



**A PHONOLOGICAL COMPARISON OF
SELECTED BISOID SPEECH
VARIETIES**

by

Kitjapol Udomkool

Presented to the Graduate School of Payap University

in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF ARTS IN LINGUISTICS

PAYAP UNIVERSITY, CHIANG MAI, THAILAND

July 2006

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The members of the Committee approve the master's thesis of Kitjapol Udomkool

Dr. Kirk Roger Person _____
Supervising Professor

Ajam Ken Manson _____

Dr. Larin Adams _____

Prof. Dr. Somsonge Burusphat _____

Assoc. Pro. Dr. Saranya Savetamalya _____

Approval Date: _____

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RESUME

Name: Kitjapol Udomkool

Date of Birth: 28 January 1978

Place of Birth: Chiangmai, Thailand

Institutions Attended:

1993 The Prince Royal's college, Certificate of Mathayon 3

1996 The Prince Royal's college, Certificate of Mathayon 6

2000 Payap University, Bachelor of Arts in English

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AUTHOR : Kitjapol Udomkool
FACULTY: LINGUISTICS, GRADUATE SCHOOL, PAYAP UNIVERSITY,
CHIANG MAI, THAILAND
YEAR : 2006
THE MEMBER OF THE COMMITTEES:
1. Asst. Prof. Dr. Kirk Roger Person
2. Ajarn Ken Manson
3. Dr. Larin Adams
4. Prof. Dr. Somsonge Burusphat
5. Assoc. Prof. Dr. Saranya Savetamalya
SUPERVISING PROFESSOR: Asst. Prof. Dr. Kirk Roger Person

Abstract

This thesis is a phonological comparison of Bisoid speech varieties. Bisoid is a subbranch of Southern Loloish, Loloish, Lolo-Burmese, Tibeto-Burman (Bradley 1997). The languages under study are Bisu and Mpi from Thailand; Pyen from Myanmar; Coong from Vietnam; Laopin, Laomian and Tsukong from China; and eight Phunoi varieties: Cauho, Bantang, Laopan, Phongku, Phongset, Sinsali, Cantan, and Laoseng from Laos.

A lexicostatistic analysis was applied to these 15 speech varieties to determine the lexical relatedness between the varieties. On the basis of these results a representative variety was chosen from each cluster.

Further analysis of the phonological inventories of the selected speech varieties was done and the resulting inventories were compared.

This thesis provides new material and phonological descriptions for 3 Bisoid speech varieties (Bantang, Cauho, and Tsukong) as well as giving additional phonological description for in already described variety, Bisu.

ชื่อเรื่อง :

การวิเคราะห์เปรียบเทียบระบบเสียงของภาษาคัดเลือกในกลุ่มบี
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สาขาวิชา : ภาษาศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยพายัพ

จังหวัดเชียงใหม่ ประเทศไทย

ปี : 2549

รายชื่อคณะกรรมการ :

6. Dr. Kirk Roger Person

7. Ken Manson

8. Dr Larin Adams

9. Prof. Dr. Somsonge Burusphat

10. Assoc. Prof. Dr. Saranya Savetamalya

ประธานควบคุมวิทยานิพนธ์ : Dr. Kirk Roger Person

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วิทยานิพนธ์ฉบับนี้

นำเสนอการวิเคราะห์เปรียบเทียบเชิงสัทศาสตร์ทางภาษาที่หล
ากหลายในกลุ่มบีชอยด์(Bisoid) ตามที่แบรดลีย์ (Bradley 1978)

ได้ค้นคว้าไว้ได้กล่าวว่าภาษาในกลุ่มบีชอยด์

(Bisoid) จัดอยู่ในกลุ่มภาษาโลโลทางใต้ (Southern Loloish)

ซึ่งแยกมาจากกลุ่มโลโล (Lolo) ซึ่งแยกมาจากกลุ่มโลโล-พม่า

(Lolo-Burmese)

ซึ่งเป็นแขนงสาขาทางภาษาหนึ่งภายใต้กลุ่มภาษาตระกูล

ทิเบต-พม่า

(Tibeto-Burman)

ภาษาที่ใช้วิเคราะห์ในงานวิจัยนี้มีแหล่งการใช้ภาษาในหลายป
ระเทศ ซึ่งได้แก่ ภาษาบิซู่ (Bisu) และภาษามปี
(Mpi) ในประเทศไทย ภาษาเพน(Pyen) ในประเทศพม่า
ภาษากอง(Coong) ในประเทศเวียดนาม ภาษาลาวปิ่น(Laopin)
ภาษาลาวเมียน(Laomian) และภาษาซึกอง(Tsukong) ในประเทศจีน
และ 8

ภาษาในกลุ่มภาษาพูนอย(Phunoi) ในประเทศลาวซึ่งประกอบด้วย
ภาษาจาวโฮ(Cauho) ภาษามานตาง(Bantang)
ภาษาลาวปิ่น(Laopan) ภาษาฟงกู(Phongku) ภาษาฟงเสด(Phongset)
ภาษาสินสาลี(Sinsali) ภาษาจันตัน(Cantan)
และภาษาลาวเซ่ง(Laoseng)

การวิเคราะห์สถิติรูปศัพท์ (Lexicostatistics)
ถูกนำมาประยุกต์ใช้ศึกษากับภาษาที่หลากหลายทั้งหมด 15
ภาษา เพื่อศึกษาถึงความสัมพันธ์ระหว่างภาษา
ผลที่ได้จากการศึกษาถึงความสัมพันธ์ระหว่างภาษานำไปสู่กา
รคัดเลือกภาษาตัวแทน

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สำหรับ ภาษาในกลุ่มบีชอยด์ 3
ภาษาได้แก่ภาษาบานตาง(Bantang)ภาษาจาโฮ(Cauho)และภาษ
าซึกอง(Tsukong)พร้อมกับได้อธิบายเพิ่มเติมทางสัทศาสตร์เช่นเดีย
วกันนี้กับภาษาบีซุ (Bisu)

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LIST OF ABBREVIATIONS AND SYMBOLS

Language Abbreviations

C	Checked syllables
Ca.	Category
dip	Diphthong
Lex.	Lexical
PA.	Loloish place of articulation
Sim.	Loloish place of articulation
V	Vowel
\$	Syllable boundary
T	Tone
—	No data
/ /	Phonemic form

CHAPTER 1

INTRODUCTION

1.0 Introduction

This thesis studies the phonological relationships between Bisoid speech varieties. Fifteen speech varieties are analyzed to find the lexical similarity using lexicostatistics. These fifteen speech varieties are Bantang (Laos), Bisu (Thailand), Cantan (Laos), Cauho (Laos), Coong (Vietnam), Pyen (Myanmar), Laomian (China), Laopan (Laos), Laopin (China), Laoseng (Laos), Mpi (Thailand), Phongku (Laos), Phongset (Laos), Sinsali (Laos), and Tsukong (China). The main focus of this thesis will be a phonological description and comparative description discussion of four selected speech varieties – Bantang (Laos), Bisu (Thailand), Cauho (Laos), and Tsukong (China).

1.1 Background

Bisu is a relatively recently discovered language considered by some linguists (e.g. Bradley, Matisoff, Nishida) as an endangered language. Bisu was first described in Thailand in the 1960s by Nishida (1973). During the 1960s Nishida investigated languages belonging to Burmese-Lolo group in northern areas of Thailand (mainly Chiang Rai and Tak Provinces). On his survey trips, not only were Loloish languages discovered, but also unreported dialects of the Thai language. The mixing of languages in this linguistically complex region motivated his investigations. During the investigation, he was able to study the language of Akha, Lahu Na, Lahu Shi, and Lisu. Bisu was the last language encountered in the investigation.

One of the Bisu informants reported by Nishida (1966) states that the Bisu originally came from China. Shixuan (2001) states that Bisu is spoken in the border areas of China, Thailand, Myanmar, and Laos. In addition, Bradley (1979) states that Bisu is spoken in Northwestern Vietnam, but there is almost no linguistic data available from that area. Gordon (2005) states that the Bisu in China are found in the Xishuangbanna area of southwestern Yunnan province. The term Bisoid quoted from Bradley (1979) was coined by Matisoff to refer to the Southern Loloish subgroup. Bisoid denotes Bisu as the head of a group of speech varieties related to Bisu.

Bradley (1979) states that Bisoid is a subgroup within Southern Loloish. This subgroup includes three subbranches: Akoid, Mpioid, and Bisoid (Bisu and Phunoi). The Akoid group comprises of Akha, Akeu, and Sila. For the Akoid group, there have been numerous studies already done. Therefore, the author selected Bisoid as the scope for this study as so little study has been done on this cluster. In this study, the subgroup Bisoid was selected because the author would like to know the internal relationships in terms of phonology. During the process of collecting wordlists an Mpi wordlist was also collected. Many words in Mpi are very close to speech varieties in Bisoid. Within Southern Loloish, the subgroups are as follows.

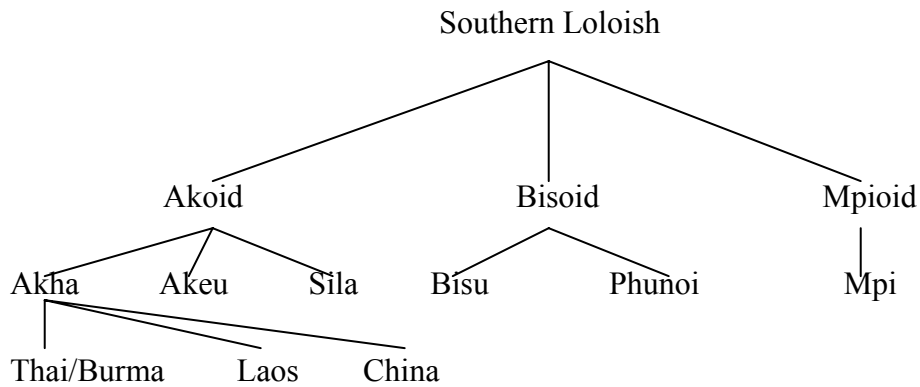


Figure 1. The Subgroups of Southern Loloish from Bradley (1979)

From the figure shown above, Southern Loloish forms three main sub groups, one of which is the scope of this study.

Bradley (1979) classifies Tibeto-Burman, with one of the main branches being Burmese-Loloish, from which Loloish and then Southern Loloish is derived. Southern Loloish contains Akoid, Bisoid and Mpioid languages. Bisoid contains Bisu, Phunoi; Mpioid comprises of Mpi. What was once simply called “Phunoi” is now known to encompass numerous distinct varieties including: Cauho, Bantang, Laopan, Phongku, Phongset, Sinsali, Cantan, and Laoseng. From many classifications of Tibeto-Burman shown in Bradley (1979), with the information in hand, the author adopted and expanded Bradley’s classification. This expanded classification is shown in the following figure.

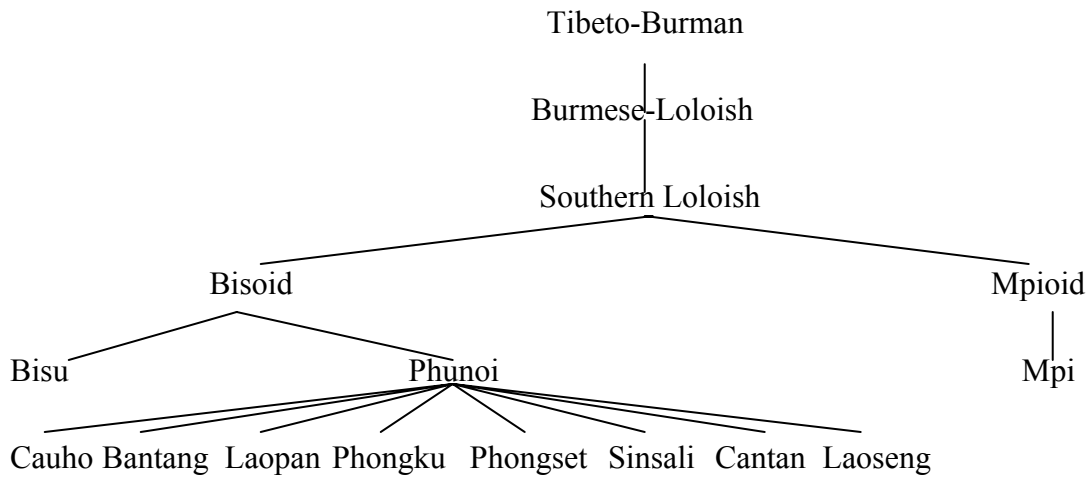


Figure 2. Classification of Bisoid and Mpioid Languages

1.2 Geography

Bisoid people live in several countries in Southeast Asia, including China, Laos, Myanmar, Thailand, and Vietnam. Nishida (1973) notes that the Bisu in Thailand live in mountainous areas. This information is also supported by Gordon (2005) who states that the Bisu live on mountainous slopes in southwest Chiang Rai and in the north of Lampang in Thailand. The populations of Bisu in Thailand is around 1,000. There are two main villages. The largest village has 100 houses. The literacy rate in Bisu is below 1 %. The literacy rate in second language (Thai) is below 5%. They have their own traditional religion. The information about Bisu population is also supported by Person (1999). The Bisu population in Thailand is concentrated in two villages in Chiang Rai Province: Doi Chomphuu (Amphoe Mae Lao, Tambon Pong Phrae) and Doi Pui (Amphoe Muang, Tambon Sa-a Dong Chai) Person (1999).

Gordon (2005) states that Bisu people in China live on high mountain slopes. This group is agriculturalists. Bisu is found in the Xishuangbanna area of southwestern Yunnan Province. The populations of Bisu people in China is around 2,000. Shixuan (2001) states that Bisu is spoken in the border areas of Yunnan Province in several

counties and villages. In Lancang County, there are the villages of Zhutang, Laba, Donglang, and Fubang. In Menghai County, there is the village of Mengzhe village. In Ximeng County, there is the village of Lisu village. In Menglian County, there is the village of Nanya village. They have traditional religion.

1.3 People

Bisoid people have many different names. In Vietnam the Bisoid are called Coong [kɔŋ³³]. In Myanmar they are called Pyen [p^hjiən³³]. In Thailand they are called Bisu [bi³³su³³]. In China they are called Laomian [lau³³miən³⁵¹], Laopin [lau³³pin³³] and Tsukong [tsu³³kɔŋ³³]. In Laos, Bisoid people are called Phunoi [p^hu³⁵¹nɔi³³]. Phunoi includes Cauho [cau³³ho³³], Bantang [ban³³taŋ³³], Laopan [lau³³pan³³], Phongku [p^hoŋ³³k^hu³³], Phongset [p^hoŋ³³set³¹], Sinsali [sin³⁵sa³³li³³], Cantan [can³³tan³³], and Laoseng [lau³³seŋ³⁵¹]. These names were originally geographical terms – “the Phunoi speakers who live in X” but now these names are used as endonyms.

1.4 Previous Research

There is some previous research on Bisoid linguistics. In Nishida (1973), he discussed the survey study of Burmese-Lolo group in Northern areas of Thailand. From this survey, it is the discovery of Bisu and encounters as a language of Burmese-Lolo. Most of the previous work in this area has been done by David Bradley. In *Proto-Loloish* (1979) Bradley compared Akha, Bisu, and Mpi. This was followed by Bradley’s paper “A Study of Nasality in Bisu and Bisoid” (1985), in which he compared nasality in Bisu, Phyen [=Pyen], and Phunoi.

1.5 Purpose of Thesis

There has been very little previous comparison of contemporary Bisoid languages. The purpose of this thesis is to describe and compare selected Bisoid languages. This

comparison will cover lexicostatistics, phonological description and comparative description. The speech varieties of Bisoid used in this study are Bantang (Laos), Bisu (Thailand), Cantan (Laos), Cauho (Laos), Coong (Vietnam), Pyen (Myanmar), Laomian (China), Laopan (Laos), Laopin (China), Laoseng (Laos), Mpi (Thailand), Phongku (Laos), Phongset (Laos), Sinsali (Laos), and Tsukong (China). All fifteen speech varieties will be compared using lexicostatistics to find the lexical similarity between these varieties. The main section of the thesis will focus on four selected speech varieties in Bisoid. The four selected speech varieties are Bantang (Laos), Bisu (Thailand), Cantan (Laos), and Tsukong (China). These four representatives will be studied to find the phonological similarities between them.

1.6 Methodology

Most of the Bisoid wordlists were first transcribed and audio recordings were made by other linguists. Since these linguists generously made the audio recordings and transcriptions available, these wordlists were retranscribed to insure a common transcription system was applied throughout the data. This analysis then uses lexicostatistic comparison to provide a lexical subgrouping of closely related speech varieties. For transcription the following software was used: “CoolEdit”, “Speech Analyzer”, and “Wave Lab”. This analysis uses lexicostatistic comparison to classify the subgrouping of closely related speech varieties among Bisoid. In the process of doing lexicostatistics, the program suite “Phylip” was used to take the percentage of similarity to create a tree diagram of the lexical relationships. In the process of describing the phonologies, the computer program “Phonology Assistant” was used to find phones such as consonants, consonant clusters, vowels, diphthongs, and tones. This program also helps to find the distribution of consonants, consonant clusters, vowels, diphthongs, and tones.

1.6.1 Data Sources

The data in this thesis is primarily from other linguists. Dr. Kirk Person provided Pyen data from Myanmar and Laomian, Laopin and Tsukong data from China. Sue Wright provided Phunoi data from the varieties of Bantang, Cantan, Cauho, Laopan, Laoseng, Phongku, Phongset, and Sinsali from Laos. Dr. Jerry Edmonson provided Coong data from Vietnam. The author collected Bisu and Mpi data. All of the data was collected by field linguists transcribing a fairly standard wordlist using the International Phonetic Alphabet (IPA) and making audio recordings of the wordlists. The data contained in this thesis was from these sources; however, the author retranscribed the data from the audio recordings to insure uniformity of transcription. Thus, any errors in the data presented are the sole responsibility of this present author.

1.6.2 Analysis

There are two types of analysis in this thesis. These are lexical comparison (or lexicostatistics), and the phonological description and comparison of the phonological inventories. For lexicostatistics, the program “Phylip 3.6” was used to create a tree diagram of lexical relatedness of the fifteen speech varieties of Bisoid used in this thesis. And for the phonological descriptions, the program “Phonology Assistant” was used to study the phonological systems.

CHAPTER 2

LEXICAL COMPARISON

2.0 Introduction

This chapter focuses on the lexical comparison of fifteen speech varieties of Bisoid in order to find the lexical similarity and determine the lexical relationships between these speech varieties.

On the basis of the results of this analysis representative varieties will be chosen (see chapter 2.3) for more in-depth study (Chapters 3 and 4).

2.1 Lexicostatistic Analysis

In defining lexicostatistics, Blair (1990) states that lexicostatistics is the process of comparing suspected cognates in languages to determine the degree of lexical similarity. From the wordlists, the author selected one hundred words following Mann (2004). Each pair of speech varieties was compared word by word to search for degrees of similarity. In this process, the author applied a modified Blair method, as described by Mann (2001), to compare one element to one element of each gloss. In this analysis, only the root elements of the word were considered; prefixes and suffixes were ignored. For the root, the comparison was based on the syllable structure of initial (the consonants) and the rhyme (the vowels). According to Blair (1990), the criterion used to find the lexical similarity can be explained in the following.

Criterion

Category 1: (a) Exact matches

(b) Vowel differing by 1 feature

(c) Phonetically similar segments in 3 or more word pairs

Category 2: (a) Phonetically similar segments in less than 3 word pairs

(b) Vowel differing by 2 or more features

Category 3: (a) None Phonetically similar consonants

(b) A correspondence with nothing in less than 3 word pairs

Ignore: (a) Inter-consonantal schwa [ə]

(b) A regularly occurring deletion

Figure 3. Phonetic similarity according to Blair (1990)

After comparing one element to one element of each cognate, there will be conditions of categories distributed for each element. Therefore, these conditions have to be considered with the phone table in order to consider the lexical similarity. The conditions used to consider can be seen in Table 1.

Number of Phones Compared		Category 1	Category 2	Category 3
1	=	1	0	0
2	=	2	0	0
3	=	2	1	0
4	=	2	1	1
5	=	3	1	1
6	=	3	2	1
7	=	4	2	1
8	=	4	2	2

Table 1. Phone Table (minimum for lexical similarity)

From table shown above, this table is a list of the minimum score need for words to be considered similar. Longer words have more room for divergence. The reason is to get brief understanding how conditions from comparing cognates work with the phone table.

The methodology of determining the category correlations for each word is explained below.

No	Gloss	Bisu	Tsukong	Ca. 1	Ca. 2	Ca. 3	Lex. Sim.
1.	Speak	c i	c a	1	1	0	No
2.	Dog	k ^h i	k ^h i	2	0	0	Yes
3.	Egg	h j a ? u	? a ŋ ? u 3	0	0	0	Yes

Figure 4. Examples of Comparison

In comparing suspected cognates, words are compared one element by one element basis using the criterion from Figure 3 as seen in Figure. 4 above. Considering the word for *Speak*, there are two phones compared, which are c-c and i-a. The first

phone matches with the category 1(a), which means ‘exact matches’. The second phone matches with the category 2(b), which means ‘vowels differing 2 or more features’. The vowel /i/ having high, front, and + articulation differs from the vowel /a/ having low, back, and –articulation. The composite ranking is 1-1-0. Looking to the phone table, the composite ranking for the minimum for lexical similarity for two phones is 2-0-0. Comparing to the phone table, it does not match with the minimum ranking. So, this pair of words is not considered lexical similarity.

Considering the word for *dog*, there are also two phones compared, which are k^h-k^h and i-i. The first and the second phone match with the category 1(a), which means ‘exact matches’. The composite ranking is 2-0-0. Looking to the phone table, the composite ranking for the minimum for lexical similarity for two phones is 2-0-0. Based on the phone table, it matches with the minimum ranking. So, this pair of words is considered lexical similarity.

Considering the word for *egg*, there are six phones compared, which are h-ʔ, j-ø, a-a, ø-ŋ, ʔ-ʔ and u-u. The first phone matches with the category 2(a), which means ‘phonetically similar segments in less than 3 word pairs’. The second phone matches with the ignore (b), which means ‘a regularly occurring deletion’. The third phone matches with the category 1(a), which means ‘exact matches’. The fourth phone matches with the ignore (b), which means ‘a regularly occurring deletion’. The fifth and sixth phones match with the category 1(a), which means ‘exact matches’. The composite ranking is 2-0-0. Looking to the phone table, the composite ranking for the minimum for lexical similarity for two phones is 3-0-0. Comparing to the phone table, it matches with the minimum ranking. So, this pair of words is considered lexical similarity.

The lexical relationships of all fifteen speech varieties can be shown in terms of percentages. The percentage of lexical similarity was calculated for pair-wise comparisons of the speech varieties. The results of the lexical similarity are arranged in a matrix in Figure 5.

Coong														
67	Pyen													
75	81	Laomian												
80	63	66	Tsukong											
72	89	90	63	Laopin										
46	39	48	48	37	Mpi									
68	72	80	60	65	39	Phongset								
58	70	72	54	68	38	83	Laoseng							
55	68	79	54	63	42	75	80	Phongku						
51	62	72	52	55	40	80	80	73	Sinsali					
58	57	54	53	59	45	62	57	58	48	Cauho				
65	87	82	63	81	53	68	71	72	65	53	Bisu			
59	54	57	61	61	45	52	50	43	40	51	43	Bantang		
61	80	74	61	79	46	71	69	74	63	52	75	47	Laopan	
54	70	74	53	68	39	76	82	76	78	56	69	46	72	Cantan

Figure 5. Lexicostatistic Similarity of Bisoid Speech Varieties

From all percentages of all fifteen speech varieties, the numbers show that the highest lexical similarity percentages are between Laomian and Laopin with 90%. The lowest percentage of lexical similarity is between Mpi and Laoseng with only 38%.

2.2 Lexical Tree

From the lexical matrix of similarities, a program called Phylip 3.6 generated, using the “Unweighed Pairs Grouped Method with Arithmetic Average” (UPGMA, or Average Link) method, a lexical similarity tree as shown in the following figure.

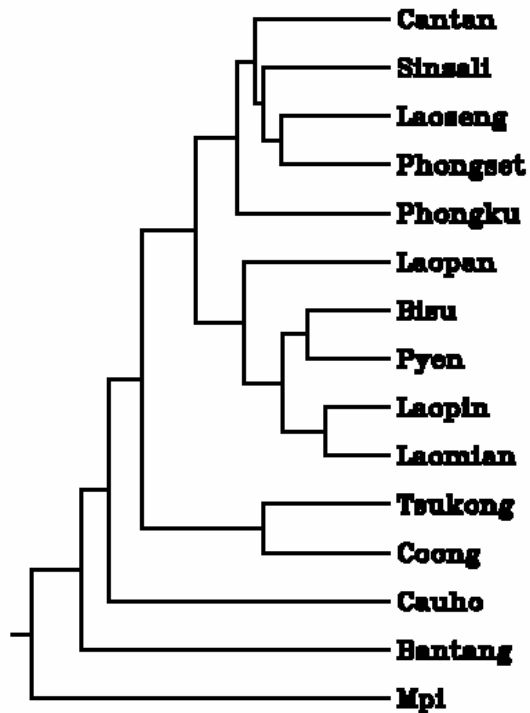


Figure 6. Rooted tree of Bisoid varieties based on UPGMA method

From Figure 6, there are five groups of speech varieties. Group 1 with the most members consists of Cantan, Sinsali, Laoseng, Phongset, Phongku, Laopan, Bisu, Pyen, Laopin, and Laomian. Group 2 consists of Tsukong and Coong. Group 3 consists of Cauho. Group 4 consists of Bantang. Group 5 consists of our Mpioid out-group Mpi.

According to Bradley (1979), Mpi belongs to the subgroup of Mpioid as a different branch from Akoid and Bisoid. From the lexical tree showing, it confirms that Mpi is a separated branch of the subgroup of Southern Loloish. Therefore, this analysis agrees with what Bradley's earlier work.

2.3 Selection of Representative Varieties

From the results of the lexical similarity analysis of the 15 Bisoid speech varieties, a representative variety from each cluster of speech varieties was chosen. As there were four clusters of Bisoid observed, four representatives were chosen. For Group 1 Bisu was chosen as the representative so as to provide a link to previous research. For Group 2 Tsukong was chosen as the data was considered to be more reliable. And for Groups 3 and 4, both which each have only one representative, Cauho and Bantang respectively were chosen.

The lexicostatistic similarity between Bantang, Bisu, Cauho, and Tsukong can be seen in the following table.

	Tsukong			
	53	Cauho		
	63	53	Bisu	
	61	51	43	Bantang

Figure 7. Lexicostatistic Similarity of Speech Varieties

The lexical similarity between Bantang and Bisu is 43%, Bantang and Cauho is 51%, Bantang and Tsukong is 61%, Bisu and Cauho is 53%, Bisu and Tsukong, 63%, and Cauho and Tsukong is 53%. Bisu and Tsukong have highest percentages of lexical similarity.

CHAPTER 3

PHONOLOGICAL DESCRIPTION

3.0 Introduction

This chapter describes the phonological inventories of the selected Bisoid speech varieties: Bantang, Bisu, Cauho, and Tsukong (see chapter 2.3). The discussion focuses on syllable structure, consonants, consonant clusters, plain vowels, diphthongs, and tones.

3.1 Bantang

Bantang is one of the distinct language varieties formerly covered by the blanket term “Phunoi” spoken in northern Laos. The total number of Phunoi people is about 20,000 people, but the population of Bantang speakers is unknown at present. Details about syllable structures, consonants, consonant clusters, plain vowels, diphthongs, tones, and voice qualities will be discussed in the following section.

3.1.1 Bantang Syllable Structure

The syllable structures in Bantang comprise of four types altogether. There are CV, CVC, CVV, and CVVC syllable types. Each type will be explained in the following sections.

3.1.1.1 Bantang CV Syllable Structure

The CV syllable structure type comprises of one consonant as the initial position and one vowel.

Phonetic	Gloss
k ^h i ³³	‘dog’
sa ³¹	‘flesh’
ʃi ³¹	‘blood’
fi ^{a315}	‘yawn’
ni ³³	‘two’

Table 2. Bantang CV Syllable Structure

3.1.1.2 Bantang CVC Syllable Structure

The CVC syllable structure type comprises of two consonants as the initial position, the final position, and one vowel.

Phonetic	Gloss
k ^h ɔŋ ³¹	‘village’
jam ³³	‘boat’
loŋ ³³	‘house’
ʔeŋ ³¹	‘excrement’
sip ³⁵	‘ten’

Table 3. Bantang CVC Syllable Structure

3.1.1.3 Bantang CVV Syllable Structure

The CVV syllable structure type comprises of one consonant as the initial position and two vowels working as the diphthong.

Phonetic	Gloss
p ^h iu ³³	‘silver’
p ^h iə ³¹	‘sarong’
nai ³⁵¹	‘sick’
lau ³⁵¹	‘come’
ɣai ³³	‘winnow (rice)’

Table 4. Bantang CVV Syllable Structure

3.1.1.4 Bantang CVVC Syllable Structure

The CVVC syllable structure type comprises of two consonants as the initial position, final position, and two vowels working together as a diphthong.

Phonetic	Gloss
jæk ³³ kiəw ³¹	‘mosquito’
moŋ ³³ miəp ³³	‘lightning’
to ³³ k ^h iəŋ ³³	‘comb’
sam ³³ k ^h iəŋ ³³	‘hair’
ŋo ³³ piəŋ ³³	‘full (container)’

Table 5. Bantang CVVC Syllable Structure

3.1.2 Bantang Consonants

Bantang has twenty five consonants. A phonemic inventory of Bantang consonants is shown in Table 6.

	Bilabial		Labioden		Alveolar		Postalv		Palatal		Velar		Glottal	
Plosive	p	b			t	d			c		k	g	ʔ	
Aspirated Plosive	p ^h				t ^h				c ^h		k ^h			
Nasal		m				n			ɲ		ŋ			
Fricative				v	s		ʃ				ɣ	h	f	
Approximant			w						j					
Lateral Approximant						l								

Table 6. Bantang Consonant Inventory

The follow sections provide evidence for the phonemes as well as distributional information for each consonant.

3.1.2.1 Bantang Consonant Contrasts

The consonant contrasts are shown in the following table.

Minimal Pair	Suspect Pair		Gloss		Suspect pair		Gloss	
/p/ /b/	jup ³¹	p	o ³³ vi ³¹	‘sleep’		pu ³³	b o ³³ vi ³¹	‘full, satisfied’
/p/ /p ^h /	ʔa ³³	p	i ³³	‘duck’		ko ³¹	p ^h i ³¹	‘door’
/t/ /d/	ti ³³	t	iŋ ³³ laŋ ³³ c ^h u ³¹	‘rainbow’		d	iŋ ³³	‘rattan’
/t/ /t ^h /		t	u ³¹ ʔai ³¹	‘crawl’		t ^h	u ³³ ʔai ³¹	‘thick’
/c/ /k/	hi ³¹	c	aŋ ³³	‘tree’		k	aŋ ³¹ kiə ³³	‘mountain’
/c/ /c ^h /		c	u ³³ ʔai ³¹	‘straight’		c ^h	u ³¹ c ^h u ³¹	‘thorn’
/k/ /g/	pi ³³	k	i ³⁵	‘star’		ʔo ³³	g i ^{ʔ33}	‘dry’
/k/ /k ^h /		k	i ³¹ lau ³⁵	‘pull’		k ^h	i ³³	‘dog’
/m/ /n/	ʔa ³³	m	i ³³	‘cat’		ju ³¹	n i ³⁵	‘cow’
/n/ /ɲ/		n	u ³³ ʔai ³¹	‘know’		ʔa ³³	ɲ u ³⁵ ʔai ³¹	‘small’
/ɲ/ /ŋ/		ɲ	a ³³ moʔ ³¹	‘grass’		lak ³³	ŋ a ³¹	‘branch’
/s/ /ʃ/	soŋ ³¹	s	i ³³	‘candle’		c ^h oŋ ³³	ʃ i ³¹	‘mist’
/ɣ/ /h/	ʔo ³³	ɣ	a ³¹	‘child’			h a ³³ poŋ ³³	‘bamboo’
/h/ /fi/		h	ai ³³ ʔai ³¹	‘strong’		ma ³³	fi ai ³¹	‘weak’
/h/ /ʔ/		h	i ³³ ʔai ³¹	‘big’		ʔ	i ³³ ʔai ³¹	‘far’
/fi/ /ʔ/		fi	a ³¹⁵	‘yawn’		c ^h u ³¹	ʔ a ³³ k ^h u ^{ʔ33}	‘skin’
/w/ /j/	ʔa ³³	w	oŋ ³⁵ tau ³³ k ^h am ³¹	‘turtle’		ʔo ³³	j oŋ ³⁵ ʔai ³¹	‘skinny’
/m/ /v/		m	e ³³ ʔai ³¹	‘hungry’		ʔo ³³ kiəm ³¹ ca ³³	v e ³¹	‘laundry’
/m/ /w/		m	oŋ ³³ t ^h a ^{ʔ31}	‘sky’		ʔa ³³	w oŋ ³⁵ tau ³³ k ^h am ³¹	‘turtle’
/v/ /w/	piə ³¹	v	o ³³ vi ³¹	‘bright’		ʔa ³³	w oŋ ³⁵ tau ³³ k ^h am ³¹	‘turtle’
/b/ /m/		b	u ³¹ poŋ ³³	‘abdomen’			m u ³³ ʔai ³¹	‘long’
/d/ /n/		d	iŋ ³³	‘rattan’		ju ³¹	n i ³⁵	‘cow’
/n/ /l/	ja ³⁵	n	a ^{ʔ31}	‘day’		ʔo ³³	l a ^{ʔ31}	‘hand’
/ɲ/ /j/	la ³³	ɲ	u ³⁵	‘finger’			j u ³¹ ni ³⁵	‘cow’
/g/ /ŋ/	pu ³⁵ və ³³	g	a ³¹ vi ³¹	‘float (object)’		lak ³³	ŋ a ³¹	‘branch’
/g/ /ɣ/	ʔo ³³	g	i ^{ʔ33}	‘dry’		kiə ³¹	ɣ i ³³ ga ³¹ vi ³¹	‘sink’
/ŋ/ /ɣ/	ʔu ³³	ŋ	ai ³¹	‘weep’			ɣ ai ³³	‘winnow (rice)’
/ʔ/ /p/		ʔ	i ³³ ʔai ³¹	‘far’			p i ³³ lo ³³ kai ³¹	‘scratch’
/ʔ/ /t/		ʔ	u ³⁵ ʔai ³¹	‘buy’			t u ³¹ ʔai ³¹	‘crawl’
/ʔ/ /k/		ʔ	i ³⁵ ʔai ³¹	‘walk’			k i ³⁵ ʔai ³¹	‘lie, fib’

Table 7. Bantang Consonant Contrasts

3.1.2.1.1 Bantang Plosives

The voiceless unaspirated bilabial plosive /p/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p/	ʔoŋ ³³ ni ³¹	p	i ³³ lai ³¹	‘exchange’
		p	i ³³ lo ³³ kai ³¹	‘scratch’
		p	u ³³ k ^h a ^ɔ ³¹	‘shirt’
		p	en ³¹ liu ³⁵	‘throw (get fruit)’
		p	o ³³ nat ³⁵	‘buffalo’
		p	e ³¹ paɪ ^ɔ ³³	‘check’
	na ³³	p	ɔ ³³	‘deaf’
		p	æ ³¹ jo ³¹	‘bee’
	pə ³¹	p	a ^ɔ ³³	‘check’

Table 8. Bantang Plosive /p/

The voiceless aspirated bilabial plosive /p^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the central vowel /ə/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p ^h /	ʔo ³³ ki ³³	p ^h	i ³¹ tæ ^ɔ ³³	‘foot’
		p ^h	i ³³ ɲai ³¹	‘tie’
	ti ³³	p ^h	uɪ ^ɔ ³¹	‘mat’
	ʔo ³³	p ^h	e ³¹	‘liver’
		p ^h	əɪ ^ɔ ³¹ laŋ ³³ ɲai ³¹	‘correct’
		p ^h	a ³³ ya ³¹	‘frog’

Table 9. Bantang Plosive /p^h/

The voiced bilabial plosive /b/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, and the unrounded open front vowel. Examples can be seen in the following table.

/b/	ʃi ³³ vo ³³	b	i ³¹	‘die’
		b	i ³¹ t ^h o ³⁵	‘kneel’
		b	u ³¹ poŋ ³³	‘abdomen’
	pu ³³	b	o ³³ vi ³¹	‘full, satisfied’
	ha ³⁵ lup ³¹ jam ³³	b	a ³³ lai ³¹	‘when?’

Table 10. Bantang Plosive /b/

The voiceless unaspirated alveolar plosive /t/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/t/	ti ³³	t	iŋ ³³ laŋ ³³ c ^h u ³¹	‘rainbow’
		t	i ³³ li ³³	‘smooth’
		t	un ³³ ɔai ³¹	‘blunt’
		t	e ³¹ liu ³⁵	‘push’
	ɔo ³³	t	oŋ ³³	‘wing’
	ha ³³	t	əɾ ³³	‘salt’
		t	ɔp ³³	‘answer’
	ɔo ³³ ki ³³ p ^h i ³¹	t	æɾ ³³	‘foot’
	ta ³¹	t	am ³⁵ ya ³¹	‘shallow’

Table 11. Bantang Plosive /t/

The voiceless aspirated alveolar plosive /t^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/t ^h /	kiəm ³³	t ^h	iŋ ³¹	‘wall (of house)’
		t ^h	iŋ ³¹ pit ³⁵	‘all’
		t ^h	u ³³ ŋai ³¹	‘thick’
	p ^h ak ³¹	t ^h	em ³³	‘garlic’
	bi ³¹	t ^h	o ³⁵	‘kneel’
		t ^h	ə ³³ ŋai ³¹	‘bite’
	kuŋ ³⁵	t ^h	ɔŋ ³³ ŋai ³¹	‘pound (rice)’
		t ^h	aŋ ³¹ maŋ ³³	‘drum’

Table 12. Bantang Plosive /t^h/

The voiced alveolar plosive /d/ only occurs only before the unrounded close front vowel /i/. The example can be seen in the following table.

/d/		d	iŋ ³³	‘rattan’
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Table 13. Bantang Plosive /d/

The voiceless unaspirated palatal plosive /c/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c/	ʔo ³³	c	i ³¹	‘younger sibling’
	cu ³³ lu ³¹	c	u ³³ ʔai ³¹	‘shiver’
	ʔo ³³	c	en ³³	‘wet’
		c	o ³³ lam ³³	‘live’
	hi ³¹	c	aŋ ³³	‘tree’

Table 14. Bantang Plosive /c/

The voiceless aspirated palatal plosive /c^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c ^h /		c ^h	i ³³ ma ³¹	‘louse’
	pi ³³	c ^h	i ³¹	‘knee’
	ku ³¹	c ^h	u ³¹ naŋ ³³ c ^h a ³³	‘sweat’
		c ^h	e ³¹ ʔai ³¹	‘choose’
		c ^h	o ³³ k ^h a ³¹	‘dew’
	loŋ ³⁵	c ^h	oŋ ³¹	‘ring’
		c ^h	æt ³⁵ toŋ ³¹	‘navel’
	toŋ ³¹	c ^h	am ³⁵	‘mortar’

Table 15. Bantang Plosive /c^h/

The voiceless unaspirated velar plosive /k/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/k/		k	i ³⁵ ʔai ³¹	‘lie, fib’
	pi ³³	k	i ³⁵	‘star’
		k	u ³³ ʔai ³¹	‘sew’
	ku ³¹	k	e ³³	‘shin’
	ca ³⁵	k	o ³³ ʃi ³³ ʔai ³¹	‘wash (vegetables)’
	la ³³ c ^h a ³³	k	ə ³¹ ʃit ³¹	‘armpit’
		k	ɔn ³³	‘spoon’
	ba ³¹ ti ³³	k	ap ³⁵	‘extinguish (fire)’

Table 16. Bantang Plosive /k/

The voiceless aspirated velar plosive /k^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/k ^h /	ʔa ³³ sak ³¹	k ^h	i ^{33,h} t ^o ʔ ³¹	‘noon’
	ʔo ³³	k ^h	i ³³	‘horn’
		k ^h	u ³⁵ p ^h e ³¹	‘plate’
	c ^h i ³¹	k ^h	o ³³ ʃi ³¹	‘cucumber’
	miə ³³	k ^h	ə ³³	‘many’
	miə ³³	k ^h	ɔŋ ³³	‘forehead’
		k ^h	am ³⁵	‘bear’

Table 17. Bantang Plosive /k^h/

The voiced velar plosive /g/ occurs only before the unrounded close central vowel /i/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/g/	pu ³⁵ və ³³	g	a ³¹ vi ³¹	‘float (object)’
	kiə ³¹ yi ³³	g	a ³¹ vi ³¹	‘sink’
	ʔo ³³	g	iʔ ³³	‘dry’

Table 18. Bantang Plosive /g/

The glottal /ʔ/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ʔ/	ʔo ³³	ʔ	iŋ ³¹ ʔa ³¹	‘narrow’
	ʔo ³³	ʔ	i ³³	‘old’
		ʔ	u ³⁵ ʔai ³¹	‘buy’
	ja ³⁵ sai ³¹	ʔ	e ³³ le ³³	‘flute’
	ʔa ³³ c ^h u ³¹	ʔ	oŋ ³³ ʔai ³¹	‘swim’
		ʔ	a ³³ pu ³¹	‘father’

Table 19. Bantang Plosive /ʔ/

3.1.2.1.2 Bantang Nasals

The bilabial nasal /m/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/m/	ʔa ³³	m	i ³⁵ naŋ ³¹ k ^h iə ³³	‘spider’
	ʔo ³³	m	it ³¹	‘feather’
		m	u ³³ ŋai ³¹	‘long’
		m	e ³³ ʔai ³¹	‘hungry’
		m	o ³³ ho ³⁵	‘rain’
	na ³³	m	æ ³³	‘nose’
	t ^h aŋ ³¹	m	aŋ ³³ ʔa ³³ hi ³¹	‘gong’

Table 20. Bantang Nasal /m/

The alveolar nasal /n/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/n/	ʔoŋ ³³	n	i ³¹ pi ³³ lai ³¹	‘exchange’
	miŋ ³³	n	ɨŋ ³³	‘eye’
		n	u ³³ ʔai ³¹	‘know’
		n	eŋ ³¹ ŋaŋ ³¹	‘ghost’
		n	æ ³³ jen ³³	‘opium’
		n	aŋ ³³ ti ³³	‘fish’

Table 21. Bantang Nasal /n/

The palatal nasal /ɲ/ occurs only before the unrounded close front vowel /i/, the rounded close back vowel /u/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ɲ/		ɲ	i ³³ ɲai ³¹	‘dance’
	ʔa ³³	ɲ	u ³⁵ ɲa ³¹	‘few’
		ɲ	a ³³ moɲ ³¹	‘grass’

Table 22. Bantang Nasal /ɲ/

The velar nasal /ŋ/ only occurs before the unrounded open front vowel /a/.

