A PHONOLOGICAL STUDY OF PA-O (TAUNGTHU) AT BAN HUAY SALOP, TAMBON HUAY PHA, MUANG DISTRICT, MAE HONG SON PROVINCE

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This thesis was an attempt to present a Phonological Study of Pa-O (Taungthu) at Ban Huay Salop, Tambon Huay Pha, Muang District, Mae-Hong Son Province by using the Tagmemics theory.

The result of this study shows that the phonological system is composed of twenty consonant phonemes / p, p^h, b, t, t^h, d, c, c^h, k, k^h, ʔ, s, h, m, n, ŋ, l, r, w, j /, eleven vowel phonemes / i, e, ɛ, a, ɯ, ə, u, o, ɔ, a^i, a^u /, and four tonemes: high rising, high falling, mid-level, and low falling tone. The syllable structure is $C_1(C_3)(C_4)V_1^T(C_2)$. There are three types of syllables: presyllable, minor syllable and major syllable. There are three types of phonological words: monosyllabic words, disyllabic words and trisyllabic words. Intonation is caused by tone of the final syllable of the statement either falling or rising.

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วิทยานิพนธ์ฉบับนี้มีจุดมุ่งหมายเพื่อศึกษาระบบเสียงภาษาปะโอ(ตองสู) บ้านห้วยซลอบ ตำบลห้วยผา อำเภอเมือง จังหวัดแม่ฮ่องสอนโดยใช้ทฤษฎีแทคมีมิค

ผลการศึกษาพบว่าหน่วยเสียงพยัญชนะมี 20 หน่วยเสียง คือ / p, p^h, b, t, t^h, d, c, c^h, k, k^h, ʔ, s, h, m, n, ŋ, l, r, w, j / หน่วยเสียงสระมี 11 หน่วยเสียง คือ (i, e, ɛ, a, ɯ, ə, u, o, ɔ, a^i, a^u) หน่วยเสียงวรรณยุกต์มี 4 หน่วยเสียง คือ วรรณยุกต์สูงขึ้น วรรณยุกต์สูงตก วรรณยุกต์กลางระดับและวรรณยุกต์ต่ำตก โครงสร้างพยางค์ประกอบด้วย$C_1(C_3)(C_4)V_1^T(C_2)$ พยางค์ประกอบด้วย พยางค์นำ พยางค์หลักและพยางค์รอง ลักษณะคำประกอบด้วยคำพยางค์เดียว คำสองพยางค์และคำสามพยางค์ ทำนองเสียงมีสองประเภทคือ ทำนองเสียงขึ้นและทำนองเสียงตก ทั้งนี้ขึ้นอยู่กับระดับเสียงวรรณยุกต์ของพยางค์สุดท้ายของประโยค

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LIST OF ABBREVIATIONS AND SYMBOLS

C_1	Initial Consonant
C_2	Final Consonant
C_3	Second Member of Consonant Clusters
C_4	Third Member of Consonant Clusters
V_1	Single Vowel
V_2	Second Member of Diphthong
[v']	Vowel length which longer than a short vowel
[v:]	Vowel length which much longer than a short vowel
T	Tone
/ ^{1} /, / ˦ /	High-Rising Tone
/ ^{2} /, / ˥ /	High-Falling Tone
/ ^{3} /, / ˧ /	Mid-Level Tone
/ ^{4} /, / ˩ /	Low-Falling Tone
[^{45}]	Pitch Level of High-Rising Tone
[^{42}]	Pitch Level of High-Falling Tone
[^{33}]	Pitch Level of Mid-Level Tone
[^{21}]	Pitch Level of Low-Falling Tone
/ /	Phonemic Transcription
[ ]	Phonetic Transcription
( )	Optional Appearance of Phoneme
“ ”	Meaning of the Word
[ˈ]	Strong Stress
[ˌ]	Weak Stress
vd.	Voiced
vl.	Voiceless
?	Bound Morpheme

CHAPTER I

INTRODUCTION

1.1 General Information on the Karen

There are many ethnic groups in Thailand. The nine major ethnic groups cited by the Tribal Research Institute (1990: 5) are Karen, Hmong, Lisu, Lahu, Akha, Yao, Lua, Thin and Khmu. According to the Public Welfare Department, Labor and Social Welfare Ministry (1995: 9), the Karen are the largest of the nine groups. There are approximately 353, 110 Karens in Thailand. This number constitutes 41.38 % of the total hilltribe population in the country.

According to Anderson (1981:81), an original homeland of Karens is in the Gobi Desert region of Mongolia, the River of Sand as their ancestors called, where they lived about 4,500 years ago. The Karens and Burmans (Mramma) fled their native southeast Tibet in the face of aggression from both the Tibetans and the Chinese into Burma about 200 BC (Courtauld 1988:49). Karenic settlements in Burma are in the low flat plains of the Irrawaddy, Sittang and Salween deltas, extending into the plain of Tenasserim.

Karens migrated into Thailand before other minorities. Walker (1992:44) counted the Karen among the pre-Tai aboriginal peoples of what is now northern Thailand by the fact that the forefathers of the majority of Karen now in the north arrived from Burma over the past couple of hundred years or so. According to Renard (1980:119-126), during the seventeenth and eighteenth centuries, there were both diplomatic contacts and military conflicts between Khon Muang (northern Thai) and Karen. Later, at the beginning of the nineteenth century, Cao Kawila (who reestablished an independent Northern Thai dynasty in Chiang Mai in 1782) is reported to have forcibly relocated many Karen communities from his far western marches into the Ping valley, often quite close to Chiang Mai Province.

The Karens are plains as well as hill dwellers. Some of the Karens in Thailand can be found in the central plains region, but the majority of them are in the northern and western hill areas.

Karens are generally classified into four major subgroups (Lebar 1964:58).

1. **Sgaw Karen** (S'gaw, Skaw) or / pakaɲɔ cɔkɔ / as they call themselves. The Burmese call them "Bama Kayin" (Burmese Karen). In Thailand they are known as "Yang Khao" (White Karen) by the northern Thai people. They are widely distributed throughout the Irrawaddy and Sittang delta area in Burma and in the western and the northern regions along the Thai-Burmese border in Thailand.

