

# A PHONOLOGY OF MUAK SA-AAK

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Presented to Payap University in Partial Fulfillment  
Of the Requirements for the Degree of  
MASTER OF ARTS IN  
LINGUISTICS  
Faculty of Arts

Payap University  
September 2010



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## ACKNOWLEDGEMENTS

The author would like to remember first of all the late Dr. Paulette Hopple, who enthusiastically shared her passions for linguistics and for the Palaungic peoples, and who first introduced me to the Muak Sa-aak people, thus making this research possible.

I would like to express my deep gratitude to my advisor, Dr. Phinnarat Akharawatthanakun; and also to Dr. Sigrid Lew and Dr. Somsong Burusphat. In addition, I would like to thank Mr. William Hanna for his invaluable help.

I am very grateful to the Muak Sa-aak speakers who gave so much of their time and their language, and the friend who spent many hours with us translating.

Special thanks are due my family and friends, who have been very encouraging and gracious throughout this process.

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Date Approved: 10 September 2010  
Number of Pages: 93  
Keywords: Muak Sa-aak, Palaungic, Angkuic, Phonology,  
Tonogenesis

## ABSTRACT

Muak Sa-aak is a Mon-Khmer language spoken by a small community of about 4,460 people, primarily in Eastern Shan State of Myanmar, but also known to be in Yunnan province of China. The language belongs to a little-known group of languages, the Angkuic branch of Eastern Palaungic. The sound system of only one Angkuic language has previously been described. This thesis seeks to study Muak Sa-aak to present a complete phonological inventory. The data collected contain a considerable amount of vocabulary borrowed from Tai Lue, a language with which Muak Sa-aak speakers have long been in contact, so a brief investigation of the impact on the phonology of this borrowing from a Tai-Kadai language will be conducted. As special tonogenetic features are frequently mentioned in the literature on Angkuic, an excursus into tonogenesis also seems appropriate.

In this study, Muak Sa-aak was found to follow general Palaungic phonology as a sesquisyllabic language, with 22 consonants, 18 vowels, and three tones. The sound system is clearly distinct from Tai Lue, as seen by the presence of diphthongs and syllable-final palatal consonants. There are clear correspondences between tone in Tai Lue and tone in Muak Sa-aak. The three distinctive tones appear to have developed from a combination of final consonants and the effects of vowel length.

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# TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	ii
Abstract.....	iii
บทคัดย่อ.....	iv
List of Tables.....	ix
List of Figures.....	xii
Abbreviations and Symbols.....	xiii
Chapter 1	
Introduction.....	1
1.1 Linguistic affiliation.....	2
1.2 Muak Sa-aak glossonyms.....	4
1.3 Geographic location.....	4
1.4 Sociolinguistic background.....	6
1.4.1 Contact languages.....	6
1.4.2 Language attitude and use.....	6
1.5 Methodology.....	7
1.5.1 Data collection.....	7
1.5.2 Language informants.....	8
1.5.3 Data analysis.....	9
1.6 Limitations of the study.....	10
Chapter 2	
Literature review.....	11
2.1 Angkuic phonology.....	11
2.1.1 Syllable structure.....	11
2.1.2 Vowels.....	13

2.1.3 Consonants.....	14
2.2 Angkuic tonogenesis.....	18
2.2.1 Registrogenesis.....	18
2.2.2 Tonogenesis.....	21
2.3 Phonology of Tai Lue.....	30
2.3.1 Tai Lue consonants.....	30
2.3.2 Tai Lue vowels.....	33
2.3.3 Tai Lue tonal system.....	34
Chapter 3	
Muak Sa-aak consonants and vowels.....	36
3.1 Consonants.....	36
3.1.1 Initials.....	36
3.1.2 Consonant clusters.....	41
3.1.3 Final consonants.....	43
3.2 Vowels.....	45
3.2.1 Monophthongs.....	45
3.2.2 Diphthongs.....	48
3.2.3 Vowel length.....	50
3.3 Summary.....	52
Chapter 4	
Muak Sa-aak phonotactics.....	53
4.1 Potentially ambiguous sequences.....	53
4.1.1 Diphthongs.....	53
4.1.2 Final approximants .....	53
4.2 Overall word structure.....	54
4.3 Main syllable structure.....	55
4.4 Presyllables.....	56
4.5 Sesquisyllabicity in Muak Sa-aak.....	57
4.6 Compounds.....	59



4.7 Summary.....	60
Chapter 5	
Muak Sa-aak tones.....	61
5.1 Tones.....	61
5.1.1 Low tone: Tone 1.....	61
5.1.2 Checked tone: Tone 2.....	63
5.1.3 Falling tone: Tone 3.....	65
5.2 Syllable structures and tones.....	66
5.3 Tonogenesis.....	69
5.3.1 Impact of initial consonants.....	69
5.3.2 Impact of syllable coda.....	73
5.4 Summary.....	79
Chapter 6	
Effects of language contact on Muak Sa-aak.....	81
6.1 Phonological effects.....	81
6.1.1 Effects on vowels.....	81
6.1.2 Effects on consonants.....	82
6.1.3 Effects on tones.....	83
6.2 Lexical effects.....	86
6.2.1 Numerals.....	86
6.2.2 Nasal initial presyllables.....	87
6.2.3 Behavior of fricatives in initial syllables.....	88
6.3 Summary.....	89
Chapter 7	
Summary and conclusion.....	90
7.1 Results.....	90
7.1.1 Phonology.....	90
7.1.2 Borrowing.....	91
7.2 Limitations.....	92

7.3 Areas for further study.....	92
Bibliography.....	94
Appendix 1 Sociolinguistic Questionnaire.....	97
Appendix 2 1,700 Wordlist .....	105
Appendix 3 Contrasts.....	166

## LIST OF TABLES

Table 1. Background of speakers.....	9
Table 2. Examples of presyllables in U (Svantesson 1988: 75).....	12
Table 3. Comparison of presyllables in Hu and U cognates (Svantesson 1991: 69-70) .....	13
Table 4. Vowels in U (Svantesson 1988: 70).....	13
Table 5. Major syllable initials in U (Svantesson 1988: 69).....	15
Table 6. Examples of U initial consonants (Svantesson 1988: 70).....	16
Table 7. Final consonants in U (Svantesson 1988: 70).....	17
Table 8. Tones in Wiang Papao Lua (Narumol 1982: 44).....	21
Table 9. Tone contrast examples from Lamet (Conver 1999: 53).....	22
Table 10. Correspondence of voicing, register, and tone with initial stops in Khmu dialects in different stages of tonogenesis (Suwilai 2001: 54).....	23
Table 11. Laryngeal attitudes (Matisoff 1973: 76).....	24
Table 12. Register in Lampang Lamet (Narumol 1982: 40).....	25
Table 13. Pitch (not phonemic) in Lampang Lamet (Narumol 1982: 40).....	26
Table 14. Development of vowel length and tone in Hu; in comparison with Lamet (Svantesson 1991: 72).....	27
Table 15. Summary of U tonal development, shown in comparison to Hu and Lamet (Svantesson 1988: 87-92).....	29
Table 16. Tai Lue initial consonants (Hudak 1996: xxii- xxiii).....	31
Table 17. Initial consonant clusters in Tai Lue (Hudak 1996: xxiii).....	31
Table 18. Examples of initial consonants in Tai Lue (Hudak 1996: xxii- xxiii).....	32
Table 19. Examples of initial consonant clusters in Tai Lue (Hudak 1996: xxiii).....	32
Table 20. Examples of Tai Lue final consonants (Hudak 1996: xxiii).....	33

Table 21. Tai Lue vowels (Hudak 1996: xxiii).....	33
Table 22. Examples for Tai Lue vowels (Hudak 1996: xxiii-iv).....	34
Table 23. Tai Lue tones (Hudak 1996: xx-xxi).....	35
Table 24. Consonant phonemes in Muak Sa-aak.....	37
Table 25. Syllable-initial consonant clusters.....	42
Table 26. Final consonants.....	43
Table 27. Muak Sa-aak vowels.....	45
Table 28. Final /-w, -j/.....	54
Table 29. Syllable and word structures.....	55
Table 30. Presyllable onsets.....	57
Table 31. Tone 1 rhymes.....	63
Table 32. Tone 2 final consonant types distribution by allotone.....	64
Table 33. Tone 2 rhymes.....	65
Table 34. Tone 3 rhymes.....	66
Table 35. Tone and syllable type.....	67
Table 36. Tone and vowel contrast in nasal final syllables.....	68
Table 37. Tone and vowel contrast in open syllables.....	68
Table 38. Correlation of Muak Sa-aak syllable structures and tones.....	69
Table 39. Development of proto *h-, *s- initials in Palaungic languages (Diffloth 1977: 46-47).....	70
Table 40. Germanic shift in initial consonants: Muak Sa-aak compared to Hu, U, Lamet, Northern Kammu, and Southern Kammu [Khmu] (adapted from Svantesson 1991: 68).....	72
Table 41. Development of vowel length and tones in Hu; in comparison with Lamet (Svantesson 1991: 72).....	74
Table 42. Summary of U tonal development, shown in comparison to Hu and Lamet (Svantesson 1988: 87-92).....	75
Table 43. Vowel length: Muak Sa-aak, Lamet, U (Lamet and U from Svantesson 1988, 107-122).....	77

Table 44. Glottal stop finals, stop finals, and resulting tones in Muak Sa-aak (Lamet and U from Svantesson 1988: 107-122).....	78
Table 45. Tone 1 words in Muak Sa-aak which may come from proto *-h or *-s finals (Lamet and U from Svantesson 1988: 107-122).....	79
Table 46. Numeral comparison, Muak Sa-aak and Tai Lue (Tai Lue from Hudak 1996).....	81
Table 47. Tai Lue borrowed words realized with diphthongs in Muak Sa-aak (Tai Lue from Hudak 1996).....	82
Table 48. Words with final lateral approximant /-l/ and Tone 1.....	83
Table 49. Checked Tone 2 in open syllables.....	84
Table 50. Numeral comparison, Muak Sa-aak and Tai Lue (Tai Lue from Hudak 1996).....	86

## LIST OF FIGURES

Figure 1. Language family tree for Muak Sa-aak (adapted from SIL Ethnologue 2009).....	3
Figure 2. Map of known Muak Sa-aak villages, Eastern Shan State (adapted from Hopple 2007, unpublished).....	5

## ABBREVIATIONS AND SYMBOLS

C Consonant

CAE Contrast in Analogous Environments

CD Complementary Distribution

CIE Contrast in Identical Environments

IPA The International Phonetic Alphabet. It will be used for all transcriptions in this thesis, except where otherwise noted.

V Vowel

—<sup>T</sup> Tone

\*— proto (\*s, \*h); designates a historical phoneme

// Denotes phonemic transcription

[ ] Denotes phonetic transcription

# Chapter 1

## Introduction

Muak Sa-aak is an Austroasiatic language, belonging to the Angkuic subgroup of the Eastern branch of the Palaungic languages, a subgroup of Mon-Khmer. For the two other groups of Eastern Palaungic language groups, there is some published work on Waic languages, including Wa and Plang varieties (such as Diffloth 1980, Paulsen 1992, and Watkins 2002), and on Lametic languages (such as Narumol 1982 and Conner 1999). There is not, however, very much recent published work available on Angkuic languages. U and Hu have been studied by Svantesson (1988, 1991), who gives a listing of available wordlists (1988: 76). Some limited data is also available on Man Met (cited in Diffloth 1991) and on Mok (Wenk 1965, Diffloth 1982<sup>1</sup>). Other Angkuic languages are known only from very old wordlists. These include Khas Kon Keu (Lefèvre-Pontalis 1892), Khas Kiorr (Lefèvre-Pontalis 1896), Pou Ma (d'Orléans 1898), A Mok, Angku, and Mong Lwe (Scott and Hardiman 1900), P'u-man (Davies 1909). It is not even clear whether all of these languages are still in existence today, or known by those names. This thesis seeks to provide a full phonological analysis of an Angkuic language.

Muak Sa-aak has been surrounded by Tai Lue, a Tai-Kadai language, for a long time, creating a rich inventory of borrowed words. In order to investigate whether Muak Sa-aak sounds and phonotactics remain typical for Eastern Palaungic languages, a brief comparison with Tai Lue phonology will be drawn. Since the unique impact of vowel length on tonogenesis in Angkuic languages is frequently mentioned in the recent literature regarding Angkuic languages, it seemed appropriate to investigate tonogenesis in Muak Sa-aak. Based on the phonological analysis, therefore, the process of tonogenesis in this Mon-Khmer language will also be presented.

Chapter 1 will investigate the linguistic and geographic affiliation of Muak Sa-aak and describe the research procedures. Chapter 2 gives account to

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<sup>1</sup> According to Svantesson (1988: 76), Wenk's "Ya Ang Lawa" is the Mok presented by Diffloth (1982).



previous research relevant to Muak Sa-aak as an Eastern Palaungic language in general, tone and tonogenesis in Mon-Khmer languages, and Tai Lue phonology. Chapter 3 presents the results of the segmental phonological analysis and Chapter 4 presents Muak Sa-aak phonotactics. Tone will be discussed in Chapter 5, followed by effects of language contact in Chapter 6, and a summary of the research results in Chapter 7. The wordlist on which the phonological analysis is based and evidence of contrast are included as Appendix 2 and Appendix 3.

## 1.1 Linguistic affiliation

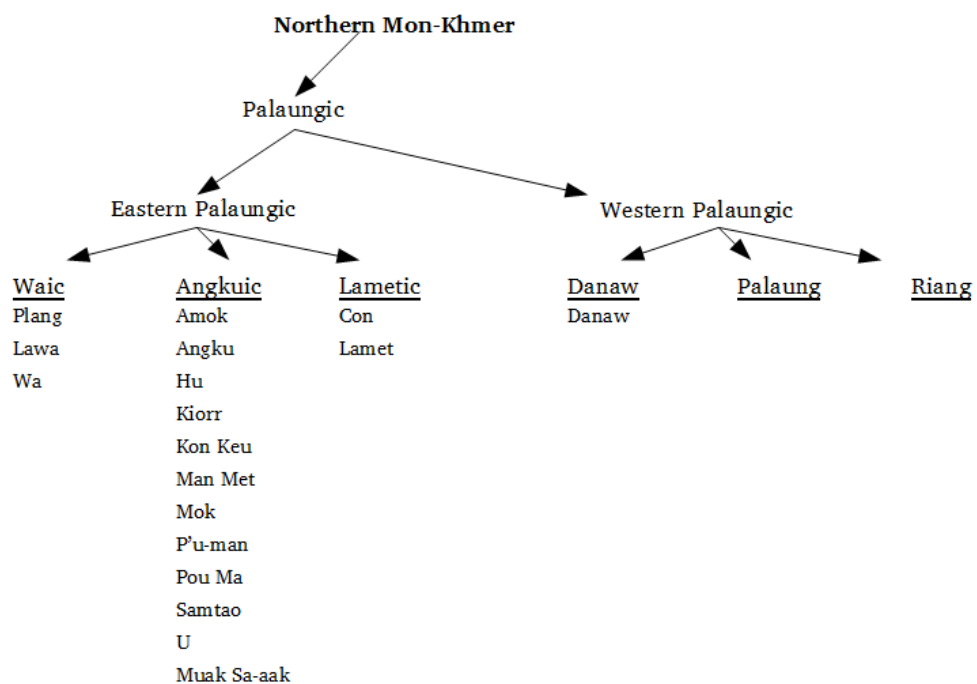
Muak Sa-aak belongs to the Austroasiatic language family; it is a Palaungic language and is classified as Austroasiatic, Mon-Khmer, Northern Mon-Khmer, Palaungic, Eastern Palaungic, Angkuic (see Figure 1, below). According to Svantesson, the Angkuic languages are marked by having undergone a Germanic shift in the initial consonants (1991: 68). That is, the old voiced initial stops have become voiceless unaspirated stops, and the old voiceless initial stops have become aspirated voiceless stops. Therefore, when comparing cognate words with other Palaungic languages, one will find voiceless aspirated stops in the Angkuic languages corresponding to voiceless unaspirated stops in other Palaungic languages. According to Diffloth, the proto \*h- and \*s- initial consonants merged into one initial, h-, in Palaungic languages today, except for the Angkuic languages and Danaw. In Angkuic languages, the distinction between the proto \*h- and \*s- initials is maintained as (h)s- and h- (1977: 42).

Some features are shared by only some of the Angkuic languages. These are the development of tone, and the denasalization of some final nasals. The latter is seen in P'u-man and Pou Ma as well as in U (Svantesson 1988: 66). In U, word-final nasals following historically short vowels have undergone denasalization of the final nasal stop, resulting in the corresponding oral stop. In words with high vowels (i, u, and possibly ɨ), this has taken place without regard to length, which suggests that the length contrast was already lost in the high vowels at the time when the denasalization took place (Svantesson 1988: 79).

“Angkuic” is an interesting name for this group of languages, as it is not remotely similar to the name of any of the languages currently listed in the SIL Ethnologue as Angkuic. However, a previous edition, the 11<sup>th</sup> edition, listed “Angku,” with the language code of ANG, as a language of China, Myanmar, and Laos, possibly also found in Thailand, and classified it as Angkuic. It also suggested that the name might possibly include more than one language, including Kiorr, Kon Keu, and Pou

Ma. This language code later became the language code for the language Kon Keu in the 12<sup>th</sup> edition, which in the 15<sup>th</sup> edition was changed to the current code, KKN. It is not clear whether Angku and Kon Keu are the same language or whether one may be a variety of the other. The group called “Angku” is in fact originally known from old sources, and Scott and Hardiman refer to them in their *Gazetteer of Upper Burma and the Shan States (Part I, Vol. 1)*. They give a wordlist of a group “known as Hka-la by Shans (they call themselves Āng-kú), Mōng-yawng district, Kēngtūng State” (Scott and Hardiman 1900: 720-722).

In his article on U, Svantesson includes Pou Ma and P’u-man, described in older sources, among the Angkuic languages (1988: 66). In addition to these, the Angkuic languages include Hu, U, Man Met, and Samtao (SIL Ethnologue 2009). The position of Muak Sa-aak and the known Angkuic language varieties in relation to other Palaungic languages is shown in Figure 1 below.



**Figure 1. Language family tree for Muak Sa-aak (adapted from SIL Ethnologue 2009)**

Outside of Angkuic, in the other Eastern Palaungic languages, there is more published work available on Waic languages, including Wa and Plang varieties (such as Diffloth 1980 Paulsen 1992, and Watkins 2002), and on Lametic languages (such as Narumol 1982 and Conner 1999), which also have some characteristics in common with Muak Sa-aak.

## 1.2 Muak Sa-aak glossonyms

Muak Sa-aak /mùak sʻʔàak/ means “mountain slope.” According to speakers, Muak is an old autonym; however, it does not seem to be one generally known by outsiders today. Both Muak and Sa-aak have similar meanings; the second word was added only recently. Many of the younger people may not even know the term “Muak Sa-aak;” they refer to their language by using the Tai word “Kam”, “language”, followed by the name of their village, i.e. “Kam Wan Fai.” Muak Sa-aak displays wide variation even from one village to the next.

The Muak Sa-aak are currently listed in the SIL Ethnologue (16th Edition) under two names. The first is “Mok” (in Thailand), for which they are listed as an alternate name. This listing, however, is still uncertain. The second is the name “Tai Loi,” for which they are listed as a dialect (“Saneung Muak;” *saneun* means “language”) (SIL Ethnologue 2009). According to speakers, the Muak Sa-aak are typically called Tai Loi or Tai Doi by outsiders, “Loi” or “Doi” being the Shan and Tai Lue words for mountain. According to Lebar, Hickey and Musgrave, the Shan sometimes call the Palaung “Kunloi,” or “mountaineer” (1964: 121) and the Buddhist Wa have been called “Tai Loi” and “Hkun Loi” (1964: 129). Scott also speaks of Tai Loi as being a generic term of reference to hill groups which have become Buddhist, but also principally meaning Buddhist Wa, also called Wa Küt (J. George Scott and J. P. Hardiman 1900: 517).

The terms for mountain, “Doi” or “Loi”, seem to refer to Buddhist peoples speaking other Palaungic languages in the area, not necessarily only Muak Sa-aak. The Muak Sa-aak do, however, use these terms to refer to themselves.

## 1.3 Geographic location

The Palaungic languages are located mainly in Southern China and in Myanmar, as well as in Thailand and also in Laos. Among these, the known Angkuic languages are located primarily in China, although some have been documented previously in Myanmar (Samtao), Thailand (Mok) and in Laos (Kiorr) (SIL Ethnologue 2009). The areas where they live are places that have been, for the most part, difficult for outside researchers to access in recent years.

The Muak Sa-aak people live primarily in the eastern part of Shan state of Myanmar, in Mong Yawng Township (see Figure 2). Some of their villages are located near Mong Yawng, and some are near the Chinese border, in what is called Special Region #4. At least two villages are located across the border in China. There are

reported to be some Muak Sa-aak people in Thailand as well, although no village locations are currently known; it is not known if they would be the same as the speakers of the language listed in the SIL Ethnologue as Mok (SIL Ethnologue 2009). The estimated population total is 4,460 in Myanmar and China (Hopple 2007, unpublished).

The data in this thesis was gathered primarily from an old village called Wan Fai in eastern Shan State, Myanmar with a population total of about 620 people (Hopple 2007, unpublished). The village is located in the border region very close to China. The community is quite homogeneous, as speakers reported only one Akha family, four Chinese families, and one Chin woman living in their village.

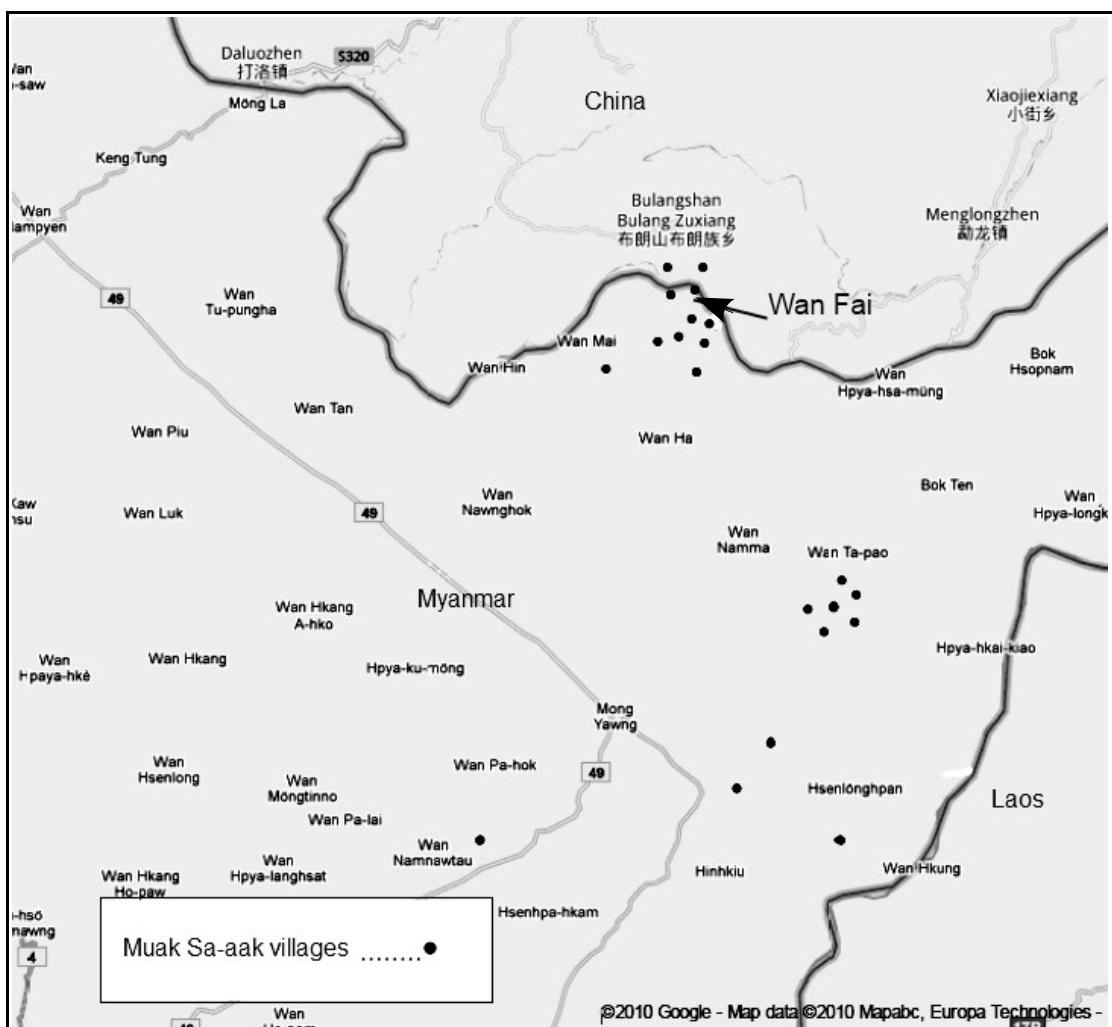


Figure 2. Map of known Muak Sa-aak villages, Eastern Shan State (adapted from Hopple 2007, unpublished)

## **1.4 Sociolinguistic background**

This subsection will discuss the surrounding languages and the language use typical for the Muak Sa-aak in Myanmar.

### **1.4.1 Contact languages**

There are at least three major languages from different language families spoken in the area where the Muak Sa-aak live: Burmese, Chinese, and Tai Lue. The national language of Myanmar, where the majority of the Muak Sa-aak are located, is Burmese, a Tibeto-Burman language. However, although it is used as the language of education in the government schools, many people in that part of Myanmar do not speak it. Like other adults in their community, none of the speakers interviewed for this phonology could speak Burmese since none of them had any formal education. However, some Muak Sa-aak children in Wan Fai and other Muak Sa-aak villages are in school now and exposed to Burmese.

A second contact language used in the areas where the Muak Sa-aak live is Chinese. Chinese is a Sino-Tibetan language and also belongs to a different language family from Muak Sa-aak. In Shan state of Myanmar, especially near the Chinese border, there are obvious signs of Chinese influence, and the speakers from Wan Fai village report that their children watch Chinese television and that Chinese traders come through their village.

The most influential contact language is Tai Lue, from the Tai- Kadai family. It is the language most commonly spoken by the Muak Sa-aak as a second language, and Muak Sa-aak shows a considerable amount of influence from Tai Lue, especially in terms of lexical borrowing. The languages have been in contact for a long time in that area, and there is evidence that in recent generations at least, there has been intentional borrowing: in reference to borrowing from Tai Lue, one speaker in his fifties said that his parents had told him that if they did not borrow words from Tai Lue, “it’s like if we eat food with no salt in it” (Personal communication Speaker A: July 2008).

### **1.4.2 Language attitude and use**

All four of the speakers interviewed (see Table 1 in Section 1.5.2) said the children learned Muak Sa-aak first, and that the parents used Muak Sa-aak with their children in their homes. Their children might sometimes use Tai Lue, Chinese, or Burmese (if they are in school) at home. While the speakers see benefits for their children

learning these other languages, they appreciate it when their children speak their own language. One speaker also expressed the fear that the use of these other languages endangers their own language. The speakers available for this study were interested in being able to write their language, and the primary reason they gave was the fear that it would be lost.

Although Shan and Tai Lue are separate Tai-Kadai languages, the Muak Sa-aak do not seem to draw an ethnic or linguistic distinction between them. They have one ethnic group name for both groups, and in survey questions they tended to refer to both languages as a group. However, the speakers on whom this phonological analysis was based speak only Tai Lue as a second language, and not Shan.

During elicitation with Speaker A and Speaker B, there were two Muak Sa-aak women who were frequently around, if they were not occupied with caring for their children or with preparing food. With certain domains of vocabulary, particularly those pertaining to cooking, childcare, and terms for jewelry, the men were sometimes slow to think of the correct vocabulary, but these women would prompt them. This partial loss of Muak Sa-aak vocabulary for the males, who may be more in touch with the outside world than their wives, could be a result of the exposure to surrounding Tai Lue; however, it could also reflect a lack of Tai Lue vocabulary for these items.

The exposure to the national language in school could create further pressure on the Muak Sa-aak language. Together with the Chinese television programs, this might cause a shift in borrowing patterns, as the children growing up now use more Burmese and Chinese and less Tai Lue than their parents.

## **1.5 Methodology**

This section lays out the research methodology. It begins with the data collection procedures, followed by a description of the language informants available for this study, and methods of data processing.

### **1.5.1 Data collection**

The research involved the collecting of a 1,700 item wordlist (see Appendix 2), originally designed for use in Africa (Snider and Roberts 2006), modified by Hopple (2008) for use in Southeast Asia, and translated into Burmese. The speakers were interviewed as well for sociolinguistic background information, using a questionnaire already in use by Hopple for sociolinguistic survey in Palaungic

languages. This questionnaire is included as Appendix 1. Since the Muak Sa-aak only speak Muak Sa-aak and Tai Lue, the major regional language, a translator was involved who speaks Burmese as a first language, but also speaks English and Tai Lue. The list of words were transcribed and an audio recording made. The transcription was checked as much as possible with the speakers.

### **1.5.2 Language informants**

The wordlist was fully or partially recorded from three male Muak Sa-aak mother tongue speakers in their early forties to mid fifties. They spent most of their lives in the same village, called Wan Fai. This is essential to the study because Muak Sa-aak displays wide variation even from one village to the next. The speakers came down to an accessible location for the specific purpose of language elicitation and recording. They all were farmers, without formal education, and with Tai Lue as a second language.

All four of the speakers can speak Tai Lue, and three can also read and write it to some extent. These three men are also familiar with the Shan script, as the Shan Bible is being used in their village church, but they cannot speak Shan. These three speakers may be unusual for the Muak Sa-aak of their generation, judging by the value they appear to place on education. Like most others of their age, they never attended school, nor were they ever monks, which is one of the ways in which older speakers of Tai Lue may have learned to read and write. While many of the children in their village are still not in school, these men put an effort into sending at least some of their children to school, even though it has meant sending them away from home.

All four men are exposed to Shan in the local Christian church where Speaker A and Speaker C were deacons. This means they were not ordained ministers, but carried church responsibilities. According to these speakers, the Bible is read in Shan, but they speak in Muak Sa-aak. Table 1 summarizes background information on the four speakers.

**Table 1. Background of speakers**

	Age	Occupation(s)	Second language(s)	Reading abilities <sup>2</sup>	Education
Speaker A	50	Farmer; deacon in the church	Tai Lue	Tai Lue, Shan	None
Speaker B	55	Farmer; soldier; church elder	Tai Lue	Tai Lue, Shan	None
Speaker C	42	Farmer; deacon in the church	Tai Lue	Shan, Tai Lue	None
Speaker D	53	Farmer; soldier	Tai Lue (best), Chinese, Akha	None	None

The wordlist was recorded over three field trips. The full wordlist was recorded for Speaker A. Only the first 1,375 words were recorded for Speaker B due to illness at the time of the third field trip which prevented him from recording the remainder of the list. Speaker A therefore recruited another speaker for the third trip to come in place of Speaker B, Speaker C<sup>3</sup> who was recorded for the remaining 325 words. For additional confirmation, a recording by Hopple of 242 words out of the list used in this study, recorded by her in November 2007, was included. The informant was 53-year old male Speaker D, who grew up in the same village.

### 1.5.3 Data analysis

An audio recording was made using a Sony minidisc recorder model MZ-R700. The recordings were analyzed with the aid of Speech Analyzer 3.0.1<sup>4</sup>. The words were entered into FieldWorks Language Explorer 3.0<sup>5</sup>. Words borrowed from Tai Lue or other languages, as much as possible, have been identified and labeled as borrowed words. The data was analyzed phonologically with the aid of Phonology Assistant 3.0.1<sup>6</sup>. The phonology is based primarily on Speaker A, from whom the entire

<sup>2</sup> Tai Lue and Shan use two different non-Roman scripts. The ability to decipher the scripts does not imply being able to speak or understand the language.

<sup>3</sup> Speaker C grew up in Wan Fai village and moved to Nawng Pok village, founded about 20 years ago by people from Wan Fai, with an estimated population of about 115 (Hopple 2007, unpublished). It has only Muak Sa-aak speakers according to the speaker. The two villages farm the same fields, conduct their celebrations together and still consider their speech to be the same.

<sup>4</sup> SIL International, 2007

<sup>5</sup> SIL International, 2009

<sup>6</sup> SIL International, 2008



wordlist was recorded, and the data from the three other speakers was used for confirmation.

## **1.6 Limitations of the study**

Muak Sa-aak is endangered by the high rate of borrowing and by pressure from the surrounding languages. The Muak Sa-aak community may benefit from the phonological analysis in this study as it provides a reliable basis for a possible orthography, and literature development for an endangered language may very well hinder it from disappearing. It is not possible within the framework of this study, though, to investigate the sociolinguistic and educational implications required for the creation of an orthography. Although sociolinguistic data have been gathered, a sociolinguistic analysis would exceed the scope of this study.

It is difficult for the author as an outsider to access the areas where the Muak Sa-aak people live. Therefore it was necessary to conduct the research with speakers who are available outside of their home area. Because of the considerable variation in speech between villages, the data have been elicited from speakers from only one village. Since Muak Sa-aak appears to vary considerably from one village to the next, it is not clear how applicable the results are to the varieties spoken in other villages.

## Chapter 2

### Literature review

This chapter will present general features of Angkuic and Palaungic phonology, followed by a discussion of tonogenesis, both in Angkuic languages specifically and in Mon-Khmer languages more generally. Finally, there will be a brief overview of the phonology of Tai Lue, the primary language from which Muak Sa-aak has borrowed.

#### 2.1 Angkuic phonology

Since there is very little information on the phonology of Angkuic languages, the phonological features of Mon-Khmer or Palaungic languages in general will be addressed. Further features relating to Angkuic languages will be given as available in the relevant sections.

##### 2.1.1 Syllable structure

A common feature of the Mon-Khmer languages is what has been termed sesquisyllabic structure. This is a syllable structure consisting of one main syllable plus a presyllable, or minor syllable, preceding it. Not all words will have presyllables. The terms “presyllable” and “minor syllable” are both widely used by different authors; for the purposes of this thesis, this phenomenon will be referred to as a “presyllable.”

David Thomas outlines four categories of sesquisyllabic languages, from Type (i) to Type (iv). Type (i) is closest to monosyllabic, while Type (iv) is closest to disyllabic:

Type (i): In this type, the presyllable is “only a predictable open transition between consonants. Phonemically it is a monosyllable” (1992: 206).

Type (ii): This type, “a slightly stronger sesquisyllabic form, has a contrast between the presence (CəC-) and the absence (CC-) of a vocalic contrast in certain environments” (1992: 207).

Type (iii): In this type, “the vocalic element has a contrast between two or three phonemes” (1992: 208).

Type (iv): In this type, “the vocalic element may have nearly full vowel contrasts in a weakly stressed minor syllable” (1992: 209).

Angkuic word structure appears to follow general Mon-Khmer phonotactics in having monosyllabic and Thomas’ Type-I sesquisyllabic words, as reported by Svantesson (1988) for U, located in Yunnan province of China. The U major syllable rhyme is composed of a vowel with or without a consonant coda (1988: 70). Svantesson finds a very limited inventory of U presyllables: ʔa, pa, sa, and a nasal. He states that the presyllable vowel transcribed with [a] is probably non-phonemic and may be reduced (1988: 74). Examples for U presyllables are given in Table 2.

**Table 2. Examples of presyllables<sup>7</sup> in U (Svantesson 1988: 75)<sup>8</sup>**

ʔaʔáã	“rock”	saŋáy	“far”
ʔavây	“tiger”	mpét	“to spit”
paʔàã	“to lie”	nthǎɿ	“tongue”
pachìp	“bird”	ŋnà	“skirt”
saʔáã	“bone”	ŋkú	“skin”

Presyllables in Hu can contain a syllabic sonorant or a vowel which, as in U, is not contrastive (Svantesson 1991: 69). One unusual feature in Hu presyllables is the distinction of the fricatives [θ] and [s], a distinction not found in U, Lamet, or Proto-Waic. There is a distinction between these consonants in main syllable initials as well, when following a presyllable. Another unusual feature is that in Hu, nasal presyllables can precede main syllables beginning with homorganic voiceless nasals. Examples of both of these features in comparison with U cognates are shown in Table 3.

<sup>7</sup> Transcription here follows Svantesson’s (1988) transcription; /m-, n-, ŋ-/ are nasal presyllables, such as the /m-/ in /mpét/. The phoneme /ã/ he considers a consonant, although phonetically a vowel; see Section 2.1.3.2 and Table 7.

<sup>8</sup> Svantesson’s transcription in this article is probably not entirely phonemic (Svantesson 1988: 69) and most transcription is not marked with // or [ ]. Therefore these items are not marked with // or [ ].

**Table 3. Comparison of presyllables in Hu and U cognates (Svantesson 1991: 69-70)<sup>9</sup>**

Hu	U	Gloss
θavàŋ	savàã	“ask”
samóʔ	samò	“stone”
nasòk	sũf	“ear”
nθàc	ntshăt	“sand”
nɲàm	sanàm	“blood”
mɲùl	mùn	“silver”

### 2.1.2 Vowels

Although Waic and Palaung are known for “precisely the poverty of their vowel systems”, there are some Waic languages with complicated vowel systems, including Lawa and Paraok (Diffloth 1991: 15). Diffloth attributes this partly to Tai borrowings and partly to the effects of register (1991: 15-16). The Angkuic language U has a small vowel inventory of 9 monophthongs, with three distinctive heights at three places of articulation (Svantesson 1988: 70), as shown in Table 4, below.

**Table 4. Vowels in U (Svantesson 1988: 70)**

i	ĩ	u
e	ə	o
ɛ	a	ɔ

Svantesson describes the Angkuic languages U and Hu as having lost vowel length contrast (1988: 78; 1991: 72).

<sup>9</sup> It is not entirely clear how phonemic Svantesson’s data is which he presents in this article. He does state that his material was not enough for a complete analysis (Svantesson 1991: 67). Therefore this data is not marked with // or [ ].

U does not have diphthongs. Although Tai Lue, the major contact language influencing Muak Sa-aak, also does not have diphthongs, Thai (which is related to Tai Lue) does. J. Marvin Brown, in his study on vowel length, identifies the vowels /ia, ua, ua/ in Thai as being vowels that do have length, and specifically, that they are long vowels (Brown 1979: 13).

### 2.1.3 Consonants

Angkuic languages differ from other Palaungic languages in their aspirated initial consonants, the result of a shift where voiced initial stops became voiceless, and the voiceless stops became aspirated (Svantesson 1988). Another typical feature of Angkuic languages is an old distinction between the proto initials \*s- and \*h-, which has been lost in most other Palaungic languages, except Danaw (Svantesson 1988: 76, Diffloth 1977: 42). This will be discussed in relation to Muak Sa-aak in Section 5.3.1.1.

Svantesson (1988) describes U major syllable initials, noting that his transcription is probably subphonemic. He finds voiceless stops with contrastive aspiration at five points of articulation, a glottal stop, four nasals, five fricatives, two affricates, and three approximants, as shown in Table 5. One fricative occurs both voiced and voiceless; the other three are voiceless, so the voiced fricative might be an allophone, although Svantesson states that he found one minimal pair for this (1988: 69). The palatal stop consonants and alveolar affricates especially seem to be in complementary distribution (1988: 69). In Svantesson's examples for initial consonants, the palatal stops [c] and [ch] occur before closed and mid front vowels, whereas the alveolar affricates [ts] and [tsh] occur before closed and mid back vowels. Similarly, the alveolar sibilant /s/ has an alveolo-palatal allophone [ç] before front vowels /i/ or /e/, and a palato-alveolar allophone [ʃ] before central and back vowels [ɨ] and [u]. The U consonant inventory is shown in Table 5 below<sup>10</sup>. It appears that the palatal approximant /y/ has been mistakenly charted into the dental, not the palatal column. According to Svantesson, the palatal /y/ may be pronounced with friction so that it is almost like [ʒ] (1988: 69).

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<sup>10</sup> Svantesson uses the IPA notation except for the palatal approximant y, which is the IPA [j]. The h following a consonant denotes aspiration.

**Table 5. Major syllable initials in U  
(Svantesson 1988: 69)<sup>11</sup>**

Labial	Dental	Palatal	Velar	Uvular	Glottal
p	t	c	k	q	ʔ
ph	th	ch	kh	qh	
	ts				
	tsh				
m	n	ɲ	ŋ		
	l				
f	s			χ	h
v					
w	y				

The uvular fricative /χ/ is the rhotic in U, equivalent to [ʁ] in Hu or [r] in other Palaungic languages. Initial consonant clusters with \*l or \*r have frequently been replaced by q or qh, according to whether the proto-initial was voiced or voiceless (Svantesson 1988: 95-96).

In U, there are no major-syllable initial consonant clusters (1988: 69). An initial nasal followed by another consonant is interpreted as having a nasal presyllable, rather than a consonant cluster, as in nchìp “claw” (1988: 70). Examples of initial consonants are given in Table 6.

<sup>11</sup> The manner of articulation for the consonants is not specified in the article.

**Table 6. Examples of U initial consonants (Svantesson 1988: 70)<sup>12</sup>**

páy	“spittle”	tû	“stomach”
cí	“to do”	kí	“pine tree”
qí	“nature”	ʔáy	“smoke”
phăy	“you (dual)”	thán	“to weave”
nchìp <sup>13</sup>	“claw”	khà	“fish”
qhà	“soul”	tsó	“ant”
tshò	“ten”	mâ	“field”
năy	“mother”	ɲăɸ	“to laugh”
ŋây	“eye”	láy	“squirrel”
fè	“left”	sò	“dog”
χò	“to wait”	hò	“to go”
váy	“after”	wáy	“three”
yàp	“to die”		

### 2.1.3.1 Palatal consonants

Palatal consonants, both initials and finals, are a common feature in Mon-Khmer languages, including the Palaungic languages (Diffloth 1980: 46). Two features which make them stand out from consonants at other points of articulation are affrication and distinctive onglides (Watkins 2002: 79).

Watkins gives an extensive phonetic description of the palatal consonants in Wa, which are the voiceless plosives /c, c<sup>h</sup>/ and prenasalized voiced plosives /<sup>ɲ</sup>j, <sup>ɲ</sup>j<sup>h</sup>/, and the nasal stop /ɲ/ (2002: 79). The voicing contrast is neutralized in the final

<sup>12</sup> Svantesson calls his transcriptions “probably less than phonemic” (1988: 69), and most transcriptions are not marked with phonological or phonetic brackets // or [ ].

<sup>13</sup> The initial nasal in this word is a presyllable. Svantesson only elicited three words with the /ch/ initial, which all appear to have presyllables (1988: 69).

position. Initial palatal stop consonants, although phonemically stops, are marked by affrication. Together with the palatal vocalic onglide, this tends to make them easily distinguished from the other stops with labial, alveolar, and velar places of articulation (2002: 82).

Narumol, in studying Lampang Lamet and Wiang Papao Lua, also notes the presence of [i] as a transition before final palatal consonants in both languages (1982: 40, 44), as seen in Examples (1) and (2).

- (1) /pap/ [pa<sup>i</sup>ɲ] (in Lampang Lamet)  
 (2) /pɯɲ/ [pɯ<sup>i</sup>ɲ] (in Wiang Papao Lua)

Watkins notes that transitions are natural with consonants at other points of articulation as well, but in the case of palatal consonants, perhaps they are more perceptible since the transition involved naturally places the tongue in the position for the vowel [i] (Watkins 2002: 82).

Watkins also finds the palatals in Wa to be actually alveolo-palatal; the presence of the [i] onglides suggests laminal articulation rather than apical articulation. Therefore, a narrow phonetic transcription would be [tç, tç<sup>h</sup>, <sup>n</sup>dʒ, <sup>n</sup>ʒ<sup>h</sup>] (2002: 82).

### 2.1.3.2 Final consonants

Only eight out of the 25 initial consonants in U, that is, unaspirated stops, nasals and approximants, can occur in the syllable-final position, with two of them realized as a pharyngeal approximant and a nasalized vowel. They are shown in Table 7 below.

**Table 7. Final consonants in U (Svantesson 1988: 70)**

p	t	
m	n	ã
w	y	ʕ

Svantesson describes the phoneme /ʕ/ as probably a voiced pharyngeal approximant, with only a little friction, and a quality similar to [a] (1988: 71). Although he places this sound in the row with the approximants according to its phonetic value, he also states that it has developed historically from \*k. An example he gives is /súʕ múʕ/, “feather”. Similarly, the corresponding nasal \*ŋ has



changed to a nasalized open back vowel /ã/, forming nasalized diphthongs in combination with the preceding vowel (1988: 72).

## **2.2 Angkuic tonogenesis**

The Mon-Khmer languages are well-known for register features. However, some Mon-Khmer languages are tonal. The development of these suprasegmental features may be related to initial consonants, final consonants, or even vowels. These factors will be discussed in the following subsections.

### **2.2.1 Registrogenesis**

A loss of contrast between voiced and voiceless initial consonants has been seen for many Mon-Khmer languages. In these languages, that loss of contrast is typically accompanied by other changes in the language which compensate for this loss of contrast. One of these is the development of a register contrast. This frequently involves a contrast in voice phonation, between either breathy and clear voice or clear and creaky voice.

There are at least two ways that “register” is used in the discussion of Mon-Khmer languages. The first is specifically in reference to this contrast in voice phonation. The second is in reference to a whole group of features, which may include a voice phonation distinction, but which may also include voicing of initial consonants, pitch distinctions, nasalization, and even diphthongization. This may be accompanied by differences in pitch, in nasalization, and/or in vowel quality between the registers. However, there are overall two separate “registers” with the difference marked by some combination of these features.

Using the term in this second sense, Huffman suggests a theory for register in Mon-Khmer languages which involves a progression from the possession of voicing distinction in initial consonants through the development of register contrast and its subsequent loss following vowel changes and diphthongization. He proposes the following five stages for the development of the system now seen in modern Cambodian (Khmer):

Stage 1: voiceless : voiced distinction in initial stops; two way distinction in initial continuants; as yet little or no vowel differentiation.

Stage 2: simultaneous change in the articulation of one set of initial consonants and development of allophonic variation in following

vowels, still in complementary distribution vis-à-vis two distinctive sets of initials.

Stage 3: register becomes phonemic due to a complete merger at some point in the system, probably in the continuants, with retention of allophonic distinction in initials in complementary distribution vis-à-vis first and second register vowels.

Stage 4: complete merger of initial stops, with complete register dichotomy in the vowels.

Stage 5: loss of register contrast due to change in vowel position and diphthongization. (Huffman 1976: 578)

Huffman analyzes fifteen Mon-Khmer languages of Thailand, Cambodia, and Laos, fitting them into these various stages of register development. He describes a transition reflecting a change of contrast from a contrast based upon the initial consonant to a contrast based upon the vowel. The pronunciation of vowels begins to change according to what type of consonant they follow, until a point where the difference in voicing between the consonants becomes redundant and is eventually lost. The contrast is now on the vowel, in the form of a register distinction, where previously it was on the consonant, in the form of voicing distinction. The vowels can continue to change, forming diphthongs. Eventually the distinction in vowel qualities becomes strong enough that this becomes phonemic and the register distinction between the first and second register is no longer needed, and is lost. This situation is seen in Khmer today, which has a large system of diphthongs instead of what was once a register system (Huffman 1976: 587). He suggests a possible classification for these fifteen languages as follows.

A. Original voiced : voiceless distinction reflected in the initials:

1: Conservative (retention of original /b, d, j, g/; little or no vowel differentiation): Loven, Lawa, Stieng, Brao

2: Transitional (\* /b, d, j, g/ > /p', t', c', k'/; sub-phonemic register differentiation in the vowels): Alak, Souei, Nge?, Mal, (Tampuon)

B. Original voiced : voiceless distinction reflected in the vowels:

3. Register (phonemic vowel register; retention of sub-phonemic differentiation in the stops vis-à-vis register): Kuy, Chaobon, Chong, Bru, Mon

4. Restructured (loss of register through restructuring of the vowel system; complete consonant merger): Cambodian

(from Huffman 1976: 587)

The first three of the stages presented in the first list match up to the first three of the classes in this list; stages 4 and 5 of the first list combine to make the fourth class of this second list.

Narumol Charoenma studied the phonologies of two languages spoken in Lampang province of Thailand, one a variety of Lamet and the second a group that has been called Khamet or Lawa, but who prefer to call themselves “Lua”. Both languages are Palaungic. Speaking of register as a distinction in voice phonation type, Narumol comments (1982: 35) that one of the difficulties of register is that it can be difficult to hear. The Lampang Lamet which she studied had been previously studied by other linguists, who suspected the presence of register, but could not find it; she did find register (1982: 35), a contrast between tense and lax, as discussed further in Section 2.2.2.3

In addition, Suwilai Premsrirat, studying Khmu dialects, writes that the correct voicing distinction between registers is quite clear in a variety spoken in Chiang Rai, Thailand. However, a Khmu informant there told her that in front of outsiders especially, they often would not pronounce words with the correct voice quality, since they do not want to seem different from Thai people (2001: 52). This may be one more reason for register to be difficult to find or easily missed in a language.

## 2.2.2 Tonogenesis

Tonogenesis is the process whereby a non-tonal language develops a tonal system. As in registrogenesis, tonogenesis also involves the loss of another contrast in the phonology, in this case replacing it with a tonal contrast. The following subsections will examine first the relationship between tone and register; since initial consonants have been implicated in the development of both tone and register, and since some languages display features of both tone and register, this is an important area. Some additional influences on tone will also be addressed, including initial consonants, final consonants, and vowel length.

### 2.2.2.1 Interaction of tone and register

In the Palaungic branch of the Mon-Khmer languages, there are both tonal languages and register languages. They may also display features of both. Some dialects of Lawa, for example, have been described as having what could be labeled either a register distinction or a tone distinction; in some cases, linguists have chosen to analyze this as tone and in others as register.

Narumol Charoenma studied Wiang Papao Lua, a Palaungic language with features of both tone and register. It was determined to be a tonal language, with a falling tone and a normal tone; the falling tone is breathy, but it is apparently the pitch which is “most distinctive” (Narumol 1982: 44). Examples of the two tones are given in Table 8.

**Table 8. Tones in Wiang Papao Lua (Narumol 1982: 44)**

p̀̀uk	“rotten”	puk	“hot”
t̀̀um	“ripe”	tum	“fishing implement”
ỳ̀ɔ̀ɔ̀ɔ̀	“intestine”	yɔ̀ɔ̀ɔ̀	“to sharpen”

In a study of a Lamet variety based on refugees (from Laos) living in America, Lynn Conver finds two contrastive tones, high and low (1999: 51), and provides a list of examples of pairs, as shown in Table 9. He does note that different linguists have found varying results in regards to manifestations of tone and register in different varieties of Lamet (Conver 1999: 50).

**Table 9. Tone contrast examples from Lamet (Conver 1999: 53)**

jó:k	“ear”	jò:k	“to pick up, carry”
kéɲ	“tooth”	kèɲ	“row of plants on a farm”
kál	“to measure”	kàl	“to be blind”

A well-documented case in registrogenesis and tonogenesis is that of Khmu, which is not a Palaungic language but which, with the Palaungic languages, belongs to the Northern branch of the Mon-Khmer language family. Suwilai Preamsirat describes Eastern Khmu as still retaining a voicing distinction, with both voiced and voiceless initial consonants (33 initial consonants), while the Western dialects now have only 21 initial consonants, having lost the voicing distinction (2001: 49). Some of the Western dialects have a register distinction between clear and breathy voice; others have a tone distinction. There is also a Western dialect with aspirated initial stops (versus voiceless, unaspirated) as well as a tone contrast; this dialect previously had a voice quality contrast which has since become only tone contrast.

The voiceless initials in this Khmu dialect correspond to clear voice in dialects with register and to high tone in dialects with tone; similarly, the voiced initials correspond to breathy voice and to low tone (Suwilai 2001: 52). Suwilai also presents a comparison of vocabulary across several dialects, shown in Table 10, demonstrating parallels between these phenomena. Dialect 1, from Eastern Khmu, shows the retention of the original voicing distinction in stop consonants. Dialects 2.1, 2.2, and 2.3, from Western Khmu, have lost this voicing contrast in the stops. Dialect 2.1 has a register contrast between lax or breathy voice and clear voice. The lax register has lower pitch and the clear register a higher pitch, but the voice quality is important for correct pronunciation. In Dialect 2.3 there is a pure tone contrast, and in Dialect 2.2 the contrast is in the tone accompanied by a distinction in aspiration (Suwilai 2001: 52).

**Table 10. Correspondence of voicing, register, and tone with initial stops in Khmu dialects in different stages of tonogenesis (Suwilai 2001: 54)**

	Eastern Khmu	Western Khmu		
	Dialect 1	Dialect 2.1	Dialect 2.2	Dialect 2.3
“rice vine”	bu:c	pɯ:c	phù:c	pù:c
“to take off clothes”	pu:c	pû:c	pú:c	pû:c
“to cut down a tree”	bok	pɔk	phòk	pòk
“to take a bite”	pok	pók	pók	pók
“to chew”	bu:m	pɯ:m	phù:m	pù:m
“to fart”	pu:m	pû:m	pú:m	pû:m
“to weigh”	jaŋ	caŋ	chàŋ	càŋ
“astringent”	caŋ	câŋ	cáŋ	câŋ
“eagle”	gla:ŋ	klɔ:ŋ	khlà:ŋ	klà:ŋ
“stone”	kla:ŋ	klâ:ŋ	klá:ŋ	klâ:ŋ

### 2.2.2.2 Initial consonant shifts in Angkuic

According to Svantesson, the Angkuic languages are marked by having undergone a Germanic shift in the initial consonants (1991: 68). That is, the old voiced initial stops have become voiceless unaspirated stops, and the old voiceless initial stops have become aspirated voiceless stops. Therefore, when comparing cognate words with other Palaungic languages, one will find voiceless aspirated stops in the Angkuic languages corresponding to voiceless (but not aspirated) stops in other Palaungic languages. Svantesson contends that this meant the Angkuic languages have not undergone tonogenesis according to the model illustrated by the situation seen today in Khmu, above, which begins from a voicing distinction. They could not generate tone from a loss of the initial voicing distinction, since the Germanic shift came first and had already changed the voicing distinction into an aspiration distinction (Svantesson 1991: 67-68). Examples of this correlation between voicing and aspiration will be given with examples from Muak Sa-aak in Section 5.3.1.2.

### 2.2.2.3 Final consonants and tonogenesis

Final consonants may also have an effect upon tone; in particular, final glottal stop [-ʔ] and final glottal fricative [-h] have been proposed as important factors in tonogenesis. James Matisoff explores the mechanisms of tone development, both from initial consonant voicing contrasts, and from final consonants. He describes final [-ʔ] and final [-h] as affecting the contour of pitch, so that [-ʔ] normally causes a rising tone, and final [-h] causes a falling tone. He places them as features associated with a “tense larynx syndrome” and a “lax larynx syndrome” (Matisoff 1973: 76), as seen in Table 11.

**Table 11. Laryngeal attitudes (Matisoff 1973: 76)**

Tense-larynx syndrome	Lax-larynx syndrome
higher pitch/ rising contour	lower pitch/ falling contour
association with -ʔ	association with -h
voicelessness	voicedness, breathiness
retracted tongue-root	advanced tongue root
“creaky” laryngeal turbulence	“rasping” laryngeal turbulence
larynx tense and/or raised = reduced	larynx lax and/or lowered = distended
supraglottal cavity	supraglottal cavity

Jean Marie Hombert examines the effects of final glottal stop [-ʔ] and final glottal fricative [-h] using Arabic as a model. His experiments showed that [-ʔ] raises fundamental frequency of the preceding vowel, but that final [-h] lowers it (1976: 43). He therefore proposes this as one mechanism for tonogenesis, involving an intermediate stage where a pitch contrast has developed between words ending in [-ʔ] and those ending in [-h], progressing to an eventual loss of the final consonant with retention of the pitch distinction (1976: 45).

In the Angkuic language U, Svantesson found that the low tone was often creaky, or in open syllables had a final glottal stop [-ʔ]. The falling tone also had a glottal stop in open syllables. This was, however, optional, especially when words were not pronounced in isolation. Therefore Svantesson chose to consider this glottal stop a feature of these tones and not a phonemic final consonant (Svantesson 1988: 74). The phonemic status of the final glottal stop is shown in Example 3.

(3)            /sì/            [çìʔ]            “tree”

Amon Thavisak, working from the theory that tonal languages develop tone initially from a prior register contrast, examines six non-tonal southeast Asian languages, three of which have a register contrast and three of which do not. The register-contrast languages were Mon, Khmu, and So, and the non-register languages were Lavue, Moken, and Urak Lawoi’ (2001: 58). Her research does not support the theory that final [-ʔ] causes a rise in pitch and final [-h] a fall; in fact, she found they resulted in similar pitch contours. In the non-register languages, she found a similar fall in pitch both for [-ʔ] and for [-h] (2001: 60). In the register languages, she found a rising then falling pitch contour for both types of glottal finals. However, she did find that the pitch contour of the glottal fricative final ended at a lower fundamental frequency than that of the final glottal stop (2001: 63).

Narumol Charoenma investigated a Lampang Lamet variety which was determined to be a register language, with tense and lax registers as shown in Table 12 below; the registers were described by the informant as “hard tongue” and “soft tongue” (1982: 35).

**Table 12. Register in Lampang Lamet (Narumol 1982: 40)**

Lax register		Tense register	
kəŋ	“half”	kóŋ	“tight”
laac	“lost”	láac	“to untie”
yuh	“gauzy, flimsy”	yúh	“to pull”
phəjɯ	“visitor”	phəjíɯ	“to cock a gun”

In addition to register, however, a subphonemic pitch difference was noted for Lampang Lamet, which was not correlated to initial consonant. The pitch difference was predictable and based upon vowel length and type of final consonant. Short vowel and stop or fricative final produced a low rising pitch; long vowel with stop or fricative final produced a mid level pitch with a down-glide at the end; short or long vowels with other final consonants or open syllables produced a mid-level pitch (Narumol 1982: 40), as summarized in Table 13, below.



**Table 13. Pitch (not phonemic) in Lamang Lamet (Narumol 1982: 40)<sup>14</sup>**

Syllable type	Pitch	Example
Short vowel with final stop or fricative	Low rising	ʔap ˧ “dark”
Long vowel with final stop or fricative	Mid-level, gliding downward at end	múus ˨ “nose”
Short or long vowel with other final consonants, or in open syllables	Mid-level	ʔím ˨ “raw” maa ˨ “field”

#### **2.2.2.4 Vowel length and tonogenesis in Angkuic languages**

Vowel length is frequently involved in discussions of tonogenesis in Angkuic languages, and this mechanism of tonogenesis is the feature for which Angkuic languages are mentioned as being unique. The loss of vowel length may be related to the development of tone in the Angkuic languages Hu, Man Met, and U.

Discussion of U will be addressed last because U tonogenesis combines features of vowel length with some of final consonant type, and even initial consonant type.

In Hu, Svantesson reports two tones. Tones in this language came about primarily from the loss of vowel length distinction. Vowels which were historically long vowels have tended to cause a low tone, and historically short vowels have caused a high tone (Svantesson 1991: 71). Svantesson uses data from Lamet (a Palaungic language, but not Angkuic; it belongs to a different branch of the Palaungic languages), which retains the vowel length distinction, to show this, as seen in Table 14.

<sup>14</sup> The diacritics above the vowel here denote register; tone sticks denote pitch.

**Table 14. Development of vowel length and tone in Hu; in comparison with Lamet (Svantesson 1991: 72)<sup>15</sup>**

	Hu <sup>16</sup>	Lamet <sup>17</sup>	
Short vowels	yám	yàm	“to die”
	paθán	phán	“five”
	méɲ	krmìɲ	“star”
	ncén	kcèn	“heavy”
Long vowels	yàm	yàam	“to cry”
	lèk	lìik	“pig”
	ʔòm	ʔóom	“water”
	nasòk	yóok	“ear”

Svantesson points out a lack of tone contrast in two environments. Before final glottal stop, only the high tone occurs; Svantesson attributes this to a loss of vowel length in this position occurring before the development of tone (1991: 72). There is also a lack of tonal distinction in the high vowels, except in open syllables or before the uvular fricative. This may be due to the length distinction being lost at an earlier time in these vowels than in others (1991: 72).