/ŋ/	lak ³³	ŋ	a ³¹	‘branch’
	neŋ ³¹	ŋ	aɲ ³¹	‘ghost’
	ʔu ³³	ŋ	ai ³¹	‘weep’

Table 23. Bantang Nasal /ŋ/

3.1.2.1.3 Bantang Fricatives

The voiced labiodental fricative /v/ occurs before the unrounded close front vowel /i/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the central vowel /ə/. Examples can be seen in the following table.

/v/	juv ³¹ po ³³	v	i ³¹	‘sleep’
	ʔo ³³ kiəm ³¹ ca ³³	v	e ³¹	‘laundry’
	piə ³¹	v	o ³³ vi ³¹	‘bright’
	pu ³⁵	v	ə ³³ ga ³¹ vi ³¹	‘float (object)’

Table 24. Bantang Fricative /v/

The voiceless alveolar fricative /s/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/s/		s	i ³³ i ³³	‘yellow’
	ʔo ³³	s	u ³¹	‘tooth’
		s	oŋ ³¹ si ³³	‘candle’
	ʔo ³³	s	ak ³¹ ko ³³ ʔai ³¹	‘breath’

Table 25. Bantang Fricative /s/

The velar nasal /ɟ/ occurs only before the unrounded close front vowel /i/, and the unrounded close central vowel /i/. Examples can be seen in the following table.

/ɟ/	ca ³⁵ ko ³³	ɟ	i ³³ ʔai ³¹	‘wash (vegetables)’
	c ^h oŋ ³³	ɟ	i ³¹	‘mist’
		ɟ	i ³¹	‘blood’
	ʔi ³¹	ɟ	i ³⁵	‘urine’
	ʔa ³³ pin ³¹ i ³³	ɟ	it ³¹	‘a fly’

Table 26. Bantang Fricative /ɟ/

The voiced velar fricative /ɣ/ occurs before the unrounded close central vowel /i/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ɣ/		ɣ	a ³¹	‘pig’
	p ^h a ³³	ɣ	a ³¹	‘frog’
	kiə ³¹	ɣ	i ³³ ga ³¹ vi ³¹	‘sink’
		ɣ	ai ³³	‘winnow (rice)’
	ʔo ³³	ɣ	aŋ ³³	‘night’

Table 27. Bantang Fricative /ɣ/

The voiceless glottal fricative /h/ only occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the

rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/h/		h	i ³¹ caŋ ³³	‘tree’
	t ^h aŋ ³¹ maʔ ³³ ʔa ³³	h	ɣ ³¹	‘gong’
		h	u ³³ lu ³¹	‘hail’
	mak ³³	h	oŋ ³³ ʃi ³¹	‘papaya’
		h	a ³³ ʔa ³¹	‘bird’

Table 28. Bantang Fricative /h/

The voiced glottal fricative /ɦ/ only occurs before the unrounded open front vowel /a/. Examples can be seen in the following table.

/ɦ/		ɦ	a ³¹³	‘yawn’
	ma ³³	ɦ	ai ³¹	‘weak’

Table 29. Bantang Fricative /ɦ/

3.1.2.1.4 Bantang Approximants

The voiced labial-velar approximant /w/ occurs before the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/w/	tu ³³	w	ai ³¹	‘plant’
	ʔa ³³	w	oŋ ³⁵ tau ³³ k ^h am ³¹	‘turtle’
	sa ³¹ k ^h a ³³	w	a ³³ ʔi ³³ ʔai ³¹	‘hunt’

Table 30. Bantang Approximant /w/

The palatal approximant /j/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the unrounded front

vowel /æ/, and the unrounded open front vowel. Examples can be seen in the following table.

/j/	ʔo ³³	j	iŋ ³³	‘flower’
	ʔo ³³	j	i ³¹ kai ³¹	‘work’
		j	up ³⁵ ʔai ³¹	‘lie down’
	næ ³³	j	en ³³	‘opium’
		j	oŋ ³¹ naŋ ³⁵	‘gibbon’
		j	æk ³³ kiəw ³¹	‘mosquito’
		j	am ³³	‘boat’

Table 31. Bantang Approximant /j/

The alveolar lateral approximant /l/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/l/	ti ³³	l	i ³³	‘smooth’
	cu ³³	l	u ³¹ cu ³³ ʔai ³¹	‘shiver’
	tu ³³	l	e ³¹ ʔai ³¹	‘think’
		l	oŋ ³³ maŋ ³³	‘lake’
		l	ə ³³ ʔai ³¹	‘grind’
	toŋ ³³	l	æ ³³ ʔai ³¹	‘wait’
	pi ³³	l	aŋ ³¹	‘moon’

Table 32. Bantang Approximant /l/

3.1.2.2 Bantang Consonant Distribution within the word

The numbers in the following table show the frequency of consonants in the initial position.

Initial Consonants												
	p	p ^h	b	t	t ^h	d	c	c ^h	k	k ^h	g	ʔ
\$-----	34	27	4	32	31	1	21	17	40	69	-	103
\$----- V	64	58	7	56	44	1	32	63	76	95	3	220
----- \$	16	-	-	26	-	-	-	-	11	-	-	53

Initial Consonants													
	m	n	ɲ	ŋ	v	s	ʃ	ʎ	h	ɦ	w	j	l
\$-----	44	34	4	-	-	37	13	3	45	1	-	32	44
\$----- V	96	50	9	13	11	46	27	17	50	2	5	46	125
----- \$	50	17	-	51	-	-	-	-	-	-	-	-	-

Table 33. Bantang Consonant Distribution

3.1.2.3 Bantang Consonant – Vowel Distribution

Consonants	Vowels								
	_ɔ	_ə	_a	_e	_i	_o	_i	_æ	_u
p									
p ^h									
t									
t ^h									
c									
k									
ʔ									
c ^h									
b									
d									
k ^h									
g									
m									
n									
ɲ									
s									
ʃ									
h									
v									
ɣ									
ɦ									
j									
l									
w									

Table 34. Bantang Consonant – Vowel Distribution

From the table above, the shaded cells refers to observed consonant-vowel sequences in Bantang. The blank cells refers to not observed patterns.

3.1.3 Bantang Consonant Clusters

There are no consonant clusters in Bantang. In this analysis clusters with high vowels /i/ or /u/ initially are not interpreted as /j/ and /w/ respectively.

3.1.4 Bantang Vowels

Bantang has nine vowels and nine diphthongs. Vowels and diphthongs are discussed in the following sections.

3.1.4.1 Bantang Observed Vowel Chart

The phonemic inventory of vowels in Bantang is shown in table 35.

	Front unrounded	Central unrounded	Back rounded
Close	i	ɨ	u
Close-mid	e		o
		ə	
Open-mid			ɔ
	æ		
Open	a		

Table 35. Bantang Vowel Inventory

3.1.4.2 Bantang Vowel Contrasts

The vowel contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/i/ /i/	t i ³¹ p ^{hi} ŋ ³³	‘some’		t i ³³ li ³³	‘smooth’
/i/ /e/	t i ³¹ k ^h a ³³	‘liquor’		t e ³¹ li ^{u35}	‘push’
/i/ /u/	t ^h i ³³ li ⁿ³¹	‘peanut’		t ^h u ³³ ʔai ³¹	‘thick’
/i/ /ə/	p i ³³ lo ³³ kai ³¹	‘scratch’		p ə ³¹ pa ^{ʔ33}	‘check’
/u/ /o/	m u ³³ ʔai ³¹	‘long’		m o ³³ ʔai ³¹	‘see’
/e/ /ə/	ʔo ³³ kiəm ³¹ ca ³³ v e ³¹	‘laundry’		pu ³⁵ v ə ³³ ga ³¹ vi ³¹	‘float (object)’
/e/ /æ/	t u ³³ e ³¹ ʔai ³¹	‘think’		pi ³³ l æ ³¹ ʔai ³¹	‘hate’
/o/ /ə/	p o ³³ loŋ ³³	‘cooking pot’		p ə ³³ ʔai ³¹	‘shoot’
/o/ /ɔ/	k o ɲ ³³ ʔai ³¹	‘sell’		k ɔ n ³³	‘spoon’
/ɔ/ /ə/	t ɔ p ³³	‘answer’		ha ³³ t ə ʔ ³³	‘salt’
/æ/ /ə/	p æ ³¹ jo ³¹	‘bee’		p ə ³³ ʔai ³¹	‘shoot’
/æ/ /a/	toŋ ³³ l æ ³³ ʔai ³¹	‘wait’		pa ³³ l a ³³ ya ³¹	‘thin’
/a/ /ɔ/	k a ɲ ³¹ kiə ³³	‘mountain’		k ɔ n ³³	‘spoon’
/a/ /ə/	ca ³³ l a ³³	‘tiger’		l ə ³³ ʔai ³¹	‘grind’

Table 36. Bantang Vowel Contrasts

3.1.4.3 Bantang Consonant Vowel Distribution

The distribution of vowels occurring with consonants is summarized in the following table.

Consonants	Vowels								
	_ɔ	_ə	_a	_e	_i	_o	_i	_æ	_u
p	1	2	6	2	23	10	3	10	7
p ^h	-	2	14	5	27	-	5	-	5
t	2	1	9	2	13	15	3	1	10
t ^h	1	3	9	3	15	3	4	-	6
c	-	-	11	12	2	2	-	-	5
k	3	1	33	2	14	9	6	-	8
ʔ	-	-	134	9	11	56	3	-	7
c ^h	3	-	6	8	7	6	6	1	26
b	-	-	2	-	2	1	1	-	1
d	-	-	-	-	1	-	-	-	-
k ^h	11	1	48	1	10	2	18	-	4
g	-	-	2	-	-	-	1	-	-
m	-	-	25	6	37	12	8	1	7
n	-	-	29	1	9	-	6	1	4
ɲ	-	-	1	-	1	-	-	-	7
ŋ	-	-	13	-	-	-	-	-	-
s	-	-	30	-	6	2	5	-	3
ʃ	-	-	-	-	26	-	1	-	-
h	-	-	16	-	2	25	4	-	3
v	-	1	-	1	6	3	-	-	-
ɣ	-	-	16	-	-	-	1	-	-
ɦ	-	-	2	-	-	-	-	-	-
j	-	-	29	1	1	5	3	1	6
l	2	3	68	8	5	24	5	2	8
w	-	-	4	-	-	1	-	-	-

Table 37. Bantang Consonant Vowel Distribution

Table 37 shows the frequency of consonant-vowel sequences. The most common consonant is the glottal plosive /ʔ/. The most common vowel is the unrounded open front vowel /a/. Both of these consonant and vowel present as the common distribution. This is because many nouns have an /ʔa/ prefix.

3.1.5 Bantang Diphthongs

There are six diphthongs found in Bantang. These are /ɔi/, /ai/, /au/, /eo/, /iə/, and /iu/. The most common diphthong is /ai/. The least common diphthongs are /ɔi/ and /ua/.

	_ə	_a	_i	_o	_u
ɔ	-	-	2		-
a	-	-	138		22
e				3	
i	38	-	-		15

Table 38. Bantang Diphthongs

3.1.6 Bantang Tones

There are three tones showing contrast. One tone, the mid tone is level, while the high tone rises from mid to high and the low tone falls from mid to low. The tones used in this analysis are expressed numerically. High tone is 35. Mid tone is 33. Low tone is 31.

High	35	mi ³¹	pi ³⁵	
Mid	33		pi ³³	ki ³⁵
Low	31		pi ³¹	lai ³¹

Table 39. Bantang Tonal Phonemes

3.1.6.1 Bantang Tone contrasts

The minimal pairs showing tone contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/35/ /33/	mi ³¹ pi ³⁵	‘chin’		pi ³³ ki ³⁵	‘star’
/33/ /31/		‘star’		pi ³¹ lai ³¹	‘give’
/35/ /31/	mi ³¹ pi ³⁵	‘chin’		pi ³¹ lai ³¹	‘give’

Table 40. Bantang Tone Contrasts

3.1.6.2 Bantang Tone Distribution

Tone distribution was also considered with respect to syllable position within the word.

3.1.6.2.1 Bantang Tones in the Initial Syllable

The following table shows the distribution of tones in the initial syllable.

High	35	ja ³⁵	ni ³¹	‘year’
Mid	33	ja ³³	c ^h u ³³	‘chicken’
Low	31	ja ³¹	pai ³¹	‘stand’

Table 41. Bantang Tones in the Initial Syllable

From the table, high tones, mid tones, and low tones occur in the initial syllable within the same environment.

3.1.6.2.2 Bantang Tones in the Medial Syllable

The following table shows the distribution of tones in the medial syllable.

High	35	mi ³¹ mi ³³	c ^h u ³⁵	lo ³³ ka ³³ lam ³³	‘shave (beard)’
Mid	33	ʔa ³³ c ^h u ³¹	c ^h u ³³	ʔai ³¹	‘bathe’
Low	31	ku ³¹	c ^h u ³¹	naŋ ³³ c ^h a ³³	‘sweat’

Table 42. Bantang Tones in the Medial Syllable

From the table, high tones, mid tones, and low tones occur in the medial syllable within the same environment.

3.1.6.2.3 Bantang Tones in the Final Syllable

The following table shows the distribution of tones in the final syllable.

High	35	mi ³¹	pi ³⁵	'chin'
Mid	33	ʔa ³³	pi ³³	'duck'

Table 43. Bantang Tones in Final Syllable

From the table, high tones and mid tones occur in the final syllable within the same environment. Since the low tone is not present word final (final syllable) there may be a word level phonological process occurring.

3.1.6.3 Summary of Bantang Tones Distribution

In Bantang, high tone and mid tone occur in all syllable position of the word. However, low tone never occurs word final.

3.2 Bisu

According to Gordon (2005), Bisu is classified as Sino-Tibetan, Tibeto-Burman, Lolo-Burmese, Loloish, and Southern. The populations of Bisu people are around 1,000 in Thailand. They live on mountainous slopes in southwest Chiang Rai and in north of Lampang in Thailand. In China Bisu are found in the Xishuangbanna area of southwestern Yunnan province. In Thailand, there are two main villages. The largest village has 100 houses. They have their own traditional religion.

The details about syllable structures, consonants, consonant clusters, plain vowels, diphthongs, and tones will be discussed in the following sections.

3.2.1 Bisu Syllable Structure Types

Bisu has seven types; these are CV, CVC, CCV, CCVC, CVV, CVVC, and CCVV. Each type will be explained in the following sections.

3.2.1.1 Bisu CV Syllable Structure

The CV syllable type contains one consonant in the initial position and one vowel.

Phonetic	Gloss
p ^h i ³⁵	‘burn’
t ^h i ³¹	‘one’
ci ³¹	‘speak’
ha ³⁵	‘five’
sæ ³¹	‘kill’

Table 44. Bisu CV Syllable Structure

3.2.1.2 Bisu CVC Syllable Structure

The CVC syllable type contains two consonants, one in the initial position, one the final position, and one vowel.

Phonetic	Gloss
juŋ ³¹	‘sleep’
tuŋ ³¹	‘dig’
diŋ ³⁵	‘live’
tan ³¹	‘push’
kɔŋ ³¹	‘sell’

Table 45. Bisu CVC Syllable Structure

3.2.1.3 Bisu CCV Syllable Structure

The CCV syllable type contains two consonants in the initial position forming a cluster and one vowel.

Phonetic	Gloss
p ^h lu ³³	‘silver’
ʔaŋ ³³ kli ³⁵	‘wide, broad’

Table 46. Bisu CCV Syllable Structure

3.2.1.4 Bisu CCVC Syllable Structure

The CCVC syllable type contains three consonants, two in the initial position forming a cluster, one in the final position, and one vowel.

Phonetic	Gloss
ʔa ³³ k ^h lɔŋ ³³	‘bamboo’
ʔaŋ ³³ blɔŋ ³⁵	‘husband’
ʔaŋ ³³ plɔŋ ³³	‘black’
tuk ³¹ klæn ³¹	‘bald’

Table 47. Bisu CCVC Syllable Structure

3.2.1.5 Bisu CVV Syllable Structure

The CVV syllable type contains one consonant in the initial position and two vowels forming a diphthong.

Phonetic	Gloss
məi ³³	‘mist’
sai ³¹	‘sand’
ʔaŋ ³³ mau ³³	‘lungs’
hau ³³	‘shout’
kau ³⁵	‘nine’

Table 48. Bisu CVV Syllable Structure

3.2.1.6 Bisu CVVC Syllable Structure

The CVVC syllable type contains two consonants, one in the initial position, one in the final position, and two vowels forming a diphthong. Note there is not much data showing for examples.

Phonetic	Gloss
ʔa ³³ miəŋ ³³	‘cow’
t ^h iən ³¹	‘noon’

Table 49. Bisu CVVC Syllable Structure

3.2.1.7 Bisu CCVV Syllable Structure

The CCVV syllable type contains two consonants in the initial position forming a cluster and two vowels forming a diphthong.

Phonetic	Gloss
k ^h lui ³¹	‘flute’
laŋ ³³ klau ³⁵¹	‘bathe’
liŋ ³³ t ^h sa ³⁵¹ klau ³¹⁵ t ^h ŋ ³⁵	‘bury (a corpse)’

Table 50. Bisu CCVV Syllable Structure

3.2.2 Bisu Consonants

Bisu has twenty two consonants. A phonemic inventory of consonants in Bisu is shown in table 51.

	Bilabial		Labiodental		Alveolar		Postalveolar		Palatal		Velar		Glottal	
Plosive	p	b			t	d			c		k		ʔ	
Aspirated Plosive	p ^h				t ^h				c ^h		k ^h			
Nasal		m				n						ŋ		
Fricative			f		s		ʃ						h	
Affricate					ts									
Approximant			w							j				
Lateral Approximant						l								

Table 51. Bisu Consonant Inventory

The follow sections provide evidence for the phonemes as well as distributional information.

3.2.2.1 Bisu Consonant Contrasts

The consonant contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/p/ /b/	p a ³¹ siŋ ³¹	‘nail’		b a ³¹ so ³³	‘hate’
/p/ /p ^h /	p uŋ ³⁵	‘swell’		p ^h uŋ ³¹	‘boil’
/b/ /m/	b ot ³¹	‘grind’		m ot ³⁵ mu ³¹	‘all’
/t/ /d/	t an ³¹	‘push’		d aŋ ³³	‘sick’
/t/ /t ^h /	t i ³¹	‘hit’		t ^h i ³¹	‘one’
/t/ /ʔ/	t uŋ ³¹	‘dig’		ʔ uŋ ³⁵	‘weep’
/c/ /c ^h /	c i ³¹	‘speak’		c ^h i ³¹	‘blood’
/c/ /k/	c uŋ ³⁵	‘stand’		k uŋ ³¹	‘sew’
/k/ /k ^h /	k a ³³ lat ³³	‘paper’		k ^h a ³¹ lau ³³	‘shirt’
/m/ /n/	m an ³¹ mi ³¹	‘beard’		n aŋ ³⁵	‘swallow’
/f/ /s/	f a ³³	‘cloud’		s a ³³ toŋ ³³	‘navel’
/s/ /ʃ/	s a ³³ toŋ ³³	‘navel’		ʃ am ³³	‘iron’
/ʃ/ /h/	ʃ am ³³	‘iron’		h a ³³ ja ³¹	‘bird’
/h/ /ʔ/	h aŋ ³¹ miŋ ³³	‘cooked rice (sticky)’		ʔ aŋ ³³ meŋ ³³	‘name’
/w/ /j/	w a ³¹	‘pig’		j a ³¹ fiŋ ³³	‘opium’
/d/ /n/	d aŋ ³³	‘sick’		n aŋ ³⁵	‘swallow’
/n/ /l/	n iŋ ³³ ba ³³	‘heart’		l iŋ ³¹ koŋ ³³	‘day’
/m/ /w/	m æ ³³ ka ³⁵¹	‘face’		w æ ³³ ja ³³	‘flower’
/f/ /w/	f a ³³	‘cloud’		w a ³¹	‘pig’
/ʔ/ /k/	ʔ uŋ ³⁵	‘weep’		k uŋ ³¹	‘sew’
/ʔ/ /c/	ʔ an ³³ pu ³⁵¹	‘rotten’		c an ³³	‘plate’
/ʔ/ /t/	ʔ i ³³	‘laugh’		t i ³¹	‘hit’
/ʔ/ /p/	ʔ uŋ ³⁵	‘weep’		p uŋ ³⁵	‘swell’
/ts/ /t/	ts uŋ ³⁵	‘wring’		t uŋ ³¹	‘dig’
/ts/ /ʃ/	ts am ³¹ mæ ³¹	‘salt’		ʃ am ³³	‘iron’
/ts/ /t ^h /	ts i ³¹ k ^h o ³¹	‘cucumber’		t ^h i ³¹	‘one’
/ts/ /s/	ts oŋ ³¹ koŋ ³³	‘forest’		s oŋ ³¹	‘two’

Table 52. Bisu Consonant Contrasts

3.2.2.1.1 Bisu Plosives

The voiceless unaspirated bilabial plosive /p/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p/	laʔ ³¹	p	iŋ ³⁵ naɛ ³³	‘red pepper’
	ka ³³	p	i ³⁵¹	‘rice husk’
		p	uŋ ³⁵	‘swell’
		p	eŋ ³¹ loŋ ³⁵	‘sing’
		p	əŋ ³⁵	‘shoot’
	ho ³³	p	oŋ ³¹	‘deer’
	caʔ ³¹	p	æk ³¹	‘snail’
	ʔaŋ ³³	p	a ³⁵¹	‘thin’

Table 53. Bisu Plosive /p/

The voiceless aspirated bilabial plosive /p^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p ^h /		p ^h	i ³⁵	‘burn’
		p ^h	iŋ ³⁵	‘tie’
		p ^h	uŋ ³¹	‘boil’
	so ³¹	p ^h	e ³¹	‘tooth’
	k ^h au ³¹	p ^h	ot ³¹	‘corn’
	pa ³¹ p ^h æk ³¹	p ^h	æ ³³	‘vomit’
	kaŋ ³¹	p ^h	a ³¹ tæŋ ³¹	‘cook (a meal)’

Table 54. Bisu Plosive /p^h/

The voiced bilabial plosive /b/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/b/		b	i ³³ t ^h ɔ ³¹	‘firewood’
	mæ ³¹	b	ɨŋ ³³ bɨn ³³	‘dream’
	haŋ ³¹	b	uŋ ³⁵	‘steam’
		b	ot ³¹	‘grind’
		b	ɔ ³¹	‘play’
		b	æŋ ³⁵	‘know’
	ʔa ³³	b	a ³³	‘mother’

Table 55. Bisu Plosive /b/

The voiceless unaspirated alveolar plosive /t/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/t/		t	i ³¹ pan ³³	‘thousand’
		t	ɨŋ ³¹ ka ³¹	‘sarong’
	ʔaŋ ³³ kaŋ ³¹⁵	t	um ³³ lau ³³	‘to dry’
	hɔm ³¹	t	em ³¹	‘garlic’
	ʔaŋ ³³	t	ɔŋ ³³	‘wing’
	lɔŋ ³³	t	æ ³¹	‘fish’
		t	am ³¹	‘cave’

Table 56. Bisu Plosive /t/

The voiceless aspirated alveolar plosive /t^h/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded open-mid back vowel

/ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/.

Examples can be seen in the following table.

/t ^h /		t ^h	i ³¹	‘one’
		t ^h	u ³³ lin ³³	‘bean’
	kɔ ³³	t ^h	ɔŋ ³⁵¹	‘pound (rice)’
	ʔaŋ ³³	t ^h	æŋ ³⁵¹	‘narrow’
	ʔaŋ ³³	t ^h	a ³³	‘sharp’

Table 57. Bisu Plosive /t^h/

The voiced alveolar plosive /d/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/d/		d	i ³¹ c ^h i ³³	‘tomorrow’
		d	ɨŋ ³⁵	‘live’
	ʔaŋ ³³	d	ɔŋ ³⁵ ja ³⁵¹	‘weak’
		d	æ ³¹ ja ³¹	‘ghost’
		d	aŋ ³³	‘sick’

Table 58. Bisu Plosive /d/

The voiceless unaspirated palatal plosive /c/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c/		c	i ³¹	‘speak’
	ʔaŋ ³³ jau ³¹	c	i ³³	‘seed (grain)’
		c	um ³³	‘sink’
	muŋ ³¹	c	e ³³ ce ³³	‘thunder’
	ba ³⁵	c	ə ³⁵	‘what?’
	can ³³ bæn ³³	c	ɔ ³⁵¹	‘wash (dishes)’
		c	am ³³ kiŋ ³³	‘hair’

Table 59. Bisu Plosive /c/

The voiceless aspirated palatal plosive /c^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c ^h /		c ^h	i ³¹	‘blood’
	təŋ ³¹	c ^h	i ³¹ lan ³⁵	‘candle’
	hɔ ³³	c ^h	u ³¹	‘porcupine’
	kɔ ³³	c ^h	en ³³	‘pounded rice’
		c ^h	ɔk ³¹ ʔun ³⁵	‘suck’
	c ^h ɔ ³¹ miə ³¹	c ^h	æ ³⁵¹	‘yawn’
	ke ³³ ke ³³	c ^h	aŋ ³¹	‘shadow (person)’

Table 60. Bisu Plosive /c^h/

The voiceless unaspirated velar plosive /k/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel. Examples can be seen in the following table.

/k/		k	im ³³ ba ³³	‘road, path’
	ʔu ³³	k	i ³³	‘star’
		k	u ³¹ mæn ³³ lam ³³	‘spider’
	ke ³³	k	e ³³ c ^h aŋ ³¹	‘shadow (person)’
		k	op ³³ na ³³	‘frog’
	lau ³⁵	k	əŋ ³⁵¹	‘where?’
	miŋ ³³	k	oŋ ³³	‘yesterday’
	kɔ ³¹	k	æŋ ³⁵¹	‘calf’
		k	a ³³ səi ³¹	‘monkey’

Table 61. Bisu Plosive /k/

The voiceless aspirated velar plosive /k^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/k ^h /	muŋ ³¹	k ^h	i ³¹	‘night’
		k ^h	ɨ ³¹	‘dog’
	man ³¹ mi ³¹	k ^h	un ³⁵	‘shave (beard)’
	mæ ³¹	k ^h	oŋ ³³	‘forehead’
		k ^h	æŋ ³⁵	‘afraid’
	mi ³¹ hau ³¹	k ^h	a ³³ la ³⁵	‘ashes’

Table 62. Bisu Plosive /k^h/

The glottal /ʔ/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ʔ/	c ^{hi} 31	ʔ	i ³³ læ ³³	‘take’
	jik ³¹	ʔ	iŋ ³⁵	‘shiver’
		ʔ	u ³³ lɔŋ ³¹	‘cooking pot’
		ʔ	ɔŋ ³³	‘enter’
		ʔ	æŋ ³¹	‘excrement’
	ʔaŋ ³³	ʔ	aŋ ³⁵	‘old’

Table 63. Bisu Plosive /ʔ/

3.2.2.1.2 Bisu Nasals

The bilabial nasal /m/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/m/		m	iŋ ³³ kɔŋ ³³	‘yesterday’
	ʔaŋ ³³	m	it ³⁵¹	‘tired’
		m	uŋ ³¹	‘sky’
	ʔa ³³	m	eŋ ³³	‘cat’
		m	ot ³⁵ mu ³¹	‘all’
		m	ɔ ³³ joŋ ³³	‘gong’
	ku ³¹	m	æn ³³ lam ³³	‘spider’
	ʔaŋ ³³	m	a ³³	‘flesh’

Table 64. Bisu Nasal /m/

The alveolar nasal /n/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/n/		n	ɲ ³³ ba ³³	‘heart’
	tan ³³	n	u ³³	‘crossbow’
	tun ³¹	n	ɔ ³¹	‘brain’
	ʔaŋ ³³	n	æ ³³	‘red’
	pɔŋ ³¹	n	a ³³ kiəw ³⁵	‘horn’

Table 65. Bisu Nasal /n/

The velar nasal /ŋ/ only occurs before the unrounded open front vowels /a/. The example can be seen in the following table. Note there are limited occurrence and subsequent distribution.

/ŋ/	tsiŋ ³¹ tsiŋ ³³ laŋ ³¹	ŋ	am ³³	‘branch’
	ko ³¹	ŋ	aŋ ³³	‘winnow (rice)’

Table 66. Bisu Nasal /ŋ/

3.2.2.1.3 Bisu Fricatives and Affricates

The voiceless labiodental fricative /f/ only occurs before the unrounded open front vowel /a/. The example can be seen in the following table.

/f/		f	a ³³	‘cloud’
	ja ³¹	f	iŋ ³³	‘opium’

Table 67. Bisu Fricative /f/

The voiceless alveolar fricative /s/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/s/	ʔaŋ ³³ piəŋ ³³	s	i ³¹	‘rib’
	tsiŋ ³¹	s	i ³³ laŋ ³¹ si ³³	‘fruit’
	tɔ ³¹	s	uŋ ³⁵	‘fight’
		s	on ³¹	‘garden’
		s	ɔ ³¹ p ^h e ³¹	‘tooth’
	tik ³¹	s	æ ³¹	‘ten’
	ʔaŋ ³³	s	a ³¹ kaŋ ³⁵	‘breath’

Table 68. Bisu Fricative /s/

The voiceless postalveolar fricative /ʃ/ only occurs before the unrounded open front vowel /a/. The example can be seen in the following table.

/ʃ/		ʃ	am ³³	‘iron’
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Table 69. Bisu Fricative /ʃ/

The voiceless glottal fricative /h/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/h/	ʔaŋ ³³	h	i ³⁵¹	‘big’
	pi ³³	h	uŋ ³³ laŋ ³³ c ^h u ³¹	‘rainbow’
	ʔu ³³	h	oŋ ³¹	‘turtle’
	ʔu ³³	h	ən ³¹	‘termite’
		h	ɔ ³³ pəŋ ³¹	‘deer’
		h	æŋ ³³	‘that’
	ʔaŋ ³³	h	an ³⁵¹	‘heavy’

Table 70. Bisu Fricative /h/

The alveolar affricate /ts/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded

close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. The alveolar affricate /ts/ is interpreted as a consonant in this study. Examples can be seen in the following table.

/ts/	tsiŋ ³³	ts	iŋ ³³ c ^h um ³¹	‘shade’
		ts	uŋ ³⁵	‘wring’
		ts	en ³³	‘louse’
	ʔaŋ ³³	ts	iŋ ³¹	‘liver’
	la ³¹	ts	ɔŋ ³¹	‘ring’
		ts	æŋ ³¹	‘bite’
		ts	am ³¹ mæ ³¹	‘salt’

Table 71. Bisu Affricate /ts/

3.2.2.1.4 Bisu Approximants

The voiced labial-velar approximant /w/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the central vowel /ə/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/w/		w	iŋ ³⁵	‘throw away’
		w	iŋ ³³	‘buy’
	ʔaŋ ³³	w	ə ³⁵¹	‘far’
		w	æ ³³ ja ³³	‘flower’
	ʔa ³³	w	am ³³	‘bear’

Table 72. Bisu Approximant /w/

The palatal approximant /j/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, the rounded

open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/j/		j	ik ³¹ ɔiŋ ³⁵	‘shiver’
	la ³¹	j	um ³³	‘finger’
	mɔ ³³	j	oŋ ³³	‘gong’
		j	ɔp ³¹ ɔim ³⁵	‘lie, fib’
	ka ³³	j	aŋ ³⁵¹ ka ³⁵	‘some’

Table 73. Bisu Approximant /j/

The alveolar lateral approximant /l/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/l/	t ^h u ³³	l	in ³³	‘bean’
		l	iŋ ³⁵ si ³⁵¹	‘neck’
		l	uŋ ³³	‘forget’
		l	ew ³⁵	‘turn’
	mæ ³¹	l	oŋ ³³	‘gibbon’
		l	ɔŋ ³³ pən ³¹	‘mud’
	c ^h i ³¹ ɔi ³³	l	æ ³³	‘take’
	pi ³³ huŋ ³³	l	aŋ ³³ c ^h u ³¹	‘rainbow’

Table 74. Bisu Approximant /l/

3.2.2.2 Bisu Consonant Distribution within the Word

The numbers in the following table show the frequency of consonants in the initial position.

Initial Consonants											
	p	p ^h	b	t	t ^h	d	c	c ^h	k	k ^h	ʔ
\$-----	42	6	23	87	7	8	27	12	58	73	291
\$----- V	93	20	60	92	21	9	40	49	126	127	338
----- \$	2	-	-	35	-	-	-	-	12	-	-

Initial Consonants											
	m	n	ŋ	f	s	ʃ	h	ts	w	j	l
\$-----	62	26	-	1	43	2	49	54	13	20	66
\$----- V	117	50	2	4	30	2	67	111	23	45	174
----- \$	66	84	223	-	-	-	-	-	3	-	-

Table 75. Bisu Consonant Distribution

3.2.2.3 Bisu Consonant – Vowel Distribution

Consonants	Vowels								
	_o	_ə	_a	_e	_i	_o	_i	_æ	_u
p									
p ^h									
b									
t									
t ^h									
d									
c									
c ^h									
k									
k ^h									
ʔ									
m									
n									
ɲ									
ŋ									
f									
s									
ʃ									
h									
j									
ts									
l									
w									

Table 76. Bisu Consonant – Vowel Distribution.

From the table above, the shaded cells refer to the occurrence of consonant-vowel sequences in Bisu. The blank cells refers to not observed sequences.

3.2.3 Bisu Consonant Clusters

In the syllable initial position, Bisu has only one consonants occurring as the second element forming consonant clusters, namely /l/.

Consonant Clusters with /l/ in Bisu

In the first element, there are five consonants, which are /p, /p^h/, /b/, /k/, and /k^h/ attached with /l/ occurring in the second element to form consonant clusters in Bisu.

Consonant Clusters	Words			Gloss
pl	p	l	ak ³¹	‘split’
p ^h l	p ^h	l	u ³³	‘silver’
bl	muŋ ³¹	b	lap ³³	‘lightning’
kl	k	l	aŋ ³¹⁵	‘fall’
k ^h l	ʔa ³³ k ^h	l	ɔŋ ³³	‘bamboo’

Table 77. Bisu Consonant Cluster with /l/

3.2.3.2 Bisu Consonant Cluster Distribution

The distribution of consonant clusters in Bisu can be presented in terms of number in order to see the frequency of the occurrence for consonants in the initial element attaching to consonants in the second element. The frequency mentioned can be seen in the following table.

Second Consonant	Initial Consonants				
	p	p ^h	b	k	k ^h
l	6	2	3	11	4

Table 78. Bisu Consonant Cluster Distribution

3.2.4 Bisu Vowels

Bisu has nine vowels and seven diphthongs. Vowels and diphthongs are explained in the following sections.

3.2.4.1 Bisu Observe Vowel Chart

Bisu shows a 9-vowel inventory. The phonemic inventory of vowels in Bisu is shown in Table 79.

	Front unrounded	Central unrounded	Back rounded
Close	i	ɨ	u
Close-mid	e		o
		ə	
Open-mid			ɔ
	æ		
Open	a		

Table 79. Bisu Vowel Inventory

3.2.4.2 Bisu Vowel Contrasts

Evidence for the nine Bisu vowel, namely minimal and near-minimal pairs, are shown in the following table.

Minimal Pair	Suspect Pair		Gloss		Suspect Pair		Gloss
/i/ /i/	t	i ³¹ pan ³³	‘thousand’		t	i ³¹	‘hit’
/i/ /e/	m	i ³³ kəŋ ³³	‘yesterday’		ʔaŋ ³³ m	e ³³	‘name’
/i/ /u/	tsiŋ ³¹ ts	i ³³	‘tree’		təŋ ³¹ ts	u ³¹	‘mortar’
/i/ /ə/	cam ³³ k	i ³³	‘hair’		lau ³⁵ k	ə ³⁵¹	‘where?’
/u/ /o/	pa ³¹ h	u ³¹	‘shoulder’		ʔu ³³ h	o ³¹	‘turtle’
/e/ /ə/	p	e ³¹ ləŋ ³⁵	‘sing’		p	ə ³¹⁵	‘shoot’
/e/ /æ/	k	e ³⁵	‘scratch’		kə ³¹ k	æ ³⁵¹	‘calf’
/o/ /ə/	ʔu ³³ h	o ³¹	‘turtle’		ʔu ³³ h	ə ⁿ³¹	‘termite’
/o/ /ɔ/	ʔaŋ ³³ s	o ³³ sa ³³	‘dirty’		s	ɔ ³¹	‘two’
/ɔ/ /ə/	p	ɔ ³¹ pəŋ ³⁵	‘abdomen’		p	ə ³¹⁵	‘shoot’
/æ/ /ə/	ʔaŋ ³³ k	æ ⁿ³⁵¹	‘hard’		lau ³⁵ k	ə ³⁵¹	‘where?’
/æ/ /a/	t	æ ³³ p ^h u ³³	‘mat’		t	a ³¹ tsæ ³³	‘mountain’
/a/ /ɔ/	tʂa ³¹ l	a ³³	‘tiger’		tɔ ³³ l	ɔ ³³	‘butterfly’
/a/ /ə/	h	a ³¹ buŋ ³⁵	‘steam’		ʔu ³³ h	ə ⁿ³¹	‘termite’

Table 80. Bisu Vowel Contrasts

3.2.4.3 Bisu Consonant Vowel Distribution

The phonemic description of vowels occurring with consonants can be expressed in a table. The co-occurrence of vowels and consonants is given in the following table.

Consonants	Vowels								
	_o	_ə	_a	_e	_i	_o	_i	_æ	_u
p	21	3	23	4	11	-	1	10	3
p ^h	-	-	2	1	9	1	1	3	3
b	4	-	30	-	7	7	3	5	4
t	23	-	12	1	1	-	16	10	29
t ^h	6	-	6	-	1	-	1	2	5
d	1	-	1	-	1	-	4	2	-
c	3	1	8	19	4	-	1	-	4
c ^h	2	1	9	11	11	-	7	1	7
k	27	1	64	4	2	2	13	6	4
k ^h	19	-	65	-	3	-	27	1	8
ʔ	2	-	265	-	9	-	21	2	40
m	14	4	27	4	21	1	9	18	13
n	1	-	32	-	-	-	10	5	2
ɲ	-	-	-	-	1	-	-	-	-
ŋ	-	-	2	-	-	-	-	-	-
f	-	-	1	-	3	-	-	-	-
s	10	1	58	1	17	3	43	5	3
ʃ	-	-	2	-	-	-	-	-	-
h	10	1	30	-	-	9	5	1	2
j	5	-	33	-	12	1	1	1	17
ts	4	-	10	1	2	-	19	2	2
l	26	-	122	1	7	1	9	3	5
w	-	3	17	-	1	-	1	1	-

Table 81. Bisu Phonemic Description

From the table above, it shows the frequency of the consonant and vowel distribution. The most common consonant is the glottal plosive /ʔ/. The most common vowel is the unrounded open front vowel /a/. Both of these consonant and vowel present as the common distribution.

3.2.5 Bisu Diphthongs

There are five diphthongs found in Bisu. The six diphthongs are /ɔi/, /əi/, /ai/, /au/, and /iə/. The most common diphthong is /au/. The least common diphthong is /ɔi/.

	<u>ə</u>	<u>i</u>	<u>u</u>
ɔ	-	3	-
ə	-	6	-
a	-	20	56
i	42	-	-

Table 82. Bisu Diphthongs

3.2.6 Bisu Tones

Bisu shows contrast evidence for four tones. The mid tone is a level tone, the high tone is a rising tone from mid to high, the low tone is a falling tone, from mid to low and the high-falling tone starts out as mid, rises to high and falls to low. The tones used in this analysis are expressed numerically. High tone is 35. Mid tone is 33. Low tone is 31, and High-falling tone is 351. Because of low occurrences for the 351 tone, this study simply shows its existence.

High	35	ka ³³ jaŋ ³⁵¹	ka ³⁵
High-falling	351	ʔaŋ ³³	ka ³⁵¹
Mid	33	bu ³³	ka ³³
Low	31	tsi ³¹	ka ³¹

Table 83. Bisu Tone Phonemes

3.2.6.1 Bisu Tone contrasts

Minimal pairs showing the tone contrasts can be seen in the following table.

Minimal Pair	Suspect Pair		Gloss		Suspect Pair		Gloss
/35/ /33/	ka ³³ jaŋ ³⁵¹	ka ³⁵	‘some’		bu ³³	ka ³³	‘grass’
/33/ /31/		bu ³³	‘grass’		tsi ³¹	ka ³¹	‘medicine’
/35/ /31/	ka ³³ jaŋ ³⁵¹	ka ³⁵	‘some’		tsi ³¹	ka ³¹	‘medicine’

Table 84. Bisu Tone Contrasts

3.2.6.2 Bisu Tone Distribution

Tone distribution is discussed in this thesis in terms of the syllable distribution in words. In the following sections, the discussion focuses on three syllable positions in the word – initial, medial and final.

3.2.6.2.1 Bisu Tones in the Initial Syllable

The following table shows the distribution of tones in the initial syllable.

Mid	33	tɔ ³³	lɔ ³³	‘butterfly’
Low	31	tɔ ³¹	suŋ ³⁵	‘fight’

Table 85. Bisu Tones in the Initial Syllable

From the table, mid tones and low tones occur in the initial syllable within the same environment.

3.2.6.2.2 Bisu Tones in the Medial Syllable

The following table shows the distribution of tones in the medial syllable.

Mid	33	mi ³¹ hau ³¹	k ^h a ³³	la ³⁵	‘ashes’
Low	31	tæ ³¹	k ^h a ³¹	mau ³⁵¹	‘drunk’

Table 86. Bisu Tones in the Medial Syllable

From the table, mid tones and low tones occur in the medial syllable within the same environment.

3.2.6.2.3 Bisu Tones in the Final Syllable

The following table shows the distribution of tones in the final syllable.