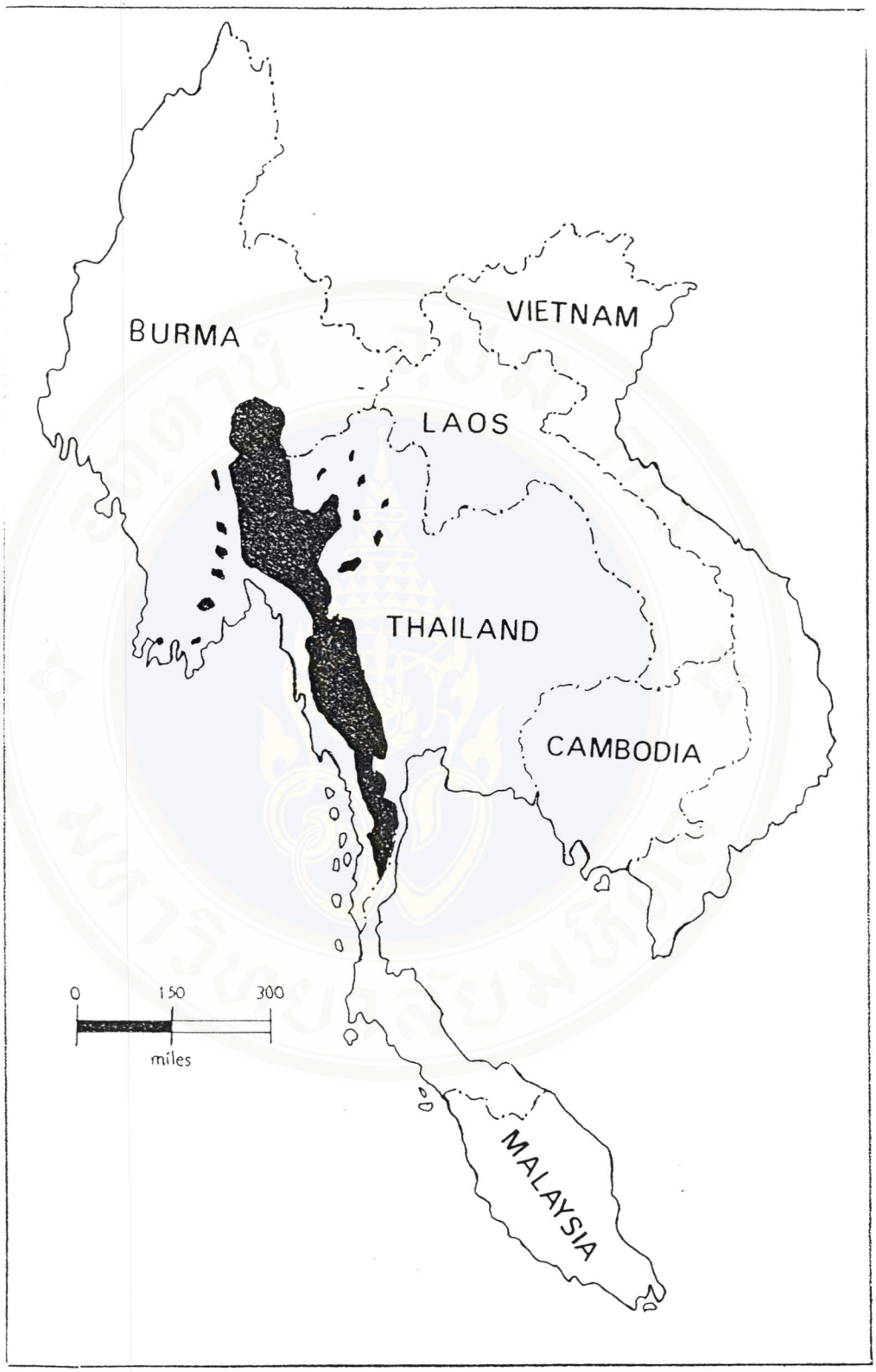
2. Pwo Karen (Pho, Po, P' wo, Pro or Phong) or / pakaɲɔ pʷo / as they call themselves. The Burmese call them "Taliang Kayin" (Mon Karen). In Thailand they are called "Yang Daeng" (Red Karen) by the northern Thai people. In Burma they are concentrated in the Irrawaddy Delta and northern Tenasserim. In Thailand they are found near the Sgaw settlements.

3. Bwe Karen (Bre, B'ghwa) or / bre / as the Sgaw Karen and Pwo Karen call them (Suriya Ratanakul 1998 : 272). The Burmese call them "Kayah", "Kayin-ni" (Red Karen)". They are in Kayah State, an area in the southern Shan State in Burma. They are also found in northern Thailand, especially in Mae Hong Son and Chiang Mai Provinces.

