}	029	stone
{mui$^{1/2}$}.{ʃa^{1}}, {sV}.{mui$^{1/2}$}	030	sand
{ʃa}.hui^{3}	031	lime (betel)
{hjVŋ^{1}}	032	gold
ŋui^{1}	033	silver
{tsaʔ^{4}}.^{ʔ}tak^{4}, {sam^{1}}	034	iron
pum^{1}	035	mountain
luk^{4}.k^{h}juŋ^{1}, luk^{4}.{ʔau^{4}}	036	cave
{saik^{4}}.{Cam}, {saik^{4}}.{k^{h}a^{1}}, {k^{h}a^{1}}.{t^{h}a^{2}}	037	forest
{saik^{4}}.{kam^{1}}	038	tree
{saik^{4}}.kuiŋ^{2}	039	branch
{saik^{4}}.^{ʔ}kauk^{4}	040	bark
tsu^{2}	041	thorn
{saik^{4}}.{mjVt^{4}}, {saik^{4}}.ki^{2}	042	root
{saik^{4}}.{Cok^{4}}	043	leaf
pan^{2}	044	flower
{saik^{4}}.ʃi^{2}	045	fruit
{ʔa}.tse^{3}, {ʔa}.ʃi^{3}	046	seed
mjak^{4}	047	grass
wa^{2}	048	bamboo
wa^{2}.{mjVk^{4}}	049	bamboo shoot
mo^{1}	050	mushroom
{kjem^{1}}	051	rattan
{lVk^{4}}.{^{ʔ}pam^{1}}	052	kapok
{p^{h}Vŋ^{3}}.tʃ^{h}o^{1}	053	sugar cane

Proto Northern Burmic	Ref	Gloss
{tʃʰa^{1}}.ʃi^{2}	054	betel nut
{pʰjen}	055	opium
{jek^{4}}	056	liquor
ŋak^{4}.mjauk^{4}.ʃi^{2}	057	banana
saŋ^{1}.pʰa^{2}.ʃi^{2}	058	papaya
ʔun^{1}.ʃi^{2}	061	coconut
{kʰVt^{4}}.lam^{2}.ʃi^{2}	062	eggplant
{mje$^{1/3}$}.nauk^{4}.ʃi^{2}, {mje$^{1/3}$}.{pV^{2}}	063	peanut
tʃʰaŋ^{2}.{kak^{4}}	064	ginger
hu^{3}.{sun^{2}}.pʰju^{1}	065	garlic
{la^{2}}.ʃi^{2}, {pʰjak^{4}}.ʃi^{2}	066	red pepper
{la^{3}}.{mi}.ʃi^{2}	067	corn
{kuk^{4}}	068	paddy rice
{wam^{2}}, {tsV^{1}}	069	cooked rice
{pʰui^{2}}, {ʔkok^{4}}, {sVn^{2}}	070	rice husk
tsʰa^{2}	071	salt
{kau}.{njok^{4}}	072	animal
{tsa^{2}}.la^{2}, {mja^{3}}.{ka^{2}}	073	tiger
{wam^{1}}	074	bear
{tsat^{4}}	075	deer
{lai$^{2/3}$}.mjauk^{4}	076	monkey
mjauk^{4}.nak^{4}	077	gibbon
ʔpju^{1}	079	porcupine
{kjVk^{4}}.nak^{4}	080	rat
{la^{1}}.kʰui^{2}	081	dog
{kʰui^{1}}, {kjap^{4}}	082	bark
ŋat^{4}	083	bite
wak^{4}	085	pig
nu^{3}, nu^{3}.{tsauŋ^{1}}	086	cow
nu^{3}.nau^{3}	087	milk
nu^{3}.lui^{2}	088	buffalo
nu^{3}.kʰjo^{1}, nu^{3}.lui^{2}.kʰjo^{1}	089	buffalo horn
ʃV^{3}.mi^{2}, mi^{2}.{ʔjak^{4}}	090	tail
{tsʰaŋ$^{1/2}$}	091	elephant
{tsʰaŋ$^{1/2}$}.tsui^{1}	092	elephant tusk
ʔŋak^{4}	093	bird
ʔŋak^{4}.suit^{4}	094	bird nest
ʔŋak^{4}.suit^{4}	094	bird nest
tauŋ^{1}, ʔŋak^{4}.tauŋ^{1}	095	wing
{ʔa}.{mo$^{2/3}$}	096	feather
{taŋ$^{1/2}$}	097	fly
ʔŋak^{4}.{ʔuk^{4}}	098	egg
kjak^{4}	099	chicken
{pe^{2}}	100	duck
ŋa^{3}	101	fish
ʔlaŋ^{2}.{mui^{1}}	102	snake
{tsV^{3}}, ʔjum^{1}.{tsV^{3}}	103	house lizard
{mV^{1}}	105	crocodile
{pa^{2}}	106	frog
pau^{2}	107	insect
ʔmja^{3}.{kaŋ$^{2/3}$}	108	spider
ʔmja^{3}.{kaŋ$^{2/3}$}.{sut^{4}}, ʔmja^{3}.{kaŋ$^{2/3}$}.{jem}	109	spider web
{ʃVn^{2}}	110	louse