Diffloth states that in the Angkuic languages, tonogenesis is related to vowel length, although vowel length does not explain the entire picture. Tonogenesis in these languages, he states, “has nothing to do with the proto-voice feature of initials” (Diffloth 1991: 19). He notes that in Man Met (another Angkuic language), tonogenesis is still related to vowel length despite the fact that the vowel length contrast in Man Met has not been eliminated (Diffloth 1991: 19).

In his article on the U language, Svantesson again uses data from Lamet for comparison. The Lamet data is useful because the language retains vowel length

<sup>15</sup> It is not entirely clear how phonemic Svantesson’s data is which he presents in this article. He does state that his material was not enough for a complete analysis (Svantesson 1991:67). Therefore in this thesis this data is not marked with // or [ ].

<sup>16</sup> In Svantesson’s transcription for Hu, there does not seem to be any separation marked between the presyllable and the main syllable. Thus for example paθán might be written pa-θán.

<sup>17</sup> In Svantesson’s transcription for Lamet, he does not necessarily write any vowel in the presyllable, and syllable boundaries are not marked. Thus krmìɲ might be written as kr-mìɲ.

distinctions which have been lost in many Palaungic languages, including U, Hu and the Waic languages (Svantesson 1988: 78). The loss of length distinction in the high vowels probably took place at an earlier time than the development of tone and the loss of length contrast in other vowels, as the proto-Palaungic high vowels behave like short vowels in U and Hu (1988: 79). Svantesson finds four factors involved in the development of tone in U: 1) vowel length; 2) vowel quality; 3) final consonant type; 4) initial consonant type. Consonant type here refers to voiceless obstruent versus voiced sonorant (1988: 86). The tones are summarized in Table 15, with examples.

**Table 15. Summary of U tonal development, shown in comparison to Hu and Lamet (Svantesson 1988: 87-92)<sup>18</sup>**

Syllable type <sup>19</sup>	Tone <sup>20</sup>	U	Hu	Lamet	
1) Originally short vowel, voiced sonorant coda. -In addition, final nasals --> stops.	Low	yàp phèt ɲàw	yám phíɲ ɲàl	yàm píɲ ɲàl	“to die” “shoot” “fire”
2) Originally short vowel followed by stop or *-s.	High	khát súʔ sé	khát θúk khasét	kát khúk krsás	“cold” “hair” “charcoal”
3) Originally long vowel followed by stop or *-s.	Rising	lăt qhǎʔ sǔʔ	--- thɤ̀àk nasòk	láat tráak yóok	“to fear” “buffalo” “ear”
4) Originally open syllable or long vowel followed by sonorant; all prevocalic consonants are sonorants. <sup>21</sup>	Falling	mâ mî yâm	mà mé? yàm	màar mii? yàam	“field” “you” “to cry”
5) Originally long vowel followed by a sonorant; a voiceless obstruent is among prevocalic consonants.	High	thám pán sáv	--- pàɲ ---	ktáam pàaɲ háaw	“crab” “white” “to climb”
6) Originally open syllable and a voiceless obstruent among the prevocalic consonants; high vowel.	High	ʔí nchí ɲkú	ʔí nsí? ---	ʔíi? sí? ɲkùu?	“people” “louse” “skin”
7) Original open syllable and a voiceless obstruent among prevocalic consonants; non-high vowel.	Low	khà là salè	--- lá? salé?	káa? lá? slèɛ?	“fish” “leaf” “rain”
8) Some words do not end in a stop or -ʔ, but have a rising tone; all have or once had a palatal final.	Rising	saɲĩ ʔăn ʔăy	ɲí? kaʔàɲ ʔày	sɲii? kʔáaɲ ʔáay	“day” “wasp” “we (dual)”
9) Most words with final *-h.	Falling	--- <sup>22</sup>			

<sup>18</sup> As mentioned previously, it is not entirely clear how phonemic Svantesson’s transcription is for U or Hu (1988, 1991); in a discussion of dental and palatal consonants he says his transcription is probably less than phonemic (1988: 69) and most transcription is not marked with // or [ ]. Therefore for this thesis these items are not marked with // or [ ].

<sup>19</sup> This column refers to historical syllable types before the development of tone in U; proto-Angkuic, not proto-Palaungic (Svantesson 1988: 87). All other columns are current. Lamet and Hu are given because they each retain some of the historical features mentioned in the first column, which may no longer be seen in U.

<sup>20</sup> “Tone” refers to the tone in U.

<sup>21</sup> Svantesson notes Lamet does not have open syllables. However, Lamet syllables with final glottal stop correspond to open syllables in U, and to glottal stop final syllables in Hu and Mok. According

In summary, tonogenesis is a phenomenon which may involve initial consonants, final consonants, or vowels. Confusingly, pitch differences may co-occur with the voice phonation features which are characteristic of register languages, since it appears both may develop out of a loss of contrast in initial consonants. In this situation, a distinction must be made between the presence of tone and the presence of register in the language. In the available literature on Angkuic languages, development of tone is seen, rather than development of register. This tonogenesis in Angkuic languages has been linked to a loss of vowel length contrast, with final consonant types also being implicated to some extent.

## **2.3 Phonology of Tai Lue**

Since Tai Lue is the major regional language in the areas where the Muak Sa-aak people live, and has had a major influence on the language, a brief sketch of the consonants, vowels, and tones will be presented here for comparison purposes.

### **2.3.1 Tai Lue consonants**

William J. Gedney describes the phonology of two dialects of Tai Lue. These are the dialects of Chieng Hung, the capital city of Sipsongpanna, in Yunnan province of China, and the dialect of Muong Yong in northeastern Myanmar; the data were collected from speakers located in Thailand (Hudak 1996: xiii). He gives an initial consonant inventory as seen in Table 16, with initial consonant clusters as seen in Table 17.

The transcription follows the IPA except that [y] is used for the IPA [j], and [h] is used for aspiration.

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to Svantesson, “in U tonogenesis, syllables of this type behave basically like syllables with long vowel and sonorant coda” (Svantesson 1988: 85).

<sup>22</sup> No examples are given in Svantesson 1988.

**Table 16. Tai Lue initial consonants (Hudak 1996: xxii- xxiii)**

Voiceless unaspirated stops	p	t	c	k	ʔ
Voiceless aspirated stops	ph	th	ch*		
Voiced stops	b	d			
Voiceless spirants		f	s	x	h
Nasals	m	n	ɲ*	ŋ	
Sonorants		v <sup>23</sup>	l, r	y	

\*Muong Yong dialect only

**Table 17. Initial consonant clusters in Tai Lue (Hudak 1996: xxiii)**

	k	t	th	x
w	kw	tw*	thw*	xw
r		tr	thr	

\*Muong Yong dialect only

One additional consonant cluster, /xl/, was found in one item in the Muong Yong dialect, /xlut<sup>5</sup>/ “sound of bone cracking when turned slowly” (Hudak 1996: xxiii).

The sounds /ch/ and /ɲ/ and the clusters /tw/ and /thw/ occurred in only one of the dialects (Muong Yong) (Hudak 1996: xxii- xxiii). Additionally, the consonant /ɲ/ is in fact an allophone of /ŋ/, occurring before /i/, /ɛ/, and perhaps /e/ (1996: xxv).

Examples of the initial consonants are given in Table 18, below, and examples of consonant clusters are given in Table 19.

<sup>23</sup> Hudak does not explain why /v/ is included among the sonorants; however, /v/ seems to be used for an initial and /w/ for a final consonant.

**Table 18. Examples of initial consonants in Tai Lue (Hudak 1996: xxii- xxiii)**

/pii <sup>5</sup> /	“older sibling”	/sew <sup>4</sup> /	“sharp”
/taan <sup>4</sup> /	“road”	/xay <sup>2</sup> /	“egg”
/caay <sup>4</sup> /	“male”	/hɣɣ <sup>2</sup> /	“sweat”
/kin <sup>1</sup> /	“to eat”	/mɔɔ <sup>3</sup> /	“pot”
/ʔum <sup>3</sup> /	“to hold in the arms”	/naa <sup>3</sup> /	“face”
/phoo <sup>1</sup> /	“husband”	/ɲen <sup>4</sup> /	“to clench”
/thaw <sup>3</sup> /	“old”	/ŋaay <sup>1</sup> /	“face up”
/suʔ <sup>1</sup> chit <sup>1</sup> /	“to crush” <sup>24</sup>	/vay <sup>6</sup> /	“to keep”
/baat <sup>2</sup> /	“foot”	/luuk <sup>5</sup> /	“child”
/dam <sup>3</sup> /	“handle”	/raak <sup>5</sup> /	“root”
/faa <sup>6</sup> /	“sky”	/yɣɣ <sup>2</sup> /	“bait”

**Table 19. Examples of initial consonant clusters in Tai Lue (Hudak 1996: xxiii)**

/kwaan <sup>1</sup> /	“axe”
/twip <sup>5</sup> /	“continent”*
/thwaay <sup>1</sup> /	“to give to royalty”*
/xwaay <sup>4</sup> /	“buffalo”
/traa <sup>1</sup> /	“brand”
/thrii <sup>4</sup> /	“soldier”

\*Muong Yong dialect only.

<sup>24</sup> This word is the example given for this initial consonant in Hudak 1996.

Final consonants include the nasals /m, n, ŋ/, the voiceless unaspirated stops /p, t, k, ʔ/, and a final /w, y/ (Hudak 1996: xxii-xxiii). Examples are given in Table 20.

**Table 20. Examples of Tai Lue final consonants (Hudak 1996: xxiii)**

/nam <sup>6</sup> /	“water”
/nɔn <sup>4</sup> /	“sleep”
/mɔŋ <sup>4</sup> /	“gong”
/baap <sup>2</sup> /	“sin”
/het <sup>5</sup> /	“to do”
/paak <sup>2</sup> /	“mouth”
/neʔ <sup>1</sup> /	“lean”
/xiw <sup>2</sup> /	“bad smell”
/tuy <sup>3</sup> /	“fat”

### 2.3.2 Tai Lue vowels

There are nine vowels, which may be either long or short. They are shown in Table 21 below. Examples are given in Table 22.

**Table 21. Tai Lue vowels (Hudak 1996: xxiii)**

	Front	Back	
		Unrounded	Rounded
High	i, ii	ɯ, ɯɯ	u, uu
Mid	e, ee	ɤ, ɤɤ	o, oo
Low	ɛ, ɛɛ	a, aa	ɔ, ɔɔ



**Table 22. Examples for Tai Lue vowels (Hudak 1996: xxiii-iv)**

/min <sup>1</sup> / “stink”	/tuŋ <sup>4</sup> / “to reach”	/hum <sup>2</sup> / “to cover”
/lii <sup>2</sup> / “to squint”	/muuut <sup>5</sup> / “dark”	/puu <sup>4</sup> / “betel”
/xew <sup>1</sup> / “green”	/lɣm <sup>1</sup> / “python”	/mon <sup>5</sup> / “fun”
/veek <sup>5</sup> / “work”	/lɣ <sup>5</sup> / “to saw”	/mook <sup>2</sup> / “hat”
/nen <sup>3</sup> / “solid”	/san <sup>3</sup> / “short”	/hɔŋ <sup>6</sup> / “to call”
/hɛɛ <sup>5</sup> / “ore”	/naaw <sup>1</sup> / “cold”	/tɔk <sup>2</sup> / “bamboo strip”

Diphthongs are analyzed as vowel plus final /w/ or /y/. These include iw, ew, ɛw, aw, aaw, uy, ɣj, oy, ay, aay, and ɔy: /xiw<sup>2</sup>/ “bad smell”, /ʔew<sup>2</sup>/ “business”, /sew<sup>1</sup>/ “strong odor”, /law<sup>3</sup>/ “liquor”, /faaw<sup>6</sup>/ “to hurry”, /tuy<sup>3</sup>/ “fat”, /nɣy<sup>2</sup>/ “tired”, /koy<sup>3</sup>/ “banana”, /pay<sup>6</sup>/ “to snare”, /ʔaay<sup>2</sup>/ “to lie in wait”, /hɔy<sup>6</sup>/ “to string” (1996: xxiv).

Gedney found a length contrast in all vowels, but only for checked syllables. In syllables ending in nasals or approximants /m, n, ŋ, w, y/, the long-short contrast occurred only with the vowel /a/ (1996: xxv).

### 2.3.3 Tai Lue tonal system

There are six tones in Tai Lue. Gedney describes these for both dialects. The tones are given in Table 23 with a comparison between the two dialects; the tones that differ in pronunciation have been underlined.

**Table 23. Tai Lue tones (Hudak 1996: xx-xxi)**

Tone	Chieng Hung			Muong Yong
1	high level	/55/	haa <sup>1</sup> “to seek”	high rising /45/
2	low rising	/12/	haa <sup>2</sup> “shower”	low rising /12/
3	low level, glottalized	/11/	haa <sup>3</sup> “five”	low level, glottalized /11/
4	low falling	/21/	haa <sup>4</sup> “mold”	mid, with slight rise and fall /342/
5	mid level	/33/	haa <sup>5</sup> “epidemic”	mid level /33/
6	falling, glottalized	/31/	haa <sup>6</sup> “to ferment”	falling, glottalized /31/

It should be noted that two of these tones (3 and 6) are glottalized tones. In addition, there is a difference in the tonal systems of these two dialects which does not show up in the table, involving words with the Proto-Tai A-tone and originally preglottalized initial consonants. In the Muong Yong dialect, these words take the same tone as words with originally voiced initial consonants. In the Chieng Hung dialect, however, these words take the same tone as words with originally voiceless initial consonants (Hudak 1996: xv).

## Chapter 3

### Muak Sa-aak consonants and vowels

This chapter describes the Muak Sa-aak inventory of 22 consonants, 18 vowels. Tone will be addressed in Chapter 5. Consonants will be described first, including initial consonants, consonant clusters, and final consonants. The second part of the chapter will address vowels, including monophthongs and diphthongs, and vowel length.

#### 3.1 Consonants

Muak Sa-aak has 22 distinctive consonants. They include oral and nasal stops at the bilabial, alveolar, palatal, and velar points of articulation, plus a glottal stop. Aspiration and voicing are distinctive for the stops, although the voiced stops are not common, and there are no voiced stops at the palatal or velar points of articulation. The four aspirated consonants /p<sup>h</sup>, t<sup>h</sup>, c<sup>h</sup>, k<sup>h</sup>/ have been analyzed as single segments since they form clusters with sonorants, and there are no clusters consisting of three consonants in Muak Sa-aak. There are three voiceless fricatives: labiodental /f/; alveolar sibilant /s/; and glottal /h/. There are also four approximants, the lateral approximant /l/, and the central approximants /r/, /w/ and /j/. The following sections will discuss major-syllable initials, consonant clusters, final consonants, and presyllable onsets.

##### 3.1.1 Initials

All 22 consonants may occur syllable-initially. The full inventory is shown in Table 24, below. Any context-dependent alterations or other phonetic detail of interest will be given in the following subsections to identify the phonetic value of Muak Sa-aak consonants, followed by an example. Contrasts are included in Appendix 3.

**Table 24. Consonant phonemes in Muak Sa-aak**

	Labial		Alveolar		Palatal		Velar		Glottal
Stop	p	b	t	d	c		k		ʔ
	p <sup>h</sup>		t <sup>h</sup>		c <sup>h</sup>		k <sup>h</sup>		
Nasal	m		n		ɲ		ŋ		
Fricative	f		s						h
Central approximant	w		r		j				
Lateral approximant			l						

### 3.1.1.1 Stops

As shown in Table 24, Muak Sa-aak has 11 stops at five places of articulation.

- /p/: voiceless bilabial stop.

(4) 1557 /piaŋ<sup>3</sup>/ “red”

- /p<sup>h</sup>/: voiceless aspirated bilabial stop.

(5) 1431 /p<sup>h</sup>ɣɲ<sup>3</sup>/ “shoot (v)”

- /b/: voiced bilabial stop.

(6) 1315 /bɔt<sup>2</sup> c<sup>h</sup>aɲ<sup>1</sup>/ “cloud”

- /t/: voiceless alveolar stop.

Phonetically this phoneme is realized as a fronted voiceless alveolar stop [t̪].

(7) 327 /ti<sup>2</sup>/ “self”

- /t<sup>h</sup>/: voiceless aspirated alveolar stop.

(8) 150 /t<sup>h</sup>e:t<sup>1</sup>/ “sit”

- /d/: voiced alveolar stop.

(9) 133 /duam<sup>3</sup>/ “look at (far)”

- /c/: voiceless palatal stop.

Phonetically this phoneme is realized as a slightly affricated voiceless alveolo-palatal stop [t̪].<sup>25</sup>

The degree of friction is speaker-dependent (more friction for Speaker B than for Speaker A).

(10) 63 /cʷɪŋ³/ “leg”

- /c<sup>h</sup>/: voiceless palatal aspirated stop.

Phonetically this phoneme is realized as a voiceless alveolo-palatal aspirated stop [t̪<sup>h</sup>~ç].

This stop occurs in free inter- and intra-speaker variation with a homorganic fricative. Speaker A used both allophones, sometimes in the same word on different occasions. Speaker B used the fricative more frequently than Speaker A; Speaker D always used a fricative.

(11) 1202 [çak²] /c<sup>h</sup>ak²/ “seed” Speaker B

(12) 1202 [t̪<sup>h</sup>ak²] /c<sup>h</sup>ak²/ “seed” Speaker A

- /k/: voiceless velar stop.

(13) 1650a /kaj³/ “they (3 Dual)”

- /k<sup>h</sup>/: voiceless aspirated velar stop.

(14) 18 /k<sup>h</sup>ɛŋ³/ “tooth”

- /ʔ/: glottal stop.

This occurs phonemically only syllable-initially.

(15) 326 /ʔic²/ “person”

### 3.1.1.2 Nasals

Muak Sa-aak has four distinctive nasals, /m, n, ɲ, ŋ/. These nasal finals vary in length according to the length of the preceding vowel, having a long allophone whose distribution is predictable. A longer vowel tends to produce a shorter final, and a shorter vowel a longer final (see discussion in Section 3.2.3.1).

<sup>25</sup> Since alveolo-palatal consonants appear to be a Mainland-Southeast Asian areal feature, Clark represents them with single letters that Chinese researchers use in their description of Hmong-Mien languages (2008: 24). These symbols are chosen for the phonetic transcriptions of the alveolo-palatal consonants in this study as they accurately describe the phonetic quality of these sounds; however, the usual palatal symbols will be used for the phonemes since they are widely used in the literature.

- /m/: voiced bilabial nasal.

(16) 1281 /mul<sup>3</sup>/ “silver”

The voiced bilabial nasal also occurs as a syllabic nasal, but there was only one example of this in the data set ([mk<sup>h</sup>ot<sup>2</sup>] “rice, dehusked”). The speakers, when asked, could not think of other words with syllabic nasals.

- /n/: voiced alveolar nasal.

(17) 435 /nɤn<sup>3</sup>/ “speak”

- /ɲ/: voiced alveolo-palatal nasal.

Phonetically this phoneme is realized as a voiced alveolo-palatal nasal [ɲ].

(18) 467 /ɲel<sup>3</sup>/ “grumble, complain”

- /ŋ/: voiced velar nasal.

(19) 134 /ŋaŋ<sup>3</sup>/ “hear”

### 3.1.1.3 Fricatives

Muak Sa-aak has three voiceless fricatives, /f, s, h/.

- /f/: voiceless labiodental fricative.

(20) 491 /faj<sup>3</sup>/ “whip” (n)<sup>26</sup>

There are only a few occurrences of this fricative (23 items in the wordlist, of which nine are borrowed), and some speakers seem to realize it as the frequently occurring aspirated stop [p<sup>h</sup>] instead (the phoneme /p<sup>h</sup>/ is found in 116 items). For example, when referring to the name of their own village, sometimes a speaker would say /fa:j<sup>1</sup>/ and other times a speaker would say /p<sup>h</sup>a:j<sup>1</sup>/. It is possible that this is variation resulting from their contact with Tai Lue, which is described as having [f]. Further research with more speakers is needed to determine whether the labiodental is a phoneme undergoing a sound change, or the result of influence from a neighboring language.

- /s/: voiceless alveolar sibilant.

<sup>26</sup> Not the same word as the name of the village in the next paragraph.

(21) 900 /sep<sup>2</sup>/ “play”

- /h/: voiceless glottal fricative.

This phoneme occurs in only 31 words in the data (all but four of these are Tai Lue loanwords), and only in monosyllables. It does appear in contrast with the sibilant /s/, which is more common because it serves both as a presyllable initial consonant and as a main syllable initial.

(22) 423 /hel<sup>3</sup>/ “avoid”

### 3.1.1.4 Approximants

Muak Sa-aak has three central approximants /w, r, j/, and the lateral approximant, /l/.

As noted for the final nasals (see also discussion in Section 3.2.3.1), these approximant finals have lengthened final allophones. Their distribution is predictable based upon the length of the preceding vowel, such that a longer vowel tends to produce a shorter final, and a shorter vowel a longer final.

A phonetic description of all Muak Sa-aak approximants is given below.

- /w/: voiced labio-velar approximant [w~β].

/w/~ [w] \_openV<sub>2</sub>; C<sub>2</sub>\_V<sub>2</sub>; \_#

~ [β] \_elsewhere

~ [β~w] C<sub>1</sub>V<sub>1</sub> . \_V

(C<sub>1</sub> = presyllable initial consonant; V<sub>1</sub> = presyllable vowel;

C<sub>2</sub> = main syllable initial consonant; V<sub>2</sub> = main syllable vowel)

Syllable-initially, there is an overall pattern of free variation between these two allophones. However, in monosyllabic words, the allophone [w] commonly occurs before open vowels, particularly the vowel /a/. Before other vowels, however, particularly high unrounded front vowels, it is usually delabialized to a bilabial approximant [β]. This variation is shown in Examples (23) to (26). As the initial of the main syllable in a sesquisyllabic word, however, it occurs in free variation, as seen in Examples (27) and (28), “flea”. As the second consonant of a cluster, or as a final consonant, this phoneme is realized as [w].

(23) 809 [wa:<sup>1</sup>] /wa:<sup>1</sup>/ “give”

(24)	871	[wa <sup>i</sup> c <sup>2</sup> m.kep <sup>2</sup> ]	/wac <sup>2</sup> m.kep <sup>2</sup> /	“sword”	
(25)	1430	[βɣl: <sup>3</sup> ]	/wɣl <sup>3</sup> /	“throw”	
(26)	165	[βu <sup>1</sup> βi: <sup>3</sup> ]	/wu <sup>1</sup> wi: <sup>3</sup> /	“wave” (hand)	
(27)	1118	Speaker A	[s.wɛŋ: <sup>3</sup> ]	/s.wɛŋ <sup>3</sup> /	“flea”
(28)	1118	Speaker B	[s.βɛŋ: <sup>3</sup> ]	/s.wɛŋ <sup>3</sup> /	“flea”

- /r/: voiced alveolar approximant [ɹ~r]

Word initially, the alveolar approximant is in free variation with an alveolar trill. When it is the second consonant of a cluster, it is usually pronounced as an approximant. It does not occur word-finally. If the speaker is paying attention to his speech, he will produce a trill. If not, he will use an approximant. For this reason, it seems that the trill is considered the more proper or the clearer pronunciation.

(29)	533	/rim <sup>3</sup> /	“village”
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- /j/: voiced palatal approximant [j~j̥~ç]

(30)	249	/jam <sup>3</sup> /	“die”
------	-----	---------------------	-------

Word initially, /j/ is sometimes realized with devoicing and increased friction, as seen in this example of one word pronounced twice by the same speaker:

(31)	571	[p <sup>h</sup> jaŋ <sup>3</sup> ]	[p.çəŋ <sup>3</sup> ]	/p <sup>h</sup> .jaŋ <sup>3</sup> /	“fat”
------	-----	------------------------------------	-----------------------	-------------------------------------	-------

This is in agreement with Svantesson’s finding of friction in the realization of the palatal approximant in U as discussed in Section 2.1.3 (1988: 69).

- /l/: voiced lateral approximant

(32)	1408	/li: <sup>1</sup> /	“come/ go out”
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### 3.1.2 Consonant clusters

A limited number of consonant clusters are permitted. There are no syllable-final consonant clusters; all are syllable-initial. Only the voiceless bilabial and velar stops take the position of the first consonant in a cluster; only the consonants /w/ and /r/



can take the position of the second consonant in a cluster. The clusters found in the data are given in Table 25, below.

**Table 25. Syllable-initial consonant clusters**

	<b>w</b>	<b>r</b>
<b>p</b>	pw	pr
<b>p<sup>h</sup></b>	p <sup>h</sup> w	p <sup>h</sup> r
<b>k</b>	kw	kr
<b>k<sup>h</sup></b>	k <sup>h</sup> w	k <sup>h</sup> r
<b>(t)</b>	---	<b>(tr)</b>

One cluster has been included in parentheses in Table 25, /tr/.

There is only one example of the cluster /tr/, shown in Example (33) below:

(33) 324 /ʔun<sup>3</sup> tra:j<sup>3</sup>/ “danger”

This particular word is a borrowed word from Tai Lue. In addition, only Speaker A pronounced it this way; Speaker B did not pronounce it as a cluster, but with a presyllable, as in Example (34):

(34) 324 /ʔun<sup>3</sup> t.ra:j<sup>3</sup>/ “danger”

Example (33) could be the result of careless pronunciation or slurring of the presyllable by Speaker A. Therefore, /tr/ was not considered a true cluster in the language.

In addition, none of the consonant clusters with /w/ as the second consonant have more than one or two distinct lexical items that are not clearly borrowed words. Examples of these clusters are given in Examples (35) to (38).

(35) 1303 /pwi:<sup>1</sup> ʔo:m<sup>3</sup>/ “foam”

(36) 639 /p<sup>h</sup>wi:<sup>1</sup>/ “open”

- (37) 846 /kwaŋ<sup>3</sup> s.ruɑŋ<sup>3</sup>/ “(be) lost”  
 (38) 418 /k<sup>h</sup>waj<sup>1</sup> k.tit<sup>2</sup>/ “invite”

Consonant clusters with /r/, however, are common in the data. Examples of these consonant clusters are given in (39) to (42).

- (39) 578 /prut<sup>2</sup>/ “salt”  
 (40) 688 /p<sup>h</sup>raŋ<sup>3</sup>/ “thatch”  
 (41) 597a /krew<sup>3</sup>/ “stir (in circles)”  
 (42) 437 /k<sup>h</sup>ra:k<sup>1</sup>/ “shout, cry out”

### 3.1.3 Final consonants

The following consonants occur in the syllable-final position: /p/, /t/, /c/, /k/, /m/, /n/, /ŋ/, /l/, /j/, and /w/. They are shown in Table 26 below.

**Table 26. Final consonants**

	Bilabial	Alveolar	Palatal	Velar
Stop	p	t	c	k
Nasal	m	n	ɲ	ŋ
Central approximant	w		j	
Lateral approximant		l		

These finals are the voiceless unaspirated stops, the nasals, the lateral approximant, and the central approximants. The approximant /r/ does not occur in the syllable-final position. The final stops are unreleased: [p̚, t̚, c̚, k̚]. Examples of the final consonants are given in (43) to (53).

- (43) 22 /k<sup>h</sup>a:p<sup>1</sup>/ “chin”  
 (44) 1517 /k.sɿt<sup>2</sup>/ “be thick”

(45)	89	/sɤc <sup>2</sup> /	“muscle”
(46)	987	/le:k <sup>1</sup> /	“pig”
(47)	714	/su <sup>2</sup> lɛm <sup>2</sup> /	“log”
(48)	470	/k <sup>h</sup> i:n <sup>3</sup> /	“deny”
(49)	1322	/s.mɤŋ <sup>3</sup> /	“star”
(50)	1567	/c <sup>h</sup> aŋ <sup>3</sup> /	“(be) bitter”
(51)	597a	/krew <sup>3</sup> /	“stir (in circles)”
(52)	140	/k <sup>h</sup> a:j <sup>3</sup> /	“to eat”
(53)	974	/ʔɛl <sup>3</sup> /	“chicken”

The lack of syllable-final /r/ is interesting because /r/ does occur in consonant clusters; /l/, in contrast, occurs syllable-finally but not in clusters. They must be considered two separate phonemes, however, because both occur word-initially, with many examples, and there is clear evidence of contrast, with minimal pairs.

The glottal stop, although phonetically it occurs frequently in the syllable-final position, is not a final consonant phoneme. It occurs predictably in the syllable-final position of Tone 2 syllables which do not have a stop final consonant of /p/, /t/, /c/, or /k/. It does not occur with Tone 1 or Tone 3. With Tone 2, however, it can follow vowels, or syllable-final nasals or approximants, although no other syllable-final consonant clusters occur. The glottal stop in syllable-final position is therefore considered a feature of tone, rather than a separate final consonant phoneme.

The final palatal consonants /c/ and /ɲ/ normally cause a high vowel [i] onglide. When these consonants follow any vowel other than /i/, this tends to generate what at first appear to be vowel glides, but these glides do not occur in other environments. They are predictable, and occur only with final palatal consonants. Therefore the [i] onglide may be considered part of the phonemes /c/ and /ɲ/ when they occur in the final position, rather than part of the vowel. This is common in Mon-Khmer languages. Examples (54) and (55) show final /c/ when following a front high vowel versus final /c/ when following another vowel.

(54) 326 [ʔic<sup>2</sup>] /ʔic<sup>2</sup>/ “person”

(55) 1243a [lo:c<sup>1</sup>] /lo:c<sup>1</sup>/ “rattan, cane”

Examples (56) and (57) show final /ɲ/ following a non- front high vowel; there are no examples in the data of final /ɲ/ following a front high vowel as there are for final /c/.

(56) 328 [p.k<sup>h</sup>u<sup>i</sup>ɲ<sup>3</sup>] /p.k<sup>h</sup>uɲ<sup>3</sup>/ “man”

(57) 1322 [s.mɣ<sup>i</sup>ɲ<sup>3</sup>] /s.mɣɲ<sup>3</sup>/ “star”

These final palatal consonants are one place where Muak Sa-aak differs in phonology from Tai Lue, which does not have final palatal consonants. It is, however, typical of other Mon-Khmer languages (see discussion, Section 2.1.3.1).

### 3.2 Vowels

This section will discuss the distinctive vowels in Muak Sa-aak, both monophthongs and diphthongs, and address the issue of vowel length. Muak Sa-aak has sixteen monophthongs with nine distinctive vowel qualities. All monophthongs are distinguished by length, apart from the open front and open back vowels. In addition, there are two diphthongs. The complete inventory of 18 vowels is shown in Table 27, below.

**Table 27. Muak Sa-aak vowels**

	Front	Back unrounded	Back rounded
Close	i i:	ɯ ɯ:	u u:
Close-mid	e e:	ɤ ɤ:	o o:
Open	ɛ	a a:	ɔ
Diphthongs	ia		ua

#### 3.2.1 Monophthongs

- /i, i:/ close unrounded front vowel

This vowel occurs both as long and short vowels in Muak Sa-aak. The short vowel has the near-close allophone [ɪ], occurring before final nasals or the lateral approximant. Before all other final consonants and in open syllables, it is realized as the close vowel [i], as seen in Examples (37) to (41).

/i/      —> [ɪ]/ \_\_{N, /l/}  
           —> [i] all other environments

(58)	823	[k <sup>h</sup> ɪŋ <sup>3</sup> ]	/k <sup>h</sup> ɪŋ <sup>3</sup> /	“(be) expensive”
(59)	1041	[çɪm <sup>3</sup> ]	/ç <sup>h</sup> ɪm <sup>3</sup> /	“bird”
(60)	266	[pɪl <sup>3</sup> ]	/pɪl <sup>3</sup> /	“forget”
(61)	1425	[ç <sup>h</sup> ɪp <sup>2</sup> ]	/ç <sup>h</sup> ɪp <sup>2</sup> /	“pick up” <sup>27</sup>
(62)	1119	[çɪt <sup>2</sup> ]	/ç <sup>h</sup> ɪt <sup>2</sup> /	“head louse”

The long vowel /i:/ can occur in either of these environments, as seen in Examples (63) and (64).

(63)	470	[k <sup>h</sup> i:n <sup>3</sup> ]	/k <sup>h</sup> i:n <sup>3</sup> /	“deny”
(64)	1019	[k <sup>h</sup> i:t <sup>1</sup> ]	/k <sup>h</sup> i:t <sup>1</sup> /	“bat”

- /e, e:/ close-mid unrounded front vowels.

This vowel quality occurs both as long and short vowels.

(65)	1652	/p <sup>h</sup> e <sup>2</sup> /	“you (2PL)”
(66)	781	/te: <sup>3</sup> /	“arrow”

- /ɛ/ open-mid unrounded front vowel.

This vowel quality occurs only as a short vowel.

(67)	900	/sep <sup>2</sup> /	“play”
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- /u, u:/ close unrounded back vowels.

This vowel quality occurs both as long and short vowels.

(68)	421	/tun <sup>1</sup> /	“flee”
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<sup>27</sup> There is a Tai Lue word, /yip<sup>1</sup>/ “pick up, hold in the hand” (Hudak 1996: 1193).

(69) 63 /cu:ŋ<sup>3</sup>/ “leg”

- /ɤ, ɤ:/ close-mid unrounded back vowels.

This vowel quality occurs as both long and short vowels.

(70) 435 /nɤn<sup>3</sup>/ “speak”

(71) 268 /so:<sup>1</sup> ɲɤ:m<sup>3</sup>/ “rejoice”

- /a, a:/ open unrounded back vowel.

This vowel quality occurs both as long and short vowels.

(72) 249 /jam<sup>3</sup>/ “die”

(73) 272 /ja:m<sup>3</sup>/ “cry, weep”

- /u, u:/ close rounded back vowel [u ~ ʊ].

This vowel quality occurs both as long and short vowels. The short vowel has two allophones in free variation, [u] and [ʊ]. However, there is a pattern to the free variation; in the data, the occurrence of the near-close allophone [ʊ] usually occurs before final nasals, with checked Tone 2, or falling Tone 3. The allophone [u] is far more common, and may occur in all environments (including those where [ʊ] occurs), as seen in Examples (74) to (78).

(74) 897 [puat<sup>1</sup> pum<sup>1</sup>] /puat<sup>1</sup> pum<sup>1</sup>/ “draw picture”

(75) 252 [kut<sup>2</sup>] /kut<sup>2</sup>/ “think”<sup>28</sup>

(76) 1469 [ʔun<sup>3</sup> ʔun<sup>3</sup>] /ʔun<sup>3</sup> ʔun<sup>3</sup>/ “put, place, set”

(77) 380 [cum<sup>3</sup>] /cum<sup>3</sup>/ “friend

(78) 1407 [lup<sup>2</sup>] /lup<sup>2</sup>/ “enter, go in”

- /o, o:/ close-mid rounded back vowel.

This vowel quality occurs both as long and short vowels.

(79) 654 /p.k<sup>h</sup>on<sup>3</sup>/ “knot”

(80) 1384 /t.po:l<sup>3</sup>/ “night”

- /ɔ/ open-mid rounded back vowel.

<sup>28</sup> There is a Tai Lue word /xit<sup>1</sup>/ “to think” (Hudak 1996: 1124); /x/ in Tai Lue has an allophone of [k<sup>h</sup>] and is usually /k<sup>h</sup>/ in Muak Sa-aak. These words are similar and may represent borrowing.

This vowel quality occurs phonemically only as a short vowel.

(81) 1174a /k.cɔk<sup>2</sup>/ “bamboo shoot”

This vowel quality does occur phonetically long, but [ɔ:] is considered here to be an allophone of the diphthong /ua/, as described in Section 3.2.2 below.

The hole in the chart under ([ɛ:]) may be a neutralization of [ɛ:] and [e:] in open syllables. The pronunciation of these vowels can, indeed, vary from [ɛ:] to [e:], but there is no contrast.

There is a clear contrast between the short vowels /ɛ/ and /e/ in all environments in which they occur. The long [ɔ:] and [ɛ:], however, appear to have shifted to the diphthongs described in Section 3.2.2 in all other syllable types except for the open syllable.

There are very few of the long vowel [ɔ:]; these occur only in open syllables and in a few Tai Lue borrowed words. They will be considered to be an allophone of the diphthong /ua/, occurring in open syllables, discussed further in Section 3.2.2.

### 3.2.2 Diphthongs

The diphthongs /ia/ and /ua/ are best analyzed as taking the place of the long vowel qualities [ɛ:] and [ɔ:], which are spaces left empty in the vowel chart (see Table 27). There are several reasons for this.

First, the diphthongs /ia/ and /ua/ in Wan Fai Muak Sa-aak correspond to the long vowels [ɛ:] and [ɔ:], respectively, in the variety of Muak Sa-aak spoken in Wan Saw [wan<sup>1</sup> sɔʔ<sup>2</sup>], a Muak Sa-aak variety which does not have these diphthongs. When speakers from Wan Fai try to write their own words in the Tai Lue script, which does not have /ia/ or /ua/, the vowels they choose are ones normally used to write the Tai Lue vowels /ɛ:/ and /ɔ:/. If they then unintentionally read them back as written, instead of with the normal Wan Fai pronunciation, they refer to it as “Wan Saw language.” This is evidence that not only is it a sound change between the two language varieties, but it is one with which the speakers themselves are familiar.

Secondly, this sound change also affects words borrowed from Tai Lue; if the Tai Lue word contains the Tai Lue phoneme /ɛ:/ or /ɔ:/, when borrowed into Wan Fai Muak Sa-aak, it typically becomes /ia/ or /ua/ (see Section 6.1.1).

In the Muak Sa-aak variety under study (Wan Fai variety), /ua/ occurs only in closed syllables (189 occurrences in the data), although it can occur in any of the

three tones and with any of the final consonants. The sound [ɔ:] normally occurs in open syllables (60 occurrences), although there are a few occurrences with final consonants, mainly in borrowed words (9 occurrences total, of which four are the same word, [sɔ:ŋ<sup>3</sup>], the number “two”). It is a complementary distribution.

Therefore, the sounds [ua] and [ɔ:] are actually allophones of one phoneme, /ua/.

The sound [ɛ:] occurs in free variation with the frequently occurring long mid vowel /e:/ in open syllables.

The diphthongs /ia/ and /ua/, if seen as replacements of former [ɔ:] and [ɛ:] in most environments, fill in their spaces in the vowel chart (Table 27, above).

The distribution of the two Muak Sa-aak diphthongs can be summarized as follows:

- /ua/ --> [ɔ:]/ \_#
- > [ua] elsewhere

Examples:

(82)	462	[sɔ: <sup>1</sup> ]	/sua <sup>1</sup> /	“insult”
(83)	831	[p <sup>h</sup> ua <sup>3</sup> ]	/p <sup>h</sup> ua <sup>3</sup> /	“beg”
(84)	54	[t <sup>h</sup> i <sup>2</sup> suak <sup>1</sup> ]	/t <sup>h</sup> i <sup>2</sup> suak <sup>1</sup> /	“forearm”
(85)	592	[s.ruaj <sup>3</sup> ]	/s.ruaj <sup>3</sup> /	“cut”

This phoneme could have been represented as /ɔ:/ or as /ua/. In this paper, the latter has been chosen because of the limited occurrence of [ɔ:], and for greater symmetry with the diphthong /ia/.

- /ia/ \_[C]

Examples:

(86)	133b	[liam <sup>3</sup> ]	/liam <sup>3</sup> /	“watch”
(87)	273	[s.ʔuat <sup>1</sup> s.ʔiat <sup>1</sup> ]	/s.ʔuat <sup>1</sup> s.ʔiat <sup>1</sup> /	“sorrow”
(88)	1557	[piaŋ <sup>3</sup> ]	/piaŋ <sup>3</sup> /	“red”
(89)	558	[len <sup>3</sup> niaw <sup>1</sup> ]	/len <sup>3</sup> niaw <sup>1</sup> /	“braid” (hair)



### 3.2.3 Vowel length

As seen in the previous subsection, monophthongs have distinctive vowel length. The speakers seem to notice length, and when trying to describe the difference in some words, one speaker used the terms “heavy” and “light” to refer to syllables with short and long vowels (short being “heavy” and long being “light”).

Some examples are shown here to illustrate contrast between short and long vowels. Further contrasts are included in Appendix 3.

/a/ and /a:/

(90)	249	/jam <sup>3</sup> /	“die”
(91)	272	/ja:m <sup>3</sup> /	“cry, weep”
(92)	134	/ɲaŋ <sup>3</sup> /	“hear”
(93)	1565	/ɲa:ŋ <sup>3</sup> /	“sweet”
(94)	607	/raŋ <sup>3</sup> /	“smoked”
(95)	1188	/ra:ŋ <sup>3</sup> /	“flower”
(96)	798a	/k <sup>h</sup> a <sup>2</sup> /	“fish”
(97)	877a	/k <sup>h</sup> a: <sup>2</sup> /	“slave” <sup>29</sup>

/i/ and /i:/

(98)	1458a	/ci <sup>2</sup> /	“do/ make”
(99)	166	/ci: <sup>2</sup> /	“point” <sup>30</sup>

/o/ and /o:/

(100)	474	/to <sup>2</sup> /	“persuade”
(101)	37	/k.to: <sup>2</sup> /	“navel”

<sup>29</sup> Borrowed word from Tai Lue.

<sup>30</sup> Borrowed word from Tai Lue.

For Examples (96) and (97), speakers identified these words as being the same tone. However, the pitch of /k<sup>h</sup>a<sup>2</sup>/, “fish,” is higher than that of /k<sup>h</sup>a:<sup>2</sup>/, “slave,” which falls. Both are Tone 2.

Minimal pairs based on vowel length contrast frequently include borrowed words. The length contrast is clearest between long and short /a/ and /a:/.

Vowel length contrast is restricted by syllable structure (see Sections 4.2 and 5.2). Due to the restrictions on syllable structure, minimal pairs on the basis of vowel length contrast can only occur in two circumstances: between words which are open syllables occurring with Tone 2, or between syllables ending with sonorant finals (any tone, but there are far more Tone 3 syllables with sonorant finals than Tone 1 or Tone 2).

### 3.2.3.1 Lengthening of final sonorants

An interesting phenomenon was observed among sonorant final consonants. Nasals and the final lateral and central approximants /l, w, j/ (see Examples (102)-(109)) are usually audibly shorter after long vowels, and longer if preceded by short vowels, so that the overall syllable length appears equal. This final consonant lengthening did not appear to be contrastive. Although there were exceptions, and it was most easily heard in utterance-final syllables, there seemed to be a preference for a certain syllable length, with lengthened final consonants paired with short vowels.

(102)	1071	[p <sup>h</sup> ʎl: <sup>3</sup> ]	/p <sup>h</sup> ʎl <sup>3</sup> /	“fly”
(103)	1059	[p <sup>h</sup> .ju:l <sup>3</sup> ]	/p <sup>h</sup> .ju:l <sup>3</sup> /	“wing”
(104)	249	[jam: <sup>3</sup> ]	/jam <sup>3</sup> /	“die”
(105)	272	[ja:m <sup>3</sup> ]	/ja:m <sup>3</sup> /	“cry, weep”
(106)	1041	[c <sup>h</sup> im: <sup>3</sup> ]	/c <sup>h</sup> im <sup>3</sup> /	“bird”
(107)	731a	[cup <sup>2</sup> c <sup>h</sup> u:ŋ <sup>3</sup> ]	/cup <sup>2</sup> c <sup>h</sup> u:ŋ <sup>3</sup> /	“dye cloth”
(108)	140	[k <sup>h</sup> a:e <sup>3</sup> ]	/k <sup>h</sup> a:j <sup>3</sup> /	“eat”
(109)	571a	[k <sup>h</sup> ai: <sup>3</sup> ]	/k <sup>h</sup> aj <sup>3</sup> /	“fat (cow)”

An explanation for this might be available from Thai. Brown sees vowel length in Thai as “more a function of where the final consonant begins than where the vowel ends” (1979: 12). He uses a two-fold classification of Thai tones, the one-part tones: falling, low, and high dead in closed syllables, and the two-part tones: rising, mid, and high live in open syllables. After a short vowel, the final consonant begins earlier, in the first part, or head, of the tone; if a vowel is long, the final consonant begins in the second part, the tail (1979: 12).

Rungpat Roengpitya similarly found that vowel quality and length of final nasal consonants in Thai are secondary markers used to distinguish between short and long vowels. In particular, short vowels have longer nasal finals than long vowels, and a word with a long nasal final was more likely to be identified by the listener as having a short vowel (2002: 360).

Although Roengpitya deals only with nasals, perhaps a similar phenomenon could be at work with Muak Sa-aak final sonorants, especially since it has long been in direct contact with a Tai language.

### **3.3 Summary**

There are 22 consonants and 18 vowels in Muak Sa-aak as spoken in Wan Fai; 16 of the vowels are monophthongs and two are diphthongs. Although the literature available on the Angkuic languages suggests that there is no vowel length contrast in Angkuic languages, these vowels do include a length contrast, although most notable in the vowels /a/-/a:/. In syllables with final sonorants, the length contrast in the vowels seems to be reflected in a corresponding length variation (non-distinctive) in the finals, so that sonorant finals following short vowels are longer than sonorant finals following long vowels.

## Chapter #

### M a\$ Sa%aa\$ phonota!t"!&

This chapter will review the analysis of some ambiguous sequences, then give a brief description of general Muak Sa-aak word structure. After that, syllable types and their respective phoneme inventory will be described.

#### 4.1 Potentially ambiguous sequences

There are two groups of segments in Muak Sa-aak which are potentially ambiguous sequences. The first are the diphthongs /ia, ua/; the second is the final approximants /w, j/.

##### 4.1.1 Diphthongs

Since there are consonant clusters with /w/ in Muak Sa-aak, the diphthongs /ua/ and /ia/ were considered to be potentially ambiguous. These sequences are interpreted as diphthongs in this analysis for the following reasons. First, they are found in clear contrast with monophthongs. The sequence /ia/ does appear after consonant clusters, as in /kwian<sup>1</sup> k.tit<sup>2</sup>/ “acquaintance” and /k<sup>h</sup>riat<sup>1</sup> kriŋ<sup>2</sup>/, “clean”. Therefore, the first part of the ambiguous vowel sequence cannot be interpreted as a semivowel, since clusters with three consonants are not found in Muak Sa-aak. The diphthong /ua/ also occurs after a consonant cluster, seen in /k<sup>h</sup>ruan<sup>2</sup>/, “gather”, and is audibly clearly distinguishable from the approximant-vowel sequence /wa/ by the length of the first segment, as in /kuan<sup>3</sup>/, “hope”, vs. /kwan<sup>3</sup> s.ruan<sup>3</sup>/, “be lost”.

##### 4.1.2 Final approximants

The syllable-final semivowels (see examples in Table 28 below) could be interpreted as either vowels or semivowels. However, the ambiguous segments in question cannot be followed by stops, and syllable final consonant clusters are prohibited by Muak Sa-aak syllable structure. In addition, syllable-final

consonants are allowed in Muak Sa-aak phonotactics, so these ambiguous segments are interpreted as consonants.

Although some of these final semivowels are notably longer than others, this is not distinctive; therefore, length is not marked in the phonemic notation.

**Table 28. Final /-w, -j/**

a:j	6	[c <sup>h</sup> ak <sup>2</sup> ηa:j <sup>3</sup> ]	/c <sup>h</sup> ak <sup>2</sup> ηa:j <sup>3</sup> /	“eyeball”
aj:	1649a	[p <sup>h</sup> aj: <sup>3</sup> ]	/p <sup>h</sup> aj <sup>3</sup> /	“you (2D)”
ɣj:	549	[m.dɣj: <sup>3</sup> ka:j <sup>1</sup> ]	/m.dɣj <sup>3</sup> ka:j <sup>1</sup> /	“bead”
a:w	306	[sa:w <sup>1</sup> ha:w <sup>3</sup> ]	/sa:w <sup>1</sup> ha:w <sup>3</sup> /	“be fierce”
aw:	708	[saw: <sup>1</sup> t <sup>h</sup> ɛŋ <sup>3</sup> ]	/saw <sup>1</sup> t <sup>h</sup> ɛŋ <sup>3</sup> /	“bellows”
e:w	153	[le:w <sup>3</sup> ]	/le:w <sup>3</sup> /	“turn around” <sup>31</sup>

## 4.2 Overall word structure

Muak Sa-aak words follow general Mon-Khmer word structure in being mono- and sesquisyllabic. Taking into account main syllable structure, presyllables, and tone, the overall word structure can be represented as follows:

(C).C(C)V(C)<sup>T</sup>

Where C = Consonant, V = Vowel, . = Syllable boundary, <sup>T</sup> = Tone, and ( ) means the element is optional. Presyllable vowel and tone are not included in the formula, since they are non-contrastive (see Section 4.4, below).

Examples of the possible syllable and word structures are given in Table 29, below.

<sup>31</sup> Borrowed word from Tai Lue.

**Table 29. Syllable and word structures**

	Syllable Structure	Example	Gloss	Wordlist No.
1	CV <sup>T</sup>	/ci <sup>2</sup> /	“do”	702
2	CVC <sup>T</sup>	/puk <sup>2</sup> /	“rotten”	1250
3	CCV <sup>T</sup>	/kra: <sup>3</sup> /	“mat”	697
4	CCVC <sup>T</sup>	/k <sup>h</sup> rep <sup>2</sup> /	“fish scale”	1088
5	C.CV <sup>T</sup>	/k.tu <sup>2</sup> /	“nose”	11
6	C.CVC <sup>T</sup>	/k.can <sup>3</sup> /	“stand up”	151
7	C.CCV <sup>T</sup>	/t.krɔ <sup>2</sup> /	“peel/ shell”	1203/ 1204
8	C.CCVC <sup>T</sup>	/t.pru:t <sup>1</sup> /	“swallow”	145

### 4.3 Main syllable structure

The main syllable in Muak Sa-aak has a much wider variation in possible structure than does the presyllable. This includes the full range of consonants and of vowels. It may also have consonant clusters and final consonants, and there is a tonal contrast.

The main syllable has a structure of C(C)V(C)<sup>T</sup> as presented in this section. It can have any of the range of possible initial consonants in Muak Sa-aak, and any of the possible vowels. It can also include syllable-initial consonant clusters of a voiceless stop consonant (except the palatal or the unaspirated alveolar) plus either /r/, /w/ or /j/. Initial consonants are mandatory; there are no vowel-initial syllables. However, there are open syllables; these occur with all three tones, including both allotones of Tone 2:

C(C)V<sup>T</sup>

The vowel here may be short or long, since with the high allotone of Tone 2, this syllable structure can occur as an open syllable with short vowel; with other tones, it must be long.

#### 4.4 Presyllables

Muak Sa-aak word structure is mono- and sesquisyllabic; that is, many words consist of a main syllable preceded by presyllable. The presyllable in Muak Sa-aak consists of an initial consonant plus a very short vowel with predictable quality. The initial consonant inventory is very reduced, there are no consonant clusters, and there is no final consonant (although, when words are pronounced carefully, they may be realized with a final glottal stop).

The vowel occurring in presyllables is most commonly pronounced as a very short mid-centralized back vowel [ɤ̃]. There is also a short open central vowel [ǎ] if following the glottal stop or the bilabial nasal. but the actual pronunciation of the presyllable vowel may vary widely, from close vowels [ĩ] or [ũ]; sometimes it is deleted when following /m/ or /s/. Since neither tone nor vowel quality are distinctive in presyllables, they will be transcribed with only the contrastive initial consonant and a period (.) to mark the syllable break /C./.

With the exclusion of the palatal stops and the aspirated alveolar stop, only voiceless oral stops, the nasal /m/ and fricative /s/ can occur in this position. The eight possible initial consonants in presyllables are /p, p<sup>h</sup>, t, k, k<sup>h</sup>, ʔ, m, s/. Examples of these are shown in Table 30, below.

**Table 30. Presyllable onsets**

Stop			
624	p	/p.ja <sup>2</sup> /	“bag”
517	t	/t.pra <sup>2</sup> /	“to steal”
42	k	/k.ta <sup>1</sup> /	“back”
1456	p <sup>h</sup>	/p <sup>h</sup> .jet <sup>2</sup> /	“squeeze”
1106	k <sup>h</sup>	/k <sup>h</sup> .jak <sup>2</sup> /	“frog”
1107	ʔ	/ʔa <sup>1</sup> ro:k <sup>1</sup> /	“toad”
Nasal			
1386	m	/m.kɤt <sup>2</sup> /	“piece of wood”
Fricative			
1322	s	/s.mɤp <sup>3</sup> /	“star”

#### 4.5 Sesquisyllabicity in Muak Sa-aak

Section 2.1.1 outlined four types of sesquisyllabic languages, as described by David Thomas (1992). These categories are given again here.

Type (i): In this type, the presyllable is “only a predictable open transition between consonants. Phonemically it is a monosyllable” (1992: 206).

Type (ii): This type, “a slightly stronger sesquisyllabic form, has a contrast between the presence (CəC-) and the absence (CC-) of a vocalic contrast in certain environments” (1992: 207).

Type (iii): In this type, “the vocalic element has a contrast between two or three phonemes” (1992: 208).

Type (iv): In this type, “the vocalic element may have nearly full vowel contrasts in a weakly stressed minor syllable” (1992: 209).

Muak Sa-aak fits best into the first category, closest to being a monosyllabic language, where the presyllable serves essentially to place an open transition



between consonant combinations that are not allowed by the syllable structure. The structure for sesquisyllables is C.C(C)V(C)<sup>T</sup>. In comparison, the structure for main syllables can be summarized as C(C)V(C)<sup>T</sup>.

Permitted consonant cluster combinations in Muak Sa-aak are those of voiceless stops with the approximants /r/ or /w/. These sequences are not found in Muak Sa-aak as presyllable initial + main syllable initial. Examples (110) to (114) are presyllables which insert a vowel (marked here by a period) between consonant sequences that are prohibited by Muak Sa-aak phonotactic rules.

(110)	13	/k.c <sup>h</sup> o: <sup>1</sup> /	“ear”
(111)	42	/k.ta: <sup>1</sup> /	“back”
(112)	847	/s.ruaŋ <sup>3</sup> /	“path, road”
(113)	909	/p.krit <sup>2</sup> p.kra:c <sup>1</sup> /	“ghost”
(114)	1095	/p.sɤŋ <sup>3</sup> /	“snake”

The combinations p\_r\_, p<sup>h</sup>\_r\_, k\_r\_, k<sup>h</sup>\_r\_, do not occur in the data as combinations of presyllable initial plus main syllable initial consonants, but they do occur as consonant clusters (see Section 3.1.2). This is also consistent with Muak Sa-aak fitting into Thomas’s first category of sesquisyllabic languages, the languages which are closest to being monosyllabic. The predictable vowel insertion is only found for the consonant combinations that do not occur as consonant clusters, as shown in Examples (115) to (127) below.

Alveolar stop followed by approximant

(115)	1024a	t_w_	/t.wa:j <sup>3</sup> /	“tiger”
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Stop followed by consonant cluster

(116)	908a	p_kr_	/p.krit <sup>2</sup> ma <sup>1</sup> muuk <sup>2</sup> /	“evil spirit”
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(117)	31	t_pr_	/t.pra:ŋ <sup>3</sup> /	“shoulder”
-------	----	-------	-------------------------	------------

Fricative followed by a stop consonant

(118)	1555	s_p_	/s.pual <sup>3</sup> /	“white”
-------	------	------	------------------------	---------

Stop consonant followed by a fricative consonant

(119)	921	p_s_	/p.sat <sup>2</sup> /	“curse” (n)
(120)	723	k_s_	/k.sə: <sup>1</sup> /	“chisel” (n)
Stop consonant followed by a nasal consonant				
(121)	1279	t_ŋ_	t.ŋaŋ <sup>3</sup>	“iron”
Stop consonant followed by another stop consonant				
(122)	15	p_t_	/p.tɤŋ <sup>3</sup> /	“mouth”
(123)	1373	p_c_	/p.ca: <sup>1</sup> /	“tomorrow”
(124)	42	k_t_	/k.ta: <sup>1</sup> /	“back”
(125)	83	k_t <sup>h</sup> _	/k.t <sup>h</sup> uam <sup>3</sup> /	“liver”
(126)	665	k_c <sup>h</sup> _	/k.c <sup>h</sup> aŋ <sup>3</sup> /	“door”
(127)	79	k_ʔ_	/k.ʔa:ŋ <sup>3</sup> ta:j <sup>1</sup> /	“spine, backbone”

#### 4.6 Compounds

In the data elicited for the wordlist, there are many examples of terms, such as Examples (128) to (130), which are more than two syllables. For the most part, these are easily explained by either compounding or the use of a phrase, as each syllable has a meaning by itself.

(128)	551	/mul <sup>3</sup>	t <sup>h</sup> i <sup>2</sup> /	“bracelet”	
		silver	hand		
(129)	7	/k.ʔual <sup>3</sup>	k.t <sup>h</sup> et <sup>2</sup> /	“earthenware cooking pot”	
		pot	earth		
(130)	10	/c <sup>h</sup> ak <sup>2</sup>	ŋa:j <sup>3</sup>	laŋ <sup>3</sup> /	“pupil” (eye)
		seed	eye	black	

In Examples (131) to (133), the first syllable is probably not a presyllable, as the vowel quality is clearly [a:], and it has a more stress and length than is normal for a presyllable. In these words, moreover, one might suggest a theme of “location”.

(131)	1655a	/ʔa:¹ jɛn²/	“there (closest)”
(132)	1655c	/ʔa:¹ juaj²/	“there (farthest)”
(133)	1686	/ʔa:¹ mɤ²/	“where?”

The word is found in at least two more words in the data, Examples (134) and (135):

(134)	1429	/wɤl³ ʔa:¹/	“drop” (tr.)
(135)	1432	/bup² ʔa:¹/	“knock down/ over”

In (134) and (135), the morpheme is found in a different position than it was in Examples (131) to (133).

There are only a few words in the data which are truly of more than one syllable, but which also appear to be single-morphemes, and not compound words. These are borrowed words from Tai Lue, as seen in the following Examples, (136) and (137).

(136)	324	/ʔun³ tra:j³/	danger	Tai Lue:	/ʔun⁴ ta laaj⁴/ <sup>32</sup>
(137)	257	/pan¹ ja:³/	wisdom	Tai Lue:	/pan¹ jaa⁴/

#### 4.7 Summary

There are several possible ambiguous segments in Muak Sa-aak. Of these, syllable-final /j/ and /w/ are analyzed as consonants because they do follow vowels and because Muak Sa-aak does have other final consonants. Vowel sequences of /ia/ or /ua/ have been analyzed as diphthongs which pattern as long vowels. They occur following consonant clusters, including clusters containing the approximant /w/.

The presyllable in Muak Sa-aak has no contrast in the tone or the vowel. It serves essentially to place an open transition between consonants which are not permitted as consonant clusters. Therefore although the language is sesquisyllabic, it is actually very close to being monosyllabic. The word structure may be summarized as (C.)C(C)V(C)<sup>T</sup>. The most common syllable types are CVC<sup>T</sup>, C.CVC<sup>T</sup>, and CV<sup>T</sup>. The least common is C.CCV<sup>T</sup>.

<sup>32</sup> Hudak 1996

## Chapter 5

### Muak Sa-aak tones

Muak Sa-aak is a tonal language, with three tones which will be described in this chapter. The tones are closely linked with syllable structure. Because the existing literature on Angkuic languages suggests that tone in Angkuic languages develops out of vowel length, resulting in a loss of contrastive vowel length, tone presents a special problem in the phonology. Muak Sa-aak is tonal, yet it retains contrastive vowel length; it has a vowel inventory approximately twice as big as would be expected in an Angkuic language with tone, such as U (see Section 2.1.2). Therefore this chapter will present the tones found in Muak Sa-aak, then examine the relationship of tone to syllable structure, and finally present a discussion of tonogenesis.

#### 5.1 Tones

In Muak Sa-aak, there are three distinctive tones, a low tone, a checked tone, and a falling tone. All main syllables have one of these. Presyllables do not display tonal contrast; although speakers labeled them all as Tone 1, the fact that they routinely identified them as the same tone shows that there is no contrast in tone.

In Muak Sa-aak, voice quality is not distinctive but is an accompanying feature of tone. This is most apparent in words with long vowels. Except for the falling Tone 3, these voice qualities are not produced consistently and showed a high degree of both intra- and interspeaker variation.