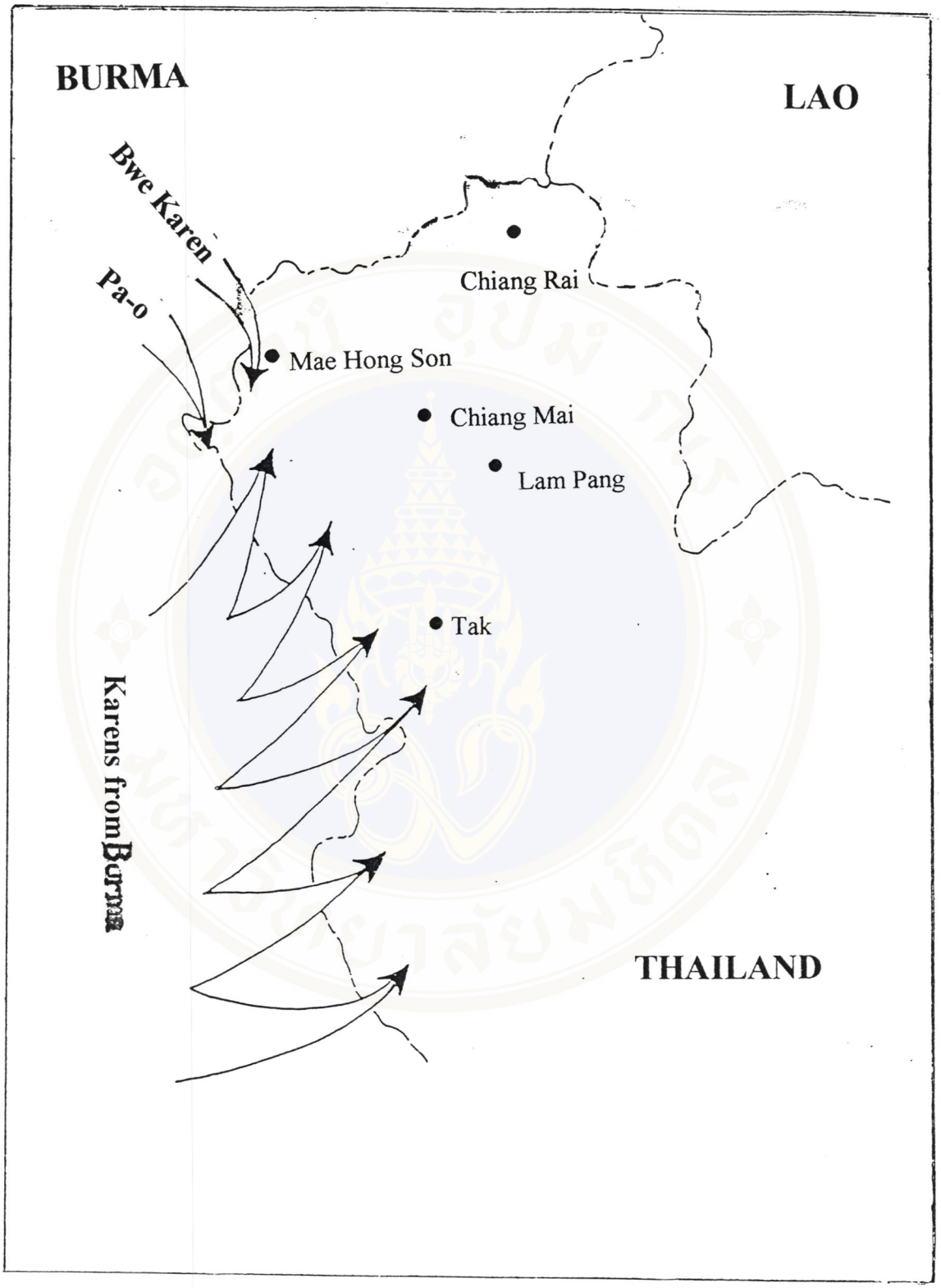
4. Pa-O (Taungthu) or / pá? ʔo / as they call themselves. They are called "Taungthu" (which means hillman) by the Burmese, or "Tong-Su" by the Shan in Burma and Thailand. The name is borrowed from Burmese. Sgaw Karen and Pwo Karen do not call them as / pakaɲɔ / (which means Karen), they call them "/ tɔʔsù /" as a loan word from Burmese.

In this language, /pá? / means to break, and / ʔo / means to pick out. The meaning is according to their belief that the Pa-O and other Karens were sons of a Nagra (a big snake in their fairly tale). After lying, other eggs could break themselves but he, as the youngest one, could not so a hermit had to break his egg and picked him out.

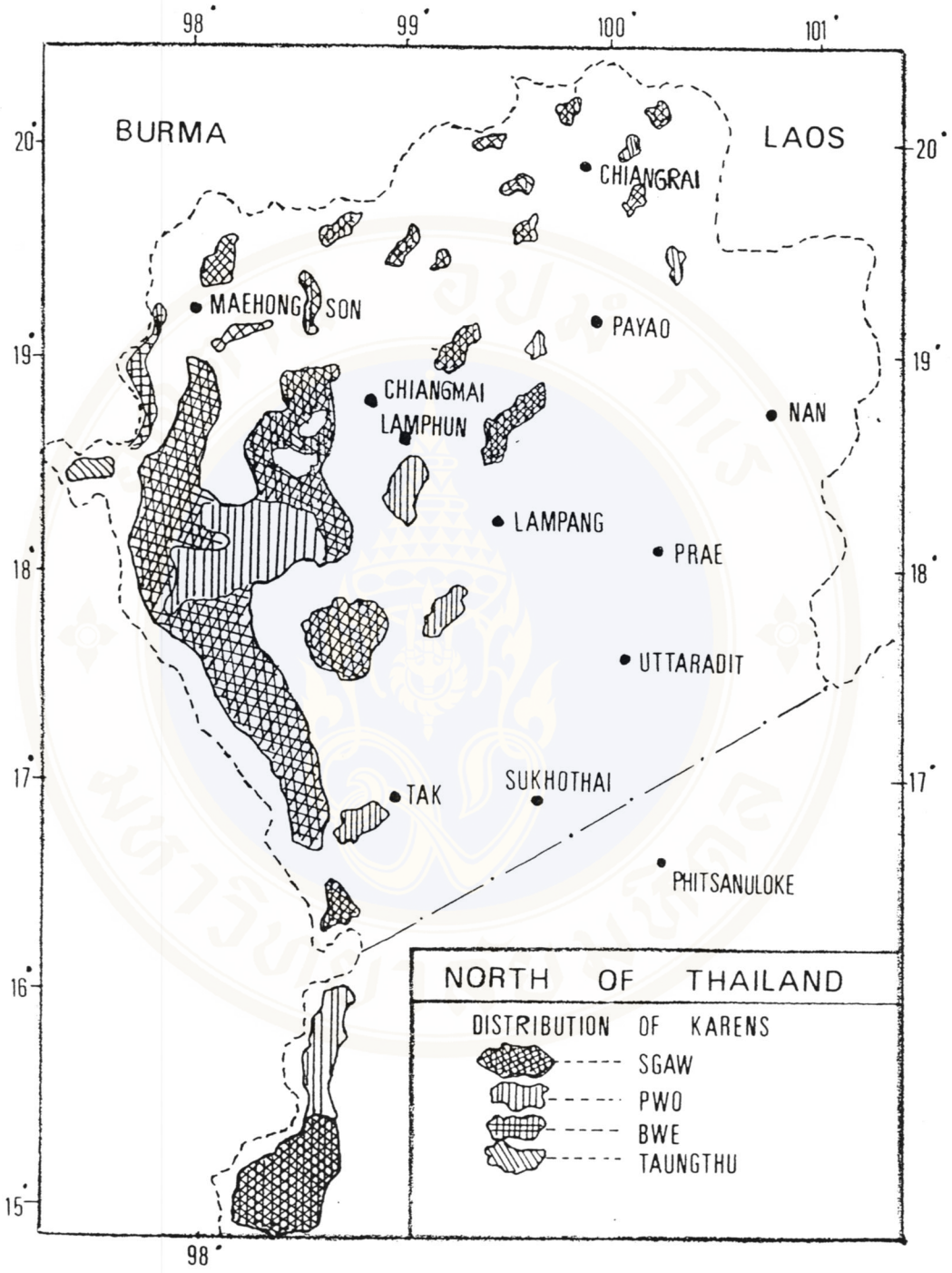
In Burma, they are in the southwestern part of the Shan State, and east of the Gulf of Martaban in Tenasserim. Young (1962:109) reported that a few Pa-O (Taungthu) were found in Mae Hong Son Province in Thailand (five villages). Similary, according to the data collecting on my fieldwork, there are some few Pa-O in Thailand, mostly in Mae Hong Son Province and also, scattered along the Thai-Burmese border in Tak Province. Besides, they are found some in the Lam Phun, Chiang Mai and Chiang Rai Provinces.