Proto Northern Burmic	Ref	Gloss
tsaŋ$^{2/3}$.{kan}	111	termite
p^{h}ja^{1}	112	cockroach
{nV^{2}}.{paC^{4}}	113	snail
^{ʔ}kjaŋ^{1}	114	mosquito
pja^{2}	115	bee
jaŋ^{1}.k^{h}uŋ^{2}	116	fly (insect)
{p^{h}at^{4}}.{lam$^{1/2}$}, {p^{h}ja^{4}}.{lam$^{1/2}$}	117	butterfly
{kVŋ$^{1/2}$}.ko^{3}, {kVŋ$^{1/2}$}.{kauk^{4}}	118	scorpion
{ʔut^{3}}.{^{ʔ}lVm}	119	head
mjak^{4}.na^{1}	120	face
{ʔu^{2}}.nauk^{4}	121	brain
ts^{h}am^{1}	122	hair
{ŋa}.laŋ^{2}	123	forehead
mjak^{4}.{mV^{3}}	124	eyebrow
mjak^{4}.tsi^{3}	125	eye
mjak^{4}.^{ʔ}kuk^{4}	126	eyelid
^{ʔ}na^{1}	127	nose
{pa^{3}}.{lVt^{4}}	128	cheek
na^{3}, na^{3}.k^{h}jap^{4}	129	ear
^{ʔ}nut^{4}	130	mouth
ʃa^{1}, ja^{1}	131	tongue
{kV^{4}}, {tsui^{4}}	132	saliva
{tsui$^{1/2}$}	133	tooth
{tsui$^{1/2}$}.{njeŋ^{1}}	134	gums
ʔam^{3}.{tʃ^{h}am$^{2/3}$}	135	chin
^{ʔ}nut^{4}.{mV^{4}}	136	beard
{jVt^{4}}	137	shave (beard)
naŋ^{2}.{k^{h}Vŋ^{1}}	138	back
{wVm$^{2/3}$}.to^{2}	139	abdomen
tʃ^{h}ak^{4}	140	navel
^{ʔ}nak^{4}.lum^{2}	141	heart
^{ʔ}tsut^{4}	142	lungs
saŋ^{2}	143	liver
{u^{1}}	144	intestines
lak^{4}	145	hand
lak^{4}.{mVN^{3}}.{t^{h}auŋ}.{kue^{1}}	146	elbow
lak^{4}.{tʃ^{h}ap^{4}}.{k^{h}uiŋ}	147	armpit
lak^{4}.wa^{2}	148	palm
lak^{4}.^{ʔ}njo^{2}	149	finger
lak^{4}.saŋ^{2}	150	nail
tʃ^{h}auŋ	151	buttocks
k^{h}je^{1}	152	leg=foot (157)
taŋ^{3}.pau	153	thigh
{pV^{3}}.luk^{4}, {pV^{3}}.luk^{4}.{tʃ^{h}ap^{4}}	154	knee
k^{h}je^{1}.puʔ^{4}	155	calf
^{ʔ}mjaŋ^{3}.^{ʔ}kaŋ, k^{h}je^{1}.^{ʔ}mjaŋ^{3}.^{ʔ}kaŋ	156	shin
k^{h}je^{1}	157	foot
k^{h}je^{1}.t^{h}aŋ^{3}	158	heel
{ʃe^{1}}.{jau}	159	bone
{nam$^{1/2}$}.tʃ^{h}am^{1}	160	rib
ʃa^{2}	161	flesh
ʃa^{2}.{ts^{h}V^{1}}	162	fat
ʃa^{2}.je^{1}	163	skin