##### 5.1.1 Low tone: Tone 1

The first tone, Tone 1, is a low tone. In one of the four recorded speakers (Speaker D), it tends to rise a little. In some words it is realized with stiff voice, a tight, tense phonation type which is more tense than modal voice but less tense

than creaky voice<sup>33</sup> such as in Example (138), below. In that example, /t<sup>h</sup>a:k<sup>1</sup>/, “tongue” was often pronounced with even creaky voice, [t<sup>h</sup>ǣ:k<sup>1</sup>]. However, no contrast could be identified based on voice phonation, and this phonation was not even heard consistently with the same word and the same speaker on different occasions.

(138)	17	/t <sup>h</sup> a:k <sup>1</sup> /	“tongue”
(139)	987	/le:k <sup>1</sup> /	“pig”
(140)	1100	/t.lɿ: <sup>1</sup> /	“lizard”
(141)	1313	/c <sup>h</sup> a:j <sup>1</sup> /	“sky”
(142)	1408	/li: <sup>1</sup> /	“come out, exit”
(143)	1493	/rɿ:m <sup>1</sup> /	“fade”
(144)	1499	/naj <sup>1</sup> /	“melt” <sup>34</sup>

Tone 1 occurs only in long syllables: syllables with long vowels or diphthongs (regardless of final consonant), or short vowels if followed by a sonorant final.

Presyllables form an exception in that they do have short vowels, and no final consonant; they do not display tonal contrast, but if asked, speakers consistently identify them as having this tone. This suggests that Tone 1 may be the default tone; as Yip describes, tone languages may be considered to have a default, or unmarked, tone, and another tone or tones which are marked (Yip 2002: 62).

The final lateral occurs only rarely and the final palatal nasal does not occur with this tone. Although the other final nasals do occur with this tone, they occur more frequently with the falling Tone 3; those occurring with Tone 1 are commonly borrowed words (see Section 6.1.3). Syllable rhymes which occur with Tone 1 in the data are shown in Table 31.

<sup>33</sup> See Ladefoged and Maddieson (1996: 48-50) for further discussion of these voice phonation types.

<sup>34</sup> Probably a borrowed word from Tai Lue.

**Table 31. Tone 1 rhymes**

	p	t	c	k	m	n	ɲ	ŋ	l	j	w	(open)
i						in		iŋ				
i:	i:p	i:t										i:
e										e:j		
e:	e:p	e:t		e:k		e:n						e:
ɛ											ɛw	
u						un		uŋ				
u:	u:p	u:t	u:c		u:m			u:ŋ				u:
ʌ						ʌn		ʌŋ	ʌl	ʌj		
ʌ:		ʌ:t		ʌ:k	ʌ:m	ʌ:n		ʌ:ŋ				ʌ:
a					am	an		aŋ	al	aj	aw	
a:	a:p	a:t	a:c	a:k	a:m	a:n		a:ŋ		a:j	a:w	a:
u					um	un		uŋ	ul			
u:	u:p	u:t		u:k		u:n		u:ŋ	u:l			u:
o					om					oj		
o:	o:p	o:t	o:c	o:k		o:n		o:ŋ		o:j		o:
ɔ						ɔn		ɔŋ		ɔj		
ia	iap	iat	iac	iak	iam	ian		iaŋ			iaw	
ua	uap	uat		uak	uam	uan		uaŋ		uaj		ua

### 5.1.2 Checked tone: Tone 2

Tone 2 occurs only on checked syllables, and has two allotones in complementary distribution: high tone on short syllables, and high falling tone on long syllables. The first allotone is a high tone. It occurs only with syllables that have short vowels, with either stop final consonants or a phonetic glottal stop.

The high-falling allotone occurs less frequently. It occurs in phonologically open syllables with long vowels, or in closed syllables which have either long or short vowels followed by sonorant finals. This allotone has very creaky voice, and long vowels with this allotone of Tone 2 are slightly shorter than long vowels with either Tone 1 or Tone 3.

With the falling allotone, there are no final stop consonants other than the glottal stop. All syllable types with this allotone can occur with a final glottal stop; however, final glottal stop occurs only with Tone 2 (either allotone), and should be considered a suprasegmental feature of this tone.

There is a complementary distribution between the types of syllables which can occur with the high allotone of Tone 2, and the types which may occur with the

falling allotone (Table 32, below). The two allotones are identified by speakers as being the same tone.

**Table 32. Tone 2 final consonant types distribution by allotone**

	High allotone (short)	High-falling allotone (long)
Open syllable-short vowel	X	
Open syllable-long vowel		X
Stop consonant finals	X	
Nasal consonant finals		X

Examples (145)-(149) are words with short vowels and the high allotone of Tone 2.

(145)	802	/rɤp <sup>2</sup> /	“fishing net”
(146)	50	/t <sup>h</sup> i <sup>2</sup> /	“arm”
(147)	136	/sut <sup>2</sup> /	“smell” <sup>35</sup>
(148)	806	/pa <sup>2</sup> /	“have”
(149)	991	/c <sup>h</sup> ɔ <sup>2</sup> /	“dog”

Examples (150)-(153) are words which take the falling allotone of Tone 2.

(150)	1143	/p <sup>h</sup> rɤ:ŋ <sup>2</sup> /	“bee” <sup>36</sup>
(151)	1130	/cu: <sup>1</sup> ci: <sup>2</sup> /	“dung beetle” <sup>37</sup>
(152)	1370	/p.ni: <sup>2</sup> /	“today”
(153)	1461	/ma:ŋ <sup>2</sup> /	“destroy, spoil” <sup>38</sup>

<sup>35</sup> There is a Tai Lue word /sew<sup>1</sup>/, “to have a strong odor” (Hudak 1996: 851). The initial consonant is similar, but the original source of this word is not clear.

<sup>36</sup> Probable borrowed word from Tai Lue, although in Tai Lue it is /ph/, not /phr/.

<sup>37</sup> Probable borrowed word from Tai Lue.

<sup>38</sup> Borrowed word from Tai Lue.

A problem with these examples is that all but one are probably borrowed words. This is characteristic of words with this allotone of Tone 2, and will be discussed further in Chapter 6.

Syllable rhymes found in the data for Tone 2 are shown in Table 33.

**Table 33. Tone 2 rhymes**

	p	t	c	k	m	n	ɲ	l	j	w	(open)
i	ip	it	ic	ik		in	iŋ			iw	i
i:											i:
e		et		ek			eŋ				e
e:											e:
ɛ	ɛp	ɛt		ɛk	ɛm	ɛn	ɛŋ				
ɯ			ɯc	ɯk							ɯ
ɯ:											
ɤ	ɤp	ɤt	ɤc	ɤk		ɤn	ɤŋ				ɤ
ɤ:							ɤ:ŋ				
a	ap	at		ak	am	an	aŋ		aj	aw	a
a:					a:m	a:n	a:ŋ		a:j	a:w	a:
u	up	ut	uc	uk	um		uŋ	ul			u
u:											u:
o	op	ot		ok	om		oŋ		oj		o
o:					o:m	o:n			o:j		
ɔ	ɔp	ɔt		ɔk		ɔn					ɔ
ia	iap	iat				ian	iaŋ			iaw	
ua					uam	uan	uaŋ		uaj		ua

### 5.1.3 Falling tone: Tone 3

Falling Tone 3 has modal voice and is a high falling tone. Examples (154) to (162) take this tone. This tone does not occur with stop final syllables but only on live syllables. Open syllables do not show a vowel length contrast in this tone; they are all long vowels. The final palatal nasal /ɲ/ occurs only in syllables with this tone, and only with short vowels in the data collected. The majority of words ending with the lateral approximant /l/ also occur with this tone. Table 34 shows the rhymes found in the data for Tone 3.

- (154) 1024a /t.wa:j<sup>3</sup>/ “tiger”
- (155) 140 /k<sup>h</sup>a:j<sup>3</sup>/ “eat”
- (156) 1384 /t.po:l<sup>3</sup>/ “night”



(157)	725	/kual <sup>3</sup> /	“sew”
(158)	1565	/ŋa:ŋ <sup>3</sup> /	“sweet”
(159)	134	/ŋaŋ <sup>3</sup> /	“hear”
(160)	1095	/p.sɤŋ <sup>3</sup> /	“snake”
(161)	820	/fe: <sup>3</sup> /	“buy”
(162)	562	/t <sup>h</sup> u: <sup>3</sup> /	“apply, besmear”

**Table 34. Tone 3 rhymes**

	p	t	c	k	m	n	ɲ	ŋ	l	j	w	(open)
i					im	in		iŋ	il		iw	
i:						i:n		i:ŋ	i:l			i:
e											ew	
e:						e:n		e:ŋ	e:l		e:w	e:
ɛ						ɛn	ɛɲ	ɛŋ	ɛl			
u					um		uɲ			uj		
u:					u:m	u:n		u:ŋ	u:l	u:j		u:
ɤ					ɤm	ɤn	ɤɲ	ɤŋ	ɤl			
ɤ:					ɤ:m	ɤ:n		ɤ:ŋ	ɤ:l	ɤ:j		ɤ:
a					am	an	aɲ	aŋ	al	aj	aw	
a:					a:m	a:n		a:ŋ	a:l	a:j	a:w	a:
u					um	un	uɲ	uŋ	ul			
u:					u:m	u:n		u:ŋ	u:l	u:j		u:
o						on	oɲ	oŋ		oj		
o:					o:m	o:n		o:ŋ	o:l	o:j		o:
ɔ						ɔn	ɔɲ	ɔŋ		ɔj		
ia					iam	ian		iaŋ	ial		iaw	
ua					uam	uan		uaŋ	ual	uaj		ua

## 5.2 Syllable structures and tones

This section will revisit syllable structure, to examine the correlation of syllable structure with tone. There are clear restrictions on the distribution of each tone according to syllable structure.

The environments and laryngeal features of the three tones of Muak Sa-aak can be summarized as follows:

Low Tone 1: with stop finals, sonorant finals, or open syllables (dead or live syllables) but only long syllables.

Checked Tone 2: every syllable type, except that long syllables do not occur with stop finals; creaky voice. Within this tone, only the high, short allotone (with short vowels) occurs with stop final consonants.

Falling Tone 3: in long and short syllables, but only sonorant finals or open syllables (live syllables).

Syllables with nasal finals, including the palatal nasal, which does not occur in borrowed words from Tai Lue, occur primarily with Tone 3. Some of these also occur with Tone 1 or Tone 2; however, many of these are borrowed words from Tai Lue, and it is hard to find minimal pairs with native words. A possible explanation would be that the occurrence of nasal finals with low Tone 1 or checked Tone 2 is a result of borrowing. It would be expected that checked Tone 2 would occur with syllables having long vowel and stop final, but it does not. Tone in Muak Sa-aak does not seem to have a high functional load, as there are not many minimal pairs found in the data, probably because of the correlation between tone and syllable structure.

The syllable types which are found with each tone are summarized in Table 35.

**Table 35. Tone and syllable type**

Syllable type	Tone 1	Checked Tone 2		Tone 3 Falling
	Low	High	Falling	
short vowel + stop		X		
long vowel + stop	X			
short open syllable		X		
vowel + sonorant or long open	X		X	X

Various minimal pairs were found based on tone. Two full sets of minimal pairs, based upon tone plus vowel length, are shown in Tables 36 and 37, below. Note the asterisk \* marks words that are borrowed from Tai Lue.

**Table 36. Tone and vowel contrast in nasal final syllables**

	Short vowel		Long vowel	
Tone 1	/raŋ <sup>1</sup> /	“rich”	/ra:ŋ <sup>1</sup> /	“no one there”*
Tone 2	/raŋ <sup>2</sup> /	“field with no-one working it”*	/ra:ŋ <sup>2</sup> /	“leave/ separate”*
Tone 3	/raŋ <sup>3</sup> /	“shining” [of the sun]	/ra:ŋ <sup>3</sup> /	“flower”

**Table 37. Tone and vowel contrast in open syllables**

	Short vowel		Long vowel	
Tone 1	(not possible)		/ci: <sup>1</sup> /	“sap”
Tone 2	/ci <sup>2</sup> /	“do, make”	/cu <sup>1</sup> ci: <sup>2</sup> / /ci: <sup>2</sup> /	“dung beetle”* “point”*
Tone 3	(not possible)		/cu <sup>1</sup> ci: <sup>3</sup> /	“make a hole”*

Open syllables with short vowels can occur, but only with Tone 2; they cannot occur with Tone 1 or Tone 3.

These tone contrasts do include borrowed words from Tai Lue. It is difficult to get tone contrasts between all of the tones without involving borrowed words, since tone is linked to syllable structure, particularly final consonants. The links between tone and syllable structure may also be seen in Table 38, below, showing examples of syllable structures which can occur with each tone. Tone, vowel length, and final consonant type are all linked together.

**Table 38. Correlation of Muak Sa-aak syllable structures and tones**

	Tone 1 (low)	Tone 2 (checked)	Tone 3 (falling)
CV <sub>S</sub> S	/pɤl <sup>1</sup> / “fall”	/kan <sup>2</sup> / “be defeated”*	/kam <sup>3</sup> / “language”*
CCV <sub>S</sub> S	/k <sup>h</sup> u:³ kran <sup>1</sup> / “lazy”	/p <sup>h</sup> rɤŋ <sup>2</sup> / “clam”	/prɛŋ <sup>3</sup> / “head”
CV <sub>L</sub> S	/kɤ:n <sup>1</sup> / “before”*	/kuan <sup>2</sup> / “bottle”	/ka:ŋ <sup>3</sup> / “house”
CCV <sub>L</sub> S	/krɤ:n <sup>1</sup> / “lying down”	/k <sup>h</sup> ruan <sup>2</sup> / “gather”	/kri:l <sup>3</sup> / “skinny”
CV <sub>S</sub> P	--	/kat <sup>2</sup> / “burn”	--
CCV <sub>S</sub> P	--	/prɛt <sup>2</sup> / “lick”	--
CV <sub>L</sub> P	/kat <sup>1</sup> / “fasten”	--	--
CCV <sub>L</sub> P	/t.pru:t <sup>1</sup> / “swallow”	--	--
CV <sub>S</sub>	--	/ke <sup>2</sup> / “they (3PL)”	--
CCV <sub>S</sub>	--	/kra <sup>2</sup> / “stir”	--
CV <sub>L</sub>	/ke:¹/ “pour”	/pɔ:¹ ka:²/ “trader”*	/ka:³/ “pack (v)”
CCV <sub>L</sub>	/pra:¹/ “split open”	---	/kra:³/ “mat”

\*Borrowed words from Tai Lue

S = Sonorant final P = stop final V<sub>S</sub> = Short vowel V<sub>L</sub> = Long vowel

### 5.3 Tonogenesis

Muak Sa-aak has developed three tones. The development of tone appears to be correlated not only to vowel length, but to final consonant type. The following subsections will review the known factors that may be influencing the development of tone in Angkuic languages, and then suggest a hypothesis regarding how tone may have developed in Muak Sa-aak.

#### 5.3.1 Impact of initial consonants

There are two groups of initial consonants that have been used to differentiate Angkuic languages from other Eastern Palaungic languages. These are the retention of a distinction between the proto \*h- and \*s- initials, and aspirated initial oral stop

consonants. In addition to distinguishing Angkuic languages from other Eastern Palaungic languages, the aspirated stops also play an important role in tonogenesis.

### 5.3.1.1 Maintenance of the initial \*h-, \*s- contrast

The proto \*h- and \*s- initial fricatives merged into one glottal initial fricative, h- in Palaungic languages today, except for the Angkuic languages and Danaw. According to Diffloth, in Angkuic languages, the distinction between the proto \*h- and \*s- initials is maintained as (h)s- and h-; in Danaw this is also maintained, but the \*s- became θ- (1977: 42). Diffloth discusses this using Angku and Ya-Ang Lawa as examples for Angkuic languages; Svantesson also addresses these initial consonants in his discussion of Hu, but is unable to elicit any vocabulary with the \*h- initial (1991: 69). Table 39, below, compares Muak Sa-aak data to the words given by Diffloth (1977: 46-47). In the Muak Sa-aak data studied here, only one item was found with the \*h- initial. The \*s- which is lost in most of Palaungic is maintained in Muak Sa-aak as /s-/, in contrast to /h-/.

**Table 39. Development of proto \*h-, \*s- initials in Palaungic languages (Diffloth 1977: 46-47)<sup>39</sup>**

Angku s- or hs-, Danaw θ-, other Palaungic h-				
	Angku	Danaw	Other Palaungic (Palaung)	Muak Sa-aak
“hair” (body)	suk, hsuk	---	hǔ	/suk <sup>2</sup> /
“thick”	hsut, asút	---	hăt	/k.sɯt <sup>2</sup> /
“to bathe”	sǔm	θɔn	hūm, hōm	/sum <sup>3</sup> /
h- in all languages <sup>40</sup>				
	Angku	Danaw	Other Palaungic	Muak Sa-aak
“clever”	han	---	hiang (Lawa)	/hat <sup>2</sup> ha:n <sup>3</sup> /

<sup>39</sup> The words given from languages other than Muak Sa-aak are not marked as phonemic or phonetic transcription because it is not clear from the source.

<sup>40</sup> Diffloth (1977: 47) does give more examples for /h-/ initial; they are not included here because the Muak Sa-aak word has been replaced by borrowed words from Tai Lue and is no longer useful for this comparison, or is not cognate.

### **5.3.1.2 Aspirated stops**

As discussed in Section 2.2.3.2, Svantesson states that the Angkuic languages do not follow the model of registrogenesis or of tonogenesis based primarily on a devoicing of voiced initial consonants. They had already undergone a shift in their initial consonants, causing contrast between voiceless and aspirated initials, instead of a contrast between voiced and voiceless initial consonants (1991: 67-68). Angkuic languages therefore have many aspirated stops in places where other Palaungic languages (belonging to branches other than Angkuic, i.e. Waic or Lametic) have voiceless unaspirated stops. Muak Sa-aak follows this Angkuic pattern, as shown in Table 40, below.

**Table 40. Germanic shift<sup>41</sup> in initial consonants: Muak Sa-aak compared to Hu, U, Lamet, Northern Kammu, and Southern Kammu [Khmu]<sup>42</sup> (adapted from Svantesson 1991: 68)<sup>43</sup>**

Muak Sa-aak	Hu	U	Lamet	Northern Kammu	Southern Kammu	
*voiceless						
/p <sup>h</sup> ɲ <sup>3</sup> /	phíɲ	phèt	píɲ	píɲ	piɲ	“to shoot”
/tam <sup>1</sup> /	thàɲ	thán	táaɲ	táaɲ	taaɲ	“to weave”
/k <sup>h</sup> a:p <sup>1</sup> /	khàp	khap	káap	káap	kaap	“jaw”
*voiced						
/s.pua <sup>3</sup> /	pàɲ	pán	pàaɲ	--	--	“white”
/pri <sup>2</sup> /	pɸíʔ	qí	priiʔ	priʔ	briʔ	“forest”
/puɯ <sup>2</sup> ta:k <sup>1</sup> /	phltàk <sup>44</sup>	ʔatǎʔ <sup>45</sup>	pltàak	ktáak	kdaak	“palm (of hand)”
/ka:ɲ <sup>3</sup> /	kàɲ	káã	---	kàaɲ	gaɲ	“house”
/kak <sup>2</sup> /	kák	kàk	kàk	--	--	“to bite”

Table 40 is adapted from Svantesson’s study on Hu (1991), where he compares it to U, Lamet, and two dialects of Kammu [Khmu]. Lamet is classified in the SIL Ethnologue as Eastern Palaungic. Kammu, or Khmu, is classified in the Khmuic branch of Mon-Khmer (Lewis 2009). In these examples, only Muak Sa-aak, Hu and

<sup>41</sup> See Section 2.2.2.2 for discussion of this “Germanic” shift; in this shift, voiced initial stops become voiceless unaspirated stops, and voiceless initial stops have become aspirated voiceless stops.

<sup>42</sup> Suwilai Pemsrirat and Jan-Olof Svantesson use different spellings for this language, “Khmu” (Suwilai) and “Kammu” (Svantesson) and slightly different terminology for the dialects. Suwilai’s work in “Khmu” is discussed in Section 2.2.2.1.

<sup>43</sup> It is not entirely clear how phonemic Svantesson’s data is from which this table is adapted. In the article on Hu where this comes from, he does state that his material was not enough for a complete analysis (1991: 67), and his article on U states that at least parts of his transcription may be subphonemic (1988: 69). Therefore the data in Table 40 is not marked with // or [ ].

<sup>44</sup> Svantesson does not appear to include either presyllable vowels or hyphens in his transcriptions in Hu, Lamet, Northern Kammu, and Southern Kammu to distinguish presyllable consonants from main syllable consonants; these apparent consonant clusters in “palm of hand” are presyllable consonants plus main syllable initials, that is, /phl-tàk/. In this case, /h/ designates aspiration.

<sup>45</sup> The final consonant /ʔ/ is a voiced pharyngeal approximant (Svantesson 1988: 71).

U have aspirated initial stops. Lamet, which is a Palaungic language but does not belong to the Angkuic branch, has initial voiceless unaspirated stops like Khmu, which is not Palaungic, but along with the Palaungic languages is Northern Mon-Khmer. Therefore, Muak Sa-aak appears to behave like the Angkuic languages Hu and U in this area.

Svantesson (1991: 67 and 1988: 87) and Diffloth (1991: 19) both contend that the Angkuic languages follow a different route of tonogenesis from the other Palaungic languages, where tonogenesis or registrogenesis follows the pattern of loss of initial consonant voicing distinction. They contend that Angkuic tonogenesis is primarily based on vowel length. It seems reasonable to expect that, like Hu and U, Muak Sa-aak probably does not follow the model of registrogenesis and/or tonogenesis based primarily on changes in initial consonants, as outlined in Sections 2.2.2.1 above.

### 5.3.2 Impact of syllable coda

Originally Angkuic languages are believed to have had an initial consonant voicing distinction (voiced/ voiceless), like other Mon-Khmer languages. They would also have been atonal and without a register distinction. Typically Mon-Khmer languages possess a short-long vowel contrast as well, or are believed to have possessed one at some point. Many of the Mon-Khmer languages have undergone changes resulting in loss of the initial voicing distinction and development of register or tonal contrast, such as Bru, Cambodian,<sup>46</sup> or the western dialects of Khmu.<sup>47</sup> Some in the Palaungic languages, such as Hu and U, have lost vowel length contrasts.<sup>48</sup>

It is suggested that Angkuic languages underwent a Germanic shift,<sup>49</sup> replacing the initial consonant voicing distinction with an aspirated/ unaspirated distinction. Tonogenesis came later, and has replaced an earlier vowel length distinction. In Hu, this has resulted in a simple 2-tone system whose origins can be fully explained by the transfer of vowel length distinction to tonal distinction (Svantesson 1991: 67). Table 14 from Section 2.2.2.4 is presented again below, in Table 41. Again, Svantesson used the Lamet data for comparison, since it preserves the vowel length distinction.

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<sup>46</sup> See Section 2.2.1 for discussion, and Huffman (1976: 587).

<sup>47</sup> See Section 2.2.2.1 for discussion, and Suwilai (2001: 49).

<sup>48</sup> See Section 2.2.2.4 for discussion of vowel length in Angkuic languages, and also Svantesson (1988: 78-79), (1991: 71-72) and Diffloth (1991: 19).

<sup>49</sup> See discussion in Sections 2.2.2.2.



**Table 41. Development of vowel length and tones in Hu; in comparison with Lamet (Svantesson 1991: 72)<sup>50</sup>**

	Hu <sup>51</sup>	Lamet <sup>52</sup>	
Short vowels	yám	yàm	“to die”
	paθán	phán	“five”
	méɲ	krmìɲ	“star”
	ncén	kcèn	“heavy”
Long vowels	yàm	yàam	“to cry”
	lèk	lìik	“pig”
	ʔəm	ʔóom	“water”
	nasòk	yóok	“ear”

In U, final consonants have also affected the resulting tonal system, so that as many as four tones have resulted (1988: 74, 86). Table 15 from Section 2.2.2.4, showing the development of tones in U from vowel length plus final consonants, is given here again below, as Table 42. As with Hu, Svantesson uses Lamet data for comparison because it retains the Proto-Palaungic vowel length distinctions (Svantesson 1988: 77).

<sup>50</sup> See Footnote 15, page 27.

<sup>51</sup> See Footnote 16, page 27.

<sup>52</sup> See Footnote 17, page 27.

**Table 42. Summary of U tonal development, shown in comparison to Hu and Lamet (Svantesson 1988: 87-92)<sup>53</sup>**

Syllable type <sup>54</sup>	Tone <sup>55</sup>	U <sup>56</sup>	Hu	Lamet	
1) Originally short vowel, voiced sonorant coda. Original nasals --> stops.	Low	yàp phèt ɲàw	yám phǎɲ ɲàl	yàm pǎɲ ɲàl	“to die” “shoot” “fire”
2) Originally short vowel followed by stop or *-s	High	khát súʃ sé	khát θúk khasét	kát khúk krsás	“cold” “hair” “charcoal”
3) Originally long vowel followed by stop or *-s	Rising	lăt qhǎʃ sǔʃ	--- thwək nasòk	láat tráak yóok	“to fear” “buffalo” “ear”
4) Originally open syllable or long vowel followed by sonorant; all prevocalic consonants are sonorants <sup>57</sup>	Falling	mâ mî yâm	mà mé? yàm	màar mii? yàam	“field” “you” “to cry”
5) Originally long vowel followed by a sonorant; a voiceless obstruent is among prevocalic consonants.	High	thám pán sáw	--- pàɲ ---	ktáam pàaɲ háaw	“crab” “white” “to climb”
6) Originally open syllable and a voiceless obstruent among the prevocalic consonants; high vowel.	High	ʔí nchí ɲkú	ʔí nsí? ---	ʔii? sí? ɲkùu?	“people” “louse” “skin”
7) Original open syllable and a voiceless obstruent among prevocalic consonants; non-high vowel	Low	khà là salè	--- lá? salé?	káa? lá? slèɛ?	“fish” “leaf” “rain”
8) Some words do not end in a stop or ʔ, but have a rising tone; all have or once had a palatal final.	Rising	saɲǐ ʔǎn ʔǎy	ɲí? kaʔaɲ ʔày	sɲii? kʔaaɲ ʔáay	“day” “wasp” “we (dual)”
9) Most words with final *h	Falling	---	---	---	<sup>58</sup>

<sup>53</sup> See Footnote 18, page 29.

<sup>54</sup> See Footnote 19, page 29.

<sup>55</sup> “Tone” refers to the tone in U.

<sup>56</sup> Svantesson uses /h/ to denote aspiration, and /y/ for the sound represented by /j/ in the IPA. As mentioned in Section 2.1.3.2, /ʃ/ denotes a voiced pharyngeal approximant (Svantesson 1988: 72).

<sup>57</sup> See Footnote 21, page 29.

<sup>58</sup> No examples given in Svantesson 1988.

Although Diffloth (1991: 19) suggests that tonogenesis in Angkuic languages comes primarily from vowel length, Muak Sa-aak appears to have developed tone while retaining features of vowel length, although the functional load of length does not seem to be high, since there are few minimal pairs based on length distinction. Instead, Muak Sa-aak has developed tone partly out of vowel length, partly out of final consonants (something described by Svantesson in U), and perhaps partly also due to borrowing.

Svantesson in his study of U compared his data to a list of Lamet data, since Lamet, unlike many other Palaungic languages, still retains the vowel length distinction (Svantesson 1988: 77). He used this to see what happened to the vowel length in U, and to show that it was one of the main factors involved in tonogenesis. Therefore, in Sections 5.3.2.1- 5.3.2.4, this data from Muak Sa-aak was compared with the Lamet data given by Svantesson in his study of U (Svantesson 1988: 107-122).

#### **5.3.2.1 Final nasals and lateral approximants**

In Muak Sa-aak, tonogenesis seemed to be only partially affected by vowel length. Most final nasals and lateral approximants seem to have retained their vowel length contrast and were the same tone, the falling Tone 3, regardless of vowel length. Within this tone, vowels that were short in Lamet, were short, and vowels that were long in Lamet were long in Muak Sa-aak, as seen in Table 43.

**Table 43. Vowel length: Muak Sa-aak, Lamet, U (Lamet and U from Svantesson 1988, 107-122)<sup>59</sup>**

	Muak Sa-aak	Lamet <sup>60</sup>	U (Angkuic)
“dry field”	/ma:l <sup>3</sup> /	màar	mâ
“black”	/laŋ <sup>3</sup> /	lèŋ	làŋ <sup>61</sup>
“iron”	/t.ŋaŋ <sup>3</sup> /	rŋàŋ	?aŋàŋ
“eye”	/ŋa:j <sup>3</sup> /	ŋàay	ŋây
“arrow”	/te: <sup>3</sup> /	tèey	tè
“belly, stomach”	/k.tɿl <sup>3</sup> /	ktil	tû

It can be seen that the vowel length in the Muak Sa-aak Tone 3 words here (Table 43) matches with the corresponding Lamet words, short or long. The U words, however, all have short vowels in this position; the length contrast has been lost as U developed tones.

### 5.3.2.2 Glottalized short open syllable

The words which took the short allotone of Tone 2, and did not end in a stop final correlate to Lamet words with final glottal stops. However, many of these Lamet words had long vowels. So if the Lamet vowel was short, the Muak Sa-aak word was the high allotone of checked Tone 2, with the short vowel. If the vowel is long in the Lamet cognate, in most cases, the Muak Sa-aak vowel here is also short, and again, it is the high allotone of checked Tone 2 as well. It appears that the length contrast here in Muak Sa-aak has been lost, but it is not reflected in a tone contrast, resulting in a neutralization of an earlier contrast. Examples are shown in Table 44, below (Section 5.3.2.3)

<sup>59</sup> Svantesson’s transcription of U in this article is probably not entirely phonemic (Svantesson 1988: 69); he does not discuss this for Lamet and most transcription is not marked with // or [ ]. Therefore the items from U and from Lamet are not marked with // or [ ].

<sup>60</sup> In Svantesson’s transcription for Lamet and for U, there does not seem to be any syllable break marked between the presyllable and main syllable; he does not necessarily write any vowel in the presyllable. Thus rŋàŋ in Lamet might be written as r-ŋàŋ, or ?aŋàŋ in U might be written ?a-ŋàŋ.

<sup>61</sup> Svantesson describes /ŋ/ as a voiced pharyngeal approximant (1988: 72). See Section 2.1.3.2 for discussion.

### 5.3.2.3 Final stops

Final non-glottal stops form a contrast to final glottal stops. If the vowel is short, final stops created the high allotone of checked Tone 2, and if long, they became low Tone 1. In terms of vowel length, short vowels in the Muak Sa-aak data (Tone 2) correspond to short vowels in the Lamet data used by Svantesson, and long vowels in the Muak Sa-aak data (Tone 1) correspond to long vowels in the Lamet data. Here, in the case of final stops, it is possible that tonogenesis may have resulted from the vowel length contrast, although the length difference has not disappeared. That is, the length distinction has not been lost, but it has been doubled in a tone contrast. Another piece of evidence in support of this conclusion is the fact that Muak Sa-aak appears to have no Tone 1 words with short vowel and stop final consonants. Likewise, Tone 2 has no words with long vowel and stop final consonants. See Table 44 below for comparison of the Muak Sa-aak to the U and Lamet data.

**Table 44. Glottal stop finals, stop finals, and resulting tones in Muak Sa-aak (Lamet and U from Svantesson 1988: 107-122)<sup>62</sup>**

	Muak Sa-aak	Lamet <sup>63</sup>	U (Angkuic)
“rope, string”	/p.c <sup>hi</sup> ²/	płsíʔ	sí
“dog”	/c <sup>h</sup> ɔ²/	sóʔ	sò
“wind”	/s.ma²/	ʔmáaʔ	samà
“fish”	/k <sup>h</sup> a²/	káaʔ	khà
“bite”	/kak²/	kàk	káʃ <sup>64</sup>
“hair”	/suk²/	khúk	súʃ
“pig”	/le:k¹/	lìik	líʃ
“bow, crossbow”	/ʔa:k¹/	ʔáak	ʔǎʃ

<sup>62</sup> See Footnote 59, page 77.

<sup>63</sup> See Footnote 60, page 77.

<sup>64</sup> Svantesson describes /ʃ/ as a voiced pharyngeal approximant. It is the historical final \*k (1988: 72). See Section 2.1.3.2 for discussion.

### 5.3.2.4 Tone 1 open syllables

There are not many Muak Sa-aak words ending in open syllables and occurring with Tone 1; when these words were compared with the Lamet data given in Svantesson’s article, it was found that in Lamet, they were primarily words with final /-h/ or /-s/ (Lamet still has these finals, but Muak Sa-aak does not). The interesting question is at what point in time Muak Sa-aak lost the final /-h/ and /-s/, in relation to the development of tone. Table 45 shows some of these words in comparison with Lamet and U from Svantesson (1988). U, like Muak Sa-aak, has lost the final /-h/ and /-s/.

**Table 45. Tone 1 words in Muak Sa-aak which may come from proto \*-h or \*-s finals (Lamet and U from Svantesson 1988: 107-122)<sup>65</sup>**

	Muak Sa-aak	Lamet <sup>66</sup>	U (Angkuic)
“wide”	/wa: <sup>1</sup> /	wàh	vâ
“charcoal”	/c <sup>h</sup> e: <sup>1</sup> /	krsás	é
“bear”	/k <sup>h</sup> re:j <sup>1</sup> /	kríis	χί
However:			
“begin”	/kaw <sup>2</sup> /	kóh	kò

In the last item, the Muak Sa-aak word has Tone 2.

For these particular final consonants to occur with a low tone is consistent with the evidence (see Section 2.2.2.3). To draw definite conclusions in this area, however, would require examining more words, and this area of final /-h/ and /-s/ would be an area for further study.

## 5.4 Summary

There are three tones in Muak Sa-aak, a low tone, Tone 1, a checked tone, Tone 2, and a falling tone, Tone 3. Although there are some features of voice phonation, register is not distinctive. The occurrence of the three tones is closely correlated to syllable structure, and in particular to final consonant type, but also to vowel length.

<sup>65</sup> See Footnote 59, page 77.

<sup>66</sup> See Footnote 60, page 77.

Tone is partially but not fully predictable based upon syllable structure. It is hypothesized that tones in Muak Sa-aak have come about as a result of the influence of both final consonants and vowel length. Borrowed words from Tai Lue may also have played a role, since most of the words occurring with the falling allotone of checked Tone 2 are borrowed words.

## Chapter 6

### Effects of Contact on Muak Sa-aak

Muak Sa-aak has been in contact with Tai Lue for a long time, as discussed in Section 1.4.1. The influences of this contact may be seen at various levels in Muak Sa-aak, including phonological effects and lexical effects.

#### 6.1 Phonological effects

The phonological influences of borrowing on Muak Sa-aak may be examined in regards to vowels, consonants, and tones.

##### 6.1.1 Effects on vowels

The numbers given in Table 46 below are borrowed from Tai Lue; they are also good examples of the correlation between the Muak Sa-aak diphthongs /ia/ and /ua/ and the Tai Lue vowels /ɔ:/ and /ɛ:/.

**Table 46. Numeral comparison, Muak Sa-aak and Tai Lue (Tai Lue from Hudak 1996)**

	Muak Sa-aak	Tai Lue
2	/sɔ:ŋ <sup>3</sup> /	/sɔŋ <sup>1</sup> / <sup>67</sup>
8	/piat <sup>1</sup> /	/pɛɛt <sup>2</sup> /
12	/sip <sup>2</sup> suaŋ <sup>3</sup> /	/sip <sup>1</sup> sɔŋ <sup>1</sup> /

The number “two” was not pronounced consistently. In the number “two” Speaker A pronounced it with the Lue vowel [ɔ], but in “twelve” he pronounced it with the diphthong [ua].

<sup>67</sup> Tai Lue does possess a vowel length contrast, but before nasal or approximant finals, there is no short/ long vowel length contrast, except with the vowel /a/, and Gedney does not write one in his dictionary (Hudak 1996). See Section 2.3.2.



The diphthongs /ia/ and /ua/ appear to have developed from the long vowels /ɛ:/ and /ɔ:/. Since Tai Lue does not have these two diphthongs, their appearance in borrowed words which in Tai Lue contain /ɛ:/ or /ɔ:/ suggests that the Muak Sa-aak diphthongs actually come from prior long vowels /ɛ:/ and /ɔ:/ (which still exist in Wan Saw Muak Sa-aak, a variety which does not have these diphthongs). There are other examples of this replacement of /ɛ:/ or /ɔ:/ in Tai Lue with /ia/ or /ua/ in Muak Sa-aak outside of the number system as well. Some of these are shown in Table 47, below.

**Table 47. Tai Lue borrowed words realized with diphthongs in Muak Sa-aak (Tai Lue from Hudak 1996)**

	Muak Sa-aak	Tai Lue	Gloss
1122	/mian <sup>3</sup> sa:p <sup>1</sup> /	/mɛŋ <sup>4</sup> saap <sup>2</sup> /	“cockroach” <sup>68</sup>
1539	/liam <sup>1</sup> /	/lɛm <sup>1</sup> /	“sharp-pointed”
53	/suak <sup>1</sup> tɔ <sup>2</sup> /	/sɔɔk <sup>2</sup> /	“elbow”
1552	/ruan <sup>2</sup> /	/hɔn <sup>6</sup> /	“hot”

### 6.1.2 Effects on consonants

There are several consonants which differ between Muak Sa-aak and Tai Lue phonology. One group of these are the final consonants which do not occur as finals in Tai Lue: /c, ɲ, l/. Another is the group of /h, r/. In Tai Lue, both of these occur in writing; only /h/ occurs in spoken Tai Lue. However, in Muak Sa-aak, both occur, and /r/ is the more common.

Another important group of consonants to consider is the voiced stops /b, d/, which are a point of similarity between Tai Lue and Muak Sa-aak. According to Svantesson’s statements about the historical Germanic shifts in Angkic languages (1991: 68), by which the voicing contrast was replaced with an aspiration contrast (see Section 2.2.2.2 for discussion), these should not exist. The existence of voiced stops in Muak Sa-aak today may therefore be the result of contact with Tai Lue, which also has these consonants. It is possible that Muak Sa-aak may have either developed them (after previously losing them) or retained them due to the influence

<sup>68</sup> See Footnote 67, page 81.

of Tai Lue. The fact that a large proportion of the words in the data with these initials (about half) appear to be borrowed supports this conclusion.

### 6.1.3 Effects on tones

The observations on tonogenesis in the previous chapter do not account for all of the data. In particular, final nasal consonants are a problem. There are a number of Muak Sa-aak words ending with final nasals that occur with low Tone 1 or checked Tone 2. However, most of the words ending in nasals which matched up to Svantesson’s (1988) Lamet list occurred with falling Tone 3. One possible explanation is that these words ending in nasals and taking the low or checked tones are largely borrowed words, since Muak Sa-aak has a large number of borrowed words, primarily from Tai Lue. One piece of evidence supporting this is the fact that of the data in the wordlist, all words ending in a palatal nasal /-ɲ/ occur with falling Tone 3; none occur with low Tone 1 or checked Tone 2. Nearly all of those ending in a lateral approximant /-l/ occur with Tone 3 as well; there are only a handful of exceptions which occur with Tone 1. Examples are given in Table 48, below.

**Table 48. Words with final lateral approximant /-l/ and Tone 1**

1633	/pa <sup>1</sup> k.tit <sup>2</sup> /	“(be) equal”
744	/mu:l <sup>1</sup> /	“boundary”
1457b	/ɲul <sup>1</sup> ɲil <sup>3</sup> /	“crush to powder”
1411	/pɣl <sup>1</sup> /	“fall”

These few words are most likely native words, not borrowings from Tai Lue. However, since Tai Lue which is the source of most of the borrowed words does not have final palatal nasals or lateral approximants, it is not surprising to find that there are no words with final palatal nasals occurring with low Tone 1, and only a handful of words with final lateral approximants. Another remaining item to account for is the group of words occurring with checked Tone 2, which are open syllables with long vowels followed by a final glottal stop. Since this is not a large group of words, it is very likely that many of them are also borrowed words from Tai Lue. A few examples are given in Table 49.

**Table 49. Checked Tone 2 in open syllables**

	Muak Sa-aak	Tai Lue	Tai Lue tone (phonetic)	Gloss
5	/na: <sup>2</sup> ɲa:j <sup>3</sup> / (1 <sup>st</sup> syllable)	/naa <sup>3</sup> /	[11]	“face”
877a	/k <sup>h</sup> a: <sup>2</sup> /	/xaa <sup>3</sup> /	[11]	“slave”
1238	/t.ɲa: <sup>2</sup> /	/ɲaa <sup>4</sup> /	[21]/[342] <sup>69</sup>	“sesame seed”
1436	/ɲu: <sup>2</sup> /	/yuu <sup>6</sup> /	[31]	“push”

All four of these examples are probably Tai Lue borrowings. There are Tai Lue borrowed words in Muak Sa-aak which do not occur with this tone. However, some of those with this tone come from words that carry one of the checked tones in Tai Lue, Tones 3 and 6. This does not account for everything; /t.ɲa:<sup>2</sup>/, “sesame seed,” is not pronounced with a checked tone in Tai Lue. There appears, however, to be a correlation between tone of borrowed words from Tai Lue and tone in Muak Sa-aak, so that borrowed words with a checked tone in Tai Lue tend to occur with checked Tone 2 in Muak Sa-aak.

The falling allotone of Tone 2 also includes a number of words with final nasals. About half of those in the data at least were recognizable as borrowed from Tai Lue. All of this suggests that Tai Lue has had a particularly large influence on this tone, Tone 2, and in particular, the falling allotone. An area for further research is whether this allotone itself could have originated through borrowing.

Given the extensive amount of vocabulary borrowed from Tai Lue- even the numeral system has been borrowed essentially intact- and the length of contact between the languages, it is worth asking to what extent this has affected the tones seen today.

If it were not for the borrowed vocabulary, tones on nasal-final syllables would actually be predictable, based upon vowel length and final consonant. These tones may also be compared to the pitches described by Narumol Charoenma for Lampang Lamet (see Section 2.2.2.3), despite the fact that the Lamet variety was described as having a register contrast and its pitches as being non-phonemic. The pitches of that variety of Lamet appear to be related to a combination of vowel length and final consonant, with the important distinction in the final consonants being that between

<sup>69</sup> The pronunciation of the tones varies according to dialect. The first one given is for Chieng Hung; the second is for Muong Yong.

dead and live syllables (Narumol 1982: 40). This is what Svantesson describes for U (see Section 2.2.2.4) as being the important distinction between final consonant types (1988: 86). A similar distinction may be what has happened here in this variety of Muak Sa-aak, except that some of the final consonants have been lost, making the tone no longer predictable. Extensive borrowing has perhaps contributed to this.

### 6.1.3.1 Contrast of tonal behavior in dead and live syllables

In Section 5.2, and Table 35, a pattern was demonstrated between tone and syllable type, in particular, final consonants. This section will revisit final consonant contrasts, to compare final stops against their corresponding nasals. This is a contrast between what are sometimes termed dead syllables (stop final) and live syllables (sonorant final). Indeed, some contrasts are found, as seen in the following examples.

final /-p/, /-m/

777	/ru:p <sup>1</sup> /	“chase”	CAE
802	/rɤp <sup>2</sup> /	“fishing net”	
1493	/rɤ:m <sup>1</sup> /	“fade”	

final /-t/, /-n/

607	/mut <sup>2</sup> /	“smoked” (not meat)	CAE
188	/mun <sup>1</sup> /	“pimple”	

final /-k/, /-ŋ/

997	/s.ra:k <sup>1</sup> /	“buffalo”	CAE
1193	/s.ra:ŋ <sup>3</sup> /	“thorn”	

Examples like these show a contrast in the final consonants between final stops and nasals, even after discounting borrowed words. However, it does not represent the overall pattern. After borrowed words are eliminated, almost all words with nasal

finals occur with falling Tone 3, so underneath the borrowed words, there is actually a complementary distribution. The overall pattern, outside of borrowed words, is one where dead syllables, those ending in stops, take low Tone 1 or checked Tone 2, and live syllables, those ending in sonorants (nasals or lateral approximants), take the falling Tone 3. Final stops and their corresponding nasals in native words do not contrast within the same tone. In terms of tonogenesis, this suggests that final consonants have played an important role.

However, partly as a result of borrowing from Tai Lue, there are words with final nasals occurring with all three distinctive tones (See Table 36, Section 5.2 for examples).

## 6.2 Lexical effects

Borrowing from Tai Lue has had an impact on the use of numerals. The behavior of borrowed words may also be seen in grammatical prefixes, which will be discussed in the following two sections.

### 6.2.1 Numerals

Muak Sa-aak appears to have lost its native numerals. The numbers are very similar to those in Tai Lue, as shown in Table 50.

**Table 50. Numeral comparison, Muak Sa-aak and Tai Lue (Tai Lue from Hudak 1996)**

	Muak Sa-aak	Tai Lue		Muak Sa-aak	Tai Lue
1	/ʔak <sup>2</sup> /	/nuŋ <sup>5</sup> /	8	/piat <sup>1</sup> /	/pɛɛt <sup>2</sup> /
2	/sɔ:ŋ <sup>3</sup> /	/sɔŋ <sup>1</sup> / <sup>70</sup>	9	/ka:w <sup>2</sup> /	/kaw <sup>3</sup> /
3	/sa:m <sup>3</sup> /	/saam <sup>1</sup> /	10	/sip <sup>2</sup> /	/sip <sup>1</sup> /
4	/si: <sup>1</sup> /	/sii <sup>2</sup> /	11	/sip <sup>2</sup> ʔɛt <sup>2</sup> /	/sip <sup>1</sup> ʔɛt <sup>1</sup> /
5	/ha: <sup>2</sup> /	/haa <sup>3</sup> /	12	/sip <sup>2</sup> suaŋ <sup>3</sup> /	/sip <sup>1</sup> sɔŋ <sup>1</sup> /
6	/rɔk <sup>2</sup> /	/hok <sup>1</sup> /	20	/sa:w <sup>3</sup> /	/saaw <sup>4</sup> /
7	/cɛt <sup>2</sup> /	/cɛt <sup>1</sup> /	100	/ruaj <sup>2</sup> nɔŋ <sup>1</sup> /	/hɔy <sup>6</sup> /

<sup>70</sup> See Footnote 67, page 81.

The numbers for “six” and “one hundred” are interesting because the initial consonants in Muak Sa-aak replace the Lue /h/ with /r/, which does not occur in spoken Tai Lue. However, there are Tai Lue words in which the spoken form has /h/ but which are written with /r/, an older form. Gedeney lists /hɔy<sup>6</sup>/ or /rɔy<sup>6</sup>/ “hundred” as one of these, but not /hok<sup>1</sup>/ “six” (Hudak 1996). It is interesting that the Muak Sa-aak pronounce both of these equally with /r/ in their own language.

### 6.2.2 Nasal initial presyllables

There is only one nasal which can occur in presyllables, the voiced bilabial nasal m. However, presyllables with the nasal may be divided into groups: the first is a presyllable occurring frequently in borrowed sesquisyllables; and the second appears to be a derivational prefix.

There were several examples of /m/ as a presyllable-initial consonant. The vowel transition here was frequently pronounced as the open central vowel [a], not the usual mid back vowel, and was seen in two groups of words. The first is in a group of words borrowed from Tai Lue for various kinds of fruit, where it is probably a reduced form of a longer word which meant “fruit.”

(163)	1211	/m.cuk <sup>2</sup> /	“orange”
(164)	1217c	/m.paw <sup>2</sup> /	“coconut”
(165)	1217a	/m.mo:ŋ <sup>1</sup> /	“mango”

In the second group, which includes some words borrowed from Tai Lue (Examples (166), (167), and (172)), the presyllable most likely has an independent grammatical function, as a nominalizer which is applied to either native or borrowed words. In Example (171), /m.tək<sup>2</sup>/ “fellow-wife”, /tək<sup>2</sup>/ appears to be the /tək<sup>2</sup>/ which means “little”. With the addition of /m./ it becomes a noun, “co-wife.” Example (172) involves the Tai Lue word for “sew,” /yep<sup>1</sup>/, but it appears that the addition of /m./ allows it to become the noun “thread.”

(166)	645	/m.mat <sup>2</sup> /	“bundle” (n)
(167)	646	/m.kuaŋ <sup>2</sup> /	“heap” (n)
(168)	755	/m.kɛp <sup>2</sup> /	“machete”

(169)	1185	/m.sen <sup>2</sup> /	“stem, stalk”
(170)	1386	/m.kɔt <sup>2</sup> /	“piece of wood”
(171)	364	/m.tɛk <sup>2</sup> /	“fellow-wife/ co-wife”
(172)	727	/m.nɛp <sup>2</sup> /	“thread”

This phenomenon is different from what is seen in the Tai Lue borrowed words in Examples (163) to (165). This second /m./ appears to be a derivational affix which attaches both to native words and to foreign words. However, a further analysis of it is beyond the scope of this thesis

### 6.2.3 Behavior of fricatives in initial syllables

The only fricative occurring in this position is the voiceless alveolar sibilant /s/. Presyllables beginning with the consonant /s/ may reduce to a syllabic consonant in fast speech. Example (173) shows this reduction; it was pronounced in both ways.

(173)	1351	/s.wɛk <sup>2</sup> /	[su <sup>1</sup> βɛk <sup>2</sup> ], [sβɛk <sup>2</sup> ]	“darkness”
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There are at least two different initial syllables beginning with the voiceless alveolar sibilant /s/, which at first appear to be the same. An example of each is given, Examples (174) and (175).

(174)	689	/s.ta:j <sup>3</sup> /	“plaster”
(175)	631	/su <sup>2</sup> nap <sup>2</sup> /	“handle” (horizontal)

The initial syllables of these two words, especially in fast speech, may sound alike, especially since the glottal stop tends to disappear and the vowel also tends to collapse. They are, however, identified by native speakers as being different. Example (174) is a likely borrowed word: Tai Lue /sa taaj<sup>4</sup>/ “plaster.” The initial syllable /su<sup>2</sup>/ in Example (175) is probably actually a grammatical affix, like /m./ (Section 6.2.2), another nominalizer, as it attaches to many verbs to produce nouns. As seen in Examples (176) to (183), it can attach to native words or to borrowed words.

(176)	430	/su <sup>2</sup> nɔn <sup>3</sup> /	“language”	/nɔn <sup>3</sup> /	“speak”
(177)	566	/su <sup>2</sup> k <sup>h</sup> u:t <sup>1</sup> /	“razor”	/k <sup>h</sup> u:t <sup>1</sup> /	“shave” (v) (Tai Lue)

(178)	569	/su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup> /	“food”	/k <sup>h</sup> a:j <sup>3</sup> /	“eat”
(179)	695	/su <sup>2</sup> t <sup>h</sup> a:j <sup>3</sup> /	“wickerwork”	/t <sup>h</sup> a:j <sup>3</sup> /	“weave” wicker (Tai Lue /tɔ <sup>4</sup> /) <sup>71</sup>
(180)	703	/su <sup>2</sup> ci <sup>2</sup> /	“work” (n)	/ci <sup>2</sup> /	“work” (v)
(181)	829	/su <sup>2</sup> tuan <sup>2</sup> /	“gift”	/tuan <sup>2</sup> /	“give” (Tai Lue /tɔn <sup>3</sup> /)
(182)	852	/su <sup>2</sup> fa:j <sup>1</sup> rɣ: <sup>3</sup> /	“paddle”	/fa:j <sup>1</sup> rɣ: <sup>3</sup> /	“paddle” (v) (Tai Lue /faaj <sup>4</sup> /)
(183)	901	/su <sup>2</sup> sɛp <sup>2</sup> /	“game”	/sɛp <sup>2</sup> /	“play”

Example (174), however, does not display such a neat grammatical pattern, and is probably a true presyllable.

### 6.3 Summary

In comparison to Tai Lue, the Tai Kadai language from which Muak Sa-aak has borrowed heavily, there is a great amount of similarity in phonemes; differences include the retention of /r/, which has been lost in spoken Tai Lue; final /l/, and final palatal consonants. In consonant clusters, Tai Lue has many with /w/, while Muak Sa-aak has only a few of these; Muak Sa-aak however, has many with /r/, and only a few with /w/. In the vowels, this variety of Muak Sa-aak has two diphthongs /ia/ and /ua/, which Tai Lue does not have.

The effects of lexical borrowing on Muak Sa-aak can be seen at several levels. Muak Sa-aak has many borrowed words from Tai Lue. However, phonologically, the borrowed words are modified to fit the patterns of Muak Sa-aak phonology; this is especially visible in terms of the initial consonants /h/ and /r/ and in diphthongs. Furthermore, the language shows the evidence of some word-formation patterns which have applied equally to both native and borrowed words. The borrowings appear in turn to have influenced the tonal patterns of Muak Sa-aak.

<sup>71</sup> Examples (177), (179), (181), and (182) incorporate words from Tai Lue; the Tai Lue given in the right-hand column for Examples (179), (181), and (182) comes from Hudak 1996.



## Chapter ,

### S - - ar. and !on!\* &"on

The purpose of this study was to study the phonology of an unknown language, Muak Sa-aak, a Palaungic language belonging to the little known Angkuic branch, found in Myanmar and China. There is no previous published research available on Muak Sa-aak, although some research was undertaken by Hopple in 2007. Since there is clear evidence of lexical borrowing from Tai Lue, an unrelated language, it seemed essential to consider the impact of this on the phonology of the language. In addition, since tonogenesis is frequently mentioned as the interesting feature of Angkuic languages, it seemed appropriate to explore these processes also.

#### 7.1 Results

The following sections summarize the findings on Muak Sa-aak phonological inventory and phonotactics, tone and tonogenesis, and the effects of borrowing from a neighboring Tai-Kadai language on its phonology.

##### 7.1.1 Phonology

In this study of the phonology, Muak Sa-aak was found to be a mono- and sesquisyllabic language with 22 consonants, 18 vowels, and three phonemic tones. Muak Sa-aak shows a shift in initial consonants, with voiceless initials having become voiceless aspirated, and voiced initials having become voiceless, characteristic of Angkuic languages. It also shows the retention of the historical distinction between initial \*h- and \*s-; both of these features are characteristic of the Angkuic languages. The vowels include 16 monophthongs, 9 of which are short, and 7 long; there are two diphthongs making up the remaining two long vowels. There is no contrastive voice register, but the tones do include features of voice phonation. The three tones are a low Tone 1, a checked Tone 2, sometimes with creaky voice, and a falling Tone 3. Tones and syllable structures

are correlated, so that there are restrictions on the co-occurrence of tones and syllable structures.

While previous studies of Angkuic languages have emphasized that tonogenesis resulted primarily from a loss of phonemic vowel length, in this language tonogenesis seems to be the result of a combination of the effects of vowel length and final consonants. Although vowel length has been involved in tonogenesis, the length contrast appears to be preserved. The most important distinction between final consonant types involved in tonogenesis is that between sonorants and stops or fricatives.

This pattern of tonogenesis suggests that overall syllable structure is the primary mechanism for tonogenesis. Although vowel length does appear to be part of the process of tonogenesis, the type of final consonant involved seems to be at least as important.

### **7.1.2 Borrowing**

Borrowing is an interesting phenomenon in this language, as it has been heavily influenced by Tai Lue, a language of an entirely different family, from which it has borrowed large amounts of vocabulary. Even the numeral system has been borrowed essentially intact from Tai Lue. However, the Tai Lue words borrowed into Muak Sa-aak frequently show the effects of Muak Sa-aak phonology and sound substitutions, as they have been borrowed into Muak Sa-aak vocabulary, and Tai Lue has affected the phonology of Muak Sa-aak in only minor ways.

Despite the borrowing, some phonological features stand out as native to Muak Sa-aak. These include palatal final consonants and a final lateral consonant. It also includes various features which may reflect things which have been lost in the surrounding Tai Lue but not in Muak Sa-aak. One of these is the phoneme /r/; Muak Sa-aak has many, both word-initially and in consonant clusters, while Tai Lue does not have an /r/ in its phonemic inventory, and has very few clusters at all. In many words borrowed from Tai Lue, Muak Sa-aak actually replaces initial /h/ sounds in Tai Lue with an /r/. Conversely, this particular variety of Muak Sa-aak shows at least one development which does not appear in Tai Lue, the development of diphthongs (/ia/ and /ua/ from a former /ɛ:/ and /ɔ:/). These also may be seen in words originally borrowed from Tai Lue, which, in Tai Lue, do not contain diphthongs, but in Muak Sa-aak usage have the monophthong replaced with a diphthong.

## **7.2 Limitations**

There are a number of limitations to this study. Ideally, it would have been better to have recorded more speakers. Another difficulty is that this study looks only at the variety spoken in one village. Since Muak Sa-aak appears to vary considerably from one village to the next, it is not clear how applicable the results are to the varieties spoken in other villages.

Another limitation is that there has been a lot of borrowing from the major language used in that area, which is a Tai-Kadai language, and thus belongs to a different language family entirely. A lot of work was required to separate borrowed words from native words. Another difficulty here is also in knowing how much the borrowed words may or may not have changed in pronunciation to reflect the phonology of Muak Sa-aak. The speakers could not always think of alternative words that were not borrowed from Tai Lue.

## **7.3 Areas for further study**

The findings on the interaction of Muak Saak vowel and sonorant length and their impact on tonal behavior suggest further studies on syllable weight. The presyllables seen in the data also suggest further study on their semantic and grammatical categories. To this author's knowledge, nothing else has been published yet on this language, so there are many additional areas for further study, especially dialect survey and diachronic linguistics, as well as grammar and discourse studies.

Since this study examined only the variety of Muak Sa-aak spoken in one village, it would be very interesting to compare it to that spoken in other villages, to see just how great the variation is geographically between villages. Further analysis of the tones and of the voice phonation features, especially in comparison with the speech of other villages, might also be useful. Since the speakers in this study were primarily older speakers, it would also be helpful to examine the speech of younger speakers, to see how the language and its phonology might be changing between generations. This is a concern of the speakers involved in this study, as several of them expressed concern about the possibility of their children or grandchildren losing their language.

A detailed historical comparative linguistic study would be helpful in better defining the relationships between Muak Sa-aak and the other Angkuic languages. The situation with /f/ and /p<sup>h</sup>/ is not clear; it is possible that there is a change ongoing,

but analysis of this in more speakers with more data might perhaps resolve this question. It would be interesting to examine this to try to determine the direction of this change. It is very likely that other changes are also ongoing. The diphthongs /ia/ and /ua/ were not seen in the small amount of data this author has from another Muak Sa-aak village. These diphthongs are also not seen in Tai Lue, the major language influencing Muak Sa-aak. In Muak Sa-aak as spoken in Wan Fai village, however, the diphthongs are seen both in native words and in borrowed words.

A study of the grammar of Muak Sa-aak remains to be done; in fact there is still very little written on the grammar of any Angkuic languages. Likewise, this author is not aware of any discourse studies having been done in these languages to this date.

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## **APPENDIX 1 SOCIOLINGUISTIC QUESTIONNAIRE**



# Individual Sociolinguistic Questionnaire

## *Instructions*

- Record all answers in a bound data notebook.
- Leave a few pages at the beginning for a table of contents.
- Number all pages.
- If possible, read the questions exactly as written. However, you may at times need to offer an explanation to make the question clearer. **If you have to explain the question, make sure you do NOT suggest an answer. Note in your notebook (near the answer) that you had to explain the question.**
- **Shaded items** are NOT to be read aloud.
- Items in parentheses ( ) give information about when or how to ask a question.
- Items in brackets [ ] require a choice depending on whatever is appropriate.
- Record the answers in the notebook using the same numbering as in the questionnaire. In that way it will be clear later what answers go with what questions.
- Try to write as neatly as possible.
- Write **exactly** what the subject answers.
- Enjoy!

## **Oral Consent**

- Introduce yourself and explain your purpose.
- Tell the person approximately how long it will take to answer the questionnaire.
- Let them know that their identity will be kept confidential.
- Ask if they are willing to be interviewed.