Map 1
Location of Karen Population
Source : Adapted from Keys (1979 : 9)



Map 2
The Migration of Karens to the North of Thailand
Source : Adapted from Young (1962:x)



Map 3
The Distribution of Karens in the North of Thailand
Source : Adapted from Young (1962:xii)

1.2 Language Affiliation

The Pa-O language belongs to the Karenic family, which is of Sino-Tibetan stock and is more closely related to Tibeto-Burman than to Sinetic (Benedict 1972:2,128; Lebar 1964:58). However, its relation to the Tibeto-Burman family is still disputed.

Benedict (1972:6) grouped Karen with Tibeto-Burman under the Tibeto-Karen stock whereas Bradley (1979:15) and Matisoff (1973:84) placed Karen under the Tibeto-Burman stock within the Sino-Tibetan superstock. There are some linguistic features, which differentiate the Karenic languages from other languages in the Tibeto-Burman group. For example, the word order in Karen is SVO whereas in other Tibeto-Burman languages, it is SOV (Fraser 1995:159).

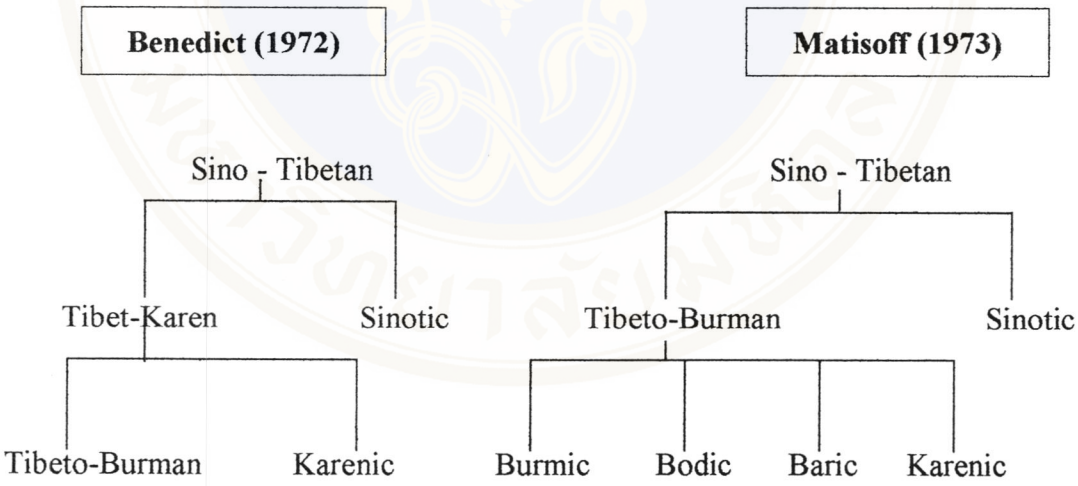


Figure 1: Alternate places of Karenic languages within Sino-Tibetan (Fraser 1995:159)

Karen comprises at least six major languages whose speakers are divided into three main groups by geographical designation: the northern, central, and southern groups. The Pa-O, who lives in the Shan state in Myanmar form the northern group. The central group refers to the Karen language spoken in Kayah State of Myanmar, the adjacent areas in Myanmar and Mae Hong Son Province, Thailand. The southern group has the two largest groups of Karen speakers: the Sgaw and the Pwo as diagrammed below (Fraser 1995:160).

Two varieties of Pa-O (or Taungthu) are spoken in Burma. The northern variety is spoken around Taunggyi. A second, southern variety is spoken around Thaton.