Proto Northern Burmic	Ref	Gloss
sui^{2}	164	blood
{pau^{1}}.{kje^{2}}	165	sweat
{CVk^{4}}	166	pus
k^{h}je^{2}	167	excrement
^{ʔ}je^{3}, ^{ʔ}je^{3}.{ʃe^{2}}	168	urine
jauk^{4}.{kai}	169	man
{mji}.{je$^{2/3}$}	170	woman
pju^{1}	171	person
{ʔa}.{p^{h}a}	172	father
{ʔa}.{jVp}, {ʔa}.{NV^{3}}	173	mother
{tsV^{3}}, {tsV^{3}}.{ʃaŋ^{2}}, {lV^{2}}.{ʃaŋ^{2}}	174	child
{tsV^{3}}.mak^{4}, {tsV^{3}}.{ʔo^{1}}, {lV^{2}}.mak^{4}	175	son-in-law
{^{ʔ}jV^{3}}.{saŋ^{1}}.{p^{h}auʔ^{4}}, {^{ʔ}jV^{3}}.{lVŋ^{1}}	176	husband
{^{ʔ}jV^{3}}.{saŋ^{1}}.{^{ʔ}mV^{3}}	177	wife
tʃ^{h}o^{2}.ma^{3}	178	widow
{ʔa}.maŋ^{2}	179	elder sibling
{ʔa}.nauŋ^{3}	180	younger sibling
pjen^{1}.tʃ^{h}aŋ^{3}	181	friend
{^{ʔ}mjaŋ^{1}}	182	name
wa^{2}.{k^{h}auŋ}	183	village
k^{h}ja, {lV^{2}}	184	road or path
{tse^{1}}.{^{ʔ}lVC^{1}}	185	boat
^{ʔ}jum^{1}	186	house
{k^{h}Vm^{2}}	187	door
{k^{h}Vm^{2}}.{taŋ$^{1/2}$}, {k^{h}Vm^{2}}.{pauk^{4}}	188	window
^{ʔ}jum^{1}.k^{h}auŋ^{1}	189	roof
^{ʔ}jum^{1}.{ke}	190	space under house
{ts^{h}V^{1}}.^{ʔ}jum^{1}	191	wall of house
t^{h}an^{1}, {p^{h}ja^{1}}	192	mat
{ʔu^{3}}.k^{h}auk^{4}	193	pillow
mai^{1}, mai^{1}.{p^{h}ok^{4}}, {p^{h}ok^{4}}.{tsaŋ^{1}}	194	blanket
mai^{1}.pu^{2}	195	clothing
jak^{4}.{kan^{2}}	196	weave (cloth)
{ts^{h}o}	197	dye (cloth)
{lu}, {lu}.{^{ʔ}kaŋ^{1}}	198	sarong
{lu}.k^{h}jap^{4}	199	trousers
{C^{h}up^{4}}	200	sew
^{ʔ}nap^{4}	201	needle
pje^{2}, {^{ʔ}tV^{3}}	202	comb
lak^{4}.{pVn$^{2/3}$}, lak^{4}.kjap^{4}	203	ring
{ʔo^{2}}	205	cooking pot
{mut^{4}}	206	ladle
{ts^{h}am^{1}}	207	mortar
{tʃ^{h}Vŋ^{3}}.{kje^{1}}	208	pestle
{mVt^{4}}.{tsa$^{2/3}$}	209	spoon
pan^{1}, {tsaŋ^{1}}.pan^{1}	210	plate
t^{h}aŋ^{2}	211	firewood
mi^{2}	212	fire
mi^{2}.jap^{4}, mi^{2}.{k^{h}V^{4}}	213	ashes
mi^{2}.k^{h}o^{2}	214	smoke
mi^{2}.tsaŋ^{1}, {p^{h}a}.{jauŋ^{2}}	215	candle
maŋ^{3}	217	gong
{lai$^{2/3}$}	218	crossbow

Proto Northern Burmic	Ref	Gloss
mja^{2}	219	arrow
ʔlam^{1}	220	spear
ʃam^{2}	221	knife
hjau^{3}.{kja}	222	hear
{nam}	223	smell
mjaŋ^{1}	224	see
mjak^{4}.{lup^{3}}	225	wink
ŋo^{1}	226	weep
tsa^{2}	227	eat
ʔmjo^{1}	228	swallow
{jVt^{4}}, {mVt^{4}}	229	hungry
ki^{1}	230	full or satisfied
{tse^{1}}.{ʃip^{4}}	231	thirsty
{tse^{1}}.ʃauk^{4}	232	drink
{jet^{4}}	233	drunk
{tuk^{4}}	234	vomit
{pV^{3}}, {pV^{3}}.{pjV^{4}}	235	spit
k^{h}jauŋ^{3}.{tsau}	236	cough
{tse^{1}}, {tʃ^{h}a^{3}}	237	sneeze
ham^{2}	238	yawn
sak^{4}.ʃe^{1}	239	breathe
ʔnut^{4}	240	whistle
ʔtsup^{4}	241	suck
jak^{4}	242	lick
ʔji	244	laugh
{ʔtaŋ}, {tsau}	245	speak
ʔtai^{1}.kja^{3}	246	tell
{hV^{4}}.{kVt^{4}}	247	shout
{teʔ^{4}}.{tu^{2}}, {p^{h}uk^{4}}	248	answer
ʔmauk^{4}	249	lie or fib
tʃ^{h}auŋ^{2}, {kjV^{1}}	250	sing
{mVt^{4}}	251	think
{sek^{4}}	252	know
ʔta^{2}.mjet^{4}	253	forget
{k^{h}jVn^{1}}, {k^{h}jVn^{1}}.{ju}	254	choose
{tset^{4}}.{tap^{4}}	255	love
{ʔa}	256	hate
{laŋ}, {laŋ}.{na}	257	wait
{sV^{2}}, {ŋVp^{4}}	258	count
kjauk^{4}	259	afraid
{ʔnV^{4}}.ja^{1}	260	angry
{ʔjVp^{4}}	261	sleep
{ʔjVp^{4}}.{Nja^{1}}, {ʔjVp^{4}}.{k^{h}auk^{4}}	262	snore
{ʔjVp^{4}}.mak^{4}	263	dream
na^{1}	264	painful
{mV^{2}}.tʃ^{h}e^{2}	265	medicine
ja^{2}	266	itch
kjen^{1}	267	scratch
{nan}	268	shiver
{ʃe^{1}}	269	die
{sV^{3}}.pja^{1}	270	ghost
{tsuiŋ$^{1/2}$}	271	sit
jap^{4}	272	stand