**“Oral consent given.” Note in your notebook if they say “yes” or “no”.**

*NOTE: If they say no, number this questionnaire and go on to the next subject. It is important to keep this “rejected” questionnaire in the numbering so we know how much non-response there was.*

## **Preliminary Information**

1. Questionnaire Number (start with 1 and number consecutively)
2. Survey
3. Interview Location
4. Interviewer Name
5. Date
6. Language of Elicitation
7. Language of Response
8. Interpreter Name (if needed)
9. Comments (anything unusual or noteworthy about this interview)

## Subject Demographics

10. What is your name?
11. Gender
12. How old are you?
13. Are you married?
14. (if married) How many children do you have?
15. What is your job?
16. What is the highest level of education you have completed?
  - a. Level
  - b. What school did you go to?
  - c. What was the language of instruction at that school?
17. What is your religion?
18. When you were born, what village/town did you live in?  
(For Palaungic groups ask the following in addition.)
  - a. Did your village move frequently?
  - b. Where did you move from first?
  - c. After that where did you move?
19. Where did you grow up?  
(For Palaungic groups ask the following in addition.)
  - a. What villages did you stay in for a long time?
  - b. How long did you live in each of these places?
20. Where do you live now?
21. How long have you lived there/here?  
(For Palaungic groups ask the following in addition.)
  - a. Does your language group often live with another language group in the same village?
  - b. What language groups usually live together with your language group?
  - c. Do most people from your language group speak all the languages of their village?
22. What do you call your language?
23. What do others call your language?
  - a. Language name
  - b. (if not the same as their own name for the language) Who calls it that?
  - c. (if not the same as their own name for the language) Do you like that name?
24. What do you call the people who speak your language?
25. What do others call the people who speak your language?
  - a. People name
  - b. (if not the same as their own name for their people) Who calls you that?
  - c. (if not the same as their own name for their people) Do you like that name?
26. What language did you speak first as a child?
27. What languages do you speak now?
28. Of all the languages you speak, which language...
  - a. ...do you speak best?
  - b. ...do you speak second best?
  - c. ...do you speak third best?
29. (Subject's father)
  - a. Where was your father born?

- b. What [people group / tribe / clan] is your father from?
- c. What language did your father speak first as a child?
- d. What language did he usually speak to you when you were a child?

30. (Subject's mother)

- a. Where was your mother born?
- b. What [people group / tribe / clan] is your mother from?
- c. What language did your mother speak first as a child?
- d. What language did she usually speak to you when you were a child?

31. When you were a child, what language did your parents speak to each other?

32. (if married)

- a. Where was your [husband/wife] born?
- b. What [people group / tribe / clan] is your [husband/wife] from?
- c. What language did your [husband/wife] speak first as a child?

### Domains of Language Use

[In this section, if they mention more than one language for one of the situations, ask them which one they use more often in that situation.]

Next, I want to ask about when you use your language...

33. I want to ask you about what languages you use with people **in your house**. If they don't live with you, then think about what language you use with them when they visit you in your house.

**In your house**, what languages do you speak...

- a. ...with your parents?
- b. ...with your grandparents?
- c. ...with your siblings?
- d. (if married) ... with your spouse?
- e. (if have children) ... with your children?
- f. ... with your grandchildren?
- g. ...with friends?
- h. So, in your house, what language do you use the most?**

34. Next, I want to ask you about what languages you use **outside your house**.

When you are **not in your house**, what languages do you speak...

- a. ...with your parents?
- b. ...with your grandparents?
- c. ...with your siblings?
- d. (if married) ... with your spouse?
- e. (if have children) ... with your children?
- f. ... with your grandchildren?
- g. ...with friends?
- h. (ask if young enough to be in school or university) What languages do you use with classmates at school?
- i. (if go to school) ...with your teacher?
- j. ...with co-workers?
- k. ...at the market?
- l. ...at a funeral?
- m. ...at a village meeting?
- n. ...at (a temple / church)?
- o. ...with a government worker?

35. Do you sometimes meet Shan people or Chinese people or Burmese?

- a. (if yes) What language do you use with them?
- 36. Do you sometimes meet Wa people?
  - a. (if yes) What language do you use with them?

### **Ethnolinguistic Identity**

- 37. How are the customs of your people different from Chinese/ Shan/ Burmese people?
- 38. Do you think of yourself first as Burmese, Shan, Plang, Wa, Palaung or something else?
- 39. What customs of being [X] ethnicity would you like to see your children continue?

### **Bilingual Proficiency Evaluation**

**[Do a Bilingualism Proficiency Evaluation for Shan, Burmese, and any other LWC in use e.g. Tai Lue.]**

**Next, I want to ask you some questions about how well you can speak [LWC].**

40. LWC being evaluated

- 41. Can you buy something in [LWC]?
- 42. Can you tell about your family in [LWC]?

**“Explanation given.” Note in your notebook if you have to give the explanation below.**

[If they ask, “What do you mean?” say “Can you explain things like the number of siblings you have and in what order they were born, etc., using [LWC]?”]

- 43. If you overhear two [LWC] people speaking [LWC] in the market...
  - a. Can you describe in [X] what you heard?
  - b. Can you describe in [LWC] what you heard?
- 44. Could you use [LWC] to explain to a [LWC] speaker who does not speak [X] how to do your job?
- 45. Can you speak [LWC] as fast as a [LWC] person and still be understood?
- 46. Can you speak [LWC] as well as a [LWC] person?

### **Language Attitudes**

- 47. Out of all the villages/towns that are your ethnic group, where is your language spoken the best?
  - a. Village/town
  - b. Why?
- 48. Out of all the villages/townsthat are your ethnic group, which village/town is the most important?
  - a. Village/town
  - b. Why?
- 49. If your child married a Shan/ Chinese/ Burmese/ Wa person, how would you feel?
  - a. (answer)
  - b. Why?
- 50. What language do parents of your ethnic group teach their children?
  - a. (language)
  - b. Why?
- 51. What language do children of your ethnic group in this village speak first?
- 52. Do your children ever speak anything other than your language at home?
  - a. (if yes) What else do they speak?
  - b. (if yes) How do you feel when they do that?
- 53. What language do children from your ethnic group speak when they play in the village?

- a. Language
  - b. (if not only [X]) How do you feel when they speak a different language?
54. [Ask for each LWC in use in the area including Shan, Burmese, Chinese, Wa]  
Would you like to be able to speak [LWC] better?
- a. [For each LWC] Yes or no
  - b. [For each LWC] Why?
55. [Ask for each LWC in use in the area including Shan, Burmese, Chinese, Wa]
- a. Can you read [LWC] ?
  - b. Can you write [LWC] ?
  - c. Do you see any advantage in being able to read and write [LWC]?
  - d. (if yes) What advantage?
  - e. (if no) Why not?
56. Have you ever been a Buddhist monk or a novice?
- (if yes)
- a. For how long?
  - b. What languages did you read?
- (if no)
- c. Have you ever studied at the temple?
  - d. (if yes) What? For how long?
- (An example might be that the subject attended a literacy class.)
57. (Literacy in your language)
- a. Can you read your language?
  - b. Can you write your language?
  - c. Do you see any advantage in being able to read and write your language?
  - d. (if yes) What advantage?
  - e. (if no) Why not?
58. Twenty years from now, do you think the children from this village will be speaking your language? (N.B. We want to know about those who will be children in 20 years' time so they are not yet born.)
- a. Yes or no
  - b. (if no) Do you think this is good or bad?
  - c. (if no) Why?

### Dialect Perceptions

59. Does everyone in your village speak your language about the same?  
[If no, find out what the subject's variety is and make sure the comparisons below are all made with that variety.]
60. About how many villages speak your language? [Not looking for an exact number... just a guess to give you an idea of what to expect for the rest of the dialect perception questions.]
- Please compare the villages that speak your language and split them into three groups: villages that speak your language the **same** as here, a **little different** from here, and **very different** from here.
61. What are the names of other villages that speak your language the **same** as here?
- a. List names
  - b. Do you call their language the same as yours or not?
  - c. What do you call those people?
62. What are the names of other villages that speak your language a **little different** from here, but you can understand each other?

- a. List names How much of their language do you understand: i) everything; ii) most things or iii) some things?
- b. (if “most things” or “some things”)  
How are the language here and their language different?  
(if they don’t answer)  
 **“Examples given.” Note in your notebook if you have to give the “for example” below.**  
For example...How are the sounds different?  
How are the words different?  
How is the speed of speech different?
- c. What do you call that language?
- d. What do you call those people?
- e. Do you often talk with people from there?
- f. When you speak with people from one of those villages what language do you use with each other?  
(If they answer your language then ask which of the following scenarios results)  
I. We each use our own variety of my language  
II. I switch to their variety of my language  
III. S/he switches to my variety of my language.  
(If they don’t answer [X] then ask the following question to clarify)  
IV. Why don’t you speak to them in your language?
63. What are the names of other villages that speak your language **very differently** from here, so different that you have trouble understanding each other?
- a. List names
- b. How much of their language do you understand: i) most things; ii) some things or iii) nothing?
- c. (if “most things” or “some things”)  
How are the language here and their language different?  
(if they don’t answer)  
 **“Examples given.” Note in your notebook if you have to give the “for example” below.**  
For example...How are the sounds different?  
How are the words different?  
How is the speed of speech different?
- d. What do you call that language?
- e. What do you call those people?
- f. Do you often talk with people from there?
- g. When you speak with people from one of those villages what language do you use with each other?  
(If they answer your language then ask which of the following scenarios results)  
I. We each use our own variety of my language.  
II. I switch to their variety of my language.  
III. S/he switches to my variety of my language.  
(If they don’t answer [X] then ask the following question to clarify)  
IV. Why don’t you speak to them in my language?

## Interviewer Observations

**[Ideally, answer these questions in your notebook right away. If you cannot do that, try to do so as soon as you can, perhaps at the end of each day's work.]**

64. Were there any **distractions** or **interruptions** that interfered with the flow of the interview or seemed to influence some of the responses?
65. Did the subject seem to **understand** the language of elicitation?
66. Did the subject seem **shy** or **fairly confident** about expressing his/her opinions?
67. Did the interpreter change any of the questions? **Note what was actually asked.**
68. **Other observations** about the interview?
69. Were there any **questions** that seemed to **work really well**? Which questions? Why?
70. Were there any **questions** that seemed to **not work well**? Which questions? Why?

## **APPENDIX 2 1,700 WORDLIST**



Speaker B and Speaker C have been combined into one column, as items 1-1375 were elicited for Speaker B, and 1376-1700 were elicited for Speaker C.<sup>72</sup>

The presyllable vowel and tone are not contrastive, and the phonetic realization of the vowel varies widely; therefore they are not transcribed. The syllable break between presyllable and main syllable is marked with /./.

No.	Gloss	Speaker A	Speaker B	Speaker D
1	body/ self	k <sup>h</sup> u <sup>2</sup>	k <sup>h</sup> u <sup>2</sup>	--
2	self	t.ku <sup>2</sup>	t.ku <sup>2</sup>	t.ku <sup>2</sup>
3	head	preŋ <sup>3</sup>	preŋ <sup>3</sup>	preŋ <sup>3</sup>
4	forehead	t.muɑŋ <sup>3</sup>	t.muɑŋ <sup>3</sup>	--
5	face	na: <sup>2</sup> ɲa:j <sup>3</sup>	na: <sup>2</sup> ɲa:j <sup>3</sup>	--
6	eyeball	c <sup>h</sup> ak <sup>2</sup> ɲa:j <sup>3</sup>	c <sup>h</sup> ak <sup>2</sup> ɲa:j <sup>3</sup>	ɲa:j <sup>3</sup>
7	eyebrow	suk <sup>2</sup> ɲa:j <sup>3</sup>	suk <sup>2</sup> ɲa:j <sup>3</sup>	--
8	eyelid	t.ku <sup>2</sup> ɲa:j <sup>3</sup>	t.ku <sup>2</sup> ɲa:j <sup>3</sup>	--
9	eyelash	suk <sup>2</sup> riap <sup>2</sup> ɲa:j <sup>3</sup>	suk <sup>2</sup> riap <sup>2</sup> ɲa:j <sup>3</sup>	--
10	pupil (of eye)	c <sup>h</sup> ak <sup>2</sup> ɲa:j <sup>3</sup> laŋ <sup>3</sup>	c <sup>h</sup> ak <sup>2</sup> ɲa:j <sup>3</sup> laŋ <sup>3</sup>	--
11	nose	k.tu <sup>2</sup>	k.tu <sup>2</sup>	k.tu <sup>2</sup>
12	bridge (of nose)	k <sup>h</sup> ɔŋ <sup>3</sup> k.tu <sup>2</sup>	k <sup>h</sup> ɔŋ <sup>3</sup> k.tu <sup>2</sup>	--
13	ear	k.c <sup>h</sup> o: <sup>1</sup>	k.c <sup>h</sup> o: <sup>1</sup>	k.c <sup>h</sup> o: <sup>1</sup>
14	cheek	?ua <sup>1</sup>	?ua <sup>1</sup>	--
15	mouth	p.tɤŋ <sup>3</sup>	p.tɤŋ <sup>3</sup>	p.tɔŋ <sup>3</sup>
16	lip	t <sup>h</sup> o:j <sup>3</sup>	t <sup>h</sup> o:j <sup>3</sup>	--
17	tongue	t <sup>h</sup> a:k <sup>1</sup>	t <sup>h</sup> a:k <sup>1</sup>	t <sup>h</sup> a:k <sup>1</sup>
18a	gums	hɤ:k <sup>1</sup>	hɤ:k <sup>1</sup>	--
18	tooth	k <sup>h</sup> ɛŋ <sup>3</sup>	k <sup>h</sup> ɛŋ <sup>3</sup>	k <sup>h</sup> ɛŋ <sup>3</sup>
19	molar tooth	k <sup>h</sup> ɛŋ <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup>	k <sup>h</sup> ɛŋ <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup>	--
20	palate	hɤ:k <sup>1</sup> to: <sup>1</sup> t <sup>h</sup> a:k <sup>1</sup>	hɤ:k <sup>1</sup> to: <sup>1</sup> t <sup>h</sup> a:k <sup>1</sup>	--
21	jaw	k.ʔa:ŋ <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup>	k.ʔa:ŋ <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup>	--
22	chin	k <sup>h</sup> a:p <sup>1</sup>	k <sup>h</sup> a:p <sup>1</sup>	--
23	neck	kan <sup>1</sup> lul <sup>3</sup>	kan <sup>1</sup> lul <sup>3</sup>	kan <sup>1</sup> lul <sup>3</sup>
24	nape of neck	s.lɔk <sup>2</sup> lul <sup>3</sup>	s.lɔk <sup>2</sup> lul <sup>3</sup>	--

<sup>72</sup> Forms given in this appendix are phonemic, although they are not marked with //. If a space is blank (--), the item was not elicited from that speaker.

No.	Gloss	Speaker A	Speaker B	Speaker D
25	throat	s.ro:ŋ <sup>3</sup>	s.ro:ŋ <sup>3</sup>	--
26	voice box, larynx, Adam's apple	k <sup>h</sup> ɔ: <sup>1</sup> hɔ:j <sup>3</sup>	k <sup>h</sup> ɔ: <sup>1</sup> hɔ:j <sup>3</sup>	--
27	hair (of head)	t.k <sup>h</sup> iŋ <sup>3</sup>	t.k <sup>h</sup> iŋ <sup>3</sup>	t.k <sup>h</sup> iŋ <sup>3</sup>
28	beard	s.mɔŋ <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup>	s.mɔŋ <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup>	--
29	hair (of body)	suk <sup>2</sup>	suk <sup>2</sup>	--
30	tuft, lock (of hair)	t.k <sup>h</sup> iŋ <sup>3</sup> m.t.ŋɔm	t.k <sup>h</sup> iŋ <sup>3</sup> m.t.ŋɔm	--
31	shoulder	t.pra:ŋ <sup>3</sup>	t.pra:ŋ <sup>3</sup>	--
32	shoulder blade	k.ʔa:ŋ <sup>3</sup> tɤŋ <sup>1</sup> fɤj <sup>1</sup>	k.ʔa:ŋ <sup>3</sup> tɤŋ <sup>1</sup> fɤj <sup>1</sup>	--
33	chest	na: <sup>2</sup> ʔɤk <sup>2</sup>	na: <sup>2</sup> ʔɤk <sup>2</sup>	--
34a	breast (woman's)	to: <sup>1</sup> ʔu <sup>2</sup>	to: <sup>1</sup> ʔu <sup>2</sup>	--
34b	breast (man)	to: <sup>1</sup> ʔɤk <sup>2</sup>	to: <sup>1</sup> ʔɤk <sup>2</sup>	--
35	side (of body)	pa:ŋ <sup>3</sup> k <sup>h</sup> a:ŋ <sup>2</sup>	pa:ŋ <sup>3</sup> k <sup>h</sup> a:ŋ <sup>2</sup>	--
36	waist	ta:j <sup>1</sup> k <sup>h</sup> iaw <sup>2</sup>	ta:j <sup>1</sup> k <sup>h</sup> iaw <sup>2</sup>	--
37	navel	k.toʔ <sup>2</sup>	k.toʔ <sup>2</sup>	--
38	umbilical cord	k.to <sup>2</sup> la:n <sup>3</sup>	k.to <sup>2</sup> la:n <sup>3</sup>	--
39	abdomen (external)	k.tɤl <sup>3</sup>	k.tɤl <sup>3</sup>	k.tɤl <sup>3</sup>
40	stomach (internal)	bo:n <sup>3</sup>	bo:n <sup>3</sup>	--
41	womb	t.ka:n <sup>3</sup> k <sup>h</sup> uan <sup>3</sup>	t.ka:n <sup>3</sup> k <sup>h</sup> uan <sup>3</sup>	--
42	back	k.ta: <sup>1</sup>	k.ta: <sup>1</sup>	--
43	small of back	ta:j <sup>1</sup> k <sup>h</sup> iaw <sup>2</sup>	ta:j <sup>1</sup> k <sup>h</sup> iaw <sup>2</sup>	--
44	buttock	p <sup>h</sup> ɤm <sup>3</sup> k <sup>h</sup> ru <sup>2</sup> ʔaŋ <sup>3</sup>	p <sup>h</sup> ɤm <sup>3</sup> k <sup>h</sup> ru <sup>2</sup> ʔaŋ <sup>3</sup>	--
45	anus	t <sup>h</sup> u <sup>2</sup> k <sup>h</sup> ru <sup>2</sup> ʔaŋ <sup>3</sup>	t <sup>h</sup> u <sup>2</sup> k <sup>h</sup> ru <sup>2</sup> ʔaŋ <sup>3</sup>	--
46	penis	li <sup>2</sup>	li <sup>2</sup>	--
47	testicle	t.k <sup>h</sup> ra: <sup>3</sup>	t.k <sup>h</sup> ra: <sup>3</sup>	--
48	vagina	ʔɔk <sup>2</sup>	ʔɔk <sup>2</sup>	--
49	clitoris	t.p <sup>h</sup> e: <sup>3</sup>	t.p <sup>h</sup> e: <sup>3</sup>	--
50a	push (verb)	t <sup>h</sup> i: <sup>3</sup>	t <sup>h</sup> i: <sup>3</sup>	--
50	arm	t <sup>h</sup> i <sup>2</sup>	t <sup>h</sup> i <sup>2</sup>	--
51	armpit	k <sup>h</sup> ru <sup>1</sup> ʔiak <sup>1</sup>	k <sup>h</sup> ru <sup>1</sup> ʔiak <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
52	upper arm	pruaŋ <sup>2</sup> t <sup>h</sup> i <sup>2</sup> kaw <sup>2</sup>	pruaŋ <sup>2</sup> t <sup>h</sup> i <sup>2</sup> kaw <sup>2</sup>	--
53	elbow	suak <sup>1</sup> tɔ <sup>2</sup>	suak <sup>1</sup> tɔ <sup>2</sup>	--
54	forearm	t <sup>h</sup> i <sup>2</sup> suak <sup>1</sup>	t <sup>h</sup> i <sup>2</sup> suak <sup>1</sup>	--
55	wrist	kaw <sup>2</sup> t <sup>h</sup> i <sup>2</sup> puw <sup>2</sup> ta:k <sup>1</sup>	kaw <sup>2</sup> t <sup>h</sup> i <sup>2</sup> puw <sup>2</sup> ta:k <sup>1</sup>	--
56	hand	dian <sup>3</sup> t <sup>h</sup> i <sup>2</sup> puw <sup>2</sup> ta:k <sup>1</sup>	dian <sup>3</sup> t <sup>h</sup> i <sup>2</sup> puw <sup>2</sup> ta:k <sup>1</sup>	t <sup>h</sup> i <sup>2</sup>
57	fist	t <sup>h</sup> i <sup>2</sup> t <sup>h</sup> .kwi: <sup>3</sup>	t <sup>h</sup> i <sup>2</sup> t <sup>h</sup> .kwi: <sup>3</sup>	--
58	palm (of hand)	t <sup>h</sup> i <sup>2</sup> puw <sup>2</sup> ta:k <sup>1</sup>	t <sup>h</sup> i <sup>2</sup> puw <sup>2</sup> ta:k <sup>1</sup>	t <sup>h</sup> i <sup>2</sup> p.ta:k <sup>1</sup>
59	finger	t <sup>h</sup> i <sup>2</sup> t <sup>h</sup> .kul <sup>3</sup>	t <sup>h</sup> i <sup>2</sup> t <sup>h</sup> .kul <sup>3</sup>	t <sup>h</sup> i <sup>2</sup> t.kul <sup>3</sup>
60	thumb	t <sup>h</sup> i <sup>2</sup> t <sup>h</sup> .k <sup>h</sup> ɣn <sup>3</sup>	t <sup>h</sup> i <sup>2</sup> t <sup>h</sup> .k <sup>h</sup> ɣn <sup>3</sup>	--
61	knuckle	k <sup>h</sup> ua <sup>2</sup> lɔt <sup>2</sup> let <sup>2</sup>	k <sup>h</sup> ua <sup>2</sup> lɔt <sup>2</sup> let <sup>2</sup>	--
62	finger nail	p.sim <sup>3</sup>	p.sim <sup>3</sup>	p.sim <sup>3</sup> t <sup>h</sup> i <sup>2</sup>
63	leg	cuw:ŋ <sup>3</sup>	cuw:ŋ <sup>3</sup>	cuw:ŋ <sup>3</sup> k <sup>h</sup> ial <sup>3</sup>
64	hip	k <sup>h</sup> o: <sup>2</sup> t.lu <sup>2</sup> tɔ <sup>2</sup>	k <sup>h</sup> o: <sup>2</sup> t.lu <sup>2</sup> tɔ <sup>2</sup>	--
65	thigh	t.lu <sup>2</sup>	t.lu <sup>2</sup>	--
66	knee	ŋaj: <sup>3</sup> kro:ŋ <sup>3</sup>	ŋaj: <sup>3</sup> kro:ŋ <sup>3</sup>	ŋaj: <sup>3</sup> kro:ŋ <sup>3</sup>
67	shin	na: <sup>2</sup> k <sup>h</sup> iaŋ <sup>1</sup>	na: <sup>2</sup> k <sup>h</sup> iaŋ <sup>1</sup>	--
68	calf of leg	cuw:ŋ <sup>3</sup> k <sup>h</sup> ial <sup>3</sup> p <sup>h</sup> ut <sup>2</sup>	cuw:ŋ <sup>3</sup> k <sup>h</sup> ial <sup>3</sup> p <sup>h</sup> ut <sup>2</sup>	--
69	ankle	cuw:ŋ <sup>3</sup> k <sup>h</sup> ial <sup>3</sup> tek <sup>2</sup>	cuw:ŋ <sup>3</sup> k <sup>h</sup> ial <sup>3</sup> tek <sup>2</sup>	--
70	foot	cuw:ŋ <sup>3</sup> ta <sup>2</sup>	cuw:ŋ <sup>3</sup> ta <sup>2</sup>	cuw:ŋ <sup>3</sup> c <sup>h</sup> ɣl <sup>3</sup>
71	heel	cuw:ŋ <sup>3</sup> c <sup>h</sup> ɣl <sup>3</sup>	cuw:ŋ <sup>3</sup> c <sup>h</sup> ɣl <sup>3</sup>	--
72	sole (of foot)	cuw:ŋ <sup>3</sup> puw <sup>2</sup> ta:k <sup>1</sup>	cuw:ŋ <sup>3</sup> puw <sup>2</sup> ta:k <sup>1</sup>	cuw:ŋ <sup>3</sup> pu <sup>2</sup> ta:k <sup>1</sup>
73	toe	cuw:ŋ <sup>3</sup> t <sup>h</sup> .kul <sup>3</sup>	cuw:ŋ <sup>3</sup> t <sup>h</sup> .kul <sup>3</sup>	--
74	bone	k.ʔa:ŋ <sup>3</sup>	k.ʔa:ŋ <sup>3</sup>	k.ʔa:ŋ <sup>3</sup>
75	bone marrow	k.cuak <sup>1</sup> k.ʔa:ŋ <sup>3</sup>	k.cuak <sup>1</sup> k.ʔa:ŋ <sup>3</sup>	--
76	skeleton	rop <sup>2</sup> k.ʔa:ŋ <sup>3</sup>	rop <sup>2</sup> k.ʔa:ŋ <sup>3</sup>	--
77	skull	k.ʔa:ŋ <sup>3</sup> preŋ <sup>3</sup>	k.ʔa:ŋ <sup>3</sup> preŋ <sup>3</sup>	--
78	breastbone	k.ʔa:ŋ <sup>3</sup> ʔɣk <sup>2</sup>	k.ʔa:ŋ <sup>3</sup> ʔɣk <sup>2</sup>	--
79	spine, backbone	k.ʔa:ŋ <sup>3</sup> ta:j <sup>1</sup>	k.ʔa:ŋ <sup>3</sup> ta:j <sup>1</sup>	--
80	rib	k.ʔa:ŋ <sup>3</sup> p <sup>h</sup> ruk <sup>1</sup>	k.ʔa:ŋ <sup>3</sup> p <sup>h</sup> ruk <sup>1</sup>	--
81	brain	k.cuak <sup>1</sup> preŋ <sup>3</sup>	k.cuak <sup>1</sup> preŋ <sup>3</sup>	k.cuak <sup>1</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
82	heart	roc <sup>3</sup> caj <sup>3</sup>	roc <sup>3</sup> caj <sup>3</sup>	ro: <sup>1</sup> caj <sup>3</sup>
83	liver	k.t <sup>h</sup> uam <sup>3</sup>	k.t <sup>h</sup> uam <sup>3</sup>	--
84	kidney	m.dan <sup>3</sup>	m.dan <sup>3</sup>	--
85	lung	t.ro <sup>2</sup> p <sup>h</sup> op <sup>2</sup>	t.ro <sup>2</sup> p <sup>h</sup> up <sup>2</sup>	t.ro p <sup>h</sup> op <sup>2</sup>
86	intestines	k.tu: <sup>1</sup>	k.tu: <sup>1</sup>	k.tu: <sup>1</sup>
87	bladder	t <sup>h</sup> uaŋ <sup>3</sup> ʔom <sup>3</sup> num <sup>3</sup>	t <sup>h</sup> aw <sup>2</sup> ʔom <sup>3</sup> num <sup>3</sup>	--
88	gall bladder	bi: <sup>3</sup>	bi: <sup>3</sup>	--
89	muscle	sɤc <sup>2</sup>	sɤc <sup>2</sup>	--
90	tendon	p.si <sup>2</sup> p.sa:c <sup>1</sup>	p.si <sup>2</sup> p.sa:c <sup>1</sup>	--
91	vein	p.si <sup>2</sup>	p.si <sup>2</sup>	--
92	breath	t <sup>h</sup> o: <sup>1</sup> p.su:m <sup>3</sup>	t <sup>h</sup> o: <sup>1</sup> p.su:m <sup>3</sup>	--
93	saliva	ʔom <sup>3</sup> ʔɛl <sup>3</sup>	ʔom <sup>3</sup> ʔɛl <sup>3</sup>	--
94	phlegm	k <sup>h</sup> aw <sup>2</sup> k <sup>h</sup> ɔ: <sup>1</sup>	k <sup>h</sup> aw <sup>2</sup> k <sup>h</sup> ɔ: <sup>1</sup>	--
95	nasal mucus, snot	ʔaŋ <sup>3</sup> k.tu: <sup>2</sup>	ʔaŋ <sup>3</sup> k.tu: <sup>2</sup>	--
96	earwax	ʔaŋ <sup>3</sup> c <sup>h</sup> o: <sup>1</sup>	ʔaŋ <sup>3</sup> c <sup>h</sup> o: <sup>1</sup>	--
97	tears (n)	ʔom <sup>3</sup> ŋa:j <sup>3</sup>	ʔom <sup>3</sup> ŋa:j <sup>3</sup>	--
98	blood	s.na:m <sup>3</sup>	s.na:m <sup>3</sup>	s.na:m <sup>3</sup>
99	bile, gall	ʔom <sup>3</sup> bi: <sup>3</sup>	ʔom <sup>3</sup> bi: <sup>3</sup>	--
100	semen	ʔom <sup>3</sup> li <sup>2</sup>	ʔom <sup>3</sup> li <sup>2</sup>	--
101	urine	ʔom <sup>3</sup> num <sup>3</sup>	ʔom <sup>3</sup> num <sup>3</sup>	num <sup>3</sup>
102	excrement, faeces	ʔaŋ <sup>3</sup>	ʔaŋ <sup>3</sup>	ʔaŋ <sup>3</sup>
103	blink	k <sup>h</sup> .jɛp <sup>2</sup> ŋa:j <sup>3</sup>	k <sup>h</sup> .jɛp <sup>2</sup> ŋa:j <sup>3</sup>	--
104	wink (eye)	ɲum <sup>3</sup> ŋa:j <sup>3</sup> m.t.p <sup>h</sup> ra:k <sup>1</sup>	ɲum <sup>3</sup> ŋa:j <sup>3</sup> m.t.p <sup>h</sup> ra:k <sup>1</sup>	--
105a	blow	p <sup>h</sup> uŋ <sup>3</sup>	p <sup>h</sup> uŋ <sup>3</sup>	p <sup>h</sup> uŋ <sup>3</sup>
105	blow nose	sul <sup>3</sup>	sul <sup>3</sup>	--
106	breathe	t <sup>h</sup> o: <sup>1</sup> pu: <sup>1</sup> su:m <sup>3</sup> lup <sup>2</sup>	t <sup>h</sup> o: <sup>1</sup> pu: <sup>1</sup> su:m <sup>3</sup> lup <sup>2</sup>	t <sup>h</sup> o: <sup>1</sup> p.su:m <sup>3</sup>
107	yawn	su: <sup>2</sup> ʔa:p <sup>1</sup>	su: <sup>2</sup> ʔa:p <sup>1</sup>	--
108	snore	k.tɤl <sup>3</sup> ʔɛt <sup>2</sup>	k.tɤl <sup>3</sup> ʔɛt <sup>2</sup>	--
109	pant	t <sup>h</sup> o: <sup>1</sup> pu: <sup>1</sup> su:m <sup>3</sup> riaŋ <sup>3</sup>	t <sup>h</sup> o: <sup>1</sup> pu: <sup>1</sup> su:m <sup>3</sup> riaŋ <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
110	blow (with mouth)	p <sup>h</sup> ut <sup>2</sup> ŋal <sup>3</sup>	p <sup>h</sup> ut <sup>2</sup> ŋal <sup>3</sup>	p <sup>h</sup> ut <sup>2</sup> ŋal <sup>3</sup>
111	spit	pɛk <sup>2</sup> ʔom <sup>3</sup> ʔɛl <sup>3</sup>	pɛk <sup>2</sup> ʔom <sup>3</sup> ʔɛl <sup>3</sup>	pɛk <sup>2</sup> ʔom <sup>3</sup> ʔɛl <sup>3</sup>
112	cough (v)	k <sup>h</sup> ua <sup>1</sup>	k <sup>h</sup> ua <sup>1</sup>	k <sup>h</sup> ua <sup>1</sup>
113	belch	sum <sup>1</sup> lak <sup>2</sup>	sum <sup>1</sup> lak <sup>2</sup>	--
115	sneeze (v)	sum <sup>1</sup> ʔaj <sup>1</sup>	sum <sup>1</sup> ʔaj <sup>1</sup>	--
116	groan (with pain)	ŋɛl <sup>3</sup>	ŋɛl <sup>3</sup>	--
117	grunt (from effort)	p <sup>h</sup> .net <sup>2</sup>	p <sup>h</sup> .net <sup>2</sup>	--
118	palpitate (of heart)	t.k <sup>h</sup> ɣl <sup>3</sup> pu <sup>1</sup> su:m <sup>3</sup>	t.k <sup>h</sup> ɣl <sup>3</sup> pu <sup>1</sup> su:m <sup>3</sup>	--
119	urinate	num <sup>3</sup>	num <sup>3</sup>	--
120	break wind, fart	sɣm <sup>3</sup>	sɣm <sup>3</sup>	--
121	defecate	ʔaŋ <sup>3</sup>	ʔaŋ <sup>3</sup>	--
122	shiver, tremble	t.k <sup>h</sup> ɣl <sup>3</sup>	t.k <sup>h</sup> ɣl <sup>3</sup>	--
123	perspire, sweat (v)	ʔom <sup>3</sup> k <sup>h</sup> ru <sup>1</sup> ʔo: <sup>1</sup> li: <sup>1</sup>	ʔom <sup>3</sup> k <sup>h</sup> ru <sup>1</sup> ʔo: <sup>1</sup> li: <sup>1</sup>	ʔom <sup>3</sup> k <sup>h</sup> ra <sup>2</sup> ʔo: <sup>1</sup>
124	bleed	li: <sup>1</sup> s.na:m <sup>3</sup>	li: <sup>1</sup> s.na:m <sup>3</sup>	--
125	coagulate, clot	k.ta:ŋ <sup>2</sup>	k.ta:ŋ <sup>2</sup>	--
126	(be) dizzy	bun <sup>1</sup> bin <sup>1</sup>	bun <sup>1</sup> bin <sup>1</sup>	--
127	faint	pil <sup>3</sup> ʔic <sup>2</sup>	pil <sup>3</sup> ʔic <sup>2</sup>	--
128	sleep (v)	ʔɛt <sup>2</sup>	ʔɛt <sup>2</sup>	--
129	dream (n)	t.mu <sup>2</sup>	t.mu <sup>2</sup>	ʔɛt <sup>2</sup> t.mu <sup>2</sup>
130	wake up (intr)	s.ŋe: <sup>3</sup>	s.ŋe: <sup>3</sup>	--
131	see	lua <sup>3</sup>	lua <sup>3</sup>	lua <sup>3</sup>
132	notice (v)	ʔun <sup>3</sup> s.ti <sup>2</sup>	ʔun <sup>3</sup> s.ti <sup>2</sup>	--
133b	look at, watch (close)	liam <sup>3</sup>	liam <sup>3</sup>	diam <sup>3</sup>
133c	look around, out	k <sup>h</sup> e:l <sup>3</sup>	k <sup>h</sup> e:l <sup>3</sup>	--
133	look at, watch (far)	duam <sup>3</sup>	duam <sup>3</sup>	duam <sup>3</sup>
134	hear	ŋaŋ <sup>3</sup>	ŋaŋ <sup>3</sup>	ŋaŋ <sup>3</sup>
135	listen	faŋ <sup>3</sup>	faŋ <sup>3</sup>	--
136	smell (v)	sut <sup>2</sup>	sut <sup>2</sup>	huam <sup>3</sup>
139	taste	c <sup>h</sup> ak <sup>2</sup>	c <sup>h</sup> ak <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
140	eat	k <sup>h</sup> a:j <sup>3</sup>	k <sup>h</sup> a:j <sup>3</sup>	k <sup>h</sup> a:j <sup>3</sup>
141	bite (v)	kat <sup>2</sup>	kak <sup>2</sup>	kak <sup>2</sup>
142	crunch	kruac <sup>1</sup>	kruac <sup>1</sup>	--
143	chew	mam <sup>1</sup>	mam <sup>1</sup>	--
145	swallow	t.pru:t <sup>1</sup>	t.pru:t <sup>1</sup>	--
146	choke	tʰŋ <sup>1</sup> k <sup>h</sup> uak <sup>1</sup>	tʰŋ <sup>1</sup> k <sup>h</sup> uak <sup>1</sup>	--
147	lick	pret <sup>2</sup>	pret <sup>2</sup>	pret <sup>2</sup>
148	suck	tut <sup>1</sup> ʔo:m <sup>3</sup>	tut <sup>1</sup> ʔo:m <sup>3</sup>	--
149	drink	k <sup>h</sup> a:j <sup>3</sup> ʔo:m <sup>3</sup>	k <sup>h</sup> a:j <sup>3</sup> ʔo:m <sup>3</sup>	k <sup>h</sup> u:p <sup>1</sup>
150	sit	t <sup>h</sup> e:t <sup>1</sup>	t <sup>h</sup> e:t <sup>1</sup>	t <sup>h</sup> e:t <sup>2</sup>
151	rise up (intr) /stand up	k.can <sup>3</sup>	k.can <sup>3</sup>	ru:j <sup>3</sup>
152	lie down	ʔuŋ <sup>1</sup> kuŋ <sup>2</sup>	ʔuŋ <sup>1</sup> kuŋ <sup>2</sup>	--
153	turn round (intr)	le:w <sup>3</sup>	le:w <sup>3</sup>	--
154	walk	te:w <sup>3</sup>	te:w <sup>3</sup>	--
155	step (v)	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	--
156	stumble	tʰŋ <sup>1</sup> k <sup>h</sup> o: <sup>1</sup>	tʰŋ <sup>1</sup> k <sup>h</sup> o: <sup>1</sup>	--
157	limp	ŋoj <sup>3</sup> cu:ŋ <sup>3</sup>	ŋoj <sup>3</sup> cu:ŋ <sup>3</sup>	--
158	crawl	mu:l <sup>3</sup>	mu:l <sup>3</sup>	--
159	run down (not up)	tun <sup>1</sup> lat <sup>2</sup>	tun <sup>1</sup> lat <sup>2</sup>	--
160	swim	dam <sup>3</sup> ʔo:m <sup>3</sup>	dam <sup>3</sup> ʔo:m <sup>3</sup>	dam <sup>1</sup> ʔo:m <sup>3</sup>
161	jump (v)	hək <sup>2</sup> k.cəp <sup>2</sup>	hək <sup>2</sup> k.cəp <sup>2</sup>	--
162	kick	da: <sup>2</sup>	da: <sup>2</sup>	da: <sup>2</sup>
163	stamp (with foot)	rum <sup>1</sup> cu:ŋ <sup>3</sup>	rum <sup>1</sup> cu:ŋ <sup>3</sup>	--
164	trample	da <sup>2</sup> ʔɛn	da <sup>2</sup> ʔɛn	--
165	wave (hand as a greeting) (v)	wu <sup>1</sup> wi: <sup>3</sup>	wu <sup>1</sup> wi: <sup>3</sup>	--
166	indicate, point	ci: <sup>2</sup> ʔun <sup>3</sup> ŋua <sup>3</sup>	ci: <sup>2</sup> ʔun <sup>3</sup> ŋua <sup>3</sup>	--
167	clap (hands)	t <sup>h</sup> e: <sup>1</sup> t <sup>h</sup> i <sup>2</sup>	t <sup>h</sup> e: <sup>1</sup> t <sup>h</sup> i <sup>2</sup>	--
168	slap (v)	t <sup>h</sup> e: <sup>1</sup> ʔua <sup>1</sup>	t <sup>h</sup> e: <sup>1</sup> ʔua <sup>1</sup>	t <sup>h</sup> e: <sup>2</sup> ʔua <sup>1</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
169	stand	k.can <sup>3</sup> dɤŋ <sup>3</sup>	k.can <sup>3</sup> dɤŋ <sup>3</sup>	--
170	straddle	t <sup>h</sup> e:t <sup>1</sup> be:3	t <sup>h</sup> e:t <sup>1</sup> be:3	--
171	lean against (intr)	k <sup>h</sup> ru <sup>1</sup> ʔiŋ <sup>3</sup>	k <sup>h</sup> ru <sup>1</sup> ʔiŋ <sup>3</sup>	--
172	bend down, stoop	ku:k <sup>1</sup>	ku:k <sup>1</sup>	--
173	bow (as in greeting)	kup <sup>2</sup> ŋup <sup>2</sup>	kup <sup>2</sup> ŋup <sup>2</sup>	--
174	(be) seated	t <sup>h</sup> e:t <sup>1</sup> ŋua <sup>1</sup>	t <sup>h</sup> e:t <sup>1</sup> ŋua <sup>1</sup>	--
175	squat	t <sup>h</sup> e:t <sup>1</sup> sam <sup>1</sup> cam <sup>3</sup>	t <sup>h</sup> e:t <sup>1</sup> sam <sup>1</sup> cam <sup>3</sup>	--
176	kneel	kru <sup>2</sup> kro:ŋ <sup>3</sup>	kru <sup>2</sup> kro:ŋ <sup>3</sup>	--
177	(be) lying down	krɤ:n <sup>1</sup>	krɤ:n <sup>1</sup>	--
178	(be) hot (of person)	ruan <sup>2</sup>	ruan <sup>2</sup>	s.ʔɤm <sup>3</sup>
179	(be) hungry, hunger	t.pra:j <sup>3</sup>	t.pra:j <sup>3</sup>	--
180	(be) sated / (be) full	su:k <sup>1</sup>	su:k <sup>1</sup>	--
181	(be) thirsty, thirst	t.pra:j <sup>3</sup> ʔo:m <sup>3</sup>	t.pra:j <sup>3</sup> ʔo:m <sup>3</sup>	--
182	(be) drunk	maw <sup>3</sup> law <sup>2</sup>	maw <sup>3</sup> law <sup>2</sup>	--
183	(be) tired	muaj <sup>1</sup>	muaj <sup>1</sup>	--
184	(be) sleepy	ŋu <sup>2</sup> ʔet <sup>2</sup>	ŋu <sup>2</sup> ʔet <sup>2</sup>	--
185	rest	c <sup>h</sup> ɤn <sup>3</sup>	c <sup>h</sup> ɤn <sup>3</sup>	--
186	(be) awake, alert	keŋ <sup>3</sup> wɔŋ <sup>3</sup>	keŋ <sup>3</sup> wɔŋ <sup>3</sup>	--
187	wrinkle (on skin)	hew <sup>1</sup>	hew <sup>1</sup>	--
188	pimple	mun <sup>1</sup>	mun <sup>1</sup>	--
189	hump (of hunchback)	p <sup>h</sup> um <sup>3</sup> k.ta:1	p <sup>h</sup> um <sup>3</sup> k.ta:1	--
190	(be) bald	t.muaj <sup>3</sup> mua <sup>1</sup>	t.muaj <sup>3</sup> mua <sup>1</sup>	--
191	(be) blind	s.wək <sup>2</sup> ŋa:j <sup>3</sup>	s.wək <sup>2</sup> ŋa:j <sup>3</sup>	--
192	(be) myopic, shortsighted	sa:j <sup>3</sup> ŋa:j <sup>3</sup> to:t <sup>1</sup>	sa:j <sup>3</sup> ŋa:j <sup>3</sup> to:t <sup>1</sup>	--
194	(be) impotent	li <sup>2</sup> ʔam <sup>3</sup> k <sup>h</sup> aŋ <sup>3</sup>	li <sup>2</sup> ʔam <sup>3</sup> k <sup>h</sup> aŋ <sup>3</sup>	--
195	barren woman	man <sup>3</sup>	man <sup>3</sup>	--
196	blind person	ʔic <sup>2</sup> s.wək <sup>2</sup> ŋa:j <sup>3</sup>	ʔic <sup>2</sup> s.wək <sup>2</sup> ŋa:j <sup>3</sup>	--
197	deaf (mute) person	c <sup>h</sup> o:k <sup>1</sup> lut <sup>2</sup>	c <sup>h</sup> o:k <sup>1</sup> lut <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
198	hunchback	ʔic <sup>2</sup> p <sup>h</sup> um <sup>3</sup> k.ta: <sup>1</sup>	ʔic <sup>2</sup> p <sup>h</sup> um <sup>3</sup> k.ta: <sup>1</sup>	--
199	cripple (n)	lu <sup>2</sup> ʔuŋ <sup>3</sup> ka <sup>2</sup>	lu <sup>2</sup> ʔuŋ <sup>3</sup> ka <sup>2</sup>	--
200	dwarf	ʔic <sup>2</sup> tian <sup>3</sup>	ʔic <sup>2</sup> tian <sup>3</sup>	--
201	giant	ʔic <sup>2</sup> rɤk <sup>2</sup>	ʔic <sup>2</sup> rɤk <sup>2</sup>	--
202	stupid person	ʔic <sup>2</sup> ʔam <sup>3</sup> c <sup>h</sup> uaŋ <sup>3</sup>	ʔic <sup>2</sup> ʔam <sup>3</sup> c <sup>h</sup> uaŋ <sup>3</sup>	--
203	senile person	t <sup>h</sup> aw <sup>2</sup> pɔn <sup>2</sup> lat <sup>2</sup>	t <sup>h</sup> aw <sup>2</sup> pɔn <sup>2</sup> lat <sup>2</sup>	--
204	mad person	ʔic <sup>2</sup> jɔŋ <sup>1</sup>	ʔic <sup>2</sup> jɔŋ <sup>1</sup>	--
205	(be) healthy, well	ŋo:t <sup>1</sup> juaŋ <sup>3</sup>	ŋo:t <sup>1</sup> juaŋ <sup>3</sup>	--
206	(be) sick, (be) ill	k <sup>h</sup> at <sup>2</sup>	k <sup>h</sup> at <sup>2</sup>	c <sup>h</sup> o: <sup>1</sup> k <sup>h</sup> at <sup>2</sup>
207	hurt oneself	le: <sup>3</sup>	le: <sup>3</sup>	--
208	heal (tr), cure (v)	ja: <sup>3</sup> wan <sup>1</sup> ra: <sup>1</sup>	ja: <sup>3</sup> wan <sup>1</sup> ra: <sup>1</sup>	--
209	medicine	ja: <sup>3</sup>	ja: <sup>3</sup>	ja: <sup>3</sup>
210	get well, recover	kua <sup>1</sup> ra: <sup>1</sup>	kua <sup>1</sup> ra: <sup>1</sup>	--
211	revive	jam <sup>3</sup> lam <sup>1</sup> vɤj <sup>1</sup> ʔim <sup>3</sup>	jam <sup>3</sup> lam <sup>1</sup> vɤj <sup>1</sup> ʔim <sup>3</sup>	--
238	life	co: <sup>1</sup> ʔa: <sup>1</sup> ju <sup>2</sup>	co: <sup>1</sup> ʔa: <sup>1</sup> ju <sup>2</sup>	--
239	(be) alive	ʔim <sup>3</sup>	ʔim <sup>3</sup>	ʔim <sup>3</sup>
240	menstrual period	na <sup>2</sup> dɤ:n <sup>3</sup>	na <sup>2</sup> dɤ:n <sup>3</sup>	--
241	(be) pregnant	rɤk <sup>2</sup> k.tɤl <sup>3</sup>	rɤk <sup>2</sup> k.tɤl <sup>3</sup>	--
242	miscarriage	luat <sup>1</sup> k <sup>h</sup> uan <sup>3</sup>	luat <sup>1</sup> k <sup>h</sup> uan <sup>3</sup>	--
243	labour, birth pains	ŋaŋ <sup>3</sup> ʔa <sup>2</sup> ŋa:k <sup>1</sup>	ŋaŋ <sup>3</sup> ʔa <sup>2</sup> ŋa:k <sup>1</sup>	--
244	give birth	kɤ:t <sup>1</sup> k <sup>h</sup> uan <sup>3</sup>	kɤ:t <sup>1</sup> k <sup>h</sup> uan <sup>3</sup>	--
245	(be) born	kɔj <sup>1</sup> kɤ:t <sup>1</sup>	kɔj <sup>1</sup> kɤ:t <sup>1</sup>	--
246	(be) young	k <sup>h</sup> uan <sup>3</sup> juam <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> juam <sup>3</sup>	--
247a	grow up ("up big")	rɤk <sup>2</sup> sa: <sup>3</sup>	rɤk <sup>2</sup> sa: <sup>3</sup>	--
247	grow up ("come big")	rɤk <sup>2</sup> ʔi: <sup>3</sup>	rɤk <sup>2</sup> ʔi: <sup>3</sup>	--
248	(be) old (not young)	kua <sup>1</sup> t <sup>h</sup> aw <sup>2</sup>	kua <sup>1</sup> t <sup>h</sup> aw <sup>2</sup>	--
249	die	jam <sup>3</sup>	jam <sup>3</sup>	jam <sup>3</sup>
250	death	s.ruaŋ <sup>3</sup> jam <sup>3</sup>	s.ruaŋ <sup>3</sup> jam <sup>3</sup>	--