High	35	ka ³³ jaŋ ³⁵¹	ka ³⁵	‘some’
Mid	33	bu ³³	ka ³³	‘grass’
Low	31	tʃi ³¹	ka ³¹	‘medicine’

Table 87. Bisu Tones in Final Syllable

From the table, high tones, mid tones, and low tones occur in the final syllable within the same environment.

3.2.6.3 Summary of Bisu Tones Distribution

In Bisu, high tone 35 occurs only on the final syllable. Mid tone 33 and low tone 31 occur in all position of the syllable.

3.3. Cauho

Cauho is one of the distinct language varieties formerly covered by the blanket term “Phunoi” spoken in northern Laos. Discussion of syllable structures, consonants, consonant clusters, plain vowels, diphthongs, and tones are discussed in the following sections.

3.3.1 Cauho Syllable Structure

Cauho has four syllable structure types. There are CV, CVC, CVV, and CVVC syllables. Each type is documented in the following sections.

3.3.1.1 Cauho CV Syllable Structure

The CV syllable type contains one consonant in the initial position and one vowel.

Phonetic	Gloss
sɪ ³³	‘mist’
mu ³¹	‘mushroom’
ja ³⁵	‘field’
tʰə ³¹	‘one’
si ³³	‘four’

Table 88. Cauho CV Syllable Structure

3.3.1.2 Cauho CVC Syllable Structure

The CVC syllable type contains two consonants, one in the initial position, one the final position, and one vowel.

Phonetic	Gloss
ʃuɾ ³¹	‘thorn’
maŋ ³⁵¹	‘mother’
miŋ ³⁵	‘name’
laŋ ³¹	‘hand’
het ³¹	‘two’

Table 89. Cauho CVC Syllable Structure

3.3.1.3 Cauho CVV Syllable Structure

The CVV syllable type contains one consonant in the initial position and two vowels forming a diphthong.

Phonetic	Gloss
piə ³³	‘bee’
tai ³¹⁵	‘eat’
lau ³⁵¹	‘come’
kau ³¹	‘nine’
lai ³³	‘many’

Table 90. Cauho CVV Syllable Structure

3.3.1.4 Cauho CVVC Syllable Structure

The CVVC syllable type contains two consonants, one in the initial position, one in the final position, and two vowels forming a diphthong. Note, this syllable type occurs very infrequently in the wordlist.

Phonetic	Gloss
tu ³¹ k ^h iəp ³³	‘comb’
ku ³¹ kiəp ³¹	‘needle’

Table 91. Cauho CVVC Syllable Structure

3.3.2 Cauho Consonants

Cauho has twenty six consonants. The phonemic inventory of Cauho consonants is shown in Table 92.

	Bilabial		Labioden		Alveolar		Postalveolar		Palatal		Velar		Glottal	
Plosive	p	b			t	d			c		k	g	ʔ	
Aspirated Plosive	p ^h				t ^h				c ^h		k ^h			
Nasal	m̥	m		ɱ	n̥	n			ɲ		ŋ			
Fricative					s		ʃ						h	f̥
Approximant			w						j					
Lateral Approximant						l								

Table 92. Cauho Consonant Inventory

The follow sections provide evidence for the phonemes as well as distributional information.

3.3.2.1 Cauho Consonant Contrasts

The consonant contrasts are shown in the following table.

Minimal Pair	Suspect Pair		Gloss		Suspect Pair		Gloss
/p/ /p ^h /	p	ʔai ³³ ʔai ³¹⁵	‘shoot’		p ^h	ʔin ³³ ʔin ³³	‘termite’
/p/ /b/	p	i ³¹ ʔai ³¹⁵	‘give’		b	i ³¹ t ^h i ³¹	‘extinguish (fire)’
/t/ /t ^h /	t	iŋ ³³ ʔai ³³ c ^h u ³³	‘rainbow’		t ^h	iŋ ³³ ʔai ³¹⁵	‘stab’
/t/ /d/	t	u ³¹ k ^h iəp ³³	‘comb’		d	u ³¹ ŋe ³³	‘tired’
/c/ /c ^h /	c	eŋ ³³ ʔai ³¹⁵	‘bright’		c ^h	æŋ ³¹ ŋæ ³¹	‘cold’
/c/ /k/	c	a ³¹ ʔai ³¹⁵	‘live’		k	a ³¹ p ^h i ³⁵¹	‘rice husk’
/k/ /k ^h /	k	iə ³³ ʔai ³¹⁵	‘heart’		k ^h	iə ³³ ʔai ³³	‘scratch’
/k/ /g/	k	iŋ ³³ ʔai ³³	‘shiver’		g	iŋ ³⁵ ʔai ³¹⁵	‘pull’
/m̥/ /m/	m̥	eŋ ³⁵ nə ³¹	‘yesterday’		m	eŋ ³¹ nai ³¹⁵	‘fast’
/m̥/ /m̥/	m̥	o ³³ ʔai ³¹⁵	‘grind’		ʔa ³³ juŋ ³⁵	m̥a ³³ ŋə ³³	‘who?’
/m/ /m̥/	m	a ³³	‘seed’		ʔa ³³ juŋ ³⁵	m̥a ³³ ŋə ³³	‘who?’
/ŋ/ /n/	siŋ ³¹	n̥a ³¹	‘crossbow’		n	a ³¹ ʔai ³¹⁵	‘tall’
/ŋ/ /ɲ/	siŋ ³¹	n̥a ³¹	‘crossbow’		ɲ	a ³¹ k ^h əŋ ³¹⁵	‘forehead’

Minimal Pair	Suspect Pair		Gloss		Suspect Pair		Gloss
/ŋ/ /ŋj/	siŋ ³¹	ŋ aŋ ³¹	‘crossbow’		tat ³¹ tiŋ ³⁵ lak ³⁵	ŋ a ³¹	‘branch’
/n/ /ŋj/		n aŋ ³³ liŋ ³³	‘gibbon’			ŋ aŋ ³³	‘a fly’
/n/ /ŋj/		n e ³¹ ban ³³ sut ³¹ ŋæ ³³	‘angry’		du ³¹	ŋ e ³³	‘tired’
/ŋj/ /ŋj/		ŋj at ³¹ k ^h ŋ ³¹⁵	‘forehead’		tat ³¹ tiŋ ³⁵ lak ³⁵	ŋ a ³¹	‘branch’
/s/ /ʃ/		s o ³³ daŋ ³³	‘morning’		hoŋ ³¹	ʃ u ³³	‘porcupine’
/ʃ/ /h/	hoŋ ³¹	ʃ u ³³	‘porcupine’		haŋ ³¹	h u ³³ ŋai ³¹⁵	‘steam’
/h/ /fi/		h an ³¹ si ³³ le ³¹ ji ³⁵ ŋai ³¹⁵	‘take’			fi an ³¹ ŋai ³¹⁵	‘heavy’
/m̥/ /w/		m̥ o ³³ ŋai ³¹⁵	‘grind’		lu ³³	w ə ³⁵ si ³³	‘forget’
/m/ /w/		m o ³³ ŋup ³⁵ ʃu ³³ mai ³¹⁵	‘shade’		lu ³³	w ə ³⁵ si ³³	‘forget’
/ŋj/ /w/	ŋa ³³ juŋ ³⁵	ŋj a ³³ ŋə ³³	‘who?’		lu ³³	w ə ³⁵ si ³³	‘forget’
/w/ /j/	lu ³³	w ə ³⁵ si ³³	‘forget’			j o ³³	‘buffalo’
/b/ /m̥/		b ə ³¹ ŋai ³¹⁵	‘big’			m̥ o ³³ ŋai ³¹⁵	‘grind’
/b/ /m/	k ^h a ³¹	b a ³¹	‘wife’			m a ³³	‘seed’
/b/ /ŋj/	bə ³¹	b a ³¹ bə ³⁵¹	‘far’		ŋa ³³ juŋ ³⁵	ŋj a ³³ ŋə ³³	‘who?’
/b/ /w/		b ə ³¹ ŋai ³¹⁵	‘big’		lu ³³	w ə ³⁵ si ³³	‘forget’
/d/ /ŋj/	so ³³	d aŋ ³³	‘morning’		siŋ ³¹	ŋ aŋ ³¹	‘crossbow’
/d/ /n/		d u ³¹ ŋe ³³	‘tired’			n u ³¹ pə ³¹ pə ³¹ ŋai ³¹⁵	‘dream’
/d/ /l/		d æt ³¹	‘ghost’			l æ ³¹	‘that’
/ŋj/ /l/	siŋ ³¹	ŋ aŋ ³¹	‘crossbow’			l aŋ ³¹ t ^h iŋ ³³ toŋ ³¹	‘elbow’
/n/ /l/		n æ ³¹ p ^h i ³¹ ŋai ³¹⁵	‘tie’			l æ ³¹	‘that’
/ŋj/ /j/	ŋ ³¹	ŋj uŋ ³⁵	‘green’		ŋa ³³	j uŋ ³⁵ ka ³¹ ca ³¹ ŋə ³³	‘where?’
/ʔ/ /p/		ʔ i ³¹	‘urine’			p i ³³	‘flute’
/ʔ/ /t/		ʔ o ³³ ŋup ³⁵	‘shadow’			t o ³¹ ŋai ³¹⁵	‘crawl’
/ʔ/ /k/	pa ³¹	ʔ ai ³¹⁵	‘thin’		hak ³¹ ŋa ³¹ laŋ ³¹	k ai ³¹⁵	‘love’
/ʔ/ /h/	puŋ ³⁵	ʔ ai ³³	‘swell’		kap ³¹ m̥iə ³⁵¹	h ai ³³	‘yawn’
/ʔ/ /fi/		ʔ am ³⁵	‘bear’			fi an ³¹ ŋai ³¹⁵	‘heavy’
/ʔ/ /c/		ʔ i ³¹ təŋ ³⁵	‘this’		moŋ ³³ ce ³¹	c i ³³ ŋai ³¹⁵	‘thunder’

Table 93. Cauho Consonant Contrasts

3.3.2.1.1 Cauho Plosives

The voiceless unaspirated bilabial plosive /p/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p/	ʔu ³¹ sap ³¹	p	i ³³ liu ³³	‘snail’
		p	i ³³ ʔai ³¹⁵	‘shoot’
		p	um ³⁵ pu ³³ lup ³⁵¹	‘butterfly’
		p	en ³⁵ ʔa ³¹ laŋ ³¹ kai ³¹⁵	‘exchange’
		p	oŋ ³⁵	‘turtle’
	pu ³¹	p	ə ³⁵ si ³³	‘rotten’
	pa ³¹	p	oŋ ³⁵	‘abdomen’
	nu ³¹ pæ ³¹	p	æ ³¹ ʔai ³¹⁵	‘dream’
	kiə ³¹ ʔa ³¹	p	a ³⁵	‘correct’

Table 94. Cauho Plosive /p/

The voiceless aspirated bilabial plosive /p^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p ^h /		p ^h	i ³³ ki ³³	‘star’
		p ^h	it ³¹ ʔai ³¹⁵	‘burn’
	ta ³³	p ^h	u ³⁵¹	‘mat’
		p ^h	o ³¹ lɔŋ ³¹	‘cooking pot’
	toŋ ³¹	p ^h	a ³¹ tɔŋ ³³	‘thigh’

Table 95. Cauho Plosive /p^h/

The voiced bilabial plosive /b/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/b/		b	i ³¹ k ^h əŋ ³¹	‘smoke’
		b	it ³¹ ʔai ³¹⁵	‘throw away’
	m ³³	b	o ³¹	‘grass’
	ʔa ³¹	b	ə ³¹ pa ³¹ k ^h i ³⁵¹	‘left side’
	m ³³	b	ɔŋ ³⁵	‘husband’
	muŋ ³⁵¹	b	æn ³³ lak ³¹ ʔai ³¹⁵	‘lightning’
	net ³¹	b	a ³³ c ^h i ³¹	‘heart’

Table 96. Cauho Plosive /b/

The voiceless unaspirated alveolar plosive /t/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/t/	tat ³¹	t	iŋ ³⁵ sæ ³¹⁵	'root'
		t	uŋ ³³ ʔai ³¹⁵	'fat'
		t	e ³¹ k ^h a ³⁵	'liquor'
		t	o ³³ k ^h u ^{ʔ35}	'pillow'
	ʔi ³¹	t	əʔ ³⁵	'this'
	na ³¹	t	ɔŋ ³⁵¹ miŋ ³³ ʔai ³³	'snore'
	k ^h ot ³¹ lɔŋ ³⁵	t	æ ³¹	'forest'
		t	a ³³ p ^h u ³⁵¹	'mat'

Table 97. Cauho Plosive /t/

The voiceless aspirated alveolar plosive /t^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/t ^h /	p ^h a ³¹	t ^h	i ³⁵ tu ³³	'knee'
		t ^h	iŋ ³¹ ʔai ³¹⁵	'cough'
		t ^h	u ³⁵¹ ʔai ³¹⁵	'wring'
	tɔn ³³	t ^h	eŋ ³³	'noon'
	p ^h iŋ ³¹	t ^h	o ³⁵ ʔai ³³	'sing'
		t ^h	ə ³¹	'one'
		t ^h	æt ³³	'deer'
	moŋ ³³	t ^h	a ³¹	'sky'

Table 98. Cauho Plosive /t^h/

The voiced alveolar plosive /d/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/d/	di ³³	d	i ³⁵ ja ³¹	‘near’
		d	u ³¹ ŋe ³³	‘tired’
		d	æt ³¹	‘ghost’
	so ³³	d	aɿ ³³	‘morning’

Table 99. Cauho Plosive /d/

The voiceless unaspirated palatal plosive /c/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c/	moŋ ³³ ce ³¹	c	i ³³ ɾai ³¹⁵	‘thunder’
	ŋ ³³	c	iŋ ³¹ cap ³³ ɾai ³¹⁵	‘laundry’
		c	eŋ ³³ ɾai ³¹⁵	‘bright’
		c	om ³³ ɾai ³³	‘sink’
	ŋ ³³	c	əŋ ³³ lap ³³ ɾai ³¹⁵	‘to dry’
	t ^h əŋ ³¹ k ^h a ³¹	c	aɿ ³³	‘all’

Table 100. Cauho Plosive /c/

The voiceless aspirated palatal plosive /c^h/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c ^h /	p ^h o ³³ la ³⁵	c ^h	i ³¹	‘moon’
	tiŋ ³³ laŋ ³³	c ^h	u ³³	‘rainbow’
		c ^h	æŋ ³¹ ŋæ ³¹	‘cold’
	ɾu ³¹	c ^h	aɿ ³¹	‘navel’

Table 101. Cauho Plosive /c^h/

The voiceless unaspirated velar plosive /k/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel

/e/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/k/	p ^h i ³³	k	i ³³	‘star’
		k	u ³¹ kiəp ³¹	‘needle’
	ŋ ³³	k	eŋ ³⁵	‘black’
	ʔaŋ ³¹ ko ³⁵	k	o ³⁵ ʔai ³¹⁵	‘cook (a meal)’
	k ^h it ³¹	k	ɔŋ ³³	‘night’
		k	æ ³³ laŋ ³⁵¹	‘road, path’
	jæk ³¹	k	a ^{ʔ31}	‘friend’

Table 102. Cauho Plosive /k/

The voiceless aspirated velar plosive /k^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/k ^h /		k ^h	i ³³ sai ³¹	‘sand’
	te ³¹	k ^h	iŋ ³⁵ ja ³¹	‘half’
	to ³³	k ^h	u ^{ʔ35}	‘pillow’
	ba ³¹	k ^h	eŋ ³³ heŋ ³¹	‘weak’
		k ^h	ot ³¹ lɔŋ ³⁵ tæ ³¹	‘forest’
		k ^h	ə ³³ lɔŋ ³⁵	‘ashes’
		k ^h	æp ³¹ ʔai ³¹⁵	‘narrow’
	tat ³¹ tiŋ ³⁵	k ^h	ɔ ^{ʔ33}	‘bark’
		k ^h	a ³¹ to ^{ʔ35}	‘door’

Table 103. Cauho Plosive /k^h/

The voiced velar plosive /g/ only occurs before the unrounded close central vowel /i/. It occurs only in the initial element of consonant clusters. Examples can be seen in the following table..

/g/		g	in ³⁵ ɣai ³¹⁵	‘pull’
		g	i ³¹ ɣe ³³ pa ³¹	‘dry’

Table 104. Cauho Plosive /g/

The glottal /ʔ/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ʔ/		ʔ	i ³⁵ ɣai ³¹⁵	‘small’
		ʔ	i ³³	‘snake’
		ʔ	u ³³ ɣai ³¹⁵	‘laugh’
		ʔ	eɲ ³³ pət ³³	‘mud’
		ʔ	o ³¹ ɣa ³¹ pin ³³ pa ³⁵	‘full, satisfied’
	nu ³¹	ʔ	əm ³³ c ^h i ³³	‘sleep’
	laɲ ³³ bat ³¹	ʔ	æ ³³	‘thirsty’
	kiə ³¹	ʔ	a ³¹ pa ³⁵	‘correct’

Table 105. Cauho Plosive /ʔ/

3.3.2.1.2 Cauho Nasals

The voiceless bilabial nasal /m̥/ occurs before the unrounded close front vowel /i/, the unrounded close-mid front vowel /e/, and the rounded open-mid back vowel /ɔ/. It occurs only in the initial element of consonant clusters.

/m̥/	to ³³	m̥	in ³³	‘tail’
		m̥	en ³⁵ nə ³¹	‘yesterday’
		m̥	ɔ ³³ ʔai ³¹⁵	‘grind’

Table 106. Cauho Nasal /m̥/

The bilabial nasal /m/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/m/	ʔa ³³	m	it ³³	‘bamboo shoot’
		m	it ³³ ʔai ³¹⁵	‘blow’
		m	uj ³⁵¹ bæn ³³ lak ³¹ ʔai ³¹⁵	‘lightning’
		m	en ³¹ nai ³¹⁵	‘fast’
		m	oŋ ³³ hɔ ³⁵	‘rain’
	ʔa ³³ juŋ ³⁵ ʔa ³¹	m	ə ³³	‘when?’
		m	ɔn ³⁵ nai ³¹⁵	‘round’
	ʔa ³³	m	æŋ ³³	‘cat’
	p ^h a ³³ toŋ ³¹	m	an ³¹ næ ³³	‘heel’

Table 107. Cauho Nasal /m/

The labiodental nasal /m̥/ occurs before the unrounded open front vowel /a/. It occurs only in the initial element of consonant clusters.

/m̥/	ʔa ³³ juŋ ³⁵	m̥	a ³³ ŋə ³³	‘who?’
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Table 108. Cauho Nasal /m̥/

The voiceless alveolar nasal /ɲ/ only occurs before the unrounded open front vowel /a/. It occurs only in the initial element of consonant clusters.

ɲ	siŋ ³¹	ɲ	aɪ ³¹	‘crossbow’
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Table 109. Cauho Nasal /ɲ/

The alveolar nasal /n/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/n/	jæ ³¹	n	iŋ ³⁵¹	‘day’
	moŋ ³³	n	iŋ ³⁵ c ^h i ³¹	‘sun’
		n	u ³¹ ŋəm ³³ c ^h i ³³	‘sleep’
		n	eɪ ³¹ ba ³³ c ^h i ³¹	‘heart’
	cen ³³	n	o ³⁵¹ si ³³	‘wet’
	mən ³⁵	n	əɪ ³¹	‘yesterday’
		n	ɔɪ ³¹	‘brain’
		n	æ ³¹ p ^h i ³¹ ŋai ³¹⁵	‘tie’
		n	a ³¹ tuŋ ³⁵	‘nose’

Table 110. Cauho Nasal /n/

The palatal nasal /ɲ/ occurs before the rounded close back vowel /u/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ɲ/		ɲ	um ³¹ ŋai ³¹⁵	‘short (length)’
		ɲ	aɪ ³¹ k ^h oŋ ³¹⁵	‘forehead’
		ɲ	aŋ ³³	‘a fly’
	ŋa ³³	ɲ	uŋ ³⁵ ŋa ³¹ mə ³³	‘when?’
	ɲ ³¹	ɲ	uŋ ³⁵	‘green’

Table 111. Cauho Nasal /ɲ/

The velar nasal /ŋ/ occurs before the unrounded close-mid front vowel /e/, the central vowel /ə/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/.

Examples can be seen in the following table.

/ŋ/	lɔŋ ³¹	ŋ	e ³¹	‘hot’
	ʔa ³³ juŋ ³⁵ ŋ a ³³	ŋ	ə ³³	‘who?’
	c ^h æŋ ³¹	ŋ	æ ³¹	‘cold’
	naŋ ³¹	ŋ	a ³¹ ha ³¹ næ ³³	‘swallow’

Table 112. Cauho Nasal /ŋ/

3.3.2.1.3 Cauho Fricatives

The voiceless alveolar fricative /s/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/s/		s	i ³¹ k ^h o ³¹ si ³¹	‘cucumber’
	pin ³³	s	ɨŋ ³¹⁵	‘sugar cane’
	ne ³¹ ban ³³	s	ut ³¹ ʔæ ³³	‘angry’
	ʔa ³³	s	ot ³³ na ³⁵¹ ʔə ³¹⁵	‘tomorrow’
		s	ɔŋ ³¹⁵	‘trousers’
		s	æn ³³ ʔai ³¹⁵	‘sour’
		s	aŋ ³¹ ne ³¹ pa ³¹	‘smooth’

Table 113. Cauho Fricative /s/

The voiceless unaspirated alveolar plosive /ʃ/ only occurs before the rounded close back vowel /u/. Examples can be seen in the following table.

/ʃ/		ʃ	u ³¹	‘thorn’
	mo ³³ ɔp ³⁵	ʃ	u ³³ mai ³¹⁵	‘shade’
	ho ³¹	ʃ	u ³³	‘porcupine’

Table 114. Cauho Fricative /ʃ/

The voiceless glottal fricative /h/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/h/	laŋ ³³	h	i ³¹ ʔai ³¹⁵	‘bathe’
	haŋ ³¹	h	u ³³ ʔai ³¹⁵	‘steam’
		h	e ³¹	‘two’
		h	o ³¹ ʃu ³³	‘porcupine’
	mæŋ ³¹ caŋ ³³	h	ən ³³	‘house lizard’
	moŋ ³³	h	ɔ ³⁵	‘rain’
		h	a ³¹ si ³¹	‘banana’

Table 115. Cauho Fricative /h/

The voiced glottal fricative /ɦ/ only occurs before the unrounded open front vowel /a/. An example can be seen in the following table.

/ɦ/		ɦ	a ³¹ ʔai ³¹⁵	‘heavy’
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Table 116. Cauho Fricative /ɦ/

3.3.2.1.4 Cauho Approximants

The voiced labial-velar approximant /w/ only occurs before the central vowel /ə/. An example can be seen in the following table..

/w/	lu ³³	w	ə ³⁵ si ³³	‘forget’
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Table 117. Cauho Approximant /w/

The palatal approximant /j/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/j/		j	i ³³ ŋai ³¹⁵	‘walk’
	ŋa ³³	j	uŋ ³⁵ ka ³¹ ca ³¹ ŋə ³³	‘where?’
	na ³¹	j	eŋ ³⁵	‘face’
		j	oŋ ³⁵ ŋai ³¹⁵	‘skinny’
		j	æ ³¹ niŋ ³⁵¹	‘day’
	di ³³ di ³⁵	j	a ³¹	‘near’

Table 118. Cauho Approximant /j/

The alveolar lateral approximant /l/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/l/	naŋ ³³	1	liŋ ³³	‘gibbon’
	koŋ ³¹	1	um ³¹	‘paddy rice’
	t ^h oi ³⁵	1	e ³¹	‘plate’
		1	oŋ ³⁵ moŋ ³⁵	‘gong’
	k ^h ə ³³	1	əŋ ³³	‘dust’
	k ^h oŋ ³¹	1	oŋ ³⁵ tæ ³¹	‘forest’
		1	æ ³¹	‘that’
	p ^h o ³³	1	a ³⁵ c ^h i ³¹	‘moon’

Table 119. Cauho Approximant /l/

3.3.2.2 Cauho Consonant Distribution within the Word

The numbers in the following table show the frequency of consonants in the initial position.

Initial Consonants												
	p	p ^h	b	t	t ^h	d	c	c ^h	k	k ^h	g	ʔ
\$-----	43	31	15	40	29	6	15	13	48	77	2	63
\$----- V	74	62	48	72	51	9	26	25	85	105	2	221
----- \$	19	-	-	36	-	-	-	-	10	-	-	34

Initial Consonants														
	m̥	m	ŋ	ŋ̥	n	ɲ	ŋ	s	ʃ	h	f	w	j	l
\$-----	2	38	-	-	36	3	-	74	1	41	1	-	37	56
\$----- V	4	74	1	1	54	5	11	111	3	51	1	1	64	110
----- \$	-	53	-	-	20	-	119	-	-	-	-	-	-	-

Table 120. Cauho Consonant Distribution

3.3.2.3 Cauho Consonant- Vowel Distribution

Consonants	Vowels								
	_o	_ə	_a	_e	_i	_o	_i	_æ	_u
p									
p ^h									
t									
t ^h									
c									
k									
ʔ									
c ^h									
b									
d									
k ^h									
g									
m									
m̥									
ŋ									
n									
n̥									
ɲ									
ŋ									
s									
ʃ									
h									
fi									
j									
l									
w									

Table 121. Cauho Consonant – Vowel Distribution

From the table above, the shaded cells refers to observed consonants-vowel sequences in Bisu. The blank cells refer to not observed sequences.

3.3.3 Cauho Consonant Clusters

No consonant clusters have been observed for Cauho.

3.3.4 Cauho Vowels

Cauho has nine vowels and seven diphthongs. Vowels and diphthongs are explained in the following sections.

3.3.4.1 Cauho Observed Vowel Chart

The phonemic inventory of nine vowels in Cauho is shown in Table 122.

	Front unrounded	Central unrounded	Back rounded
Close	i	i	u
Close-mid	e		o
		ə	
Open-mid			ɔ
	æ		
Open	a		

Table 122. Cauho Vowels Inventory

3.3.4.2 Cauho Vowel Contrasts

The vowel contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/i/ /i/	p i ³³	‘flute’		p i ³³ ʔai ³¹⁵	‘shoot’
/i/ /e/	kat ³³ le ³³ c i ³³ ʔai ³¹⁵	‘lie, fib’		c e ³¹ ʔai ³¹⁵	‘speak’
/i/ /u/	p ^h i ³³ ʔin ³³	‘termite’		p ^h u ³³	‘silver’
/i/ /ə/	t ^h i ɲ ³¹ ʔai ³¹⁵	‘cough’		t ^h ə ɲ ³¹ k ^h a ³¹ ca ^{ʔ33}	‘all’
/u/ /o/	t u ³¹ ʔai ³¹⁵	‘dig’		t o ³¹ ʔai ³¹⁵	‘crawl’
/e/ /ə/	t e ³¹ k ^h a ³⁵	‘liquor’		ʔi ³¹ t ə ʔ ³⁵	‘this’
/e/ /æ/	m e n ³¹ nai ³¹⁵	‘fast’		m æ ɲ ³¹ caŋ ³³ hən ³³	‘house_lizard’
/o/ /ə/	m ³³ b o ³¹	‘grass’		b ə ³¹ ʔai ³¹⁵	‘big’
/o/ /ɔ/	p o ɲ ³⁵	‘turtle’		pa ³¹ p ɔ ɲ ³⁵	‘abdomen’
/ɔ/ /ə/	k ^h ot ³¹ l ɔ ɲ ³⁵ tæ ³¹	‘forest’		k ^h ə ³³ l ə ɲ ³⁵	‘ashes’
/æ/ /ə/	tam ³³ k ^h ij ³⁵ t ^h æ ³¹ nai ³¹⁵	‘cut (hair)’		t ^h ə ³¹	‘one’
/æ/ /a/	kæ ³³ laŋ ³⁵	‘road, path’		k a ³¹ la ³⁵	‘paper’
/a/ /ɔ/	m a n ³¹ ni ³³	‘beard’		m ɔ n ³⁵ nai ³¹⁵	‘round’
/a/ /ə/	pa ³¹ ʔai ³¹⁵	‘thin’		pu ³¹ p ə ³⁵ si ³³	‘rotten’

Table 123. Cauho Vowel Contrasts

3.3.4.3 Cauho Consonant and Vowel Distribution

The phonemic description of vowels occurring with consonants can be explained in a table. The co-occurrence of vowels and consonants is given in the following table.

Consonants	Vowels								
	__ɔ	__ə	__a	__e	__i	__o	__ɪ	__æ	__u
p	3	1	22	1	27	3	2	11	7
p ^h	-	-	22	-	17	2	7	-	14
t	4	1	21	7	8	14	-	6	11
t ^h	-	3	16	4	12	5	1	3	7
c	-	1	7	13	3	1	1	-	-
k	10	-	48	1	5	10	4	2	3
ʔ	-	4	174	12	8	3	4	4	12
c ^h	-	-	2	-	20	-	-	2	1
b	1	4	30	-	5	1	6	1	-
d	-	-	3	-	4	-	-	1	1
k ^h	14	4	41	2	5	6	29	1	2
g	-	-	-	-	-	-	2	-	-
m	2	1	22	4	17	11	5	5	7
m̥	1	-	-	1	2	-	-	-	-
ŋ	-	-	1	-	-	-	-	-	-
n	1	1	30	3	7	1	3	4	4
n̥	-	-	1	-	-	-	-	-	-
ɲ	-	-	2	-	-	-	-	-	3
ŋ	-	1	6	3	-	-	-	1	-
s	5	-	27	-	46	7	19	5	2
ʃ	-	-	-	-	-	-	-	-	3
h	1	1	25	3	-	14	4	-	3
ɦ	-	-	1	-	-	-	-	-	-
j	-	-	37	7	3	10	-	4	3
l	10	3	74	6	4	7	-	1	5
w	-	1	2	-	-	-	-	-	-

Table 124. Cauho Phonemic Description

From the table above, it shows the frequency of the consonant and vowel distribution. The most common consonant is the glottal plosive /ʔ/. The most common vowel is the unrounded open front vowel /a/. Both of these consonant and vowel present as the common distribution.

3.3.5 Cauho Diphthongs

There are five diphthongs found in Cauho. These are /uə/, /ɔi/, /ai/, /au/, and /iə/. The most common diphthong is /ai/. The rarest diphthongs are /uə/, and /ɔi/.

	_ə	_i	_u
u	2	-	-
ɔ	-	3	-
a	-	157	21
i	31	-	-

Table 125. Cauho Diphthongs

3.3.6 Cauho Tones

There are four tones showing contrast. The mid tone is level tone, while the high, low and low-rising are contour. The tones used in this analysis are expressed numerically: High tone is 35; Low-rising is 315; Mid tone is 33; and Low tone is 31. Because of low frequency for the 315 tone, this study simply shows the existence of the tone. This tone could be a result of influence from Lao.

High	35	ŋ ³³	si ³⁵
Low-rising	315	soŋ ³¹	si ³¹⁵
Mid	33	jæŋ ³¹	si ³³
Low	31	hat ³¹	si ³¹

Table 126. Cauho Tonal Phonemes

3.3.6.1 Cauho Tone contrasts

The tone contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/35/ /33/	ŋ ³³ si ³⁵	'fruit'		jæŋ ³¹ si ³³	'ginger'
/33/ /31/	jæŋ ³¹ si ³³	'ginger'		hat ³¹ si ³¹	'banana'
/35/ /31/	ŋ ³³ si ³⁵	'fruit'		hat ³¹ si ³¹	'banana'

Table 127. Cauho Tone Contrasts

3.3.6.2 Cauho Tone Distribution

Tone distribution is discussed in this thesis in terms of the syllable distribution in words. In the following sections, the discussion focuses on three syllable positions in the word – initial, medial and final.

3.3.6.2.1 Cauho Tones in the Initial Syllable

The following table shows the distribution of tones in the initial syllable.

Mid	33	pu ³³	ʔai ³¹⁵	'flow'
Low	31	pu ³¹	pə ³⁵ si ³³	'rotten'

Table 128. Cauho Tones in the Initial Syllable

From the table, mid tones and low tones occur in the initial syllable within the same environment.

3.3.6.2.2 Cauho Tones in the Medial Syllable

The following table shows the distribution of tones in the medial syllable.

Mid	33	ko ³¹ loŋ ³⁵ kuə ³³	ca ³³	ŋe ³³	‘hunt’
Low	31	ʔa ³³ juŋ ³⁵ ka ³¹	ca ³¹	ʔə ³³	‘where?’

Table 129. Cauho Tones in the Medial Syllable

From the table, mid tones and low tones occur in the medial syllable within the same environment.

3.3.6.2.3 Cauho Tones in the Final Syllable

The following table shows the distribution of tones in the final syllable.

High	35	ŋ ³³	si ³⁵	‘fruit’
Mid	33	jæŋ ³¹	si ³³	‘ginger’
Low	31	hat ³¹	si ³¹	‘banana’

Table 130. Cauho Tones in Final Syllable

From the table, high tones, mid tones, and low tones occur in the final syllable within the same environment.

3.3.6.3 Summary of Cauho Tones Distribution

In Cauho, high tone 35 occurs only in the final syllable. Mid tone 33 and low tone 31 occur in all position of the syllable.

3.4 Tsukong

Tsukong is a Bisoid language spoken in China. The number of Tsukong people is about 2,000 people. The location of speakers of Tsukong is Xishuangbanna area of southwestern Yunnan province (Gordon 2005). A description of syllable structures, consonants, consonant clusters, plain vowels, diphthongs, and tones are discussed in the following sections.

3.4.1 Tsukong Syllable Structure Types

The syllable structures in Tsukong are comprised of four types. There are CV, CVC, CVV, and CVVC, syllables. Each type will be explained in the following sections.

3.4.1.1 Tsukong CV Syllable Structure

The CV syllable type contains one consonant in the initial position and one vowel.

Phonetic	Gloss
mo ³⁵	'rain'
si ³⁵	'gold'
ko ³³	'paddy rice'
k ^h a ³⁵	'plant'
c ^h e ³⁵	'ten'

Table 131. Tsukong CV Syllable Structure

3.4.1.2 Tsukong CVC Syllable Structure

The CVC syllable type contains two consonants, one in the initial position, one the final position, and one vowel.

Phonetic	Gloss
sam ³⁵	‘iron’
muŋ ³⁵	‘mushroom’
sem ³⁵	‘three’
hin ³⁵	‘four’
pan ³¹	‘thousand’

Table 132. Tsukong CVC Syllable Structure

3.4.1.3 Tsukong CVV Syllable Structure

The CVV syllable type contains one consonant in the initial position and two vowels forming a diphthong.

Phonetic	Gloss
piə ³¹	‘bee’
mi ³¹ k ^h ui ³¹	‘smoke’
ta ³¹ kau ³¹ ba ³⁵	‘woman’
pəi ³¹⁵	‘scratch’
ka ³¹ ʔa ³³ kai ³⁵	‘weak’

Table 133. Tsukong CVV Syllable Structure

3.4.1.4 Tsukong CVVC Syllable Structure

The CVVC syllable type contains two consonants, one in the initial position, one in the final position, and two vowels forming a diphthong.

Phonetic	Gloss
miəŋ ³⁵ ŋe ³⁵	‘see’
miəŋ ³⁵ la ³³ dam ³³	‘wink’
piəm ³⁵ ma ³³ le ³⁵	‘fly’
piəm ³¹ la ³⁵	‘float (object)’
miəw ³¹ tse ³⁵ le ³⁵	‘extinguish (fire)’

Table 134. Tsukong CVVC Syllable Structure

3.4.2 Tsukong Consonants

Tsukong has twenty-four consonants. A phonemic inventory of Tsukong consonants is shown in Table 135.

	Bilabial		Labioden		Alveolar		Postalv		Palatal		Velar		Glottal	
Plosive	p	b			t	d			c		k	g	ʔ	
Aspirated Plosive	p ^h				t ^h				c ^h		k ^h			
Nasal		m				n				ɲ		ŋ		
Fricative					s		ʃ				x		h	
Affricate					ts									
Approximant			w							j				
Lateral Approximant						l								

Table 135. Tsukong Consonant Inventory

The follow sections provide evidence for the phonemes as well as distributional information.

3.4.2.1 Tsukong Consonant Contrasts

The consonant contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/p/ /p ^h /	p e ³¹ le ³⁵	‘snail’		ʔa ³³ p ^h e ³¹	‘liver’
/p/ /b/	p a ³¹ ʔe ³⁵	‘thin’		jam ³⁵ b a ³¹	‘a fly’
/b/ /m/	ʔa ³³ b i ³¹	‘wife’		m i ³¹ t ^h i ³¹	‘saliva’
/t/ /t ^h /	ʔa ³³ t ə ³³	‘salt’		ʔa ³³ t ^h ə ³¹	‘what?’
/t/ /d/	t i ³¹ p ^h a ³⁵	‘half’		d i ³¹ ʔe ³⁵	‘near’
/d/ /n/	ka ³¹ d u ³¹ le ³⁵	‘tired’		n u ³¹ ʔe ³⁵	‘think’
/c/ /c ^h /	c a ³⁵	‘speak’		c ^h a ³⁵	‘hundred’
/c/ /k/	moŋ ³¹ c e ³¹	‘thunder’		k e ³¹ ʔe ³⁵	‘lie, fib’
/k/ /k ^h /	k o ³³ p ^h i ³¹	‘door’		k ^h o ³⁵ le ³⁵	‘all’
/k/ /x/	k a ³¹ k ^h aŋ ³⁵ je ³⁵	‘strong’		x a ³¹	‘chicken’
/k/ /g/	k u ³³ c ^h o ³⁵	‘sweat’		g u ³⁵ ʔe ³⁵	‘buy’
/k ^h / /x/	k ^h i ³¹ ʔe ³⁵	‘big’		ha ³³ x i ³¹	‘rat’
/m/ /n/	m i ³¹ liŋ ³⁵	‘sun’		n i ³¹ le ³⁵	‘sink’
/n/ /l/	ʔa ³³ n a ³¹	‘ear’		tsa ³⁵ l a ³¹	‘person’
/n/ /ŋ/	n aŋ ³¹	‘kneel’		ŋ aŋ ³⁵ koŋ ³⁵	‘tomorrow’
/n/ /ŋ/	n e ³⁵ ne ³⁵	‘red’		ŋ e ³⁵	‘frost’
/ŋ/ /j/	ŋ u ³⁵ luŋ ³⁵	‘green’		j u ³⁵ ʔe ³⁵	‘flow’
/ŋ/ /ŋ/	ʔa ³³ jo ³¹ ŋ i ³⁵	‘friend’		kaŋ ³³ ŋ i ³⁵	‘spider web’
/s/ /ʃ/	s i ³⁵ ʔe ³⁵	‘die’		ʔa ³³ ʃ i ³⁵	‘fat’
/s/ /ts/	s a ³⁵ k ^h im ³⁵	‘hair’		ts a ³⁵ la ³¹	‘person’
/ʃ/ /h/	ʔa ³³ ʃ i ³⁵	‘fat’		ʔa ³³ h i ³⁵ jam ³⁵	‘when?’
/ts/ /t/	ʔa ³³ ts u ³¹	‘thorn’		t u ³¹ ʔe ³⁵	‘dig’
/ts/ /t ^h /	mi ³⁵ ts a ³¹	‘earth, soil’		t ^h a ³¹ le ³⁵	‘sharp’
/w/ /j/	ko ³³ jo ³¹ w aŋ ³¹	‘mat’		j aŋ ³¹ ko ³³ lok ³³	‘space under house’
/ʔ/ /p/	ʔ a ³³ bi ³¹	‘wife’		p a ³¹ ʔe ³⁵	‘thin’
/ʔ/ /t/	ʔ oŋ ³¹ ʔe ³⁵	‘swim’		t oŋ ³¹ taŋ ³⁵	‘buttocks’
/ʔ/ /c/	ʔ i ³⁵ ʔe ³⁵	‘small’		no ³¹ c i ³⁵	‘man’
/ʔ/ /k/	ʔ i ³³ laŋ ³³	‘snake’		k i ³¹ le ³⁵	‘thirsty’
/ʔ/ /h/	ʔ o ³³ la ³⁵	‘enter’		h o ³³ c ^h e ³³	‘deer’

Table 136. Tsukong Consonant Contrasts

3.4.2.1.1 Tsukong Plosives

The voiceless unaspirated bilabial plosive /p/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p/		p	i ³³ ɨe ³⁵	‘heart’
	k ^h a ³⁵	p	ɨ ³⁵	‘flute’
	ʔa ³³	p	u ³³	‘father’
		p	e ³¹ la ³⁵	‘moon’
	kap ³⁵ ko ³¹ ʔe ³⁵	p	oŋ ³¹ ʔe ³⁵	‘turn’
		p	ə ³¹ ʔe ³⁵	‘shoot’
		p	ɔŋ ³¹ mi ³⁵	‘cooking pot’
	pa ³¹	p	a ³¹ ba ³¹ c ^h i ³⁵	‘check’

Table 137. Tsukong Plosive /p/

The voiceless aspirated bilabial plosive /p^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/p ^h /	ko ³³	p ^h	i ³¹	‘door’
		p ^h	ɨ ³¹ tem ³⁵	‘blanket’
		p ^h	u ³⁵ lu ³⁵	‘white’
	ʔa ³³	p ^h	e ³¹	‘liver’
	kap ³⁵	p ^h	a ³⁵ la ³⁵ ba ³¹	‘cockroach’

Table 138. Tsukong Plosive /p^h/

The voiced bilabial plosive /b/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/b/	ʔa ³³	b	i ³¹	‘wife’
		b	in ³¹ je ³⁵	‘good’
		b	e ³¹⁵	‘hungry’
	ʔa ³³	b	oŋ ³⁵	‘elder sibling’
	soŋ ³¹	b	a ³³ la ³³	‘morning’

Table 139. Tsukong Plosive /b/

The voiceless unaspirated alveolar plosive /t/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/t/		t	i ³¹ p ^h a ³⁵	‘half’
	ʔa ³³	t	in ³¹	‘blunt’
	tʂa ³¹	t	u ³³	‘corn’
	p ^h i ³¹	t	em ³⁵	‘blanket’
		t	oŋ ³³ mi ³³	‘tail’
	ʔa ³³	t	ə ³³	‘salt’
	la ³⁵ pi ³¹	t	ɔ ³¹ k ^h ɔ ³¹	‘papaya’
		t	an ³¹ ne ³⁵	‘push’

Table 140. Tsukong Plosive /t/

The voiceless aspirated alveolar plosive /t^h/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-

mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/tʰ/	mi ³¹	tʰ	i ³¹	‘saliva’
		tʰ	u ³⁵ ŋe ³⁵	‘kick’
	kam ³⁵	tʰ	e ³¹	‘wall (of house)’
		tʰ	oŋ ³⁵ ŋe ³⁵	‘cook (a meal)’
	ʔa ³³	tʰ	ə ³¹	‘what?’
		tʰ	oŋ ³¹ cʰen ³⁵	‘pestle’
	la ³⁵	tʰ	æn ³¹	‘lake’
		tʰ	a ³¹ le ³⁵	‘sharp’

Table 141. Tsukong Plosive /tʰ/

The voiced alveolar plosive /d/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/d/		d	i ³¹ ŋe ³⁵	‘near’
	ka ³¹	d	u ³¹ le ³⁵	‘tired’
		d	o ³¹ ŋe ³⁵	‘know’
	ka ³⁵	d	at ³⁵	‘paper’

Table 142. Tsukong Plosive /d/

The voiceless unaspirated palatal plosive /c/ occurs before the unrounded close front vowel /i/, the unrounded close-mid front vowel /e/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c/	no ³¹	c	i ³⁵	‘man’
		c	e ³¹ p ^h a ³⁵	‘split’
		c	aŋ ³⁵ c ^h i ³¹	‘ginger’

Table 143. Tsukong Plosive /c/

The voiceless aspirated palatal plosive /c^h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/c ^h /	miŋ ³¹	c ^h	i ³⁵	‘night’
		c ^h	ɨ ³³ ɿe ³⁵	‘sweet’
		c ^h	u ³¹ ba ³⁵	‘dew’
		c ^h	e ³¹	‘eight’
	c ^h o ³⁵	c ^h	o ³¹ c ^h o ³⁵ ɿe ³⁵	‘whistle’
	si ³¹ siŋ ³⁵	c ^h	ɔŋ ³¹	‘forest’
	ʔa ³³	c ^h	a ³⁵ ka ³⁵	‘left side’

Table 144. Tsukong Plosive /c^h/

The voiceless unaspirated velar plosive /k/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

k	pam ³¹	k	ɨ ³¹ ɿe ³⁵	‘to dry’
		k	u ³¹ ɿe ³⁵	‘sew’
		k	e ³¹ ɿe ³⁵	‘lie, fib’
	ʔa ³³	k	o ³¹ la ³⁵ kaŋ ³³	‘spider’
		k	ə ³⁵	‘count’
	mi ³⁵ na ³¹	k	o ³³ lɔŋ ³³	‘yesterday’
	ta ³¹	k	æ ³¹ le ³⁵	‘armpit’
	po ³⁵ lɔŋ ³⁵	k	a ³⁵	‘straight’

Table 145. Tsukong Plosive /k/

The voiceless aspirated velar plosive /k^h/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/k ^h /	sa ³⁵	k ^h	im ³⁵	‘hair’
	ca ³⁵	k ^h	u ³¹	‘knife’
		k ^h	e ³⁵ ŋe ³⁵	‘afraid’
		k ^h	o ³⁵ je ³⁵	‘all’
	si ³¹	k ^h	ɔ ³¹	‘cucumber’
	ka ³¹	k ^h	aŋ ³⁵ je ³⁵	‘strong’

Table 146. Tsukong Plosive /k^h/

The voiced velar plosive /g/ occurs before the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/g/		g	u ³⁵ ŋe ³⁵	‘buy’
	ʔa ³¹	g	eŋ ³¹ ŋe ³⁵	‘narrow’
		g	oŋ ³¹ ŋe ³⁵	‘sell’
	p ^h a ³¹	g	a ³¹	‘frog’

Table 147. Tsukong Plosive /g/

The glottal /ʔ/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/ʔ/		ʔ	i ³⁵ ŋe ³⁵	‘small’
	ʔa ³³	ʔ	in ³⁵	‘old’
		ʔ	uŋ ³⁵ ŋe ³⁵	‘laugh’
	pi ³¹	ʔ	e ³⁵	‘give’
		ʔ	o ³³ la ³⁵	‘enter’
	pen ³¹	ʔ	a ³³ le ³⁵	‘throw (get fruit)’

Table 148. Tsukong Plosive /ʔ/

3.4.2.1.2 Tsukong Nasals

The bilabial nasal /m/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/m/	pəŋ ³¹	m	i ³⁵	‘cooking pot’
		m	ɨŋ ³¹ c ^h i ³⁵	‘night’
		m	uŋ ³¹	‘sky’
	ca ³¹ tem ³⁵	m	e ³⁵	‘answer’
		m	oŋ ³¹ ce ³¹	‘thunder’
	piəm ³⁵	m	a ³³ le ³⁵	‘fly’

Table 149. Tsukong Nasal /m/

The alveolar nasal /n/ occurs before the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/n/		n	iŋ ³³	‘day’
		n	u ³¹ ŋe ³⁵	‘think’
	ca ³¹ p ^h i ³⁵	n	e ³⁵ le ³⁵	‘red pepper’
		n	o ³¹ ŋe ³⁵	‘long’
	pan ³¹	n	a ³³	‘buffalo’

Table 150. Tsukong Nasal /n/

The palatal nasal /ɲ/ occurs before the unrounded close front vowel /i/, the rounded close back vowel /u/, and the unrounded open front vowel /a/. Examples can be seen in the following table. Note there are limited occurrence and subsequent distribution.