Proto Northern Burmic	Ref	Gloss
{pV^{3}}.luk^{4}.t^{h}auk^{4}	273	kneel
{sV^{2}}, k^{h}ja.{sV^{2}}	274	walk
tu^{2}, tu^{2}.{la}	275	crawl
{la}	276	come
waŋ^{1}, waŋ^{1}.{la}	277	enter
{ʔtau^{4}}, {tam}.{la}	278	return
ʔtuan^{2}	279	push
{laŋ$^{2/3}$}	280	pull
{t^{h}VC^{4}}	281	kick
{tu^{1}}, {ʔpjap^{4}}	282	throw
kja^{3}	283	fall
{k^{h}V^{2}}	284	swim
{mju^{2}}	285	float
mjap^{4}.{wa^{2}}	286	sink
ʔjo.{njV^{1}}	287	flow
pje^{2}	288	give
tui^{2}	289	tie
{pV}, sut^{4}	290	wipe
{tsVʔ^{4}}	291	rub or scrub
tʃ^{h}e^{2}	292	wash
{kVŋ^{1}}.tʃ^{h}e^{2}	294	bathe
{pat^{4}}, {jVk^{4}}, {t^{h}uik^{4}}	295	hit
k^{h}aʔ^{4}	296	split
ts^{h}am^{1}.{ʔnjauC^{4}}	297	cut (hair)
t^{h}au^{2}	298	stab
{lVN$^{1/2}$}	299	grind
{tsuik^{4}}, hja^{2}	300	plant
tu^{2}	301	dig
ʔjup^{4}	302	burned (a corpse)
{pja$^{1/2}$}, {ʔlak^{4}}	303	winnow (rice)
ʔlap^{4}	304	to dry
t^{h}auŋ^{2}	305	pound (rice)
ʔtsauk^{4}	306	cook (rice)
{ʔtsu^{4}}	307	boil
{ʔŋa^{2}}	308	burn
{mi^{3}}.{se^{1}}	309	extinguish
mu^{3}.{tsui}	310	work
{lu}	311	play
ka^{3}	312	dance
{pak^{4}}	313	shoot
ʃo^{3}.k^{h}at^{4}	314	hunt
ʔsat^{4}, ʔsat^{4}.{pjak^{4}}	315	kill
{ʔpjap^{4}}	316	fight
wai^{1}	317	but
{ʔauŋ^{2}}	318	sell
t^{h}ai^{1}, t^{h}ai^{1}.{lV^{2}}	319	exchange
{tʃ^{h}i$^{2/3}$}, {tʃ^{h}i$^{2/3}$}.{pe^{2}}	320	pay
k^{h}o^{2}	321	steal
{tai^{4}}.jauk^{4}	322	one (person)
{ʔVk^{4}}.jauk^{4}	323	two (people)
{sum}.jauk^{4}	324	three (people)
mje^{3}.jauk^{4}	325	four (people)
ŋa^{2}.jauk^{4}	326	five (people)

Proto Northern Burmic	Ref	Gloss
$k^{h}jauk^{4}.jauk^{4}$	327	six (people)
$\{^{ʔ}njVt^{4}\}.jauk^{4}$	328	seven (people)
$hjet^{4}.jauk^{4}$	329	eight (people)
$\{jaŋ\}.jauk^{4}$	329	eight (people)
$ko^{2}.jauk^{4}$	330	nine (people)
$\{ta\}.ts^{h}e^{1}.jauk^{4}$	331	ten (people)
$\{ta\}.hja^{1}.jauk^{4}$	332	hundred (people)
$\{ta\}.k^{h}jiŋ.jauk^{4}$, $\{ta\}.\{heŋ\}.jauk^{4}$	333	thousand (people)
{mja}, $\{mja\}.\{ʃaʔ^{4}\}$	334	many (people)
$\{ta\}.\{ŋan\}$	335	all
$\{ta\}.^{ʔ}jam^{3}$	336	some
$\{ta\}.\{^{ʔ}mau^{2}\}$, $\{ta\}.\{tsit^{4}\}$, $\{ne^{2}\}$	337	few
$\{ta\}.ka^{3}.ji^{3}$	338	half
$\{^{ʔ}kV^{2}\}$	339	big
$ŋai^{1}$	340	small
$hjaŋ^{1}$	341	long
$\{tat^{4}\}$, $\{laŋ^{2}\}$	342	short (length)
$^{ʔ}mjaŋ^{2}$	343	tall
$^{ʔ}njam$	344	short (height)
$t^{h}u^{1}$	345	thick
$\{pa^{2}\}$	346	thin
$ts^{h}u^{1}$	347	fat
ki^{3}	348	skinny
lam^{1}	349	wide or broad
$\{tsap^{4}\}$	350	narrow
nak^{4}	351	deep
$\{pVk^{4}\}$	352	shallow
$laŋ^{2}$	353	round
$\{pjVŋ^{2}\}$	354	full
$lak^{4}.ja^{1}$	355	right side
$lak^{4}.\{kauŋ^{3}\}$, $lak^{4}.\{wi^{2}\}$	356	left side
$\{tan^{2/3}\}$	357	straight
we^{2}	358	far
$\{tsaŋ^{1/2}\}$, $\{ni^{2}\}$	359	near
hai^{1}, $tʃ^{h}e^{1}$, $hai^{1}.tʃ^{h}e^{1}$	360	this
$\{hV^{1}\}$	361	that
$\{ʔa\}.nak^{4}$	362	black
$\{ʔa\}.p^{h}ju^{1}$	363	white
$\{ʔa\}.ne^{1}$	364	red
$\{ʔa\}.\{njo^{1}\}$	365	green
$\{ʔa\}.pa^{3}$	366	yellow
$\{ʔa\}.tʃ^{h}ak^{4}$. $\{ʔa\}.\{lVk^{4}\}$	367	dirty
$\{ʔa\}.\{saik^{4}\}$	368	new
$\{ʔa\}.ts^{h}o^{3}$	369	old
$\{ʔa\}.\{tʃ^{h}ut^{4}\}$, {no}, $mo^{1}.\{tʃ^{h}ut^{4}\}$	370	dark
{paŋ}, $mo^{1}.\{paŋ\}$	371	bright
$\{tu^{1/2}\}$	372	same
$\{ka^{2}\}.\{tu\}$	373	different
$tʃ^{h}o^{1}$	374	sweet
$\{tsjeN^{1}\}$	375	sour
$k^{h}a^{2}$	376	bitter
$p^{h}jak^{4}$	377	spicy
pup^{4}	378	rotten