No.	Gloss	Speaker A	Speaker B	Speaker D
251a	kill	p <sup>h</sup> .jam <sup>3</sup> jam <sup>3</sup>	p <sup>h</sup> .jam <sup>3</sup> jam <sup>3</sup> , p.c <sup>h</sup> am <sup>3</sup> jam <sup>3</sup>	--
251	(be) dead	kɔj <sup>1</sup> jam <sup>3</sup>	kɔj <sup>1</sup> jam <sup>3</sup>	--
252	think	kut <sup>2</sup>	kut <sup>2</sup>	--
253	believe	jum <sup>1</sup> jam <sup>3</sup>	jum <sup>1</sup> jam <sup>3</sup>	--
254	hope (v)	kuaŋ <sup>3</sup>	kuaŋ <sup>3</sup>	--
255	know	c <sup>h</sup> u:3	c <sup>h</sup> u:3	c <sup>h</sup> u:3
256	knowledge	s.c <sup>h</sup> u:3	s.c <sup>h</sup> u:3	--
257	wisdom	pan <sup>1</sup> ɲa:3	pan <sup>1</sup> ɲa:3	--
258	(be) wise	pa <sup>2</sup> pan <sup>1</sup> ɲa:3	pa <sup>2</sup> pan <sup>1</sup> ɲa:3	--
259	(be) intelligent	p <sup>h</sup> .ɲa:3	p <sup>h</sup> .ɲa:3	--
260	(be) stupid	p <sup>h</sup> .ɲa:3 pɣk <sup>2</sup>	p <sup>h</sup> .ɲa:3 pɣk <sup>2</sup>	--
261	(be) confused	su:k <sup>2</sup> sak <sup>2</sup> p.su:m <sup>3</sup>	su:k <sup>2</sup> sak <sup>2</sup> p.su:m <sup>3</sup>	--
262	learn	re:n <sup>3</sup> t.no:3	re:n <sup>3</sup> t.no:3	--
263	teach	suan <sup>3</sup> k.no:3	suan <sup>3</sup> k.no:3	--
264	show	wa:1 ʔic <sup>2</sup> lua <sup>3</sup>	wa:1 ʔic <sup>2</sup> lua <sup>3</sup>	--
265	remember	ra:1 nut <sup>2</sup>	ra:1 nut <sup>2</sup>	--
266	forget	pil <sup>3</sup>	pil <sup>3</sup>	pil <sup>3</sup>
267	(be) happy, (be) joyful	mon <sup>1</sup> p.sum <sup>3</sup>	mon <sup>1</sup> p.sum <sup>3</sup>	--
268a	enjoy	ɲaŋ <sup>3</sup> juaŋ <sup>3</sup>	ɲaŋ <sup>3</sup> juaŋ <sup>3</sup>	--
268	rejoice	so:1 ɲɣ:m <sup>3</sup>	so:1 ɲɣ:m <sup>3</sup>	--
269	laugh	mɛ <sup>2</sup>	mɛ <sup>2</sup>	mɛ <sup>2</sup>
270	smile	--	--	naŋ <sup>1</sup> sel <sup>3</sup>
270	smile	ɲɣ:m <sup>3</sup> rap <sup>2</sup>	ɲɣ:m <sup>3</sup> rap <sup>2</sup>	naŋ <sup>1</sup> ju:m <sup>3</sup>
271	(be) sad	k.cɣ:m <sup>1</sup> p.su:m <sup>3</sup>	k.cɣ:m <sup>1</sup> p.su:m <sup>3</sup>	--
272	cry, weep	ja:m <sup>3</sup>	ja:m <sup>3</sup>	ja:m <sup>3</sup>
273	sorrow (n)	s.ʔuat <sup>1</sup> s.ʔiat <sup>1</sup>	s.ʔuat <sup>1</sup> s.ʔiat <sup>1</sup>	--
274	shame (n)	cw:1 m.juaŋ <sup>3</sup> ka:n <sup>3</sup>	cw:1 m.juaŋ <sup>3</sup> ka:n <sup>3</sup>	--
275	pity (n)	naŋ <sup>1</sup> ʔe:ŋ <sup>3</sup>	naŋ <sup>1</sup> ʔe:ŋ <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
276	fear (n)	juan <sup>3</sup> ra:t <sup>1</sup>	juan <sup>3</sup> ra:t <sup>1</sup>	--
277a	(be) afraid	ra:t <sup>1</sup>	ra:t <sup>1</sup>	lat <sup>2</sup>
277	frighten	ra:t <sup>1</sup> k <sup>h</sup> ap <sup>2</sup> t.k <sup>h</sup> ɿl <sup>3</sup>	ra:t <sup>1</sup> k <sup>h</sup> ap <sup>2</sup> t.k <sup>h</sup> ɿl <sup>3</sup>	--
278	startle, surprise	ŋu:t <sup>1</sup>	ŋu:t <sup>1</sup>	--
279	(be) angry	p.su:m <sup>3</sup> laŋ <sup>3</sup>	p.su:m <sup>3</sup> laŋ <sup>3</sup>	--
280	calm (oneself) calm person	ʔic <sup>2</sup> cɿ: <sup>2</sup> ma: <sup>1</sup> dɿŋ <sup>3</sup>	ʔic <sup>2</sup> cɿ: <sup>2</sup> ma: <sup>1</sup> dɿŋ <sup>3</sup>	--
281	(be) proud	le <sup>2</sup> ɲuk <sup>2</sup> le <sup>2</sup> sak <sup>2</sup>	le <sup>2</sup> ɲuk <sup>2</sup> le <sup>2</sup> sak <sup>2</sup>	--
282	respect (v)	k <sup>h</sup> up <sup>2</sup> jam <sup>3</sup>	k <sup>h</sup> up <sup>2</sup> jam <sup>3</sup>	--
283	honour (v)	nap <sup>2</sup> t <sup>h</sup> u: <sup>3</sup>	nap <sup>2</sup> t <sup>h</sup> u: <sup>3</sup>	--
284	love (v)	t <sup>h</sup> u:m <sup>3</sup>	t <sup>h</sup> u:m <sup>3</sup>	t <sup>h</sup> u:m <sup>3</sup>
285	hate (v)	k.caŋ <sup>3</sup>	k.caŋ <sup>3</sup>	--
286a	disgusting	ra:j <sup>3</sup> p.su:m <sup>3</sup>	ra:j <sup>3</sup> p.su:m <sup>3</sup>	--
286	despise, disdain	ʔam <sup>3</sup> bɿ:ŋ <sup>3</sup>	ʔam <sup>3</sup> bɿ:ŋ <sup>3</sup>	--
287	want, desire (v)	ŋaŋ <sup>3</sup>	ŋaŋ <sup>3</sup>	--
288	decide	wan <sup>1</sup> kuc <sup>1</sup> haj <sup>3</sup> p.su:m <sup>3</sup>	wan <sup>1</sup> kuc <sup>1</sup> haj <sup>3</sup> p.su:m <sup>3</sup>	--
289	choose (tr), pick (tr)	raj <sup>1</sup>	raj <sup>1</sup>	--
290	hesitate	t.ba:p <sup>1</sup> p.su:m <sup>3</sup>	t.ba:p <sup>1</sup> p.su:m <sup>3</sup>	--
291	abstain	vin <sup>2</sup>	vin <sup>2</sup>	--
292	allow, permit	wa:ŋ <sup>3</sup>	wa:ŋ <sup>3</sup>	--
293	forbid	ha:m <sup>2</sup>	ha:m <sup>2</sup>	--
294	prevent	me: <sup>3</sup> rɛn <sup>3</sup>	me: <sup>3</sup> rɛn <sup>3</sup>	--
295	plan (n)	kɿt <sup>2</sup> kɔj <sup>3</sup> ʔun <sup>3</sup>	kɿt <sup>2</sup> kɔj <sup>3</sup> ʔun <sup>3</sup>	--
296	try	le <sup>2</sup> p.su:m <sup>3</sup> nam <sup>3</sup>	le <sup>2</sup> p.su:m <sup>3</sup> nam <sup>3</sup>	--
297	succeed	kua <sup>1</sup> mu:n <sup>3</sup> p.su:m <sup>3</sup>	kua <sup>1</sup> mu:n <sup>3</sup> p.su:m <sup>3</sup>	--
298	fail	kua <sup>1</sup> sum <sup>3</sup>	kua <sup>1</sup> sum <sup>3</sup>	--
299	pretend	ŋaŋ <sup>3</sup> wa: <sup>1</sup> ʔic <sup>2</sup> ʔo:t <sup>1</sup>	ŋaŋ <sup>3</sup> wa: <sup>1</sup> ʔic <sup>2</sup> ʔo:t <sup>1</sup>	--
300	(be) kind	kian <sup>2</sup> p.su:m <sup>3</sup>	kian <sup>2</sup> p.su:m <sup>3</sup>	--
301	(be) generous	ʔam <sup>3</sup> t <sup>h</sup> i: <sup>1</sup>	ʔam <sup>3</sup> t <sup>h</sup> i: <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
302	(be) selfish	kʏt <sup>2</sup> let <sup>2</sup> pon <sup>1</sup> ti <sup>2</sup>	kʏt <sup>2</sup> let <sup>2</sup> pon <sup>1</sup> ti <sup>2</sup>	--
303	(be) honest	ru: <sup>1</sup> ruam <sup>3</sup>	ru: <sup>1</sup> ruam <sup>3</sup>	--
304	(be) corrupt	p.su:m <sup>3</sup> ʔam <sup>3</sup> juaŋ <sup>3</sup>	p.su:m <sup>3</sup> ʔam <sup>3</sup> juaŋ <sup>3</sup>	--
305	(be) wicked	p.su:m <sup>3</sup> k <sup>h</sup> ɔk <sup>2</sup>	p.su:m <sup>3</sup> k <sup>h</sup> ɔk <sup>2</sup>	--
306	(be) fierce	sa:w <sup>1</sup> ha:w <sup>3</sup>	sa:w <sup>1</sup> ha:w <sup>3</sup>	--
307	(be) jealous	ʔam <sup>3</sup> ŋaŋ <sup>3</sup> pun <sup>1</sup> lua <sup>3</sup>	ʔam <sup>3</sup> ŋaŋ <sup>3</sup> pun <sup>1</sup> lua <sup>3</sup>	--
308	(be) shy	ŋaŋ <sup>3</sup> ka:n <sup>3</sup>	ŋaŋ <sup>3</sup> ka:n <sup>3</sup>	--
309	(be) courageous, (be) brave	hat <sup>2</sup> ha:n <sup>3</sup>	hat <sup>2</sup> ha:n <sup>3</sup>	--
310	coward	ʔam <sup>3</sup> hat <sup>2</sup> ha:n <sup>3</sup>	ʔam <sup>3</sup> hat <sup>2</sup> ha:n <sup>3</sup>	--
311	(be) curious	ca:ŋ <sup>1</sup> sua <sup>1</sup>	ca:ŋ <sup>1</sup> sua <sup>1</sup>	--
312	(be) eager, (be) zealous	pa <sup>2</sup> pu <sup>1</sup> su:m <sup>3</sup> ʔuak <sup>1</sup> riaŋ <sup>3</sup>	pa <sup>2</sup> pu <sup>1</sup> su:m <sup>3</sup> ʔuak <sup>1</sup> riaŋ <sup>3</sup>	--
313	(be) lazy	k <sup>h</sup> u: <sup>3</sup> kran <sup>1</sup>	k <sup>h</sup> u: <sup>3</sup> kran <sup>1</sup>	--
314	(be) patient	p.su:m <sup>3</sup> la:n <sup>3</sup>	p.su:m <sup>3</sup> la:n <sup>3</sup>	--
315	(be) impatient	p.su:m <sup>3</sup> ʔam <sup>3</sup> la:n <sup>3</sup>	p.su:m <sup>3</sup> ʔam <sup>3</sup> la:n <sup>3</sup>	--
316	(be) restless	p.su:m <sup>3</sup> ʔam <sup>3</sup> dʏŋ <sup>3</sup>	p.su:m <sup>3</sup> ʔam <sup>3</sup> dʏŋ <sup>3</sup>	--
317	(be) stubborn	tu <sup>1</sup> ba:p <sup>1</sup> nʏn <sup>3</sup>	tu <sup>1</sup> ba:p <sup>1</sup> nʏn <sup>3</sup>	--
318	reputation	ŋa:j <sup>3</sup> k.tu <sup>2</sup>	ŋa:j <sup>3</sup> k.tu <sup>2</sup>	--
319	hardship, distress	tu <sup>1</sup> k <sup>h</sup> a <sup>2</sup>	tu <sup>1</sup> k <sup>h</sup> a <sup>2</sup>	--
320a	(be) easy	su <sup>1</sup> ba:j <sup>3</sup>	su <sup>1</sup> ba:j <sup>3</sup>	--
320b	difficult to teach	t.ba:p <sup>1</sup>	t.ba:p <sup>1</sup>	--
320	(be) difficult	ɲa:p <sup>1</sup>	ɲa:p <sup>1</sup>	--
321	suffer	k <sup>h</sup> a:m <sup>1</sup> ɲa:p <sup>1</sup> t.ba:p <sup>1</sup>	k <sup>h</sup> a:m <sup>1</sup> ɲa:p <sup>1</sup> t.ba:p <sup>1</sup>	--
322	obstruct	kak <sup>2</sup>	kak <sup>2</sup>	--
323	stumbling block, obstruction	riw <sup>2</sup>	riw <sup>2</sup>	--
324	danger	ʔun <sup>3</sup> tra:j <sup>3</sup>	ʔun <sup>3</sup> t.ra:j <sup>3</sup>	--
326	human being, person	ʔic <sup>2</sup>	ʔic <sup>2</sup>	ʔic <sup>2</sup>
327	self	ti <sup>2</sup>	ti <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
328	man (male)	p.k <sup>h</sup> uŋ <sup>3</sup>	p.k <sup>h</sup> uŋ <sup>3</sup>	pɣ k <sup>h</sup> uŋ <sup>3</sup>
329	woman	p <sup>h</sup> ɣn <sup>3</sup>	p <sup>h</sup> ɣn <sup>3</sup>	t.p <sup>h</sup> ɣn <sup>3</sup>
330	white man	k.la: <sup>3</sup> p <sup>h</sup> ɣ:k <sup>1</sup>	k.la: <sup>3</sup> p <sup>h</sup> ɣ:k <sup>1</sup>	--
331	fetus	k <sup>h</sup> uan <sup>3</sup> ʔa <sup>2</sup> ŋa:k <sup>1</sup>	k <sup>h</sup> uan <sup>3</sup> ʔa <sup>2</sup> ŋa:k <sup>1</sup>	--
332	baby	k <sup>h</sup> uan <sup>3</sup> ŋuam <sup>3</sup> tək <sup>2</sup>	k <sup>h</sup> uan <sup>3</sup> ŋuam <sup>3</sup> tək <sup>2</sup>	--
333	twin	k <sup>h</sup> uan <sup>3</sup> t.ba:p <sup>1</sup>	k <sup>h</sup> uan <sup>3</sup> t.ba:p <sup>1</sup>	--
334	child	k <sup>h</sup> uan <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup>
335	boy	k <sup>h</sup> uan <sup>3</sup> p.k <sup>h</sup> uŋ <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> p.k <sup>h</sup> uŋ <sup>3</sup>	--
336	girl	k <sup>h</sup> uan <sup>3</sup> t.p <sup>h</sup> ɣn <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> t.p <sup>h</sup> ɣn <sup>3</sup>	--
337	adult	ʔic <sup>2</sup> rɣk <sup>2</sup>	ʔic <sup>2</sup> rɣk <sup>2</sup>	--
338	young man	ŋuam <sup>3</sup> p.k <sup>h</sup> uŋ <sup>3</sup>	ŋuam <sup>3</sup> p.k <sup>h</sup> uŋ <sup>3</sup>	--
339	virgin	ŋuam <sup>3</sup> t.p <sup>h</sup> .ja <sup>2</sup>	ŋuam <sup>3</sup> p <sup>h</sup> .ja <sup>2</sup>	--
340	old person	ʔic <sup>2</sup> t <sup>h</sup> aw <sup>2</sup>	ʔic <sup>2</sup> t <sup>h</sup> aw <sup>2</sup>	t <sup>h</sup> aw <sup>2</sup>
341	relative (by blood)	bi: <sup>1</sup> nuɑŋ <sup>2</sup>	bi: <sup>1</sup> nuɑŋ <sup>2</sup>	--
342a	ancestor	ja <sup>2</sup> muan <sup>1</sup>	ja <sup>2</sup> muan <sup>1</sup>	--
342	ancestor	t <sup>h</sup> a <sup>2</sup> muan <sup>1</sup>	t <sup>h</sup> a <sup>2</sup> muan <sup>1</sup>	--
343	grandparent	t <sup>h</sup> a <sup>2</sup> ja <sup>2</sup>	t <sup>h</sup> a <sup>2</sup> ja <sup>2</sup>	--
344	father	pua <sup>1</sup>	pua <sup>1</sup>	pua <sup>1</sup>
345a	mother (Wan Sɔʔ)	ma: <sup>2</sup>	ma: <sup>2</sup>	--
345b	mother	ʔu <sup>2</sup>	ʔu <sup>2</sup>	--
345c	mother	nɣ:j <sup>3</sup>	nɣ:j <sup>3</sup>	--
345	mother	me: <sup>1</sup>	me: <sup>1</sup>	me: <sup>1</sup>
346b	brother (younger) [male speaker]	ʔiam <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup>	ʔiam <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup>	--
346	brother (elder) [male speaker]	maj <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup>	maj <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup>	--
347a	sister (younger) [male speaker]	ʔiam <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	ʔiam <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	--
347	sister (elder) [male speaker]	maj <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	maj <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
348a	father's younger brother (uncle)	ʔiam <sup>3</sup> pua <sup>1</sup>	ʔiam <sup>3</sup> pua <sup>1</sup>	--
348	father's older brother (uncle)	maj <sup>3</sup> pua <sup>1</sup>	maj <sup>3</sup> pua <sup>1</sup>	--
349a	mother's younger brother (uncle)	ʔiam me: <sup>1</sup>	ʔiam me: <sup>1</sup>	--
349	mother's older brother (uncle)	maj <sup>3</sup> me: <sup>1</sup>	maj <sup>3</sup> me: <sup>1</sup>	--
350a	mother's younger sister (aunt)	ʔiam <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> me: <sup>1</sup>	ʔiam <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> me: <sup>1</sup>	--
350	mother's older sister (aunt)	maj <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> me: <sup>1</sup>	maj <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> me: <sup>1</sup>	--
351a	father's younger sister (aunt)	ʔiam <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> pua <sup>1</sup>	ʔiam <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> pua <sup>1</sup>	--
351	father's older sister (aunt)	maj <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> pua <sup>1</sup>	maj <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> pua <sup>1</sup>	--
352a	younger cousin	k <sup>h</sup> uan <sup>3</sup> ʔiam <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> ʔiam <sup>3</sup>	--
352	older cousin	k <sup>h</sup> uan <sup>3</sup> maj <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> maj <sup>3</sup>	--
353a	firstborn boy	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> kaw <sup>2</sup>	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> kaw <sup>2</sup>	--
353	firstborn girl	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> kaw <sup>2</sup>	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> kaw <sup>2</sup>	--
354	descendant	co: <sup>1</sup> k <sup>h</sup> uan <sup>3</sup> c <sup>h</sup> u <sup>2</sup>	co: <sup>1</sup> k <sup>h</sup> uan <sup>3</sup> c <sup>h</sup> u <sup>2</sup>	--
355	son	k <sup>h</sup> uan <sup>3</sup> to: <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> to: <sup>3</sup>	--
356	daughter	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup>	--
357	grandchild	k <sup>h</sup> uan <sup>3</sup> c <sup>h</sup> u <sup>2</sup>	k <sup>h</sup> uan <sup>3</sup> c <sup>h</sup> u <sup>2</sup>	--
358	nephew	k <sup>h</sup> uan <sup>3</sup> maj <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> ʔɔk <sup>2</sup>	k <sup>h</sup> uan <sup>3</sup> maj <sup>3</sup> k <sup>h</sup> ʔn <sup>3</sup> ʔɔk <sup>2</sup>	--
359	name	cu: <sup>1</sup>	cu: <sup>1</sup>	cu: <sup>1</sup>
360	namesake	na:m <sup>3</sup> pua <sup>1</sup> na:m <sup>3</sup> me: <sup>1</sup>	na:m <sup>3</sup> pua <sup>1</sup> na:m <sup>3</sup> me: <sup>1</sup>	--
361	in-law, relative by marriage	k <sup>h</sup> ʔj: <sup>3</sup>	k <sup>h</sup> ʔj: <sup>3</sup>	--
362	husband	me: <sup>2</sup>	me: <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
363	wife	p <sup>h</sup> ɣn <sup>3</sup>	p <sup>h</sup> ɣn <sup>3</sup>	--
364	fellow-wife, co-wife	ma: <sup>1</sup> tek <sup>2</sup>	ma: <sup>1</sup> tek <sup>2</sup>	--
365a	father-in-law (husband's father)	pua <sup>1</sup> me <sup>2</sup>	pua <sup>1</sup> me <sup>2</sup>	--
365	father-in-law (wife's father)	pua <sup>1</sup> p <sup>h</sup> ɣn <sup>3</sup>	pua <sup>1</sup> p <sup>h</sup> ɣn <sup>3</sup>	--
366a	mother-in-law (wife's mother)	me: <sup>1</sup> p <sup>h</sup> ɣn <sup>3</sup>	me: <sup>1</sup> p <sup>h</sup> ɣn <sup>3</sup>	--
366	mother-in-law (husband's mother)	me: <sup>1</sup> me <sup>2</sup>	me: <sup>1</sup> me <sup>2</sup>	--
367a	brother-in-law (younger)	k <sup>h</sup> ɣj <sup>3</sup> ʔiam <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	k <sup>h</sup> ɣj <sup>3</sup> ʔiam <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	--
367	brother-in-law (older)	k <sup>h</sup> ɣj <sup>3</sup> maj <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	k <sup>h</sup> ɣj <sup>3</sup> maj <sup>3</sup> k <sup>h</sup> ɣn <sup>3</sup>	--
368a	sister-in-law (younger)	p <sup>h</sup> ɣn <sup>3</sup> ʔiam <sup>3</sup> k <sup>h</sup> ɣj <sup>3</sup>	p <sup>h</sup> ɣn <sup>3</sup> ʔiam <sup>3</sup> k <sup>h</sup> ɣj <sup>3</sup>	--
368	sister-in-law (older)	p <sup>h</sup> ɣn <sup>3</sup> maj <sup>3</sup> k <sup>h</sup> ɣj <sup>3</sup>	p <sup>h</sup> ɣn <sup>3</sup> maj <sup>3</sup> k <sup>h</sup> ɣj <sup>3</sup>	--
369	son-in-law	k <sup>h</sup> ɣj <sup>3</sup>	k <sup>h</sup> ɣj <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> k <sup>h</sup> ɣj <sup>3</sup>
370	daughter-in-law	ʔɛk <sup>2</sup>	ʔɛk <sup>2</sup>	--
371	widow	ra:ŋ <sup>1</sup> ma:j <sup>2</sup>	ra:ŋ <sup>1</sup> ma:j <sup>2</sup>	--
372	widower	pua <sup>1</sup> maj <sup>2</sup>	pua <sup>1</sup> maj <sup>2</sup>	--
373	orphan	k <sup>h</sup> uan <sup>3</sup> jo:l <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> jo:l <sup>3</sup>	--
374	fiance(betrothed boyfriend)	ma <sup>2</sup> ʔu: <sup>1</sup>	ma <sup>2</sup> ʔu: <sup>1</sup>	--
375	fiancee (betrothed girlfriend)	p <sup>h</sup> .ja <sup>2</sup>	p <sup>h</sup> .ja <sup>2</sup>	--
377	tribe, ethnic group	p <sup>h</sup> a: <sup>3</sup> sa: <sup>3</sup>	p <sup>h</sup> a: <sup>3</sup> sa: <sup>3</sup>	--
378	clan	cɣ: <sup>2</sup> ca:t <sup>1</sup>	cɣ: <sup>2</sup> ca:t <sup>1</sup>	--
379	family	ʔic <sup>2</sup> t.ka:ŋ <sup>3</sup>	ʔic <sup>2</sup> t.ka:ŋ <sup>3</sup>	--
380	friend	cum <sup>3</sup>	cum <sup>3</sup>	--
381	neighbour	ʔic <sup>2</sup> ka:ŋ <sup>3</sup> te: <sup>1</sup> k.tit <sup>2</sup>	ʔic <sup>2</sup> ka:ŋ <sup>3</sup> te: <sup>1</sup> k.tit <sup>2</sup>	--
382a	acquaintance	kwian <sup>1</sup> k.tit <sup>2</sup>	kwian <sup>1</sup> k.tit <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
382	acquaintance	lu:n <sup>1</sup> k.tit <sup>2</sup>	lu:n <sup>1</sup> k.tit <sup>2</sup>	--
383	host	caw <sup>2</sup> ka:ŋ <sup>3</sup>	caw <sup>2</sup> ka:ŋ <sup>3</sup>	--
384	guest, visitor	k <sup>h</sup> iak <sup>1</sup>	k <sup>h</sup> iak <sup>1</sup>	--
385a	stranger (unknown person)	ʔic <sup>2</sup> priap <sup>1</sup>	ʔic <sup>2</sup> priap <sup>1</sup>	--
385	stranger (unknown person)	ʔic <sup>2</sup> ʔam <sup>3</sup> tuan <sup>2</sup> lua <sup>3</sup>	ʔic <sup>2</sup> ʔam <sup>3</sup> tuan <sup>2</sup> lua <sup>3</sup>	--
386	enemy	ʔic <sup>2</sup> ma: <sup>1</sup> ʔi: <sup>3</sup> ɲa: <sup>2</sup>	ʔic <sup>2</sup> ma: <sup>1</sup> ʔi: <sup>3</sup> ɲa: <sup>2</sup>	--
388	thief	co:n <sup>3</sup>	co:n <sup>3</sup>	--
389	guide (n)	ʔic <sup>2</sup> k <sup>h</sup> rum <sup>3</sup> s.ruəŋ <sup>3</sup>	ʔic <sup>2</sup> k <sup>h</sup> rum <sup>3</sup> s.ruəŋ <sup>3</sup>	--
390	messenger	ʔic <sup>2</sup> k <sup>h</sup> rum <sup>3</sup> k <sup>h</sup> aw <sup>1</sup>	ʔic <sup>2</sup> k <sup>h</sup> rum <sup>3</sup> k <sup>h</sup> aw <sup>1</sup>	--
391	crowd	ʔic <sup>2</sup> jʁŋ <sup>3</sup>	ʔic <sup>2</sup> jʁŋ <sup>3</sup>	--
392	chief, headman	na:j <sup>3</sup> rim <sup>3</sup>	na:j <sup>3</sup> rim <sup>3</sup>	--
393	elder	t <sup>h</sup> aw <sup>2</sup> kap <sup>2</sup> rim <sup>3</sup>	t <sup>h</sup> aw <sup>2</sup> kap <sup>2</sup> rim <sup>3</sup>	--
394	master	ʔic <sup>2</sup> ma: <sup>1</sup> mun <sup>1</sup> na:j <sup>3</sup>	ʔic <sup>2</sup> ma: <sup>1</sup> mun <sup>1</sup> na:j <sup>3</sup>	--
395	slave	k <sup>h</sup> uan <sup>3</sup> ka:ŋ <sup>3</sup>	k <sup>h</sup> uan <sup>3</sup> ka:ŋ <sup>3</sup>	--
396	farmer	ʔic <sup>2</sup> ci <sup>2</sup> na: <sup>3</sup>	ʔic <sup>2</sup> ci <sup>2</sup> na: <sup>3</sup>	--
397	fisherman	ʔic <sup>2</sup> s.ra <sup>2</sup> k <sup>h</sup> a <sup>2</sup>	ʔic <sup>2</sup> s.ra <sup>2</sup> k <sup>h</sup> a <sup>2</sup>	--
398	hunter	ʔic <sup>2</sup> s.ra <sup>2</sup> sat <sup>2</sup>	ʔic <sup>2</sup> s.ra <sup>2</sup> sat <sup>2</sup>	--
399	blacksmith	ca:ŋ <sup>1</sup> t.ŋaŋ <sup>3</sup>	ca:ŋ <sup>1</sup> t.ŋaŋ <sup>3</sup>	--
400	potter	ʔic <sup>2</sup> p <sup>h</sup> at <sup>2</sup> k.ʔual <sup>3</sup>	ʔic <sup>2</sup> p <sup>h</sup> at <sup>2</sup> k.ʔual <sup>3</sup>	--
401	weaver	ʔic <sup>2</sup> tam <sup>1</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	ʔic <sup>2</sup> tam <sup>1</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	--
402	butcher(n)	ʔic <sup>2</sup> p <sup>h</sup> ul <sup>3</sup> sat <sup>2</sup>	ʔic <sup>2</sup> p <sup>h</sup> ul <sup>3</sup> sat <sup>2</sup>	--
403	trader	pɔ: <sup>1</sup> ka: <sup>2</sup>	pɔ: <sup>1</sup> ka: <sup>2</sup>	--
404	(domestic) servant	ʔic <sup>2</sup> caj <sup>2</sup> maj <sup>2</sup> te:w <sup>3</sup>	ʔic <sup>2</sup> caj <sup>2</sup> maj <sup>2</sup> te:w <sup>3</sup>	--
405	beggar	ʔic <sup>2</sup> p <sup>h</sup> ual <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup>	ʔic <sup>2</sup> p <sup>h</sup> ual <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup>	--
406	soldier	luk <sup>2</sup> sʁk <sup>2</sup>	luk <sup>2</sup> sʁk <sup>2</sup>	--
407	prostitute	me: <sup>1</sup> k <sup>h</sup> am <sup>3</sup> raŋ <sup>3</sup>	me: <sup>1</sup> k <sup>h</sup> am <sup>3</sup> raŋ <sup>3</sup>	--
409	medicine man, traditional healer	mua <sup>3</sup> ja: <sup>3</sup> ra:k <sup>1</sup> maj <sup>2</sup> ra:k <sup>1</sup> tuak <sup>1</sup>	mua <sup>3</sup> ja: <sup>3</sup> ra:k <sup>1</sup> maj <sup>2</sup> ra:k <sup>1</sup> tuak <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
410	fetish priest	mua <sup>3</sup> p.krit <sup>2</sup>	mua <sup>3</sup> p.krit <sup>2</sup>	--
411	sorcerer(male or witch, female)	prut <sup>2</sup>	prut <sup>2</sup>	--
413a	fortune teller (female)	me: <sup>1</sup> mua <sup>3</sup>	me: <sup>1</sup> mua <sup>3</sup>	--
413	fortune teller (male)	pua <sup>1</sup> mua <sup>3</sup>	pua <sup>1</sup> mua <sup>3</sup>	--
414	meet, encounter	t.pon <sup>3</sup> k.tit <sup>2</sup>	t.pon <sup>3</sup> k.tit <sup>2</sup>	--
415	accompany	ʔi: <sup>3</sup> mɣ: <sup>1</sup> k.tit <sup>2</sup>	ʔi: <sup>3</sup> mɣ: <sup>1</sup> k.tit <sup>2</sup>	--
416	(be) together	co: <sup>3</sup> k.tit <sup>2</sup>	co: <sup>3</sup> k.tit <sup>2</sup>	--
417	assemble, meet together	k <sup>h</sup> ruan <sup>2</sup> ruam <sup>3</sup> k.tit <sup>2</sup>	k <sup>h</sup> ruan <sup>2</sup> ruam <sup>3</sup> k.tit <sup>2</sup>	--
418	invite	k <sup>h</sup> waj <sup>1</sup> k.tit <sup>2</sup>	k <sup>h</sup> waj <sup>1</sup> k.tit <sup>2</sup>	--
419	(be) alone	ɲot <sup>2</sup> no: <sup>3</sup> k.tit <sup>2</sup>	ɲot <sup>2</sup> no: <sup>3</sup> k.tit <sup>2</sup>	--
420	abandon	wɣl <sup>3</sup> k.tit <sup>2</sup>	wɣl <sup>3</sup> k.tit <sup>2</sup>	--
421	flee, run away from	tun <sup>1</sup>	tun <sup>1</sup>	--
422	drive away	ra <sup>2</sup>	ra <sup>2</sup>	--
423a	avoid (a thing)	le:p <sup>1</sup>	le:p <sup>1</sup>	--
423	avoid (a person)	hɛl <sup>3</sup>	hɛl <sup>3</sup>	--
424	(be) same	mɯ:n <sup>3</sup> k.tit <sup>2</sup>	mɯ:n <sup>3</sup> k.tit <sup>2</sup>	--
425	(be) different	pɛt <sup>2</sup> k.tit <sup>2</sup>	pɛt <sup>2</sup> k.tit <sup>2</sup>	--
426	resemble	ca <sup>2</sup> mɯ:n <sup>3</sup> k.tit <sup>2</sup>	ca <sup>2</sup> mɯ:n <sup>3</sup> k.tit <sup>2</sup>	--
427	imitate	re:p <sup>3</sup>	re:p <sup>3</sup>	--
428	admire	t <sup>h</sup> a:ŋ <sup>1</sup> k.tak <sup>2</sup> k.dun <sup>3</sup>	t <sup>h</sup> a:ŋ <sup>1</sup> k.tak <sup>2</sup> k.dun <sup>3</sup>	--
429	benefit, suit	cap <sup>2</sup> t.rap <sup>2</sup> pap <sup>2</sup> kɣŋ <sup>1</sup>	cap <sup>2</sup> t.rap <sup>2</sup> pap <sup>2</sup> kɣŋ <sup>1</sup>	--
430a	language	kam <sup>3</sup>	kam <sup>3</sup>	--
430	language	su <sup>2</sup> nɣn <sup>3</sup>	su <sup>2</sup> nɣn <sup>3</sup>	--
431	word	k <sup>h</sup> ua <sup>2</sup> su <sup>2</sup> ʔu: <sup>1</sup>	k <sup>h</sup> ua <sup>2</sup> su <sup>2</sup> ʔu: <sup>1</sup>	--
432	meaning (n)	ŋaŋ <sup>3</sup> t.ʔu: <sup>1</sup> su <sup>2</sup>	ŋaŋ <sup>3</sup> t.ʔu: <sup>1</sup> su <sup>2</sup>	--
433	say	ʔu: <sup>1</sup>	ʔu: <sup>1</sup>	ʔu: <sup>1</sup>
434	voice	se:ŋ <sup>3</sup>	se:ŋ <sup>3</sup>	--



No.	Gloss	Speaker A	Speaker B	Speaker D
435	speak	nɣn <sup>3</sup>	nɣn <sup>3</sup>	nɣn <sup>3</sup>
436a	speak quietly	cuam <sup>3</sup> t.nɣn <sup>3</sup>	cuam <sup>3</sup> t.nɣn <sup>3</sup>	--
436	whisper (v)	p.siac <sup>1</sup>	p.siac <sup>1</sup>	--
437	shout (v), cry out	k <sup>h</sup> ra:k <sup>1</sup>	k <sup>h</sup> ra:k <sup>1</sup>	--
438	chat (v)	fo: <sup>1</sup> k.tit <sup>2</sup>	fo: <sup>1</sup> k.tit <sup>2</sup>	--
439	mumble	sɛm <sup>1</sup>	sɛm <sup>1</sup>	--
440	stutter	nɣn <sup>3</sup> k <sup>h</sup> ɣk <sup>2</sup>	nɣn <sup>3</sup> k <sup>h</sup> ɣk <sup>2</sup>	--
441	(be) eloquent	ca:ŋ <sup>1</sup> nɣn <sup>3</sup> mo:n <sup>1</sup>	ca:ŋ <sup>1</sup> nɣn <sup>3</sup> mo:n <sup>1</sup>	--
442a	paper	k.da:t <sup>1</sup>	k.da:t <sup>1</sup>	--
442	(be) silent	dɣŋ <sup>3</sup>	dɣŋ <sup>3</sup>	--
442b	write (v)	puat <sup>1</sup> to: <sup>3</sup>	puat <sup>1</sup> to: <sup>3</sup>	--
443	greet (v)	rap <sup>2</sup> tuan <sup>2</sup>	rap <sup>2</sup> tuan <sup>2</sup>	--
444	call (someone)	k <sup>h</sup> ra:k <sup>1</sup>	k <sup>h</sup> ra:k <sup>1</sup>	--
445	say goodbye, take leave of	p <sup>h</sup> ra: <sup>1</sup> k.tit <sup>2</sup> juaŋ <sup>3</sup>	p <sup>h</sup> ra: <sup>1</sup> k.ti <sup>2</sup> juaŋ <sup>3</sup>	--
446	announce	ba:w <sup>1</sup>	ba:w <sup>1</sup>	--
447	announcement	suw <sup>2</sup> ba:w <sup>1</sup>	suw <sup>2</sup> ba:w <sup>1</sup>	--
448	news	k <sup>h</sup> aw <sup>1</sup> k <sup>h</sup> iw <sup>1</sup>	k <sup>h</sup> aw <sup>1</sup> k <sup>h</sup> iw <sup>1</sup>	--
449	explain	law <sup>1</sup>	law <sup>1</sup>	--
451	gossip (v)	sa:ŋ <sup>3</sup> jɔk <sup>2</sup>	sa:ŋ <sup>3</sup> jɔk <sup>2</sup>	--
452	lie (n) (falsehood)	ca:ŋ <sup>1</sup> mɔ <sup>2</sup>	ca:ŋ <sup>1</sup> mɔ <sup>2</sup>	--
453	ask, request	s.wa:ŋ <sup>3</sup>	s.wa:ŋ <sup>3</sup>	s.wa:ŋ <sup>3</sup>
454	plead, implore	nuam <sup>2</sup>	nuam <sup>2</sup>	--
455	request (n)	vuan <sup>3</sup>	vuan <sup>3</sup>	--
456	answer, reply (v)	tuap <sup>1</sup>	tuap <sup>1</sup>	--
457	thank	ɲum <sup>3</sup> sɛl <sup>3</sup>	ɲum <sup>3</sup> sɛl <sup>3</sup>	--
458	promise (n)	s.ca <sup>2</sup>	s.ca <sup>2</sup>	--
461	insult (v)	sua <sup>1</sup> k.tit <sup>2</sup>	sua <sup>1</sup> k.tit <sup>2</sup>	--
462	insult (n)	sua <sup>1</sup>	sua <sup>1</sup>	--
463	slander (v)	nap <sup>2</sup> t.ʔu: <sup>1</sup>	nap <sup>2</sup> t.ʔu: <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
464	threaten	sum <sup>3</sup> pra:t <sup>1</sup>	sum <sup>3</sup> pra:t <sup>1</sup>	--
465	argue	suŋ <sup>1</sup> rɛt <sup>2</sup> k.tit <sup>2</sup>	suŋ <sup>1</sup> rɛt <sup>2</sup> k.tit <sup>2</sup>	--
466	argument	su <sup>2</sup> suŋ <sup>1</sup> rɛt <sup>2</sup>	su <sup>2</sup> suŋ <sup>1</sup> rɛt <sup>2</sup>	--
467	grumble, complain	ɲɛl <sup>3</sup>	ɲɛl <sup>3</sup>	--
468	contradict	ma:ŋ <sup>2</sup> su <sup>2</sup> ci <sup>2</sup>	ma:ŋ <sup>2</sup> su <sup>2</sup> ci <sup>2</sup>	--
469	accuse	nɛŋ <sup>2</sup>	nɛŋ <sup>2</sup>	--
470	deny	k <sup>h</sup> i:n <sup>3</sup>	k <sup>h</sup> i:n <sup>3</sup>	--
472	agree	ʔu: <sup>1</sup> su <sup>2</sup>	ʔu: <sup>1</sup> su <sup>2</sup>	--
474	persuade	to <sup>2</sup>	to <sup>2</sup>	--
475	praise (n)	ɲuk <sup>2</sup> ɲua <sup>3</sup>	ɲuk <sup>2</sup> ɲua <sup>3</sup>	--
476	bless, praise	wa: <sup>1</sup> ta:ŋ <sup>3</sup> ɲuaŋ <sup>3</sup>	wa: <sup>1</sup> ta:ŋ <sup>3</sup> ɲuaŋ <sup>3</sup>	--
478	boast, brag	ŋaŋ <sup>3</sup> wa: <sup>1</sup> ʔic <sup>2</sup> ʔo:t <sup>1</sup>	ŋaŋ <sup>3</sup> wa: <sup>1</sup> ʔic <sup>2</sup> ʔo:t <sup>1</sup>	--
479	tell, recount(story)	k <sup>h</sup> rum <sup>3</sup>	k <sup>h</sup> rum <sup>3</sup>	--
480	story(tale)	t.ɲa:j <sup>3</sup>	t.ɲa:j <sup>3</sup>	--
481	proverb	kam <sup>3</sup> bo: <sup>3</sup> ra:n <sup>3</sup>	kam <sup>3</sup> bo: <sup>3</sup> ra:n <sup>3</sup>	--
483	account (report) (n)	puan <sup>1</sup> k <sup>h</sup> rum <sup>3</sup>	puan <sup>1</sup> k <sup>h</sup> rum <sup>3</sup>	--
484	embrace, hug (v)	huap <sup>1</sup>	huap <sup>1</sup>	--
485	caress(v)	cuam <sup>3</sup> t.huap <sup>1</sup>	cuam <sup>3</sup> t.huap <sup>1</sup>	--
486	kiss(v)	p <sup>h</sup> u:p <sup>1</sup>	p <sup>h</sup> u:p <sup>1</sup>	--
487a	copulate, have sexual intercourse	t.k <sup>h</sup> ɛt <sup>2</sup> k.tit <sup>2</sup>	t.k <sup>h</sup> ɛt <sup>2</sup> k.tit <sup>2</sup>	--
487	copulate, have sexual intercourse	t <sup>h</sup> ot <sup>2</sup>	t <sup>h</sup> ot <sup>2</sup>	--
488	nurse, suckle(baby)	wa: <sup>1</sup> ʔu <sup>2</sup>	wa: <sup>1</sup> ʔu <sup>2</sup>	--
489	tickle(v)	kuak <sup>1</sup> ke:k <sup>1</sup>	kuak <sup>1</sup> ke:k <sup>1</sup>	--
490	spank(child)	t <sup>h</sup> e: <sup>1</sup>	t <sup>h</sup> e: <sup>1</sup>	--
491	whip(n)	faj <sup>3</sup>	faj <sup>3</sup>	--
492	help	tʁ:m <sup>1</sup> k.tit <sup>2</sup>	tʁ:m <sup>1</sup> k.tit <sup>2</sup>	--
493	protect	rɛt <sup>2</sup>	rɛt <sup>2</sup>	--
494	look after	duam <sup>3</sup> liam <sup>3</sup> po: <sup>3</sup>	duam <sup>3</sup> liam <sup>3</sup> po: <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
495	bring up(a child)	c <sup>h</sup> o:m <sup>3</sup>	c <sup>h</sup> o:m <sup>3</sup>	--
500	send(someone)	t <sup>h</sup> o:3	t <sup>h</sup> o:3	--
502	lead, guide(v)	ʔual <sup>3</sup>	ʔual <sup>3</sup>	--
503	follow	p.tɔ <sup>2</sup>	p.tɔ <sup>2</sup>	--
504	obey	p.tal <sup>3</sup> su <sup>2</sup> ʔur:1	p.tal <sup>3</sup> su <sup>2</sup> ʔur:1	--
505	please	pe:1 p.su:m <sup>3</sup>	pe:1 p.su:m <sup>3</sup>	--
506	annoy	ci <sup>2</sup> su <sup>k</sup> 2 sak <sup>2</sup>	ci <sup>2</sup> su <sup>k</sup> 2 sak <sup>2</sup>	--
508	quarrel	t <sup>h</sup> ek <sup>2</sup> dua <sup>1</sup> k.tit <sup>2</sup>	t <sup>h</sup> ek <sup>2</sup> dua <sup>1</sup> k.tit <sup>2</sup>	--
509	fight	rɔp <sup>2</sup> k.tit <sup>2</sup>	rɔp <sup>2</sup> k.tit <sup>2</sup>	--
510	stab	po:1 k.tit <sup>2</sup>	po:1 k.tit <sup>2</sup>	--
511	kill, murder	p <sup>h</sup> .jam <sup>3</sup>	p <sup>h</sup> .jam <sup>3</sup>	p <sup>h</sup> .jam <sup>3</sup>
512	take revenge	tuap <sup>1</sup>	tuap <sup>1</sup>	--
513	resolve, settle (dispute)	tiaŋ <sup>1</sup> mian <sup>1</sup>	tiaŋ <sup>1</sup> mian <sup>1</sup>	--
514	intercede, mediate	tɤ:m <sup>1</sup> ʔur:1	tɤ:m <sup>1</sup> ʔur:1	--
517	steal	t.pra <sup>2</sup>	t.pra <sup>2</sup>	t.pla <sup>2</sup>
518	rape	kan <sup>2</sup> su <sup>2</sup> jel <sup>3</sup>	kan <sup>2</sup> su <sup>2</sup> jel <sup>3</sup>	--
524	punish	wa:1 to:t <sup>1</sup>	wa:1 to:t <sup>1</sup>	--
525	penalty, punishment	to:t <sup>1</sup>	to:t <sup>1</sup>	--
526	dwell	ŋo:t <sup>1</sup>	ŋo:t <sup>1</sup>	--
527	inhabitant, resident	k <sup>h</sup> o <sup>2</sup> ŋo:t <sup>1</sup>	k <sup>h</sup> o <sup>2</sup> ŋo:t <sup>1</sup>	--
528	country dweller	ʔic <sup>2</sup> ma:1 ko:1 pri <sup>2</sup>	ʔic <sup>2</sup> ma:1 ko:1 pri <sup>2</sup>	--
529	move away	k <sup>h</sup> a:j <sup>2</sup>	k <sup>h</sup> a:j <sup>2</sup>	--
530	country, ethnic area	ro:3 bo:k <sup>1</sup>	ro:3 bo:k <sup>1</sup>	--
531	frontier (of ethnic area)	dian <sup>3</sup> k.t <sup>h</sup> et <sup>2</sup>	dian <sup>3</sup> k.t <sup>h</sup> et <sup>2</sup>	--
532	town, city	we:ŋ <sup>3</sup>	we:ŋ <sup>3</sup>	--
533	village	rim <sup>3</sup>	rim <sup>3</sup>	rim <sup>3</sup>
534	camp	tu:p <sup>1</sup> c <sup>h</sup> ɤn <sup>3</sup>	tu:p <sup>1</sup> c <sup>h</sup> ɤn <sup>3</sup>	--
535	market(n)	ka:t <sup>1</sup>	ka:t <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
536	article of clothing	kro: <sup>3</sup> krɔŋ <sup>3</sup>	kro: <sup>3</sup> krɔŋ <sup>3</sup>	--
537	wear clothes	c <sup>h</sup> up <sup>2</sup> muak <sup>1</sup>	c <sup>h</sup> up <sup>2</sup> muak <sup>1</sup>	--
538	dress(v)	c <sup>h</sup> up <sup>2</sup>	c <sup>h</sup> up <sup>2</sup>	--
539	undress	p <sup>h</sup> oc <sup>2</sup>	p <sup>h</sup> oc <sup>2</sup>	--
540	(be) naked	ŋo:t <sup>1</sup> ŋu:l <sup>3</sup>	ŋo:t <sup>1</sup> ŋu:l <sup>3</sup>	--
541	hat	mo:k <sup>1</sup>	mo:k <sup>1</sup>	--
542	shirt	muak <sup>3</sup>	muak <sup>3</sup>	--
543	trousers	ciam <sup>3</sup>	ciam <sup>3</sup>	--
544	loincloth	p <sup>h</sup> a: <sup>2</sup> we:n <sup>3</sup> kɔt <sup>2</sup>	p <sup>h</sup> a: <sup>2</sup> we:n <sup>3</sup> kɔt <sup>2</sup>	--
545	robe (man's surong)	p <sup>h</sup> a: <sup>2</sup> we:n <sup>3</sup>	p <sup>h</sup> a: <sup>2</sup> we:n <sup>3</sup>	--
546	cloth worn by a woman	ŋa <sup>2</sup>	ŋa <sup>2</sup>	--
547	baby sling	bɤŋ <sup>2</sup> ʔem <sup>3</sup>	bɤŋ <sup>2</sup> ʔem <sup>3</sup>	--
548	shoe, sandal	suw <sup>2</sup> tat <sup>2</sup>	suw <sup>2</sup> tat <sup>2</sup>	--
549	bead	m.dɤj <sup>3</sup> ka:j <sup>1</sup>	m.dɤj <sup>3</sup> ka:j <sup>1</sup>	--
550	string, thread (beads)	m.dɤj <sup>3</sup> nap <sup>2</sup>	m.dɤj <sup>3</sup> nap <sup>2</sup>	--
551a	bracelet (Wan Teŋ)	la: <sup>1</sup> t <sup>h</sup> i <sup>2</sup>	la: <sup>1</sup> t <sup>h</sup> i <sup>2</sup>	--
551	bracelet (Wan Fai)	mul <sup>3</sup> t <sup>h</sup> i <sup>2</sup>	mul <sup>3</sup> t <sup>h</sup> i <sup>2</sup>	--
552	necklace	suaj <sup>2</sup> kan <sup>3</sup> lul <sup>3</sup>	suaj <sup>2</sup> kan <sup>3</sup> lul <sup>3</sup>	--
553a	ankle ring, bangle	mul <sup>3</sup> cu:ŋ <sup>3</sup>	mul <sup>3</sup> cu:ŋ <sup>3</sup>	--
553	ankle ring, bangle	la: <sup>1</sup> cu:ŋ <sup>3</sup>	la: <sup>1</sup> cu:ŋ <sup>3</sup>	--
554	ring (finger)	mul <sup>3</sup> c <sup>h</sup> up <sup>2</sup> t <sup>h</sup> i <sup>2</sup>	mul <sup>3</sup> c <sup>h</sup> up <sup>2</sup> t <sup>h</sup> i <sup>2</sup>	--
555	earring	suw <sup>2</sup> sɔ <sup>2</sup> c <sup>h</sup> o: <sup>1</sup>	suw <sup>2</sup> sɔ <sup>2</sup> c <sup>h</sup> o: <sup>1</sup>	--
556	pierce (ears)	c <sup>h</sup> ut <sup>2</sup> c <sup>h</sup> o: <sup>1</sup>	c <sup>h</sup> ut <sup>2</sup> c <sup>h</sup> o: <sup>1</sup>	--
558	plait, braid (hair)	len <sup>3</sup> niaw <sup>1</sup>	len <sup>3</sup> niaw <sup>1</sup>	--
559	tattoo(s)	sak <sup>2</sup> nam <sup>1</sup> muuk <sup>2</sup>	sak <sup>2</sup> nam <sup>1</sup> muuk <sup>2</sup>	--
560	cane, walking stick	suŋ <sup>1</sup> jo:l <sup>3</sup>	suŋ <sup>1</sup> jo:l <sup>3</sup>	--
561	bathe, wash oneself	sum <sup>3</sup> ʔo:m <sup>3</sup>	sum <sup>3</sup> ʔo:m <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
562	apply (ointment), besmear	t <sup>h</sup> u: <sup>3</sup>	t <sup>h</sup> u: <sup>3</sup>	--
563	wipe off (excreta)	ʔuat <sup>1</sup> c <sup>h</sup> at <sup>2</sup> k <sup>h</sup> r.ʔa:ŋ <sup>3</sup>	ʔuat <sup>1</sup> c <sup>h</sup> at <sup>2</sup> k <sup>h</sup> r.ʔa:ŋ <sup>3</sup>	--
564	cut (hair)	k <sup>h</sup> ip <sup>2</sup> t.k <sup>h</sup> iŋ <sup>3</sup>	k <sup>h</sup> ip <sup>2</sup> t.k <sup>h</sup> iŋ <sup>3</sup>	k <sup>h</sup> ip <sup>2</sup>
565	shave (v)	k <sup>h</sup> u:t <sup>1</sup>	k <sup>h</sup> u:t <sup>1</sup>	--
566	razor	su <sup>2</sup> k <sup>h</sup> u:t <sup>1</sup>	su <sup>2</sup> k <sup>h</sup> u:t <sup>1</sup>	--
567	comb (n)	s.na:j <sup>1</sup>	s.na:j <sup>1</sup>	--
568	tooth stick, toothbrush	su <sup>2</sup> si: <sup>3</sup> k <sup>h</sup> ɛŋ <sup>3</sup>	su <sup>2</sup> si: <sup>3</sup> k <sup>h</sup> ɛŋ <sup>3</sup>	--
569	food	su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup>	su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup>	--
570	meat	ne <sup>2</sup>	ne <sup>2</sup>	ne <sup>2</sup>
571a	fat (cow only)	k <sup>h</sup> aj <sup>3</sup>	k <sup>h</sup> aj <sup>3</sup>	k <sup>h</sup> aj <sup>3</sup>
571	fat	p <sup>h</sup> .jaŋ <sup>3</sup>	p.c <sup>h</sup> aŋ <sup>3</sup>	p.c <sup>h</sup> aŋ <sup>3</sup>
572	oil	p <sup>h</sup> .jaŋ <sup>3</sup>	p.c <sup>h</sup> aŋ <sup>3</sup>	--
573	soup, broth	ʔom <sup>3</sup> t <sup>h</sup> u <sup>2</sup>	ʔom <sup>3</sup> t <sup>h</sup> u <sup>2</sup>	--
575	bread	k <sup>h</sup> aw <sup>2</sup> mun <sup>3</sup> ʔo:p <sup>1</sup>	k <sup>h</sup> aw <sup>2</sup> mun <sup>3</sup> ʔo:p <sup>1</sup>	--
577	flour	k <sup>h</sup> aw <sup>2</sup> cu:ŋ <sup>1</sup>	k <sup>h</sup> aw <sup>2</sup> cu:ŋ <sup>1</sup>	--
578	salt	prut <sup>2</sup>	prut <sup>2</sup>	plut <sup>2</sup>
579	breakfast	c <sup>h</sup> uam <sup>3</sup> ɲa:l <sup>3</sup>	c <sup>h</sup> uam <sup>3</sup> ɲa:l <sup>3</sup>	--
580	evening meal	c <sup>h</sup> uam <sup>3</sup> pol <sup>3</sup>	c <sup>h</sup> uam <sup>3</sup> pol <sup>3</sup>	--
581	feast	k <sup>h</sup> a:j <sup>3</sup> k <sup>h</sup> iak <sup>1</sup>	k <sup>h</sup> a:j <sup>3</sup> k <sup>h</sup> iak <sup>1</sup>	--
582	leftovers (food)	su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup> lɣ: <sup>3</sup>	su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup> lɣ: <sup>3</sup>	--
583	spoil (food)	ʔuj <sup>3</sup> ʔoj <sup>1</sup>	ʔuj <sup>3</sup> ʔoj <sup>1</sup>	--
584	mold (n)	k <sup>h</sup> .nuk <sup>2</sup> k <sup>h</sup> .nak <sup>2</sup>	k <sup>h</sup> .nuk <sup>2</sup> k <sup>h</sup> .nak <sup>2</sup>	--
585	milk	ʔom <sup>3</sup> ʔu <sup>2</sup>	ʔom <sup>3</sup> ʔu <sup>2</sup>	ʔom <sup>3</sup> ʔu <sup>2</sup>
587	alcohol	law <sup>2</sup>	law <sup>2</sup>	--
590	rice wine	law <sup>2</sup> c <sup>h</sup> uam <sup>3</sup>	law <sup>2</sup> c <sup>h</sup> uam <sup>3</sup>	law <sup>1</sup> c <sup>h</sup> uam <sup>3</sup>
591	prepare (food to cook)	me: <sup>3</sup> su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup>	me: <sup>3</sup> su <sup>2</sup> k <sup>h</sup> a:j <sup>3</sup>	--
592	cut (trans.)	s.ruaj <sup>3</sup>	s.ruaj <sup>3</sup>	s.ruaj <sup>3</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
593	cut open (cut off top)	le: <sup>3</sup>	le: <sup>3</sup>	--
594	slice	s.ruaj <sup>3</sup> kril <sup>3</sup>	s.ruaj <sup>3</sup> kril <sup>3</sup>	mak <sup>2</sup>
595	peel	c <sup>h</sup> it <sup>2</sup> t.krɔ <sup>2</sup>	c <sup>h</sup> it <sup>2</sup> t.krɔ <sup>2</sup>	--
596a	split open	pra: <sup>1</sup>	pra: <sup>1</sup>	--
596b	peel (egg)	p <sup>h</sup> a: <sup>1</sup>	p <sup>h</sup> a: <sup>1</sup>	--
596	mix	p.c <sup>h</sup> o <sup>2</sup>	p.c <sup>h</sup> o <sup>2</sup>	--
597a	stir (in circles)	krew <sup>3</sup>	krew <sup>3</sup>	--
597	stir (back and forth)	kra <sup>2</sup>	kra <sup>2</sup>	--
598	strain (food)	rot <sup>1</sup>	rot <sup>1</sup>	--
599	pound (v)	po:k <sup>1</sup>	po:k <sup>1</sup>	--
600a	grind (between 2 plates)	mua <sup>1</sup>	mua <sup>1</sup>	mua <sup>1</sup>
600	grind (w/ pestle)	bɔt <sup>2</sup>	bɔt <sup>2</sup>	--
602	pluck (feathers)	rɤt <sup>2</sup>	rɤt <sup>2</sup>	--
603	cook (v)	p <sup>h</sup> ul <sup>3</sup>	p <sup>h</sup> ul <sup>3</sup>	p <sup>h</sup> ul <sup>3</sup>
604	roast	k <sup>h</sup> ro: <sup>2</sup>	k <sup>h</sup> ro: <sup>2</sup>	--
605	fry	k <sup>h</sup> ro: <sup>2</sup> saj <sup>1</sup> p.c <sup>h</sup> aj <sup>3</sup>	k <sup>h</sup> ro: <sup>2</sup> saj <sup>1</sup> p <sup>h</sup> .jaŋ <sup>3</sup>	--
606	bake (in ashes)	ʔo:p <sup>1</sup>	ʔo:p <sup>1</sup>	--
607a	(be) smoked (not meat)	mut <sup>2</sup>	mut <sup>2</sup>	--
607	(be) smoked (meat)	raŋ <sup>3</sup>	raŋ <sup>3</sup>	--
608	boil, bubble up	tɤm <sup>1</sup>	tɤm <sup>1</sup>	--
609	ferment (alcohol)	diaŋ <sup>1</sup> law <sup>2</sup> to: <sup>3</sup>	diaŋ <sup>1</sup> law <sup>2</sup> to: <sup>3</sup>	--
610	cooking pot (earthenware)	k.ʔual <sup>3</sup> k.t <sup>h</sup> et <sup>2</sup>	k.ʔual <sup>3</sup> k.t <sup>h</sup> et <sup>2</sup>	--
611	metal pot	k.ʔual <sup>3</sup> s.tu <sup>2</sup>	k.ʔual <sup>3</sup> s.tu <sup>2</sup>	--
612	pot	k.ʔual <sup>3</sup> ʔo:m <sup>3</sup>	k.ʔual <sup>3</sup> ʔo:m <sup>3</sup>	--
613a	ladle	bo:j <sup>3</sup>	bo:j <sup>3</sup>	--
613	ladle	t.k <sup>h</sup> u:p <sup>1</sup> rɤk <sup>2</sup>	t.k <sup>h</sup> u:p <sup>1</sup> rɤk <sup>2</sup>	--
618	pestle	k.t <sup>h</sup> em <sup>3</sup>	k.t <sup>h</sup> em <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
619a	mortar (big, for rice)	t.ʔək <sup>2</sup> p <sup>h</sup> al <sup>3</sup>	t.ʔək <sup>2</sup> p <sup>h</sup> al <sup>3</sup>	--
619	mortar (small)	t.ʔək <sup>2</sup> prut <sup>2</sup>	t.ʔək <sup>2</sup> prut <sup>2</sup>	t.ʔua <sup>1</sup>
620	plate	t.laj <sup>3</sup>	t.laj <sup>3</sup>	--
621	bowl	k.te: <sup>1</sup>	k.te: <sup>1</sup>	--
622	cup	kək <sup>2</sup>	kək <sup>2</sup>	--
623	spoon	t.k <sup>h</sup> u:p <sup>1</sup>	t.k <sup>h</sup> u:p <sup>1</sup>	--
624	bag	p.ja <sup>2</sup>	p.ja <sup>2</sup>	--
625	box	tʁ:k <sup>1</sup>	tʁ:k <sup>1</sup>	--
626	basket	p.ca <sup>2</sup>	p.ca <sup>2</sup>	--
627	bucket, pail	puŋ <sup>3</sup> ʔo:m <sup>3</sup>	puŋ <sup>3</sup> ʔo:m <sup>3</sup>	--
629	bottle	kuaŋ <sup>2</sup>	kuaŋ <sup>2</sup>	--
630	stopper, plug	su <sup>2</sup> sɔ <sup>2</sup>	su <sup>2</sup> sɔ <sup>2</sup>	--
631a	handle (vertical hand)	su <sup>2</sup> tun <sup>3</sup>	su <sup>2</sup> tun <sup>3</sup>	--
631	handle (horizontal hand)	su <sup>2</sup> ɲap <sup>2</sup>	su <sup>2</sup> ɲap <sup>2</sup>	--
632a	pour (a lot)	ruk <sup>2</sup>	ruk <sup>2</sup>	--
632	pour (a little)	ke: <sup>1</sup>	ke: <sup>1</sup>	--
633a	spill (liquid)	pʁl <sup>3</sup>	pʁl <sup>3</sup>	--
633	spill (liquid)	suŋ <sup>1</sup> ruk <sup>2</sup>	suŋ <sup>1</sup> ruk <sup>2</sup>	--
634	take out (from container)	le <sup>2</sup> li: <sup>1</sup>	le <sup>2</sup> li: <sup>1</sup>	--
635	fill	saj <sup>1</sup>	saj <sup>1</sup>	--
636	(be) full	no:k <sup>1</sup>	no:k <sup>1</sup>	no: <sup>1</sup>
637	(be) empty	suŋ <sup>1</sup> rut <sup>2</sup>	suŋ <sup>1</sup> rut <sup>2</sup>	--
638	(be) open	kɔj <sup>3</sup> p <sup>h</sup> wi: <sup>1</sup>	kɔj <sup>3</sup> p <sup>h</sup> wi: <sup>1</sup>	--
639	open	p <sup>h</sup> wi: <sup>1</sup>	p <sup>h</sup> wi: <sup>1</sup>	--
640	close, shut	c <sup>h</sup> ɛl <sup>3</sup>	c <sup>h</sup> ɛl <sup>3</sup>	--
641	stop up	ʔɾt <sup>2</sup>	ʔɾt <sup>2</sup>	--
642	cover (v)	kɔp <sup>2</sup>	kɔp <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
643	uncover	p <sup>h</sup> wi: <sup>1</sup>	p <sup>h</sup> wi: <sup>1</sup>	--
644	store up	le <sup>2</sup> ʔun <sup>3</sup>	le <sup>2</sup> ʔun <sup>3</sup>	--
645	bundle (n)	ma: <sup>1</sup> mat <sup>2</sup>	ma: <sup>1</sup> mat <sup>2</sup>	--
646	heap (n)	ma: <sup>1</sup> kuaŋ <sup>2</sup>	ma: <sup>1</sup> kuaŋ <sup>2</sup>	--
647	heap up	kuaŋ <sup>2</sup>	kuaŋ <sup>2</sup>	--
648	wrap up	wal <sup>2</sup>	wal <sup>2</sup>	--
649	unwrap	la: <sup>1</sup>	la: <sup>1</sup>	--
650	pack (v)	ka: <sup>3</sup>	ka: <sup>3</sup>	--
651	strap (n)	p.c <sup>h</sup> i <sup>2</sup> rat <sup>2</sup>	p.c <sup>h</sup> i <sup>2</sup> rat <sup>2</sup>	--
652	string (n)	p.c <sup>h</sup> i <sup>2</sup>	p.c <sup>h</sup> i <sup>2</sup>	--
653	rope	p.c <sup>h</sup> i <sup>2</sup> len <sup>3</sup>	p.c <sup>h</sup> i <sup>2</sup> len <sup>3</sup>	--
654	knot (n)	p.k <sup>h</sup> on <sup>3</sup>	p.k <sup>h</sup> on <sup>3</sup>	--
655	fasten, bind (load)	ka:t <sup>1</sup>	ka:t <sup>1</sup>	--
656	tie (knot)	pɣk <sup>2</sup> raw <sup>2</sup>	pɣk <sup>2</sup> raw <sup>2</sup>	puk <sup>2</sup>
657	untie	k <sup>h</sup> a: <sup>1</sup> p.c <sup>h</sup> i <sup>2</sup>	k <sup>h</sup> a: <sup>1</sup> p.c <sup>h</sup> i <sup>2</sup>	--
658	tighten	ra:t <sup>1</sup> man <sup>2</sup>	ra:t <sup>1</sup> man <sup>2</sup>	--
659	(be) tight	kua <sup>1</sup> man <sup>2</sup>	kua <sup>1</sup> man <sup>2</sup>	--
660	loosen	tiaŋ <sup>3</sup> wan <sup>1</sup> s.lom <sup>1</sup>	tiaŋ <sup>3</sup> wan <sup>1</sup> s.lom <sup>1</sup>	--
661	loose, slack	s.lom <sup>1</sup>	s.lom <sup>1</sup>	s.lo:m <sup>1</sup>
662	house	ka:ŋ <sup>3</sup>	ka:ŋ <sup>3</sup>	ka:ŋ <sup>3</sup>
663	hut (in the field)	tu:p <sup>1</sup> na: <sup>3</sup>	tu:p <sup>1</sup> na: <sup>3</sup>	--
664	wall	k.t <sup>h</sup> e:ŋ <sup>3</sup>	k.t <sup>h</sup> e:ŋ <sup>3</sup>	--
665	door	k.c <sup>h</sup> aŋ <sup>3</sup>	k.c <sup>h</sup> aŋ <sup>3</sup>	--
666	doorway	t.p <sup>h</sup> rɔ <sup>2</sup>	t.p <sup>h</sup> rɔ <sup>2</sup>	--
667	window	p <sup>h</sup> a <sup>2</sup> buaŋ <sup>1</sup>	p <sup>h</sup> a <sup>2</sup> buaŋ <sup>1</sup>	--
668	roof	t <sup>h</sup> ɔ <sup>2</sup> k <sup>h</sup> i:ŋ <sup>3</sup> p <sup>h</sup> raŋ <sup>3</sup>	t <sup>h</sup> ɔ <sup>2</sup> k <sup>h</sup> i:ŋ <sup>3</sup> p <sup>h</sup> raŋ <sup>3</sup>	--
669	beam, rafter	be: <sup>3</sup>	be: <sup>3</sup>	--
670	floor	pu:n <sup>3</sup> ka:ŋ <sup>3</sup>	pu:n <sup>3</sup> ka:ŋ <sup>3</sup>	--
671	room	huaŋ <sup>2</sup> ka:ŋ <sup>3</sup>	huaŋ <sup>2</sup> ka:ŋ <sup>3</sup>	--