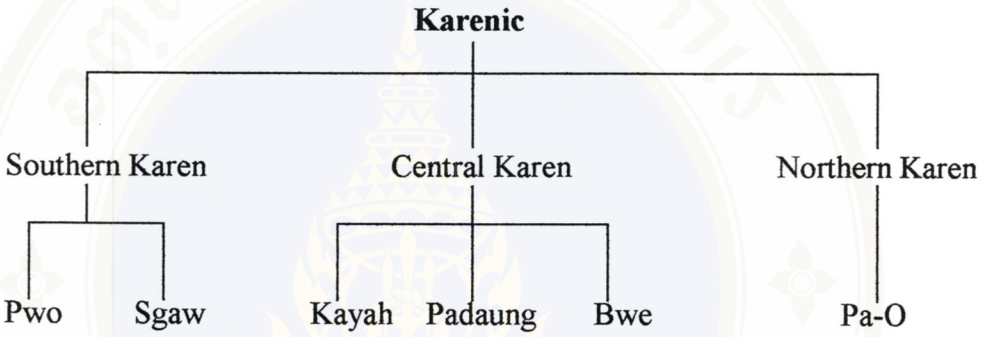


Figure 2: Geographical groupings of Karenic Languages

(Fraser 1995:160)

1.3 Geographical Location

1.3.1 The Pa-O in Thailand

The Pa-O, who number about 200,000, make their principle home near Taunggyi in the Shan State, where they fled during Anawratha's attack on Thaton in the 11th Century (Anderson 1981:81). They are found from Thaton, on the Gulf of Martaban, and reaching north of Taunggyi into the southern Shan State.

It was after Burma became a British colony in 1826 that the Pa-O migrated into Thailand together with Burmese, Shan and Karens. They were employed by the English Teak Trading Company during the Lan Na Period, i.e. during the reigns of Cao Luang Buddhawong (เจ้าหลวงพุทธวงศ์) and Cao Mahotaraprathet (เจ้ามโหตรประเทศ) (1823-1854) (Parichat Ruengwiset 1993 : 30).

According to a document found in Wat Nong Kham (วัดหนองคำ), which located at Chang Moi Street, Muang District, Chiang Mai Province, there were many ethnic groups living near this temple: Pa-O, Shan and Northern Thais. Being Buddhists, they built this temple in 1837. In the history of the temple, most abbots were Pa-O. Today, there are more than twenty Pa-O monks, twenty-five Pa-O novices and fifteen Pa-O people living in this temple. They learn and speak Pa-O. Most Pa-O in Thailand from the Mae Hong Son, Lam Phun, Chiang Mai, Chiang Rai and Tak Provinces and the Pa-O from Taunggyi, Burma, use this place (Wat Nong Kham) as their cultural center. Besides, in the Lam Phun Province, there is an old Pa-O temple called Wat Sri Rong Muang (วัดศรีรองเมือง).

During my field work, I found the Pa-O not only in the Mae Hong Son Province but also in some northern provinces of Thailand: Chiang Rai, Chiang Mai, Tak, and Lam Phun Provinces. About 20 years ago, four Pa-O families migrated from their homeland in Taunggyi to Doi Wa-wi Mountain in the Chiang Rai Province. In the Tak Province, there are Pa-O peoples who migrated from Thaton. They are scattered among other Karen near the Thai-Burmese border in the Tha Song Yang, Mae Sot, and Mae Ramat Districts. They have established the Pa-O People's Liberation Organization. In the Chiang Mai and Lam Phun Provinces, they have mixed with northern Thai families, but some of them can still speak Pa-O language.

1.3.2 The Pa-O in the Mae Hong Son Province

Mae Hong Son is a mountainous northwestern province bordering on Myanmar to the west and north, the Chiang Mai Province to the east, and the Tak Province to the south.

The Mae Hong Son Province covers an area of 12,681 square kilometers. It is divided into 6 districts and 1 subdistrict: Muang, Mae Sariang, Mae La Noi, Pai,

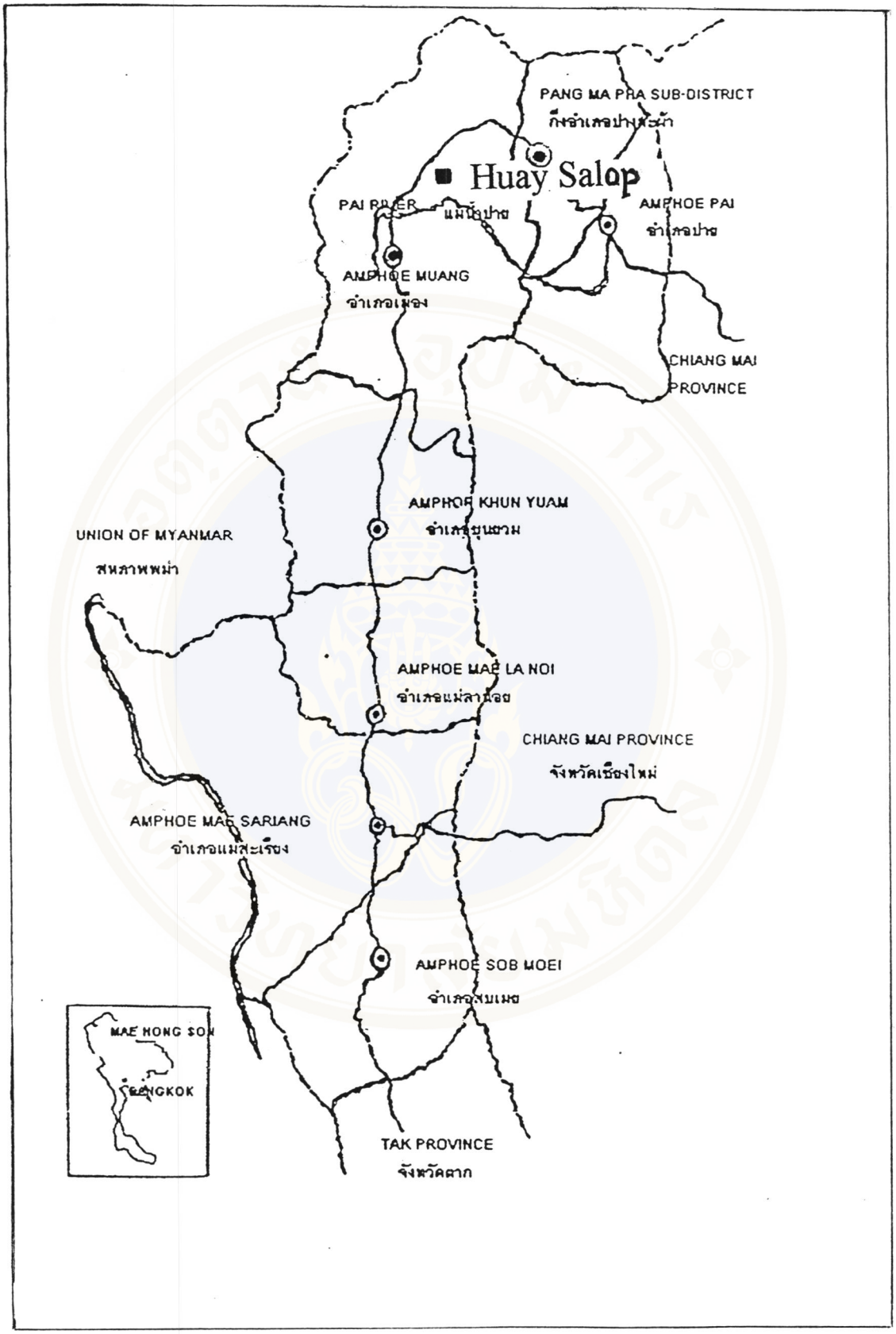
Khun Yuam, Sop Moei and Pang Ma Pha Subdistrict. It can be reached from Chiang Mai either by Highway No. 108 via Mae Sariang, or Highway No. 1095 via Pai, which shortens the distance to some 274 kilometers.