Proto Northern Burmic	Ref	Gloss
jam^{2}	379	swell
^{ʔ}kjauk^{4}	380	dry
{tsV^{4}}	381	wet
{ŋje^{3}}, {lauŋ$^{1/2}$}	382	hot
{kjok^{2}}, {tsam^{2}}	383	cold
{t^{h}Vk^{4}}	384	sharp
{ʔa}.{tum^{2}}	385	blunt
{lV^{2}}	386	heavy
t^{h}an^{2}	387	hard
{tsut^{4}}.{jauŋ}	388	smooth
{mjap^{4}}	389	fast
tsa^{2}, tsa^{2}.{jV^{1}}	390	slow
jum^{3}.pa^{1}	391	strong
jum^{3}.{^{ʔ}nV^{2}}	392	weak
{mjVŋ^{2}}	393	tired
mjak^{4}.{tsVt^{4}}	394	blind
na^{3}.{tsVt^{4}}	395	deaf
{la^{1}}, {kjet^{4}}, {ŋat^{4}}	396	bald
{ʔa}.tʃ^{h}en^{2}	397	naked
{kV^{2}}	398	good
{ʔa}.{kV^{2}}	398	bad
k^{h}a^{3}.{^{ʔ}nap^{4}}	402	when?
k^{h}a^{3}.{ma^{1}}, k^{h}a^{3}.{tV}	403	where?
k^{h}a^{3}.hak^{4}.{ŋV^{4}}	404	who?
k^{h}a^{3}.{tʃ^{h}V^{1}}, k^{h}a^{3}.{ha}.{tʃ^{h}V^{1}}	405	what?
k^{h}a^{3}.{^{ʔ}njak^{4}}	406	how many?

APPENDIX A

ABBREVIATIONS

APPENDIX A: ABBREVIATIONS

Abbreviation	Definition
1,2,3,4,5	tonal scale, 1 is low, 5 is high
A	Achang
adj	adjective
ALP	alveopalatal
ALV	alveolar
asp	aspirated
ASP	aspirated
ATR	advanced tongue root
B	Bela
Bang.	Bangladesh
C	consonant
C_{vl}	voiceless consonant
C_s	sibilant consonant
C_T	creaky tone (Burmese)
C_1	initial consonant in a syllable
C_2	final consonant in a syllable
C_{2s}	stopped final consonant in a syllable
cl	classifier
CECIL	Computerized Extraction of Components of Intonation in Language
CONS	consonantal
CONT	continuant
DTL	dental
ed.	editor
G	glide or approximant
gl	glottis
glot	glottal
GLT	glottal
H/L	high/low (falling or level tone)
HF	high falling tone
HL	high level tone
H_T	heavy tone (Burmese)
K_T	killed tone (Burmese)
L	Lashi
LF	low falling tone
LT	level tone
L_T	level tone (Burmese)
LAB	labial
LBD	labiodental
LL	low level tone
LSA	Linguistic Society of America
LTBA	Linguistics of the Tibeto-Burman Area (Journal)
M	Maru
No	Number
P	Phon
PAL	palatal
PNB	Proto Northern Burmic
ppl	people

Abbreviation	Definition
Pt	part
R.	River
Ref	Reference
rd	round
recons	reconstruction
ris	falling rising tone in Bela [323]
S	Spoken (Burmese)
SEA	Southeast Asia
sib	sibilant
SIL	Summer Institute of Linguistics
sp	spread
T	tone
tns	tense vocalic (tongue root - ATR)
ten	tense syllable (phonation)
Tran	Transcription
Ttl	total
unasp	unaspirated
Unq	unique
UNESCO	United Nations Educational, Scientific, and Cultural Organization
V	vowel
var	variation
V_1	simple vowel or first vocalic element in a diphthong
V_2	second vocalic element in a diphthong
VC/vc	voiced
vd	voiced
vl	voiceless
VLR	velar
Vol.	volume
Z	Zaiwa
W	Written (Burmese)
WB	Written Burmese
σ_t	tense syllable
#	syllable boundary
[x]	"x" is phonetic
/x/	"x" is phonemic