/ɲ/	ʔa ³³ jo ³¹	ɲ	i ³⁵	‘friend’
		ɲ	u ³⁵ luŋ ³⁵	‘green’
		ɲ	aŋ ³⁵ kɔŋ ³⁵	‘tomorrow’

Table 151. Tsukong Nasal /ɲ/

The velar nasal /ŋ/ occurs only before the unrounded close front vowel /i/ and the unrounded close-mid front vowel /e/. Examples can be seen in the following table.

/ŋ/	kaŋ ³³	ŋ	i ³⁵	‘spider web’
		ŋ	e ³⁵	‘frost’

Table 152. Tsukong Nasal /ŋ/

3.4.2.1.3 Tsukong Fricatives and Affricates

The voiceless unaspirated alveolar plosive /s/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/s/	caŋ ³¹	s	i ³¹	'mist'
		s	i ³⁵ liŋ ³⁵	'yellow'
		s	e ³¹	'kill'
	ʔa ³³	s	o ³¹	'tooth'
		s	ə ³⁵ ʔe ³⁵	'pull'
	k ^h i ³⁵	s	ɔŋ ³¹ c ^h i ³³ ʔe ³⁵	'rub, scrub'
	niŋ ³⁵	s	æŋ ³⁵	'shade'
	ʔa ³³	s	a ³¹ kaŋ ³⁵ ŋe ³⁵	'breath'

Table 153. Tsukong Fricative /s/

The voiceless unaspirated alveolar plosive /ʃ/ only occurs before the unrounded close front vowel /i/. Examples can be seen in the following table.

/ʃ/	ʔa ³³	ʃ	i ³⁵	'fat'
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Table 154. Tsukong Fricative /ʃ/

The voiceless velar fricative /x/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/x/	ha ³³	x	i ³¹	'rat'
		x	u ³¹ ʔe ³⁵	'steal'
	ʔa ³³	x	o ³¹	'year'
		x	aŋ ³¹	'boat'

Table 155. Tsukong Fricative /x/

The voiceless glottal fricative /h/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/h/	ʔa ³³	h	i ³⁵ jam ³⁵	‘when?’
		h	in ³⁵	‘four’
	ʔa ³³	h	u ³¹	‘skin’
	kan ³¹	h	e ³⁵	‘work’
		h	o ³⁵ ban ³⁵	‘wind’
		h	a ³³ ga ³¹	‘bird’

Table 156. Tsukong Fricative /h/

The alveolar affricate /ts/ occurs before the unrounded close central vowel /i/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, and the unrounded open front vowel /a/. The alveolar affricate /ts/ is interpreted as a single consonant in this study. Examples can be seen in the following table.

/ts/	pi ³⁵	ts	i ³¹	‘knee’
		ts	u ³¹ la ³⁵	‘shiver’
	miəw ³¹	ts	e ³⁵ le ³⁵	‘extinguish (fire)’
		ts	aŋ ³¹ je ³⁵	‘correct’

Table 157. Tsukong Affricate /ts/

3.4.2.1.4 Tsukong Approximants

The voiced labial-velar approximant /w/ only occurs before the unrounded open front vowel /a/. The example can be seen in the following table.

/w/	ko ³³ jo ³¹	w	aŋ ³¹	‘mat’
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Table 158. Tsukong Approximant /w/

The palatal approximant /j/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded

close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/j/		j	im ³⁵	‘house’
	ʔa ³³	j	i ³¹	‘flower’
		j	u ³¹ ba ³³	‘dream’
	tsaŋ ³¹	j	e ³⁵	‘correct’
	ko ³³	j	o ³¹ waŋ ³¹	‘mat’
		j	a ³¹ ŋe ³⁵	‘stand’

Table 159. Tsukong Approximant /j/

The alveolar lateral approximant /l/ occurs before the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the rounded open-mid back vowel /ɔ/, and the unrounded open front vowel /a/. Examples can be seen in the following table.

/l/	pi ³¹	l	i ³⁵	‘butterfly’
	t ^h i ³⁵	l	in ³³	‘peanut’
		l	u ³¹ luŋ ³⁵ ka ³¹	‘round’
		l	em ³¹ me ³⁵	‘smooth’
	po ³⁵	l	oŋ ³⁵ ka ³⁵	‘straight’
	ti ³¹ k ^h o ³¹	l	ɔ ³⁵ tu ³⁵ le ³⁵	‘same’
	ʔa ³³ ko ³¹	l	a ³⁵ kaŋ ³³	‘spider’

Table 160. Tsukong Approximant /l/

3.4.2.2 Tsukong Consonant Distribution within the Word

The numbers in the following table show the frequency of consonants in the initial position.

Initial Consonants												
	p	p ^h	b	t	t ^h	d	c	c ^h	k	k ^h	g	ʔ
\$-----	40	24	10	53	12	8	9	36	35	52	6	145
\$----- V	59	42	41	63	17	15	13	72	83	79	11	223
----- \$	5	-	-	3	-	-	-	-	1	-	-	-

Initial Consonants												
	m	n	ɲ	ŋ	s	ʃ	x	h	ts	w	j	l
\$-----	54	27	9	6	65	-	3	27	10	10	29	20
\$----- V	92	42	10	29	124	1	5	36	11	14	1	101
----- \$	41	17	-	77	-	-	-	-	-	-	44	-

Table 161. Tsukong Consonant Distribution

3.4.2.3 Tsukong Consonant – Vowel Distribution

Consonants	Vowels								
	_ɔ	_ə	_a	_e	_i	_o	_ɪ	_æ	_u
p									
p ^h									
t									
t ^h									
c									
k									
ʔ									
c ^h									
b									
d									
k ^h									
g									
m									
n									
ɲ									
ŋ									
s									
ʃ									
x									
h									
ts									
j									
l									
w									

Table 162. Tsukong Consonant – Vowel Distribution

From the table above, the shaded cells refer to observed consonant-vowel sequences in Bisu, while the blank cells refers to not observed sequences.

3.4.3 Tsukong Consonant Clusters

Tsukong has only one consonant cluster /k^hl/. It has only been observed in the following word

Consonant Clusters	Words			Gloss
k ^h l	la ³⁵ tɔŋ ³¹ k ^h	l	ɔŋ ³¹ miŋ ³⁵ ŋe ³⁵	'snore'

Table 163. Tsukong Consonant Clusters with /l/

3.4.4 Tsukong Vowels

Tsukong has nine vowels and five diphthongs. Vowels and diphthongs are explained in the following sections.

3.4.4.1 Tsukong Observed Vowel Chart

The phonemic inventory of vowels in Tsukong is shown in table 164.

	Front unrounded	Central unrounded	Back rounded
Close	i	ɨ	u
Close-mid	e		o
		ə	
Open-mid			ɔ
	æ		
Open	a		

Table 164. Tsukong Vowel Inventory.

3.4.4.2 Tsukong Vowel Contrasts

The vowel contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/i/ /i/	ko ³³ p ^h i ³¹	‘door’		p ^h i ³¹ tem ³⁵	‘blanket’
/i/ /e/	p ^h i ³¹ ŋe ³⁵	‘give’		p ^h e ³¹ le ³⁵	‘snail’
/i/ /u/	t ^h i ³⁵ lin ³³	‘peanut’		t ^h u ³⁵ ŋe ³⁵	‘kick’
/i/ /ə/	p ^h i ³¹ li ³⁵	‘butterfly’		p ^h ə ³¹ ŋe ³⁵	‘shoot’
/u/ /o/	ka ³¹ du ³¹ le ³⁵	‘tired’		d ^h o ³¹ ŋe ³⁵	‘know’
/e/ /ə/	kam ³⁵ t ^h e ³¹	‘wall (of house)’		ŋa ³³ t ^h ə ³¹	‘what?’
/e/ /æ/	ke ³¹ ŋe ³⁵	‘lie, fib’		ta ³¹ k ^h æ ³¹ le ³⁵	‘armpit’
/o/ /ə/	k ^h a ³³ po ³¹	‘cow’		p ^h ə ³¹ ŋe ³⁵	‘shoot’
/o/ /ɔ/	p ^h oŋ ³¹ c ^h i ³⁵	‘sugar cane’		p ^h ɔŋ ³¹ mi ³⁵	‘cooking pot’
/ɔ/ /ə/	la ³⁵ pi ³¹ t ^h ɔ ³¹ k ^h ɔ ³¹	‘papaya’		ŋa ³³ t ^h ə ³³	‘salt’
/æ/ /ə/	ta ³¹ k ^h æ ³¹ le ³⁵	‘armpit’		k ^h ə ³⁵	‘count’
/æ/ /a/	ta ³¹ k ^h æ ³¹ le ³⁵	‘armpit’		ŋa ³³ k ^h a ³¹	‘child’
/a/ /ɔ/	k ^h a ³¹ ŋe ³⁵	‘bitter’		si ³¹ k ^h ɔ ³¹	‘cucumber’
/a/ /ə/	na ³¹ pa ³¹	‘deaf’		p ^h ə ³¹ ŋe ³⁵	‘shoot’

Table 165. Tsukong Vowel Contrast

3.4.4.3 Tsukong Consonant and Vowel Distribution

The phonemic description of vowels occurring with consonants can be explained in a table. The co-occurrence of vowels and consonants is given in the following table.

Consonants	Vowels								
	__ɔ	__ə	__a	__e	__i	__o	__i	__æ	__u
p	1	2	13	7	18	9	6	-	2
p ^h	-	-	15	5	6	-	3	-	13
t	6	1	14	10	7	12	1	-	12
t ^h	3	1	2	1	-	2	3	1	4
c	-	-	9	3	1	-	-	-	-
k	4	3	47	1	-	12	12	1	3
ʔ	-	-	129	55	1	2	14	-	22
c ^h	1	-	11	13	17	9	10	-	11
b	-	-	24	1	3	7	3	-	-
d	-	-	8	-	1	3	-	-	2
k ^h	4	-	36	3	-	10	23	-	3
g	-	-	6	2	-	2	-	-	1
m	-	-	12	11	33	11	14	-	6
n	-	-	18	11	-	3	9	-	1
ɲ	-	-	1	-	7	-	-	-	2
ŋ	-	-	5	23	1	-	-	-	-
s	2	1	52	6	26	3	30	1	3
ʃ	-	-	-	-	1	-	-	-	-
x	-	-	2	-	-	1	1	-	1
h	-	-	7	4	1	21	1	-	2
ts	-	-	11	2	-	-	5	-	3
j	-	-	25	9	5	5	2	-	5
l	4	-	52	22	2	7	7	-	7
w	-	-	13	1	-	-	-	-	-

Table 166. Tsukong Phonemic Description

From the table above, it shows the frequency of the consonant and vowel distribution. The most common consonant is the glottal plosive /ʔ/. The most common vowel is the unrounded open front vowel /a/. Both of these consonant and vowel present as the common distribution.

3.4.5 Tsukong Diphthongs

There are three diphthongs found in Tsukong. These are /iə/, /iu/, and /ui/. The most common diphthong is /iə/. The least common diphthongs are /iu/, and /ui/.

	<u>ə</u>	<u>i</u>	<u>u</u>
i	29	-	2
u	-	2	-

Table 167. Tsukong Diphthongs

3.4.6 Tsukong Tones

Tsukong has three tones. The high tone is mid-rising, the mid tone is mid-level, and the low tone is mid-falling. The tones used in this analysis are expressed numerically. High tone is 35. Mid tone is 33. Low tone is 31.

High	35	miu ³¹ p ^h u ³⁵	
Mid	33	mi ³³ p ^h u ³³	
Low	31		p ^h u ³¹ la ³⁵

Table 168. Tsukong Tonal Phonemes

3.4.6.1 Tsukong Tone contrasts

The tone contrasts are shown in the following table.

Minimal Pair	Suspect Pair	Gloss		Suspect Pair	Gloss
/35/ /33/	miu ³¹ p ^h u ³⁵	‘gibbon’		mi ³³ p ^h u ³³	‘forehead’
/33/ /31/	mi ³³ p ^h u ³³	‘forehead’		p ^h u ³¹ la ³⁵	‘swell’
/35/ /31/	miu ³¹ p ^h u ³⁵	‘gibbon’		p ^h u ³¹ la ³⁵	‘swell’

Table 169. Tsukong Tone Contrasts

3.4.6.2 Tsukong Tone Distribution

The discussion about tone distribution will be explained in terms of the position for the occurrences. The discussion will be in the following sections.

3.4.6.2.1 Tsukong Tones in the Initial Syllable

The following table shows the distribution of tones in the initial syllable.

High	35	k ^h a ³⁵	ʔe ³⁵	‘hard’
Mid	33	k ^h a ³³	po ³¹	‘cow’
Low	31	k ^h a ³¹	ʔe ³⁵	‘bitter’

Table 170. Tsukong Tones in the Initial Syllable

From the table, high tones, mid tones, and low tones occur in the initial syllable within the same environment.

3.4.6.2.2 Tsukong Tones in the Medial Syllable

The following table shows the distribution of tones in the medial syllable.

High	35	ʔa ³³	ho ³⁵	lo ³¹	‘how many?’
Mid	33	ʔa ³³ k ^h e ³¹	ho ³³	lom ³³	‘banana’
Low	31	naŋ ³¹	ho ³¹	ʔe ³⁵	‘hunt’

Table 171. Tsukong Tones in the Medial Syllable

From the table, high tones, mid tones, and low tones occur in the medial syllable within the same environment.

3.4.6.2.3 Tsukong Tones in the Final Syllable

The following table shows the distribution of tones in the final syllable.

High	35	ta ³¹ kau ³¹	ba ³⁵	‘woman’
Mid	33	c ^h a ³³	ba ³³	‘elephant’
Low	31	niŋ ³⁵	ba ³¹	‘heart’

Table 172. Tsukong Tones in Final Syllable

From the table, high tones, mid tones, and low tones occur in the final syllable within the same environment.

3.4.6.3 Summary of Tsukong Tones Distribution

In Tsukong, all three tones occur in all position of the word.

CHAPTER 4

COMPARATIVE DESCRIPTION

4.0 Introduction

This chapter answers the question “How related are these four selected Bisoid varieties with respect to their phonological inventories?”

It looks at syllable structures, initial consonants, consonant clusters, vowels, diphthongs, rhymes and tones from two perspectives. The first section is a discussion of the distribution of the phone across the varieties, and the second section looks at distribution within the form with the same meaning.

4.1 Syllable Structures

All four speech varieties have four syllable types in common. These syllable types can be generalized as CV₁(V₂)(C)T. The onset consists of a single consonant. The nucleus consists of a required vowel and possibly an optional vowel, which forms a diphthong. The coda consists of optional consonant. Tone is required on all syllables.

Bantang	Bisu	Cauho	Tsukong
CV	CV	CV	CV
CVC	CVC	CVC	CVC
CVV	CVV	CVV	CVV
CVVC	CVVC	CVVC	CVVC
	CCV		
	CCVV		
	CCVC		

Table 173 Syllable Types

Bisu adds an additional three syllable types due to it having syllable initial consonant clusters. So a generalized syllable pattern that covers all observed syllable types under analysis would be: C₁(C₂)V₁(V₂)(C)T. The onset consists of a required consonant and an optional consonant, which forms a consonant cluster. The nucleus consists of a required vowel and possibly an optional vowel, which forms a diphthong. The coda consists of an optional consonant. Tone is required on all syllables.

4.2 Consonants

The following table shows the comparison of the phonemes of Bantang, Bisu, Cauho, and Tsukong.

The Phonemes of the Four Speech Varieties in Comparison

Bantang					Bisu				
p ^h	t ^h	c ^h	k ^h		p ^h	t ^h	c ^h	k ^h	
p	t	c	k	ʔ	p	t	c	k	ʔ
b	d		g		b	d			
m	n		ɲ	ŋ	m	n		ŋ	
	v	s	ʃ	ɣ	h	f	s	ʃ	h
				fi			ts		
w			j		w			j	
	l					l			

Cauho					Tsukong					
p ^h	t ^h	c ^h	k ^h		p ^h	t ^h	c ^h	k ^h		
p	t	c	k	ʔ	p	t	c	k	ʔ	
b	d		g		b	d		g		
ɱ	ɳ									
m	ɱ	n		ɲ	ŋ	m	n		ɲ	ŋ
		s	ʃ		h		s	ʃ	x	h
				fi						
w			j		w			j		
	l					l				

Table 174. Phonemes in Comparison

From the table, all four speech varieties have voiceless aspirated and unaspirated plosives. For voiced plosives, Bantang, Cauho, and Tsukong have three places of articulation, while Bisu does not show the occurrence of the voiced velar plosive /g/. For voiceless nasals, only Cauho has the voiceless bilabial nasal /m̥/ and the voiceless alveolar nasal /n̥/. The palatal nasal /ɲ/ does not occur in Bisu. In addition, the labiodental nasal /ɱ/ only occurs in Cauho. For fricatives, the voiceless labiodental fricative /f/ only occurs in Bisu. The voiced labiodental fricative /v/ and the voiced velar fricative /ɣ/ occurs only in Bantang. The voiceless velar fricative /x/ occurs only in Tsukong. The voiced glottal fricative /ɦ/ occurs in Bantang and Cauho. For affricates, the affricate /ts/ occurs only in Bisu. All of the speech varieties show the consistent occurrence of approximants.

4.2.1 Initial Consonants

The four following charts compare the initial consonants of the four languages.

Bintang	
Plosive	p ^h p b t ^h t d c ^h c k ^h k ʔ
Nasal	m n ɲ ŋ
Fricative	v s ʃ y h fi
Affricate	-
Approximant	w j l

Bisu	
Plosive	p ^h p b t ^h t d c ^h c k ^h k ʔ
Nasal	m n ŋ
Fricative	f s ʃ h
Affricate	ts
Approximant	w j l

Cauho	
Plosive	p ^h p b t ^h t d c ^h c k ^h k ʔ
Nasal	m̥ m n̥ n ɲ ŋ
Fricative	s ʃ h fi
Affricate	-
Approximant	w j l

Tsukong	
Plosive	p ^h p b t ^h t d c ^h c k ^h k ʔ
Nasal	m n ɲ ŋ
Fricative	s ʃ x h
Affricate	-
Approximant	w j l

Table 175. Initial Consonants in Comparison

According to the preceding table, Bisu does not have the voiced velar plosive /g/ and the palatal nasal /j/ as the initial consonant. Cauho shows the voiceless bilabial nasal /m̥/, the voiceless alveolar nasal /n̥/, and the labiodental nasal /ɲ/ as the initial consonant. The voiceless labiodental fricative /f/ and the affricate /ts/ occur as the initial consonant only in Bisu. The voiced labiodental fricative /v/ and the voiced velar fricative /y/ occurs as the initial consonant only in Bintang. The voiceless velar fricative /x/ occurs as the initial consonant only in Tsukong. The voiced glottal fricative /fi/ occurs as the initial consonant in Bintang and Cauho.

This section will examine the correspondences of initial consonants. The following table shows the correspondences of initial consonants in Bintang, Bisu, Cauho, and Tsukong.

Bantang	Bisu	Cauho	Tsukong
p ^h	p ^h /p	p ^h	p ^h
p	p	p	p
m	b	b	b/m
t ^h	t ^h	t ^h	t ^h
t	t	t	t
n	d	d/n	d/n/ɲ
c ^h	c ^h /ts	t ^h /s	c ^h /ts/ʃ
c	c	c	c/s/ts
k ^h	k ^h	k ^h	k ^h
k	k	k	k
ʔ	ʔ	ʔ	ʔ
m	m	m	m
n	n	n	n
–	w	b	w
s	s	s	s
h	h	h	h
l	l	l	l

Table 176. Correspondences of Initial Consonants

According to the preceding table, the consistent correspondences in the speech varieties include voiceless initial plosives /p^h/, /p/, /t^h/, /t/, /c/, /k^h/, /k/, /ʔ/, nasals /m/ and /n/, fricatives /s/ and /h/, and lateral approximant /l/. In Bisu and Cauho voiced initial plosives /b/ corresponds with /m/ in Bantang and Tsukong, and /d/ in Bisu corresponds with /n/ in Bantang and Cauho, and with /n/ and /ɲ/ in Tsukong. The voiced labial-velar approximant /w/ in Bisu and Tsukong corresponds with /b/ in Cauho. Note there are limited occurrence and subsequent distribution of initial consonants in Bantang. The voiceless aspirated palatal plosive /c^h/ corresponds with /ts/ in Bisu and Tsukong, with /t^h/ in Cauho, with /s/ in Cauho, and with /ʃ/ in Tsukong. The affricate /ts/ occurs as a variant in Bisu and Tsukong.

In conclusion, most of the plosives, including voiceless aspirated and unaspirated bilabial /p^h/ and /p/, voiceless aspirated and unaspirated alveolar /t^h/ and /t/, voiceless unaspirated palatal /c/, voiceless aspirated and unaspirated velar /k^h/ and /k/, and glottal /ʔ/ have a high frequency of consistency across all varieties.

The following table shows the correspondences of the initial consonant.

Bantang	Bisu	Cauho	Tsukong
p ^h	p ^h /p	p ^h	p ^h
p	p	p	p
m	b	b	b/m
t ^h	t ^h	t ^h	t ^h
t	t	t	t
n	d	d/n	d/n/ɲ
c ^h	c ^h /ts	t ^h /s	c ^h /ts/ʃ
c	c	c	c/s/ts
k ^h	k ^h	k ^h	k ^h
k	k	k	k
ʔ	ʔ	ʔ	ʔ
m	m	m	m
n	n	n	n
–	w	b	w
s	s	s	s
h	h	h	h
l	l	l	l

Table 177. Correspondences of Initial Consonants

The highest frequency of consistent correspondences of initial consonant are with the voiceless aspirated bilabial plosive /p^h/, the voiceless unaspirated bilabial plosive /p/, the voiceless aspirated alveolar plosive /t^h/, the voiceless unaspirated alveolar plosive /t/, the voiceless unaspirated palatal plosive /c/, the voiceless aspirated velar plosive /k^h/, the voiceless unaspirated velar plosive /k/, the glottal /ʔ/, the bilabial nasal /m/, the alveolar nasal /n/, the voiceless alveolar fricative /s/, the voiceless

glottal fricative /h/, and the alveolar lateral approximant /l/. The correspondences of initial consonants with the voiced alveolar plosive /d/, the voiceless aspirated palatal plosive /c^h/, and the voiced labial-velar approximant /w/ are not consistent.

4.2.2 Initial Consonant Clusters

This section examines the correspondences of consonant clusters. The following table shows the correspondences of consonant clusters.

Bantang	Bisu	Cauho	Tsukong
p ^h	p ^h l	p ^h	p ^h
p ^h	pl	p ^h	p ^h
p	pl	p	p
m	bl	b	b
k ^h	k ^h l	k ^h	k ^h
k	kl	k	k
k	kl	kw	g
m	bl	m	m

Table 178. Correspondences of Consonant Clusters

According to the preceding table, it is rare to find clusters that correspond consistently. However, sometimes it is simply one speech variety that is a little different or similar from the cognates in the rest of the varieties, such as with clusters /p^hl/, /pl/, /bl/, /k^hl/, and /kl/. In the correspondence set for the cluster /k^hl/, with limited supporting data, only Bisu has the cluster /k^hl/ as common while the rest of the varieties have the simple plosive /k^h/. In the case of the clusters /kw/ there is no consistent occurrences although further data would be helpful to support these correspondence.

In conclusion, there are no clusters, which could be considered to have the highest frequency of consistent occurrence. There is only the cluster /k^hl/, which guides the possibility to find the consistent occurrence of consonant clusters in any further study.

The following table shows the correspondences of the Bisu consonant cluster /bl/. Other clusters are poorly represented and do not show clear correspondences.

Bantang	Bisu	Cauho	Tsukong
mj	bl	b	b

Table 179. Correspondences of Consonant Clusters

4.3 Vowels

There are two sections describing vowels. The first section will focus on the correspondences of plain vowels. The second section will focus on the correspondences of diphthongs.

4.3.1 Plain Vowels

The following table compares all of the plain vowels occurring in four speech varieties.

Bantang			Bisu		
i	i	u	i	i	u
e		o	e		o
	ə			ə	
		ɔ			ɔ
æ			æ		
a			a		

Cauho			Tsukong		
i	i	u	i	i	u
e		o	e		o
	ə			ə	
		ɔ			ɔ
æ			æ		
a			a		

Table 180. Plain Vowels

All four speech varieties have the same 9 plain vowels, which are the unrounded close front vowel /i/, the unrounded close central vowel /i/, the rounded close back

vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, the central vowel /ə/, the rounded open-mid back vowel /ɔ/, the unrounded front vowel /æ/, and the unrounded open front vowel /a/.

This section will examine the correspondences of plain vowels. The following table shows the correspondences of plain vowels

Bantang	Bisu	Cauho	Tsukong
i	i	i	i
i	i	i	i
u	u	u	u
e	e	e/ æ	e
o/u	o/u/ɔ	o	o/ɔ
æ	–	æ	e
a	a	a	a

Table 181. Correspondences of Plain Vowels

According to the preceding table, unrounded front vowels /i/, /e/, /a/, unrounded central vowel /i/, and rounded back vowels /u/ and /o/ consistently occur in all the speech varieties. The front vowel /æ/ corresponds with /e/ in Tsukong. Note there is limited occurrence and distribution of the vowel /æ/ in Bisu. The rounded open-mid back vowel /ɔ/ occurs as a variant in Bisu and Tsukong.

In conclusion, the front vowels /i/, /e/, and /a/ show the highest frequency of consistent occurrence.

The following table shows the correspondences of vowels.

Bantang	Bisu	Cauho	Tsukong
i	i	i	i
ɨ	ɨ	ɨ	ɨ
u	u	u	u
e	e	e/ æ	e
o/u	o/u/ɔ	o	o/ɔ
æ	–	æ	e
a	a	a	a

Table 182. Correspondences of Vowels

The highest frequency of consistent vowel correspondences are the unrounded close front vowel /i/, the unrounded close central vowel /ɨ/, the rounded close back vowel /u/, the unrounded close-mid front vowel /e/, the rounded close-mid back vowel /o/, and the unrounded open front vowel /a/. The other correspondences vowels with the rounded open-mid back vowel /ɔ/, and the unrounded front vowel /æ/ are not consistent.

4.3.2 Diphthongs

The diphthongs in the four speech varieties are shown in the following table.

Bantang		
Front	Central	Back
iə	-	ɔi
iu	-	-
eo	-	-
ai	-	-
au	-	-

Bisu		
Front	Central	Back
iə	əi	ɔi
ai	-	-
au	-	-

Cauho		
Front	Central	Back
iə	-	uə
-	-	ɔi
ai	-	-
au	-	-

Tsukong		
Front	Central	Back
iə	-	ui
iu	-	-

Table 183. Bisoid Diphthongs

According to the table, only the diphthong /iə/ occurs in all four speech varieties. Only Tsukong does not have the diphthongs /ɔi/, /ai/, and /au/. The diphthong /iu/ occurs in Bantang and Tsukong. The diphthong /eo/ occurs only in Bantang. The diphthong /əi/ occurs only in Bisu. The diphthong /uə/ occurs only in Cauho. The diphthong /ui/ occur only in Tsukong.

The following table shows the correspondences of diphthongs.

Bantang	Bisu	Cauho	Tsukong
a	au	a	a
a	iə	a	a
a	iə	a/iə	i
a/au	ɔ	iə	ɔ
au	au	au	i/e
iə	æ	a	iə/ɪ
iə	i	æ	a
iə	iə	iə	iə
iə	ɪ	ɪ	i/e/a
o	əi	ɪ	i/au
o/ɔi	ɔi	ɔi	o
i/u	au	ɪ	ɪ

Table 184. Correspondences of Diphthongs

Diphthongs provided to be exceedingly difficult to show correspondences across the speech varieties. Table 184 summarizes the general tendencies of correspondences. Only one diphthong /iə/ is unchanged across all the speech varieties. Further study is needed to understand the relationship of diphthongs within Bisoid.

The following table shows the correspondences of diphthongs in Bisoid.

Bantang	Bisu	Cauho	Tsukong
a	au	a	a
a	iə	a	a
a	iə	a/iə	i
a/au	ɔ	iə	ɔ
au	au	au	i/e
iə	æ	a	iə/ɨ
iə	i	æ	a
iə	iə	iə	iə
iə	i	i	i/e/a
o	əi	i	i/au
o/ɔi	ɔi	ɔi	o
i/u	au	ɨ	ɨ

Table 185. Correspondences of Bisoid Diphthongs

As mentioned earlier, the correspondences of diphthongs is not as regular as that of vowels or consonants. Only the diphthong /iə/ could be said to occur consistently in the data.

4.4 Rhymes

This section will examine the correspondences of rhymes. The following table shows the correspondences of rhymes.

Bisu	Bantang	Cauho	Tsukong
iŋ	i	i	i
in	en/e	iŋ/en	eŋ/e
ik	i	e	em
en	en	æn	en
et	et	et	i
oŋ	u	u	u
ok	ok	ok	o
oŋ/om/u/o	ɔŋ	oŋ/ɔŋ/ɔʔ/o	oŋ/ɔŋ/o
æŋ	eŋ/ə/ak	æt/eŋ/e	e/a
æt	æt	æt	e
æn	a	eŋ	a
ap	ap/aʔ	aʔ/æn	at/a
a	a	at	a

Table 186. Correspondences of Rhymes

In Table 189, the vowel /i/ is followed by the voiceless unaspirated velar plosive /k/ in addition to the alveolar nasal /n/ and /ŋ/. The vowel /e/ is followed by the nasal /m/, /n/, and /ŋ/ in addition to the voiceless unaspirated alveolar plosive /t/. None of consonants and vowels follows after the vowel /u/. The vowel /o/ is followed by the voiceless unaspirated velar plosive /k/ in addition to the nasals /m/ and /ŋ/. The vowel /ɔ/ is followed by the velar nasal /ŋ/. The vowel /æ/ are followed by the voiceless unaspirated alveolar plosive /t/, the alveolar nasal /n/, and the velar nasal /ŋ/. The vowel /a/ is followed by the voiceless unaspirated bilabial plosive /p/, the voiceless unaspirated alveolar plosive /t/, the voiceless unaspirated velar plosive /k/, and the glottal /ʔ/.

In conclusion, the unrounded vowels /i/, /e/, /æ/, and /a/ in addition to the rounded vowels /o/ and /ɔ/, are most often followed by the alveolar nasal /n/ and the velar nasal /ŋ/. However the unrounded vowel /a/ is not only followed by the alveolar nasal

/n/ and the velar nasal /ŋ/, but also by the voiceless unaspirated bilabial plosive /p/, the voiceless unaspirated alveolar plosive /t/, the voiceless unaspirated velar plosive /k/, the glottal /ʔ/, and the unrounded close front vowel /i/.

The following table shows the correspondences of rhymes.

Bisu	Bantang	Cauho	Tsukong
iŋ	i	i	i
in	en/e	iŋ/en	eŋ/e
ik	i	e	em
en	en	æn	en
et	et	et	i
oŋ	u	u	u
ok	ok	ok	o
oŋ/om/u/o	ɔŋ	oŋ/ɔŋ/ɔʔ/o	oŋ/ɔŋ/o
æŋ	eŋ/ə/ak	æt/eŋ/e	e/a
æt	æt	æt	e
æn	a	eŋ	a
ap	ap/aʔ	aʔ/æn	at/a
a	a	at	a

Table 187. Correspondences of Rhymes

It is rare to find the consistent correspondences of rhymes. In general, most of vowels followed by a consonant or a vowel has many occurrences in Cauho in contrast to Tsukong which has the fewest occurrences. If there is further data to support this, it can be clearer to find the consistent occurrences of rhymes. Bisu would appear to be the most conservative using this data, but it must be remembered that Bisu was used as a baseline in this data. From this data, it can be concluded that Bisu, Bantang, and Cauho are more conservative than Tsukong. Tsukong appears to be more conservative in its nasal rhymes than stopped rhymes.

4.5 Tones

This section will discuss tone correspondences in the speech varieties.

The following table shows the correspondences of tones.

Bantang	Bisu	Cauho	Tsukong	Checked Syllable	Manner of Articulation
33	31	31	31	Yes	asp
33/31	—	35/31	35/31	Yes	asp
33/31	33/31	31/35/33	35		asp
33	31	31	31/35		asp
33	33	31	31	Yes	vd
33	33	31	—	Yes	vd
33	33	351	33		vd
33	33	33	31		vd
33/31	31	33/31/35	31/35	Yes	vl
—	31	—	—	Yes	vl
33	33	33	35	Yes	vl
33/35/31	33/31	31/33	31/35		vl
33	31/351	31/33	31		vl

Table 188. Correspondences of Tones

The most frequently consistent tones across the four speech varieties are 1) tone 31 with an aspirated initial consonant with a syllable final consonant, 2) tone 31 with an aspirated initial consonant and open syllable, 3) tone 31 with a voiceless initial consonant with a syllable final consonant, and 4) tone 31 with a voiceless initial consonant and open syllable.

CHAPTER 5

SUMMARY AND CONCLUSION

5.0 Introduction

This chapter contains the summary and conclusions to the thesis. Each chapter is briefly summarized, followed by a synthesis of the different chapters and then finally further research is suggested.

5.1 Summary

Chapter one presented general background knowledge about Bisoid such as including geography, people, previous research, plus also the purpose of the thesis was given, namely to describe and compare Bisoid speech varieties.

Chapter two answered the question “How related are the Bisoid speech varieties lexically?”. This chapter compared fifteen Bisoid speech varieties using lexicostatistics following Mann (2004). The highest lexical similarity of all fifteen speech varieties is between Laopin and Laomian with 90%. On the basis of these results four speech varieties were chosen to represent each of the four clusters discovered through the lexical comparison. These were Bantang, Bisu, Cauho and Tsukong. These four varieties were then analyzed and described in more detail in chapters three and four.

Chapter three presented a phonological description for Bantang, Bisu, Cauho, and Tsukong. The following table presents a summary of the phonological systems of each speech.

	Consonants	Consonant Clusters	Vowels	Diphthongs	tones
Bantang	25	-	9	6	3
Bisu	22	5	9	5	4
Cauho	26	-	9	5	4
Tsukong	24	1	9	3	3

Table 189. Distribution of Phonological Features

From this table we can see that Cauho has highest number of consonants. Bisu has highest occurrence of consonant clusters. All four speech varieties have the same number of vowels. Bantang has highest number of diphthongs. All four speech varieties have the same occurrence of tones, which are level tones. Only Bisu and Cauho show the existence of the contour tones.

Chapter four presented phonological comparisons between Bantang, Bisu, Cauho, and Tsukong based on the phonological descriptions of chapter. In phonological description section, the most consistent syllable structures are CV, CVC, CVV, and CVVC. The consonants having a high frequency of the consistent occurrence are the plosives /p^h/, /p/, /b/, /t^h/, /t/, /d/, /c^h/, /c/, /k^h/, /k/, and /ŋ/, the nasals /m/, /n/, and /ŋ/, the fricatives /s/, /ʃ/, and /h/, and the approximants /w/, /j/, and /l/. The plosive /g/ and the nasal /ŋ/ do not occur only in Bisu. Bisu has a highest occurrence of consonant clusters. All four speech varieties have the same nine vowels. Bantang has a highest occurrence of diphthongs. The most common occurrences of tones in four speech varieties are 35 (high tone), 33 (mid tone), and 31 (low tone). In comparative description section, the plosives /t/, and /k^h/ and the nasals such as /m/, and /n/ presents a high frequency of the consistent occurrences. The front vowels /æ/ and /a/ have a high frequency of consistent occurrences across all varieties.

5.2 Synthesis

This thesis considers three areas of comparison between four selected Bisoid speech varieties. These are lexical comparison, phonological description, and correspondence sets. The lexical comparison shows that the varieties are fairly similar, with Bisu and Tsukong being the most similar, followed by Cauho and Bantang. Bantang is the most lexically different from the other speech varieties.

In terms of phonological complexity, Cauho has the largest consonant inventory, followed by Bantang, Tsukong and then Bisu. Cauho has the most phonological complexity with nasals while Bantang has the most phonological complexity amongst fricatives. Bisu has the largest initial consonant cluster inventory. All four varieties have the same number of plain vowels. Bantang has the most diphthongs, followed by Bisu and Cauho and then Tsukong. Both Bisu and Cauho have more tones than Bantang and Tsukong. The following table summarizes the basic findings of the lexical, phonological and correspondence comparisons:

	Lexically	Phonology					Correspondences		
	similar	C	V	VC	dip	T	C	V	T
Bantang	lowest	25	9	nasal	6	3	conservative	conservative	conservative
Bisu	---	22	9	nasal, stop	5	4	conservative	conservative	conservative
Cauho	lower	26	9	nasal, stop	5	4	neutral	conservative	innovative
Tsukong	highest	23	9	nasal	3	3	innovative	innovative	innovative

Table 190. The Summary of the Different Aspects Analysis

From this table, it can be seen that there is not a strong general relationship between all of the different aspects analyzed in this thesis. The comparative description shows Tsukong to be the most innovative, yet lexically it is the most conservative with the highest lexical similarity to another speech variety (Bisu).

Cauho is the most conservative in terms of codas, yet the most innovative with respect to the consonant inventory. Correlations between lexical similarity and other

features such as phonology and systematic correspondences are a function of the methodology used in lexical counting.