The Pa-O came to the Mae Hong Son Province more than 150 years ago (1823-1854) as employees of the English Teak Trading Company (Parichat Ruengwiset 1993 : 30). In 1962, when General Ne Win staged a military coup and established the Revolutionary Council of Myanmar, some of the Pa-O fled to the Thai-Burmese border and established the Pa-O People's Liberation Organization. After they had been attacked by Khun Sa (the Shan State Army), some of them migrated to the Mae Sariang District. It has been reported that the few Pa-Os who live in Thailand can be found in five villages in the Mae Hong Son Province (Young 1962: 109).

The great Pa-O migration from the Thai-Burmese border to the Mae Hong Son Province took place during the premiership of Prem Tinnasulanontha when the Thai Army expelled the Shan State Army from the border of Thailand. The Pa-O who lived nearby had to move to the villages of Huay Salop (ห้วยซลอบ) and Huay Khan (ห้วยขาน) in the Mae Hong Son Province.

According to my informant (Mr. Prasoet Kamoldecha) and the Residents' Registration Office of Muang District, there are forty-four Pa-O families in the village of Huay Salop (ห้วยซลอบ), thirty families in the village of Mae Suya (แม่สุยะ), Tambon Huay Pha (ห้วยผา), forty families in the village of Huay Khan (ห้วยขาน), and a few families in the Huay Ma-khue Som (ห้วยมะเขือส้ม), Tambon Mok Cam Pae (หมอก-จำแป่), Muang District, Mae Hong Son Provinces.

Figure 3: The Ubosoth of Wat Nong Kham, Chiang Mai Province.



Map 4
Changwat Mae Hong Son Administrative Divisions
Source: Adapted from Documents of the Tourism Authority of Thailand (1993)

1.3.3 The Pa-O in the Village of Huay Salop

- History and Geography

Huay Salop is a Pa-O village, which was established about 20 years ago. Before that, the Pa-O was widely scattered along Thai-Burmese border and in Mae Sariang District, Mae Hong Son Province.

Huay Salop is situated in Tambon Huay Pha, Muang district and 30 kilometers northern to Muang district. It is surrounded by mountains. A small river crosses and divides the village into two parts, a northern part and a southern one.

- Population

According to the records of the secular headman in 1997, the village has 304 inhabitants, consisting of 44 families with 128 Pa-O females, 175 Pa-O males and one Shan male, a religious headman in the temple who married into the village.

Most of the males and some of the females in the village are in contact with the surrounding Thai communities. Most of them have become Thai citizens. There is a Thai government school where most of the children learn Thai. The inhabitants of the village accept the Thai political system and the development projects of the government. The adult inhabitants trade with Thais or work as labourers for Thais.

- Occupation

Most of the Pa-O in the village of Huay Salop are farmers. They earn their living by cultivating upland fields and harvest crops from the forest. They shift their cropping areas from place to place around their village every 4-5 years. The Pa-O dwellers of the wooded hills practice swidden agriculture (slash and burn or shifting cultivation). They mainly grow rice. After the harvest, the rice is stored in granaries. They also grow vegetables (chilies, garlic, onions, pumpkins, peas, and potatoes) and fruit (papayas, corn, bananas and jackfruit). Apart from agriculture they do trade with Thais or work as labourers in restaurants and furniture shops in Bangkok. Their domestic animals include dogs, pigs, and hens.

- Religion

The Pa-O are Buddhists, although most of them still believe in animism. They believe that they adopted Theravada Buddism earlier than the Mon. They practice the *shin-pyu* ceremony in which boys at the age of 9 to 12 become "sons of the Buddha". During the ceremony, the boys are given the saffron-colored robes of the Sangha. They do declare themselves Buddhists who could enunciate the "triple gems" (*Buddha, Dhamma, Sangha*), nor could most follow the formulation of the "five

precepts"(*prohibitions against killing, theft, unlawful sex, lying, and imbibing intoxicants*)

- Housing

The Pa-O houses are of the raised floor varieties, made from wood or bamboo. Roofs are of grass or leaf thatch. Here an entire settlement of 40 households occupies a single structure composed of apartments opening on a central corridor, each with its veranda on the outer side. There are Buddha image shelves as a center of the house. Fireplace, pot, jar, utensils, and equipment are kept outside the house. Animals are kept in pen outside the house. Buddhist temple can be founded in most villages.