APPENDIX B

PHONOLOGICAL RULES

APPENDIX B: PHONOLOGICAL RULES

SUMMARY OF PHONOLOGICAL RULES

Rule	Achang	Bela	Lashi	Maru	Phon	Zaiwa
3.01	NA	NA	NA	NA	NA	NA
3.02	NA	NA	NA	NA	NA	NA
3.03	NA	NA	NA	NA	NA	NA
3.04	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.05	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.06	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.07	x	-	x	x	-	x
3.08	x	-	-	-	-	-
3.09	Rule 8	-	-	-	-	-
3.10	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.11	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.12	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.13	Rule 7	-	Rule 7	Rule 7	-	Rule 7
3.14	-	-	-	-	x	-
3.15	-	-	-	-	Rule 14	-
3.16	-	-	Free var	-	-	-
3.17	x	-	x	x	-	x
3.18	x	-	x	x	-	x
3.19	-	-	-	-	x	-
3.20	-	-	-	-	x	-
3.21	x	-	-	-	-	-
3.22	-	x	-	x	-	-
3.23	-	-	-	-	-	x
3.24	-	x	x	x	x	x
3.25	Rule 8	-	-	-	-	-
3.26	-	Free var	-	Free var	-	Free var
3.27	x	-	-	-	-	-
3.28	-	x	-	x	x	x
3.29	-	-	-	x	-	-
3.30	-	-	Free var	Free var	-	-
3.31	x	-	x	x	-	x
3.32	x	-	-	-	-	-
3.33	-	-	-	x	-	-
3.34	-	-	-	-	x	-
3.35	x	x	x	-	-	x
3.36	-	-	-	-	-	x

Rule	Achang	Bela	Lashi	Maru	Phon	Zaiwa
3.37	-	-	-	Free var	Free var	-
3.38	-	-	-	Free var	-	-
3.39	-	-	x	-	-	-
3.40	-	-	-	x	-	-
3.41	-	-	-	x	x	-
3.42	-	x	-	-	-	-
3.43	-	x	-	-	x	-
3.44	-	-	x	-	-	-
3.45	-	-	-	x	-	-
3.46	-	-	-	x	-	-
3.47	-	-	-	-	x	-
3.48	Free var	-	-	-	-	-
3.49	x	-	-	-	-	-
3.50	-	x	-	x	x	-
3.51	-	-	-	x	-	-
3.52	-	-	-	-	x	-
3.53	x	-	-	-	-	-
3.54	x	-	-	-	-	x
3.55	-	-	-	-	x	-
3.56	-	x	-	-	-	-
3.57	x	-	x	-	-	-
3.58	-	-	-	x	-	-
3.59	x	-	-	-	-	-
3.60	x	-	-	-	-	-
3.61	-	x	-	x	-	-
3.62	-	-	x	-	-	-
3.63	-	-	-	-	x	-
3.64	-	-	-	-	-	x
3.65	-	x	-	x	x	-
3.66	-	x	-	x	x	-
3.67	-	x	-	x	x	-
3.68	-	-	x	-	-	-
3.69	-	-	-	-	x	-
3.70	-	x	x	x	x	-
3.71	-	-	-	-	x	-
3.72	x	x	x	x	x	x
3.73	x	-	-	-	-	-
3.74	-	x	-	x	x	-
3.75	-	-	-	x	-	-
3.76	-	-	-	-	x	-

Rule	Achang	Bela	Lashi	Maru	Phon	Zaiwa
3.77	Free var	-	-	-	-	-
3.78	x	-	-	-	-	-
3.79	-	-	-	Free var	Free var	-
3.80	-	x	-	x	x	-
3.81	-	-	x	-	-	-
3.82	-	-	x	-	x	-
3.83	x	-	-	-	-	x
3.84	-	-	x	-	x	-
3.85	-	-	Free var	-	-	-
3.86	-	-	Free var	Free var	Free var	-
3.87	-	x	-	-	-	x
3.88	-	-	-	x	x	-
3.89	x	-	-	-	-	-
3.90	x	-	x	x	-	-
3.91	x	-	x	x	-	-
3.92	x	-	x	-	-	-
3.93	x	x	x	x	-	x
3.94	-	-	-	-	-	x
3.95	x	-	x	x	-	x
3.96	x	-	x	x	-	x
3.97	x	-	x	x	-	x

APPENDIX C

DISTINCTIVE FEATURES

APPENDIX C: DISTINCTIVE FEATURES

The following are the Northern Burmic Distinctive features:

Consonants

+asp, -vc	p^h	t^h	k^h		ts^h	$tʃ^h$												
-vc	p	t	k	ʔ	ts	tʃ	f	s	ʃ	x	h							
+vc	b	d	g		dz	dʒ	v		ʒ	ɣ		m	n	ŋ	l	w	r	j
Syllabic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sonorant	-	-	-	-	-	-	-	-	-	-	*	+	+	+	+	+	+	+
Continuant	-	-	-	-	-	-	+	+	+	+	+	-	-	-	*	+	+	+
Nasal	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-
Strident	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-
Lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Distributed	+	*	-	-	+	+	-	*	+	-	-	-	*	-	*	-	-	-
Labial	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	*	-
Coronal	-	+	-	-	+	+	-	+	+	-	-	-	+	-	+	-	+	+
Anterior	+	+	-	-	+	-	+	+	-	-	-	+	+	-	+	-	-	-
High	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	+	-	+
Back	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	+	+	-
Low	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-

Note: where asterisks (*) are present, the precise value is uncertain.