In conclusion, the four speech varieties compared are quite similar. Bisu and Tsukong are very similar lexically, with Cauho and Bantang a little different. There are similarities in the phonological inventories, with Bantang and Cauho having the most consonants. The number of vowels in each language is the same. All four varieties have nasal codas but Cauho also has stops final rhymes.

5.3 Further Study

Further study on Bisoid speech varieties is essential for a clearer understanding of the history of the various Bisoid varieties. A major area of further study would be a reconstruction of Proto-Bisoid. However for a reconstruction, the wordlists used would need to be augmented with a larger selection of nouns and verbs as well as grammatical particles.

While this study has only looked at only four Bisoid speech varieties, there are many more varieties that need phonological analysis and description (at least the remaining eleven varieties used in chapter two).

Further comparison needs to be done between the various Bisoid varieties spoken in the countries of Southeast Asia. For example, a phonological comparison of Bisoid speech varieties in each country, such as a comparison of Bisu and Mpi phonology in Thailand, a comparison of Laomian, Laopin, and Tsukong phonology in China. Another related area of research would be to compare Bisoid speech varieties in one country to another country such as the Bisu in Thailand and Pyen in Myanmar, or a phonological comparison of Coong in Vietnam and Pyen in Myanmar.

Another area, not directly related to phonology is discourse analysis. There has been no discourse study done of any Bisoid variety. But not only discourse, but also

grammar has been poorly studied, especially a cross-variety comparison. Each variety has different grammar structure, which some add prefixes to derive a noun. In contrast, some add suffixes to derive a noun.

APPENDIX A

WORDLIST IN FULL SYLLABLE

The following table shows phonetic transcription of the wordlist of 397 vocabularies of selected four Bisoid speech varieties in full syllable.

No	Gloss	Bantang	Bisu	Cauho	Tsukong
1	elephant	ja ³³ ma ³³	hiə ³³ ja ³³ ba ³³	saŋ ³⁵	c ^h a ³³ ba ³³
2	tiger	ca ³³ la ³³	t ^h sa ³¹ la ³³	t ^h a ³³ la ³³	c ^h a ³³ la ³¹
3	bear	k ^h am ³⁵	ʔa ³³ wam ³³	ʔam ³⁵	k ^h am ³⁵
4	deer	c ^h et ³⁵	ho ³³ pəŋ ³¹	t ^h æt ³³	ho ³³ c ^h e ³³
5	monkey	miu ^{ʔ33}	ka ³³ səi ³¹	ʔa ³³ mo ^{ʔ351}	miu ³¹
6	gibbon	jo ^{ʔ31} na ^{ʔ35}	mæ ³¹ loŋ ³³	naŋ ³³ liŋ ³³	miu ³¹ p ^h u ³⁵
7	porcupine	ho ³³ c ^h u ³¹	ho ³³ c ^h u ³¹	ho ^{ʔ31} ʃu ³³	ho ³³ c ^h u ³¹
8	rat	ho ³³ tam ³¹	ho ³³ tam ³¹	ho ^{ʔ31} jum ³³	ha ³³ xi ³¹
9	dog	k ^h i ³³	k ^h i ³¹	k ^h i ³¹	k ^h i ³¹
10	cat	ʔa ³³ mi ³³	ʔa ³³ meŋ ³³	ʔa ³³ mæŋ ³³	ʔa ³³ mi ³³
11	pig	ya ^{ʔ31}	wa ³¹	ba ^{ʔ31}	wa ³¹
12	cow	ju ³¹ ni ³⁵	ʔa ³³ miəŋ ³³	ʔa ³³ miəŋ ³⁵	k ^h a ³³ po ³¹
13	buffalo	po ³³ nat ³⁵	pəŋ ³¹ na ³³	jo ³³	pan ³¹ na ³³
14	horn	ʔo ³³ k ^h i ³³	pəŋ ³¹ na ³³ kiəw ³⁵	jo ³³ k ^h iŋ ³⁵	pan ³¹ na ³³ c ^h i ³⁵
15	tail	tom ³³ mi ³¹	təŋ ³¹ ju ³³	to ³³ m̥in ³³	toŋ ³³ mi ³³
16	bird	ha ³³ ya ³¹	ha ³³ ja ³¹	hat ³³ ja ³³	ha ³³ ga ³¹
17	bird nest	ʔo ³³ pam ³¹	ʔai ³³ jaŋ ³¹ pam ³¹	hat ³³ ja ³³ ʔa ³³ pam ³⁵¹	ha ³³ ga ³¹ pam ³¹
18	wing	ʔo ³³ toŋ ³³	ʔaŋ ³³ təŋ ³³	hat ³³ ja ³³ ʔa ³³ toŋ ³⁵	ʔa ³³ toŋ ³⁵
19	feather	ʔo ³³ mit ³¹	ʔai ³³ jaŋ ³¹ mi ³³	hat ³³ ja ³³ ʔa ³³ my ³³	ʔaŋ ³³ mi ³¹

No	Gloss	Batang	Bisu	Cauho	Tsukong
20	chicken	ja ³³ c ^h uɿ ³³	hiə ³¹	ja ³³	xa ³¹
21	egg	ʔok ³³	hiə ³¹ ʔu ³³	ja ³³ ʔu ³³	ʔaŋ ³³ ʔu ³³
22	duck	ʔa ³³ pi ³³	ʔa ³³ kau ³¹	ʔa ³³ kap ³⁵	ʔa ³³ kap ³⁵
23	fish	naŋ ³³ ti ³³	lɔŋ ³³ tæ ³¹	lɔŋ ³¹ tæɿ ³⁵	ten ³³ ne ³³
24	snake	ʔi ³³ lo ³³	ʔu ³³ laŋ ³³	ʔi ³³	ʔi ³³ laŋ ³³
25	house lizard	k ^h a ³¹ jo ³⁵	cɔk ³¹ cɔk ³³	mæŋ ³¹ caŋ ³³ hən ³³	toŋ ³⁵ to ³¹
26	turtle	ʔa ³³ wɔŋ ³⁵ tau ³³ k ^h am ³¹	ʔu ³³ hoŋ ³¹	poŋ ³⁵	piə ³¹ piə ³⁵
27	frog	p ^h a ³³ ya ³¹	kop ³³ na ³³	p ^h a ³¹	p ^h a ³¹ ga ³¹
28	spider	ʔa ³³ mi ³⁵ naŋ ³¹ k ^h iə ³³	ku ³¹ mæn ³³ lam ³³	ʔa ³³ mup ³⁵ ʔa ³³ mæŋ ³¹	ʔa ³³ ko ³¹ la ³⁵ kaŋ ³³
29	spider web	ʔo ³³ pam ³¹	ku ³¹ mæn ³³ lam ³³ ce ³¹	ʔa ³³ mup ³⁵ ʔa ³³ mæŋ ³¹ pam ³¹	kaŋ ³³ ŋi ³⁵
30	louse	c ^h i ³³ ma ³¹	tsen ³³	sæn ³³	san ³⁵
31	termite	pün ³³	ʔu ³³ hən ³¹	p ^h i ³³ ʔin ³³	pim ³¹
32	cockroach	no data	piə ³¹ lam ³⁵ ba ³³	mæŋ ³³ sap ³⁵	kap ³⁵ p ^h a ³⁵ la ³⁵ ba ³¹
33	snail	pi ³³ lü ³⁵	ca ³¹ pæk ³¹	ʔu ³¹ sap ³¹ pi ³³ liu ³³	pe ³¹ le ³⁵
34	mosquito	jæk ³³ kiəw ³¹	mæŋ ³³ mɔŋ ³³	jæŋ ³³ k ^h iəŋ ³³	jaŋ ³⁵ ko ³¹
35	bee	pæ ³¹ jo ³¹	piə ³¹	piə ³³	piə ³¹
36	a fly	ʔa ³³ pin ³¹ li ³³ ʃit ³¹	mæŋ ³³ ba ³³	jaŋ ³³	jam ³⁵ ba ³¹
37	butterfly	no data	tɔ ³³ lɔ ³³	pum ³⁵ pu ³³ lup ³⁵	pi ³¹ li ³⁵
38	sky	mɔŋ ³³ t ^h a ³¹	muŋ ³¹	mɔŋ ³³ t ^h a ³¹	muŋ ³¹
39	sun	naŋ ³³ c ^h a ³³	muŋ ³¹ niŋ ³¹	mɔŋ ³³ niŋ ³⁵ c ^h i ³¹	mi ³¹ liŋ ³⁵
40	moon	pi ³³ la ³¹	ʔu ³³ la ³³	p ^h o ³³ la ³⁵ c ^h i ³¹	pe ³¹ la ³⁵
41	star	pi ³³ ki ³⁵	ʔu ³³ ki ³³	p ^h i ³³ ki ³³	piə ³¹ ki ³⁵
42	cloud	mo ³³ mu ³⁵	fa ³³	siŋ ³¹ tam ³³	caŋ ³¹ si ³¹
43	mist	c ^h oŋ ³³ ʃi ³¹	məi ³³	si ³³	caŋ ³¹ si ³¹
44	rain	mo ³³ ho ³⁵	muŋ ³¹ ho ³¹	mɔŋ ³³ ho ³⁵	mo ³⁵

No	Gloss	Batang	Bisu	Cauho	Tsukong
45	rainbow	ti ³³ tiŋ ³³ laŋ ³³ c ^h u ³¹	pi ³³ huŋ ³³ laŋ ³³ c ^h u ³¹	tiŋ ³³ laŋ ³³ c ^h u ³³	c ^h i ³³ la ³³ kaŋ ³³
46	lightning	moŋ ³³ miəp ³³	muŋ ³¹ blap ³³	muŋ ³⁵¹ bæn ³³ lak ³¹ ʔai ³¹⁵	muŋ ³¹ bat ³¹
47	thunder	moŋ ³³ ce ³³	muŋ ³¹ ce ³³ ce ³³	moŋ ³³ ce ³¹ ci ³³ ʔai ³¹⁵	moŋ ³¹ ce ³¹
48	wind	hom ³³ me ³³	haŋ ³³ man ³³	ha ³³ man ³³	ho ³⁵ ban ³⁵
49	hail	hu ³³ lu ³¹	hə ³¹ lo ³³	ho ³⁵ lo ³⁵ si ³³	ho ³⁵ lo ³¹
50	frost	cap ³¹ p ^h ɪ ³³	no data	siŋ ³¹ tam ³³ piŋ ³¹ ʔai ³¹⁵	ŋe ³⁵
51	dew	c ^h o ³³ k ^h a ³¹	məl ³³	siŋ ³¹ tam ³³	c ^h u ³¹ ba ³⁵
52	shadow (person)	ʔo ³³ hup ³³	ke ³³ ke ³³ c ^h aŋ ³¹	ʔo ³³ ʔup ³⁵	ʔa ³³ laŋ ³⁵
53	shade	k ^h i ³⁵ caŋ ³¹ ʔo ³³ hup ³³	tsiŋ ³³ tsiŋ ³³ c ^h um ³¹	mo ³³ ʔup ³⁵ ʃu ³³ mai ³¹⁵	niŋ ³⁵ sæn ³⁵
54	night	ʔo ³³ ʔaŋ ³³	muŋ ³¹ k ^h i ³¹	k ^h it ³¹ kəŋ ³³	miŋ ³¹ c ^h i ³⁵
55	day	ja ³⁵ na ³¹	liŋ ³¹ kəŋ ³³	jæ ³¹ niŋ ³⁵¹	niŋ ³³
56	morning	jaŋ ³⁵ si ³¹ t ^h a ³¹	sət ³¹ t ^h a ³¹	so ³³ da ³³	səŋ ³¹ ba ³³ la ³³
57	noon	ʔa ³³ sak ³¹ k ^h i ³³ t ^h o ³¹	t ^h iən ³¹	tən ³³ t ^h eŋ ³³	na ³¹ kə ³³ loŋ ³³
58	yesterday	mi ³³ naŋ ³¹ ko ³³	miŋ ³³ kəŋ ³³	mən ³⁵ nə ³¹	mi ³⁵ na ³¹ kə ³³ loŋ ³³
59	tomorrow	nu ³¹ si ³³ na ³³	di ³¹ c ^h ɪ ³³	ʔa ³³ sət ³³ na ³⁵¹ ʔə ³¹⁵	jaŋ ³⁵ kəŋ ³⁵
60	year	ja ³⁵ ni ³¹	ʔaŋ ³³ pi ³¹	jam ³⁵ ni ³¹	ʔa ³³ xo ³¹
61	water	ʔa ³³ c ^h u ³¹	laŋ ³³	laŋ ³³	la ³⁵ c ^h o ³¹
62	river	lo ³⁵ k ^h am ³¹ ma ³³	laŋ ³³ ba ³³	laŋ ³³ ba ³⁵¹	la ³⁵ k ^h am ³¹
63	lake	loŋ ³³ ma ³³	no data	loŋ ³³	la ³⁵ t ^h æn ³¹
64	earth, soil	naŋ ³⁵ c ^h a ³¹	niŋ ³³ t ^h a ³¹	niŋ ³³ t ^h a ³³	mi ³⁵ t ^h a ³¹
65	mud	loŋ ³³ pot ³¹	loŋ ³³ pən ³¹	ʔeŋ ³³ pot ³³	loŋ ³⁵ t ^h a ³¹
66	dust	k ^h a ³³ la ³³	k ^h a ³³ la ³³	k ^h o ³³ ləŋ ³³	k ^h o ³⁵ lu ³⁵
67	stone	loŋ ³³ ma ³³ ya ³¹	lə ³³ ba ³³	la ³¹ p ^h u ³⁵ c ^h i ³¹	ho ³³ ba ³³
68	sand	mi ³⁵ ʃi ³¹	sai ³¹	k ^h i ³³ sai ³¹	mi ³⁵ si ³¹
69	gold	k ^h am ³¹	k ^h am ³¹	k ^h am ³¹	si ³⁵
70	silver	p ^h iu ³³	p ^h lu ³³	p ^h u ³³	p ^h u ³⁵

No	Gloss	Batang	Bisu	Cauho	Tsukong
71	iron	sam ³³	ʃam ³³	lek ³⁵	sam ³⁵
72	mountain	kaŋ ³¹ kie ³³	ta ³¹ tsæ ³³	tap ³³ p ^h up ³⁵	ʔaŋ ³³ kiŋ ³¹
73	cave	loŋ ³³ le ³³	tam ³¹	t ^h am ³¹⁵	ʔa ³³ k ^h oŋ ³¹
74	forest	sa ³¹ k ^h a ^{ʔ33}	tsoŋ ³¹ kəŋ ³³	k ^h ot ³¹ loŋ ³⁵ tæ ³¹	si ³¹ siŋ ³⁵ c ^h oŋ ³¹
75	tree	hi ³¹ caŋ ³³	tsiŋ ³¹ tsiŋ ³³	tat ³¹ tiŋ ³⁵	si ³¹ siŋ ³⁵
76	branch	lak ³³ ŋa ³¹	tsiŋ ³¹ tsiŋ ³³ laŋ ³¹ ŋam ³³	tat ³¹ tiŋ ³⁵ lak ³⁵ ŋa ³¹	ʔa ³³ la ³¹
77	bark	ʔo ³³ c ^h e ³³	tsiŋ ³¹ tsiŋ ³³ ʔaŋ ³³ k ^h o ³¹	tat ³¹ tiŋ ³⁵ k ^h o ^{ʔ33}	si ³¹ siŋ ³⁵ la ³¹
78	thorn	c ^h u ³¹ c ^h u ³¹	ʔaŋ ³³ c ^h u ³¹	ʃu ^{ʔ31}	ʔa ³³ tsu ³¹
79	root	ʔo ³³ c ^h e ³³ ma ^{ʔ31}	tsiŋ ³¹ tsiŋ ³³ c ^h e ³³	tat ³¹ tiŋ ³⁵ sæ ³¹⁵	ʔa ³³ c ^h e ³⁵
80	leaf	ʔo ³³ p ^h a ^{ʔ31}	tsiŋ ³¹ tsiŋ ³³ pa ³¹	tat ³¹ tiŋ ³⁵ p ^h a ^{ʔ31}	ʔa ³³ p ^h a ³¹
81	flower	ʔo ³³ ji ^{ʔ33}	wæ ³³ ja ³³	ŋ ³³ bat ³³	ʔa ³³ ji ³¹
82	fruit	hi ³¹ caŋ ³³ ʔo ³³ ʃi ³¹	tsiŋ ³¹ si ³³ laŋ ³¹ si ³³	ŋ ³³ si ³⁵	ʔa ³³ si ³¹
83	seed (grain)	ʔo ³³ ju ³¹	ʔaŋ ³³ jau ³¹ ci ³³	ma ³³	ʔa ³³ ji ³³
84	grass	ja ³³ mo ^{ʔ31}	bu ³³ ka ³³	ŋ ³³ bo ³¹	mo ³¹ ka ³¹
85	bamboo	ha ³³ poŋ ³³	ʔa ³³ k ^h loŋ ³³	mai ³¹ p ^h ai ³³	tsa ³¹ tu ³³
86	bamboo shoot	ha ³³ mi ^{ʔ31}	ʔa ³³ mit ³⁵¹	ʔa ³³ mit ³³	mi ³¹ c ^h i ³⁵ i ³⁵ pan ³⁵
87	mushroom	mū ³³	məŋ ³³	mu ³¹	muŋ ³⁵
88	rattan	din ³³	tsaŋ ³¹ laŋ ³¹	din ³¹ ni ³³	ne ³³ k ^h oŋ ³³
89	sugar cane	poŋ ³¹ c ^h i ³³	poŋ ³¹ c ^h au ³¹	pin ³³ siŋ ³¹⁵	poŋ ³¹ c ^h i ³⁵
90	opium	næ ³³ jen ³³	ja ³¹ fin ³³	jaŋ ³³ jen ³⁵	je ³¹ jen ³⁵
91	liquor	ti ³¹ k ^h a ³³	tæ ³¹ k ^h a ³¹	te ³¹ k ^h a ³⁵	te ³¹ k ^h a ³⁵
92	banana	hat ³³ ʃi ³¹	ʔa ³³ tsi ³¹	hat ³¹ si ³¹	ʔa ³³ k ^h e ³¹ ho ³³ lom ³³
93	papaya	mak ³³ hoŋ ³³ ʃi ³¹	kui ³³ pau ³¹	mak ³¹ huŋ ³³	la ³⁵ pi ³¹ tə ³¹ k ^h o ³¹
94	mango	kaŋ ³³ ku ³¹ ʔu ³³ ʃi ³¹	məŋ ³¹ məŋ ³¹	mak ³¹ məŋ ³¹	piə ³⁵ k ^h e ³¹
95	bean	məŋ ³³ pi ³³	t ^h u ³³ lin ³³	ŋ ³³ pat ³³	nom ³³ pe ³³
96	cucumber	c ^h i ³¹ k ^h o ³³ ʃi ³¹	tsi ³¹ k ^h o ³¹	si ³¹ k ^h o ³¹ si ³¹	si ³¹ k ^h o ³¹

No	Gloss	Batang	Bisu	Cauho	Tsukong
97	peanut	tʰi ³³ lin ³¹	tʰu ³³ lin ³³	tʰo ³³ din ³¹	tʰi ³⁵ lin ³³
98	ginger	cʰi ³³ cʰi ³¹	miŋ ³³ tsi ³¹	jæŋ ³¹ si ³³	caŋ ³⁵ cʰi ³¹
99	garlic	pʰak ³¹ tʰem ³³	həm ³¹ tem ³¹	pʰak ³¹ tʰem ³¹	ho ³⁵ hom ³⁵
100	red pepper	la ³¹ pʰi ³³	laŋ ³¹ piŋ ³⁵ næ ³³	la ³¹ pʰi ³¹⁵	ca ³¹ pʰi ³⁵ ne ³⁵ le ³⁵
101	corn	sa ³³ lən ³¹	kʰau ³¹ pʰot ³¹	ku ³¹ sa ³⁵¹	tʰa ³¹ tu ³³
102	paddy rice	kuŋ ³³	kɔ ³³ tsi ³¹	kot ³¹ lum ³¹	ko ³³
103	pounded rice	kuŋ ³³ cʰe ³³	kɔ ³³ cʰen ³³	kot ³¹ sæn ³⁵	ko ³³ tsan ³³
104	cooked rice sticky	ho ³³ miəŋ ³³	haŋ ³¹ miŋ ³³	haŋ ³¹ miŋ ³⁵	haŋ ³¹
105	rice husk	kʰap ³³ pʰi ³¹	ka ³³ pi ³⁵¹	ka ³¹ pʰi ³⁵¹	ko ³³ kʰam ³¹
106	salt	ha ³³ təŋ ³³	tsam ³¹ mæ ³¹	tʰaŋ ³¹	ʔa ³³ tə ³³
107	field	ja ³³	hiə ³³	ja ³⁵	la ³⁵ cʰa ³⁵
108	garden	ja ³³ kʰiəm ³³	son ³¹	son ³³	tʰa ³⁵ kaŋ ³¹ cʰa ³⁵
109	village	kʰəŋ ³¹	kʰəŋ ³¹	kʰəŋ ³¹	pʰu ³⁵
110	road, path	kiəm ³³ ma ³¹	kim ³³ ba ³³	kæ ³³ laŋ ³⁵¹	ka ³⁵ ba ³³
111	boat	jam ³³	ləŋ ³³	laŋ ³¹	xəŋ ³¹
112	house	ləŋ ³³	jum ³³	pam ³¹	jim ³⁵
113	door	ko ³¹ pʰi ³¹	laŋ ³³ kɔ ³³	kʰa ³¹ toŋ ³⁵	ko ³³ pʰi ³¹
114	roof	jaŋ ³³ mu ³¹	jum ³³ muŋ ³⁵¹	pam ³¹ mum ³⁵¹	jim ³⁵ cʰi ³⁵
115	space under house	ʔo ³³ kʰan ³⁵	təŋ ³¹ kɔ ³¹ lək ³⁵	ŋ ³³ pʰin ³⁵	jaŋ ³¹ ko ³³ lək ³³
116	wall (of house)	kiəm ³³ tʰi ³¹	kʰam ³³ piə ³³	kʰam ³³ piə ³⁵	kam ³⁵ tʰe ³¹
117	mat	ti ³³ pʰuŋ ³¹	tæ ³³ pʰu ³³	ta ³³ pʰu ³⁵¹	ko ³³ jo ³¹ waŋ ³¹
118	pillow	ti ³³ kiəm ³¹	tu ³¹ kʰu ³³	to ³³ kʰu ³⁵	tu ³¹ kim ³¹
119	blanket	tam ³³ pʰuŋ ³¹	ʔa ³³ pen ³¹	ʔa ³³ kʰu ³⁵	pʰi ³¹ tem ³⁵
120	shirt	pu ³³ kʰaŋ ³¹	kʰa ³¹ lau ³³	kʰa ³³ lap ³⁵	ʔa ³³ kʰa ³¹ pa ³¹ la ³¹
121	sarong	pʰiə ³¹	tŋ ³¹ ka ³¹	tŋ ³¹ ka ³¹	taŋ ³¹
122	trousers	kʰi ³³ cʰəŋ ³¹	tŋ ³¹ tsəŋ ³¹	səŋ ³¹⁵	tʰa ³¹ ga ³¹

No	Gloss	Bantang	Bisu	Cauho	Tsukong
123	needle	ko ³³ kiəp ³³	kəŋ ³¹ kiəw ³¹	ku ³¹ kiəp ³¹	ku ³¹ lap ³¹
124	comb	to ³³¹ k ^h iəɿ ³³	tu ³³ k ^h iə ³³	tu ³¹ k ^h iəp ³³	tu ³¹ k ^h a ³⁵
125	ring	loŋ ³⁵ c ^h əŋ ³¹	la ³¹ tsəŋ ³¹	pək ³³ mi ³⁵¹	la ³¹ c ^h əŋ ³¹
126	paper	so ³³ ka ³¹	ka ³³ lat ³³	ka ³¹ lat ³⁵	ka ³⁵ dat ³⁵
127	cooking pot	po ³³ loŋ ³³	ʔu ³³ ləŋ ³¹	p ^h o ³¹ ləŋ ³¹	pəŋ ³¹ mi ³⁵
128	mortar	təŋ ³¹ c ^h am ³⁵	təŋ ³¹ tsuŋ ³¹	təŋ ³¹ t ^h um ³³	tsem ³⁵ si ³¹
129	pestle	təŋ ³¹ kü ³³	təŋ ³¹ kan ³¹	tonŋ ³¹ kan ³³	t ^h əŋ ³¹ c ^h en ³⁵
130	spoon	kən ³³	kən ³¹	sot ³¹ tam ³³	t ^h əŋ ³¹ kin ³⁵
131	knife	miə ³³ ya ³¹	miə ³³	t ^h ai ³⁵ ja ³⁵	ca ³⁵ k ^h u ³¹
132	plate	k ^h u ³⁵ p ^h e ³¹	can ³³	t ^h oi ³⁵ le ³¹	mja ³⁵
133	firewood	mi ³³ t ^h uɿ ³¹	bi ³³ t ^h ɔ ³¹	m ³³ bi ³¹ t ^h um ³⁵	mi ³¹ tsa ³¹
134	fire	mi ³³ lam ³⁵	bi ³³ t ^h ɔ ³¹	m ³³ bi ³¹	mi ³¹ tsa ³¹
135	ashes	k ^h a ³³ la ³³	mi ³¹ hau ³¹ k ^h a ³³ la ³⁵	k ^h ə ³³ ləŋ ³⁵	k ^h i ³⁵ fi ³⁵
136	smoke	mi ³³ k ^h ü ³¹	bi ³¹ kau ³¹	bi ³¹ k ^h əŋ ³¹	mi ³¹ k ^h ui ³¹
137	candle	soŋ ³¹ si ³³	təŋ ³¹ c ^h i ³¹ lan ³⁵	soŋ ³¹ si ³¹⁵	ten ³⁵ ne ³⁵ c ^h i ³⁵
138	drum	t ^h aŋ ³¹ maɿ ³³	kəŋ ³³ man ³³	kəŋ ³⁵	t ^h uŋ ³¹
139	gong	t ^h aŋ ³¹ maɿ ³³ ʔa ³³ hi ³¹	mɔ ³³ joŋ ³³	loŋ ³⁵ moŋ ³⁵	bi ³⁵ liŋ ³⁵
140	flute	ja ³⁵ sai ³¹ ʔe ³³ le ³³	k ^h lui ³¹	pi ³³	k ^h a ³⁵ pi ³⁵
141	crossbow	saŋ ³¹ naɿ ³³	tan ³³ nu ³³	siŋ ³¹ ŋaɿ ³¹	si ³¹ la ³⁵
142	arrow	mi ³¹ c ^h eɿ ³³	no data	m ³³ ba ³¹	ba ³¹
143	man	ka ³³ p ^h a ³³ ya ³¹	ka ³¹ p ^h a ³³ ja ³³	ka ³¹ p ^h a ³¹	no ³¹ ci ³⁵
144	woman	k ^h a ³³ ma ³³ ya ³¹	k ^h a ³¹ ba ³³ ja ³³	k ^h a ³¹ bai ³³ ja ³¹	ta ³¹ kau ³¹ ba ³⁵
145	person	c ^h oa ³¹	tsaŋ ³³	t ^h aŋ ³⁵	tsa ³⁵ la ³¹
146	father	ʔa ³³ pu ³¹	ʔa ³³ boŋ ³³	m ³³ pu ³⁵	ʔa ³³ pu ³³
147	mother	ʔa ³³ maɿ ³¹	ʔa ³³ ba ³³	maɿ ³⁵¹	ʔa ³³ ba ³³
148	child	ʔo ³³ ya ³¹	ʔaŋ ³³ ja ³³	ŋ ³³ ja ³¹	ʔa ³³ ka ³¹

No	Gloss	Bantang	Bisu	Cauho	Tsukong
149	husband	ʔo ³³ miu ³³	ʔaŋ ³³ bləŋ ³⁵	m ³³ bəŋ ³⁵	ʔa ³³ bəŋ ³⁵
150	wife	k ^h am ³¹ maɿ ³³	k ^h a ³¹ ba ³³	k ^h a ³¹ ba ³¹	ʔa ³³ bi ³¹
151	elder sibling	ʔa ³³ c ^h i ³¹ /ʔa ³³ moŋ ³⁵¹	ʔa ³³ ʔai ³³ /ʔa ³³ tsi ³³	m ³³ t ^h i ³³ /məŋ ³⁵	ʔa ³³ bəŋ ³⁵ /ʔa ³³ c ^h i ³¹
152	younger sibling	ʔo ³³ ci ³¹	ʔa ³³ p ^h æ ³³ /ʔa ³³ pə ³⁵¹	ŋ ³³ ji ³⁵	ʔa ³³ ji ³⁵
153	friend	mak ³⁵¹	ʔaŋ ³³ tsaŋ ³⁵¹	ʃæk ³¹ kaɿ ³¹	ʔa ³³ jo ³¹ ji ³⁵
154	name	ʔo ³³ miəŋ ³³	ʔaŋ ³³ meŋ ³³	miŋ ³⁵	ʔa ³³ mi ³⁵
155	head	ʔo ³³ tu ³¹	ʔaŋ ³³ tu ³³	ŋ ³³ tu ³¹	ʔa ³³ tu ³¹
156	face	miə ³³ p ^h u ³³	mæ ³³ ka ³⁵¹	na ³¹ jeŋ ³⁵	miə ³⁵ p ^h a ³¹
157	brain	tu ³¹ c ^h i ³³	tun ³¹ no ³¹	no ³¹	ʔa ³³ do ³¹
158	hair	sam ³³ k ^h əŋ ³³	cam ³³ kiŋ ³³	tam ³³ k ^h iŋ ³⁵	sa ³⁵ k ^h im ³⁵
159	forehead	miə ³³ k ^h əŋ ³³	mæ ³¹ k ^h əŋ ³³	ŋat ³¹ k ^h əŋ ³¹⁵	mi ³³ p ^h u ³³
160	eyebrow	miə ³³ mi ³¹	mæ ³¹ kiəw ³³ mi ³³	met ³¹ mi ³¹ k ^h əŋ ³⁵	miə ³³ mi ³¹
161	eye	miɿ ³³ niɿ ³³	mæ ³¹ ni ³¹	na ³¹ miɿ ³³	miə ³³ si ³¹
162	nose	na ³³ mæ ³³	na ³³ k ^h aŋ ³³	na ³¹ tuŋ ³⁵	niŋ ³⁵ k ^h aŋ ³⁵
163	check	pə ³¹ paɿ ³³	pa ³¹ pa ³³	pa ³¹ kæm ³¹⁵	pa ³¹ pa ³¹ ba ³¹ c ^h i ³⁵
164	ear	ʔo ³³ na ³¹	na ³¹ siŋ ³¹	na ³¹ k ^h əŋ ³¹	ʔa ³³ na ³¹
165	mouth	me ³¹ t ^h əŋ ³³	man ³¹ pəŋ ³¹	man ³¹ sæn ³⁵¹	ma ³¹ t ^h əŋ ³¹
166	tongue	mi ³¹ la ³⁵	man ³¹ la ³¹	ŋ ³³ la ³⁵	ka ³¹ ka ³⁵
167	saliva	k ^h a ³¹ tü ³¹	kan ³¹ laŋ ³¹	k ^h at ³¹ laŋ ³¹⁵	mi ³¹ t ^h i ³¹
168	tooth	ʔo ³³ su ³¹	sə ³¹ p ^h e ³¹	ŋ ³³ sə ³¹	ʔa ³³ so ³¹
169	gums	su ³¹ k ^h əŋ ³³	man ³¹ k ^h ə ³⁵	sok ³¹ k ^h əŋ ³¹⁵	ma ³¹ kaŋ ³¹
170	chin	mi ³¹ pi ³⁵	man ³¹ tiŋ ³¹	man ³¹ pi ³¹⁵	ma ³¹ pi ³⁵
171	beard	mi ³¹ miɿ ³³	man ³¹ mi ³¹	man ³¹ ni ³³	ma ³¹ mi ³¹
172	shave (beard)	mi ³¹ miɿ ³³ c ^h u ³⁵ lo ³³ ka ³³ lam ³³	man ³¹ mi ³¹ k ^h un ³¹⁵	man ³¹ ni ³³ sut ³³ tam ³³	ma ³¹ mi ³¹ c ^h o ³¹ le ³⁵
173	neck	naŋ ³³ c ^h i ³¹	liŋ ³⁵ si ³⁵¹	niŋ ³¹ t ^h i ³¹	la ³⁵ tsi ³¹

No	Gloss	Batang	Bisu	Cauho	Tsukong
174	shoulder	p ^h a ³¹ p ^h u ³³	pa ³¹ huŋ ³¹	la ³¹ p ^h a ³¹⁵	p ^h a ³¹ p ^h u ³⁵
175	back	naŋ ³³ k ^h u ³³	taŋ ³¹ k ^h aŋ ³¹	niŋ ³³ po ³¹⁵	ta ³¹ k ^h a ³⁵ laŋ ³⁵
176	abdomen	bu ³¹ poŋ ³³	pəŋ ³¹ pəŋ ³⁵	pa ³¹ pəŋ ³⁵	ʔu ³³ poŋ ³³
177	navel	c ^h æt ³⁵ toŋ ³¹	sa ³³ toŋ ³³	ʔu ³¹ c ^h a ³¹	ʔu ³³ ʔi ³⁵
178	heart	niŋ ³³ ma ³³ ʃi ³¹	niŋ ³³ ba ³³	net ³¹ ba ³³ c ^h i ³¹	niŋ ³⁵ ba ³¹
179	lungs	ʔo ³³ map ³³	ʔaŋ ³³ mau ³³	m ³³ p ^h ap ³¹	ʔa ³³ p ^h am ³¹
180	liver	ʔo ³³ p ^h e ³¹	ʔaŋ ³³ tsin ³¹	m ³³ t ^h iŋ ³¹	ʔa ³³ p ^h e ³¹
181	intestines	ʔo ³³ ʔu ³³	ʔaŋ ³³ ʔu ³³	ʔu ³¹ ʔu ³⁵	ʔa ³³ ʔu ³⁵
182	hand	ʔo ³³ la ³¹	lap ³¹ pu ³¹	la ³¹	ʔa ³³ la ³¹
183	elbow	la ³³ c ^h i ³³ toŋ ³¹	pa ³¹ si ³¹ toŋ ³¹	la ³¹ t ^h i ³³ toŋ ³¹	la ³¹ toŋ ³⁵ tsi ³¹
184	armpit	la ³³ c ^h a ³³ kə ³¹ ʃit ³¹	ka ³¹ lɔp ³¹ ka ³¹ lip ³⁵	la ³¹ ko ³³ toŋ ³¹	ta ³¹ kə ³¹ le ³⁵
185	palm	la ³³ te ³³	lau ³¹ wa ³¹	la ³¹ ba ³⁵¹	la ³¹ p ^h a ³⁵
186	finger	la ³³ ju ³⁵	la ³¹ jum ³³	la ³¹ nuŋ ³¹⁵	la ³¹ luŋ ³⁵
187	nail	la ³³ c ^h eŋ ³¹	pa ³¹ siŋ ³¹	la ³¹ c ^h iŋ ³³	la ³¹ si ³¹
188	buttocks	toŋ ³¹ k ^h əŋ ³³	təŋ ³¹ k ^h lɔŋ ³¹	toŋ ³¹ p ^h um ³³	toŋ ³¹ taŋ ³⁵
189	leg	ʔo ³³ k ^h i ³³	la ³¹ k ^h i ³¹	toŋ ³¹ p ^h a ³¹	ʔa ³³ k ^h i ³⁵
190	thigh	ʔo ³³ poŋ ³³	pəŋ ³⁵ tu ³⁵	toŋ ³¹ p ^h a ³¹ tɔ ³³	ʔa ³³ poŋ ³⁵
191	knee	pi ³³ c ^h i ³¹	pa ³¹ tu ³³	p ^h a ³¹ t ^h i ³⁵ tu ³³	pi ³⁵ tsi ³¹
192	calf	ko ³³ poŋ ³¹ c ^h i ³¹	kɔ ³¹ kæŋ ³⁵¹	k ^h ə ³¹ p ^h uŋ ³⁵¹	ma ³¹ ka ³⁵ ʔa ³³ tu ³³
193	shin	ku ³¹ ke ³³	kɔ ³¹ kæŋ ³⁵¹	man ³¹ kaŋ ³³	ma ³¹ ka ³⁵ ka ³⁵ c ^h i ³⁵
194	foot	ʔo ³³ ki ³³ p ^h i ³¹ tæ ³³	la ³¹ k ^h i ³¹	ŋ ³³ k ^h i ³⁵	ʔa ³³ k ^h i ³⁵
195	heel	p ^h a ³³ toŋ ³¹	la ³¹ k ^h i ³¹ pa ³⁵ toŋ ³¹ siŋ ³³	p ^h a ³³ toŋ ³¹ man ³¹ næ ³³	p ^h a ³¹ toŋ ³¹
196	bone	ʔoŋ ³³ ju ³¹	ʔaŋ ³³ kau ³³	ŋ ³³ kiŋ ³¹	ʔa ³³ ji ³¹
197	rib	nam ³³ piə ³³	ʔaŋ ³³ piəŋ ³³ si ³¹	nam ³¹ p ^h iə ³⁵¹ kiŋ ³¹	ʔa ³³ nam ³⁵ ji ³¹
198	flesh	sa ³¹	ʔaŋ ³³ ma ³³	ŋ ³³ sa ³¹	ʔa ³³ sa ³¹
199	fat	ya ³¹ c ^h i ³³	ʔaŋ ³³ tsi ³³	ba ³¹ t ^h i ³¹ ʔi ³⁵	ʔa ³³ ʃi ³⁵

No	Gloss	Batang	Bisu	Cauho	Tsukong
200	skin	c ^h u ³¹ ʔa ³³ k ^h u ^{ʔ33}	ʔaŋ ³³ k ^h ɔ ³¹	ŋ ³³ lu ³³	ʔa ³³ hu ³¹
201	blood	ʃi ³¹	c ^h i ³¹	c ^h i ³¹	si ³¹
202	sweat	ku ³¹ c ^h u ³¹ naŋ ³³ c ^h a ³³	muŋ ³¹ ni ³¹	luŋ ³¹ laŋ ³¹⁵	ku ³³ c ^h o ³⁵
203	pus	ʔo ³³ piəm ³³	ʔaŋ ³³ ʔum ³⁵	ŋ ³³ piŋ ³⁵	ho ³³ piŋ ³⁵
204	excrement	ʔeŋ ³¹	ʔæŋ ³¹	ʔeŋ ³¹	jaŋ ³¹
205	urine	ʔi ³¹ ʃi ³⁵	ʔi ³¹ c ^h i ³¹	ʔi ³¹	ʔa ³³ si ³⁵
206	smell	na ³³ mai ³¹	nam ³¹	ŋ ³¹ pat ³¹	nam ³⁵ me ³⁵
207	see	mo ³³ ʔai ³¹	miəŋ ³³	miəŋ ³³ c ^h i ³³	miəŋ ³⁵ ŋe ³⁵
208	wink	mi ^{ʔ33} ni ^{ʔ33} mi ³³ ʔai ³¹	mæ ³¹ ni ³¹ blum ³⁵	na ³³ mit ³³ mit ³³ ʔai ³³	miən ³⁵ la ³³ dam ³³
209	weep	ʔu ³³ ŋai ³¹	ʔuŋ ³⁵	ʔu ³³ ŋai ³³	ʔuŋ ³⁵ ŋe ³⁵
210	eat	ca ³³ ʔai ³¹	tsa ³¹	tai ³¹⁵	sa ³¹⁵
211	swallow	mü ³³ pi ³⁵ ka ³¹ lam ³³	naŋ ³⁵	naŋ ³¹ ŋa ³¹ ha ³¹ næ ³³	bwe ³⁵
212	drink	to ³³ ʔai ³¹	laŋ ³³ taŋ ³³	laŋ ³³ ta ³³ ŋai ³¹	taŋ ³⁵ ŋe ³⁵
213	vomit	p ^h i ³³ ʔai ³¹	pa ³¹ p ^h æk ³¹ p ^h æ ³³	p ^h at ³¹ ʔai ³¹⁵	p ^h e ³¹ k ^h a ³⁵
214	spit	t ^h i ³³ ʔai ³¹	k ^h an ³¹ laŋ ³¹ p ^h it ³⁵¹	k ^h at ³¹ laŋ ³³ p ^h it ³¹ ʔai ³¹⁵	k ^h a ³⁵
215	cough	c ^h i ³³ ʔai ³¹	tsau ³¹ ʔuŋ ³¹⁵	t ^h iŋ ³¹ ʔai ³¹⁵	c ^h u ³¹ ʔe ³⁵
216	sneeze	ha ³³ p ^h i ³³ ʃi ³³	hat ³⁵ c ^h əi ³¹	hat ³¹ si ³¹ ʔai ³¹⁵	ha ³⁵ tsi ³¹
217	sick	nai ³⁵¹	daŋ ³³	da ³³ ʔai ³³	da ³⁵
218	medicine	sa ³¹ ka ³¹	tsi ³¹ ka ³¹	ja ³⁵ ʔai ³³	c ^h i ³¹
219	itch	ja ³³ ʔai ³¹	hiə ³¹	ja ³¹ tæ ³³	tsi ³³
220	scratch	pi ³³ lo ³³ kai ³¹	keŋ ³⁵	k ^h iə ³³ ʔai ³³	pəi ³¹⁵
221	shiver	cu ³³ lu ³¹ cu ³³ ʔai ³¹	ʃik ³¹ ʔiŋ ³⁵	kiŋ ³³ ʔai ³³	tsu ³¹ la ³⁵
222	swell	p ^h u ³¹ la ³⁵ lai ³¹	puŋ ³⁵	puŋ ³⁵ ʔai ³³	p ^h u ³¹ la ³⁵
223	live	co ³³ lam ³³	diŋ ³⁵	ca ³¹ ʔai ³¹⁵	te ³¹⁵
224	die	ʃi ³³ vo ³³ bi ³¹	c ^h i ³³	c ^h i ³³ ʔai ³³	si ³⁵ ʔe ³⁵
225	ghost	neŋ ³¹ ŋai ³¹	dæ ³¹ ja ³¹	dæt ³¹	diə ³¹