- Clothes

The Pa-O is easily recognizable by their colorful bath-towel turbans, which are worn by males and females, children and adults. Men generally wear loose-fitting (baggy) dark-blue or black trousers, a tunic, and a tight-fitting jacket with long sleeves reaching to the wrist of the same color. The women wear a dark-blue or black sarong, a sleeveless blouse of hip length made by sewing together two rectangular pieces of cloth with openings for neck and arms, and a jacket like men. But they are embroidered with colored lines around the neck, arms, along the shoulders, and the mid front sheet.

They wear costumes only on ritual or solemn occasions. Normally they dress like Thais.

Figure 4 : Buddhist' Temple in Huay Salop.

Figure 5: The Extended Thai School in Huay Salop.

Figure 6: Pa-O's House in Huay Salop.

Figure 7: Pa-O People in their Costume Dresses.

Figure 8: Pa-O Girls.

Figure 9 : Pa-O Dance.

1.4 Objective of this Study

The objective of the study is to describe the phonological system of the Pa-O which is spoken in the village of Huay Salop (ห้วยซลอบ) Village, Tambon Huay-Pha (ห้วยผา), Muang District, Mae Hong Son Province, and to make the data available to scholars and others who are interested in this language.

1.5 Benefits of the Study

1.5.1 This study provides information on Pa-O phonology, the history and the way of life of the Pa-O people.

1.5.2 This study is of use to Tibeto-Burman linguistics as it provide additional information on an unexplored Karen dialect.

1.5.3 This study will help minimize the language barrier for those who need to communicate in Pa-O.

1.5.4 This study will help to improve the relationship between local Thais and Pa-O.

1.6 Scope of the Study

1.6.1 This study presents the phonological system of the Pa-O spoken by native speakers in the village of Huay Salop, Tambon Huay-Pha, Muang District, Mae Hong Son Province.

1.6.2 The study is organized as follows:

- Intonation
- the phonological word
- the syllable
- the phoneme

CHAPTER II

LITERATURE REVIEW

Reviews of many important articles are included here to provide a basic overview of the studies that have been done on the Karenic languages.

2.1 Northern Karen: Pa-O

The previous studies of Northern Karen include *Karen Linguistic Studies : Description, Comparison, and Text* by Robert B. Jones (1961) and *Insight Guides Burma* by Anderson (1981).

2.1.1 John G. Anderson.

John G. Anderson, 1981. *Insight Guides Burma*. Anderson (1981:81) notes on his study. That the Pa-o language is an older, purer tongue than standard modern Karen and the written language of the Pa-O is unique.

2.1.2 Robert B. Jones: Pa-O

Robert B. Jones, 1961. *Karen Linguistic Studies : Description, Comparison, and Texts.* Jones presents the northern variety of Pa-O spoken around Taunggyi in Burma. The phonemic systems of this variety are presented briefly as follows:

Consonant Phonemes : There are 20 single consonant phonemes as follows:

	Labial	Alveolar	Palatal	Retroflex	Velar	Glottal
Plosive						
Vl.unasp.	p	t	c		k	ʔ
Vl.asp.	p^h	t^h	c^h		k^h	
Vd.	b	d				
Nasal	m	n			ŋ	
Fricative		s				h
Lateral		l				
Trill				r		
Semi- vowel	w		j			

Jones notes "/h/ has an affricated allophone in free variation with the spirant allophone. /w/ has a labido-dental allophone [v] in initial position, and a post-consonantal allophone which is a nonsyllabic high back rounded vowel, [^{u}] . /j/ has an allophone with spirantal friction [j] in initial position, and a post-consonantal allophone which is a nonsyllabic high front unrounded vowel, [^{i}]."

Final consonants : There are 7 consonant phonemes / p, t, k, ʔ, m, n, ŋ / occur in final position. All are unreleased in final position. The stops /p, t, k/ are somewhat frontier. Final / ŋ / sometimes has weak closure resulting in a lenis nasalized prevelar stop which is in free variation with simple nasalization of the vowel. Final /ʔ/ in unstressed syllables is dropped, but the nucleus retains its proper allophones of position and length. Such unstressed syllables occur only in normal transition with the following syllable. Final stops occur only with high and low tones.

Consonalt Clusters : There are 4 second consonant phonemes / w, j, r, l,/ occurs with initial consonants as consonant clusters as follows :

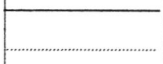
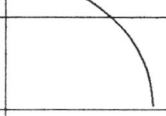
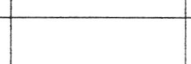
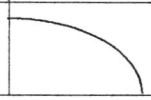
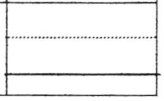
Second and third Consonant	Initial Consonant
w	p b t t^h n c c^h k k^h ŋ ʔ s h l
j	p p^h m t n c^h k k^h ʔ r l
r	p p^h k k^h
l	p b k
rw	p^h k^h

Vowel phonemes : There are 10 single vowel phonemes / i, e, ɛ, y, ə, a, ʉ, u, o, ɔ / and 2 glide vowels / a^{i}, a^{u} / , as follows :

	Front		Central		Back	
	unround	round	unround	round	unround	round
Close	i		y	ʉ		u
Half-Close	e		ə			o
Half-Open	ɛ					ɔ
Open			a			
Glide		a^{i}		a^{u}		

Jones suggests " /ʉ/ is a high back unrounded vowel, founded only in Taungthu deviation from the nine-vowel system of syllabic nuclei of the other five varieties of Karen. /y/ is high central. /o/ is diphthongal, [o^{u}] , but /e/ is monophthongal. The mid central vowel, /ə/, is some what lower when stressed, somewhat higher and fronter when unstressed. The high vowels are all somewhat lower before final stops and nasals. The low central vowel, /a/, is fronter before /i/ , backer before /u/. All nuclei are considerably shorter when followed by a stop."

Tone phonemes : There are four phonemic tones : high, high. falling, mid, and low. Closed syllables occur only with the high and the low tones. In unstressed position the high tone of closed syllables has a some what lower allotone. Similarity, the low tone has a somewhat higher allotone under the same conditions. In the accompanying diagram the relative pitch and contour of the tones in stressed positions are indicated by solid lines. Unstressed allophone of the high and the low tones in closed syllables are indicated by broken lines.