No.	Gloss	Speaker A	Speaker B	Speaker D
672	bedroom, sleeping area	som <sup>2</sup>	som <sup>2</sup>	--
673	kitchen	ka:ŋ <sup>3</sup> p <sup>h</sup> ul <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup>	ka:ŋ <sup>3</sup> p <sup>h</sup> ul <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup>	--
674	entrance hut	t.p <sup>h</sup> rɔ <sup>2</sup> tu:p <sup>1</sup>	t.p <sup>h</sup> rɔ <sup>2</sup> tu:p <sup>1</sup>	--
675	courtyard	ka:ŋ <sup>3</sup> k <sup>h</sup> o:ŋ <sup>1</sup>	ka:ŋ <sup>3</sup> k <sup>h</sup> o:ŋ <sup>1</sup>	--
676	fence (n)	ro: <sup>2</sup>	ro: <sup>2</sup>	--
677	fence in	kɔ <sup>1</sup> ro: <sup>2</sup>	kɔ <sup>1</sup> ro: <sup>2</sup>	--
678	granary (rice)	juŋ <sup>2</sup> s.ŋɔ <sup>2</sup>	juŋ <sup>2</sup> s.ŋɔ <sup>2</sup>	--
679	well (n)	nam <sup>2</sup> bua <sup>1</sup>	nam <sup>2</sup> bua <sup>1</sup>	--
680	bathing place	k <sup>h</sup> o <sup>2</sup> sum <sup>3</sup> ʔo:m <sup>3</sup>	k <sup>h</sup> o <sup>2</sup> sum <sup>3</sup> ʔo:m <sup>3</sup>	--
681	latrine, toilet	k <sup>h</sup> um <sup>1</sup> vit <sup>2</sup>	k <sup>h</sup> um <sup>1</sup> vit <sup>2</sup>	--
682	garbage dump	k <sup>h</sup> o <sup>2</sup> vɣl <sup>3</sup> ŋaj <sup>1</sup>	k <sup>h</sup> o <sup>2</sup> vɣl <sup>3</sup> ŋaj <sup>1</sup>	--
683	garden	so:n <sup>3</sup>	so:n <sup>3</sup>	--
684a	area under house	ko <sup>2</sup> s.rum <sup>3</sup>	ko <sup>2</sup> s.rum <sup>3</sup>	--
684	shelter (n)	k <sup>h</sup> o <sup>2</sup> c <sup>h</sup> ɣn <sup>3</sup>	k <sup>h</sup> o <sup>2</sup> c <sup>h</sup> ɣn <sup>3</sup>	--
685	build	tiaŋ <sup>1</sup> ka:ŋ <sup>3</sup>	tiaŋ <sup>1</sup> ka:ŋ <sup>3</sup>	--
686	mark out, peg out	kum <sup>3</sup> p.tam <sup>3</sup>	kum <sup>3</sup> p.tam <sup>3</sup>	--
687	loaf-shape (cake, bread)	bɣ:ŋ <sup>3</sup>	bɣ:ŋ <sup>3</sup>	--
688	thatch	p <sup>h</sup> raŋ <sup>3</sup>	p <sup>h</sup> raŋ <sup>3</sup>	--
689	plaster (n)	s.ta:j <sup>3</sup>	s.ta:j <sup>3</sup>	--
690	lime, whitewash	bun <sup>3</sup> s.pual <sup>3</sup>	bun <sup>3</sup> s.pual <sup>3</sup>	--
691	paint (n)	ʔo:m <sup>3</sup> si: <sup>3</sup>	ʔo:m <sup>3</sup> si: <sup>3</sup>	--
692	ladder	p.tual <sup>3</sup>	p.tual <sup>3</sup>	--
693	chair	taŋ <sup>1</sup> kuŋ <sup>3</sup>	taŋ <sup>1</sup> kuŋ <sup>3</sup>	--
694	stool	t.kuŋ <sup>3</sup>	t.kuŋ <sup>3</sup>	--
695	wickerwork	su <sup>2</sup> t <sup>h</sup> a:j <sup>3</sup>	su <sup>2</sup> t <sup>h</sup> a:j <sup>3</sup>	--
696a	blanket	bɣŋ <sup>2</sup>	bɣŋ <sup>2</sup>	--
696b	bed	tian <sup>1</sup> ʔet <sup>2</sup>	tian <sup>1</sup> ʔet <sup>2</sup>	--
696	bed	k <sup>h</sup> o <sup>2</sup> ʔet <sup>2</sup>	k <sup>h</sup> o <sup>2</sup> ʔet <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
697a	pillow	k <sup>h</sup> um <sup>1</sup> k <sup>h</sup> ru <sup>1</sup> ?iŋ <sup>3</sup>	k <sup>h</sup> um <sup>1</sup> k <sup>h</sup> ru <sup>1</sup> ?iŋ <sup>3</sup>	--
697	mat	kra: <sup>3</sup>	kra: <sup>3</sup>	--
699	fan (n)	saw <sup>1</sup> s.ma <sup>2</sup>	saw <sup>1</sup> s.ma <sup>2</sup>	--
700	bell	ma: <sup>1</sup> riŋ <sup>3</sup>	ma: <sup>1</sup> riŋ <sup>3</sup>	--
701	ring (bell) (v)	k.san <sup>1</sup>	k.san <sup>1</sup>	--
702	act, do	ci <sup>2</sup>	ci <sup>2</sup>	--
702a	work (v)	ci <sup>2</sup> ka:n <sup>3</sup>	ci <sup>2</sup> ka:n <sup>3</sup>	--
703	work (n)	su <sup>2</sup> ci <sup>2</sup>	su <sup>2</sup> ci <sup>2</sup>	--
704	mend, repair	suam <sup>3</sup> tiaŋ <sup>3</sup>	suam <sup>3</sup> tiaŋ <sup>3</sup>	--
705	forge (n)	t.p <sup>h</sup> rɔ <sup>2</sup> ŋal <sup>3</sup>	t.p <sup>h</sup> rɔ <sup>2</sup> ŋal <sup>3</sup>	--
706	hammer	paj <sup>2</sup>	paj <sup>2</sup>	--
707	anvil	taŋ <sup>1</sup> t.ŋaŋ <sup>3</sup>	taŋ <sup>1</sup> t.ŋaŋ <sup>3</sup>	--
708	bellows	saw <sup>1</sup> t <sup>h</sup> eŋ <sup>3</sup>	saw <sup>1</sup> t <sup>h</sup> eŋ <sup>3</sup>	--
709	lump	k.t <sup>h</sup> et <sup>2</sup> ɲɔk <sup>2</sup>	k.t <sup>h</sup> et <sup>2</sup> ɲɔk <sup>2</sup>	--
711	potter's kiln	taw <sup>3</sup> k.ʔual <sup>3</sup>	taw <sup>3</sup> k.ʔual <sup>3</sup>	--
712	wood	su <sup>2</sup>	su <sup>2</sup>	--
713	cut down (tree)	t <sup>h</sup> aŋ <sup>3</sup>	t <sup>h</sup> aŋ <sup>3</sup>	--
714	log	su <sup>2</sup> lɛm <sup>2</sup>	su <sup>2</sup> lɛm <sup>2</sup>	--
715a	hollow (log)	t <sup>h</sup> u <sup>2</sup>	t <sup>h</sup> u <sup>2</sup>	--
715	hollow (log)	kroŋ <sup>3</sup>	kroŋ <sup>3</sup>	--
716	axe	muŋ <sup>3</sup> pok <sup>2</sup>	muŋ <sup>3</sup> pɔk <sup>2</sup>	--
717	chop into pieces	k <sup>h</sup> o: <sup>1</sup>	k <sup>h</sup> o: <sup>1</sup>	--
718	saw (n)	t.ŋaŋ <sup>3</sup> lɣ: <sup>1</sup>	t.ŋaŋ <sup>3</sup> lɣ: <sup>1</sup>	--
719	saw (wood) (v)	lɣ: <sup>1</sup>	lɣ: <sup>1</sup>	--
720	plank	ma: <sup>1</sup> pian <sup>2</sup>	ma: <sup>1</sup> pian <sup>2</sup>	--
721	knot (in wood)	na:j <sup>3</sup> su <sup>2</sup>	na:j <sup>3</sup> su <sup>2</sup>	--
722	splinter, sliver (n)	su <sup>2</sup> sɛ <sup>2</sup>	su <sup>2</sup> sɛ <sup>2</sup>	--
723	chisel (n)	k.sua <sup>1</sup>	k.sua <sup>1</sup>	--
724	nail (n)	t.ŋaŋ <sup>3</sup> tuak <sup>1</sup>	t.ŋaŋ <sup>3</sup> tuak <sup>1</sup>	--
725	sew	kual <sup>3</sup>	kual <sup>3</sup>	kual <sup>3</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
726	needle	s.net <sup>2</sup>	s.net <sup>2</sup>	s.net <sup>2</sup>
727	thread (n)	m.ɲep <sup>2</sup>	m.ɲep <sup>2</sup>	--
728	hem (n)	p <sup>h</sup> rep <sup>2</sup>	p <sup>h</sup> rep <sup>2</sup>	--
729	pocket	ko <sup>2</sup> pe: <sup>3</sup>	ko <sup>2</sup> pe: <sup>3</sup>	--
730	(be) torn	tɯŋ <sup>1</sup> t <sup>h</sup> a:k <sup>1</sup>	tɯŋ <sup>1</sup> t <sup>h</sup> a:k <sup>1</sup>	--
731a	dye cloth	cup <sup>2</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	cup <sup>2</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	--
731	weave	tam <sup>1</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	tam <sup>1</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	tam <sup>1</sup> c <sup>h</sup> u:ŋ <sup>3</sup>
732	cloth	c <sup>h</sup> u:ŋ <sup>3</sup> ram <sup>3</sup>	c <sup>h</sup> u:ŋ <sup>3</sup> ram <sup>3</sup>	--
733	rag	suw <sup>2</sup> lo:p <sup>1</sup>	suw <sup>2</sup> lo:p <sup>1</sup>	--
734	broom	t.ʔuak <sup>1</sup>	t.ʔuak <sup>1</sup>	--
735	sweep	t.ʔuak <sup>1</sup> ka:ŋ <sup>3</sup>	t.ʔuak <sup>1</sup> ka:ŋ <sup>3</sup>	--
736	polish	suw <sup>2</sup> si: <sup>3</sup>	suw <sup>2</sup> si: <sup>3</sup>	--
737a	wash (clothes)	k.t <sup>h</sup> u <sup>2</sup> ko <sup>2</sup> krɔŋ <sup>3</sup>	k.t <sup>h</sup> u <sup>2</sup> ko <sup>2</sup> krɔŋ <sup>3</sup>	--
737	wash (utensils)	s.na:j <sup>3</sup>	s.na:j <sup>3</sup>	--
738	draw water	ca:k <sup>2</sup> ʔo:m <sup>3</sup>	ca:k <sup>2</sup> ʔo:m <sup>3</sup>	--
739	fetch firewood	k <sup>h</sup> ɔn <sup>3</sup> si <sup>2</sup>	k <sup>h</sup> ɔn <sup>3</sup> si <sup>2</sup>	--
740	dig (in ground)	k <sup>h</sup> u:ŋ <sup>3</sup>	k <sup>h</sup> u:ŋ <sup>3</sup>	k <sup>h</sup> u:ŋ <sup>3</sup>
741	rubbish	ŋa:j <sup>1</sup> ŋam <sup>3</sup>	ŋa:j <sup>1</sup> ŋam <sup>3</sup>	--
742	plow (v)	t <sup>h</sup> aj <sup>1</sup> bɔk <sup>2</sup>	t <sup>h</sup> aj <sup>1</sup> bɔk <sup>2</sup>	--
743a	wet rice field	na: <sup>3</sup>	na: <sup>3</sup>	na: <sup>3</sup>
743	field (dry/ mountain)	ma:l <sup>3</sup>	ma:l <sup>3</sup>	--
744	boundary (of field)	mu:l <sup>1</sup>	mu:l <sup>1</sup>	--
745	fertile soil	fun <sup>1</sup>	fun <sup>1</sup>	--
746	barren land	k.t <sup>h</sup> et <sup>2</sup> t <sup>h</sup> ɔj <sup>1</sup>	k.t <sup>h</sup> et <sup>2</sup> t <sup>h</sup> ɔj <sup>1</sup>	--
747	clear (land for planting)	p.ca:ŋ <sup>3</sup>	p.ca:ŋ <sup>3</sup>	--
748	sow/ plant	c <sup>h</sup> ɣm <sup>3</sup>	c <sup>h</sup> ɣm <sup>3</sup>	c <sup>h</sup> ɣm <sup>3</sup>
749	transplant	ruc <sup>2</sup> c <sup>h</sup> ɣm <sup>3</sup>	ruc <sup>2</sup> c <sup>h</sup> ɣm <sup>3</sup>	--
750	weed (v)	ci <sup>2</sup> ma:l <sup>3</sup>	ci <sup>2</sup> ma:l <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
751	hoe (v)	t.pro <sup>2</sup> cual <sup>3</sup>	t.pro <sup>2</sup> cual <sup>3</sup>	--
752	hoe (n)	t.pro <sup>2</sup>	t.pro <sup>2</sup>	--
753	big hoe	p <sup>h</sup> a:k <sup>1</sup> so:k <sup>1</sup>	p <sup>h</sup> a:k <sup>1</sup> so:k <sup>1</sup>	--
754	sickle	t.wɣc <sup>2</sup>	t.wɣc <sup>2</sup>	--
755	machete	m.kep <sup>2</sup>	m.kep <sup>2</sup>	--
756	harvest season	ɲa:m <sup>1</sup> m.s.ɲɔ <sup>2</sup>	ɲa:m <sup>1</sup> m.s.ɲɔ <sup>2</sup>	--
757	harvest (rice) (v)	kew <sup>1</sup> s.ɲɔ <sup>2</sup>	kew <sup>1</sup> s.ɲɔ <sup>2</sup>	--
758	harvest, dig up (root crops)	ruc <sup>2</sup> p <sup>h</sup> e:1 k.t <sup>h</sup> et <sup>2</sup>	ruc <sup>2</sup> p <sup>h</sup> e:1 k.t <sup>h</sup> et <sup>2</sup>	--
759	pick, pluck (fruit)	p <sup>h</sup> e:1	p <sup>h</sup> e:1	--
760	pick tea	kɣt <sup>2</sup> la:2	kɣt <sup>2</sup> la:2	--
761	threshing floor	p.tam <sup>3</sup> k <sup>h</sup> a:w <sup>2</sup> kuaŋ <sup>3</sup>	p.tam <sup>3</sup> k <sup>h</sup> a:w <sup>2</sup> kuaŋ <sup>3</sup>	--
762	thresh, beat (grain)	pup <sup>2</sup> s.ɲɔ <sup>2</sup>	pup <sup>2</sup> s.ɲɔ <sup>2</sup>	--
763	winnow (n)	fɣj <sup>1</sup> s.ɲɔ <sup>2</sup>	fɣj <sup>1</sup> s.ɲɔ <sup>2</sup>	--
764	winnow, throw in air (grain) (v)	p <sup>h</sup> .jɣ:l <sup>3</sup>	p <sup>h</sup> .jɣ:l <sup>3</sup>	--
765	shell (ground nuts) (v)	p <sup>h</sup> e:1	p <sup>h</sup> e:1	--
766	husk (corn) (v)	p <sup>h</sup> a:1	p <sup>h</sup> a:1	--
767b	wild animal	sat <sup>2</sup> prit <sup>2</sup>	sat <sup>2</sup> prit <sup>2</sup>	--
767	domestic animal	sat <sup>2</sup> c <sup>h</sup> o:m <sup>3</sup>	sat <sup>2</sup> c <sup>h</sup> o:m <sup>3</sup>	--
768	herd (n)	mu:1 sat <sup>2</sup>	mu:1 sat <sup>2</sup>	--
769	herd, tend (v)	c <sup>h</sup> o:m <sup>3</sup>	c <sup>h</sup> o:m <sup>3</sup>	--
770	cattle pen	k <sup>h</sup> uak <sup>1</sup>	k <sup>h</sup> uak <sup>1</sup>	--
771	tether (v)	bɛt <sup>2</sup>	bɛt <sup>2</sup>	--
772	feed (animals)	wa:1 luk <sup>2</sup>	wa:1 luk <sup>2</sup>	--
773	milk (v)	p <sup>h</sup> ɛt <sup>2</sup> ʔo:m <sup>3</sup> ʔu <sup>2</sup>	p <sup>h</sup> ɛt <sup>2</sup> ʔo:m <sup>3</sup> ʔu <sup>2</sup>	--
774	castrate	tuan <sup>3</sup>	tuan <sup>3</sup>	--
775a	hunt (v) (w/ group)	lu <sup>1</sup> fa:l <sup>3</sup>	lu <sup>1</sup> fa:l <sup>3</sup>	nu:1 fa:l <sup>3</sup>
775	hunt (one person)	ʔi:3 re <sup>2</sup>	ʔi:3 re <sup>2</sup>	s.wat <sup>2</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
776	stalk	ka:t <sup>1</sup> k <sup>h</sup> uak <sup>1</sup>	ka:t <sup>1</sup> k <sup>h</sup> uak <sup>1</sup>	--
777	chase	ru:p <sup>1</sup>	ru:p <sup>1</sup>	--
778	track (animal) (n)	p.ta:l <sup>3</sup> ta:j <sup>1</sup>	p.ta:l <sup>3</sup> ta:j <sup>1</sup>	--
779	footprint (human)	t.k <sup>h</sup> o <sup>2</sup> cu:ŋ <sup>3</sup>	t.k <sup>h</sup> o <sup>2</sup> cu:ŋ <sup>3</sup>	--
780	bow (hunting)	ʔa:k <sup>1</sup>	ʔa:k <sup>1</sup>	ʔa:k <sup>1</sup>
781	arrow	te: <sup>3</sup>	te: <sup>3</sup>	te: <sup>3</sup>
782	poison (on arrow)	ʔɣm <sup>3</sup>	ʔɣm <sup>3</sup>	--
783	head of arrow	to:j <sup>3</sup>	to:j <sup>3</sup>	--
784	quiver (n)	t.ka:ŋ <sup>3</sup> te: <sup>3</sup>	t.ka:ŋ <sup>3</sup> te: <sup>3</sup>	--
785	lance (spear) (n)	m.buaŋ <sup>2</sup>	m.buaŋ <sup>2</sup>	--
786	knife	wac <sup>2</sup> m.nɛp <sup>2</sup>	wac <sup>2</sup> m.nɛp <sup>2</sup>	--
787	throwing stick (n)	t.p <sup>h</sup> ɛk <sup>2</sup>	t.p <sup>h</sup> ɛk <sup>2</sup>	--
788	club, cudgel	t.k <sup>h</sup> ɣ:m <sup>3</sup>	t.k <sup>h</sup> ɣ:m <sup>3</sup>	--
789	hunting net	ra:j <sup>1</sup>	ra:j <sup>1</sup>	--
790	birdlime	ta:ŋ <sup>3</sup>	ta:ŋ <sup>3</sup>	--
791	trap (n)	riw <sup>2</sup>	riw <sup>2</sup>	--
792	set trap (on ground)	sa:j <sup>1</sup> riw <sup>2</sup>	sa:j <sup>1</sup> riw <sup>2</sup>	--
793	trap (animal) (in air) (v)	kra:ŋ <sup>3</sup> ra:j <sup>1</sup>	kra:ŋ <sup>3</sup> ra:j <sup>1</sup>	--
794	evade	bɔn <sup>2</sup>	bɔn <sup>2</sup>	--
795	escape	k <sup>h</sup> rit <sup>2</sup> bɔn <sup>2</sup>	k <sup>h</sup> rit <sup>2</sup> bɔn <sup>2</sup>	--
796	wound	k <sup>h</sup> o <sup>2</sup> c <sup>h</sup> ut <sup>2</sup>	k <sup>h</sup> o <sup>2</sup> c <sup>h</sup> ut <sup>2</sup>	--
798a	skin animal (v) (with tool)	lup <sup>2</sup> t.ku <sup>2</sup>	lup <sup>2</sup> t.ku <sup>2</sup>	--
798	skin animal (v) (by hand)	lup <sup>2</sup> t.ku <sup>2</sup>	lup <sup>2</sup> t.ku <sup>2</sup>	--
799	fish (v)	ŋom <sup>3</sup> ŋɣt <sup>2</sup> k <sup>h</sup> a <sup>2</sup>	ŋom <sup>3</sup> ŋɣt <sup>2</sup> k <sup>h</sup> a <sup>2</sup>	--
800	fish dam	ʔo:m <sup>3</sup> lo <sup>2</sup> k <sup>h</sup> a <sup>2</sup>	ʔo:m <sup>3</sup> lo <sup>2</sup> k <sup>h</sup> a <sup>2</sup>	--
801	fishtrap	nian <sup>3</sup>	nian <sup>3</sup>	--
802	fishing net	rɣp <sup>2</sup>	rɣp <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
803	fishing line	t.koŋ <sup>3</sup> bet <sup>2</sup>	t.koŋ <sup>3</sup> bet <sup>2</sup>	--
804	fish hook	bet <sup>2</sup>	bet <sup>2</sup>	--
805	bait	s.ni:l <sup>3</sup>	s.ni:l <sup>3</sup>	--
806	have, possess	pa <sup>2</sup>	pa <sup>2</sup>	--
807	need (v)	lo: <sup>1</sup>	lo: <sup>1</sup>	--
808	get, obtain	rap <sup>2</sup> t.no: <sup>3</sup>	rap <sup>2</sup> t.no: <sup>3</sup>	--
809	give	wa: <sup>1</sup>	wa: <sup>1</sup>	wa: <sup>1</sup>
810	return, give back	t <sup>h</sup> o: <sup>3</sup> we: <sup>1</sup>	t <sup>h</sup> o: <sup>3</sup> we: <sup>1</sup>	--
812	owner	caw <sup>2</sup> k <sup>h</sup> uaŋ <sup>3</sup>	caw <sup>2</sup> k <sup>h</sup> uaŋ <sup>3</sup>	--
813	rich man	ʔic <sup>2</sup> raŋ <sup>1</sup>	ʔic <sup>2</sup> raŋ <sup>1</sup>	--
814	poor man	ʔic <sup>2</sup> tuk <sup>2</sup>	ʔic <sup>2</sup> tuk <sup>2</sup>	--
815	rich	raŋ <sup>1</sup>	raŋ <sup>1</sup>	--
816	poor	tuk <sup>2</sup>	tuk <sup>2</sup>	--
817	money	mul <sup>3</sup> paj <sup>3</sup>	mul <sup>3</sup> paj <sup>3</sup>	--
818	cowrie shell	prɔ: <sup>2</sup>	prɔ: <sup>2</sup>	--
819	barter, exchange	liak <sup>1</sup>	liak <sup>1</sup>	--
820	buy	fe: <sup>3</sup>	fe: <sup>3</sup>	fe: <sup>3</sup>
821	sell	p <sup>h</sup> ɣt <sup>2</sup>	p <sup>h</sup> ɣt <sup>2</sup>	p <sup>h</sup> ɣt <sup>2</sup>
822	(be) scarce	raj <sup>2</sup>	raj <sup>2</sup>	--
823	(be) expensive	k <sup>h</sup> iŋ <sup>3</sup>	k <sup>h</sup> iŋ <sup>3</sup>	--
824	(be) inexpensive	k <sup>h</sup> rɔ: <sup>2</sup>	k <sup>h</sup> rɔ: <sup>2</sup>	--
825	price	k <sup>h</sup> iŋ <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup>	k <sup>h</sup> iŋ <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup>	k <sup>h</sup> iŋ <sup>3</sup>
826	haggle, negotiate a price	ra:n <sup>3</sup> k <sup>h</sup> iŋ <sup>3</sup>	ra:n <sup>3</sup> k <sup>h</sup> iŋ <sup>3</sup>	--
827	payment (n)	k <sup>h</sup> iŋ <sup>3</sup> ca:j <sup>1</sup>	k <sup>h</sup> iŋ <sup>3</sup> ca:j <sup>1</sup>	--
828	pay (v)	ca:j <sup>1</sup> k <sup>h</sup> iŋ <sup>3</sup>	ca:j <sup>1</sup> k <sup>h</sup> iŋ <sup>3</sup>	--
829	gift	su: <sup>2</sup> tuan <sup>2</sup>	su: <sup>2</sup> tuan <sup>2</sup>	--
830	hire (v)	caŋ <sup>2</sup>	caŋ <sup>2</sup>	--
831	beg	p <sup>h</sup> ual <sup>3</sup>	p <sup>h</sup> ual <sup>3</sup>	p <sup>h</sup> ual <sup>3</sup>
832	borrow	ɲu:m <sup>3</sup>	ɲu:m <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
833	lend	ra:m <sup>3</sup>	ra:m <sup>3</sup>	--
834	debt	ni: <sup>2</sup>	ni: <sup>2</sup>	--
835	offer (v)	ʔu: <sup>1</sup> k <sup>h</sup> iŋ <sup>3</sup>	ʔu: <sup>1</sup> k <sup>h</sup> iŋ <sup>3</sup>	--
836	accept, receive	rap <sup>2</sup>	rap <sup>2</sup>	--
838	tax	k <sup>h</sup> ɔn <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	--
839	tribute	tiŋ <sup>3</sup>	tiŋ <sup>3</sup>	--
840	inheritance	su: <sup>2</sup> co: <sup>1</sup> bua <sup>1</sup>	su: <sup>2</sup> co: <sup>1</sup> bua <sup>1</sup>	--
841	inherit	su:p <sup>1</sup> su: <sup>2</sup> bua <sup>1</sup>	su:p <sup>1</sup> su: <sup>2</sup> bua <sup>1</sup>	--
843	travel	te:w <sup>3</sup> s.ruɑŋ <sup>3</sup>	te:w <sup>3</sup> s.ruɑŋ <sup>3</sup>	--
844	traveler	ʔi: <sup>2</sup> te:w <sup>3</sup> s.ruɑŋ <sup>3</sup>	ʔi: <sup>2</sup> te:w <sup>3</sup> s.ruɑŋ <sup>3</sup>	--
845	wander	lat <sup>2</sup> lat <sup>2</sup> ʔi: <sup>3</sup> ʔi: <sup>3</sup>	lat <sup>2</sup> lat <sup>2</sup> ʔi: <sup>3</sup> ʔi: <sup>3</sup>	--
846	(be) lost	kwaŋ <sup>3</sup> s.ruɑŋ <sup>3</sup>	kwaŋ <sup>3</sup> s.ruɑŋ <sup>3</sup>	--
847	path, road	s.ruɑŋ <sup>3</sup>	s.ruɑŋ <sup>3</sup>	s.ruɑŋ <sup>3</sup>
848	fork (in path)	s.ruɑŋ <sup>3</sup> taŋ <sup>1</sup> ka: <sup>1</sup>	s.ruɑŋ <sup>3</sup> taŋ <sup>1</sup> ka: <sup>1</sup>	--
849	crossroads, intersection	s.ruɑŋ <sup>3</sup> su:m <sup>3</sup>	s.ruɑŋ <sup>3</sup> su:m <sup>3</sup>	--
850	cross (river)	ta: <sup>1</sup> ʔo:m <sup>3</sup>	ta: <sup>1</sup> ʔo:m <sup>3</sup>	--
851	boat	ɾɿ: <sup>3</sup>	ɾɿ: <sup>3</sup>	ɾɿ: <sup>3</sup>
852	paddle (n)	su: <sup>2</sup> fa:j <sup>1</sup> ɾɿ: <sup>3</sup>	su: <sup>2</sup> fa:j <sup>1</sup> ɾɿ: <sup>3</sup>	--
853	paddle (v)	fa:j <sup>1</sup> ɾɿ: <sup>3</sup>	fa:j <sup>1</sup> ɾɿ: <sup>3</sup>	--
854	bail out (canoe, boat)	tik <sup>2</sup> ʔo:m <sup>3</sup> wɿl <sup>3</sup>	tik <sup>2</sup> ʔo:m <sup>3</sup> wɿl <sup>3</sup>	--
855	capsize	ɾɿ: <sup>3</sup> t.k <sup>h</sup> up <sup>2</sup>	ɾɿ: <sup>3</sup> t.k <sup>h</sup> up <sup>2</sup>	--
856	bring	le: <sup>2</sup> ʔi: <sup>3</sup>	le: <sup>2</sup> ʔi: <sup>3</sup>	--
857	take away, carry away	le: <sup>2</sup> lat <sup>2</sup>	le: <sup>2</sup> lat <sup>2</sup>	--
858	send (something to someone)	t <sup>h</sup> o: <sup>3</sup> kro: <sup>3</sup>	t <sup>h</sup> o: <sup>3</sup> kro: <sup>3</sup>	--
859	carry (in arms)	huap <sup>1</sup>	huap <sup>1</sup>	--
860	carry (child) on back	ʔɛm <sup>3</sup>	ʔɛm <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
861	carry on head	tɔt <sup>2</sup>	tɔt <sup>2</sup>	--
862	head pad	s.luaŋ <sup>3</sup> prɛŋ <sup>3</sup>	s.luaŋ <sup>3</sup> prɛŋ <sup>3</sup>	--
863	load, burden (n)	su <sup>2</sup> k.cɛn <sup>3</sup>	su <sup>2</sup> k.cɛn <sup>3</sup>	--
864	load (v)	taŋ <sup>1</sup> kro: <sup>3</sup>	taŋ <sup>1</sup> kro: <sup>3</sup>	--
865	unload	k <sup>h</sup> ɔn <sup>3</sup> li: <sup>1</sup>	k <sup>h</sup> ɔn <sup>3</sup> li: <sup>1</sup>	--
866	war	sɤk <sup>2</sup>	sɤk <sup>2</sup>	--
867	peace	joŋ <sup>3</sup> jɛn <sup>3</sup>	joŋ <sup>3</sup> jɛn <sup>3</sup>	--
868	army	ta <sup>p</sup> <sup>2</sup> sɤk <sup>2</sup>	ta <sup>p</sup> <sup>2</sup> sɤk <sup>2</sup>	--
869	spy (n)	ʔic <sup>2</sup> p <sup>h</sup> rɔk <sup>2</sup>	ʔic <sup>2</sup> p <sup>h</sup> rɔk <sup>2</sup>	--
870	spy, spy on (v)	p <sup>h</sup> rɔk <sup>2</sup> duam <sup>3</sup>	p <sup>h</sup> rɔk <sup>2</sup> duam <sup>3</sup>	--
871	sword	wac <sup>2</sup> m.kep <sup>2</sup>	wac <sup>2</sup> m.kep <sup>2</sup>	--
872	gun	s.na:t <sup>1</sup>	s.na:t <sup>1</sup>	--
874	conquer, defeat	be: <sup>2</sup> sɤk <sup>2</sup>	be: <sup>2</sup> sɤk <sup>2</sup>	--
875	(be) defeated	kan <sup>2</sup>	kan <sup>2</sup>	--
876	prisoner, captive	ʔic <sup>2</sup> m.ŋuut <sup>2</sup> pu:n <sup>3</sup>	ʔic <sup>2</sup> m.ŋuut <sup>2</sup> pu:n <sup>3</sup>	--
877a	slave	k <sup>h</sup> a: <sup>2</sup>	k <sup>h</sup> a: <sup>2</sup>	--
879	song	kam <sup>3</sup> p <sup>h</sup> e:ŋ <sup>3</sup>	kam <sup>3</sup> p <sup>h</sup> e:ŋ <sup>3</sup>	--
880	sing	ʔu: <sup>1</sup> p <sup>h</sup> e:ŋ <sup>3</sup>	ʔu: <sup>1</sup> p <sup>h</sup> e:ŋ <sup>3</sup>	--
881	hum (v)	ŋɛl <sup>3</sup> ʔu: <sup>1</sup>	ŋɛl <sup>3</sup> ʔu: <sup>1</sup>	--
882	whistle (v)	p.suam <sup>3</sup>	p.suam <sup>3</sup>	--
883	dance (n)	wuan <sup>2</sup>	fuan <sup>2</sup>	--
884	dance (v)	fuan <sup>2</sup>	fuan <sup>2</sup>	--
885	big drum	k.t <sup>h</sup> uŋ <sup>3</sup> jɤ: <sup>ŋ</sup> <sup>3</sup>	k.t <sup>h</sup> uŋ <sup>3</sup> jɤ: <sup>ŋ</sup> <sup>3</sup>	--
886a	gong	mɛŋ <sup>3</sup>	mɛŋ <sup>3</sup>	--
886	small drum	k.t <sup>h</sup> uŋ <sup>3</sup> tek <sup>2</sup>	k.t <sup>h</sup> uŋ <sup>3</sup> tek <sup>2</sup>	--
889	flute	pi: <sup>3</sup>	pi: <sup>3</sup>	--
895	play instrument	pɤ <sup>2</sup> tiŋ <sup>3</sup>	pɤ <sup>2</sup> tiŋ <sup>3</sup>	--
896	blow (horn)	p <sup>h</sup> uŋ <sup>3</sup>	p <sup>h</sup> uŋ <sup>3</sup>	--
897	draw (picture)	puat <sup>1</sup> pum <sup>1</sup>	puat <sup>1</sup> pum <sup>1</sup>	--
898	decorate	juan <sup>2</sup>	juan <sup>2</sup>	--



No.	Gloss	Speaker A	Speaker B	Speaker D
899	carve	kuak <sup>2</sup> ro:p <sup>1</sup>	kuak <sup>2</sup> ro:p <sup>1</sup>	--
900	play (child)	sep <sup>2</sup>	sep <sup>2</sup>	--
901	game	suw <sup>2</sup> sep <sup>2</sup>	suw <sup>2</sup> sep <sup>2</sup>	--
902	tobacco pipe	ba: <sup>1</sup> ja: <sup>3</sup> kək <sup>2</sup>	ba: <sup>1</sup> ja: <sup>3</sup> kək <sup>2</sup>	--
903	water pipe	baŋ <sup>1</sup> ba: <sup>1</sup> ja: <sup>3</sup> ʔo:m <sup>3</sup>	baŋ <sup>1</sup> ba: <sup>1</sup> ja: <sup>3</sup> ʔo:m <sup>3</sup>	--
904	tobacco	ja: <sup>3</sup> diaŋ <sup>3</sup>	ja: <sup>3</sup> diaŋ <sup>3</sup>	--
905	awe, reverence (for God)	juan <sup>3</sup> ʔam <sup>3</sup> kɔ <sup>1</sup> caŋ <sup>1</sup> ʔu: <sup>1</sup>	juan <sup>3</sup> ʔam <sup>3</sup> kɔ <sup>1</sup> caŋ <sup>1</sup> ʔu: <sup>1</sup>	--
906	God (supreme being)	p <sup>h</sup> ra: <sup>1</sup> caw <sup>2</sup> ma: <sup>1</sup> lu:ŋ <sup>3</sup> lu:ŋ <sup>3</sup> ʔic <sup>2</sup> seŋ <sup>3</sup> kɤ <sup>1</sup> <sup>3</sup>	p <sup>h</sup> ra: <sup>1</sup> caw <sup>2</sup> ma: <sup>1</sup> lu:ŋ <sup>3</sup> lu:ŋ <sup>3</sup> ʔic <sup>2</sup> seŋ <sup>3</sup> kɤ <sup>1</sup> <sup>3</sup>	--
907	god (lesser), spirit	p <sup>h</sup> ra: <sup>1</sup> mək <sup>2</sup>	p <sup>h</sup> ra: <sup>1</sup> mək <sup>2</sup>	--
908a	evil "rude" spirit	p.krit <sup>2</sup> m.muuk <sup>2</sup>	p.krit <sup>2</sup> m.muuk <sup>2</sup>	--
908	evil spirit	p.krit <sup>2</sup> m.ra:j <sup>2</sup>	p.krit <sup>2</sup> m.ra:j <sup>2</sup>	--
909	ghost (visible apparition)	p.krit <sup>2</sup> p.kra:c <sup>1</sup>	p.krit <sup>2</sup> p.kra:c <sup>1</sup>	--
910	soul, spirit (of living person)	p.sum <sup>3</sup> wi <sup>2</sup> ɲa:n <sup>3</sup>	p.sum <sup>3</sup> wi <sup>2</sup> ɲa:n <sup>3</sup>	--
911	spirit (of dead person) (invisible)	p.krit <sup>2</sup> ʔic <sup>2</sup> jam <sup>3</sup>	p.krit <sup>2</sup> ʔi <sup>2</sup> cam <sup>3</sup>	--
912	pray	ʔu: <sup>1</sup> seŋ <sup>3</sup> m.p <sup>h</sup> ul <sup>3</sup> haj <sup>3</sup> p <sup>h</sup> ra: caw <sup>2</sup>	ʔu: <sup>1</sup> seŋ <sup>3</sup> m.p <sup>h</sup> ul <sup>3</sup> haj <sup>3</sup> p <sup>h</sup> ra: caw <sup>2</sup>	--
913	blessing	ma: <sup>1</sup> juan <sup>3</sup> mon <sup>1</sup> p.su:m <sup>3</sup>	ma: <sup>1</sup> juan <sup>3</sup> mon <sup>1</sup> p.su:m <sup>3</sup>	--
914	divine, prophesy (v)	c <sup>h</sup> u: <sup>3</sup> taŋ <sup>3</sup> tɔ <sup>2</sup> to: <sup>1</sup> ŋa:j <sup>3</sup>	c <sup>h</sup> u: <sup>3</sup> taŋ <sup>3</sup> tɔ <sup>2</sup> to: <sup>1</sup> ŋa:j <sup>3</sup>	--
915	prophecy (n)	suw <sup>2</sup> ʔu: <sup>1</sup> taŋ <sup>3</sup> tɔ <sup>2</sup> to: <sup>1</sup> ŋa:j <sup>3</sup>	suw <sup>2</sup> ʔu: <sup>1</sup> taŋ <sup>3</sup> tɔ <sup>2</sup> to: <sup>1</sup> ŋa:j <sup>3</sup>	--
916	vision (supernatural)	p <sup>h</sup> ra: <sup>1</sup> caw <sup>2</sup> sam <sup>1</sup> diaŋ <sup>3</sup> wa: <sup>1</sup> ʔic <sup>2</sup> lɔ: <sup>3</sup>	p <sup>h</sup> ra: <sup>1</sup> caw <sup>2</sup> sam <sup>1</sup> diaŋ <sup>3</sup> wa: <sup>1</sup> ʔic <sup>2</sup> lɔ: <sup>3</sup>	--
917	omen	sam <sup>1</sup> diaŋ <sup>3</sup>	sam <sup>1</sup> diaŋ <sup>3</sup>	--
918	witchcraft	sa:t <sup>1</sup> mun <sup>3</sup>	sa:t <sup>1</sup> mun <sup>3</sup>	--
919	bewitch, cast spell	ci <sup>2</sup> sa:t <sup>1</sup> mun <sup>3</sup>	ci <sup>2</sup> sa:t <sup>1</sup> mun <sup>3</sup>	--
920	curse (v)	p.sa <sup>2</sup>	p.sa <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
921	curse (n)	p.sa <sup>2</sup>	p.sa <sup>2</sup>	--
922	poison (n)	ja: <sup>3</sup> bɣ: <sup>1</sup>	ja: <sup>3</sup> bɣ: <sup>1</sup>	--
923	poison (a person)	sa:j <sup>1</sup> ja: <sup>3</sup> bɣ: <sup>1</sup>	sa:j <sup>1</sup> ja: <sup>3</sup> bɣ: <sup>1</sup>	--
924	amulet, charm	ɲan <sup>3</sup>	ɲan <sup>3</sup>	--
925	protect by charm	t <sup>h</sup> uk <sup>2</sup> ɲan <sup>3</sup>	t <sup>h</sup> uk <sup>2</sup> ɲan <sup>3</sup>	--
926	mask (n)	ɲa:j <sup>3</sup> p <sup>h</sup> i <sup>2</sup> ko:n <sup>3</sup>	ɲa:j <sup>3</sup> p <sup>h</sup> i <sup>2</sup> ko:n <sup>3</sup>	--
927	(be) taboo (spoken)	su: <sup>2</sup> ʔam <sup>1</sup> jɛl <sup>3</sup> ʔu: <sup>1</sup>	su: <sup>2</sup> ʔam <sup>1</sup> jɛl <sup>3</sup> ʔu: <sup>1</sup>	--
928	exorcise	su:ɲ <sup>1</sup>	su:ɲ <sup>1</sup>	--
929	sacrifice (blood)	suaŋ <sup>2</sup>	suaŋ <sup>2</sup>	--
930	pour libation (pour water over it)	ja:t <sup>1</sup> ʔo:m <sup>3</sup>	ja:t <sup>1</sup> ʔo:m <sup>3</sup>	--
931	dwelling place of the dead (spiritual)	muaŋ <sup>3</sup> ʔic <sup>2</sup> jam <sup>3</sup>	muaŋ <sup>3</sup> ʔic <sup>2</sup> jam <sup>3</sup>	--
932	tradition, custom	rit <sup>1</sup> kuaŋ <sup>3</sup>	rit <sup>1</sup> kuaŋ <sup>3</sup>	--
933	feast (n)	ka:n <sup>3</sup> ta:n <sup>3</sup>	ka:n <sup>3</sup> ta:n <sup>3</sup>	--
934	naming ceremony (baby)	luan <sup>3</sup> dɣ:n <sup>3</sup>	luan <sup>3</sup> dɣ:n <sup>3</sup>	--
939	marry	taŋ <sup>1</sup> ka:ŋ <sup>3</sup>	taŋ <sup>1</sup> ka:ŋ <sup>3</sup>	--
941	(be) engaged, (be) betrothed	k <sup>h</sup> uap <sup>1</sup>	k <sup>h</sup> uap <sup>1</sup>	--
942	brideprice (for bride's family)	s.wa:ŋ <sup>3</sup> k <sup>h</sup> iŋ <sup>3</sup>	s.wa:ŋ <sup>3</sup> k <sup>h</sup> iŋ <sup>3</sup>	--
943	wedding ceremony:	k <sup>h</sup> a:j <sup>3</sup> k <sup>h</sup> iak <sup>1</sup>	k <sup>h</sup> a:j <sup>3</sup> k <sup>h</sup> iak <sup>1</sup>	--
944	bride	t.p <sup>h</sup> .ja <sup>2</sup>	t.p <sup>h</sup> .ja <sup>2</sup>	--
945	groom (wedding)	s.la: <sup>2</sup>	s.la: <sup>2</sup>	--
946	polygamy	no: <sup>3</sup> p <sup>h</sup> ɣn <sup>3</sup> jɣŋ <sup>3</sup>	no: <sup>3</sup> p <sup>h</sup> ɣn <sup>3</sup> jɣŋ <sup>3</sup>	--
947	adultery	sɛp <sup>2</sup> me <sup>1</sup> rɣ:n <sup>3</sup>	sɛp <sup>2</sup> me <sup>1</sup> rɣ:n <sup>3</sup>	--
948	divorce	ra:ŋ <sup>2</sup>	ra:ŋ <sup>2</sup>	--
949	funeral	lat <sup>2</sup> rim <sup>3</sup> cual <sup>3</sup>	lat <sup>2</sup> rim <sup>3</sup> cual <sup>3</sup>	--
950	mourning	ɲɛl <sup>3</sup> ja:m <sup>3</sup>	ɲɛl <sup>3</sup> ja:m <sup>3</sup>	--
951	wail (v) (at funeral)	k <sup>h</sup> ra:k <sup>1</sup> ja:m <sup>3</sup>	k <sup>h</sup> ra:k <sup>1</sup> ja:m <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
952	condole, comfort	fo: <sup>1</sup> me: <sup>3</sup> p.su:m <sup>3</sup>	fo: <sup>1</sup> me: <sup>3</sup> p.su:m <sup>3</sup>	--
953	corpse	k <sup>h</sup> u <sup>2</sup> ʔic <sup>2</sup> jam <sup>3</sup>	k <sup>h</sup> u <sup>2</sup> ʔic <sup>2</sup> jam <sup>3</sup>	--
954	bury	t <sup>h</sup> ʏl <sup>3</sup> ʔic <sup>2</sup> jam <sup>3</sup>	t <sup>h</sup> ʏl <sup>3</sup> ʔic <sup>2</sup> jam <sup>3</sup>	--
955	grave	k <sup>h</sup> um <sup>3</sup> t.ba: <sup>1</sup>	k <sup>h</sup> um <sup>3</sup> t.ba: <sup>1</sup>	t.pa: <sup>1</sup>
956	cemetery	t.ba: <sup>1</sup>	t.ba: <sup>1</sup>	--
957	animal	sat <sup>2</sup> siŋ <sup>1</sup>	sat <sup>2</sup> siŋ <sup>1</sup>	sat <sup>2</sup> si:ŋ <sup>1</sup>
958	ox	mɔj <sup>3</sup>	mɔj <sup>3</sup>	--
959	bull	mɔj <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup>	mɔj <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup>	--
960	cow	mɔj <sup>3</sup> k <sup>h</sup> ʏn <sup>3</sup>	mɔj <sup>3</sup> k <sup>h</sup> ʏn <sup>3</sup>	--
961	heifer	mɔj <sup>3</sup> t <sup>h</sup> a:w <sup>1</sup>	mɔj <sup>3</sup> t <sup>h</sup> a:w <sup>1</sup>	--
962	steer	mɔj <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup> t <sup>h</sup> a:w <sup>1</sup>	mɔj <sup>3</sup> k <sup>h</sup> uŋ <sup>3</sup> t <sup>h</sup> a:w <sup>1</sup>	--
963	calf	k <sup>h</sup> uan <sup>3</sup> mɔj <sup>3</sup> tɛk <sup>2</sup>	k <sup>h</sup> uan <sup>3</sup> mɔj <sup>3</sup> tɛk <sup>2</sup>	--
964	herd of cattle	mu: <sup>1</sup> mɔj <sup>3</sup>	mu: <sup>1</sup> mɔj <sup>3</sup>	--
965	goat	pɛ <sup>2</sup>	pɛ <sup>2</sup>	--
966	billy goat	pɛ <sup>2</sup> k <sup>h</sup> uŋ <sup>3</sup>	pɛ <sup>2</sup> k <sup>h</sup> uŋ <sup>3</sup>	--
974	chicken	ʔɛl <sup>3</sup>	ʔɛl <sup>3</sup>	--
980	duck	ʔɛl <sup>3</sup> ka:p <sup>1</sup>	ʔɛl <sup>3</sup> ka:p <sup>1</sup>	--
981	camel	k.la: <sup>3</sup> ʔuk <sup>2</sup>	k.la: <sup>3</sup> ʔuk <sup>2</sup>	--
982	horse	t.praŋ <sup>3</sup>	t.praŋ <sup>3</sup>	--
986a	mule	t.praŋ <sup>3</sup> lua <sup>2</sup>	t.praŋ <sup>3</sup> lua <sup>2</sup>	--
986	donkey	t.praŋ <sup>3</sup> la: <sup>3</sup>	t.praŋ <sup>3</sup> la: <sup>3</sup>	--
987	pig	le:k <sup>1</sup>	le:k <sup>1</sup>	le:k <sup>1</sup>
991	dog	c <sup>h</sup> ɔ <sup>2</sup>	c <sup>h</sup> ɔ <sup>2</sup>	c <sup>h</sup> ɔ <sup>2</sup>
993	cat	miw <sup>3</sup>	miw <sup>3</sup>	--
995	elephant	c <sup>h</sup> a:ŋ <sup>3</sup>	c <sup>h</sup> a:ŋ <sup>3</sup>	c <sup>h</sup> a:ŋ <sup>3</sup>
996	hippopotamus	t.praŋ <sup>3</sup> ʔo:m <sup>3</sup>	t.praŋ <sup>3</sup> ʔo:m <sup>3</sup>	--
997	buffalo	s.ra:k <sup>1</sup>	s.ra:k <sup>1</sup>	s.ra:k <sup>1</sup>
1000	wild pig	le:k <sup>1</sup> pri <sup>2</sup>	le:k <sup>1</sup> pri <sup>2</sup>	--
1001	monkey	ʔuak <sup>1</sup>	ʔuak <sup>1</sup>	ʔuak <sup>1</sup>
1004	bear	k <sup>h</sup> re:j <sup>1</sup>	k <sup>h</sup> re:j <sup>1</sup>	k <sup>h</sup> re: <sup>1</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
1005	deer	p <sup>h</sup> o:j <sup>3</sup>	p <sup>h</sup> o:j <sup>3</sup>	p <sup>h</sup> o:j <sup>1</sup>
1005	deer (different kind)	--	--	suat <sup>1</sup>
1006	rabbit	k.ta:j <sup>1</sup>	k.ta:j <sup>1</sup>	--
1009	mouse	su:c <sup>1</sup>	su:c <sup>1</sup>	--
1010	rat	su:c <sup>1</sup> p <sup>h</sup> ra: <sup>3</sup>	su:c <sup>1</sup> p <sup>h</sup> ra: <sup>3</sup>	su:c <sup>1</sup>
1015	mongoose	pa:ŋ <sup>3</sup> buan <sup>3</sup>	pa:ŋ <sup>3</sup> buan <sup>3</sup>	--
1017	squirrel	s.lual <sup>3</sup>	s.lual <sup>3</sup>	--
1018	porcupine	p <sup>h</sup> wi: <sup>3</sup>	p <sup>h</sup> wi: <sup>3</sup>	--
1019	bat (animal)	k <sup>h</sup> i:t <sup>1</sup>	k <sup>h</sup> i:t <sup>1</sup>	--
1021	wild cat	c <sup>h</sup> ɛl <sup>3</sup>	c <sup>h</sup> ɛl <sup>3</sup>	--
1024a	tiger	t.wa:j <sup>3</sup>	t.wa:j <sup>3</sup>	--
1024	leopard	t.wa:j <sup>3</sup> buak <sup>1</sup> man <sup>3</sup>	t.wa:j <sup>3</sup> buak <sup>1</sup> man <sup>3</sup>	--
1025	lion	siŋ <sup>3</sup>	siŋ <sup>3</sup>	--
1026	hide (of animal)	t.ku <sup>2</sup> sat <sup>2</sup>	t.ku <sup>2</sup> sat <sup>2</sup>	--
1027	fur	suk <sup>2</sup> sat <sup>2</sup>	suk <sup>2</sup> sat <sup>2</sup>	--
1028	horn	t.krɤ:ŋ <sup>1</sup>	t.krɤ:ŋ <sup>1</sup>	t.krɤ:ŋ <sup>1</sup>
1029	hump (of cow)	ʔu <sup>2</sup> ʔu: <sup>3</sup>	ʔu <sup>2</sup> ʔu: <sup>3</sup>	--
1030	udder	t.ka:ŋ <sup>3</sup> ʔu <sup>2</sup>	t.ka:ŋ <sup>3</sup> ʔu <sup>2</sup>	--
1031	tail	k.t <sup>h</sup> a: <sup>2</sup>	k.t <sup>h</sup> a: <sup>2</sup>	k.t <sup>h</sup> a: <sup>2</sup>
1032	hoof	ki:p <sup>1</sup>	ki:p <sup>1</sup>	--
1033	mane (of horse)	t.k <sup>h</sup> o:m <sup>3</sup>	t.k <sup>h</sup> o:m <sup>3</sup>	--
1034	elephant's trunk	ŋoŋ <sup>3</sup> c <sup>h</sup> a:ŋ <sup>3</sup>	ŋoŋ <sup>3</sup> c <sup>h</sup> a:ŋ <sup>3</sup>	--
1035	elephants' tusk	ŋa: <sup>3</sup> c <sup>h</sup> a:ŋ <sup>3</sup>	ŋa: <sup>3</sup> c <sup>h</sup> a:ŋ <sup>3</sup>	--
1037	bark (as dog)	fa:l <sup>3</sup>	fa:l <sup>3</sup>	--
1038a	bite (a dog)	kak <sup>2</sup> k.tit <sup>2</sup>	kak <sup>2</sup> k.tit <sup>2</sup>	--
1038	bare, show teeth	reŋ <sup>3</sup> k <sup>h</sup> e:ŋ <sup>3</sup> reŋ <sup>3</sup> k <sup>h</sup> eŋ <sup>3</sup>	reŋ <sup>3</sup> k <sup>h</sup> eŋ <sup>3</sup>	--
1039	growl	ɲɛl <sup>3</sup>	ɲɛl <sup>3</sup>	--
1040	ruminates, chew cud	m.miam <sup>3</sup>	m.miam <sup>3</sup>	--
1041	bird	c <sup>h</sup> im <sup>3</sup>	c <sup>h</sup> im <sup>3</sup>	c <sup>h</sup> im <sup>3</sup>
1042	crow	dɔk <sup>2</sup> ʔa:k <sup>1</sup>	dɔk <sup>2</sup> ʔa:k <sup>1</sup>	--

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1043	dove	ʔo:j <sup>3</sup>	ʔo:j <sup>3</sup>	--
1045	parrot	le: <sup>3</sup>	le: <sup>3</sup>	--
1048	heron	dɔk <sup>2</sup> ja:ŋ <sup>3</sup>	dɔk <sup>2</sup> ja:ŋ <sup>3</sup>	--
1049	kingfisher	c <sup>h</sup> im <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup> k <sup>h</sup> a <sup>2</sup>	c <sup>h</sup> im <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup> k <sup>h</sup> a <sup>2</sup>	--
1050	hornbill	c <sup>h</sup> o: <sup>1</sup> biaŋ <sup>3</sup>	c <sup>h</sup> o: <sup>1</sup> biaŋ <sup>3</sup>	--
1054	owl	puk <sup>2</sup> pak <sup>2</sup>	puk <sup>2</sup> pak <sup>2</sup>	--
1055	eagle	k <sup>h</sup> ra:ŋ <sup>3</sup>	k <sup>h</sup> ra:ŋ <sup>3</sup>	--
1056	hawk	lew <sup>1</sup>	lew <sup>1</sup>	--
1057	vulture	riaŋ <sup>2</sup>	riaŋ <sup>2</sup>	--
1058	feather	suk <sup>2</sup> c <sup>h</sup> im <sup>3</sup>	suk <sup>2</sup> c <sup>h</sup> im <sup>3</sup>	suk <sup>2</sup>
1059	wing	p <sup>h</sup> .ju:l <sup>3</sup>	p <sup>h</sup> .ju:l <sup>3</sup>	p <sup>h</sup> .ju:l <sup>3</sup>
1060	beak, bill	p.tuŋ <sup>3</sup> c <sup>h</sup> im <sup>3</sup>	p.tuŋ <sup>3</sup> c <sup>h</sup> im <sup>3</sup>	--
1061	crest (of bird)	t.ko:j <sup>3</sup> c <sup>h</sup> im <sup>3</sup>	t.ko:j <sup>3</sup> c <sup>h</sup> im <sup>3</sup>	--
1062	comb (rooster)	t.ko:j <sup>3</sup> ʔel <sup>3</sup>	t.ko:j <sup>3</sup> ʔel <sup>3</sup>	--
1063	crop (of bird)	p <sup>h</sup> ru: <sup>1</sup> ʔuak <sup>1</sup>	p <sup>h</sup> ru: <sup>1</sup> ʔuak <sup>1</sup>	--
1064	gizzard	t.lɔŋ <sup>3</sup> k <sup>h</sup> ɣ:n <sup>3</sup>	t.lɔŋ <sup>3</sup> k <sup>h</sup> ɣ:n <sup>3</sup>	--
1065	claw	p.sim <sup>3</sup>	p.sim <sup>3</sup>	--
1066	eggshell	t.krɔ <sup>2</sup> t <sup>h</sup> am <sup>3</sup>	t.krɔ <sup>2</sup> t <sup>h</sup> am <sup>3</sup>	--
1066	egg	t <sup>h</sup> am <sup>3</sup>	t <sup>h</sup> am <sup>3</sup>	--
1068	yolk (egg)	t <sup>h</sup> am <sup>3</sup> lɔŋ <sup>3</sup>	t <sup>h</sup> am <sup>3</sup> lɔŋ <sup>3</sup>	--
1069	nest	su:m <sup>3</sup>	su:m <sup>3</sup>	--
1070	flock (of birds)	mu: <sup>1</sup> c <sup>h</sup> im <sup>3</sup>	mu: <sup>1</sup> c <sup>h</sup> im <sup>3</sup>	--
1071	fly (v)	p <sup>h</sup> ɣl <sup>3</sup>	p <sup>h</sup> ɣl <sup>3</sup>	p <sup>h</sup> ɣl <sup>3</sup>
1072	dive	t.lew <sup>1</sup>	t.lew <sup>1</sup>	--
1073	soar	p <sup>h</sup> ɣl <sup>3</sup> ʔam <sup>3</sup> jup <sup>2</sup>	p <sup>h</sup> ɣl <sup>3</sup> ʔam <sup>3</sup> jup <sup>2</sup>	--
1074	land, alight	pem <sup>3</sup>	pem <sup>3</sup>	--
1075	perch	kuan <sup>3</sup> c <sup>h</sup> im <sup>3</sup>	kuan <sup>3</sup> c <sup>h</sup> im <sup>3</sup>	--
1076	flap wings	jup <sup>2</sup>	jup <sup>2</sup>	--
1077	cackle (as of chicken)	ʔel <sup>3</sup> t.k <sup>h</sup> rap <sup>2</sup>	ʔel <sup>3</sup> t.k <sup>h</sup> rap <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1078	crow (as rooster)	ʔel <sup>3</sup> k <sup>h</sup> uak <sup>1</sup>	ʔel <sup>3</sup> k <sup>h</sup> uak <sup>1</sup>	--
1079	peck	ko: <sup>1</sup>	ko: <sup>1</sup>	--
1080	lay (eggs)	ʔel <sup>3</sup> t <sup>h</sup> am <sup>3</sup>	ʔel <sup>3</sup> t <sup>h</sup> am <sup>3</sup>	--
1081	incubate, set (on eggs)	num <sup>3</sup>	num <sup>3</sup>	--
1082	hatch	ʔel <sup>3</sup> kɔ <sup>1</sup> p <sup>h</sup> a: <sup>1</sup>	ʔel <sup>3</sup> kɔ <sup>1</sup> p <sup>h</sup> a: <sup>1</sup>	--
1083	fish (n)	k <sup>h</sup> a <sup>2</sup>	k <sup>h</sup> a <sup>2</sup>	k <sup>h</sup> a <sup>2</sup>
1084	catfish	k <sup>h</sup> a <sup>2</sup> sɤc <sup>2</sup>	k <sup>h</sup> a <sup>2</sup> sɤc <sup>2</sup>	--
1086	eel	k <sup>h</sup> a <sup>2</sup> cian <sup>3</sup>	k <sup>h</sup> a <sup>2</sup> cian <sup>3</sup>	--
1087	fish bone	k.ʔa:ŋ <sup>3</sup> k <sup>h</sup> a <sup>2</sup>	k.ʔa:ŋ <sup>3</sup> k <sup>h</sup> a <sup>2</sup>	--
1088	fish scale	k <sup>h</sup> rɛp <sup>2</sup>	k <sup>h</sup> rɛp <sup>2</sup>	--
1089	gill	ŋa:p <sup>1</sup> k <sup>h</sup> a <sup>2</sup>	ŋa:m <sup>1</sup> k <sup>h</sup> a <sup>2</sup>	--
1090	fin	kum <sup>1</sup> ko: <sup>1</sup> k <sup>h</sup> a <sup>2</sup>	kum <sup>1</sup> ko: <sup>1</sup> k <sup>h</sup> a <sup>2</sup>	--
1091	crab	ʔɛŋ <sup>2</sup>	ʔɛŋ <sup>2</sup>	--
1092	shrimp	k <sup>h</sup> a <sup>2</sup> p.te:t <sup>1</sup>	k <sup>h</sup> a <sup>2</sup> p.te:t <sup>1</sup>	--
1093	clam	koŋ <sup>2</sup>	koŋ <sup>2</sup>	--
1094	snail	li:l <sup>3</sup>	li:l <sup>3</sup>	--
1095	snake	p.sɤŋ <sup>3</sup>	p.sɤŋ <sup>3</sup>	p.sɤŋ <sup>3</sup>
1096	spitting cobra	p.sɤŋ <sup>3</sup> c <sup>h</sup> aŋ <sup>3</sup>	p.sɤŋ <sup>3</sup> c <sup>h</sup> aŋ <sup>3</sup>	--
1098	python	p.sɤŋ <sup>3</sup> jɤŋ <sup>3</sup>	p.sɤŋ <sup>3</sup> jɤŋ <sup>3</sup>	--
1100	lizard	t.lɤ: <sup>1</sup>	t.lɤ: <sup>1</sup>	--
1101	house lizard- gecko	ca:ŋ <sup>1</sup> rɤ:n <sup>3</sup>	ca:ŋ <sup>1</sup> rɤ:n <sup>3</sup>	--
1102	chameleon	k <sup>h</sup> o:j <sup>3</sup>	k <sup>h</sup> o:j <sup>3</sup>	--
1103	gecko- this is really the tuk-kɛɛ	tɔk <sup>2</sup> tua <sup>3</sup>	tɔk <sup>2</sup> tua <sup>3</sup>	--
1104	monitor lizard	s.ta:n <sup>2</sup>	s.ta:n <sup>2</sup>	--
1105	crocodile	ca <sup>2</sup> k <sup>h</sup> e: <sup>1</sup>	ca <sup>2</sup> k <sup>h</sup> e: <sup>1</sup>	--
1106	frog	k <sup>h</sup> .jak <sup>2</sup>	k <sup>h</sup> .jak <sup>2</sup>	k <sup>h</sup> .jak <sup>2</sup>
1107	toad	ʔ.ro:k <sup>1</sup>	ʔ.ro:k <sup>1</sup>	--
1108	tortoise (land)	pa: <sup>1</sup> fa: <sup>3</sup>	pa: <sup>1</sup> fa: <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1109	turtle (water)	taw <sup>1</sup> pa: <sup>1</sup> fa: <sup>3</sup>	taw <sup>1</sup> pa: <sup>1</sup> fa: <sup>3</sup>	--
1110	fang (of snake)	ŋa: <sup>3</sup> p.sɤŋ <sup>3</sup>	ŋa: <sup>3</sup> p.sɤŋ <sup>3</sup>	--
1111	venom (of snake)	pik <sup>2</sup> p.sɤŋ <sup>3</sup>	pik <sup>2</sup> p.sɤŋ <sup>3</sup>	--
1112	shell (of turtle)	t.krɔ <sup>2</sup> pa: <sup>1</sup> fa: <sup>3</sup>	t.krɔ <sup>2</sup> pa: <sup>1</sup> fa: <sup>3</sup>	--
1113	slither (snake)	t.lur:t <sup>1</sup>	t.lur:t <sup>1</sup>	--
1114	bite (snake) (v)	p.sɤŋ <sup>3</sup> ko: <sup>1</sup>	p.sɤŋ <sup>3</sup> ko: <sup>1</sup>	--
1115	crawl (lizard)	mu:l <sup>3</sup>	mu:l <sup>3</sup>	--
1116	hiss (snake)	le <sup>2</sup> ʔ.ri <sup>2</sup>	le <sup>2</sup> ʔ.ri <sup>2</sup>	--
1117	insect	miaŋ <sup>3</sup>	miaŋ <sup>3</sup>	sɤm <sup>1</sup> ʔɤt <sup>2</sup>
1118	flea	s.wɛŋ <sup>3</sup>	s.wɛŋ <sup>3</sup>	s.wɛŋ <sup>3</sup>
1119	head louse	c <sup>h</sup> it <sup>2</sup>	c <sup>h</sup> it <sup>2</sup>	c <sup>h</sup> i: <sup>2</sup>
1120	bedbug	sɤŋ <sup>2</sup>	sɤŋ <sup>2</sup>	--
1121	maggot (in rotten meat)	pri <sup>2</sup>	pri <sup>2</sup>	--
1122	cockroach	miaŋ <sup>3</sup> sa:p <sup>1</sup>	miaŋ <sup>3</sup> sa:p <sup>1</sup>	--
1123	ant	ʔaŋ <sup>3</sup> ʔ.ma:l <sup>3</sup>	ʔaŋ <sup>3</sup> ʔ.ma:l <sup>3</sup>	ʔaŋ <sup>1</sup> ma:l <sup>3</sup>
1124	army ant, soldier ant	ʔaŋ <sup>3</sup> ma:l <sup>3</sup> piaŋ <sup>3</sup>	ʔaŋ <sup>3</sup> ma:l <sup>3</sup> piaŋ <sup>3</sup>	--
1125	flying ant (more than one)	ʔaŋ <sup>3</sup> ma:l <sup>3</sup> p <sup>h</sup> ɤl <sup>3</sup>	ʔaŋ <sup>3</sup> ma:l <sup>3</sup> p <sup>h</sup> ɤl <sup>3</sup>	--
1126	termite	ʔaŋ <sup>3</sup> ʔ.ruŋ <sup>3</sup>	ʔaŋ <sup>3</sup> ʔ.ruŋ <sup>3</sup>	--
1127	spider	ʔu:l <sup>3</sup> c <sup>h</sup> a:j <sup>1</sup>	ʔu:l <sup>3</sup> c <sup>h</sup> a:j <sup>1</sup>	--
1128	poisonous spider	ʔu:l <sup>3</sup> c <sup>h</sup> a:j <sup>1</sup> pik <sup>2</sup>	ʔu:l <sup>3</sup> c <sup>h</sup> a:j <sup>1</sup> pik <sup>2</sup>	--
1129	scorpion	miaŋ <sup>3</sup> puaŋ <sup>1</sup>	miaŋ <sup>3</sup> puaŋ <sup>1</sup>	--
1130	dung beetle	cu: <sup>1</sup> ci: <sup>2</sup>	cu: <sup>1</sup> ci: <sup>2</sup>	--
1131	jigger	m.diaŋ <sup>3</sup> dian <sup>1</sup>	m.diaŋ <sup>3</sup> dian <sup>1</sup>	--
1132	grasshopper	mɔŋ <sup>3</sup> c <sup>h</sup> ial <sup>3</sup>	mɔŋ <sup>3</sup> c <sup>h</sup> ial <sup>3</sup>	--
1133	cricket	ʔo <sup>2</sup>	ʔo <sup>2</sup>	--
1134	locust	miaŋ <sup>3</sup> jul <sup>2</sup>	miaŋ <sup>3</sup> jul <sup>2</sup>	--
1135	praying mantis	kɔt <sup>2</sup> kɔŋ <sup>1</sup>	kɔt <sup>2</sup> kɔŋ <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1136a	leech (water)	pri:ŋ <sup>3</sup>	pri:ŋ <sup>3</sup>	pri:ŋ <sup>3</sup>
1136	leech (land)	p <sup>h</sup> ru:m <sup>3</sup>	p <sup>h</sup> ru:m <sup>3</sup>	p <sup>h</sup> ru:m <sup>3</sup>
1137	caterpillar	kuaŋ <sup>3</sup>	kuaŋ <sup>3</sup>	--
1138	centipede	k <sup>h</sup> r.ʔip <sup>2</sup>	k <sup>h</sup> r.ʔip <sup>2</sup>	--
1140	earthworm	ʔaŋ <sup>3</sup> ʔ.ŋu:l <sup>3</sup>	ʔaŋ <sup>3</sup> ʔ.ŋu:l <sup>3</sup>	--
1141	fly (n)	ruaj <sup>3</sup>	ruaj <sup>3</sup>	--
1142	mosquito	sum <sup>1</sup> ʔɿt <sup>2</sup>	sum <sup>1</sup> ʔɿt <sup>2</sup>	--
1143	bee	p <sup>h</sup> rɿŋ <sup>2</sup>	p <sup>h</sup> rɿŋ <sup>2</sup>	p <sup>h</sup> u:ŋ <sup>2</sup> / p <sup>h</sup> ruŋ <sup>2</sup>
1144	mud wasp	miaŋ <sup>3</sup> rot <sup>2</sup>	miaŋ <sup>3</sup> rot <sup>2</sup>	--
1145	dragonfly	muaŋ <sup>3</sup>	muaŋ <sup>3</sup>	--
1146	butterfly	ɲa <sup>2</sup> p <sup>h</sup> ra <sup>2</sup>	ɲa <sup>2</sup> p <sup>h</sup> ra <sup>2</sup>	--
1148	antenna	s.moŋ <sup>3</sup> miaŋ <sup>3</sup>	s.moŋ <sup>3</sup> miaŋ <sup>3</sup>	--
1149	sting (v)	p.si <sup>2</sup>	p.si <sup>2</sup>	--
1151	spider's web	sum <sup>3</sup> ʔul <sup>3</sup>	sum <sup>3</sup> ʔul <sup>3</sup>	--
1152	cocoon	paw <sup>2</sup> kuaŋ <sup>3</sup>	paw <sup>2</sup> kuaŋ <sup>3</sup>	--
1153	termite hill	p.nɿm <sup>3</sup>	p.nɿm <sup>3</sup>	--
1154	beehive	sum <sup>3</sup> p <sup>h</sup> rɿŋ <sup>2</sup>	sum <sup>3</sup> p <sup>h</sup> rɿŋ <sup>2</sup>	--
1155	beeswax	ʔaŋ <sup>3</sup> p <sup>h</sup> rɿŋ <sup>2</sup>	ʔaŋ <sup>3</sup> p <sup>h</sup> rɿŋ <sup>2</sup>	--
1156	honey	ʔom <sup>3</sup> nam <sup>1</sup> ŋo:n <sup>3</sup> p <sup>h</sup> rɿŋ <sup>2</sup>	ʔom <sup>3</sup> nam <sup>1</sup> ŋo:n <sup>3</sup> p <sup>h</sup> rɿŋ <sup>2</sup>	--
1157	swarm (n)	p <sup>h</sup> rɿŋ <sup>2</sup> tal <sup>3</sup>	p <sup>h</sup> rɿŋ <sup>2</sup> tal <sup>3</sup>	--
1158	tree	k <sup>h</sup> ɿn <sup>3</sup> su <sup>2</sup>	k <sup>h</sup> ɿn <sup>3</sup> su <sup>2</sup>	k <sup>h</sup> ɿn <sup>3</sup> su <sup>2</sup>
1161	teak tree	k <sup>h</sup> ɿn <sup>3</sup> m.sak <sup>2</sup>	k <sup>h</sup> ɿn <sup>3</sup> m.sak <sup>2</sup>	--
1163	silk-cotton tree	k <sup>h</sup> ɿn <sup>3</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	k <sup>h</sup> ɿn <sup>3</sup> c <sup>h</sup> u:ŋ <sup>3</sup>	--
1165	fig tree	k <sup>h</sup> ɿn <sup>3</sup> m.dɿ: <sup>1</sup>	k <sup>h</sup> ɿn <sup>3</sup> m.dɿ: <sup>1</sup>	--
1166	thorn-tree	k <sup>h</sup> ɿn <sup>3</sup> s.ra:ŋ <sup>3</sup>	k <sup>h</sup> ɿn <sup>3</sup> s.ra:ŋ <sup>3</sup>	--
1167	tamarind tree	k <sup>h</sup> ɿn <sup>3</sup> m.k <sup>h</sup> ɔk <sup>2</sup>	k <sup>h</sup> ɿn <sup>3</sup> m.k <sup>h</sup> ɔk <sup>2</sup>	--
1169	coconut palm	k <sup>h</sup> ɿn <sup>3</sup> m.pa:w <sup>2</sup>	k <sup>h</sup> ɿn <sup>3</sup> m.pa:w <sup>2</sup>	--
1171	date palm	k <sup>h</sup> ɿn <sup>3</sup> kua <sup>2</sup>	k <sup>h</sup> ɿn <sup>3</sup> kua <sup>2</sup>	--
1172	bush	jo:m <sup>3</sup>	jo:m <sup>3</sup>	--