No	Gloss	Batang	Bisu	Cauho	Tsukong
226	yawn	fiə ³¹⁵	c ^h ɔ ³¹ miə ³¹ c ^h æ ³⁵¹	kap ³¹ miə ³⁵¹ hai ³³	ʔa ³³ hwa ³⁵ he ³⁵
227	sleep	ju ³¹ po ³³ vi ³¹	ju ³¹	nu ³¹ ʔəm ³³ c ^h i ³³	ju ³¹ ʔe ³⁵
228	dream	ju ³¹ ma ³³ ma ³³ ʔai ³¹	mæ ³¹ biŋ ³³ bin ³³	nu ³¹ pæ ³¹ pæ ³¹ ʔai ³¹⁵	ju ³¹ ba ³³
229	snore	lə ³⁵ toŋ ³¹ ma ³³ ʔai ³¹	mæ ³¹ biŋ ³³ kləŋ ³⁵¹	na ³¹ toŋ ³⁵¹ miŋ ³³ ʔai ³³	la ³⁵ toŋ ³¹ k ^h lɔŋ ³¹ miŋ ³⁵ ŋe ³⁵
230	breath	ʔo ³³ sak ³¹ ko ³³ ʔai ³¹	ʔaŋ ³³ sa ³¹ kaŋ ³¹⁵	ŋ ³³ sak ³¹ ka ³³ ʔai ³¹⁵	ʔa ³³ sa ³¹ kaŋ ³⁵ ŋe ³⁵
231	whistle	bi ³¹ c ^h u ³³ c ^h u ³³ ʔai ³¹	ʔu ³³ c ^h en ³³ c ^h en ³³	kon ³¹ son ³³ son ³³ ʔai ³¹⁵	c ^h o ³⁵ c ^h o ³¹ c ^h o ³⁵ ʔe ³⁵
232	blow	mi ³³ ʔai ³¹	mi ³⁵	mi ³³ ʔai ³¹⁵	mi ³³ ʔe ³⁵
233	suck	nuŋ ³³ ʔai ³¹	c ^h ɔk ³¹ ʔun ³⁵	taŋ ³¹ ʔai ³¹⁵	duŋ ³¹ ŋe ³⁵
234	lick	miək ³³ ʔai ³¹	bæŋ ³¹	me ³¹ ʔai ³¹⁵	biə ³¹⁵
235	bite	t ^h ə ³³ ʔai ³¹	tsæŋ ³¹	t ^h æt ³³ ʔai ³¹⁵	c ^h e ³¹ ŋe ³⁵
236	laugh	ʔi ³¹ ʔai ³¹	ʔi ³³	ʔu ³³ ʔai ³¹⁵	ʔuŋ ³⁵ ŋe ³⁵
237	speak	kiəw ³¹ ʔai ³¹	ci ³¹	ce ³¹ ʔai ³¹⁵	ca ³⁵
238	shout	ʔo ³³ ʔai ³¹	hau ³³	ʔaŋ ³¹ ʔai ³¹⁵	na ³³ hu ³³ ʔe ³³
239	hear	na ³⁵ ʔai ³¹	kiəŋ ³¹	kiə ³³ ʔai ³¹⁵	pi ³³ ŋe ³⁵
240	answer	təp ³³	no data	təp ³¹ ʔai ³¹⁵	ca ³¹ tem ³⁵ me ³⁵
241	lie, fib	ki ³⁵ ʔai ³¹	jɔp ³¹ ʔim ³⁵	kat ³³ le ³³ ci ³³ ʔai ³¹⁵	ke ³¹ ʔe ³⁵
242	sing	kap ³¹ ʔai ³¹	peŋ ³¹ lɔŋ ³⁵	p ^h iŋ ³¹ t ^h o ³⁵ ʔai ³³	he ³⁵
243	think	tu ³³ le ³¹ ʔai ³¹	kit ³⁵ ʔin ³⁵	ʔau ³¹ ʔai ³¹⁵	nu ³¹ ʔe ³⁵
244	know	nu ³³ ʔai ³¹	bæŋ ³⁵	c ^h iə ³³ kai ³³	do ³¹ ŋe ³⁵
245	forget	coŋ ³¹ la ³³ la ³³ wai ³¹	luŋ ³³	lu ³³ wə ³⁵ si ³³	biŋ ³¹ sa ³⁵
246	choose	c ^h e ³¹ ʔai ³¹	tsæŋ ³³	lək ³¹ ʔai ³¹⁵	c ^h e ³⁵
247	love	p ^h i ³¹ lü ³³ kai ³¹	lak ³¹ ʔin ³⁵	hak ³¹ ʔa ³¹ laŋ ³¹ kai ³¹⁵	k ^h a ³⁵ sa ³⁵
248	hate	pi ³³ læ ³¹ ʔai ³¹	ba ³¹ sɔ ³³	nai ³⁵ ʔe ³³	niŋ ³¹ ba ³¹ p ^h e ³⁵
249	wait	toŋ ³³ læ ³³ ʔai ³¹	lɔŋ ³¹	taŋ ³¹ ʔai ³¹⁵	taŋ ³¹ ŋe ³⁵
250	count	nap ³³ ʔai ³¹	nap ³¹ ʔin ³⁵	nap ³³ ʔai ³¹⁵	kə ³⁵
251	sit	na ³³ ʔai ³¹	diŋ ³³	niŋ ³⁵ ʔai ³¹⁵	niŋ ³⁵ ŋe ³⁵

No	Gloss	Bintang	Bisu	Cauho	Tsukong
252	stand	ja ³¹ pai ³¹	cuŋ ³⁵	t ^h a ³¹ ʔai ³¹⁵	jap ³¹ ŋe ³⁵
253	kneel	bi ³¹ t ^h o ³⁵	k ^h uk ³⁵ k ^h au ³¹	p ^h a ³¹ t ^h i ³⁵ la ³³ t ^h o ³⁵ ʔai ³¹⁵	naŋ ³¹
254	lie down	ju ³⁵ ʔai ³¹	ju ³¹ li ³⁵¹	nu ³¹ ʔe ³³ ten ³³ ʔai ³¹⁵	ju ³¹ ʔa ³³ le ³⁵
255	walk	ʔi ³⁵ ʔai ³¹	jo ³¹	ji ³³ ʔai ³¹⁵	ʔe ³⁵
256	crawl	tu ³¹ ʔai ³¹	tɔ ³¹	to ³¹ ʔai ³¹⁵	ʔi ³³
257	come	lau ³⁵¹	la ³⁵	lau ³⁵¹	la ³⁵
258	enter	ʔoŋ ³³ lau ³³	ʔoŋ ³³	ʔoŋ ³⁵ la ³⁵ ʔau ³¹⁵	ʔo ³³ la ³⁵
259	return	ʔi ³³ leo ³¹	pik ³¹ lan ³⁵	je ³⁵ le ³⁵ ʔau ³¹⁵	tem ³⁵ le ³⁵
260	turn	p ^h iə ³⁵ pliu ³¹	lew ³⁵	je ³⁵ le ³⁵ k ^h ot ³¹ lau ³¹⁵	kap ³⁵ ko ³¹ ʔe ³⁵ poŋ ³¹ ʔe ³⁵
261	push	te ³¹ liu ³⁵	tan ³¹	hi ³³ ʔai ³¹⁵	tan ³¹ ne ³⁵
262	pull	ki ³¹ lau ³⁵	ca ^k ʔi ⁿ ³⁵	gin ³⁵ ʔai ³¹⁵	sə ³⁵ ʔe ³⁵
263	kick	ʃi ³⁵ t ^h u ³³ ʔai ³¹	tæ ³¹ ʔi ⁿ ³⁵	te ³³ ʔai ³¹⁵	t ^h u ³⁵ ʔe ³⁵
264	throw away	ci ³⁵ liu ³⁵	wiŋ ³⁵	bit ³¹ ʔai ³¹⁵	pen ³¹ sa ³⁵
265	throw (get fruit)	pen ³¹ liu ³⁵	laŋ ³¹ liŋ ³¹ si ³¹ c ^h u ³⁵	bit ³¹ ʔai ³¹⁵	pen ³¹ ʔa ³³ le ³⁵
266	fall	kiə ³¹ vo ³³ vi ³¹	klaŋ ³⁵	ka ³³ c ^h i ³³	ka ³¹ ʔe ³⁵
267	fly	piə ³³ mai ³¹	piəm ³³	piəm ³⁵¹ mai ³¹⁵	piəm ³⁵ ma ³³ le ³⁵
268	swim	ʔa ³³ c ^h u ³¹ ʔoŋ ³³ ʔai ³¹	laŋ ³³ loi ³⁵¹	laŋ ³³ loi ³¹ ʔai ³¹⁵	ʔoŋ ³¹ ʔe ³⁵
269	float (object)	pu ³⁵ və ³³ ga ³¹ vi ³¹	laŋ ³³ loi ³⁵¹	pu ³³ ʔai ³¹⁵	piəm ³¹ la ³⁵
270	sink	kiə ³¹ vi ³³ ga ³¹ vi ³¹	cum ³³	com ³³ ʔai ³³	ni ³¹ le ³⁵
271	flow	ʔoŋ ³³ le ³³ ʔai ³¹	lai ³³ ʔi ⁿ ³⁵	pu ³³ ʔai ³¹⁵	ju ³⁵ ʔe ³⁵
272	give	pi ³¹ lai ³¹	pi ³¹	pi ³¹ ʔai ³¹⁵	pi ³¹ ʔe ³⁵
273	take	ʔi ³³ c ^h o ³¹ lai ³¹	c ^h i ³¹ ʔi ³³ læ ³³	han ³¹ si ³³ le ³¹ ji ³⁵ ʔai ³¹⁵	ju ³⁵ ʔe ³⁵
274	tie	p ^h i ³³ ʔai ³¹	p ^h iŋ ³⁵	næ ³¹ p ^h i ³¹ ʔai ³¹⁵	p ^h i ³¹ le ³⁵
275	wipe	ʃi ³³ ʔai ³¹	cet ³¹ ʔi ⁿ ³⁵	pat ³¹ ʔai ³¹⁵	c ^h i ³³ ʔe ³⁵
276	rub, scrub	k ^h i ³³ ʔai ³¹	cet ³¹ ʔi ⁿ ³⁵	hi ³³ ʔai ³¹⁵	k ^h i ³⁵ soŋ ³¹ c ^h i ³³ ʔe ³⁵
277	wash (dishes)	ʃi ³³ ʔai ³¹	can ³³ bæn ³³ cə ³⁵¹	t ^h i ³¹ ʔai ³¹⁵	tsap ³¹ me ³⁵

No	Gloss	Batang	Bisu	Cauho	Tsukong
278	wash (vegetables)	ca ³⁵ ko ³³ ʃi ³³ ʔai ³¹	kaŋ ³¹ pak ³¹ si ³¹	kaŋ ³¹ p ^h ak ³³ hi ³¹ ʔai ³¹⁵	c ^h i ³³ ʔe ³⁵
279	launder	ʔo ³³ kiəm ³¹ ca ³³ ve ³¹	ʔaŋ ³³ kaŋ ³¹ tun ³³ cau ³⁵	ŋ ³³ ciŋ ³¹ cap ³³ ʔai ³¹⁵	ʔa ³³ ka ³¹ pen ³⁵ tsap ³¹ me ³⁵
280	wring	cup ³⁵ ʔai ³¹	tsuŋ ³⁵	t ^h up ³⁵¹ ʔai ³¹⁵	tsu ³¹ ki ³⁵ ʔe ³⁵
281	bathe	ʔa ³³ c ^h u ³¹ c ^h u ³³ ʔai ³¹	laŋ ³³ klau ³⁵¹	laŋ ³³ hi ³¹ ʔai ³¹⁵	la ³⁵ c ^h o ³¹ k ^h o ³¹ le ³⁵
282	hit	ti ³³ lo ³³ kai ³¹	ti ³¹	teo ³⁵¹ ʔai ³¹⁵	ti ³¹ laŋ ³³ ka ³⁵
283	split	p ^h a ³³ ʔai ³¹	plak ³¹	p ^h a ³¹ ʔai ³¹⁵	ce ³¹ p ^h a ³⁵
284	cut (hair)	sa ³³ k ^h iəm ³³ p ^h e ³¹	cam ³³¹ k ^h iŋ ³³ jam ³⁵¹ ʔin ³⁵	tam ³³¹ k ^h iŋ ³⁵ t ^h æ ³¹ nai ³¹⁵	t ^h a ³¹ ne ³⁵
285	stab	t ^h aŋ ³³ ʔai ³¹	tsau ³⁵	t ^h iŋ ³³ ʔai ³¹⁵	tsam ³¹ da ³⁵
286	grind	lə ³³ ʔai ³¹	bot ³¹	mɔ ³³ ʔai ³¹⁵	mo ³⁵ ʔe ³⁵
287	plant	tu ³³ wai ³¹	klaŋ ³⁵	k ^h a ³¹ ʔai ³¹⁵	k ^h a ³⁵
288	dig	k ^h i ³³ ʔai ³¹	tuj ³¹	tu ³¹ ʔai ³¹⁵	tu ³¹ ʔe ³⁵
289	bury (a corpse)	p ^h a ³³ mup ³³	liŋ ³³ t ^h sa ³⁵¹ klau ³⁵ tuj ³⁵	t ^h um ³³ ʔai ³¹⁵	p ^h im ³¹ me ³⁵
290	winnow (rice)	ʔai ³³	ko ³¹ ŋaŋ ³³	kiə ³³ ʔai ³¹⁵	ga ³⁵
291	to dry	la ³¹ piu ³³	ʔaŋ ³³ kaŋ ³¹⁵ tum ³³ lau ³³	ŋ ³³ cəŋ ³³ lap ³³ ʔai ³¹⁵	pam ³¹ ki ³¹ ʔe ³⁵
292	pound (rice)	ku ³⁵ t ^h ɔŋ ³³ ʔai ³¹	ko ³³ t ^h ɔŋ ³⁵¹	ko ³¹ t ^h ɔŋ ³¹ ʔai ³¹⁵	t ^h ɔŋ ³¹ ŋe ³⁵
293	cook (a meal)	c ^h a ³³ k ^h at ³¹ to ³³ cai ³¹	kaŋ ³¹ p ^h a ³¹ tæŋ ³¹	ʔaŋ ³¹ ko ³⁵ ko ³⁵ ʔai ³¹⁵	t ^h ɔŋ ³⁵ ŋe ³⁵
294	steam	ho ³³ ʔam ³⁵ ʔai ³¹	haŋ ³¹ buŋ ³⁵	haŋ ³¹ hu ³³ ʔai ³¹⁵	ʔim ³⁵ me ³⁵
295	boil	pə ³¹ ʔau ³³	p ^h uŋ ³¹	t ^h u ³⁵ ʔai ³¹⁵	c ^h u ³⁵ la ³⁵
296	burn	p ^h i ³³ ʔai ³¹	p ^h i ³⁵	p ^h it ³¹ ʔai ³¹⁵	p ^h i ³⁵ ʔe ³⁵
297	extinguish (fire)	ba ³¹ ti ³³ kap ³⁵	bi ³¹ t ^h ɔ ³¹ c ^h uŋ ³¹	bi ³¹ t ^h i ³¹	miəw ³¹ tse ³⁵ le ³⁵
298	sew	ku ³³ ʔai ³¹	kuŋ ³¹	k ^h in ³³ ʔai ³¹⁵	ku ³¹ ʔe ³⁵
299	work	ʔo ³³ ji ³¹ kai ³¹	lak ³¹ kan ³³ wa ³³	ŋ ³³ bik ³³ tæŋ ³³ ʔai ³¹⁵	kan ³¹ he ³⁵
300	play	ni ³⁵ kai ³³ jai ³¹	bɔ ³¹	tæn ³³ nai ³¹⁵	ca ³⁵ ʔa ³³ ne ³⁵
301	dance	ŋi ³³ ʔai ³¹	pət ³¹ ʔin ³⁵	jen ³⁵ ʔai ³¹⁵	jan ³¹ ne ³⁵
302	shoot	pə ³³ ʔai ³¹	pəŋ ³⁵	pɪ ³³ ʔai ³¹⁵	pə ³¹ ʔe ³⁵
303	hunt	sa ³¹ k ^h a ³³ wa ³³ ʔi ³³ ʔai ³¹	tsəŋ ³¹ kəŋ ³¹ sat ³⁵ c ^h aŋ ³⁵	ko ³¹ loŋ ³⁵ kuə ³³ ca ³³ ŋe ³³	naŋ ³¹ ho ³¹ ʔe ³⁵

No	Gloss	Bintang	Bisu	Cauho	Tsukong
304	kill	ʃi ³³ ʔai ³¹	sæ ³¹	c ^h æt ³¹ ʔai ³¹⁵	se ³¹
305	fight	ti ³³ lo ³³ kai ³¹	tɔ ³¹ suŋ ³⁵	lop ³¹ ʔa ³¹ laŋ ³¹ kai ³¹⁵	ti ³¹ laŋ ³⁵ ka ³⁵
306	buy	ʔu ³⁵ ʔai ³¹	wiŋ ³³	bi ³⁵ ʔai ³¹⁵	gu ³⁵ ʔe ³⁵
307	sell	koŋ ³³ ʔai ³¹	kəŋ ³¹	koŋ ³¹ ʔai ³¹⁵	goŋ ³¹ ŋe ³⁵
308	exchange	ʔoŋ ³³ ni ³¹ pi ³³ lai ³¹	pen ³¹ kaŋ ³⁵	pen ³⁵ ʔa ³¹ laŋ ³¹ kai ³¹⁵	p ^h a ³⁵ ʔe ³⁵
309	steal	c ^h o ³⁵ c ^h ü ³¹	kau ³¹ ʔin ³⁵	t ^h aŋ ³¹ k ^h iŋ ³⁵¹	xu ³¹ ʔe ³⁵
310	one	t ^h i ³³	t ^h i ³¹	t ^h ə ³¹	ti ³¹
311	two	ni ³³	səŋ ³¹	het ³¹	ji ³¹
312	three	sam ³⁵	sam ³³	sam ³¹	sem ³⁵
313	four	ʔü ³³	si ³¹	si ³³	hin ³⁵
314	five	ha ³⁵	ha ³⁵	ha ³¹	ŋa ³¹
315	six	hok ³⁵	hok ³⁵	hok ³⁵	k ^h o ³¹
316	seven	cet ³⁵	cet ³⁵	cet ³⁵	si ³¹
317	eight	pæt ³⁵	pæt ³⁵	pæt ³¹	c ^h e ³¹
318	nine	kau ³⁵	kau ³⁵	kau ³¹	kɪ ³¹
319	ten	sip ³⁵	tik ³¹ sæ ³¹	sip ³³	c ^h e ³⁵
320	hundred	t ^h ə ³³ loi ³⁵	ti ³¹ loi ³¹	t ^h a ³³ loi ³³	c ^h a ³⁵
321	thousand	ti ³¹ p ^h an ³³	ti ³¹ pan ³³	p ^h an ³¹	pan ³¹
322	many	miə ³³ k ^h ə ³³	lai ³³	lai ³³	biə ³¹⁵
323	all	t ^h iŋ ³¹ pit ³⁵	mot ³⁵ mu ³¹	t ^h əŋ ³¹ k ^h a ³¹ ca ³³	k ^h o ³⁵ le ³⁵
324	some	ti ³¹ p ^h iŋ ³³	ka ³³ jaŋ ³⁵¹ ka ³⁵	t ^h 31mü ³³	biə ³⁵ ka ³¹
325	few	ʔa ³³ ju ³⁵ ya ³¹	ʔaŋ ³¹ ʔit ³⁵¹	ʔa ³¹ ja ³⁵ ja ³¹	c ^h i ³¹ ʔe ³⁵
326	half	t ^h i ³¹ peo ³³	tik ³¹ k ^h liŋ ³⁵¹	te ³¹ k ^h iŋ ³⁵ ja ³¹	ti ³¹ p ^h a ³⁵
327	tall	mo ³³ ŋai ³¹	ʔaŋ ³³ məŋ ³¹	na ³¹ ʔai ³¹⁵	moŋ ³¹ ŋe ³⁵
328	short (height)	ja ³³ mai ³¹	ʔaŋ ³³ jum ³¹	tam ³⁵ ʔai ³¹⁵	mi ³¹ me ³⁵
329	long	mu ³³ ŋai ³¹	ʔaŋ ³³ məŋ ³⁵	moŋ ³³ ʔai ³¹⁵	no ³¹ ʔe ³⁵

No	Gloss	Batang	Bisu	Cauho	Tsukong
330	short (length)	ʔa ³³ jam ³⁵ ka ³¹	ʔaŋ ³³ jum ³⁵	ɲum ³¹ ʔai ³¹⁵	ʔu ³¹ ʔe ³⁵
331	big	hi ³³ ʔai ³¹	ʔaŋ ³³ hi ³⁵¹	bə ³¹ ʔai ³¹⁵	k ^h i ³¹ ʔe ³⁵
332	small	ʔa ³³ ɲu ³⁵ ʔai ³¹	ʔaŋ ³³ ʔi ³⁵	ʔi ³⁵ ʔai ³¹⁵	ʔi ³⁵ ʔe ³⁵
333	thick	t ^h u ³³ ʔai ³¹	ʔaŋ ³³ tu ³⁵	t ^h u ³³ ʔai ³¹⁵	t ^h u ³⁵ ʔe ³⁵
334	thin	pa ³³ la ³³ ya ³¹	ʔaŋ ³³ pa ³⁵¹	pa ³¹ ʔai ³¹⁵	pa ³¹ ʔe ³⁵
335	fat	jo ³⁵ ŋai ³¹	ʔaŋ ³³ tuŋ ³⁵¹	tuŋ ³³ ʔai ³¹⁵	tuŋ ³¹ ŋe ³⁵
336	skinny	ʔo ³³ joŋ ³⁵ ʔai ³¹	ʔaŋ ³³ hiuŋ ³⁵	joŋ ³⁵ ʔai ³¹⁵	jom ³¹ me ³⁵
337	wide, broad	ke ³³ ʔai ³¹	ʔaŋ ³³ kli ³⁵	kuəŋ ³⁵ ʔai ³¹⁵	geŋ ³¹ ŋe ³⁵
338	narrow	ʔo ³³ ʔiŋ ³¹ ʔa ³¹	ʔaŋ ³³ t ^h əŋ ³⁵¹	k ^h əp ³¹ ʔai ³¹⁵	ʔa ³¹ geŋ ³¹ ŋe ³⁵
339	deep	na ³³ ʔai ³¹	ʔaŋ ³³ na ³³	na ³¹ ʔai ³¹⁵	na ³⁵
340	shallow	ta ³¹ tam ³⁵ ya ³¹	ban ³¹ na ³³	tam ³⁵ ʔai ³¹⁵	ʔa ³¹ na ³⁵
341	round	to ³³ lo ³³	ʔaŋ ³³ bun ³³	mən ³⁵ nai ³¹⁵	lu ³¹ luŋ ³⁵ ka ³¹
342	full (container)	ʔo ³³ piəŋ ³³	ʔaŋ ³³ pliŋ ³⁵	piŋ ³³ ʔai ³¹⁵	piŋ ³¹ ŋe ³⁵
343	right side	la ³¹ men ³³	la ³¹ ma ³¹	ʔa ³¹ la ³¹ pa ³¹ k ^h i ³⁵¹	ʔa ³³ ma ³⁵ ka ³⁵
344	left side	la ³¹ kam ³⁵	la ³¹ sai ³³	ʔa ³¹ bə ³¹ pa ³¹ k ^h i ³⁵¹	ʔa ³³ c ^h a ³⁵ ka ³⁵
345	straight	cu ³³ ʔai ³¹	ʔaŋ ³³ si ³³	ɲ ³³ miŋ ³⁵	po ³⁵ loŋ ³⁵ ka ³⁵
346	near	ni ³³ ni ³³ ya ³¹	ʔaŋ ³³ t ^h ə ³³	di ³³ di ³⁵ ja ³¹	di ³¹ ʔe ³⁵
347	far	ʔi ³³ ʔai ³¹	ʔaŋ ³³ wə ³⁵¹	bə ³¹ ba ³¹ bə ³⁵¹	go ³¹ ʔe ³⁵
348	this	ni ³³ kie ³³	nu ³⁵	ʔi ³¹ tə ³⁵	ja ³⁵
349	that	t ^h i ³³ kiə ³³	həŋ ³³	læ ³¹	k ^h a ³⁵
350	black	na ³³ la ³³	ʔaŋ ³³ plaŋ ³³	ɲ ³³ keŋ ³⁵	da ³⁵ la ³⁵
351	white	p ^h iu ³³ lu ³³	ʔaŋ ³³ pən ³¹	ɲ ³³ cin ³³	p ^h u ³⁵ lu ³⁵
352	red	ni ³³ li ³³	ʔaŋ ³³ nə ³³	ɲ ³³ nə ³¹	ne ³⁵ ne ³⁵
353	green	ɲu ³³ luŋ ³³	ʔaŋ ³³ keo ³³	ɲ ³¹ ɲuŋ ³⁵	ɲu ³⁵ luŋ ³⁵
354	yellow	si ³³ li ³³	ʔaŋ ³³ c ^h i ³⁵	ɲ ³³ c ^h i ³⁵	si ³⁵ liŋ ³⁵
355	dirty	ʔo ³³ jai ³¹	ʔaŋ ³³ soŋ ³³ sa ³³	bin ³⁵ ʔai ³¹⁵	c ^h a ³¹ ʔe ³⁵

No	Gloss	Bintang	Bisu	Cauho	Tsukong
356	new	ʔo ³³ sik ³³	ʔaŋ ³³ c ^h i ³³	ŋ ³³ si ^ʔ 31	ʔa ³³ si ³¹
357	old	ʔo ³³ ʔi ³³	ʔaŋ ³³ ʔan ³⁵	ŋ ³³ ʔan ³⁵	ʔa ³³ ʔin ³⁵
358	bright	piə ³¹ vo ³³ vi ³¹	ʔaŋ ³³ plæn ³⁵	ceŋ ³³ ʔai ³¹⁵	pa ³¹ ʔe ³⁵
359	same	t ^h i ³³ ju ³³ ʔa ³¹	ʔaŋ ³³ tuj ³³ ka ³¹	t ^h i ³¹ saŋ ³³ ja ³¹	ti ³¹ k ^h o ³¹ lo ³⁵ tu ³⁵ le ³⁵
360	different	t ^h i ³³ ju ³³ ʔa ³¹ ma ³³ ʔa ³⁵	ba ³¹ tuj ³³ ka ³¹	ba ³¹ tu ³⁵ laŋ ³¹ ka ³³	ʔa ³³ tu ³⁵ le ³⁵
361	sweet	c ^h u ³³ wai ³¹	ʔaŋ ³³ c ^h au ³⁵	siŋ ³⁵ ʔai ³¹⁵	c ^h i ³³ ʔe ³⁵
362	sour	ʔo ³³ c ^h en ³³	ʔaŋ ³³ c ^h en ³⁵	sæn ³³ ʔai ³¹⁵	c ^h an ³⁵ ne ³⁵
363	bitter	k ^h a ³³ ʔai ³¹	ʔaŋ ³³ k ^h a ³¹	k ^h a ³¹ ʔai ³¹⁵	k ^h a ³¹ ʔe ³⁵
364	spicy, hot	p ^h i ³⁵ ʔai ³¹	ʔaŋ ³³ p ^h i ³³	p ^h i ³⁵ ʔai ³¹⁵	p ^h i ³⁵ ʔe ³⁵
365	rotten	ʔo ³³ pup ³¹	ʔan ³³ pu ³⁵¹	pu ³¹ pə ³⁵ si ³³	nam ³⁵ me ³⁵
366	dry	ʔo ³³ gi ^ʔ 33	ʔaŋ ³³ ki ³¹	gi ³¹ ʔe ³³ pa ³¹	ʔa ³³ ki ³⁵
367	wet	ʔo ³³ cen ³³	ʔaŋ ³³ cen ³³	cen ³³ no ³⁵¹ si ³³	ʔa ³³ can ³⁵
368	hot	lo ³³ ŋai ³¹	ʔaŋ ³³ loŋ ³³	loŋ ³¹ ŋe ³¹	hoŋ ³⁵ ʔe ³⁵
369	cold	c ^h o ³³ ʔai ³¹	ʔaŋ ³³ tsi ³³	c ^h æŋ ³¹ ŋæ ³¹	c ^h o ³¹ ʔe ³⁵
370	sharp	t ^h a ³³ ʔai ³¹	ʔaŋ ³³ t ^h a ³³	t ^h a ³¹ ʔai ³¹⁵	t ^h a ³¹ le ³⁵
371	blunt	tun ³³ ʔai ³¹	k ^h i ³¹ lim ³³	ŋ ³³ tum ³⁵	ʔa ³³ tin ³¹
372	heavy	k ^h iəŋ ³³ ʔai ³¹	ʔaŋ ³³ han ³⁵¹	fian ³¹ ʔai ³¹⁵	k ^h iŋ ³¹ ʔe ³⁵
373	hard	k ^h a ³³ ʔai ³¹	ʔaŋ ³³ kæn ³⁵¹	k ^h a ³¹ ʔai ³¹⁵	k ^h a ³⁵ ʔe ³⁵
374	smooth	ti ³³ li ³³	ʔaŋ ³³ peŋ ³³	saŋ ³¹ ne ³¹ pa ³¹	lem ³¹ me ³⁵
375	fast	k ^h eo ³³ ʔai ³¹	ʔaŋ ³³ wai ³³	men ³¹ nai ³¹⁵	k ^h aŋ ³⁵ ʔe ³⁵
376	slow	lo ³³ lo ³³ ya ³¹	ʔaŋ ³³ klam ³⁵¹	dap ³¹ ʔai ³¹⁵	je ³¹ je ³¹
377	strong	hai ³³ ʔai ³¹	ʔaŋ ³³ kæn ³⁵ k ^h a ³³	k ^h eŋ ³³ heŋ ³¹	ka ³¹ k ^h aŋ ³⁵ je ³⁵
378	weak	ma ³³ fai ³¹	ʔaŋ ³³ dəŋ ³⁵ ja ³⁵¹	ba ³¹ k ^h eŋ ³³ heŋ ³¹	ka ³¹ ʔa ³³ kai ³⁵
379	tired	k ^h a ³¹ tu ³³ tu ³³ ʔai ³¹	ʔaŋ ³³ mit ³⁵¹	du ³¹ ŋe ³³	ka ³¹ du ³¹ le ³⁵
380	blind	miəp ³⁵ kai ³¹	mæ ³³ pə ³³	na ³¹ mit ³³ m ³³ pək ³³	mi ³⁵ c ^h i ³⁵
381	deaf	na ³³ pə ³³	na ³¹ paŋ ³³	na ³¹ paŋ ³¹	na ³¹ pa ³¹

No	Gloss	Bintang	Bisu	Cauho	Tsukong
382	bald	ti ³³ ti ³⁵	tuk ³¹ klæn ³¹	ŋ ³³ tut ³⁵ lon ³⁵	pa ³⁵ lan ³⁵ ba ³¹
383	hungry	me ³³ ŋai ³¹	haŋ ³¹ bæŋ ³¹	haŋ ³¹ bat ³¹ ŋæ ³³	be ³¹⁵
384	full, satisfied	pu ³³ bo ³³ vi ³¹	kəŋ ³³	ʔo ³¹ ʔa ³¹ pin ³³ pa ³⁵	po ³¹ le ³⁵
385	thirsty	ʔa ³³ c ^h um ³¹ me ³³ ŋai ³¹	laŋ ³³ bæŋ ³⁵¹	laŋ ³³ bat ³¹ ŋæ ³³	kɪ ³¹ le ³⁵
386	drunk	ma ³³ ŋai ³¹	tæ ³¹ k ^h a ³¹ mau ³⁵¹	mau ³¹ ŋai ³¹⁵	c ^h e ³¹ le ³⁵
387	afraid	k ^h i ³³ ŋai ³¹	k ^h æŋ ³⁵	k ^h at ³¹ ŋæ ³³	k ^h e ³⁵ ŋe ³⁵
388	angry	ʔo ³³ ŋai ³¹	niŋ ³³ ba ³³ k ^h aŋ ³⁵¹	ne ³¹ ban ³³ sut ³¹ ŋæ ³³	niŋ ³¹ ba ³¹ p ^h e ³⁵ la ³⁵
389	good	mi ³³ ŋai ³¹	ʔaŋ ³³ mæŋ ³⁵¹	bi ³¹ ŋai ³¹⁵	biŋ ³¹ je ³⁵
390	bad	m ³³ mi ³³	ba ³¹ mæŋ ³⁵¹	ba ³¹ bi ³⁵¹	ʔa ³¹ biŋ ³¹ je ³⁵
391	correct	p ^h ə ³¹ laŋ ³³ ŋai ³¹	ʔaŋ ³³ ka ³⁵¹	kiə ³¹ ʔa ³¹ pa ³⁵	tsaŋ ³¹ je ³⁵
392	wrong	m ³³ p ^h ət ³³ la ³³	ba ³¹ ka ³⁵¹	p ^h it ³³ ŋai ³¹⁵	ʔa ³¹ tsaŋ ³¹ je ³⁵
393	when?	ha ³⁵ lup ³¹ jam ³³ ba ³³ lai ³¹	ʔa ³³ lom ³⁵¹	ʔa ³³ juŋ ³⁵ ʔa ³¹ mə ³³	ʔa ³³ hi ³⁵ jam ³⁵
394	where?	ha ³⁵ kiə ³³ cua ³¹ le ³¹	lau ³⁵ kəŋ ³⁵¹	ʔa ³³ juŋ ³⁵ ka ³¹ ca ³¹ ŋə ³³	ʔa ³³ hwa ³⁵ ta ³⁵
395	who?	ʔa ³³ su ³³ le ³¹	ʔa ³³ saŋ ³⁵	ʔa ³³ juŋ ³⁵ ŋa ³³ ŋə ³³	ʔa ³³ saŋ ³⁵
396	what?	m ³³ nu ³³ le ³¹	ba ³⁵ cə ³⁵	ʔa ³³ tæn ³⁵ jo ³¹ ŋə ³³	ʔa ³³ t ^h ə ³¹
397	how many?	ha ³⁵ lup ³¹ lam ³³ lai ³¹	ʔa ³³ lo ³⁵	ʔa ³³ lop ³⁵ pan ³⁵ nə ³⁵	ʔa ³³ ho ³⁵ lo ³¹

APPENDIX B

WORDLISTS USED FOR LEXICOSTATISTICS

The following table shows the 100 words sorted alphabetically by gloss.

	Gloss	Ban-tang	Bisu	Cauho	Lao-pin	Lao-seng	Mpi	Sinsali	Cantan	Laopan	Tsu-kong	Phong-ku	Phong-set	Lao-mian	Pyen
1	abdomen	bu ³¹ poŋ ³³	poŋ ³¹ poŋ ³⁵	pa ³¹ poŋ ³⁵	poŋ ³¹ poŋ ³⁵	pa ³¹ poŋ ³⁵	ʔo ³¹ tʰa ^{ʔ33}	bo ³³ poŋ ³³	poŋ ³¹ baɿ ³¹	poŋ ³¹ poŋ ³⁵	ʔu ³³ poŋ ³³	po ³¹ poŋ ³⁵	po ³¹ poŋ ³⁵¹	poŋ ³¹ poŋ ³⁵	pʰa ³³ poŋ ³⁵
2	afraid	kʰi ³³	kʰæŋ ³⁵	kʰat ³¹	kʰe ³³	kʰat ³³	kʰe ³³	kʰat ³³	kʰat ³⁵	kʰe ³⁵	kʰe ³⁵	kʰat ³⁵	kʰaʔ	kʰæ ³⁵	kʰe ³⁵
3	all	tʰiŋ ³¹ pit ³⁵	mot ³⁵ mu ³¹	tʰəŋ ³¹ kʰa ³¹ ca ^{ʔ33}	kʰa ³⁵ kʰu ³¹	tʰəŋ ³¹ pik ³⁵	ca ³³ miəw ³ sɿi ^{ʔ35}	tʰiŋ ³¹ pit ³⁵	tʰəŋ ³¹ pit ³⁵	kʰo ³⁵ kʰo ³³ lo ³⁵ kʰo ^{ʔ33}	kʰo ³⁵ le ³⁵	tʰoŋ ³¹ pi ^{ʔ35} baŋ ³³	tʰə ³¹ pit ³⁵	kʰa ³⁵ kʰu ³¹	ʔaŋ ³³ kəŋ ³¹ ʔaŋ ³³ biə ³¹
4	ashes	kʰa ³³ la ³³	kʰa ³³ la ³⁵	kʰə ³³ ləŋ ³⁵	kʰa ³³ la ³⁵	kʰa ³⁵ la ³⁵	kʰo ³¹ lo ³⁵	kʰa ³⁵ la ³⁵	kʰə ³³ la ³³	kʰa ³⁵ la ³⁵	kʰi ³⁵ li ³⁵	kʰa ³⁵ lo ³⁵	kʰa ³³ la ³³	kʰa ³⁵ la ³⁵	kʰa ³⁵ mi ³³
5	bark	cʰe ³³	kʰo ³¹	kʰo ^{ʔ33}	kʰo ³¹	kʰo ^{ʔ33}	kʰwæ ^ʔ 31	kʰo ^{ʔ33}	ko ^{ʔ35}	ka ³¹	la ³¹	kʰo ^{ʔ31}	kʰo ^{ʔ31}	kʰo ³¹	kʰo ³¹
6	big	hi ³³	hi ³⁵¹	bə ³¹	hi ³¹	bək ³¹	hi ³¹	bə ³¹	bi ³¹	hi ^{ʔ31}	kʰi ³¹	bə ³¹	bə ³⁵	hi ³¹	hi ³¹
7	bird	ha ³³ ya ³¹	ha ³³ ja ³¹	hat ³³ ja ³³	hai ³³ ja ³¹	hi ³⁵ ja ³¹	ja ³⁵ lo ³¹	hi ³³ ja ^{ʔ31}	hi ³⁵ ja ³¹	hai ³⁵ ja ³¹	ha ³³ ga ³¹	hai ³⁵ jo ³¹	hai ³⁵ ja ^{ʔ31}	hai ³⁵ ja ³¹	hai ³⁵ ja ³¹
8	bite	tʰə ³³	tsæŋ ³¹	tʰæt ³³	ʃe ³¹	tʰæ ³¹	tʰæ ³¹⁵	tʰæ ³¹	tʰæ ³¹	cʰæŋ ³¹	cʰe ³¹	tʰæ ³¹	tʰæ ³⁵	cʰæ ³¹	cʰe ³¹
9	black	na ³³	plaj ³³	keŋ ³⁵	piəŋ ³⁵	da ³³	næ ³³	da ^{ʔ31}	da ^{ʔ33}	plaj ³⁵	da ³⁵	də ^{ʔ33}	dā ^{ʔ31}	paŋ ³⁵	plaj ³⁵
10	blood	ʃi ³¹	cʰi ³¹	cʰi ³¹	ʃi ³¹	si ³¹	si ³³	si ³¹	si ³³	ʃi ³¹	si ³¹	si ³¹	si ³⁵	ʃi ³¹	ʃi ³¹
11	bone	jü ³¹	kau ³³	kiŋ ³¹	kau ³¹	jau ³³	ʔi ^{ʔ33}	jau ³¹	jau ³¹	jau ³³	jü ³¹	jau ³¹	jau ³³	kau ³¹	jau ³¹
12	breath	sak ³¹ ko ³³	sa ³¹ kaŋ ³⁵	sak ³¹ ka ³³	sa ³¹ kaŋ ³⁵	sa ³¹ kaŋ ³⁵	sə ³¹ ko ³⁵¹	sa ³¹ ka ³³	sa ³¹ ka ³³	sa ³¹ kaŋ ³¹	sa ³¹ kaŋ ³⁵	sə ³¹ kaŋ ³⁵	sa ³⁵ kaŋ ³¹	sa ³¹ kaŋ ³⁵	sa ³¹ kaŋ ³⁵
13	burn	pʰi ³³	pʰi ³⁵	pʰit ³¹	ciŋ ³³	ʔoŋ ³¹	pæw ³³	ʔoŋ ³¹	ʔoŋ ³¹	ʔuŋ ³³	pʰi ³⁵	ʔoŋ ³³	ʔoŋ ³⁵	ce ³³	pʰi ³¹
14	child	ya ³¹	ja ³³	ja ³¹	ja ³¹	ja ³¹	lo ³¹	ja ³¹	ja ³¹	ja ³³	ka ³¹	jo ³¹	ja ³³	ja ³¹	ja ³¹
15	cloud	mo ³³	fa ³³	siŋ ³¹	ciŋ ³¹	caŋ ³³	fə ³¹⁵	ca ³³	ca ³³	cʰaŋ ³³	caŋ ³¹	caŋ ³¹	caŋ ³⁵	tam ³³	caŋ ³³