Vowels

Symbol	i	ɪ	e	ɛ	æ	ø	ɨ	ə	a	u	ʊ	o	ɔ
Syllabic	+	+	+	+	+	+	+	+	+	+	+	+	+
high	+	+	-	-	-	-	+	-	-	+	+	-	-
low	-	-	-	-	+	-	-	-	+	-	-	-	-
back	-	-	-	-	-	-	+	+	+	+	+	+	+
LAB/rd	-	-	-	-	-	+	-	-	-	+	+	+	+
ATR (tns)	+	-	+	-	+	-	+	*	-	+	-	+	-

BIBLIOGRAPHY

Benedict, P. 1972. *Sino-Tibetan: A Conspectus,* Cambridge: Cambridge University Press.

Bennett, F. J. 1995. Burmese Word List, Unpublished Manuscript.

Bloomfield, L. 1933. *Language*, New York: Holt.

Bradley, D. 1979. *Proto-Loloish,* London: Curzon Press Ltd.

_____. (ed.) 1989. *Tonation,* in Papers in Southeast Asian Linguistics #8, Canberra: Australian National University.

_____. 1993. *Pronouns in Burmese-Lolo,* LTBA 16:1, 157-215.

_____. (ed.) 1995. *Studies in Burmese Languages,* in Papers in Southeast Asian Linguistics #13, Canberra: Australian National University.

Burling, Robbins. 1966. *The addition of final stops in the history of Maru,* Language 42:3. 581-86.

_____. 1967. *International Journal of American Linguistics, Vol. 33, No. 2, publication forty-three, PROTO LOLO-BURMESE,* Indiana: Indiana University Research Center.

_____. 1971. *The Historical place of Jinghpaw in Tibeto-Burman, Occasional Papers of the Wolfenden Society on Tibeto-Burman Linguistics Vol. II,* Urbana, Illinois: University of Illinois.

Bynon, T. 1977. *Historical Linguistics,* Cambridge: Cambridge Textbooks in Linguistics.

Cornyn, W. S. 1944. *Outline of Burmese Grammar,* in Language Dissertations Oct. to Dec. 1944, 38, 41-46, Ch. 1; 31-2, 34-40, Ch. 2, Baltimore, Maryland: LSA.

Dai Qingxia, et al. 1985. *Achang yu Jianzhi,* Beijing: Minorities Publishing House.

Davies, H. R. 1909. *Yun-nan the link between India and the Yangtze,* Cambridge.

_____. 1993. *A genetic classification for Tibeto-Burman languages in China,* Recent contributions to Tibeto-Burman studies. Beijing: CUN Press.

Delancy, S. 1990. "Sino-Tibetan Languages," in Bernard Comrie (ed.) *The World's Major Languages,* Oxford: Oxford University Press, 797-810.

Diehl, L. Jan 10, 1993. *The Kachin in China: Who Calls Whom What,* Unpublished Manuscript.

Edmondson, J. A. 1992. Trip notebook and audio tapes on Bela language, Unpublished source material.

_____. 1993. *Tense-lax voice quality in the Naxi language,* Arlington, Texas: The University of Texas at Arlington.

Egerod, S. C. 1974. "Sino-Tibetan languages," in *Encyclopedia Britannica* 16: 796-806.

Grimes, B. 1996. *Ethnologue: Languages of the World,* Dallas, Texas: Summer Institute of Linguistics.

Hale, A. 1982. *Research on Tibeto-Burman Languages,* Trends in Linguistics State of the Art Report 14, New York: Mouton Publishers.

Haudricourt, A. G. 1954. "De l'origine des tons en viêtnamien," in Journal Asiatique, Paris, 242:68-82.

Henderson, E. J. A. 1985. "Greenberg's "Universals" Again: A Note on the Case of Karen," in Linguistics of the Sino-Tibetan Area: The State of the Art, Pacific Linguistics C-87.

_____. 1986. "Some Hitherto Unpublished Material on Northern (Megyaw) Hpun," in McCoy, J. and Light, T. (ed.) *Contributions to Sino-Tibetan Studies,* Netherlands: E. J. Brill, 101-134.

Hock, H. H. 1991. *Principles of Historical Linguistics,* Berlin: Mouton de Gruyter.

Hu Tan and Dai Qingxia. 1964. *Haniyu yuanyin de songji,* Zhongguo yuwen, 1.

Huang Bufan. (ed.) 1992. *A Tibeto-Burman Lexicon,* Beijing: Chinese Linguistic Institute.

Huffman, F. E. 1986. *Bibliography and Index of Mainland Southeast Asian Languages and Linguistics,* New Haven: Yale University Press.

Javkin, H. and Maddison, I. 1983. *An Inverse Filtering Analysis of Burmese Creaky Voice,* in Working Papers in Phonetics, Los Angeles, California: UCLA.

Johnstone, P. J. 1993. *Operation World,* Michigan: Zondervan Publishing House.