No.	Gloss	Speaker A	Speaker B	Speaker D
1173	grass	la: <sup>2</sup> luk <sup>2</sup>	la: <sup>2</sup> luk <sup>2</sup>	la: <sup>2</sup> luk <sup>2</sup>
1174a	bamboo shoot	k.cək <sup>2</sup>	k.cək <sup>2</sup>	--
1174	bamboo	k <sup>h</sup> ɣn <sup>3</sup> m.po:k <sup>1</sup>	k <sup>h</sup> ɣn <sup>3</sup> m.po:k <sup>1</sup>	k <sup>h</sup> ɣn <sup>3</sup> m.po:k <sup>1</sup>
1175	reed	k <sup>h</sup> ɣn <sup>3</sup> ʔua <sup>2</sup>	k <sup>h</sup> ɣn <sup>3</sup> ʔua <sup>2</sup>	--
1176	weeds	ɲa <sup>2</sup> k <sup>h</sup> .nək <sup>2</sup>	ɲa <sup>2</sup> k <sup>h</sup> .nək <sup>2</sup>	--
1177	leaf	la: <sup>2</sup> suw <sup>2</sup>	la: <sup>2</sup> suw <sup>2</sup>	la: <sup>2</sup> suw <sup>2</sup>
1178	branch (of tree)	tan <sup>1</sup> suw <sup>2</sup>	tan <sup>1</sup> suw <sup>2</sup>	tan <sup>1</sup> suw <sup>2</sup>
1179	trunk (of tree)	lam <sup>3</sup> suw <sup>2</sup>	lam <sup>3</sup> suw <sup>2</sup>	--
1180	bark (of tree)	t.krɔ <sup>2</sup> suw <sup>2</sup>	t.krɔ <sup>2</sup> suw <sup>2</sup>	t.krɔ <sup>2</sup> suw <sup>2</sup>
1181	sap	ci: <sup>1</sup>	ci: <sup>1</sup>	--
1182	stump	ŋo: <sup>1</sup> suw <sup>2</sup>	ŋo: <sup>1</sup> suw <sup>2</sup>	--
1183	root	k.je: <sup>1</sup>	k.je: <sup>1</sup>	kri <sup>1</sup> je <sup>1</sup> suw <sup>2</sup>
1184	bulb, tuber	ŋo:n <sup>3</sup> suw <sup>2</sup>	ŋo:n <sup>3</sup> suw <sup>2</sup>	--
1185	stem, stalk	m.sen <sup>2</sup>	m.sen <sup>2</sup>	--
1186	silk, hair (of corn)	s.mɔŋ <sup>3</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	s.mɔŋ <sup>3</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	--
1187	blade (of grass)	luk <sup>2</sup> m.bo: <sup>1</sup>	luk <sup>2</sup> m.bo: <sup>1</sup>	--
1188	flower	ra:ŋ <sup>3</sup> suw <sup>2</sup>	ra:ŋ <sup>3</sup> suw <sup>2</sup>	ra:ŋ <sup>3</sup> suw <sup>2</sup>
1189	bud	ŋa:j <sup>3</sup> suw <sup>2</sup>	ŋa:j <sup>3</sup> suw <sup>2</sup>	--
1190	shoot (new plant)	li: <sup>1</sup> ŋa:j <sup>3</sup>	li: <sup>1</sup> ŋa:j <sup>3</sup>	--
1191	vine	k <sup>h</sup> ɣn <sup>3</sup> m.c.pit <sup>2</sup>	k <sup>h</sup> ɣn <sup>3</sup> m.c.pit <sup>2</sup>	--
1192	tendrils	t <sup>h</sup> i: <sup>2</sup> k <sup>h</sup> ɣ: <sup>1</sup> p.c <sup>h</sup> i: <sup>2</sup>	t <sup>h</sup> i: <sup>2</sup> k <sup>h</sup> ɣ: <sup>1</sup> p.c <sup>h</sup> i: <sup>2</sup>	--
1193	thorn	s.ra:ŋ <sup>3</sup>	s.ra:ŋ <sup>3</sup>	s.ra:ŋ <sup>3</sup>
1197	juice	ʔom <sup>3</sup> p <sup>h</sup> ri: <sup>2</sup> suw <sup>2</sup>	ʔom <sup>3</sup> p <sup>h</sup> ri: <sup>2</sup> suw <sup>2</sup>	--
1198	stone, pit (of fruit)	c <sup>h</sup> ak <sup>2</sup> p <sup>h</sup> ri: <sup>2</sup> suw <sup>2</sup>	c <sup>h</sup> ak <sup>2</sup> p <sup>h</sup> ri: <sup>2</sup> suw <sup>2</sup>	--
1199	regime/hand (bananas)	ma <sup>2</sup> s.na:j <sup>1</sup>	ma <sup>2</sup> s.na:j <sup>1</sup>	--
1200	corn cob	ro:ŋ <sup>3</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	ro:ŋ <sup>3</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	--
1201	kernel of corn	c <sup>h</sup> ak <sup>2</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	c <sup>h</sup> ak <sup>2</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	--
1202	seed	c <sup>h</sup> ak <sup>2</sup>	c <sup>h</sup> ak <sup>2</sup>	c <sup>h</sup> ak <sup>2</sup> suw <sup>2</sup>
1203	skin (of fruit)	t.krɔ <sup>2</sup> p <sup>h</sup> ri: <sup>2</sup> suw <sup>2</sup>	t.krɔ <sup>2</sup> p <sup>h</sup> ri: <sup>2</sup> suw <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1204	shell (of groundnut)	t.krɔ <sup>2</sup> p <sup>h</sup> e: <sup>1</sup> k.t <sup>h</sup> et <sup>2</sup>	t.krɔ <sup>2</sup> p <sup>h</sup> e: <sup>1</sup> k.t <sup>h</sup> et <sup>2</sup>	--
1205	corn husk (n)	la <sup>2</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	la <sup>2</sup> k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	--
1206	chaff	k <sup>h</sup> am <sup>3</sup> t <sup>h</sup> aw <sup>2</sup>	k <sup>h</sup> am <sup>3</sup> t <sup>h</sup> aw <sup>2</sup>	--
1207	fruit	p <sup>h</sup> ri <sup>2</sup>	p <sup>h</sup> ri <sup>2</sup>	p <sup>h</sup> ri <sup>2</sup> sur <sup>2</sup>
1208	banana	k.tɔt <sup>2</sup>	k.tɔt <sup>2</sup>	k.tɔ <sup>2</sup>
1210	lemon/ lime	m.na:w <sup>3</sup>	m.na:w <sup>3</sup>	--
1211	orange (fruit)	m.cuk <sup>2</sup>	m.cuk <sup>2</sup>	--
1213	papaya	m.koj <sup>2</sup> s.pa:w <sup>3</sup>	m.koj <sup>2</sup> s.pa:w <sup>3</sup>	--
1214	pineapple	ma <sup>2</sup> k <sup>h</sup> a <sup>2</sup> nat <sup>2</sup>	ma <sup>2</sup> k <sup>h</sup> a <sup>2</sup> nat <sup>2</sup>	--
1215	guava	m.koj <sup>2</sup>	m.koj <sup>2</sup>	--
1216	avocado	p <sup>h</sup> ri <sup>2</sup> k.do <sup>2</sup>	p <sup>h</sup> ri <sup>2</sup> k.do <sup>2</sup>	--
1217a	mango	m.mo:ŋ <sup>1</sup>	m.mo:ŋ <sup>1</sup>	--
1217b	jackfruit	m.mi: <sup>2</sup>	m.mi: <sup>2</sup>	--
1217c	coconut	m.paw <sup>2</sup>	m.paw <sup>2</sup>	--
1217	fig	p <sup>h</sup> ri <sup>2</sup> m.dv: <sup>1</sup>	p <sup>h</sup> ri <sup>2</sup> m.dv: <sup>1</sup>	--
1219	tomato	m.k <sup>h</sup> v: <sup>1</sup> sum <sup>2</sup>	m.k <sup>h</sup> v: <sup>1</sup> sum <sup>2</sup>	--
1220	onion	nam <sup>1</sup> bo: <sup>3</sup> t.lo: <sup>3</sup>	nam <sup>1</sup> bo: <sup>3</sup> t.lo: <sup>3</sup>	--
1221	garlic	huam <sup>1</sup> te:m <sup>3</sup>	huam <sup>1</sup> te:n <sup>3</sup>	--
1222	sweet chili	p.te:t <sup>1</sup> ŋa:ŋ <sup>3</sup>	p.te:t <sup>1</sup> ŋa:ŋ <sup>3</sup>	--
1223	red/ hot pepper	p.te:t <sup>1</sup> pian <sup>3</sup>	p.te:t <sup>1</sup> pian <sup>3</sup>	--
1225	eggplant	t.poj <sup>3</sup>	t.poj <sup>3</sup>	--
1226a	chili/ red pepper	p.te:t <sup>1</sup>	p.te:t <sup>1</sup>	--
1226	mushroom	jua <sup>3</sup>	jua <sup>3</sup>	jua <sup>3</sup>
1226	mushroom	--	--	t <sup>h</sup> i: <sup>1</sup>
1227	cassava, manioc	m.kiaw <sup>3</sup> la:w <sup>3</sup>	m.kiaw <sup>3</sup> la:w <sup>3</sup>	--
1229	yam	s.ro:p <sup>1</sup>	s.ro:p <sup>1</sup>	--
1231a	ginger	k <sup>h</sup> i:ŋ <sup>3</sup>	k <sup>h</sup> i:ŋ <sup>3</sup>	k <sup>h</sup> i:ŋ <sup>3</sup>
1231	potato	m.k <sup>h</sup> .lu: <sup>3</sup>	m.k <sup>h</sup> .lu: <sup>3</sup>	--
1232	corn/ maize	k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	k <sup>h</sup> aw <sup>2</sup> s.li: <sup>3</sup>	k <sup>h</sup> ɔ <sup>1</sup> s.li: <sup>3</sup>
1233	millet	suaŋ <sup>3</sup>	suaŋ <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1234	sorghum	s.ŋɔ² met² tek²	s.ŋɔ² met² tek²	--
1236a	dry rice	s.ŋɔ² ma:l³	s.ŋɔ² ma:l³	--
1236b	cooked rice	c <sup>h</sup> uam³ c <sup>h</sup> in³	c <sup>h</sup> uam³ c <sup>h</sup> in³	c <sup>h</sup> uam³
1236c	rice (dehusked)	m.k <sup>h</sup> ot²	m.k <sup>h</sup> ot²	--
1236	paddy rice	s.ŋɔ² na:³	s.ŋɔ² na:³	s.ŋɔ²
1237	groundnut, peanut	fe:¹ k.t <sup>h</sup> et²	p <sup>h</sup> e:¹ k.t <sup>h</sup> et²	--
1238	sesame seed	t.ŋa:²	t.ŋa:²	--
1241a	betel nut	t.kra:ŋ³	t.kra:ŋ³	--
1241	sugarcane	ʔom³ k <sup>h</sup> .met²	ʔom³ k <sup>h</sup> .met²	--
1242	coffee	ka² fi:¹	ka² p <sup>h</sup> i:¹	--
1243a	rattan/ cane	lo:c¹	lo:c¹	--
1243	rubber	ŋa:ŋ³	ŋa:ŋ³	--
1244a	opium	k <sup>h</sup> ʏn³ ja:³ fin¹	k <sup>h</sup> ʏn³ ja:³ fin¹	--
1244	cotton	c <sup>h</sup> u:ŋ³	c <sup>h</sup> u:ŋ³	--
1245	grow (of plants)	c <sup>h</sup> ʏm³	c <sup>h</sup> ʏm³	--
1246a	rice seedling	wan¹ kra:²	wan¹ kra:²	--
1246	sprout	li:¹ ŋɔ²	li:¹ ŋɔ²	--
1247	(be) ripe	k.tum³	k.tum³	k.tum³
1248	ripen	ham¹ haj¹	ham¹ haj¹	--
1249	(be) unripe	ʔam³ k.tum³	ʔam³ k.tum³	--
1250	(be) rotten	puk²	puk²	--
1251	(be) shrivelled, withered	la:m³	la:m³	--
1252	wither (plant)	ma:n²	ma:n²	--
1253	blight (n)	cap² p.ja:t¹	cap² p.ja:t¹	--
1254	world	t <sup>h</sup> ɔ² lo:k¹	t <sup>h</sup> ɔ² lo:k¹	--
1255	place (n)	k <sup>h</sup> o² ŋo:t¹	k <sup>h</sup> o² ŋo:t¹	--
1256	desert	mʏ:ŋ¹ liaŋ²	mʏ:ŋ¹ liaŋ²	--
1257	grassland	bua¹ luk² mɔk²	bua¹ luk² mɔk²	--
1258	forest	ko:¹ pri²	ko:¹ pri²	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1259	open space, clearing	k <sup>h</sup> o <sup>2</sup> ŋo:t <sup>1</sup> ʔak <sup>2</sup>	k <sup>h</sup> o <sup>2</sup> ŋo:t <sup>1</sup> ʔak <sup>2</sup>	--
1260	bush country, rural area	ba:ŋ <sup>1</sup> nuak <sup>1</sup> na: <sup>3</sup> ba:ŋ <sup>1</sup>	ba:ŋ <sup>1</sup> nuak <sup>1</sup> na: <sup>3</sup> ba:ŋ <sup>1</sup>	--
1261	ground, land	k.t <sup>h</sup> et <sup>2</sup>	k.t <sup>h</sup> et <sup>2</sup>	k.t <sup>h</sup> et <sup>2</sup>
1262	mountain	kəŋ <sup>3</sup>	kəŋ <sup>3</sup>	kəŋ <sup>3</sup>
1263	summit, highest point	ci: <sup>2</sup> kəŋ <sup>3</sup>	ci: <sup>2</sup> kəŋ <sup>3</sup>	--
1264	cliff	la: <sup>1</sup>	la: <sup>1</sup>	--
1265	valley	k <sup>h</sup> r.ʔoŋ <sup>2</sup>	k <sup>h</sup> r.ʔoŋ <sup>2</sup>	--
1266	ditch	ruaŋ <sup>3</sup>	ruaŋ <sup>3</sup>	--
1267	pit	k <sup>h</sup> um <sup>3</sup>	k <sup>h</sup> um <sup>3</sup>	--
1268	hole	t <sup>h</sup> u <sup>2</sup>	t <sup>h</sup> u <sup>2</sup>	--
1269	crevice	k.t <sup>h</sup> et <sup>2</sup> k.te: <sup>1</sup>	k.t <sup>h</sup> et <sup>2</sup> k.te: <sup>1</sup>	--
1270	cave	t <sup>h</sup> u <sup>2</sup> t <sup>h</sup> am <sup>2</sup>	t <sup>h</sup> u <sup>2</sup> t <sup>h</sup> am <sup>2</sup>	--
1271	rock (large)	p <sup>h</sup> ra: <sup>3</sup>	p <sup>h</sup> ra: <sup>3</sup>	--
1272	stone (small)	s.mo <sup>2</sup>	s.mo <sup>2</sup>	s.mo <sup>2</sup>
1273	gravel	s.mo <sup>2</sup> tek <sup>2</sup>	s.mo <sup>2</sup> tek <sup>2</sup>	--
1274	sand	p.sa:c <sup>1</sup>	p.sa:c <sup>1</sup>	p.sa:c <sup>1</sup>
1275	dust	t.k <sup>h</sup> ul <sup>3</sup> p <sup>h</sup> uk <sup>2</sup>	t.k <sup>h</sup> ul <sup>3</sup> p <sup>h</sup> uk <sup>2</sup>	--
1276	dirt, soil	k <sup>h</sup> o:j <sup>1</sup> k.t <sup>h</sup> et <sup>2</sup>	k <sup>h</sup> o:j <sup>1</sup> k.t <sup>h</sup> et <sup>2</sup>	--
1277	clay	lot <sup>2</sup> ɲɤk <sup>2</sup>	lot <sup>2</sup> ɲɤk <sup>2</sup>	--
1278	mud	lo <sup>2</sup> la:c <sup>2</sup>	lo <sup>2</sup> la:c <sup>2</sup>	--
1279	iron	t.ŋaŋ <sup>3</sup>	t.ŋaŋ <sup>3</sup>	t.ŋaŋ <sup>3</sup>
1280	gold	k <sup>h</sup> am <sup>3</sup>	k <sup>h</sup> am <sup>3</sup>	k <sup>h</sup> am <sup>3</sup>
1281	silver	mul <sup>3</sup>	mul <sup>3</sup>	mul <sup>3</sup>
1282	copper	tuaŋ <sup>3</sup>	tuaŋ <sup>3</sup>	--
1283	rust	k <sup>h</sup> a:j <sup>3</sup> neŋ <sup>2</sup>	k <sup>h</sup> a:j <sup>3</sup> neŋ <sup>2</sup>	--
1284	water	ʔo:m <sup>3</sup>	ʔo:m <sup>3</sup>	ʔo:m <sup>3</sup>
1286	lake	ʔo:m <sup>3</sup> lo <sup>2</sup>	ʔo:m <sup>3</sup> lo <sup>2</sup>	--
1287	pool	ʔo:m <sup>3</sup> lo <sup>2</sup> tek <sup>2</sup>	ʔo:m <sup>3</sup> lo <sup>2</sup> tek <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1288	waterhole	ʔo:m <sup>3</sup> bo:k <sup>1</sup>	ʔo:m <sup>3</sup> bo:k <sup>1</sup>	--
1289	marsh	bua <sup>1</sup> lot <sup>2</sup>	bua <sup>1</sup> lot <sup>2</sup>	--
1290	spring (water)	ʔo:m <sup>3</sup> ku <sup>2</sup>	ʔo:m <sup>3</sup> ku <sup>2</sup>	--
1291	waterfall	ʔo:m <sup>3</sup> tək <sup>2</sup> tat <sup>1</sup>	ʔo:m <sup>3</sup> tək <sup>2</sup> tat <sup>1</sup>	--
1292	brook, stream	lək <sup>2</sup> ʔo:m <sup>3</sup>	lək <sup>2</sup> ʔo:m <sup>3</sup>	--
1293	river	ʔo:m <sup>3</sup> nam <sup>2</sup> me: <sup>1</sup>	ʔo:m <sup>3</sup> nam <sup>2</sup> me: <sup>1</sup>	ʔom <sup>3</sup> jɣ: <sup>3</sup>
1294	current (in river, stream)	sa:j <sup>3</sup> ʔo:m <sup>3</sup> laj <sup>3</sup>	sa:j <sup>3</sup> ʔo:m <sup>3</sup> laj <sup>3</sup>	--
1295	riverbed (dry)	ruaŋ <sup>3</sup> liaŋ <sup>2</sup>	ruaŋ <sup>3</sup> liaŋ <sup>2</sup>	--
1296	riverbank	faŋ <sup>1</sup> ʔo:m <sup>3</sup>	faŋ <sup>1</sup> ʔo:m <sup>3</sup>	--
1297	ford (n)	ta: <sup>1</sup> ʔo:m <sup>3</sup>	ta: <sup>1</sup> ʔo:m <sup>3</sup>	--
1298	bridge	k <sup>h</sup> o: <sup>3</sup>	k <sup>h</sup> o: <sup>3</sup>	--
1299	island	ka:ŋ <sup>3</sup> kɔ <sup>2</sup> ʔo:m <sup>3</sup>	ka:ŋ <sup>3</sup> kɔ <sup>2</sup> ʔo:m <sup>3</sup>	--
1300	beach	duan <sup>3</sup> sa:j <sup>3</sup>	duan <sup>3</sup> sa:j <sup>3</sup>	--
1301	wave	ʔo:m <sup>3</sup> t <sup>h</sup> ua <sup>2</sup>	ʔo:m <sup>3</sup> t <sup>h</sup> ua <sup>2</sup>	--
1302	bubble	ʔo:m <sup>3</sup> luŋ <sup>1</sup> lɣk <sup>2</sup>	ʔo:m <sup>3</sup> luŋ <sup>1</sup> lɣk <sup>2</sup>	--
1303	foam	pwi: <sup>1</sup> ʔo:m <sup>3</sup>	pwi: <sup>1</sup> ʔo:m <sup>3</sup>	--
1304	snail slime	ɲa:ŋ <sup>3</sup> ɲɣ:n <sup>3</sup>	ɲa:ŋ <sup>3</sup> ɲɣ:n <sup>3</sup>	--
1305	fire	ŋal <sup>3</sup>	ŋal <sup>3</sup>	ŋal <sup>3</sup>
1306a	candle	te:n <sup>3</sup>	te:n <sup>3</sup>	--
1306	flame	pre:w <sup>3</sup> ŋal <sup>3</sup>	pre:w <sup>3</sup> ŋal <sup>3</sup>	--
1307	spark	raŋ <sup>3</sup> ŋal <sup>3</sup>	raŋ <sup>3</sup> ŋal <sup>3</sup>	--
1308	smoke	t <sup>h</sup> u <sup>2</sup> ŋal <sup>3</sup>	t <sup>h</sup> u <sup>2</sup> ŋal <sup>3</sup>	t <sup>h</sup> u <sup>1</sup> ŋal <sup>3</sup>
1309	fireplace	tu <sup>1</sup> fa:ŋ <sup>3</sup>	tu <sup>1</sup> fa:ŋ <sup>3</sup>	--
1310	firewood	si <sup>2</sup>	si <sup>2</sup>	--
1311	charcoal	k <sup>h</sup> o:n <sup>3</sup> c <sup>h</sup> e: <sup>1</sup>	k <sup>h</sup> o:n <sup>3</sup> c <sup>h</sup> e: <sup>1</sup>	--
1312	ashes	t.k <sup>h</sup> ul <sup>3</sup>	t.k <sup>h</sup> ul <sup>3</sup>	t.k <sup>h</sup> ul <sup>3</sup>
1313	sky	k.tɣl <sup>3</sup> c <sup>h</sup> a:j <sup>1</sup>	k.tɣl <sup>3</sup> c <sup>h</sup> a:j <sup>1</sup>	c <sup>h</sup> a:j <sup>1</sup>
1314	air (breathed)	s.ma <sup>2</sup>	s.ma <sup>2</sup>	--
1315	cloud	bɔt <sup>2</sup> c <sup>h</sup> a:j <sup>1</sup>	bɔt <sup>2</sup> c <sup>h</sup> a:j <sup>1</sup>	bɔt <sup>2</sup>

No.	Gloss	Speaker A	Speaker B	Speaker D
1316	rainbow	bin <sup>3</sup> suaŋ <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup> ʔo:m <sup>3</sup>	bin <sup>3</sup> suaŋ <sup>3</sup> k <sup>h</sup> a:j <sup>3</sup> ʔo:m <sup>3</sup>	--
1317	sun	ŋa:j <sup>3</sup> s.ŋi <sup>2</sup>	ŋa:j <sup>3</sup> s.ŋi <sup>2</sup>	ŋaj <sup>3</sup> s.ŋit <sup>2</sup>
1318	moon	t.k <sup>h</sup> ɛl <sup>3</sup>	t.k <sup>h</sup> ɛl <sup>3</sup>	t.k <sup>h</sup> ɛl <sup>3</sup>
1319	full moon	t.k <sup>h</sup> ɛl <sup>3</sup> mən <sup>3</sup>	t.k <sup>h</sup> ɛl <sup>3</sup> mən <sup>3</sup>	--
1320	new moon	t.k <sup>h</sup> ɛl <sup>3</sup> k <sup>h</sup> ɔk <sup>2</sup>	t.k <sup>h</sup> ɛl <sup>3</sup> k <sup>h</sup> ɔk <sup>2</sup>	--
1321a	eclipse (moon)	ʔ.lok <sup>1</sup> kak <sup>2</sup> t.k <sup>h</sup> ɛl <sup>3</sup>	ʔ.lok <sup>1</sup> kak <sup>2</sup> t.k <sup>h</sup> ɛl <sup>3</sup>	--
1321	no moon	t.k <sup>h</sup> ɛl <sup>3</sup> lup <sup>2</sup>	t.k <sup>h</sup> ɛl <sup>3</sup> lup <sup>2</sup>	--
1322	star	s.mɤŋ <sup>3</sup>	s.mɤŋ <sup>3</sup>	s.mɤŋ <sup>3</sup>
1326	shooting star, meteor	s.mɤŋ <sup>3</sup> ʔa: <sup>1</sup>	s.mɤŋ <sup>3</sup> ʔa: <sup>1</sup>	--
1327	noise, sound	siaŋ <sup>3</sup> s.naj <sup>1</sup>	siaŋ <sup>3</sup> s.naj <sup>1</sup>	--
1328	rustle (leaves) (v)	siaŋ <sup>3</sup> sa:w <sup>1</sup> sa:w <sup>1</sup>	siaŋ <sup>3</sup> sa:w <sup>1</sup> sa:w <sup>1</sup>	--
1329	squeak (wheel)	ʔɔl <sup>1</sup> se:ŋ <sup>3</sup>	ʔɔl <sup>1</sup> se:ŋ <sup>3</sup>	--
1330	wind (n)	s.ma <sup>2</sup>	s.ma <sup>2</sup>	s.ma <sup>2</sup>
1332	storm	s.ma <sup>2</sup> lum <sup>1</sup> liaŋ <sup>2</sup>	s.ma <sup>2</sup> lum <sup>1</sup> liaŋ <sup>2</sup>	--
1333	thunder	c <sup>h</sup> a:j <sup>1</sup> s.nɤm <sup>3</sup>	c <sup>h</sup> a:j <sup>1</sup> s.nɤm <sup>3</sup>	--
1334	lightning	c <sup>h</sup> a:j <sup>1</sup> p <sup>h</sup> rek <sup>2</sup>	c <sup>h</sup> a:j <sup>1</sup> p <sup>h</sup> rek <sup>2</sup>	--
1335a	mist	ʔa:j <sup>3</sup> ʔo:m <sup>3</sup> s.le <sup>2</sup>	ʔa:j <sup>3</sup> ʔo:m <sup>3</sup> s.le <sup>2</sup>	--
1335	rain	ʔo:m <sup>3</sup> s.le <sup>2</sup>	ʔo:m <sup>3</sup> s.le <sup>2</sup>	ʔom <sup>3</sup> le <sup>2</sup>
1336	drizzle	ʔo:m <sup>3</sup> s.le <sup>2</sup> ʔɔj <sup>1</sup>	ʔo:m <sup>3</sup> s.le <sup>2</sup> ʔɔj <sup>1</sup>	--
1337	hail	p <sup>h</sup> .jel <sup>3</sup>	p <sup>h</sup> .jel <sup>3</sup>	--
1338	dew	ʔo:m <sup>3</sup> mɤ:j <sup>3</sup>	ʔo:m <sup>3</sup> mɤ:j <sup>3</sup>	--
1339	flood	ʔo:m <sup>3</sup> t <sup>h</sup> om <sup>2</sup>	ʔo:m <sup>3</sup> t <sup>h</sup> om <sup>2</sup>	--
1340	dry up, evaporate	ʔa:j <sup>3</sup> k.t <sup>h</sup> et <sup>2</sup>	ʔa:j <sup>3</sup> k.t <sup>h</sup> et <sup>2</sup>	--
1341	drought	raj <sup>2</sup> ʔo:m <sup>3</sup> s.le <sup>2</sup>	raj <sup>2</sup> ʔo:m <sup>3</sup> s.le <sup>2</sup>	--
1342	season	r.du: <sup>3</sup>	r.du: <sup>3</sup>	--
1343	rainy season	r.du: <sup>3</sup> ʔo:m <sup>3</sup> s.le <sup>2</sup>	r.du: <sup>3</sup> ʔo:m <sup>3</sup> s.le <sup>2</sup>	--
1344	dry season	r.du: <sup>3</sup> liaŋ <sup>2</sup>	r.du: <sup>3</sup> liaŋ <sup>2</sup>	--
1345	hot season	r.du: <sup>3</sup> ruan <sup>2</sup>	r.du: <sup>3</sup> ruan <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1346	cold season	r.du: <sup>3</sup> ηo:η <sup>3</sup>	r.du: <sup>3</sup> ηo:η <sup>3</sup>	--
1347	light	c <sup>h</sup> a <sup>2</sup>	c <sup>h</sup> a <sup>2</sup>	--
1348	sunshine	c <sup>h</sup> a <sup>2</sup> ηa:j <sup>3</sup> s.ηi <sup>2</sup>	c <sup>h</sup> a <sup>2</sup> ηa:j <sup>3</sup> s.ηi <sup>2</sup>	--
1349	moonlight	c <sup>h</sup> a <sup>2</sup> t.k <sup>h</sup> ɛl <sup>3</sup>	c <sup>h</sup> a <sup>2</sup> t.k <sup>h</sup> ɛl <sup>3</sup>	--
1350	shadow	k <sup>h</sup> um <sup>1</sup> k <sup>h</sup> o:j <sup>3</sup>	k <sup>h</sup> um <sup>1</sup> k <sup>h</sup> o:j <sup>3</sup>	k <sup>h</sup> um <sup>1</sup> k <sup>h</sup> o:j <sup>3</sup>
1351	darkness	s.wɛk <sup>2</sup>	s.wɛk <sup>2</sup>	--
1352	time	ɲa:m <sup>3</sup>	ɲa:m <sup>3</sup>	--
1353	now	cɛn <sup>2</sup>	cɛn <sup>2</sup>	--
1354	before	kɤ:n <sup>1</sup>	kɤ:n <sup>1</sup>	--
1355	after	kɔj <sup>1</sup> kɤ:n <sup>1</sup>	kɔj <sup>1</sup> kɤ:n <sup>1</sup>	--
1356	early	t <sup>h</sup> am <sup>1</sup> lu <sup>2</sup>	t <sup>h</sup> am <sup>1</sup> lu <sup>2</sup>	--
1357	late	tok <sup>2</sup> p.tɔ <sup>2</sup>	tok <sup>2</sup> p.tɔ <sup>2</sup>	--
1358	once	ma <sup>2</sup> k.cɤŋ <sup>2</sup>	ma <sup>2</sup> k.cɤŋ <sup>2</sup>	--
1359	again	t <sup>h</sup> ɛŋ <sup>2</sup> ma <sup>2</sup> k.cɤŋ <sup>2</sup>	t <sup>h</sup> ɛŋ <sup>2</sup> ma <sup>2</sup> k.cɤŋ <sup>2</sup>	--
1360	sometimes	sa:n <sup>3</sup> tɤ: <sup>1</sup>	sa:n <sup>3</sup> tɤ: <sup>1</sup>	--
1361	often	m.kam <sup>3</sup> m.kam <sup>3</sup>	m.kam <sup>3</sup> m.kam <sup>3</sup>	--
1362	usually	lu:n <sup>3</sup> t.kaj <sup>1</sup>	lu:n <sup>3</sup> t.kaj <sup>1</sup>	--
1363	always	tua <sup>1</sup> lo:t <sup>1</sup>	tua <sup>1</sup> lo:t <sup>1</sup>	--
1364	never	?am <sup>3</sup> tuan <sup>2</sup>	?am <sup>3</sup> tuan <sup>2</sup>	--
1365	spend time, pass time	kɤl <sup>3</sup> we <sup>3</sup> la: <sup>3</sup>	kɤl <sup>3</sup> we <sup>3</sup> la: <sup>3</sup>	--
1366	wait	k <sup>h</sup> ua <sup>2</sup>	k <sup>h</sup> ua <sup>2</sup>	--
1367	day	wan <sup>3</sup>	wan <sup>3</sup>	--
1368	month	dɤ:n <sup>3</sup>	dɤ:n <sup>3</sup>	--
1369	year	pi: <sup>3</sup>	pi: <sup>3</sup>	pi: <sup>1</sup>
1370	today	p.ni: <sup>2</sup>	p.ni: <sup>2</sup>	--
1371	yesterday	t <sup>h</sup> am <sup>1</sup> t.k <sup>h</sup> o <sup>2</sup>	t <sup>h</sup> am <sup>1</sup> t.k <sup>h</sup> o <sup>2</sup>	--
1372	day before yesterday	t <sup>h</sup> am <sup>1</sup> ?.wɤŋ <sup>2</sup>	t <sup>h</sup> am <sup>1</sup> ?.wɤŋ <sup>2</sup>	--
1373	tomorrow	p.ca: <sup>1</sup>	p.ca: <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker B	Speaker D
1374	day after tomorrow	t.k <sup>h</sup> u <sup>2</sup>	t.k <sup>h</sup> u <sup>2</sup>	--
1375	olden times	t <sup>h</sup> am <sup>1</sup> ʔ.wɣn <sup>3</sup>	t <sup>h</sup> am <sup>1</sup> ʔ.wɣn <sup>3</sup>	--
No.	Gloss	Speaker A	Speaker C	Speaker D
1376	dawn (before sunrise)	ra:w <sup>1</sup> ruŋ <sup>1</sup>	ra:w <sup>1</sup> ruŋ <sup>1</sup>	--
1377	sunrise	rɣ:m <sup>1</sup> t.c <sup>h</sup> a <sup>2</sup>	rɣ:m <sup>1</sup> t.c <sup>h</sup> a <sup>2</sup>	--
1378	morning	t.ɲa:l <sup>3</sup>	t.ɲa:l <sup>3</sup>	--
1379a	noon	ɲa:m <sup>1</sup> liaŋ <sup>3</sup>	ɲa:m <sup>1</sup> liaŋ <sup>3</sup>	--
1379	noon	ɲa:j <sup>3</sup> s.ɲi <sup>2</sup> kɔ <sup>1</sup> k.cɣn <sup>3</sup>	ɲa:j <sup>3</sup> s.ɲi <sup>2</sup> kɔ <sup>1</sup> k.cɣn <sup>3</sup>	--
1380	afternoon	p.tɔ <sup>2</sup> liaŋ <sup>3</sup>	p.tɔ <sup>2</sup> liaŋ <sup>3</sup>	--
1381	sunset	ʔu:m <sup>1</sup> po:l <sup>3</sup>	ʔu:m <sup>1</sup> po:l <sup>3</sup>	--
1382	dusk, twilight	ɲa:m <sup>1</sup> po:l <sup>3</sup>	ɲa:m <sup>1</sup> po:l <sup>3</sup>	--
1383	daytime	s.ɲi <sup>2</sup>	s.ɲi <sup>2</sup>	s.ɲi <sup>2</sup>
1384	night	t.po:l <sup>3</sup>	t.po:l <sup>3</sup>	s.wɛk <sup>2</sup>
1385	thing	kro <sup>3</sup> krɔŋ <sup>3</sup>	kro <sup>3</sup> krɔŋ <sup>3</sup>	--
1386	piece of firewood	m.kɣt <sup>2</sup>	m.kɣt <sup>2</sup>	--
1387	top	ro:l <sup>3</sup>	ro:l <sup>3</sup>	--
1388	bottom	taŋ <sup>1</sup> t <sup>h</sup> et <sup>2</sup>	taŋ <sup>1</sup> t <sup>h</sup> et <sup>2</sup>	--
1389a	front	to: <sup>1</sup> ɲa:j <sup>3</sup>	ʔual <sup>3</sup> ɲa:j <sup>3</sup>	--
1389	front	ʔual <sup>3</sup> ɲa:j <sup>3</sup>	to: <sup>1</sup> ɲa:j <sup>3</sup>	--
1390	back	taŋ <sup>1</sup> tɔ <sup>2</sup>	taŋ <sup>1</sup> tɔ <sup>2</sup>	--
1391	side	taŋ <sup>1</sup> ciaŋ <sup>1</sup>	taŋ <sup>1</sup> ciaŋ <sup>1</sup>	--
1392	middle	ko <sup>1</sup> t.k <sup>h</sup> ruaŋ <sup>3</sup>	ko <sup>1</sup> t.k <sup>h</sup> ruaŋ <sup>3</sup>	--
1393	edge	ce: <sup>3</sup>	ce: <sup>3</sup>	--
1394	point (n)	to:j <sup>3</sup>	to:j <sup>3</sup>	--
1395	bump (n)	so:t <sup>1</sup>	so:t <sup>1</sup>	--
1396	spot	da:ŋ <sup>1</sup>	da:ŋ <sup>1</sup>	--
1397	move	k <sup>h</sup> a:j <sup>2</sup>	k <sup>h</sup> a:j <sup>2</sup>	--
1399	come	ʔi: <sup>3</sup>	ʔi: <sup>3</sup>	ʔi <sup>2</sup> pɣ: <sup>3</sup>
1400	go (down)	lat <sup>2</sup>	lat <sup>2</sup>	--



No.	Gloss	Speaker A	Speaker C	Speaker D
1401	approach	lup <sup>2</sup> ʔi: <sup>3</sup>	lup <sup>2</sup> ʔi: <sup>3</sup>	--
1402	arrive	kɔj <sup>3</sup>	kɔj <sup>3</sup>	--
1403	remain, stay	t.k <sup>h</sup> ʔt <sup>2</sup>	t.k <sup>h</sup> ʔt <sup>2</sup>	--
1404	leave (place)	li: <sup>1</sup> lat <sup>2</sup>	li: <sup>1</sup> lat <sup>2</sup>	--
1405	return, go back	ʔi: <sup>3</sup> wɔj <sup>1</sup>	ʔi: <sup>3</sup> wɔj <sup>1</sup>	--
1406	go around, detour	k <sup>h</sup> ɔk <sup>2</sup> lat <sup>2</sup> k <sup>h</sup> ɔk <sup>2</sup> ʔi: <sup>3</sup>	k <sup>h</sup> ɔk <sup>2</sup> lat <sup>2</sup> k <sup>h</sup> ɔk <sup>2</sup> ʔi: <sup>3</sup>	--
1407	enter, go in	lup <sup>2</sup>	lup <sup>2</sup>	--
1408	come (or go) out, exit	li: <sup>1</sup>	li: <sup>1</sup>	--
1409	ascend, go up (climb up)	sa: <sup>3</sup>	sa: <sup>3</sup>	--
1410	descend, go down	luan <sup>1</sup>	luan <sup>1</sup>	--
1411	fall (intr.)	pɔl <sup>1</sup>	pɔl <sup>1</sup>	ʔ.kul <sup>3</sup>
1412	swing (v)	s.wɔj <sup>3</sup>	s.wɔj <sup>3</sup>	--
1413	slide	k.t <sup>h</sup> ʔ: <sup>3</sup>	k.t <sup>h</sup> ʔ: <sup>3</sup>	--
1414	roll	k <sup>h</sup> .mɔl <sup>3</sup>	k <sup>h</sup> .mɔl <sup>3</sup>	--
1415	spread (disease, fire)	suŋ <sup>1</sup> ha <sup>2</sup>	suŋ <sup>1</sup> ha <sup>2</sup>	--
1416	burst	su <sup>2</sup> te: <sup>1</sup>	su <sup>2</sup> te: <sup>1</sup>	--
1417	disappear	ra:j <sup>3</sup>	ra:j <sup>3</sup>	--
1418	speed (n)	taŋ <sup>1</sup> waj <sup>3</sup>	taŋ <sup>1</sup> waj <sup>3</sup>	--
1419	fast	waj <sup>3</sup>	waj <sup>3</sup>	--
1420	slow	cɔ:ŋ <sup>2</sup>	cɔ:ŋ <sup>2</sup>	--
1421	hasten, hurry	ri:p <sup>1</sup>	ri:p <sup>1</sup>	--
1422	take	le <sup>2</sup>	le <sup>2</sup>	--
1423	snatch	ja:t <sup>1</sup>	ja:t <sup>1</sup>	--
1424	catch (obj. in air)	ŋut <sup>2</sup>	ŋut <sup>2</sup>	--
1425	pick up	c <sup>h</sup> ip <sup>2</sup>	c <sup>h</sup> ip <sup>2</sup>	--
1426	hold	tun <sup>3</sup>	tun <sup>3</sup>	--
1427	raise, lift	ɲua <sup>3</sup>	ɲua <sup>3</sup>	--
1428	lower (tr.)	tian <sup>3</sup>	tian <sup>3</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1429	drop (tr.)	wɣl <sup>3</sup> ʔa: <sup>1</sup>	wɣl <sup>3</sup> ʔa: <sup>1</sup>	--
1430	throw	wɣl <sup>3</sup>	wɣl <sup>3</sup>	--
1431	shoot (v)	p <sup>h</sup> ɣŋ <sup>3</sup>	p <sup>h</sup> ɣŋ <sup>3</sup>	p <sup>h</sup> ɣŋ <sup>3</sup>
1432	knock down	bup <sup>2</sup> ʔa: <sup>1</sup>	bup <sup>2</sup> ʔa: <sup>1</sup>	--
1433	turn over (tr.)	s.pri <sup>n</sup> <sup>2</sup>	s.pri <sup>n</sup> <sup>2</sup>	--
1434	pull	ca <sup>k</sup> <sup>2</sup>	ca <sup>k</sup> <sup>2</sup>	--
1435	drag	ca <sup>k</sup> <sup>2</sup> ci <sup>2</sup> saŋ <sup>3</sup>	ca <sup>k</sup> <sup>2</sup> ci <sup>2</sup> saŋ <sup>3</sup>	--
1436	push	ɟu: <sup>2</sup>	ɟu: <sup>2</sup>	--
1437	steer (v)	k <sup>h</sup> at <sup>2</sup>	k <sup>h</sup> at <sup>2</sup>	--
1438	overtake, pass (tr.)	wɣk <sup>2</sup>	wɣk <sup>2</sup>	--
1439	surround	ruam <sup>2</sup>	ruam <sup>2</sup>	--
1440	twist	le <sup>n</sup> <sup>3</sup>	le <sup>n</sup> <sup>3</sup>	--
1441	fold (v)	p <sup>h</sup> al <sup>3</sup> p.tup <sup>2</sup>	p <sup>h</sup> al <sup>3</sup> p.tup <sup>2</sup>	--
1442	coil (rope) (v)	k <sup>h</sup> ɔt <sup>2</sup>	k <sup>h</sup> ɔt <sup>2</sup>	--
1443	hang up	huaj <sup>2</sup>	huaj <sup>2</sup>	--
1444	spread out (tr.)	ja:j <sup>3</sup>	ja:j <sup>3</sup>	--
1445	stretch	ca <sup>k</sup> <sup>2</sup> taŋ kaŋ <sup>3</sup>	ca <sup>k</sup> <sup>2</sup> taŋ kaŋ <sup>3</sup>	--
1446b	hit w/ stick	faj <sup>3</sup>	bup <sup>2</sup>	--
1446	hit (something) with hand or stick	bup <sup>2</sup>	faj <sup>3</sup>	--
1447a	beat	bup <sup>2</sup> raj <sup>2</sup>	bup <sup>2</sup> raj <sup>2</sup>	t.k <sup>h</sup> um <sup>3</sup> wat <sup>2</sup>
1447b	beat, hit (w/ hand)	t.kwi: <sup>3</sup>	t.kwi: <sup>3</sup>	--
1448	bump, knock against	tam <sup>3</sup>	tam <sup>3</sup>	--
1449	rub	si: <sup>3</sup>	si: <sup>3</sup>	la <sup>2</sup> ʔaj <sup>2</sup>
1450	scrape (v)	k <sup>h</sup> u:t <sup>1</sup>	k <sup>h</sup> u:t <sup>1</sup>	--
1451	scratch (v)	k <sup>h</sup> i:t <sup>1</sup>	k <sup>h</sup> i:t <sup>1</sup>	kit <sup>2</sup>
1452	pierce	po:k <sup>1</sup>	po:k <sup>1</sup>	--
1453	tear (tr.)	t <sup>h</sup> a:k <sup>1</sup> c <sup>h</sup> e: <sup>1</sup>	t <sup>h</sup> a:k <sup>1</sup> c <sup>h</sup> e: <sup>1</sup>	--
1454	strip off (bark)	lut <sup>2</sup>	lut <sup>2</sup>	--
1455a	shake (tr.) (tree)	ra:n <sup>1</sup>	ra:n <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1455b	shake (tr.)	p.san <sup>1</sup>	p.san <sup>1</sup>	--
1456	squeeze	p <sup>h</sup> .jet <sup>2</sup>	p <sup>h</sup> .jet <sup>2</sup>	bi:p <sup>1</sup>
1457a	crush (tr.) to powder	ɲul <sup>1</sup> ɲil <sup>3</sup>	ɲuk <sup>2</sup> ɲik <sup>2</sup>	--
1457	crush (tr.) to powder	ɲuk <sup>2</sup> ɲik <sup>2</sup>	ɲul <sup>1</sup> ɲil <sup>3</sup>	--
1458a	do, make	ci <sup>2</sup>	ci <sup>2</sup>	--
1458b	don't do/ make	ʔaw <sup>3</sup> ci <sup>2</sup>	ʔaw <sup>3</sup> ci <sup>2</sup>	--
1458	create	tiaŋ <sup>3</sup>	tiaŋ <sup>3</sup>	--
1459	alter, change (tr.)	pe:n <sup>1</sup>	pe:n <sup>1</sup>	--
1460	break (tr.)	ŋek <sup>2</sup>	ŋek <sup>2</sup>	--
1461	destroy, spoil	ma:ŋ <sup>2</sup>	ma:ŋ <sup>2</sup>	--
1462	be ruined, spoiled	lu: <sup>1</sup> lew <sup>3</sup>	lu: <sup>1</sup> lew <sup>3</sup>	--
1463	join, put together	su:p <sup>1</sup>	su:p <sup>1</sup>	--
1464	accumulate	k <sup>h</sup> ruan <sup>2</sup> ruam <sup>3</sup>	k <sup>h</sup> ruan <sup>2</sup> ruam <sup>3</sup>	--
1465	gather	k <sup>h</sup> ruan <sup>2</sup>	k <sup>h</sup> ruan <sup>2</sup>	--
1466	divide, separate (tr.)	ma: <sup>1</sup> mɤ <sup>2</sup> ma: <sup>1</sup> ti: <sup>1</sup>	ma: <sup>1</sup> mɤ <sup>2</sup> ma: <sup>1</sup> ti: <sup>1</sup>	biaŋ <sup>3</sup>
1467	scatter (tr.)	re: <sup>1</sup> raj <sup>3</sup>	re: <sup>1</sup> raj <sup>3</sup>	--
1468	throw away, get rid of	wɤl <sup>3</sup> s.ŋa:j <sup>3</sup>	wɤl <sup>3</sup> s.ŋa:j <sup>3</sup>	--
1469	put, place, set	ʔun <sup>3</sup> ʔun <sup>3</sup>	ʔun <sup>3</sup> ʔun <sup>3</sup>	--
1470	leave (something somewhere)	ni: <sup>1</sup> ʔun <sup>3</sup>	ni: <sup>1</sup> ʔun <sup>3</sup>	--
1471	keep, save	c <sup>h</sup> ip <sup>2</sup> bo: <sup>1</sup> ʔun <sup>3</sup>	c <sup>h</sup> ip <sup>2</sup> bo: <sup>1</sup> ʔun <sup>3</sup>	--
1472	hide (tr.)	tɤk <sup>2</sup>	tɤk <sup>2</sup>	--
1473	lose (tr.)	wet <sup>2</sup>	wet <sup>2</sup>	--
1474a	wipe (tr.)	ʔuat <sup>1</sup>	ʔuat <sup>1</sup>	--
1474	look for	taj <sup>1</sup> pan <sup>3</sup>	taj <sup>1</sup> pan <sup>3</sup>	--
1475	find	k.lua <sup>3</sup>	k.lua <sup>3</sup>	--
1476	blow (of wind)	pat <sup>2</sup>	pat <sup>2</sup>	--
1477	blow down	pat <sup>2</sup> ʔa: <sup>1</sup>	pat <sup>2</sup> ʔa: <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1478	blow away (intr.)	tɤŋ <sup>1</sup> p <sup>h</sup> u:j <sup>3</sup>	tɤŋ <sup>1</sup> p <sup>h</sup> u:j <sup>3</sup>	--
1479	fan (v)	fɤj <sup>1</sup>	fɤj <sup>1</sup>	--
1480	flow	la:j <sup>3</sup>	la:j <sup>3</sup>	--
1481	drip	s.rua <sup>3</sup>	s.rua <sup>3</sup>	--
1482	leak (v)	ro:c <sup>1</sup>	ro:c <sup>1</sup>	--
1483	sprinkle	sum <sup>1</sup> pɾet <sup>2</sup>	sum <sup>1</sup> pɾet <sup>2</sup>	--
1484	smear (tr.)	t <sup>h</sup> u:3	t <sup>h</sup> u:3	--
1485	dip	cam <sup>1</sup>	cam <sup>1</sup>	--
1486	soak	ce:1	ce:1	--
1487	wring out	p <sup>h</sup> .jet <sup>2</sup>	p <sup>h</sup> .jet <sup>2</sup>	--
1488	dry out	la:m <sup>3</sup>	la:m <sup>3</sup>	--
1489	float	t <sup>h</sup> u:j <sup>3</sup>	t <sup>h</sup> u:j <sup>3</sup>	--
1490	sink (v)	lum <sup>2</sup>	lum <sup>2</sup>	--
1491	drown (intr.)	tek <sup>2</sup>	tek <sup>2</sup>	--
1492	shine (v)	sum <sup>1</sup> re:3	sum <sup>1</sup> re:3	--
1493	fade	rɤ:m <sup>1</sup>	rɤ:m <sup>1</sup>	--
1494	(be) bright	p <sup>h</sup> rek <sup>2</sup>	p <sup>h</sup> rek <sup>2</sup>	--
1495	(be) dim	mo:3	mo:3	--
1496	light (fire) (v)	t <sup>h</sup> uŋ <sup>3</sup>	t <sup>h</sup> uŋ <sup>3</sup>	--
1497	quench, extinguish	jet <sup>2</sup>	jet <sup>2</sup>	p <sup>h</sup> .jet <sup>2</sup> ŋa <sup>1</sup> <sup>3</sup>
1498a	burn (tr.)	kat <sup>2</sup>	kat <sup>2</sup>	--
1498	burn (intr.), blaze	pre:w <sup>3</sup>	pre:w <sup>3</sup>	--
1499	melt (intr.)	naj <sup>1</sup>	naj <sup>1</sup>	--
1500	sing	wu:l <sup>3</sup>	wu:l <sup>3</sup>	--
1501	begin	taŋ <sup>1</sup> kaw <sup>2</sup>	taŋ <sup>1</sup> kaw <sup>2</sup>	--
1502	beginning	ŋa:m <sup>3</sup> taŋ <sup>1</sup> kaw <sup>2</sup>	ŋa:m <sup>3</sup> taŋ <sup>1</sup> kaw <sup>2</sup>	--
1503	continue, resume	ci <sup>2</sup> t <sup>h</sup> ɛŋ <sup>2</sup>	ci <sup>2</sup> t <sup>h</sup> ɛŋ <sup>2</sup>	--
1504	end (n)	tɤk <sup>2</sup>	tɤk <sup>2</sup>	--
1505	cease, stop	dɤŋ <sup>3</sup>	dɤŋ <sup>3</sup>	--
1506	finish, complete (v)	kua <sup>1</sup> koj <sup>1</sup>	kua <sup>1</sup> koj <sup>1</sup>	kua <sup>1</sup> koj <sup>1</sup>