	Gloss	Ban-tang	Bisu	Cauho	Lao-pin	Laoseng	Mpi	Sinsali	Cantan	Laopan	Tsu-kong	Phong-ku	Phong-set	Laomian	Pyen
		muŋ ³⁵		tam ³³	t ^h um ³¹	t ^h am ³¹		t ^h am ³¹	t ^h am ³¹	t ^h um ³¹	si ³¹	t ^h aŋ ³¹	t ^h am ³³	t ^h am ³¹	t ^h um ³¹
16	cold	c ^h o ³³	tsi ³³	c ^h æŋ ³¹	tsi ³¹	ci ³³	c ^h ɔ ³¹⁵	ci ³¹	ciŋ ³⁵	ciŋ ³³	c ^h o ³¹	ciŋ ³⁵	ci ³⁵	c ^h ɔ ³¹	c ^h ɔ ³¹
17	come	lau ³⁵¹	la ³¹⁵	lau ³⁵¹	lau ³⁵¹	lau ³⁵¹	loŋ ³⁵	laŋ ³³	lau ³⁵¹	la ³⁵	la ³⁵	lɔ ³⁵	la ³¹	la ³⁵	la ³⁵
18	cut (hair)	k ^h iəm ³³	jam ³⁵¹	t ^h æ ³¹	t ^h a ³¹	kap ³¹	k ^h i ³⁵	t ^h an ³¹	t ^h an ³¹	t ^h a ³¹	t ^h a ³¹	kap ³¹	t ^h an ³⁵	t ^h an ³¹	t ^h an ³¹
19	die	ʃi ³³	c ^h i ³³	c ^h i ³³	ʃi ³⁵	si ³⁵	si ³⁵	si ³⁵	si ³³	ʃi ³⁵	si ³⁵	si ³³	si ³¹	ʃi ³⁵	ʃin ³⁵
20	dig	k ^h i ³³	tuŋ ³¹	tu ³¹	tu ³¹	tu ³¹	tu ³¹	tu ³¹⁵	tu ³¹	tu ³¹	tu ³¹	tu ³¹	tu ³⁵	tu ³¹	t ^h iŋ ³¹
21	dog	k ^h i ³³	k ^h i ³¹	k ^h i ³¹	k ^h i ³¹	k ^h i ³¹	k ^h i ³³	k ^h i ³³	k ^h i ³¹	k ^h i ³³	k ^h i ³¹	k ^h i ³¹	k ^h i ³⁵	k ^h i ³¹	k ^h i ³³
22	drink	to ³³	taŋ ³³	ta ³³	taŋ ³⁵	taŋ ³⁵	tɔŋ ³³	tā ³⁵	taŋ ³³	taŋ ³¹	taŋ ³⁵	taŋ ³³	tāŋ ³³	taŋ ³⁵	taŋ ³⁵
23	ear	na ³¹	na ³¹	na ³¹	na ³¹	ŋa ³¹	nɔ ³¹	la ³¹	ŋaŋ ³¹	na ³¹	na ³¹	ŋɔ ³¹	ŋa ³³	na ³¹	la ³¹
24	earth, soil	naŋ ³⁵ c ^h aŋ ³¹	niŋ ³³ tsa ³¹	niŋ ³³ t ^h aŋ ³³	liŋ ³³ tsa ³¹	mi ³³ toŋ ³⁵	ʔa ³¹ pe ³³	mi ³⁵ tōŋ ³³	mi ³⁵ tō ³⁵	ŋ ³³ c ^h a ³¹	mi ³⁵ tsa ³¹	m̄iŋ ³⁵ c ^h ɔŋ ³⁵	mi ³³ tōŋ ³³	liŋ ³⁵ c ^h a ³¹	niŋ ³¹ tsa ³⁵
25	eat	ca ³³	tsa ³¹	tai ³¹⁵	tsa ³¹	ca ³¹	co ³¹⁵	caŋ ³¹	ca ³¹	caŋ ³¹	sa ³¹⁵	cau ³¹	ca ³⁵	tsa ³¹	tsa ³¹
26	egg	ʔok ³³	ʔu ³³	ʔuŋ ³³	ʔu ³⁵	ʔu ³⁵	ʔuŋ ³⁵	ʔuŋ ³¹	ʔu ³⁵	ʔu ³⁵	ʔu ³³	ʔu ³³	ʔu ³¹	ʔu ³³	ʔu ³¹
27	eye	miŋ ³³ niŋ ³³	mæ ³¹ ni ³¹	na ³¹ miŋ ³³	mi ³³ ni ³⁵	ʔaŋ ³³ biə ³³	me ³¹ c ^h ɔŋ ³¹	ʔa ³³ biə ³³	ʔa ³³ biə ³³	mi ³³ nit ³⁵	miə ³³ si ³¹	mi ³³ ŋi ³³	ʔa ³³ biə ³⁵¹	mæ ³³ ni ³⁵	mi ³³ niŋ ³³
28	fall	kiə ³¹	klaŋ ³⁵	ka ³³	kiə ³⁵	kiə ³¹	ko ³¹	ta ³³	tan ³³	kla ³¹	ka ³¹	klɔŋ ³⁵	giə ³¹	ka ³³	k ^h la ³¹
29	far	ʔi ³³	wə ³⁵¹	bə ³¹	wə ³¹	kan ³⁵	hə ³³	kan ³⁵	kan ³⁵	və ³¹	go ³¹	kan ³⁵	kan ³³	və ³¹	wə ³¹
30	fat	ʔa ³¹ c ^h i ³³	ʔaŋ ³³ tsi ³³	baŋ ³¹ t ^h i ³¹	ʔaŋ ³³ tsi ³⁵	wa ³¹ ʃi ³¹	ʔa ³¹ t ^h i ³⁵	wa ³¹⁵ si ³⁵	wa ³¹ c ^h i ³⁵	wat ³¹ si ³³	ʔa ³³ ʃi ³⁵	wa ³¹ c ^h i ³⁵	wa ³¹ c ^h i ³⁵¹	ʔaŋ ³³ c ^h i ³⁵	ʔaŋ ³³ c ^h i ³⁵
31	feather	mit ³¹	mi ³³	my ³³	mi ³¹	m̄it ³¹	mi ³¹	mot ³³	mit ³¹	mi ³¹	mi ³¹	miŋ ³¹	m̄ut ³³	mi ³¹	mi ³¹
32	fire	mi ³³ lam ³⁵	bi ³³ t ^h ɔ ³¹	m̄ ³³ bi ³¹	mi ³¹ t ^h ɔ ³¹	bi ³¹	mi ³¹	bi ³¹	bi ³³	bi ³¹ lam ³⁵	mi ³¹ tsa ³¹	bi ³¹ lam ³⁵	bi ³¹ co ³³ ce ³¹	mi ³¹ t ^h ɔ ³¹	bi ³¹ t ^h ɔ ³¹
33	fish	naŋ ³³ ti ³³	lɔŋ ³³ tæ ³¹	lɔŋ ³¹ tæŋ ³⁵	luŋ ³¹ tæ ³¹	no ³³ tæ ³¹	ŋo ³⁵¹	juŋ ³¹ tæ ³³	ho ³³ tæ ³⁵	nɔŋ ³¹ tæ ³⁵	ten ³³ ne ³³	ŋuŋ ³¹ tæ ³⁵	no ³⁵ tæŋ ³¹	tæ ³³ si ³¹	ni ³¹ te ³¹
34	flesh	sa ³¹	ma ³³	sa ³¹	sa ³¹	sa ³¹	so ³¹	caŋ ³¹	ci ³¹	c ^h a ³¹	sa ³¹	sau ³¹	saŋ ³¹	sa ³¹	sa ³¹
35	fly	piə ³³	piəm ³³	piəm ³⁵	piəm ³⁵	pa ³¹	piə ³⁵	fa ³⁵	va ³³	piə ³⁵	piəm ³⁵	piəm ³³	piə ³³	pæm ³⁵	piəm ³⁵

	Gloss	Ban-tang	Bisu	Cauho	Lao-pin	Lao-seng	Mpi	Sinsali	Cantan	Laopan	Tsu-kong	Phong-ku	Phong-set	Lao-mian	Pyen
				1											
36	foot	ʔo ³³ ki ³³	la ³¹ k ^h i ³¹	ŋ ³³ k ^h i ³⁵	p ^h au ³³ wa ³³	la ³¹ k ^h i ³¹	laʔ ³¹ t ^h i ³⁵	lə ³¹ k ^h i ³⁵	ʔa ³³ k ^h i ³⁵	la ³¹ k ^h i ³³	ʔa ³³ k ^h i ³⁵	la ³³ k ^h i ³⁵	la ³¹ k ^h i ³⁵ ¹	p ^h au ³¹ wa ³¹	p ^h a ³¹ wa ³¹
37	full (container)	piəŋ ³³	pliŋ ³⁵	piŋ ³³	piŋ ³⁵	piŋ ³³	pi ³⁵	piŋ ³³	piŋ ³³	pli ³³	piŋ ³¹	pliŋ ³⁵	piŋ ³⁵ ¹	piŋ ³⁵	təm ³⁵
38	give	pi ³¹	pi ³¹	pi ³¹	pi ³¹	pi ³¹	peʔ ³⁵	piu ³¹⁵	pəŋ ³¹	pi ³¹	pi ³¹	pəŋ ³¹	pəŋ ³⁵	pi ³³	pi ³¹
39	good	mi ³³	mæŋ ³⁵ ¹	bi ³¹	mæn ³¹	men ³¹	mi ³¹	m̄in ³¹	men ³¹	men ³¹	biŋ ³¹	m̄en ³¹	m̄en ³⁵	mæn ³¹	men ³³
40	green	ju ³³	keo ³³	juŋ ³⁵	jum ³⁵	ju ³⁵	ji ³³	ju ³⁵	ju ³⁵	ju ³⁵	ju ³⁵	juŋ ³⁵	juŋ ³³	nuŋ ³⁵	juŋ ³⁵
41	hair	sam ³³ k ^h iəŋ ³³	cam ³³ kiŋ ³³	tam ³³ k ^h iŋ ³⁵	sam ³⁵ k ^h iŋ ³⁵	sam ³³ k ^h iŋ ³⁵	k ^h i ³⁵	sam ³⁵ k ^h iŋ ³³	sam ³³ k ^h iŋ ³³	sam ³¹ k ^h iŋ ³⁵	sa ³⁵ k ^h im ³⁵	c ^h am ³⁵ k ^h iŋ ³⁵	c ^h am ³⁵ k ^h iŋ ³⁵	sam ³⁵ k ^h iŋ ³⁵	sam ³⁵ k ^h iŋ ³⁵
42	hand	laʔ ³¹	lap ³¹ pu ³¹	laʔ ³¹	la ³¹ pu ³¹	la ³¹ pu ³¹	laʔ ³¹ p ^h i ³⁵	lə ³³ pu ³¹	la ³³ pu ³³	la ³¹ pu ³³	la ³¹	la ³³ pu ³¹	la ³¹ pu ³⁵	la ³¹ p ^h u ³¹	la ³¹ pu ³¹
43	head	tu ³¹	tu ³³	tu ³¹	tu ³¹	tu ³¹	si ³¹	tu ³¹	tu ³¹	tu ³³	tu ³¹	tu ³¹	tu ³¹	tu ³¹	tu ³¹
44	hear	na ³⁵	kiəŋ ³¹	kiə ³³	kiə ³¹	cak ³⁵	kiəw ³¹	caʔ ³⁵	caʔ ³⁵	kiə ³¹	pi ³³	kiəw ³¹	kiə ³⁵	na ³⁵	kiə ³¹
45	heart	niŋ ³³ ma ³³ ʃi ³¹	niŋ ³³ ba ³³	net ³¹ ba ³³ c ^h i ³¹	liŋ ³⁵ ba ³⁵ si ³¹ 1	ni ³⁵ ba ³⁵ si ³¹	ho ³³ cai ³¹	lō ³⁵ c ^h u ³¹ si ³¹	nuŋ ³⁵ su ³¹ c ^h i ³¹	niŋ ³¹ ba ³¹ si ³³	niŋ ³⁵ ba ³¹	ŋi ³³ bō ³⁵ tsi ³¹	ni ³¹ ba ³⁵ si ³¹	liŋ ³³ ba ³⁵	niŋ ³⁵ ba ³⁵ si ³¹
46	horn	k ^h i ³³	kiəw ³⁵	k ^h iŋ ³⁵	k ^h iəw ³⁵	k ^h iəw ³³	k ^h i ³⁵	c ^h au ³⁵	k ^h iəw ³⁵	k ^h iəw ³⁵	c ^h i ³⁵	k ^h iəw ³⁵	k ^h iəw ³³	k ^h eo ³³	k ^h iəw ³⁵
47	kill	ʃi ³³	sæ ³¹	c ^h æt ³¹	ʃe ³¹	sat ³¹	sə ³¹	sat ³¹	sat ³¹	c ^h æ ³¹	se ³¹	sat ³¹	sat ³⁵	ʃæ ³¹	ʃe ³¹
48	knee	pi ³³ c ^h i ³¹	pa ³¹ tu ³³	p ^h a ³¹ t ^h i ³⁵ tu ³³	p ^h a ³¹ tu ³⁵	ba ³⁵ tu ³⁵ si ³¹	mōʔ ³⁵ kō ³³	ba ³¹ tu ³⁵ si ³¹	bō ³¹ tu ³⁵ c ^h i ³¹	p ^h a ³¹ tu ³⁵	pi ³⁵ tsi ³¹	p ^h a ³¹ tu ³⁵	p ^h a ³¹ tu ³⁵ si ³¹	pi ³¹ tu ³⁵	p ^h a ³³ tu ³⁵
49	know	nu ³³	bæŋ ³⁵	c ^h iə ³³	bæ ³³	cak ³³	si ³¹	caʔ ³¹	ca ³³	bæn ³⁵	do ³¹	ca ³³	cau ³⁵	bæ ³¹	be ³¹
50	leaf	p ^h aʔ ³¹	pa ³¹	p ^h aʔ ³¹	p ^h a ³¹	p ^h aʔ ³¹	p ^h aʔ ³¹	p ^h aʔ ³¹	p ^h a ³¹	p ^h a ³¹	p ^h a ³¹	p ^h aʔ ³¹	p ^h aʔ ³¹	p ^h a ³¹	p ^h a ³¹
51	liver	p ^h e ³¹	tsin ³¹	t ^h iŋ ³¹	ʃi ³¹	ʃiŋ ³¹	t ^h i ³¹	sēi ³¹	c ^h iŋ ³¹	c ^h iŋ ³³	p ^h e ³¹	c ^h i ³¹	c ^h iŋ ³³	c ^h in ³¹	c ^h in ³¹
52	long	mu ³³	mōŋ ³⁵	moŋ ³³	moŋ ³⁵	muŋ ³⁵	si ³³	m̄u ³⁵	m̄o ³⁵	mōŋ ³³	no ³¹	mōŋ ³⁵	m̄ōŋ ³⁵	moŋ ³⁵	moŋ ³⁵
53	louse	c ^h i ³³	tsen ³³	sæn ³³	ʃen ³³	sæn ³⁵	se ³⁵	sæn ³³	sin ³³	ʃen ³⁵	san ³⁵	sin ³⁵	sæn ³⁵	c ^h in ³⁵	han ³³

	Gloss	Ban-tang	Bisu	Cauho	Lao-pin	Laoseng	Mpi	Sinsali	Cantan	Laopan	Tsu-kong	Phong-ku	Phong-set	Laomian	Pyen
54	man	ka ³³ p ^h a ³³ ya ³¹	ka ³¹ p ^h a ³³ ja ³³	ka ³¹ p ^h a ³¹	k ^h a ³³ p ^h ai ³³ ja ³¹	ka ³³ p ^h iə ³¹	ko ³¹ p ^h o ³⁵¹	ka ³¹ p ^h iə ³¹	ka ³¹ p ^h iə ³³	ka ³¹ p ^h ai ³³ ja ³³	no ³¹ ci ³⁵	k ^h ap ³³ pi ³³ jo ³¹	k ^h a ³¹ p ^h iə ³¹	k ^h a ³¹ p ^h a ³⁵ ja ³¹	ka ³¹ p ^h ai ³¹ ja ³¹
55	many	miə ³³	lai ³³	lai ³³	biə ³¹	ba ³⁵	miəw ³ 51	lam ³¹	pen ³¹	biə ³¹	biəj ³¹⁵	pi ³⁵	bie ³¹	biə ³¹	biə ³¹
56	moon	pi ³³ la ³¹	ʔu ³³ la ³³	p ^h o ³³ la ³⁵	ʔu ³³ la ³⁵	wa ³¹ la ³³	bi ³¹ lo ³¹	fa ³¹ la ³¹	hu ³³ la ³⁵	ʔu ³³ la ³⁵	pe ³¹ la ³⁵	hu ³¹ lo ³¹	ʔu ³³ la ³⁵	ʔu ³³ la ³³	ʔu ³³ fa ³¹
57	mountain	ka ³¹ kiə ³³	ta ³¹ tsæ ³³	tap ³³ p ^h up ³⁵	k ^h o ³³ kiə ³³	tu ³¹ lu ³¹	pe ³¹ ʔo ³⁵	tæ ³³ c ^h u ³¹	kin ³¹ t ^h æ ³⁵	tə ³¹ p ^h u ³⁵	ʔa ³³ ki ³¹	t ^h o ³¹ p ^h up ³⁵	ki ³⁵ t ^h æ ³¹ / ʔa ³³ tam ³³	k ^h o ³³ kiə ³³	k ^h o ³³ kiə ³³
58	mouth	me ³¹ t ^h o ³³	man ³¹ p o ³¹	man ³¹ s æn ³⁵¹	man ³¹ tu ³⁵	man ³¹ po ³¹	ʔa ³¹ k ^h oi ³¹	bam ³³ po ³¹	ban ³³ po ³³	man ³¹ tu ³⁵	ma ³¹ t ^h o ³³	man ³¹ tu ³⁵	man ³⁵ po ³³	man ³¹ tu ³⁵	men ³³ k ^h o ³¹
59	nail	la ³³ c ^h e ³¹	pa ³¹ si ³¹	la ³¹ c ^h i ³³	la ³¹ si ³¹	la ³¹ ʃi ³¹	la ³¹ si ³³	li ³³ sə ³¹	lə ³³ c ^h i ³³	la ³¹ si ³³	la ³¹ si ³¹	la ³³ si ³¹	la ³¹ si ³³	la ³¹ ʃi ³¹	la ³¹ si ³¹
60	name	miə ³³	me ³³	mi ³⁵	mi ³⁵	m ³⁵	mi ³⁵	mi ³³	mi ³³	mi ³⁵	mi ³⁵	m ³⁵	m ³³	me ³⁵	me ³⁵
61	neck	na ³³ c ^h i ³¹	li ³⁵ si ³⁵¹	ni ³¹ t ^h i ³¹	ni ³⁵ si ³¹	k ^h o ³¹ ba ³³	ʔi ³¹ li ³⁵	ʔa ³³ li ³³	ʔa ³³ li ³⁵	ni ³⁵ c ^h i ³³	la ³⁵ tsi ³¹	ʔu ³³ li ³⁵	ʔu ³³ li ³⁵¹	li ³⁵ c ^h i ³¹	ni ³⁵ c ^h i ³¹
62	new	sik ³³	c ^h i ³³	si ³¹	si ³¹	sik ³¹	si ³¹	si ³¹	si ³¹	ʃi ³¹	si ³¹	si ³⁵	si ³¹	ʃi ³¹	si ³⁵
63	night	ʔo ³³ ya ³³	mu ³¹ k ^h i ³¹	k ^h i ³¹ ko ³³	mi ³¹ k ^h i ³¹	k ^h i ³³ ko ³¹	ʔo ³¹ k ^h oi ³⁵¹	k ^h i ³¹ k ^h u ³⁵	k ^h i ³¹ k ^h ə ³³ va ³³	ŋ ³³ k ^h i ³¹ k ^h i ³¹ li ³¹ ŋæ ³⁵	mi ³¹ c ^h i ³⁵	k ^h i ³¹ ko ³⁵	k ^h i ³⁵ ko ³¹	k ^h i ³¹ t ^h a ³⁵	mi ³¹ k ^h i ³¹
64	nose	na ³³ mæ ³³	na ³³ k ^h a ³³	na ³¹ tu ³⁵	na ³³ k ^h a ³⁵	na ³³ k ^h a ³⁵ tu ³³	na ³¹ k ^h o ³⁵	la ³³ k ^h a ³⁵	lə ³³ ka ³⁵ t ^h o ³³	na ³¹ k ^h a ³⁵	ni ³⁵ k ^h a ³⁵	na ³⁵ k ^h a ³⁵	na ³¹ ka ³³	na ³⁵ k ^h a ³⁵	na ³³ k ^h a ³⁵
65	one	t ^h i ³³	t ^h i ³¹	t ^h ə ³¹	t ^h i ³¹	t ^h i ³¹	t ^h u ³¹	t ^h i ³⁵	t ^h a ³¹	t ^h u ³¹	ti ³¹	ti ³¹	t ^h i ³¹	t ^h i ³¹	t ^h i ³¹
66	person	c ^h o ³¹	tsa ³³	t ^h a ³⁵	tsa ³⁵	sa ³⁵	c ^h o ³⁵	sā ³⁵	sa ³³	c ^h a ³⁵	tsa ³⁵	c ^h a ³⁵	c ^h a ³³	c ^h a ³⁵	tsa ³⁵
67	rain	mo ³³ ho ³⁵	mu ³¹	mo ³³	bi ³¹	ma ³¹	ho ³³	bo ³¹	bo ³¹	bi ³¹ ho ³¹	mo ³⁵	bo ³¹ ho ³⁵	bo ³³ ho ³⁵	mi ³³	mi ³¹ ho ³¹

	Gloss	Ban-tang	Bisu	Cauho	Lao-pin	Lao-seng	Mpi	Sinsali	Cantan	Laopan	Tsu-kong	Phong-ku	Phong-set	Lao-mian	Pyen
			hɔ ³¹	hɔ ³⁵	hɔ ³³	ho ³¹	ho ³⁵	ho ³³	ho ³⁵					hɔ ³¹	li ³⁵
68	red	ni ³³	næ ³³	næ ³¹	næ ³⁵	ɲæ ³⁵	nə ³⁵¹	ɲæ ³⁵	næ ³³	næ ³⁵	ne ³⁵	ɲæ ³⁵	ɲæ ³³	næ ³⁵	ni ³⁵
69	road, path	kiəm ³³ ma ³¹	kim ³³ ba ³³	kæ ³³ laŋ ³⁵¹	kiə ³⁵ ba ³¹	ka ³¹ ba ³³	k ^h aŋ ³¹ lun ³³	ca ³³ ba ³¹	kam ³⁵ ba ³¹	ka ³³ ba ³³	ka ³⁵ ba ³³	ka ³¹ bo ³ ₅	ge ³¹ ba ³⁵	kæ ³⁵ ba ³¹	ka ³⁵ ba ³¹
70	root	c ^h e ³³	c ^h e ³³	sæ ³¹⁵	ʃe ³⁵	sæ ³¹	c ^h e ³⁵	c ^h e ³³	sæ ³³	c ^h e ³⁵	c ^h e ³⁵	c ^h æ ³³	c ^h e ³³	c ^h i ³⁵	c ^h e ³⁵
71	round	lo ³³	bun ³³	mɔn ³⁵	lum ³¹	lɔn ³³	lo ³⁵	bon ³³	bon ³³	bun ³¹	luŋ ³⁵	mun ³¹	bon ³⁵	ti ³⁵	lum ³¹
72	sand	ʃi ³¹	sai ³¹	sai ³¹	sai ³¹	sai ³¹	si ³⁵¹	sai ³¹	sai ³¹	sai ³³	si ³¹	sai ³¹	sai ³³	sai ³³	sai ³¹
73	see	mo ³³	miəŋ ³³	miəŋ ³³	miəŋ ³⁵	ɲiəŋ ³⁵	miəw ³ ₅	ɲiə ³³	ɲiə ³⁵	miəŋ ³³	miəŋ ³⁵	ɲiə ³³	ɲiəw ³³	miəŋ ³⁵	miəŋ ³⁵
74	seed (grain)	jü ³¹	jau ³¹	ma ³³	tsi ³⁵	ken ³³	ti ³³	ɲi ³¹	ɲi ³³	ɲit ³⁵	ji ³³	ɲi ³³	ken ³³	jau ³¹	ni ³³
75	sit	na ³³	diŋ ³³	niŋ ³⁵	diŋ ³⁵	niŋ ³⁵	ji ³³	niu ³³	diŋ ³⁵	niu ³⁵¹	niŋ ³⁵	di ³⁵	ɲi ³⁵	diŋ ³³	diŋ ³⁵
76	skin	k ^h u ³³	k ^h ɔ ³¹	lu ³³	k ^h ɔ ³³	lap ³³	k ^h ɔ ³⁵	lu ³¹	lu ³¹	k ^h ɔ ³¹	hu ³¹	lu ³¹	lu ³³	k ^h ɔ ³⁵	k ^h ɔ ³³
77	sleep	jup ³¹	juŋ ³¹	nu ³¹	ju ³¹	jup ³¹	t ^h ə ³⁵	jup ³¹	jup ³¹	ju ³¹	ju ³¹	jup ³¹	jup ³⁵	ju ³¹	juŋ ³¹
78	small	ju ³⁵	ɲi ³⁵	ɲi ³⁵	ɲi ³⁵	ci ³⁵	ji ³³	ci ³⁵	ci ³⁵	jiə ³⁵	ɲi ³⁵	ci ³⁵	ji ³⁵	ɲi ³⁵	ɲi ³⁵
79	smoke	mi ³³ k ^h ü ³¹	bi ³¹ kau ³¹	bi ³¹ k ^h əŋ ³¹	mi ³¹ k ^h au ³¹	bi ³¹ k ^h au ³¹	mi ³¹ k ^h ui ³¹	ba ³³ k ^h au ³¹	bə ³¹ k ^h au ³³	bi ³¹ k ^h au ³³	mi ³¹ k ^h ui ³¹	bi ³¹ k ^h au ³¹	bi ³¹ k ^h au ³³	mi ³¹ k ^h au ³¹	bi ³¹ k ^h au ³¹
80	speak	kiəw ³¹	ci ³¹	ce ³¹	ci ³¹	lom ³¹	ce ³³	lom ³¹	ce ³¹	baŋ ³⁵	ca ³⁵	bun ³¹⁵	ɲup ³⁵	ɲup ³¹	ci ³¹
81	stand	ja ³¹	cuj ³⁵	t ^h a ³¹	cuj ³⁵	cuj ³¹	hə ³¹	coŋ ³³	cuj ³¹	cu ³⁵	jap ³¹	co ³¹	fiəp ³⁵	cuj ³¹	cuj ³¹
82	star	pi ³³ ki ³⁵	ɲu ³³ ki ³³	p ^h i ³³ ki ³³	ɲu ³³ ki ³³	ho ³³ ki ³³	bi ³¹ ki ³⁵	vi ³¹ ki ³⁵	bi ³¹ ki ³⁵	ɲu ³³ ki ³³	piə ³¹ ki ³⁵	hu ³¹ ki ³⁵	ɲu ³³ ki ³⁵	ɲo ³³ ki ³¹	ɲo ³³ ki ³¹
83	stone	loŋ ³³ ma ³³	lɔ ³³ ba ³³	la ³¹ p ^h u ³⁵	lo ³¹ ba ³¹	la ³⁵ p ^h u ³⁵	sa ³¹ lo ³⁵	lə ³³ p ^h u ³¹	p ^h u ³⁵	lo ³¹ ba ³¹	ho ³³ ba ³³	lu ³¹ p ^h u ³⁵	lu ³¹ p ^h u ³⁵	lo ³³ ba ³¹	ho ³¹ ba ³¹
84	sun	naŋ ³³ c ^h a ³³	muŋ ³¹ niŋ ³¹	moŋ ³³ niŋ ³⁵	biŋ ³¹ niŋ ³³	moŋ ³¹ ni ³³	jo ³³	ɲü ³¹ ɲi ³³	mi ³⁵ sa ³⁵	moŋ ³³ ni ³³	mi ³¹ liŋ ³⁵	ɲiŋ ³⁵ c ^h ɔ ³¹	mu ³³ ni ³⁵	liŋ ³⁵ tsa ³⁵	mi ³¹ niŋ ³¹
85	swim	ɲoŋ ³³	loi ³⁵¹	loi ³¹	loi ³¹	loi ³¹	fai ³¹	ɲo ³³	loi ³¹	lui ³¹	ɲoŋ ³¹	ɲoŋ ³³	ɲoŋ ³⁵	vai ³³	hjaŋ ³¹
86	tail	tom ³³ mi ³¹	təŋ ³¹ ji ³³	to ³³ ɲin ³³	təŋ ³¹ mi ³¹	toŋ ³³ mi ³¹	ɲ ³⁵ ba ³⁵	to ³³ men ³³	kam ³⁵ ba ³³	k ^h a ³⁵ ba ³¹	toŋ ³³ mi ³³	təŋ ³³ ɲi ³¹	toŋ ³³ ɲi ³³	toŋ ³¹ mi ³¹	toŋ ³¹ mi ³¹

	Gloss	Ban-tang	Bisu	Cauho	Lao-pin	Lao-seng	Mpi	Sinsali	Cantan	Laopan	Tsu-kong	Phong-ku	Phong-set	Lao-mian	Pyen
87	that	kiə ³³	hæŋ ³³	læ ³¹	kiŋ ³¹	t ^h aj ³³	nə ³⁵¹	fiə ³¹	xiu ³⁵	kiŋ ³¹	k ^h a ³⁵	heo ³⁵	fiə ³⁵	he ³⁵	he ³⁵
88	this	ni ³³	nu ³⁵	tə ³⁵	ni ³⁵	ɲu ³⁵	hə ³³	ɲu ³⁵	ɲu ³⁵	nuə ³⁵¹	ja ³⁵	ɲi ³⁵	ɲa ³¹	ni ³⁵	niŋ ³³
89	to dry	la ³¹	lau ³³	lap ³³	lau ³¹	lap ³¹	læ ³¹	lap ³¹	lap ³¹	lau ³¹	ki ³¹	la ³¹	lap ³⁵	ki ³³	hau ³¹
90	tongue	mi ³¹ la ³⁵	man ³¹ la ³¹	ɲ ³³ la ³⁵	man ³¹ la ³¹	man ³¹ la ³¹	ʔa ³¹ lo ³⁵	ʔā ³³ la ³³	ʔa ³³ la ³⁵	ma ³¹ la ³³	ka ³¹ ka ³⁵	man ³¹ lo ³⁵	ʔā ³³ la ³³	man ³¹ la ³¹	men ³³ ha ³¹
91	tooth	ʔo ³³ su ³¹	sə ³¹ p ^h e ³¹	ɲ ³³ sə ³¹	so ³¹ p ^h e ³¹	sa ³¹ p ^h æ ³¹	ʔa ³¹ so ³³	si ³³ p ^h æ ³¹	sa ³¹ p ^h æ ³¹	so ³¹ p ^h e ³³	ʔa ³³ so ³¹	si ³¹ p ^h e ³¹	so ³³ p ^h e ³⁵	ʃo ³¹ p ^h e ³¹	sa ³¹ p ^h e ³¹
92	tree	hi ³¹ caŋ ³³	tsiŋ ³¹ tsiŋ ³³	tat ³¹ tiŋ ³⁵	tsiŋ ³¹ tsiŋ ³⁵	ciŋ ³⁵	ʔa ³¹ ti ³⁵	ci ³⁵	ciŋ ³⁵	si ³¹ si ³⁵	si ³¹ siŋ ³⁵	ci ³¹ ciŋ ³⁵ bək ³¹	si ³¹ ciŋ ³³	siŋ ³³ ciŋ ³⁵	tsa ³¹ tsiŋ ³⁵
93	two	ni ³³	səŋ ³¹	het ³¹	ni ³¹	hit ³¹	ɲi ³⁵¹	ɲi ³⁵	ɲit ³¹	ni ³³	ɲi ³¹	hit ³¹	ɲi ³⁵	ni ³¹	ɲi ³¹
94	walk	ʔi ³⁵	jo ³¹	ji ³³	jo ³¹	jo ³¹	lo ³¹	ja ³¹	ja ³⁵	jo ³¹	ʔe ³⁵	fiə ³¹	jo ³⁵	jo ³¹	joŋ ³¹
95	water	c ^h u ³¹	laŋ ³³	laŋ ³³	laŋ ³⁵	laŋ ³⁵	c ^h ə ³⁵	lā ³³	laŋ ³⁵	laŋ ³⁵	c ^h o ³¹	laŋ ³⁵	laŋ ³³	c ^h o ³¹	laŋ ³⁵
96	what?	nu ³³	ba ³⁵	tæn ³⁵	maŋ ³⁵	cə ³⁵	t ^h əŋ ³¹⁵	cə ³⁵¹	ci ³⁵	ci ³³	t ^h ə ³¹	cə ³⁵	de ³⁵	maŋ ³³	tsə ³¹⁵
97	white	p ^h iu ³³	pən ³¹	cin ³³	pən ³¹	pa ³³	pə ³³	pa ³¹	p ^h iu ³³	pən ³¹	p ^h u ³⁵	pə ³³	pā ³¹	pən ³¹	pən ³¹
98	who?	su ³³	saŋ ³⁵	juŋ ³⁵	saŋ ³⁵	saŋ ³⁵	sə ³⁵	sā ³³	sa ³⁵	sa ³³	saŋ ³⁵	ki ³⁵	sā ³⁵	saŋ ³¹	saŋ ³³
99	woman	k ^h a ³³ ma ³³ ya ³¹	k ^h a ³¹ ba ³³ ja ³³	k ^h a ³¹ bai ³³ ja ³¹	k ^h a ³³ bai ³³ ja ³¹	k ^h am ³³ biə ³¹	k ^h o ³¹ mo ³⁵	k ^h e ³⁵ biə ³³	k ^h a ³¹ biə ³³	k ^h a ³¹ bai ³³ ja ³³	ta ³¹ kau ³¹ ba ³⁵	k ^h a ³³ bai ³⁵ jo ³¹	k ^h i ³¹ biə ³³	k ^h a ³¹ bai ³⁵ ja ³¹	k ^h a ³¹ bai ³⁵ ja ³¹
100	yellow	si ³³	c ^h i ³⁵	c ^h i ³⁵	si ³⁵	ʔan ³⁵	lo ³³	ʔan ³³	ʔan ³³	ʃi ³⁵	si ³⁵	ʔan ³⁵	ʔan ³³	ʃi ³⁵	si ³⁵

APPENDIX C

ROOT WORD FORMS OF SELECTED FOUR BISOID SPEECH VARIETIES

The following table shows phonetic transcription of root word forms sorted by gloss of selected four Bisoid speech varieties. This table is used to consider for the phonological description as well as comparative description.

Order	Gloss	Bantang	Bisu	Cauho	Tsukong
1	a fly1	–	mæŋ ³³	ŋaŋ ³³	jam ³⁵
2	a fly2	pin ³¹	ba ³³	–	ba ³¹
3	abdomen1	bu ³¹	pɔŋ ³¹	pa ³¹	–
4	abdomen2	poŋ ³³	pɔŋ ³⁵	pɔŋ ³⁵	poŋ ³³
5	afraid	k ^h i ³³	k ^h æŋ ³⁵	k ^h at ³¹	k ^h e ³⁵
6	all1	t ^h iŋ ³¹	mot ³⁵	t ^h əŋ ³¹	k ^h o ³⁵
7	all2	pit ³⁵	mu ³¹	k ^h a ³¹	le ³⁵
8	angry1	ʔo ³³	niŋ ³³	ne ³¹	niŋ ³¹
9	angry2	–	ba ³³	ban ³³	ba ³¹
10	answer	tɔp ³³	no data	tɔp ³¹	tem ³⁵
11	armpit1	kə ³¹	ka ³¹	ko ³³	kæ ³¹
12	armpit2	–	lɔp ³¹	toŋ ³¹	le ³⁵
13	arrow	mi ³¹	no data	ba ³¹	ba ³¹
14	ashes1	k ^h a ³³	k ^h a ³³	k ^h ə ³³	k ^h i ³⁵
15	ashes2	la ³³	la ³⁵	ləŋ ³⁵	li ³⁵
16	back1	naŋ ³³	taŋ ³¹	niŋ ³³	ta ³¹
17	back2	k ^h u ³³	k ^h aŋ ³¹	po ³¹⁵	k ^h a ³⁵
18	bad1	m ³³	ba ³¹	ba ³¹	–
19	bad2	mi ³³	mæŋ ³⁵¹	bi ³⁵¹	biŋ ³¹
20	bald	t ³⁵	klæn ³¹	lɔn ³⁵	lan ³⁵
21	bamboo	poŋ ³³	k ^h lɔŋ ³³	p ^h ai ³³	–
22	bamboo shoot1	ha ³³	–	–	–
23	bamboo shoot2	mi ³¹	mit ³⁵¹	mit ³³	mi ³¹
24	banana1	hat ³³	ʔa ³³	hat ³¹	ho ³³
25	banana2	ʃi ³¹	tsi ³¹	si ³¹	lom ³³

26	bark	c ^h e ³³	k ^h ɔ ³¹	k ^h ɔŋ ³³	la ³¹
27	bathe	c ^h u ³³	klau ³⁵¹	hi ³¹	k ^h o ³¹
28	bean1	moŋ ³³	t ^h u ³³	–	nom ³³
29	bean2	pi ³³	lin ³³	pat ³³	pe ³³
30	bear	k ^h am ³⁵	wam ³³	ʔam ³⁵	k ^h am ³⁵
31	beard	miŋ ³³	mi ³¹	ni ³³	mi ³¹
32	bee	pæ ³¹	piə ³¹	piə ³³	piə ³¹
33	big	hi ³³	hi ³⁵¹	bə ³¹	k ^h i ³¹
34	bird nest	pam ³¹	pam ³¹	pam ³⁵¹	pam ³¹
35	bird1	ha ³³	ha ³³	hat ³³	ha ³³
36	bird2	ɣa ³¹	ja ³¹	ja ³³	ga ³¹
37	bite	t ^h ə ³³	tsæŋ ³¹	t ^h æt ³³	c ^h e ³¹
38	bitter	k ^h a ³³	k ^h a ³¹	k ^h a ³¹	k ^h a ³¹
39	black	na ³³	plaj ³³	keŋ ³⁵	da ³⁵
40	blanket	p ^h uŋ ³¹	pen ³¹	k ^h u ³⁵	p ^h i ³¹
41	blind	kai ³¹	pɔ ³³	pɔk ³³	c ^h in ³⁵
42	blood	ʃi ³¹	c ^h i ³¹	c ^h i ³¹	si ³¹
43	blow	mi ³³	mi ³⁵	mit ³³	mi ³³
44	blunt1	–	–	–	–
45	blunt2	tun ³³	lim ³³	tum ³⁵	tin ³¹
46	boat	jam ³³	loŋ ³³	laŋ ³¹	xaŋ ³¹
47	boil	pə ³¹	p ^h uŋ ³¹	t ^h u ³⁵	c ^h u ³⁵
48	bone	ju ³¹	kau ³³	kiŋ ³¹	ji ³¹
49	brain	c ^h i ³³	no ³¹	noŋ ³¹	do ³¹
50	branch1	lak ³³	laŋ ³¹	lak ³⁵	la ³¹
51	branch2	ŋa ³¹	ŋam ³³	ŋa ³¹	–
52	breath1	sak ³¹	sa ³¹	sak ³¹	sa ³¹
53	breath2	ko ³³	kaŋ ³⁵	ka ³³	kaŋ ³⁵
54	bright	piə ³¹	plæn ³⁵	ceŋ ³³	pa ³¹
55	buffalo1	po ³³	pɔŋ ³¹	jo ³³	pan ³¹
56	buffalo2	nat ³⁵	na ³³	–	na ³³
57	burn	p ^h i ³³	p ^h i ³⁵	p ^h i ³¹	p ^h i ³⁵
58	bury (a corpse)1	p ^h a ³³	tuj ³⁵	t ^h um ³³	p ^h im ³¹
59	bury (a corpse)2	mup ³³	–	–	–
60	butterfly1	no data	tɔ ³³	pu ³³	pi ³¹
61	butterfly2	no data	lɔ ³³	lup ³⁵¹	li ³⁵

62	buttocks1	–	–	–	–
63	buttocks2	toŋ ³¹	təŋ ³¹	toŋ ³¹	toŋ ³¹
64	buttocks3	k ^h əŋ ³³	k ^h ləŋ ³¹	p ^h um ³³	taŋ ³⁵
65	buy	ʔu ³⁵	wiŋ ³³	bɪ ³⁵	gu ³⁵
66	calf1	ko ³³	kə ³¹	k ^h ə ³¹	–
67	calf2	poŋ ³¹	kæŋ ³⁵¹	p ^h uŋ ³⁵¹	–
68	calf3	c ^h i ³¹	–	–	–
69	candle1	–	–	–	–
70	candle2	soŋ ³¹	təŋ ³¹	soŋ ³¹	ten ³⁵
71	candle3	si ³³	c ^h i ³¹	si ³¹⁵	ne ³⁵
72	cat	mi ³³	meŋ ³³	mæŋ ³³	mi ³³
73	cave	le ³³	tam ³¹	t ^h am ³¹⁵	k ^h əŋ ³¹
74	cheek1	pə ³¹	pa ³¹	pa ³¹	pa ³¹
75	cheek2	paɪ ³³	pa ³³	kæm ³¹⁵	pa ³¹
76	chicken	ja ³³	hiə ³¹	ja ³³	xa ³¹
77	child	ya ³¹	ja ³³	ja ³¹	ka ³¹
78	chin1	pi ³⁵	–	pi ³¹⁵	pi ³⁵
79	chin2	–	tiŋ ³¹	–	–
80	choose	c ^h e ³¹	tsæŋ ³³	lək ³¹	c ^h e ³⁵
81	cloud1	mo ³³	fa ³³	siŋ ³¹	caŋ ³¹
82	cloud2	muɪ ³⁵	–	tam ³³	si ³¹
83	cockroach	no data	piə ³¹	sap ³⁵	p ^h a ³⁵
84	cold	c ^h o ³³	tsi ³³	c ^h æŋ ³¹	c ^h o ³¹
85	comb1	to ³³	tu ³³	tu ³¹	tu ³¹
86	comb2	k ^h iəɪ ³³	k ^h iə ³³	k ^h iəp ³³	k ^h a ³⁵
87	come	lau ³⁵¹	la ³⁵	lau ³⁵¹	la ³⁵
88	cook (a meal)	to ³³	tæŋ ³¹	ko ³⁵	t ^h oŋ ³⁵
89	cooked rice (sticky)1	ho ³³	haŋ ³¹	haŋ ³¹	haŋ ³¹
90	cooked rice (sticky)2	miəŋ ³³	miŋ ³³	miŋ ³⁵	–
91	cooking pot1	po ³³	ʔu ³³	p ^h o ³¹	pəŋ ³¹
92	cooking pot2	loŋ ³³	ləŋ ³¹	ləŋ ³¹	mi ³⁵
93	corn1	sa ³³	k ^h au ³¹	sa ³⁵¹	t ^h sa ³¹
94	corn2	lən ³¹	p ^h ot ³¹	–	tu ³³
95	correct	p ^h əɪ ³¹	ka ³⁵¹	kiə ³¹	tsaŋ ³¹
96	cough	c ^h u ³³	tsau ³¹	t ^h iŋ ³¹	c ^h u ³¹
97	count	nap ³³	nap ³¹	nap ³³	kə ³⁵