King, R. D. 1969. *Historical Linguistics and Generative Grammar,* Englewood Cliffs, New Jersey: Prentice Hall.

Kratz, E. U. (ed.) 1996. *Southeast Asian Languages and Literature, A Bibliographical Guide to Burmese, Cambodian, Indonesian, Javanese, Malay, Minangkabau, Thai, and Vietnamese,* London: Taris Academic Studies.

Kundstadter, P. (ed.) 1967. *Southeast Asian Tribes, Minorities, and Nationalities*, Princeton: Princeton University Press.

Laver, J. 1994. *Principles of Phonetics,* Cambridge: Cambridge University Press.

Leach, E. R. 1968. *Political Systems of Highland Burma,* Boston: Beacon Press.

Lebar, F. M. et. al. 1964. *Ethnic Groups of Mainland Southeast Asia,* New Haven: Human Relations Area Files Press.

Lehman, F.K. 1971. *Some diachronic Rules of Burmese Phonology: The Problem of the Final "Palatals," Occasional Papers of the Wolfenden Society on Tibeto-Burman Linguistics Vol. II,* Urbana, Illinois: University of Illinois.

Lyovin, A. V. 1997. *An Introduction to the Languages of the World,* Oxford: Oxford University Press.

Maddieson, I. and Ladefoged, P. 1985. *"Tense" and "Lax" in four minority languages of China.* In M. P. R. van den Broecke, (ed.) Journal of Phonetics 13:433-54.

Matisoff, J. A. 1968. *Review of Robbins Burling, Proto Lolo-Burmese,* Language 44.4:879-897.

_____. 1969. "Lahu and Proto-Lolo-Burmese," in Occasional Publications of the Wolfenden Society on Tibeto-Burman Linguistics 1, Urbana, Illinois, 117-221.

_____. 1972. *The Loloish Tonal Split Revisited,* Research Monograph #7, Berkeley, California: Center for South and Southeast Asian Studies.

_____. July 1973. *Tonogenesis in Southeast Asia,* Occasional Papers in Linguistics, Los Angeles, California: University of Southern California.

_____. 1976. *Burmese Rhyming Dictionary,* LTBA, 3:1.

Mazaudon, M. 1974. *Notes on tones in Tibeto-Burman.* LTBA 1.1:27-54.

Moore, H. (ed.) 1991. *The Alphabet Makers,* Huntington Beach, California: Summer Institute of Linguistics.

Okell, J. 1969. *A Reference Grammar of Colloquial Burmese,* London: Oxford University Press.

_____. 1969. *Notes on tone alteration in Maru verbs,* twelfth International Conference on Sino-Tibetan Languages and Linguistics. Paris.

_____. 1971. *A Guide to the Romanization of Burmese,* London: The Royal Asiatic Society of Great Britain and Ireland.

_____. 1994 *Burmese, An Introduction to the Script,* Northern Illinois University.

Roop, D. H. 1968. *Beginning Burmese,* New Haven: Yale University Press.

_____. 1972. *An Introduction to the Burmese Writing System,* New Haven: Yale University Press.

Ruhlen, M. 1987. *A Guide to the World's Languages, Vol. 1 Classification*, Stanford, California: Stanford University Press.

Scott, J. G. and Hardiman. 1900. *Gazatteer of Upper Burma and the Shan states*, Pt. 1, Vol. 1, Rangoon.

Selkirk, E. O. 1982. "The Syllable," in *The Structure of Phonological Representations II* (edited by H. van der Hulst and N. Smith).

Shafer, R. 1966-1973. *Introduction to Sino-Tibetan*, Wiesbaden: Otto Harrassowitz.

Shiro Yabu. 1988. A Preliminary Report on the Study of the Maru, Lashi and Atsi Languages of Burma, in Ishizawa, Y. (ed.) *Historical and Cultural Studies in Burma*, Tokyo: Institute of Asian Cultures, Sophia University.

Swadesh, M. 1971. *The Origin and Diversification of Language,* edited by J. Sherzer, Chicago: Aldine Atherton.

Tegenfeldt, H. G. 1974. *A Century of Church Growth: The Kachin Baptist Church of Burma*, Pasadena, California: William Carey Library

Turner, P. et al. 1994. *South-East Asia*, Hawthorn, Australia: Lonely Planet.

Vennemann, T. 1972. *Rule Inversion*, Lingua 29:209-242.

Voegelin, C. F. and F. M. Voegelin. 1977. *Classification and index of the world's languages*, New York: Elsevier North Holland, Inc.

Wannemacher, M. 1995-1997. Notes on Achang, Atsi, Jinghpaw, Lashi, and Maru, Unpublished Manuscript.

Wannemacher, M. May 1996. *Aspects of Zaiwa Prosody: An Autosegmental Account*, Arlington, Texas: University of Texas at Arlington.

Wheatley, J. K. 1990. "Burmese," in Bernard Comrie (ed.) *The World's Major Languages*, Oxford: Oxford University Press, 834-854.

World Almanac and Book of Facts. 1995. Mahwah, New Jersey: Funk and Wagnalls.

Wurm, S. A. 1996. *Atlas of the World's Languages in Danger of Disappearing,* Paris: UNESCO Publishing.