No.	Gloss	Speaker A	Speaker C	Speaker D
1507	(be) big	rɤk <sup>2</sup>	rɤk <sup>2</sup>	rok <sup>2</sup>
1508	enlarge	rɤk <sup>2</sup> wa: <sup>1</sup>	rɤk <sup>2</sup> wa: <sup>1</sup>	--
1509	(be) small	tɛk <sup>2</sup>	tɛk <sup>2</sup>	tɛk <sup>2</sup>
1510	diminish	ci <sup>2</sup> wan <sup>1</sup> juam <sup>3</sup> ?a: <sup>1</sup>	ci <sup>2</sup> wan <sup>1</sup> juam <sup>3</sup> ?a: <sup>1</sup>	--
1511	(be) high	lu:ŋ <sup>3</sup>	lu:ŋ <sup>3</sup>	--
1512	(be) low	tian <sup>3</sup>	tian <sup>3</sup>	--
1513	(be) long	la:n <sup>3</sup>	la:n <sup>3</sup>	la:n <sup>3</sup>
1514	lengthen	ci <sup>2</sup> wan <sup>1</sup> la:n <sup>3</sup>	ci <sup>2</sup> wan <sup>1</sup> la:n <sup>3</sup>	--
1515	(be) short	to:t <sup>1</sup>	to:t <sup>1</sup>	--
1516	shorten	ci <sup>2</sup> wan <sup>1</sup> to:t <sup>1</sup>	ci <sup>2</sup> wan <sup>1</sup> to:t <sup>1</sup>	--
1517a	(be) fat	k <sup>h</sup> rɤŋ <sup>3</sup>	k <sup>h</sup> rɤŋ <sup>3</sup>	k <sup>h</sup> rɤŋ <sup>3</sup>
1517	(be) thick	k.sɤt <sup>2</sup>	k.sɤt <sup>2</sup>	k.sɤt <sup>2</sup>
1518a	(be) skinny	kri:l <sup>3</sup>	kri:l <sup>3</sup>	kril <sup>3</sup>
1518	(be) thin	hiaŋ <sup>2</sup>	hiaŋ <sup>2</sup>	--
1519	(be) wide	wa: <sup>1</sup>	wa: <sup>1</sup>	--
1520	widen	ci <sup>2</sup> wan <sup>1</sup> wa: <sup>1</sup>	ci <sup>2</sup> wan <sup>1</sup> wa: <sup>1</sup>	--
1521	(be) narrow	kiap <sup>1</sup>	kiap <sup>1</sup>	--
1522	(be) deep	kru <sup>2</sup>	kru <sup>2</sup>	--
1523	deepen	ci <sup>2</sup> wan <sup>1</sup> kru <sup>2</sup>	ci <sup>2</sup> wan <sup>1</sup> kru <sup>2</sup>	--
1524	(be) shallow	tɛl <sup>3</sup>	tɛl <sup>3</sup>	--
1525	(be) flat	tɤŋ <sup>1</sup> det <sup>2</sup>	tɤŋ <sup>1</sup> det <sup>2</sup>	--
1526	flatten	det <sup>2</sup>	det <sup>2</sup>	--
1527	(be) hollow	kro:ŋ <sup>3</sup>	kro:ŋ <sup>3</sup>	--
1528	swell (intr.)	puan <sup>3</sup>	puan <sup>3</sup>	--
1529	(be) round	mɔn <sup>3</sup>	mɔn <sup>3</sup>	mɤn <sup>3</sup>
1530	(be) straight	ru: <sup>1</sup>	ru: <sup>1</sup>	--
1531a	straighten	tiaŋ <sup>3</sup> wan <sup>1</sup> ru: <sup>1</sup>	tiaŋ <sup>3</sup> wan <sup>1</sup> ru: <sup>1</sup>	--
1531b	straighten	ci <sup>2</sup> wan <sup>1</sup> ru: <sup>1</sup>	ci <sup>2</sup> wan <sup>1</sup> ru: <sup>1</sup>	--
1532	(be) crooked	k <sup>h</sup> ɔk <sup>2</sup>	k <sup>h</sup> ɔk <sup>2</sup>	--
1533	bend, curve (n)	su <sup>2</sup> k <sup>h</sup> ɔk <sup>2</sup>	su <sup>2</sup> k <sup>h</sup> ɔk <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1534	(be) heavy	k.cɛn <sup>3</sup>	k.cɛn <sup>3</sup>	k.cɛn <sup>3</sup>
1535	weight	nam <sup>2</sup> k.cɛn <sup>3</sup>	nam <sup>2</sup> k.cɛn <sup>3</sup>	--
1536	(be) light (not heavy)	k <sup>h</sup> .ju:ŋ <sup>3</sup>	k <sup>h</sup> .ju:ŋ <sup>3</sup>	--
1537	(be) sharp	lɤp <sup>2</sup>	lɤp <sup>2</sup>	--
1538	sharpen (knife)	s.lɛŋ <sup>3</sup>	s.lɛŋ <sup>3</sup>	--
1539	sharpen, bring to a point	t.p <sup>h</sup> ɛk <sup>2</sup> liam <sup>1</sup>	t.p <sup>h</sup> ɛk <sup>2</sup> liam <sup>1</sup>	t.p <sup>h</sup> ɛk <sup>2</sup>
1540	(be) blunt, dull	ʔam <sup>3</sup> liam <sup>1</sup>	ʔam <sup>3</sup> liam <sup>1</sup>	--
1540	(be) blunt, dull	ʔam <sup>3</sup> lɤp <sup>2</sup>	ʔam <sup>3</sup> lɤp <sup>2</sup>	--
1541	(be) rough	s.ra:p <sup>1</sup>	s.ra:p <sup>1</sup>	--
1542	(be) smooth	p.cu:l <sup>3</sup>	p.cu:l <sup>3</sup>	--
1543	make smooth	tiaŋ <sup>3</sup> wan <sup>1</sup> p.cu:l <sup>3</sup>	tiaŋ <sup>3</sup> wan <sup>1</sup> p.cu:l <sup>3</sup>	--
1544	hard	ka:j <sup>1</sup>	ka:j <sup>1</sup>	--
1545	harden	tiaŋ <sup>3</sup> wan <sup>1</sup> ka:j <sup>1</sup>	tiaŋ <sup>3</sup> wan <sup>1</sup> ka:j <sup>1</sup>	--
1546	(be) soft	k.cɤ:m <sup>1</sup> no:n <sup>3</sup>	k.cɤ:m <sup>1</sup> no:n <sup>3</sup>	--
1547	soften	tiaŋ <sup>3</sup> wan <sup>1</sup> k.cɤ:m <sup>1</sup> no:n <sup>3</sup>	tiaŋ <sup>3</sup> wan <sup>1</sup> k.cɤ:m <sup>1</sup> no:n <sup>3</sup>	--
1548	(be) dry	s.ʔuaj <sup>3</sup>	s.ʔuaj <sup>3</sup>	hian <sup>2</sup>
1549	(be) wet	ce: <sup>3</sup>	ce: <sup>3</sup>	--
1550	(be) slippery	tɤŋ <sup>1</sup> kra:c <sup>1</sup>	tɤŋ <sup>1</sup> kra:c <sup>1</sup>	--
1551	(be) sticky	ɲɤk <sup>2</sup>	ɲɤk <sup>2</sup>	--
1552	(be) hot (objects)	ruan <sup>2</sup>	ruan <sup>2</sup>	--
1553	(be) cold (objects)	ŋo:ŋ <sup>3</sup>	ŋo:ŋ <sup>3</sup>	jen <sup>3</sup>
1554	color	si: <sup>3</sup>	si: <sup>3</sup>	--
1555	white	s.pual <sup>3</sup>	s.pual <sup>3</sup>	m.s.pual <sup>3</sup>
1556	black	laŋ <sup>3</sup>	laŋ <sup>3</sup>	m.laŋ <sup>3</sup>
1557	red	piaŋ <sup>3</sup>	piaŋ <sup>3</sup>	m.piaŋ <sup>3</sup>
1558	blue	lɤn <sup>2</sup>	lɤn <sup>2</sup>	--
1559	green	k <sup>h</sup> e:w <sup>3</sup>	k <sup>h</sup> e:w <sup>3</sup>	mak <sup>1</sup> t <sup>h</sup> e:w <sup>3</sup>

No.	Gloss	Speaker A	Speaker C	Speaker D
1560	brown	ja:ŋ <sup>2</sup>	ja:ŋ <sup>2</sup>	--
1561	yellow	lɣ:ŋ <sup>3</sup>	lɣ:ŋ <sup>3</sup>	--
1562	dark (color)	tɣk <sup>2</sup>	tɣk <sup>2</sup>	--
1563	light (color)	mua <sup>1</sup>	mua <sup>1</sup>	--
1564	taste (n)	nam <sup>1</sup> ɲu:m <sup>3</sup>	nam <sup>1</sup> ɲu:m <sup>3</sup>	--
1565	(be) sweet	ŋa:ŋ <sup>3</sup>	ŋa:ŋ <sup>3</sup>	ŋaŋ <sup>3</sup>
1566	(be) sour	s.ʔa:l <sup>3</sup>	s.ʔa:l <sup>3</sup>	s.ʔa:l <sup>3</sup>
1567a	(be) spicy, hot	p <sup>h</sup> rit <sup>2</sup>	p <sup>h</sup> rit <sup>2</sup>	p <sup>h</sup> ri <sup>2</sup> / p <sup>h</sup> li <sup>2</sup>
1567	(be) bitter	c <sup>h</sup> aŋ <sup>3</sup>	c <sup>h</sup> aŋ <sup>3</sup>	c <sup>h</sup> aŋ <sup>3</sup>
1567b	(be) salty	kem <sup>3</sup>	kem <sup>3</sup>	--
1568	odor, smell (n)	sa:p <sup>1</sup>	sa:p <sup>1</sup>	--
1569	stink, smell (bad)	ʔuj <sup>3</sup>	ʔuj <sup>3</sup>	t <sup>h</sup> u <sup>2</sup> ʔuj <sup>3</sup>
1570	(be) able (to)	ta:ŋ <sup>3</sup> ca:ŋ <sup>1</sup>	ta:ŋ <sup>3</sup> ca:ŋ <sup>1</sup>	--
1571	(be) strong	pa <sup>2</sup> saŋ <sup>3</sup>	pa <sup>2</sup> saŋ <sup>3</sup>	--
1572	strength	saŋ <sup>3</sup> ka:j <sup>1</sup>	saŋ <sup>3</sup> ka:j <sup>1</sup>	--
1573	(be) weak	saŋ <sup>3</sup> k.cɣ:m <sup>1</sup>	saŋ <sup>3</sup> k.cɣ:m <sup>1</sup>	--
1574	(be) powerful	r.t <sup>h</sup> i: <sup>3</sup> rɣk <sup>2</sup>	r.t <sup>h</sup> i: <sup>3</sup> rɣk <sup>2</sup>	--
1576	(be) good	juan <sup>3</sup>	juan <sup>3</sup>	juan <sup>3</sup>
1577a	(be) bad	ra:j <sup>2</sup>	ra:j <sup>2</sup>	--
1577	(be) bad	t <sup>h</sup> ɔj <sup>1</sup>	t <sup>h</sup> ɔj <sup>1</sup>	--
1578	right, (be) correct	co:p <sup>1</sup> mian <sup>1</sup>	co:p <sup>1</sup> mian <sup>1</sup>	--
1579	truth	t <sup>h</sup> am <sup>3</sup> m.s.ra: <sup>3</sup>	t <sup>h</sup> am <sup>3</sup> m.s.ra: <sup>3</sup>	--
1580	(be) perfect	t <sup>h</sup> o:m <sup>2</sup> tim <sup>3</sup>	t <sup>h</sup> o:m <sup>2</sup> tim <sup>3</sup>	--
1581	(be) wrong	p <sup>h</sup> it <sup>2</sup>	p <sup>h</sup> it <sup>2</sup>	--
1582	(be) beautiful	juan <sup>3</sup> ŋa:m <sup>3</sup>	juan <sup>3</sup> ŋa:m <sup>3</sup>	--
1583	(be) ugly	ra:ŋ <sup>1</sup> ra:j <sup>2</sup>	ra:ŋ <sup>1</sup> ra:j <sup>2</sup>	--
1584	(be) clean	k <sup>h</sup> riat <sup>1</sup> kriŋ <sup>2</sup>	k <sup>h</sup> riat <sup>1</sup> kriŋ <sup>2</sup>	--
1585	(be) dirty	p <sup>h</sup> aŋ <sup>3</sup> ra:j <sup>2</sup>	p <sup>h</sup> aŋ <sup>3</sup> ra:j <sup>2</sup>	--
1586	(be) important	k <sup>h</sup> o <sup>2</sup> sam <sup>1</sup> k <sup>h</sup> an <sup>3</sup>	k <sup>h</sup> o <sup>2</sup> sam <sup>1</sup> k <sup>h</sup> an <sup>3</sup>	--
1587	(be) amusing, funny	su <sup>2</sup> juan <sup>3</sup> met <sup>2</sup>	su <sup>2</sup> juan <sup>3</sup> met <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1588	(be) new	ma: <sup>1</sup> maj <sup>1</sup>	ma: <sup>1</sup> maj <sup>1</sup>	m.ma:j <sup>1</sup>
1589	(be) old	ma: <sup>1</sup> lu <sup>2</sup>	ma: <sup>1</sup> lu <sup>2</sup>	--
1590	one	ʔak <sup>2</sup>	ʔak <sup>2</sup>	nuŋ <sup>1</sup>
1590	one person	--	--	ʔic <sup>2</sup> ʔak <sup>2</sup>
1591	two	suaŋ <sup>3</sup>	suaŋ <sup>3</sup>	suaŋ <sup>1</sup>
1591	two people	--	--	ʔic <sup>2</sup> suaŋ <sup>1</sup> kun <sup>3</sup>
1592	three	sa:m <sup>3</sup>	sa:m <sup>3</sup>	sa:m <sup>1</sup>
1592	three people	--	--	ʔic <sup>2</sup> sa:m <sup>1</sup> kun <sup>3</sup>
1593	four	si: <sup>1</sup>	si: <sup>1</sup>	si: <sup>1</sup>
1593	four people	--	--	ʔic <sup>2</sup> si: <sup>1</sup> kun <sup>3</sup>
1594	five	ha: <sup>2</sup>	ha: <sup>2</sup>	ha: <sup>2</sup>
1594	five people	--	--	ʔic <sup>2</sup> ha: <sup>1</sup> kun <sup>3</sup>
1595	six	rək <sup>2</sup>	rək <sup>2</sup>	rək <sup>2</sup>
1595	six people	--	--	ʔic <sup>2</sup> rək <sup>2</sup> kun <sup>3</sup>
1596	seven	cət <sup>2</sup>	cət <sup>2</sup>	cət <sup>2</sup>
1596	seven people	--	--	ʔic <sup>2</sup> cət <sup>2</sup> kun <sup>3</sup>
1597	eight	piat <sup>1</sup>	piat <sup>1</sup>	piat <sup>1</sup>
1597	eight people	--	--	ʔic <sup>2</sup> piat <sup>1</sup> kun <sup>3</sup>
1598	nine	kaw <sup>2</sup>	kaw <sup>2</sup>	kaw <sup>2</sup>
1598	nine people	--	--	ʔic <sup>2</sup> kaw <sup>2</sup> kun <sup>3</sup>
1599	ten	sip <sup>2</sup>	sip <sup>2</sup>	sip <sup>2</sup>
1599	ten people	--	--	ʔic <sup>2</sup> sip <sup>2</sup> nuŋ <sup>1</sup>
1600	eleven	sip <sup>2</sup> ʔət <sup>2</sup>	sip <sup>2</sup> ʔət <sup>2</sup>	sip <sup>2</sup> ʔət <sup>2</sup>
1601	twelve	sip <sup>2</sup> suaŋ <sup>3</sup>	sip <sup>2</sup> suaŋ <sup>3</sup>	sip <sup>2</sup> suaŋ <sup>3</sup>
1602	thirteen	sip <sup>2</sup> sa:m <sup>3</sup>	sip <sup>2</sup> sa:m <sup>3</sup>	sip <sup>2</sup> sa:m <sup>3</sup>
1603	fourteen	sip <sup>2</sup> si: <sup>1</sup>	sip <sup>2</sup> si: <sup>1</sup>	sip <sup>2</sup> si: <sup>1</sup>
1604	fifteen	sip <sup>2</sup> ha: <sup>2</sup>	sip <sup>2</sup> ha: <sup>2</sup>	sip <sup>2</sup> ha: <sup>2</sup>
1605	sixteen	sip <sup>2</sup> rək <sup>2</sup>	sip <sup>2</sup> rək <sup>2</sup>	sip <sup>2</sup> rək <sup>2</sup>
1606	seventeen	sip <sup>2</sup> cət <sup>2</sup>	sip <sup>2</sup> cət <sup>2</sup>	sip <sup>2</sup> cət <sup>2</sup>
1607	eighteen	sip <sup>2</sup> piat <sup>1</sup>	sip <sup>2</sup> piat <sup>1</sup>	sip <sup>2</sup> piat <sup>1</sup>



No.	Gloss	Speaker A	Speaker C	Speaker D
1608	nineteen	sip <sup>2</sup> kaw <sup>2</sup>	sip <sup>2</sup> kaw <sup>2</sup>	sip <sup>2</sup> kaw <sup>2</sup>
1609	twenty	sa:w <sup>3</sup>	sa:w <sup>3</sup>	sa:w <sup>3</sup> nuŋ <sup>1</sup>
1609	twenty people	--	--	ʔic <sup>2</sup> sa:w <sup>2</sup> nuŋ <sup>1</sup>
1610	twenty-one	sa:w <sup>3</sup> ʔet <sup>2</sup>	sa:w <sup>3</sup> ʔet <sup>2</sup>	sa:w <sup>3</sup> ʔet <sup>2</sup>
1611a	twenty-three	sa:w <sup>3</sup> sa:m <sup>3</sup>	sa:w <sup>3</sup> sa:m <sup>3</sup>	sa:w <sup>3</sup> sa:m <sup>3</sup>
1611b	twenty-four	sa:w <sup>3</sup> si: <sup>1</sup>	sa:w <sup>3</sup> si: <sup>1</sup>	sa:w <sup>3</sup> si: <sup>1</sup>
1611c	twenty-five	sa:w <sup>3</sup> ha: <sup>2</sup>	sa:w <sup>3</sup> ha: <sup>2</sup>	sa:w <sup>3</sup> ha: <sup>2</sup>
1611d	twenty-six	sa:w <sup>3</sup> rɔk <sup>2</sup>	sa:w <sup>3</sup> rɔk <sup>2</sup>	sa:w <sup>3</sup> rɔk <sup>2</sup>
1611e	twenty-seven	sa:w <sup>3</sup> cət <sup>2</sup>	sa:w <sup>3</sup> cət <sup>2</sup>	sa:w <sup>3</sup> cət <sup>2</sup>
1611f	twenty-eight	sa:w <sup>3</sup> piat <sup>1</sup>	sa:w <sup>3</sup> piat <sup>1</sup>	sa:w <sup>3</sup> piat <sup>1</sup>
1611g	twenty-nine	sa:w <sup>3</sup> kaw <sup>2</sup>	sa:w <sup>3</sup> kaw <sup>2</sup>	sa:w <sup>3</sup> kaw <sup>2</sup>
1611	twenty-two	sa:w <sup>3</sup> suaŋ <sup>3</sup>	sa:w <sup>3</sup> suaŋ <sup>3</sup>	sa:w <sup>3</sup> suaŋ <sup>3</sup>
1612	thirty	sa:m <sup>3</sup> sip <sup>2</sup>	sa:m <sup>3</sup> sip <sup>2</sup>	sa:m <sup>3</sup> sip <sup>2</sup>
1613	forty	si: <sup>1</sup> sip <sup>2</sup>	si: <sup>1</sup> sip <sup>2</sup>	si: <sup>1</sup> sip <sup>2</sup>
1614	fifty	ha: <sup>2</sup> sip <sup>2</sup>	ha: <sup>2</sup> sip <sup>2</sup>	ha: <sup>2</sup> sip <sup>2</sup>
1615	sixty	rɔk <sup>2</sup> sip <sup>2</sup>	rɔk <sup>2</sup> sip <sup>2</sup>	rɔk <sup>2</sup> sip <sup>2</sup>
1616	seventy	cət <sup>2</sup> sip <sup>2</sup>	cət <sup>2</sup> sip <sup>2</sup>	cət <sup>2</sup> sip <sup>2</sup>
1617	eighty	piat <sup>1</sup> sip <sup>2</sup>	piat <sup>1</sup> sip <sup>2</sup>	piat <sup>1</sup> sip <sup>2</sup>
1618	ninety	kaw <sup>2</sup> sip <sup>2</sup>	kaw <sup>2</sup> sip <sup>2</sup>	kaw <sup>2</sup> sip <sup>2</sup>
1619	one hundred	ruaj <sup>2</sup> nŋŋ <sup>1</sup>	ruaj <sup>2</sup> nŋŋ <sup>1</sup>	rɔj <sup>1</sup> nuŋ <sup>1</sup>
1619	one hundred people	--	--	ʔic <sup>2</sup> rɔj <sup>1</sup> nuŋ <sup>1</sup>
1620	two hundred	suaŋ <sup>3</sup> ruaj <sup>2</sup>	suaŋ <sup>3</sup> ruaj <sup>2</sup>	suaŋ <sup>3</sup> ruaj <sup>2</sup>
1621	five hundred	ha: <sup>2</sup> ruaj <sup>2</sup>	ha: <sup>2</sup> ruaj <sup>2</sup>	ha: <sup>2</sup> ruaj <sup>2</sup>
1622a	two thousand	suaŋ <sup>3</sup> pan <sup>3</sup>	suaŋ <sup>3</sup> pan <sup>3</sup>	suaŋ <sup>3</sup> pan <sup>3</sup>
1622	one thousand	pan <sup>3</sup> nŋŋ <sup>1</sup>	pan <sup>3</sup> nŋŋ <sup>1</sup>	pan <sup>3</sup> nŋŋ <sup>1</sup>
1623	first	t <sup>h</sup> o:n <sup>2</sup> nŋŋ <sup>1</sup>	t <sup>h</sup> o:n <sup>2</sup> nŋŋ <sup>1</sup>	t <sup>h</sup> o:n <sup>2</sup> nŋŋ <sup>1</sup>
1624	second	t <sup>h</sup> o:n <sup>2</sup> suaŋ <sup>3</sup>	t <sup>h</sup> o:n <sup>2</sup> suaŋ <sup>3</sup>	t <sup>h</sup> o:n <sup>2</sup> suaŋ <sup>3</sup>
1625	third	t <sup>h</sup> o:n <sup>2</sup> sa:m <sup>3</sup>	t <sup>h</sup> o:n <sup>2</sup> sa:m <sup>3</sup>	t <sup>h</sup> o:n <sup>2</sup> sa:m <sup>3</sup>
1626	last	tɔk <sup>2</sup> p.tɔ <sup>2</sup>	tɔk <sup>2</sup> p.tɔ <sup>2</sup>	tɔk <sup>2</sup> p.tɔ <sup>2</sup>

No.	Gloss	Speaker A	Speaker C	Speaker D
1627	add	t <sup>h</sup> ɛŋ <sup>2</sup>	t <sup>h</sup> ɛŋ <sup>2</sup>	t <sup>h</sup> ɛŋ <sup>2</sup>
1628	subtract, take away	let <sup>2</sup> li: <sup>1</sup>	let <sup>2</sup> li: <sup>1</sup>	let <sup>2</sup> li: <sup>1</sup>
1631a	count (v)	sin <sup>1</sup>	sin <sup>1</sup>	sin <sup>1</sup>
1631	count (v)	nap <sup>2</sup> suan <sup>1</sup>	nap <sup>2</sup> suan <sup>1</sup>	nap <sup>2</sup> suan <sup>1</sup>
1632	arrange	raŋ <sup>2</sup> rɛn <sup>3</sup>	raŋ <sup>2</sup> rɛn <sup>3</sup>	raŋ <sup>2</sup> rɛn <sup>3</sup>
1633	(be) equal	pal <sup>1</sup> k.tit <sup>2</sup>	pal <sup>1</sup> k.tit <sup>2</sup>	pal <sup>1</sup> k.tit <sup>2</sup>
1634	(be) abundant	lɔn <sup>1</sup> lɻ: <sup>3</sup>	lɔn <sup>1</sup> lɻ: <sup>3</sup>	lɔn <sup>1</sup> lɻ: <sup>3</sup>
1635	enough	k <sup>h</sup> ap <sup>2</sup>	k <sup>h</sup> ap <sup>2</sup>	k <sup>h</sup> ap <sup>2</sup>
1636	lack	ʔam <sup>3</sup> k <sup>h</sup> ap <sup>2</sup>	ʔam <sup>3</sup> k <sup>h</sup> ap <sup>2</sup>	ʔam <sup>3</sup> k <sup>h</sup> ap <sup>2</sup>
1637	(be) used up	kɻl <sup>3</sup>	kɻl <sup>3</sup>	kɻl <sup>3</sup>
1638	all	sɛŋ <sup>3</sup> kɻl <sup>3</sup>	sɛŋ <sup>3</sup> kɻl <sup>3</sup>	sɛŋ <sup>3</sup> kɻl <sup>3</sup>
1639	many	juŋ <sup>3</sup>	juŋ <sup>3</sup>	ʔic <sup>2</sup> juŋ <sup>3</sup>
1640	few	p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup>	p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup>	--
1641	half	p <sup>h</sup> a <sup>2</sup> k <sup>h</sup> ɻŋ <sup>1</sup>	p <sup>h</sup> a <sup>2</sup> k <sup>h</sup> ɻŋ <sup>1</sup>	--
1642	whole	tɻŋ <sup>3</sup> sɛŋ <sup>3</sup>	tɻŋ <sup>3</sup> sɛŋ <sup>3</sup>	--
1643a	everybody	ku: <sup>1</sup> kun <sup>3</sup>	ku: <sup>1</sup> kun <sup>3</sup>	--
1643b	everybody	ku: <sup>1</sup> ʔic <sup>2</sup> sɛŋ <sup>3</sup>	ku: <sup>1</sup> ʔic <sup>2</sup> sɛŋ <sup>3</sup>	--
1644	everything	ku: <sup>1</sup> cu <sup>2</sup>	ku: <sup>1</sup> cu <sup>2</sup>	--
1645	everywhere	ku: <sup>1</sup> ti: <sup>1</sup> ku: <sup>1</sup> hiaŋ <sup>3</sup>	ku: <sup>1</sup> ti: <sup>1</sup> ku: <sup>1</sup> hiaŋ <sup>3</sup>	--
1646	nobody	ʔam <sup>3</sup> ru <sup>2</sup> ʔi: <sup>1</sup> mɻ <sup>2</sup>	ʔam <sup>3</sup> ru <sup>2</sup> ʔi: <sup>1</sup> mɻ <sup>2</sup>	--
1647	nothing	ʔam <sup>3</sup> pa <sup>2</sup> su <sup>1</sup> mɻ <sup>2</sup>	ʔam <sup>3</sup> pa <sup>2</sup> su <sup>1</sup> mɻ <sup>2</sup>	--
1648a	I (dual) (1d)	ʔaj <sup>3</sup>	ʔaj <sup>3</sup>	--
1648	I (1s)	ʔɔ <sup>2</sup>	ʔɔ <sup>2</sup>	ʔɔ <sup>2</sup>
1649a	you (2D)	p <sup>h</sup> aj <sup>3</sup>	p <sup>h</sup> aj <sup>3</sup>	--
1649	you (2S)	mi <sup>2</sup>	mi <sup>2</sup>	mi <sup>2</sup>
1650a	they (dual) (3D)	kaj <sup>3</sup>	kaj <sup>3</sup>	--
1650	he (human) (3S)	ʔɻn <sup>3</sup>	ʔɻn <sup>3</sup>	--
1651	we (incl.) (1PL)	ʔe <sup>2</sup>	ʔe <sup>2</sup>	--
1652	you (PL)	p <sup>h</sup> e <sup>2</sup>	p <sup>h</sup> e <sup>2</sup>	--
1653	they (human) (3PL)	ke <sup>2</sup>	ke <sup>2</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1654	here	ʔa: <sup>1</sup> ni: <sup>2</sup>	ʔa: <sup>1</sup> ni: <sup>2</sup>	--
1655a	there (closest)	ʔa: <sup>1</sup> jɛn <sup>2</sup>	ʔa: <sup>1</sup> jɛn <sup>2</sup>	--
1655b	there (farther)	nuaj <sup>3</sup>	nuaj <sup>3</sup>	--
1655c	there (farthest)	ʔa: <sup>1</sup> juaj <sup>2</sup>	ʔa: <sup>1</sup> juaj <sup>2</sup>	--
1656	far	s.ɲaj <sup>3</sup>	s.ɲaj <sup>3</sup>	s.ɲaj <sup>3</sup>
1657	near	tɛ <sup>2</sup>	tɛ <sup>2</sup>	tɛ: <sup>2</sup>
1658	north	taŋ <sup>1</sup> ʔɤŋ <sup>2</sup>	taŋ <sup>1</sup> ʔɤŋ <sup>2</sup>	--
1659	south	ta: <sup>1</sup> ʔe: <sup>2</sup>	ta: <sup>1</sup> ʔe: <sup>2</sup>	--
1660	east	ta: <sup>1</sup> ʔo:j <sup>2</sup>	ta: <sup>1</sup> ʔo:j <sup>2</sup>	--
1661	west	ta: <sup>1</sup> ʔi: <sup>2</sup>	taŋ: <sup>1</sup> ʔi: <sup>2</sup>	--
1662	up	taŋ <sup>1</sup> t <sup>h</sup> ɔ <sup>2</sup>	taŋ <sup>1</sup> t <sup>h</sup> ɔ <sup>2</sup>	--
1663	down	taŋ <sup>1</sup> t <sup>h</sup> et <sup>2</sup>	taŋ <sup>1</sup> t <sup>h</sup> et <sup>2</sup>	--
1664	forward (direction)	ʔual <sup>3</sup> ɲaj <sup>3</sup>	ʔual <sup>3</sup> ɲaj <sup>3</sup>	--
1665	backward	taŋ <sup>1</sup> tɔ <sup>2</sup>	taŋ <sup>1</sup> tɔ <sup>2</sup>	--
1666	right (direction)	taŋ <sup>1</sup> sam <sup>3</sup>	taŋ <sup>1</sup> sam <sup>3</sup>	--
1667	left	taŋ <sup>1</sup> wɛt <sup>2</sup>	taŋ <sup>1</sup> wɛt <sup>2</sup>	--
1668	over, above	taŋ <sup>1</sup> to: <sup>1</sup>	taŋ <sup>1</sup> to: <sup>1</sup>	--
1669a	under, below	taŋ <sup>1</sup> rum <sup>3</sup>	taŋ <sup>1</sup> rum <sup>3</sup>	--
1669b	under, below	taŋ <sup>1</sup> cual <sup>3</sup>	taŋ <sup>1</sup> cual <sup>3</sup>	--
1672	beside	riap <sup>1</sup>	riap <sup>1</sup>	--
1673	inside	taŋ <sup>1</sup> kro:ŋ <sup>3</sup>	taŋ <sup>1</sup> kro:ŋ <sup>3</sup>	--
1674	outside	taŋ <sup>1</sup> nuak <sup>1</sup>	taŋ <sup>1</sup> nuak <sup>1</sup>	--
1675	between	ko: <sup>3</sup> wa:ŋ <sup>1</sup>	ko: <sup>3</sup> wa:ŋ <sup>1</sup>	--
1676	towards	cu: <sup>3</sup>	cu: <sup>3</sup>	--
1677	away from	t <sup>h</sup> am <sup>1</sup> ʔa: <sup>1</sup> mɤ <sup>2</sup>	t <sup>h</sup> am <sup>1</sup> ʔa: <sup>1</sup> mɤ <sup>2</sup>	--
1678	with	kap <sup>2</sup>	kap <sup>2</sup>	--
1679	this (man)	ʔɤn <sup>3</sup> ni: <sup>2</sup>	ʔɤn <sup>3</sup> ni: <sup>2</sup>	ʔ.ni: <sup>2</sup>
1680	that (man)	ʔɤn <sup>3</sup> jɛn <sup>2</sup>	ʔɤn <sup>3</sup> jɛn <sup>2</sup>	--
1681	some (men)	ʔic <sup>2</sup> p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup>	ʔic <sup>2</sup> p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup>	--
1682	other (men)	ʔic <sup>2</sup> p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup>	ʔic <sup>2</sup> p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup>	--

No.	Gloss	Speaker A	Speaker C	Speaker D
1683	who?	ʔi: <sup>1</sup> mɣ <sup>2</sup>	ʔi: <sup>1</sup> mɣ <sup>2</sup>	ʔi <sup>1</sup> mɣ <sup>2</sup>
1684b	what?	sɣ <sup>2</sup>	sɣ <sup>2</sup>	--
1684	what?	su <sup>2</sup> mɣ <sup>2</sup>	su <sup>2</sup> mɣ <sup>2</sup>	s.mɣ <sup>2</sup>
1685	which (one)?	ma: <sup>1</sup> mɣ <sup>2</sup>	ma: <sup>1</sup> mɣ <sup>2</sup>	--
1686	where?	ʔa: <sup>1</sup> mɣ <sup>2</sup>	ʔa: <sup>1</sup> mɣ <sup>2</sup>	--
1687	when?	ɲa: <sup>1</sup> mɣ <sup>2</sup>	ɲa: <sup>1</sup> mɣ <sup>2</sup>	--
1688	why?	kaj <sup>1</sup> su <sup>2</sup> mɣ <sup>2</sup>	kaj <sup>1</sup> su <sup>2</sup> mɣ <sup>2</sup>	--
1689b	how?	ci <sup>2</sup> sɣ <sup>2</sup>	ci <sup>2</sup> sɣ <sup>2</sup>	--
1689	how?	ci <sup>2</sup> su <sup>2</sup> mɣ <sup>2</sup>	ci <sup>2</sup> su <sup>2</sup> mɣ <sup>2</sup>	--
1690	how many?	pa: <sup>1</sup> mɣ <sup>2</sup>	pa: <sup>1</sup> mɣ <sup>2</sup>	--
1691	and	le <sup>2</sup>	le <sup>2</sup>	--
1692a	if	sen <sup>2</sup> wa: <sup>1</sup>	sen <sup>2</sup> wa: <sup>1</sup>	--
1692	if	sen <sup>2</sup> ʔu: <sup>1</sup>	sen <sup>2</sup> ʔu: <sup>1</sup>	--
1693	because	juan <sup>2</sup> pɣ: <sup>1</sup>	juan <sup>2</sup> pɣ: <sup>1</sup>	--
1694	perhaps	k <sup>h</sup> .na: <sup>2</sup>	k <sup>h</sup> .na: <sup>2</sup>	--
1696	well (adv.)	ko: <sup>1</sup> juaŋ <sup>3</sup>	ko: <sup>1</sup> juaŋ <sup>3</sup>	--
1697	poorly	juan <sup>3</sup> naŋ <sup>1</sup> ʔe:ŋ <sup>3</sup>	juan <sup>3</sup> naŋ <sup>1</sup> ʔe:ŋ <sup>3</sup>	--
1698	only	le: <sup>1</sup> bi: <sup>2</sup>	le: <sup>1</sup> bi: <sup>2</sup>	--
1699	yes	mɯn <sup>1</sup>	mɯn <sup>1</sup>	--
1700a	no	ʔam <sup>3</sup> mɯn <sup>1</sup>	ʔam <sup>3</sup> mɯn <sup>1</sup>	--
1700	no	ʔam <sup>3</sup> rut <sup>2</sup>	ʔam <sup>3</sup> rut <sup>2</sup>	--
	itch (verb)	--	--	ŋa <sup>2</sup>
	cook rice	--	--	ca:w <sup>2</sup>
	cook rice (2)	--	--	so:ŋ <sup>3</sup>
	wash (dishes)	--	--	c <sup>h</sup> a: <sup>2</sup>
	stick (glue)	--	--	t <sup>h</sup> ak <sup>2</sup>
	shooting	--	--	put <sup>2</sup>
	squash	--	--	k <sup>h</sup> ɛl <sup>3</sup>
	bloom (v)	--	--	p <sup>h</sup> ɣm <sup>3</sup>
	very sweet	--	--	ɲu:m <sup>3</sup>

## **APPENDIX 3 CONTRASTS**

## Consonants

This section will give evidence of contrasts between suspicious consonant pairs. For each pair, evidence of contrast in the form of minimal pairs is provided, labeled as Contrast in Identical Environments (CIE); when this is not available, Contrast in Analogous Environments (CAE) is provided. In the case of no contrast, they are labeled as CD, Complementary Distribution.

Words marked with an asterisk \* are borrowed from Tai Lue.

/p/, /p<sup>h</sup>/

633a	/pɣl <sup>3</sup> /	“spill” (liquid)	CIE
1071	/p <sup>h</sup> ɣl <sup>3</sup> /	“fly” (v)	
1121	/pri <sup>2</sup> /	“maggot”	CIE
1207	/p <sup>h</sup> ri <sup>2</sup> /	“fruit”	
806	/pa <sup>2</sup> /	“have, possess”	CAE
1681	/ʔic <sup>2</sup> p <sup>h</sup> a <sup>2</sup> ʔe: <sup>1</sup> /	“some” (people)	
1108	/pa: <sup>1</sup> fa: <sup>3</sup> /	“tortoise” (land)*	CAE
596b	/p <sup>h</sup> a: <sup>1</sup> /	“peel” (egg)	

/p/, /b/

1369	/pi: <sup>3</sup> /	“year” *	CIE
88	/bi: <sup>3</sup> /	“gall bladder”*	
1054	/puk <sup>2</sup> pak <sup>2</sup> /	“owl”	CAE
1315	/bɔt <sup>2</sup> c <sup>h</sup> a:j <sup>1</sup> /	“cloud”	
627	/puŋ <sup>3</sup> ʔo:m <sup>3</sup> /	“bucket”	CAE
687	/bɣ:ŋ <sup>3</sup> /	“loaf-shape”*	

/p/, /m/

633a	/pʰl³/	“spill”	CAE
1281	/mul³/	“silver”	
806	/pa²/	“have”	CAE
1649	/mi²/	“you” (2S)	
895	/pʰ² tiŋ³/	“play instrument”	CAE
1684	/su² mʰ²/	“what?”	

/b/, /m/

669	/be:³/	“beam, rafter”	CAE
345	/me:¹/	“mother” *	
88	/bi:³/	“bi:³” *	CAE
1649	/mi²/	“you (2S)”	
794	/bɔn²/	“evade”	CAE
1252	/ma:n²/	“wither”	

/pʰ/, /f/

1649a	/pʰaj³/	“you (2d)”	CIE
491	/faj³/	“whip”	
1441	/pʰal³ p.tup²/	“fold” (v)	CAE
1037	/fa:l³/	“bark” (dog)	

/m/, /n/

362	/me <sup>2</sup> /	“husband” <sup>73</sup>	CIE
570	/ne <sup>2</sup> /	“meat” <sup>74</sup>	
958	/mɔj <sup>3</sup> /	“ox”	CAE
1655b	/nuaj <sup>3</sup> /	“there”	
542	/muak <sup>3</sup> /	“shirt”	CAE
636	/no:k <sup>1</sup> /	“(be) full”	
1330	/su <sup>1</sup> ma <sup>2</sup> /	“wind”	CAE
726	/s.net <sup>2</sup> /	“needle”	

/n/, /ɲ/

1081	num <sup>3</sup>	“incubate, set on” (eggs)	CAE
457	ɲum <sup>3</sup> sel <sup>3</sup>	“thank”	
636	no:k <sup>1</sup>	“full”	CAE
320	ɲa:p <sup>1</sup>	“difficult”	
570	ne <sup>2</sup>	“meat”	CAE
546	ɲa <sup>2</sup>	“cloth worn by a woman”	

/ɲ/, /ŋ/

924	/ɲan <sup>3</sup> /	“amulet, charm”	CAE
134	/ŋaŋ <sup>3</sup> /	“hear”	
467	/ɲel <sup>3</sup> /	“grumble, complain”	CAE
1305	/ŋal <sup>3</sup> /	“fire”	
1551	/ɲɤk <sup>2</sup> /	“sticky”	CAE
1460	/ŋɤk <sup>2</sup> /	“break”	

<sup>73</sup> There is a Tai Lue word /mee<sup>4</sup>/ “wife” and /mee<sup>5</sup>/ or /mɛɛ<sup>5</sup>/ “mother” (Hudak 1996: 544, 546); in this case, Muak Sa-aak does have a word /me:<sup>1</sup>/ “mother” which may be borrowed from Tai Lue; however, Tai Lue “mother” or “wife” does not seem to be the likely source of Muak Sa-aak /me<sup>2</sup>/ “husband”.

<sup>74</sup> Possible borrowed word from Tai Lue.



/f/, /w/

763	/fɤj <sup>1</sup> s.ŋɔ <sup>2</sup> /	“winnow” (n)	CAE
1405	/ʔi: <sup>3</sup> wɤj <sup>1</sup> /	“return, go back”	
820	/fe: <sup>3</sup> /	“buy”	CAE
1519	/wa: <sup>1</sup> /	“wide”	
745	/fun <sup>1</sup> /	“fertile soil”	CAE
1430	/wɤl <sup>3</sup> /	“throw”	
1037	/fa:l <sup>3</sup> /	“bark” (as dog)	CAE
420	/wɤl <sup>3</sup> k.tit <sup>2</sup> /	“abandon”	

/t/, /d/

790	/ta:ŋ <sup>3</sup> /	“birdlime”	CAE
1396	/da:ŋ <sup>1</sup> /	“spot” *	
790	/ta:ŋ <sup>3</sup> /	“birdlime”	CAE
133	/duam <sup>3</sup> /	“look at, watch”	
1509	/tɛk <sup>2</sup> /	“be small”	CAE
1526	/dɛt <sup>2</sup> /	“flatten”	
1426	/tun <sup>3</sup> /	“hold” (v)	CAE
442	/dɤŋ <sup>3</sup> /	“be silent”	

/t/, /t<sup>h</sup>/

327	/ti <sup>2</sup> /	“self”	CIE
50	/t <sup>h</sup> i <sup>2</sup> /	“arm”	
783	/to:j <sup>3</sup> /	“head of arrow”	CIE
16	/t <sup>h</sup> o:j <sup>3</sup> /	“lip”	
1390	/taŋ <sup>1</sup> tɔ <sup>2</sup> /	“back” (of something)	CIE
1662	/taŋ <sup>1</sup> t <sup>h</sup> ɔ <sup>2</sup> /	“up” <sup>75</sup>	

<sup>75</sup> The first word only (/taŋ<sup>1</sup>/) of both items in this pair is a borrowed word from Tai Lue.

/d/, /n/

1526	/dɛt <sup>2</sup> /	“flatten”	CAE
117	/p <sup>h</sup> .net <sup>2</sup> /	“grunt (from effort)”	
133	/duam <sup>3</sup> /	“look at, watch (far)”	CAE
801	/niaŋ <sup>3</sup> /	“fishtrap”	
1505	/dɣŋ <sup>3</sup> /	“cease, stop”	CAE
435	/nɣn <sup>3</sup> /	“speak”	

/s/, /c/

1310	/si <sup>2</sup> /	“firewood”	CIE
702	/ci <sup>2</sup> /	“act, do”	
1151	/sum <sup>3</sup> ʔul <sup>3</sup> /	“spider's web”	CAE
380	/cum <sup>3</sup> /	“friend”	
900	/sɛp <sup>2</sup> /	“play” (v)	CAE
1434	/cak <sup>2</sup> /	“pull” *	

/s/, /c<sup>h</sup>/

1599	/sip <sup>2</sup> /	“ten” *	CIE
1425	/c <sup>h</sup> ip <sup>2</sup> /	“pick up” <sup>76</sup>	
1065	/p.sim <sup>3</sup> /	“claw”	CAE
1041	/c <sup>h</sup> im <sup>3</sup> /	“bird”	
1684b	/sɣ <sup>2</sup> /	“what?”	CAE
1347	/c <sup>h</sup> a <sup>2</sup> /	“light”	

<sup>76</sup> There is a Tai Lue word, /yip<sup>1</sup>/ “pick up, hold in the hand” (Hudak 1996: 1193).

/c/, /c<sup>h</sup>/

63	/cu:ŋ <sup>3</sup> /	“leg”	CIE
1244	/c <sup>h</sup> u:ŋ <sup>3</sup> /	“cotton”	
1434	/cak <sup>2</sup> /	“pull” *	CIE
1202	/c <sup>h</sup> ak <sup>2</sup> /	“seed”	
1676	/cu: <sup>3</sup> /	“towards”	CAE
255	/c <sup>h</sup> u: <sup>3</sup> /	“know”	

/h/, /s/

18a	/hɤ:k <sup>1</sup> /	“gums” *	CAE
1395	/so:t <sup>1</sup> /	“bump” (n)	
193	/hiaŋ <sup>2</sup> /	“thin”	CAE
929	/suaŋ <sup>2</sup> /	“sacrifice”	
423	/hɛl <sup>3</sup> /	“avoid” (a person)	CAE
457	/ɲum <sup>3</sup> sɛl <sup>3</sup> /	“thank”	

/ʔ/, /h/

974	/ʔɛl <sup>3</sup> /	“chicken”	CIE
423	/hɛl <sup>3</sup> /	“avoid”	
348a	/ʔiam <sup>3</sup> pua <sup>1</sup> /	“father’s younger brother” <sup>77</sup>	CAE
193	/hiaŋ <sup>2</sup> /	“(be) thin”	
780	/ʔa:k <sup>1</sup> /	“bow (hunting)”	CAE
18a	/hɤ:k <sup>1</sup> /	“gums”	

<sup>77</sup> The second syllable of this, /pua<sup>1</sup>/ is borrowed from Tai Lue.

/c/, /j/

626	/p.ca <sup>2</sup> /	“basket”	CIE
624	/p.ja <sup>2</sup> /	“bag”	
63	/cu:ŋ <sup>3</sup> /	“leg”	CAE
1639	/jɣŋ <sup>3</sup> /	“many”	
1434	/cak <sup>2</sup> /	“pull” *	CAE
1497	/jet <sup>2</sup> /	“quench, extinguish”	

/k/, /k<sup>h</sup>/

1650a	/kaj <sup>3</sup> /	3D “they” (dual)	CIE
571	/k <sup>h</sup> aj <sup>3</sup> /	“fat” (from cow only)	
1498a	/kat <sup>2</sup> /	“burn” (tr.)	CIE
1437	/k <sup>h</sup> at <sup>2</sup> /	“steer” (v)	
1079	/ko: <sup>1</sup> /	“peck”	CIE
717	/k <sup>h</sup> o: <sup>1</sup> /	“chop into pieces”	

/k/, /ʔ/

1653	/ke <sup>2</sup> /	“they (3PL)”	CIE
1651	/ʔe <sup>2</sup> /	“we (incl.) (1PL)”	
1650a	/kaj <sup>3</sup> /	“they (dual) (3D)”	CIE
1648a	/ʔaj <sup>3</sup> /	“I (dual) (1D)”	
725	/kual <sup>3</sup> /	“sew”	CIE
502	/ʔual <sup>3</sup> /	“lead, guide (v)”	

/k/, /ŋ/

662	/ka:ŋ³/	“house”	CIE
1565	/ŋa:ŋ³/	“sweet”	
252	/kut²/	“think” <sup>78</sup>	CIE
1424	/ŋut²/	“catch” (object in air)	
1544	/ka:j¹/	“hard”	CAE
741	/ŋa:j¹ ŋam³/	“rubbish”	

/l/, /r/

1243a	/lo:c¹/	“rattan/ cane”	CIE
1482	/ro:c¹/	“leak” (v)	
1488	/la:m³/	“dry out”	CIE
833	/ra:m³/	“lend”	
1556	/laŋ³/	“black” <sup>79</sup>	CIE
607	/raŋ³/	“smoked” (meat)	

Final /-m/, /-n/

1488	/la:m³/	“dry out”	CIE
1513	/la:n³/	“long”	
1041	/c <sup>h</sup> im³/	“bird”	CAE
1236b	/c <sup>h</sup> uam³ c <sup>h</sup> in³/	“cooked rice”	
1081	/num³/	“incubate, set on” (eggs)	CAE
435	/nɿn³/	“speak”	

<sup>78</sup> There is a Tai Lue word /xit¹/ “to think” (Hudak 1996: 1124); /x/ in Tai Lue is usually /k<sup>h</sup>/ in Muak Sa-aak.

<sup>79</sup> In Tai Lue, “black” is /dam¹/ (Hudak 1996: 163).

Final /-n/, /-ŋ/, /-l/

329	/p <sup>h</sup> ɲn <sup>3</sup> /	“woman”	CIE
1431	/p <sup>h</sup> ɲŋ <sup>3</sup> /	“shoot”	
1071	/p <sup>h</sup> ɲl <sup>3</sup> /	“fly”	

Final /-n/, /-ŋ/

329	/p <sup>h</sup> ɲn <sup>3</sup> /	“woman”	CIE
1431	/p <sup>h</sup> ɲŋ <sup>3</sup> /	“shoot”	
177	/krɲ:n <sup>1</sup> /	“(be) lying down”	CAE
1517a	/k <sup>h</sup> rɲŋ <sup>3</sup> /	“(be) fat”	
435	/nɲn <sup>3</sup> /	“speak”	CAE
1322	/s.mɲŋ <sup>3</sup> /	“star”	

Final /-ŋ/, /-ŋ/

328	/pu <sup>1</sup> k <sup>h</sup> uŋ <sup>3</sup> /	“man (male)”	CAE
740	/k <sup>h</sup> u:ŋ <sup>3</sup> /	“dig (in ground)”	
713	/t <sup>h</sup> aŋ <sup>3</sup> /	“cut down (tree)”	CAE
708	/saw <sup>1</sup> t <sup>h</sup> ɛŋ <sup>3</sup> /	“bellows”	
15	/p.tɲŋ <sup>3</sup> /	“mouth”	CAE
694	/t.kuŋ <sup>3</sup> /	“stool”	

Final /-p/, /-t/

1635	/k <sup>h</sup> ap <sup>2</sup> /	“enough”	CIE
1437	/k <sup>h</sup> at <sup>2</sup> /	“steer (v)” <sup>80</sup>	
1425	/c <sup>h</sup> ip <sup>2</sup> /	“pick up” <sup>81</sup>	CIE
1119	/c <sup>h</sup> it <sup>2</sup> /	“head louse”	
1407	/lup <sup>2</sup> /	“enter, go in”	CIE
1454	/lut <sup>2</sup> /	“strip off (bark)”	

<sup>80</sup> There is a Tai Lue word /xap<sup>1</sup>/ “to chase” (Hudak 1996: 1083).

<sup>81</sup> There is a Tai Lue word, /yip<sup>1</sup>/ “pick up, hold in the hand” (Hudak 1996: 1193).

Final /-t/, /-c/

598	/ro:t <sup>1</sup> /	“strain (food)”	CIE
1482	/ro:c <sup>1</sup> /	“leak (v)”	
921	/p.sat <sup>2</sup> /	“curse”	CAE
1274	/p.sac <sup>2</sup> /	“sand”	
277a	/ra:t <sup>1</sup> /	“afraid”	CAE
1278	/lo <sup>2</sup> la:c <sup>2</sup> /	“mud”	

Final /-c/, /-k/

1009	/su:c <sup>1</sup> /	“mouse”	CIE
180	/su:k <sup>1</sup> /	“be sated”	
1482	/ro:c <sup>1</sup> /	“leak (v)”	CAE
1107	/ʔ.ro:k <sup>1</sup> /	“toad”	
1243a	/lo:c <sup>1</sup> /	“rattan/ cane”	CAE
987	/le:k <sup>1</sup> /	“pig”	

## Vowels

This section will give evidence of contrasts between suspicious vowel pairs. For each pair, evidence of contrast in the form of minimal pairs is provided, labeled as Contrast in Identical Environments (CIE); when this is not available, Contrast in Analogous Environments (CAE) is provided. In the case of no contrast, they are labeled as CD, Complementary Distribution.

Words marked with an asterisk \* are borrowed from Tai Lue.

/i/, /e/

46	/li <sup>2</sup> /	“penis”	CIE
1422	/le <sup>2</sup> /	“take”	
1649	/mi <sup>2</sup> /	“you (2S)”	CIE
362	/me <sup>2</sup> /	“husband”	
425	/pet <sup>2</sup> k.tit <sup>2</sup> /	“different”	CAE
1261	/k.t <sup>h</sup> et <sup>2</sup> /	“ground, land”	

/i/, /ɛ/

239	/ʔim <sup>3</sup> /	“(be) alive”	CIE
860	/ʔɛm <sup>3</sup> /	“carry (child) on back”	
1649	/mi <sup>2</sup> /	“you (2S)”	CIE
269	/mɛ <sup>2</sup> /	“laugh”	
327	/ti <sup>2</sup> /	“self”	CIE
1657	/tɛ <sup>2</sup> /	“near”	
825	/k <sup>h</sup> ij <sup>3</sup> k <sup>h</sup> a:p <sup>1</sup> /	“price”	CAE
18	/k <sup>h</sup> ɛŋ <sup>3</sup> /	“tooth” <sup>82</sup>	

<sup>82</sup> The Tai Lue word for “tooth” is /xew<sup>3</sup>/ (Hudak 1996: 1104).



/e/, /ɛ/

362	/me <sup>2</sup> /	“husband” <sup>83</sup>	CIE
269	/mɛ <sup>2</sup> /	“laugh”	
1422	/le <sup>2</sup> /	“take”	CIE
1691	/lɛ <sup>2</sup> /	“and” *	
1261	/k.t <sup>h</sup> et <sup>2</sup> /	“ground”	CAE
773	/p <sup>h</sup> et <sup>2</sup> ʔo:m <sup>3</sup> ʔu <sup>2</sup> /	“milk”	

This contrast is questionable, especially as #1691 is a borrowed word from Tai Lue. In general, /e:/ is seen in words with long vowels, /ɛ/ is seen in words with short vowels, and /e/ is uncommon in the data. The sound [ɛ:] is not phonemic. However, when various sounds were checked with speakers by rhyming, /e/ and /ɛ/ were identified as different.

/ɛ/, /a/

965	/pɛ <sup>2</sup> /	“goat” *	CIE
806	/pa <sup>2</sup> /	“have”	
1091	/ʔɛŋ <sup>2</sup> /	“crab”	CIE
102	/ʔaŋ <sup>3</sup> /	“excrement”	
3	/pɾɛŋ <sup>3</sup> /	“head”	CAE
982	/t.pɾaŋ <sup>3</sup> /	“horse”	
1628	/lɛt <sup>2</sup> li: <sup>1</sup> /	“subtract, take away”	CAE
1400	/lat <sup>2</sup> /	“go down”	

<sup>83</sup> There is a Tai Lue word /mee<sup>4</sup>/ “wife” and /mee<sup>5</sup>/ or /mɛɛ<sup>5</sup>/ “mother” (Hudak 1996: 544, 546); in this case, Muak Sa-aak does have a word /me:<sup>1</sup>/ “mother” which may be borrowed from Tai Lue; however, Tai Lue “mother” or “wife” does not seem to be the likely source of Muak Sa-aak /me<sup>2</sup>/ “husband”.

/a/, /ʌ/

836	/rap <sup>2</sup> /	“accept, receive” *	CIE
802	/rɿp <sup>2</sup> /	“fishing net”	
1330	/su <sup>1</sup> ma <sup>2</sup> /	“wind”	CIE
1684	/su <sup>2</sup> mɿ <sup>2</sup> /	“what?”	
249	/jam <sup>3</sup> /	“die”	CIE
1639	/jɿŋ <sup>3</sup> /	“many”	
1400	/lat <sup>2</sup> /	“go (down)”	CIE
1537	/lɿp <sup>2</sup> /	“sharp”	

/ɿ/, /ʉ/

1684b	/sɿ <sup>2</sup> /	“what?”	CIE
712	/su <sup>2</sup> /	“wood”	
1403	/tu <sup>1</sup> k <sup>h</sup> ɿt <sup>2</sup> /	“remain, stay”	CAE
1374	/t.k <sup>h</sup> ʉ <sup>2</sup> /	“day after tomorrow”	
730	/tɿŋ <sup>1</sup> t <sup>h</sup> a:k <sup>1</sup> /	“(be) torn”	CAE
421	/tu <sup>n</sup> <sup>1</sup> /	“flee, run away from”	

In #1374, /t.k<sup>h</sup>ʉ<sup>2</sup>/, there is phonetically a glottal stop final consonant. However, in the data, /ʉ/ does not occur with phonemic stop final consonants, and /ɿ/ occurs very rarely in open syllables, although it is not quite a complementary distribution.

/a/, /ɔ/

141	/kək <sup>2</sup> /	“bite” (v) <sup>84</sup>	CIE
622	/kɔk <sup>2</sup> /	“cup” *	
346	/maj <sup>3</sup> k <sup>h</sup> uj <sup>3</sup> /	“elder brother”	CIE
959	/mɔj <sup>3</sup> k <sup>h</sup> uj <sup>3</sup> /	“bull”	
1347	/c <sup>h</sup> a <sup>2</sup> /	“light”	CIE
991	/c <sup>h</sup> ɔ <sup>2</sup> /	“dog”	
517	/t.pra <sup>2</sup> /	“steal”	CAE
818	/prɔ <sup>2</sup> /	“cowrie shell”	
1066	/t <sup>h</sup> am <sup>3</sup> /	“egg”	CAE
865	/k <sup>h</sup> ɔn <sup>3</sup> li: <sup>1</sup> /	“unload”	

/ɔ/, /o/

1648	/ʔɔ <sup>2</sup> /	“I” (1s)	CIE
1133	/ʔo <sup>2</sup> /	“cricket”	
1262	/kɔŋ <sup>3</sup> /	“mountain”	CAE
1093	/koŋ <sup>2</sup> /	“clam”	
642	/kɔp <sup>2</sup> /	“cover”	CAE
716	/muɔj <sup>3</sup> pok <sup>2</sup> /	“axe”	

<sup>84</sup> The Tai Lue for this is /xop<sup>1</sup>/; there is a Thai word /kat/ which also means “bite”; the final consonants are different. Both /kək<sup>2</sup>/ and /kat<sup>2</sup>/ were elicited for “bite” in this data, but usually /kək<sup>2</sup>/.

/o/, /u/

1133	/ʔo <sup>2</sup> /	“cricket”	CIE
345	/ʔu <sup>2</sup> /	“mother”	
716	/muɯj <sup>3</sup> pok <sup>2</sup> /	“axe”	CAE
1250	/puk <sup>2</sup> /	“rotten”	
580	/c <sup>h</sup> uam <sup>3</sup> pol <sup>3</sup> /	“evening meal”	CAE
603	/p <sup>h</sup> ul <sup>3</sup> /	“cook”	
803	/t.koŋ <sup>3</sup> bet <sup>2</sup> /	“fishing line” <sup>85</sup>	CAE
694	/t.kuŋ <sup>3</sup> /	“stool”	

/i:/, /e:/

1661	/ta: <sup>1</sup> ʔi: <sup>2</sup> /	“west”	CIE
1659	/ta: <sup>1</sup> ʔe: <sup>2</sup> /	“south”	
1181	/ci: <sup>1</sup> /	“sap”	CAE
1393	/ce: <sup>3</sup> /	“edge”	
1019	/k <sup>h</sup> i:t <sup>1</sup> /	“bat (animal)”	CAE
150	/t <sup>h</sup> e:t <sup>1</sup> /	“sit”	

/a:/, /ɤ:/

58	/t <sup>h</sup> i: <sup>2</sup> puɯc <sup>2</sup> ta:k <sup>1</sup> /	“palm (of hand)”	CAE
625	/tɤ:k <sup>1</sup> /	“box”	
833	/ra:m <sup>3</sup> /	“lend”	CAE
1493	/rɤ:m <sup>1</sup> /	“fade”	
1264	/la: <sup>1</sup> /	“cliff”	CAE
1100	/t.lɤ: <sup>1</sup> /	“lizard”	

<sup>85</sup> /bet<sup>2</sup>/ is borrowed from Tai Lue.

/ɣ:/, /w:/

1561	/lɣ:ŋ³/	“yellow” *	CIE
1511	/lw:ŋ³/	“high”	
1420	/cɣ:ŋ²/	“slow”	CAE
732	/cw:ŋ³/	“leg”	
788	/t.kʰɣ:m³/	“club, cudgel”	CAE
284	/tʰw:m³/	“love (v)”	

/o:/, /u:/

500	/tʰo:³/	“send (someone)”	CIE
1484	/tʰu:³/	“smear”	
1452	/po:k¹/	“pierce”	CAE
172	/ku:k¹/	“bend down, stoop”	
769	/cʰo:m³/	“herd, tend”	CAE
1069	/su:m³/	“nest”	

The sound [ɔ:] actually occurred in very few items (15 items), of which most are open syllables, and most of the rest are Tai Lue borrowed words. Open syllables of this are in CD with /ua/, which occurred in closed syllables only, but was far more common. Therefore /ua/ was chosen as the phoneme.

[ɔ:], /ua/

14	[ʔɔ:¹]	/ʔua¹/	“cheek”	CD
131	[lɔ:³]	/lua³/	“see”	
1481	[s.rɔ:³]	/s.rua³/	“drip”	
734	[t.ʔuak¹]	/t.ʔuak¹/	“broom”	
847	[s.ruaj³]	/s.ruaj³/	“path, road”	
1555	[s.pual³]	/s.pual³/	“white”	

However, there are also two exceptions:

142	[krɔ:c¹]	“crunch”
489	[kɔ:k¹ ke:k¹]	“tickle”

These do not fit the pattern of complementary distribution, and do not appear to be borrowed words.

/a/, /a:/

249	/jam <sup>3</sup> /	“die”	CIE
272	/ja:m <sup>3</sup> /	“cry, weep”	
134	/ŋaŋ <sup>3</sup> /	“hear”	CIE
1565	/ŋa:ŋ <sup>3</sup> /	“sweet”	
607	/raŋ <sup>3</sup> /	“smoked”	CIE
1188	/ra:ŋ <sup>3</sup> /	“flower”	
798a	/k <sup>h</sup> a <sup>2</sup> /	“fish”	CIE
877a	/k <sup>h</sup> a: <sup>2</sup> /	“slave”*	

/i/ and /i:/

1458a	/ci <sup>2</sup> /	“do/ make”	CIE
166	/ci: <sup>2</sup> /	“point”*	
823	/k <sup>h</sup> iŋ <sup>3</sup> /	“(be) expensive”	CIE
1231a	/k <sup>h</sup> i:ŋ <sup>3</sup> /	“ginger”*	
533	/rim <sup>3</sup> /	“village”	CAE
1136a	/pri:ŋ <sup>3</sup> /	“leech (water)”*	

/o/ and /o:/

474	/to <sup>2</sup> /	“persuade”	CAE
37	/k.to: <sup>2</sup> /	“navel”	
1034	/ŋoŋ <sup>3</sup> c <sup>h</sup> a:ŋ <sup>3</sup> /	“elephant’s trunk” *	CAE
1553	/ŋo:ŋ <sup>3</sup> /	“be cold”	
654	/pɣ <sup>1</sup> k <sup>h</sup> on <sup>3</sup> /	“knot”	CAE
1033	/tɣ <sup>1</sup> k <sup>h</sup> o:m <sup>3</sup> /	“mane (of horse)”	

/ɣ/ and /ɣ:/

1153	/p.nɣm <sup>3</sup> /	“termite hill”	CAE
268	/so: <sup>1</sup> nɣ:m <sup>3</sup> /	“rejoice”	
1639	/jɣŋ <sup>3</sup> /	“many”	CAE
764	/p <sup>h</sup> ɣ <sup>1</sup> jɣ:l <sup>3</sup> /	“winnow, throw in air”	

/u/ and /u:/

380	/cum <sup>3</sup> /	“friend”	CAE
1542	/pɣ <sup>1</sup> cu:l <sup>3</sup> /	“smooth	
693	/taŋ <sup>1</sup> kuŋ <sup>3</sup> /	“chair”	CAE
670	/pu:n <sup>3</sup> ka:ŋ <sup>3</sup> /	“floor” <sup>86</sup>	

<sup>86</sup> /pu:n<sup>3</sup>/ is borrowed from Tai Lue.

# RESUME

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