98	cow	ni ³⁵	miəŋ ³³	miəŋ ³⁵	–
99	crawl	tu ³¹	tɔ ³¹	to ³¹	ʔi ³³
100	crossbow1	saŋ ³¹	tan ³³	siŋ ³¹	si ³¹
101	crossbow2	naŋ ³³	nu ³³	ŋaŋ ³¹	la ³⁵
102	cucumber1	c ^h i ³¹	tsi ³¹	si ³¹	si ³¹
103	cucumber2	k ^h o ³³	k ^h ɔ ³¹	k ^h o ³¹	k ^h ɔ ³¹
104	cut (hair)1	p ^h e ³¹	jam ³⁵¹	t ^h æ ³¹	t ^h a ³¹
105	cut (hair)2	p ^h e ³¹	–	–	–
106	dance	ji ³³	pət ³¹	jen ³⁵	jan ³¹
107	day	naŋ ³¹	liŋ ³¹	niŋ ³⁵¹	niŋ ³³
108	deaf	pɔ ³³	paŋ ³³	paŋ ³¹	pa ³¹
109	deep	na ³³	na ³³	na ³¹	na ³⁵
110	deer	c ^h et ³⁵	pɔŋ ³¹	t ^h æt ³³	c ^h e ³³
111	dew	c ^h o ³³	məi ³³	siŋ ³¹	c ^h u ³¹
112	die	ʃi ³³	c ^h i ³³	c ^h i ³³	si ³⁵
113	different1	ma ³³	ba ³¹	ba ³¹	ʔa ³³
114	different2	ʔa ³⁵	tuŋ ³³	tu ³⁵	tu ³⁵
115	dig	k ^h i ³³	tuŋ ³¹	tu ³¹	tu ³¹
116	dirty	jai ³¹	soŋ ³³	bin ³⁵	c ^h a ³¹
117	dog	k ^h i ³³	k ^h i ³¹	k ^h i ³¹	k ^h i ³¹
118	door1	ko ³¹	laŋ ³³	k ^h a ³¹	ko ³³
119	door2	p ^h i ³¹	ko ³³	toŋ ³⁵	p ^h i ³¹
120	dream1	ma ³³	biŋ ³³	pæ ³¹	ba ³³
121	dream2	ma ³³	bin ³³	pæ ³¹	–
122	drink	to ³³	taŋ ³³	ta ³³	taŋ ³⁵
123	drum1	t ^h aŋ ³¹	kɔŋ ³³	kɔŋ ³⁵	t ^h uŋ ³¹
124	drum2	maŋ ³³	man ³³	–	–
125	drunk	ma ³³	mau ³⁵¹	mau ³¹	c ^h e ³¹
126	dry	gi ³³	ki ³¹	gi ³¹	ki ³⁵
127	duck	pi ³³	kau ³¹	kap ³⁵¹	kap ³⁵
128	dust1	k ^h a ³³	k ^h a ³³	k ^h ə ³³	k ^h o ³⁵
129	dust2	la ³³	la ³³	ləŋ ³³	lu ³⁵
130	ear1	na ³¹	na ³¹	na ³¹	na ³¹
131	ear2	–	siŋ ³¹	k ^h ɔŋ ³¹	–
132	earth, soil1	naŋ ³⁵	niŋ ³³	niŋ ³³	mi ³⁵
133	earth, soil2	c ^h aŋ ³¹	tɕa ³¹	t ^h aŋ ³³	tɕa ³¹

134	eat	ca ³³	tʂa ³¹	tai ³¹⁵	sa ³¹⁵
135	egg	ʔok ³³	ʔu ³³	ʔu ³³	ʔu ³³
136	eight	pæ ³⁵	pæ ³⁵	pæ ³¹	c ^h e ³¹
137	elbow1	c ^h i ³³	ʂi ³¹	t ^h i ³³	–
138	elbow2	toŋ ³¹	tɔŋ ³¹	toŋ ³¹	toŋ ³⁵
139	elder sibling1-1	moŋ ³⁵¹	ʔai ³³	moŋ ³⁵	boŋ ³⁵
140	elder sibling1-2	–	–	–	–
141	elder sibling2	c ^h i ³¹	tʂi ³³	t ^h i ³³	c ^h i ³¹
142	elephant1	ja ³³	ja ³³	saŋ ³⁵	c ^h a ³³
143	elephant2	ma ³³	ba ³³	–	ba ³³
144	enter1	ʔoŋ ³³	ʔoŋ ³³	ʔoŋ ³⁵	ʔo ³³
145	enter2	lau ³³	–	la ³⁵	la ³⁵
146	exchange1	pi ³³	pen ³¹	pen ³⁵	p ^h a ³⁵
147	exchange2	–	kaŋ ³⁵	–	–
148	excrement	ʔeŋ ³¹	ʔæŋ ³¹	ʔeŋ ³¹	jaŋ ³¹
149	extinguish (fire)1	ba ³¹	bi ³¹	bi ³¹	mau ³¹
150	extinguish (fire)2	ti ³³	tɔ ³¹	t ^h i ³¹	–
151	eye1	mi ^{ʔ33}	mæ ³¹	na ³¹	miə ³³
152	eye2	ni ^{ʔ33}	ni ³¹	mi ^{ʔ33}	–
153	eyebrow	mi ³¹	mi ³³	mi ³¹	mi ³¹
154	face1	miə ³³	mæ ³³	na ³¹	miə ³⁵
155	face2	p ^h u ³³	ka ³⁵¹	jeŋ ³⁵	p ^h a ³¹
156	fall1	kiə ³¹	klaj ³⁵	ka ³³	ka ³¹
157	fall2	–	–	–	–
158	far	ʔi ³³	wə ³⁵¹	bə ³⁵¹	go ³¹
159	fast	k ^h eo ³³	wai ³³	men ³¹	k ^h aŋ ³⁵
160	fat	jo ³⁵	tuj ³⁵¹	tuj ³³	tuj ³¹
161	fat1	ʔa ³¹	–	ba ^{ʔ31}	–
162	fat2	c ^h i ³³	tʂi ³³	t ^h i ³¹	ʃi ³⁵
163	father	pu ³¹	boŋ ³³	pu ³⁵	pu ³³
164	feather	mi ^{t31}	mi ³³	mu ³³	mi ³¹
165	few	ju ³⁵	ʔit ³⁵¹	ja ^{ʔ35}	c ^h i ³¹
166	field	ja ³³	hiə ³³	ja ³⁵	c ^h a ³⁵
167	fight1	ti ³³	tɔ ³¹	–	ti ³¹
168	fight2	lo ³³	suŋ ³⁵	lop ³¹	–
169	fight3	–	–	–	laŋ ³⁵

170	finger1	la ³³	la ³¹	laŋ ³¹	la ³¹
171	finger2	ju ³⁵	jum ³³	nuŋ ³¹⁵	luŋ ³⁵
172	fire1	mi ³³	bi ³³	bi ³¹	mi ³¹
173	fire2	lam ³⁵	t ^h ɔ ³¹	–	t ^h sa ³¹
174	firewood1	mi ³³	bi ³³	bi ³¹	mi ³¹
175	firewood2	t ^h uŋ ³¹	t ^h ɔ ³¹	t ^h um ³⁵	t ^h sa ³¹
176	fish1	naŋ ³³	lɔŋ ³³	lɔŋ ³¹	–
177	fish2	ti ³³	tæ ³¹	tæŋ ³⁵	ten ³³
178	five	ha ³⁵	ha ³⁵	ha ³¹	ŋa ³¹
179	flesh	sa ³¹	ma ³³	sa ³¹	sa ³¹
180	float (object)	pu ³⁵	lɔi ³⁵¹	pu ³³	piəm ³¹
181	flow	le ³³	lai ³³	pu ³³	ju ³⁵
182	flower1	jiŋ ³³	wæ ³³	–	ji ³¹
183	flower2	–	ja ³³	bat ³³	–
184	flute1	ja ³⁵	k ^h lui ³¹	pi ³³	k ^h a ³⁵
185	flute2	sai ³¹	–	–	pi ³⁵
186	fly	piə ³³	piəm ³³	piəm ³⁵¹	piəm ³⁵
187	foot	ki ³³	k ^h i ³¹	k ^h i ³⁵	k ^h i ³⁵
188	forehead1	miə ³³	mæ ³¹	ŋat ³¹	mi ³³
189	forehead2	k ^h ɔŋ ³³	k ^h ɔŋ ³³	k ^h ɔŋ ³¹⁵	p ^h u ³³
190	forest1	sa ³¹	tsɔŋ ³¹	–	c ^h ɔŋ ³¹
191	forest2	k ^h aŋ ³³	kɔŋ ³³	k ^h ot ³¹	–
192	forget	la ³³	luŋ ³³	lu ³³	biŋ ³¹
193	four	ŋü ³³	si ³¹	si ³³	hin ³⁵
194	friend	mak ³⁵¹	tsaŋ ³⁵¹	jæk ³¹	jo ³¹
195	frog	p ^h a ³³	–	p ^h aŋ ³¹	p ^h a ³¹
196	frost	p ^h i ³³	no data	piŋ ³¹	ŋe ³⁵
197	fruit	fi ³¹	si ³³	si ³⁵	si ³¹
198	full (container)	piəŋ ³³	pliŋ ³⁵	piŋ ³³	piŋ ³¹
199	full, satisfied	pu ³³	kɔŋ ³³	pin ³³	po ³¹
200	garden1	k ^h iəm ³³	–	–	kaŋ ³¹
201	garden2	–	son ³¹	son ³³	c ^h a ³⁵
202	garlic1	p ^h ak ³¹	həm ³¹	p ^h ak ³¹	hom ³⁵
203	garlic2	t ^h em ³³	tem ³¹	t ^h em ³¹	–
204	ghost	nej ³¹	dæ ³¹	dæt ³¹	diə ³¹
205	gibbon1	naŋ ³⁵	mæ ³¹	naŋ ³³	p ^h u ³⁵

206	gibbon2	–	loŋ ³³	liŋ ³³	p ^h u ³⁵
207	ginger1	c ^h i ³³	miŋ ³³	jæŋ ³¹	caŋ ³⁵
208	ginger2	c ^h i ³¹	tsi ³¹	si ³³	c ^h i ³¹
209	give	pi ³¹	pi ³¹	pi ³¹	pi ³¹
210	gold	k ^h am ³¹	k ^h am ³¹	k ^h am ³¹	si ³⁵
211	gong1	hi ³¹	–	loŋ ³⁵	bi ³⁵
212	gong2	–	mɔ ³³	moŋ ³⁵	liŋ ³⁵
213	gong3	–	joŋ ³³	–	–
214	good	mi ³³	mæŋ ³⁵¹	bi ³¹	biŋ ³¹
215	grass1	moɽ ³¹	bu ³³	bo ³¹	mo ³¹
216	grass2	–	ka ³³	–	ka ³¹
217	green	ɲu ³³	keo ³³	ɲuŋ ³⁵	ɲu ³⁵
218	grind	lə ³³	bot ³¹	mo ³³	mo ³⁵
219	gums1	k ^h oŋ ³³	k ^h ɔ ³⁵	k ^h ɔŋ ³¹⁵	kaŋ ³¹
220	gums2	–	–	–	–
221	hail1	hu ³³	hɔ ³¹	ho ³⁵	ho ³⁵
222	hail2	luɽ ³¹	lɔ ³³	lo ³⁵	lo ³¹
223	hair1	sam ³³	cam ³³	tam ³³	sa ³⁵
224	hair2	k ^h iəŋ ³³	kiŋ ³³	k ^h iŋ ³⁵	k ^h im ³⁵
225	half1	t ^h i ³¹	tik ³¹	te ³¹	ti ³¹
226	half2	peo ³³	k ^h liŋ ³⁵¹	k ^h iŋ ³⁵	p ^h a ³⁵
227	hand1	laɽ ³¹	lap ³¹	laɽ ³¹	la ³¹
228	hand2	–	pu ³¹	–	–
229	hard	k ^h a ³³	kæn ³⁵¹	k ^h a ³¹	k ^h a ³⁵
230	hate	læ ³¹	ba ³¹	nai ³⁵	ba ³¹
231	head	tu ³¹	tu ³³	tu ³¹	tu ³¹
232	hear	na ³⁵	kiəŋ ³¹	kiə ³³	pi ³³
233	heart1	niŋ ³³	niŋ ³³	net ³¹	niŋ ³⁵
234	heart2	ma ³³	ba ³³	ba ³³	ba ³¹
235	heart3	ʃi ³¹	–	c ^h i ³¹	–
236	heavy	k ^h iəŋ ³³	han ³⁵¹	fian ³¹	k ^h iŋ ³¹
237	heel1	p ^h a ³³	pa ³⁵	p ^h a ³³	p ^h a ³¹
238	heel2	toŋ ³¹	təŋ ³¹	toŋ ³¹	təŋ ³¹
239	hit	ti ³³	tɿ ³¹	teo ³⁵¹	ti ³¹
240	horn	k ^h i ³³	kau ³⁵	k ^h iŋ ³⁵	c ^h i ³⁵
241	hot	lɔ ³³	ləŋ ³³	ləŋ ³¹	hoŋ ³⁵

242	house	loŋ ³³	jum ³³	pam ³¹	jim ³⁵
243	house lizard1	k ^h a ³¹	cək ³¹	caŋ ³³	toŋ ³⁵
244	house lizard2	joŋ ³⁵	cək ³³	hən ³³	to ³¹
245	how many?	lam ³³	lɔ ³⁵	loɔ ³⁵	ho ³⁵
246	hundred	loi ³⁵	loi ³¹	loi ³³	c ^h a ³⁵
247	hungry1	–	haŋ ³¹	haŋ ³¹	–
248	hungry2	me ³³	bæŋ ³¹	bat ³¹	be ³¹⁵
249	hunt1	sa ³¹	tsəŋ ³¹	loŋ ³⁵	naŋ ³¹
250	hunt2	k ^h a ³³	kəŋ ³¹	kuə ³³	ho ³¹
251	husband	miu ³³	bloŋ ³⁵	boŋ ³⁵	boŋ ³⁵
252	intestines	ʔu ³³	ʔu ³³	ʔu ³⁵	ʔu ³⁵
253	iron	sam ³³	ʃam ³³	lek ³⁵	sam ³⁵
254	itch	ja ³³	hiə ³¹	ja ³¹	tsi ³³
255	kick	t ^h u ³³	tæ ³¹	te ³³	t ^h u ³⁵
256	kill	ʃi ³³	sæ ³¹	c ^h æt ³¹	se ³¹
257	kneel	pi ³³	pa ³¹	p ^h a ³¹	pi ³⁵
258	knee2	c ^h i ³¹	tu ³³	t ^h i ³⁵	tsi ³¹
259	kneel1	bi ³¹	k ^h uk ³⁵	la ³³	naŋ ³¹
260	kneel2	t ^h o ³⁵	k ^h au ³¹	t ^h o ³⁵	–
261	knife1	miə ³³	miə ³³	t ^h ai ³⁵	ca ³⁵
262	knife2	ɣa ³¹	–	ja ³⁵	k ^h u ³¹
263	know	nu ³³	bæŋ ³⁵	c ^h ja ³³	do ³¹
264	lake1	loŋ ³³	no data	loŋ ³³	la ³⁵
265	lake2	maŋ ³³	no data	–	t ^h æn ³¹
266	laugh	ʔi ³¹	ʔi ³³	ʔu ³³	ʔuŋ ³⁵
267	laundry	ca ³³	cau ³⁵	cap ³³	tsap ³¹
268	leaf	p ^h aŋ ³¹	pa ³¹	p ^h aŋ ³¹	p ^h a ³¹
269	left side	kam ³⁵	sai ³³	bə ³¹	c ^h a ³⁵
270	leg	k ^h i ³³	k ^h i ³¹	p ^h a ³¹	k ^h i ³⁵
271	lick	miək ³³	bæŋ ³¹	me ³¹	biə ³¹⁵
272	lie down1	jup ³⁵	ju ³¹	ʔe ³³	ju ³¹
273	lie down2	–	–	ten ³³	–
274	lie, fib1	ki ³⁵	jəp ³¹	kat ³³	ke ³¹
275	lie, fib2	–	–	le ³³	ke ³¹
276	lightning1	moŋ ³³	muŋ ³¹	muŋ ³⁵¹	muŋ ³¹
277	lightning2	miəp ³³	blap ³³	bæn ³³	bat ³¹

278	liquor1	ti ³¹	tæ ³¹	te ³¹	te ³¹
279	liquor2	k ^h a ³³	k ^h a ³¹	k ^h a ³⁵	k ^h a ³⁵
280	live	co ³³	diŋ ³⁵	ca ³¹	te ³¹⁵
281	liver	p ^h e ³¹	tsin ³¹	t ^h iŋ ³¹	p ^h e ³¹
282	long	mu ³³	mɔŋ ³⁵	mɔŋ ³³	no ³¹
283	louse	c ^h i ³³	tsen ³³	sæn ³³	san ³⁵
284	love	lü ³³	lak ³¹	hak ³¹	k ^h a ³⁵
285	lungs	map ³³	mau ³³	p ^h ap ³¹	p ^h am ³¹
286	man1	ka ³³	ka ³¹	ka ³¹	no ³¹
287	man2	p ^h a ³³	p ^h a ³³	p ^h a ³¹	ci ³⁵
288	man3	ɣa ³¹	ja ³³	–	–
289	mango1	kaŋ ³³	mɔŋ ³¹	mak ³¹	pja ³⁵
290	mango2	ku ³¹	mɔŋ ³¹	mɔŋ ³¹	k ^h e ³¹
291	many	miə ³³	lai ³³	lai ³³	biəŋ ³¹⁵
292	mat1	ti ³³	tæ ³³	ta ³³	–
293	mat2	p ^h uŋ ³¹	p ^h u ³³	p ^h u ³⁵¹	–
294	medicine1	sa ³¹	tsi ³¹	ja ³⁵	c ^h i ³¹
295	medicine2	ka ³¹	ka ³¹	–	–
296	mist1	c ^h oŋ ³³	məi ³³	si ³³	caŋ ³¹
297	mist2	ʃi ³¹	–	–	si ³¹
298	monkey1	miuŋ ³³	ka ³³	moŋ ³⁵¹	miu ³¹
299	monkey2	–	səi ³¹	–	–
300	moon1	pi ³³	ʔu ³³	p ^h o ³³	pe ³¹
301	moon2	laŋ ³¹	la ³³	la ³⁵	la ³⁵
302	morning1	si ³¹	sət ³¹	so ³³	səŋ ³¹
303	morning2	t ^h aŋ ³¹	t ^h a ³¹	daŋ ³³	ba ³³
304	mortar1	toŋ ³¹	təŋ ³¹	toŋ ³¹	tsem ³⁵
305	mortar2	c ^h am ³⁵	tsuŋ ³¹	t ^h um ³³	si ³¹
306	mosquito1	jæk ³³	mæŋ ³³	jæŋ ³³	jaŋ ³⁵
307	mosquito2	kau ³¹	mɔŋ ³³	k ^h iəŋ ³³	kə ³¹
308	mother	maŋ ³¹	ba ³³	maŋ ³⁵¹	ba ³³
309	mountain1	kaŋ ³¹	ta ³¹	tap ³³	–
310	mountain2	kiə ³³	tsæ ³³	p ^h up ³⁵	kiŋ ³¹
311	mouth1	me ³¹	man ³¹	man ³¹	ma ³¹
312	mouth2	t ^h oŋ ³³	pəŋ ³¹	sæn ³⁵¹	t ^h oŋ ³¹
313	mud	pot ³¹	pən ³¹	pət ³³	tsa ³¹

314	mushroom	mũ ³³	məŋ ³³	mu ³¹	muŋ ³⁵
315	nail	c ^h eiŋ ³¹	siŋ ³¹	c ^h iiŋ ³³	si ³¹
316	name	miəŋ ³³	meŋ ³³	miŋ ³⁵	mi ³⁵
317	narrow	ʔiiŋ ³¹	t ^h æŋ ³⁵¹	k ^h æp ³¹	geŋ ³¹
318	navel1	c ^h æt ³⁵	sa ³³	c ^h aŋ ³¹	li ³⁵
319	navel2	toŋ ³¹	təŋ ³³	–	–
320	near	ni ³³	t ^h æ ³³	di ³³	di ³¹
321	neck1	naŋ ³³	liŋ ³⁵	niŋ ³¹	la ³⁵
322	neck2	c ^h ii ³¹	si ³⁵¹	t ^h i ³¹	tsi ³¹
323	needle1	ko ³³	kəŋ ³¹	ku ³¹	ku ³¹
324	needle2	kiəp ³³	kau ³¹	kiəp ³¹	lap ³¹
325	new	sik ³³	c ^h i ³³	si ³¹	si ³¹
326	night	ɣaŋ ³³	k ^h i ³¹	k ^h it ³¹	c ^h i ³⁵
327	nine	kau ³⁵	kau ³⁵	kau ³¹	ki ³¹
328	noon	t ^h oŋ ³¹	t ^h iən ³¹	t ^h eiŋ ³³	kə ³³
329	nose1	na ³³	na ³³	na ³¹	niŋ ³⁵
330	nose2	mæ ³³	k ^h aŋ ³³	tuiŋ ³⁵	k ^h aŋ ³⁵
331	old	ʔi ³³	ʔan ³⁵	ʔan ³⁵	ʔin ³⁵
332	one	t ^h i ³³	t ^h i ³¹	t ^h ə ³¹	ti ³¹
333	opium1	næ ³³	ja ³¹	jaŋ ³³	je ³¹
334	opium2	jen ³³	fiŋ ³³	jen ³⁵	jeŋ ³⁵
335	paddy rice1	ku ³³	kə ³³	kot ³¹	ko ³³
336	paddy rice2	–	tsi ³¹	lum ³¹	–
337	palm	te ³³	wa ³¹	ba ³⁵¹	p ^h a ³⁵
338	papaya1	mak ³³	kui ³³	mak ³¹	la ³⁵
339	papaya2	hoŋ ³³	–	huŋ ³³	–
340	papaya3	–	pau ³¹	–	pi ³¹
341	paper1	–	ka ³³	ka ³¹	ka ³⁵
342	paper2	–	lat ³³	lat ³⁵	dat ³⁵
343	peanut1	t ^h i ³³	t ^h u ³³	t ^h o ³³	t ^h i ³⁵
344	peanut2	lin ³¹	lin ³³	din ³¹	lin ³³
345	person	c ^h oa ³¹	tsaŋ ³³	t ^h aŋ ³⁵	t ^h sa ³⁵
346	pestle1	toŋ ³¹	təŋ ³¹	toŋ ³¹	t ^h əŋ ³¹
347	pestle2	kü ³³	kan ³¹	kan ³³	c ^h en ³⁵
348	pig	ɣaŋ ³¹	wa ³¹	bəŋ ³¹	wa ³¹
349	pillow1	ti ³³	tu ³¹	to ³³	tu ³¹

350	pillow2	kjam ³¹	k ^h u ³³	k ^h u ^{ʔ35}	kim ³¹
351	plant	tu ³³	klaj ³⁵	k ^h a ³¹	k ^h a ³⁵
352	plate1	–	can ³³	–	miə ³⁵
353	plate2	k ^h u ³⁵	–	t ^h oi ³⁵	–
354	plate3	p ^h e ³¹	–	le ³¹	–
355	play	ni ³⁵	bɔ ³¹	tæn ³³	ca ³⁵
356	porcupine1	ho ³³	ho ³³	ho ^{ʔ31}	ho ³³
357	porcupine2	c ^h u ³¹	c ^h u ³¹	ʃu ³³	c ^h u ³¹
358	pound (rice)	t ^h ɔŋ ³³	t ^h ɔŋ ³⁵¹	t ^h oŋ ³¹	t ^h ɔŋ ³¹
359	pounded rice	c ^h e ³³	c ^h en ³³	sæn ³⁵	tsan ³³
360	pull	kɪ ³¹	ca ³¹	gin ³⁵	sə ³⁵
361	pus	pjam ³³	ʔum ³⁵	piŋ ³⁵	piŋ ³⁵
362	push	te ³¹	tan ³¹	hi ³³	tan ³¹
363	rain1	mo ³³	muŋ ³¹	moŋ ³³	mo ³⁵
364	rain2	ho ³⁵	ho ³¹	ho ³⁵	–
365	rainbow1	tiŋ ³³	pi ³³	tiŋ ³³	c ^h i ³³
366	rainbow2	–	huŋ ³³	–	–
367	rat1	ho ³³	ho ³³	ho ^{ʔ31}	ha ³³
368	rat2	tam ³¹	tam ³¹	jum ³³	xi ³¹
369	rattan1	din ³³	tsaŋ ³¹	din ³¹	ne ³³
370	rattan2	–	laŋ ³¹	ni ³³	k ^h oŋ ³³
371	red	ni ³³	næ ³³	næ ³¹	ne ³⁵
372	red pepper1	la ³¹	la ^{ʔ31}	la ³¹	ca ³¹
373	red pepper2	p ^h i ³³	piŋ ³⁵	p ^h i ³¹⁵	p ^h i ³⁵
374	return1	ʔi ³³	pik ³¹	je ³⁵	tem ³⁵
375	return2	leo ³¹	lan ³⁵	le ³⁵	le ³⁵
376	rib1	nam ³³	–	nam ³¹	nam ³⁵
377	rib2	piə ³³	piəŋ ³³	p ^h iə ³⁵¹	–
378	rice husk1	p ^h i ³¹	pi ³⁵¹	p ^h i ³⁵¹	–
379	rice husk2	–	–	–	k ^h am ³¹
380	right side	men ³³	ma ³¹	la ³¹	ma ³⁵
381	ring1	loŋ ³⁵	la ³¹	pok ³³	la ³¹
382	ring2	c ^h ɔŋ ³¹	tsɔŋ ³¹	mi ³⁵¹	c ^h oŋ ³¹
383	river1	lo ³⁵	laŋ ³³	laŋ ³³	la ³⁵
384	river2	k ^h am ³¹	ba ³³	ba ^{ʔ351}	k ^h am ³¹
385	road, path1	kiəm ³³	kim ³³	kæ ³³	ka ³⁵

386	road, path2	ma ³¹	ba ³³	laŋ ³⁵¹	ba ³³
387	roof	mu ³¹	muŋ ³⁵¹	mum ³⁵¹	c ^h i ³⁵
388	root	c ^h e ³³	c ^h e ³³	sæ ³¹⁵	c ^h e ³⁵
389	rotten	pup ³¹	pu ³⁵¹	pu ³¹	nam ³⁵
390	round1	to ³³	bun ³³	møn ³⁵	
391	round2	loʔ ³³	–	–	luŋ ³⁵
392	rub, scrub	k ^h i ³³	cet ³¹	hi ³³	k ^h i ³⁵
393	saliva	k ^h a ³¹	kan ³¹	k ^h at ³¹	mi ³¹
394	salt1	ha ³³	tsam ³¹	t ^h aʔ ³¹	tə ³³
395	salt2	təʔ ³³	mæ ³¹	–	–
396	same1	t ^h i ³³	tuŋ ³³	t ^h i ³¹	ti ³¹
397	same2	ju ³³	–	saŋ ³³	k ^h o ³¹
398	same3	–	–	–	lɔ ³⁵
399	same4	ʔa ³¹	ka ³¹	ja ³¹	tu ³⁵
400	sand	ʃi ³¹	sai ³¹	sai ³¹	si ³¹
401	sarong1	p ^h ja ³¹	tiŋ ³¹	tiŋ ³¹	taŋ ³¹
402	sarong2	–	ka ³¹	ka ³¹	–
403	scratch	pi ³³	keŋ ³⁵	k ^h iə ³³	pəi ³¹⁵
404	see	mo ³³	miəŋ ³³	miəŋ ³³	miəŋ ³⁵
405	seed (grain)	jü ³¹	jau ³¹	ma ³³	ji ³³
406	sell	koŋ ³³	kəŋ ³¹	koŋ ³¹	goŋ ³¹
407	seven	cet ³⁵	cet ³⁵	cet ³⁵	si ³¹
408	sew	ku ³³	kuŋ ³¹	k ^h in ³³	ku ³¹
409	shade	–	c ^h um ³¹	ʃu ³³	sæn ³⁵
410	shadow (person) 1	–	ke ³³	–	laŋ ³⁵
411	shadow (person)2	hup ³³	ke ³³	ʔup ³⁵	–
412	shallow1	tam ³⁵	ban ³¹	tam ³⁵	na ³⁵
413	shallow2	–	na ³³	–	–
414	sharp	t ^h a ³³	t ^h a ³³	t ^h a ³¹	t ^h a ³¹
415	shave (beard)	c ^h u ³⁵	k ^h un ³⁵	sut ³³	c ^h o ³¹
416	shin1	–	–	man ³¹	ma ³¹
417	shin2	ku ³¹	ko ³¹	kaŋ ³³	ka ³⁵
418	shin3	ke ³³	kæŋ ³⁵¹	–	–
419	shirt1	k ^h aʔ ³¹	k ^h a ³¹	k ^h a ³³	k ^h a ³¹
420	shirt2	–	lau ³³	lap ³⁵	–
421	shiver	cu ³³	jik ³¹	kiŋ ³³	tsu ³¹

422	shoot	pə ³³	pəŋ ³⁵	pi ³³	pə ³¹
423	short (height)	ja ³³	jum ³¹	tam ³⁵	mi ³¹
424	short (length)	jam ³⁵	jum ³⁵	ɲum ³¹	ʔu ³¹
425	shoulder1	p ^h a ³¹	pa ³¹	la ³¹	p ^h a ³¹
426	shoulder2	p ^h uŋ ³³	huŋ ³¹	p ^h a ³¹⁵	p ^h u ³⁵
427	shout	ʔo ³³	hau ³³	ʔaŋ ³¹	hu ³³
428	sick	nai ³⁵¹	daŋ ³³	da ³³	da ³⁵
429	silver	p ^h iu ³³	p ^h lu ³³	p ^h u ³³	p ^h u ³⁵
430	sing	kap ³¹	peŋ ³¹	p ^h iŋ ³¹	he ³⁵
431	sink	–	cum ³³	com ³³	–
432	sit	na ³³	diŋ ³³	niŋ ³⁵	niŋ ³⁵
433	six	hok ³⁵	hok ³⁵	hok ³⁵	k ^h o ³¹
434	skin	k ^h uŋ ³³	k ^h ɔ ³¹	lu ³³	hu ³¹
435	skinny	joŋ ³⁵	hiuŋ ³⁵	joŋ ³⁵	jom ³¹
436	sky1	moŋ ³³	muŋ ³¹	moŋ ³³	muŋ ³¹
437	sky2	t ^h aŋ ³¹	–	t ^h a ³¹	–
438	sleep	jup ³¹	juŋ ³¹	nu ³¹	ju ³¹
439	slow	–	klam ³⁵¹	dap ³¹	je ³¹
440	small	ju ³⁵	ʔi ³⁵	ʔi ³⁵	ʔi ³⁵
441	smell	na ³³	nam ³¹	pat ³¹	nam ³⁵
442	smoke	k ^h u ³¹	kau ³¹	k ^h əŋ ³¹	k ^h ui ³¹
443	smooth	ti ³³	peŋ ³³	saŋ ³¹	lem ³¹
444	snail1	pi ³³	caŋ ³¹	pi ³³	pe ³¹
445	snail2	lüŋ ³⁵	pæk ³¹	lju ³³	le ³⁵
446	snake1	ʔi ³³	ʔu ³³	ʔiŋ ³³	ʔi ³³
447	snake2	loŋ ³³	laŋ ³³	–	laŋ ³³
448	sneeze1	ha ³³	hat ³⁵	hat ³¹	ha ³⁵
449	sneeze2	p ^h i ³³	c ^h əi ³¹	si ³¹	tsi ³¹
450	sneeze3	ji ³³	–	–	–
451	snore1	toŋ ³¹	–	təŋ ³⁵¹	təŋ ³¹
452	snore2	–	klaŋ ³⁵¹	–	k ^h ləŋ ³¹
453	snore3	–	–	miŋ ³³	–
454	some1	ti ³¹	ka ³³	t ^h i ³¹	bja ³⁵
455	some2	p ^h iŋ ³³	jaŋ ³⁵¹	mũ ³³	ka ³¹
456	sour	c ^h en ³³	c ^h en ³⁵	sæn ³³	c ^h an ³⁵
457	space under house1	k ^h an ³⁵	kɔ ³¹	p ^h in ³⁵	ko ³³

458	space under house2	–	lɔk ³⁵	–	lok ³³
459	speak	kau ³¹	ci ³¹	ce ³¹	ca ³⁵
460	spicy, hot	p ^h i ³⁵	p ^h i ³³	p ^h i ³⁵	p ^h i ³⁵
461	spider web	pam ³¹	ce ³¹	pam ³¹	kaŋ ³³
462	spider1	naŋ ³¹	lam ³³	mup ³⁵	la ³⁵
463	spider2	k ^h iə ³³	–	–	kaŋ ³³
464	spit1	–	k ^h an ³¹	k ^h at ³¹	k ^h a ³⁵
465	spit2	–	laŋ ³¹	laŋ ³³	–
466	spit3	–	p ^h it ³⁵¹	p ^h it ³¹	–
467	spit4	–	–	–	–
468	split1	p ^h a ³³	plak ³¹	p ^h a ³¹	p ^h a ³⁵
469	split2	–	–	–	–
470	spoon1	kɔn ³³	kɔn ³¹	sot ³¹	t ^h ɔŋ ³¹
471	spoon2	–	–	tam ³³	kin ³⁵
472	stab	t ^h aŋ ³³	tsau ³⁵	t ^h iŋ ³³	tsam ³¹
473	stand	ja ³¹	cuŋ ³⁵	t ^h a ³¹	jap ³¹
474	star1	pi ³³	ʔu ³³	p ^h i ³³	pja ³¹
475	star2	ki ³⁵	ki ³³	ki ³³	ki ³⁵
476	steal1	c ^h o ³⁵	–	t ^h aŋ ³¹	–
477	steal2	–	kau ³¹	k ^h iŋ ³⁵¹	xu ³¹
478	steal3	c ^h ü ³¹	–	–	–
479	steam1	ho ³³	haŋ ³¹	haŋ ³¹	–
480	steam2	ʔam ³⁵	buŋ ³⁵	hu ³	ʔim ³⁵
481	stone1	loŋ ³³	lɔ ³³	la ³¹	ho ³³
482	stone2	maʔ ³³	ba ³³	p ^h uʔ ³⁵	ba ³³
483	straight	cu ³³	si ³³	miŋ ³⁵	po ³⁵
484	strong	hai ³³	kæn ³⁵	k ^h eŋ ³³	k ^h aŋ ³⁵
485	suck	nuŋ ³³	c ^h ɔk ³¹	taŋ ³¹	duŋ ³¹
486	sugar cane1	poŋ ³¹	pɔŋ ³¹	pin ³³	poŋ ³¹
487	sugar cane2	c ^h i ³³	c ^h au ³¹	siŋ ³¹⁵	c ^h i ³⁵
488	sun	naŋ ³³	niŋ ³¹	niŋ ³⁵	liŋ ³⁵
489	swallow1	mü ³³	naŋ ³⁵	naŋ ³¹	bwe ³⁵
490	swallow2	pi ³⁵	–	–	–
491	sweat1	ku ³¹	muŋ ³¹	–	ku ³³
492	sweat2	c ^h u ³¹	ni ³¹	luŋ ³¹	c ^h o ³⁵
493	sweet	c ^h u ³³	c ^h au ³⁵	siŋ ³⁵	c ^h i ³³

494	swell	p ^h u ³¹	puŋ ³⁵	puŋ ³⁵	p ^h u ³¹
495	swim	ʔoŋ ³³	lɔi ³⁵¹	lɔi ³¹	ʔoŋ ³¹
496	tail1	tom ³³	tɔŋ ³¹	to ³³	toŋ ³³
497	tail2	mi ³¹	ɲi ³³	ɲin ³³	mi ³³
498	take	c ^h o ³¹	c ^h i ³¹	si ³³	ju ³⁵
499	tall	mo ³³	mɔŋ ³¹	na ³¹	moŋ ³¹
500	ten	sip ³⁵	sæ ³¹	sip ³³	c ^h e ³⁵
501	termite	pün ³³	hən ³¹	p ^h i ³³	pim ³¹
502	that	t ^h i ³³	hæŋ ³³	læ ³¹	k ^h a ³⁵
503	thick	t ^h u ³³	tu ³⁵	t ^h u ³³	t ^h u ³⁵
504	thigh	poŋ ³³	pɔŋ ³⁵	tɔ ³³	poŋ ³⁵
505	thin	pa ³³	pa ³⁵¹	pa ³¹	pa ³¹
506	think	tu ³³	kit ³⁵	ʔau ³¹	nu ³¹
507	thirsty	me ³³	bæŋ ³⁵¹	bat ³¹	ki ³¹
508	this	ni ³³	nu ³⁵	ʔi ³¹	ja ³⁵
509	thorn1	c ^h u ³¹	c ^h u ³¹	ʃu ³¹	tsu ³¹
510	thorn2	c ^h u ³¹	–	–	–
511	thousand	p ^h an ³³	pan ³³	p ^h an ³¹	pan ³¹
512	three	sam ³⁵	sam ³³	sam ³¹	sem ³⁵
513	throw (get fruit)1	pen ³¹	laŋ ³¹	bit ³¹	pen ³¹
514	throw (get fruit)2	–	liŋ ³¹	–	–
515	throw away1	ci ³⁵	wiŋ ³⁵	bit ³¹	pen ³¹
516	throw away2	–	–	–	–
517	thunder1	moŋ ³³	muŋ ³¹	moŋ ³³	moŋ ³¹
518	thunder2	ce ³³	ce ³³	ce ³¹	ce ³¹
519	tie	p ^h i ³³	p ^h iŋ ³⁵	p ^h i ³¹	p ^h i ³¹
520	tiger1	ca ³³	tsa ³¹	t ^h a ³³	c ^h a ³³
521	tiger2	la ³³	la ³³	la ³³	la ³¹
522	tired	tu ³³	mit ³⁵¹	du ³¹	du ³¹
523	to dry	la ³¹	lau ³³	lap ³³	ki ³¹
524	tomorrow1	nu ³¹	di ³¹	na ³⁵¹	ɲaŋ ³⁵
525	tomorrow2	si ³³	c ^h i ³³	ʔə ³¹⁵	–
526	tongue	la ³⁵	la ³¹	la ³⁵	–
527	tooth1	su ³¹	sɔ ³¹	sɔ ³¹	so ³¹
528	tooth2	–	p ^h e ³¹	–	–
529	tree1	hi ³¹	tsiŋ ³¹	tat ³¹	si ³¹

530	tree2	caŋ ³³	tsiŋ ³³	tiŋ ³⁵	siŋ ³⁵
531	trousers1	ki ³³	tiŋ ³¹	–	–
532	trousers2	c ^h əŋ ³¹	tsəŋ ³¹	səŋ ³¹⁵	tsa ³¹
533	turn	p ^h iə ³⁵	leo ³⁵	k ^h ot ³¹	ko ³¹
534	turtle1	tau ³³	ʔu ³³	–	piə ³¹
535	turtle2	k ^h am ³¹	hoŋ ³¹	poŋ ³⁵	piə ³⁵
536	two	ni ³³	səŋ ³¹	het ³¹	ʒi ³¹
537	urine1	ʔi ³¹	ʔi ³¹	ʔi ³¹	ʔa ³³
538	urine2	ʃi ³⁵	c ^h i ³¹	–	si ³⁵
539	village	k ^h əŋ ³¹	k ^h əŋ ³¹	k ^h əŋ ³¹	p ^h u ³⁵
540	vomit	p ^h i ³³	pa ³¹	p ^h at ³¹	p ^h e ³¹
541	wait	toŋ ³³	ləŋ ³¹	taŋ ³¹	taŋ ³¹
542	walk	ʔi ³⁵	ʒə ³¹	ʒi ³³	ʔe ³⁵
543	wall (of house)	t ^h i ³¹	piə ³³	piə ³⁵	t ^h e ³¹
544	wash (dishes)	ʃi ³³	cə ³⁵¹	t ^h i ³¹	tsap ³¹
545	wash (vegetables)	ʃi ³³	si ³¹	t ^h i ³¹	c ^h i ³³
546	water	c ^h u ³¹	laŋ ³³	laŋ ³³	c ^h o ³¹
547	weak1	ma ³³	–	ba ³¹	–
548	weak2	ʃai ³¹	–	k ^h eŋ ³³	ka ³¹
549	weep	ʔu ³³	ʔuŋ ³⁵	ʔu ³³	ʔuŋ ³⁵
550	wet	cen ³³	cen ³³	cen ³³	can ³⁵
551	what?	nu ³³	cə ³¹⁵	tæn ³⁵	t ^h ə ³¹
552	when?	lup ³¹	ləm ³⁵¹	ʒuŋ ³⁵	hi ³⁵
553	where?	kiə ³³	kəŋ ³⁵¹	ka ³¹	huə ³⁵
554	whistle1	c ^h u ³³	c ^h en ³³	sən ³³	c ^h o ³⁵
555	whistle2	c ^h u ³³	c ^h en ³³	sən ³³	c ^h o ³¹
556	white	p ^h iu ³³	pən ³¹	cin ³³	p ^h u ³⁵
557	who?	su ³³	saŋ ³⁵	ŋa ³³	saŋ ³⁵
558	wide, broad	ke ³³	kli ³⁵	kuəŋ ³⁵	geŋ ³¹
559	wife1	k ^h am ³¹	k ^h a ³¹	k ^h a ³¹	–
560	wife2	ma ³³	ba ³³	ba ³¹	bi ³¹
561	wind1	hom ³³	haŋ ³³	ha ³³	ho ³⁵
562	wind2	me ³³	man ³³	man ³³	ban ³⁵
563	wing	toŋ ³³	təŋ ³³	toŋ ³⁵	toŋ ³⁵
564	wink	mi ³³	blum ³⁵	mit ³³	miən ³⁵
565	winnow (rice)	ʔai ³³	kə ³¹	kiə ³³	ga ³⁵

566	wipe	ʃi ³³	ceŋ ³¹	pat ³¹	c ^h i ³³
567	woman1	k ^h a ³³	k ^h a ³¹	k ^h a ³¹	kau ³¹
568	woman2	ma ³³	ba ³³	bai ³³	ba ³⁵
569	woman3	ɣa ³¹	ja ³³	ja ³¹	–
570	work1	ʔo ³³	kan ³³	bik ³³	kan ³¹
571	work2	ji ³¹	wa ³³	tæŋ ³³	–
572	wring	cup ³⁵	tsuŋ ³⁵	t ^h up ³⁵¹	tsu ³¹
573	wrong1	m ³³	ba ³¹	–	–
574	wrong2	p ^h ət ³³	ka ³⁵¹	p ^h it ³³	tsaŋ ³¹
575	yawn	fiə ³¹³	miə ³¹	m̩iə ³⁵¹	huə ³⁵
576	year	ni ³¹	pi ³¹	ni ³¹	xo ³¹
577	yellow	si ³³	c ^h i ³⁵	c ^h i ³⁵	si ³⁵
578	yesterday	mi ³³	miŋ ³³	m̩en ³⁵	mi ³⁵
579	younger sibling1-1	ci ³¹	p ^h æ ³³	ji ³⁵	ji ³⁵
580	younger sibling1-2	–	–	–	–
581	younger sibling2-1	ci ³¹	pɔ ³⁵¹	ji ³⁵	ji ³⁵
582	younger sibling2-2	–	–	–	–

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