TONE / LEVEL	High		High Falling	Mid level	Low	
	/ ˊ /	/ˊʔ/	/ ˆ /	/ ˉ/	/ ˋ /	/ˋʔ/
H						
M						
L						

2.2 Central Karen

The previous studies of Central Karen languages include *A Grammatical Sketch of Eastern Kayah (Red Karen)* by David Solnit (1986) and *The Phonological Study of Padaung (Long-Necked Karen)* by Sarinya Khammuang (1998).

2.2.1 David Solnit

David Solnit, 1986. *A Grammatical Sketch of Eastern Kayah (Red Karen)*. Solnit describes the phonology and grammar of the Eastern Kayah (Red Karen) language spoken at Khun Huay Dya, the village on the right bank of the Paj river and Huay Sya Thaw, Huay Dya, the villages on the left bank of Paj river, Mae Hong Son Province, Thailand.

Since the present study is focused on phonology, the review of Solnit's work will be confined to Eastern Kayah Phonology as follows:

Consonant Phonemes: There are 21 single consonant phonemes, as follows:

	Labial	Alveolar	Palatal	Retroflex	Velar	Glottal
Plosive						
Vl.unasp.	p	t	c		k	(ʔ)
Vl.asp.	p^h	t^h	c^h		k^h	
Vd.	b	d	(j)			
Nasal	m	n			ŋ	
Fricative		s				h
Continuant	w	l	(j)	r		

Solnit notes "/ j / varies between standard palatal and voiced palatal, also occasionally appearing as a slightly prenasalized alveolar-palatal affricate [^{n}dʑ], especially in the low falling tone.

Vowel Phonemes: There are 10 single vowels / i, e, ɛ, ʌ, a, ɯ, ɤ, u, o, ɔ /.

Tones: There are 4 major tones and one marginal tone.

Description	Tone Stick	Phonetic Transcription
High tone		[^{55}]
High falling tone		[^{52}]
Mid tone		[^{33}]
Low level tone		[^{22}]
Low falling tone		[^{21}]

Solnit mentions about the marginal tone, which is a high-falling tone that "the high-falling tone is quite rare, occurring most often in animal names and some other polysyllabic morphemes." He treats the high-falling tone as an allophone of the high tone. Suriya (1986: XL-XLI) notes that this tone is insignificant because it is predictable, that is, it occurs with a question particle or emphatic sentence.

2.2.2 Sarinya Khammuang

Sarinya Khammuang, 1998. *The Phonological Study of Padaung (Long-Necked Karen).* Sarinya describes the phonology of the Padaung (Long-Necked Karen) spoken at Ban Naisoi, Tambol Pang Mu, Muang District, Mae Hong Son Province as follows:

Consonant Phonemes : There are 22 single consonant phonemes as follows:

	Labial	Alveolar	Palatal	Retroflex	Velar	Glottal
Plosive						
Vl.unasp.	p	t	c		k	ʔ
Vl.asp.	p^h	t^h	c^h		k^h	
Vd.	b	d	j		g	
Nasal	m	n			ŋ	
Fricative		s				h
Lateral		l				
Trill				r		
Semi- vowel	w		y			

Sarinya notes that all of the consonant phonemes can occur initially in the syllable. The phonemes / l, r, w / can also occur as the second element of the consonant cluster and there are seven final consonants: / k, ʔ, m, n, ŋ, w, y /.

Vowel phonemes : There are 9 single vowel phonemes / i, e, ɛ, ɯ, ə, a, , u, o, ɔ / and 4 diphthongs / ia, əɯ, ua, ai /, as follows :

	Front		Central		Back	
	unround	round	unround	round	unround	round
Close	i		y	ʉ		u
Half-Close	e		ə			o
Half-Open	ɛ					ɔ
Open			a			
Diphthongs		ia	əɯ		ua	
			ai			

Sarinya mentions that the length of vowel is not contrastive.

Tones: There are 4 contrastive tones.

Description	Tone Stick	Phonetic Transcription
low-falling		[^{21}] ~ [^{31}], [..^{21}]
mid-level		[^{33}]
high-rising		[^{45}], [..^{45}]
high-falling		[^{52}]

Sarinya notes that a low-falling tone with breathy voice, [..^{21}], which can occur with an unaspirated stop, affricate and trill and a high-rising tone with breathy voice, [..^{45}], which can occur only with unaspirated voiceless stops are in the process of being lost of the breathiness as seen in the speech of young informants who speak with barely audible breathiness.

2.3 Southern Karen: Sgaw Karen and Pwo Karen

There are many scholars who are interested in these Southern Karen languages. They are provided many important articles. However, reviews of a few important articles are included here to provide a basic overview of the studies that have been done on the Sgaw Karen and the Pwo Karen languages.

The previous studies of **Sgaw Karen** include *Karen Linguistic Studies : Description, Comparison, and Text* by Robert B. Jones (1961) and *Thai-Sgaw Karen Dictionary* by Suriya Ratanakul (1986).

2.3.1 Robert B. Jones: Sgaw Karen

Robert B. Jones, 1961. *Karen Linguistic Studies : Description, Comparison, and Texts.* Jones presents two varieties of Sgaw Karen (Moulmein and Bassein) spoken in Myanmar. The phonemic systems of the two varieties of Sgaw Karen are presented briefly below.

Consonant Phonemes : There are 27 single consonant phonemes in Moulmein Sgaw (MS) and 23 single consonant phonemes in the Bassein Sgaw (BS) as follows:

Moulmein Sgaw Consonants

p	t	c	k	s			ʔ
p^h	t^h	c^h	k^h	s^h	θ	x	
b	d			z		ɣ	ɦ
w		j		š			
m	n	ɲ	ŋ				
	l	r					

Bassein Sgaw Consonants

p	t		k	s			ʔ
p^h	t^h		k^h	s^h	θ	x	h
b	d					ɣ	
w		j		š			
m	n	ɲ					
	l	r					

Jones notes that the phonemes (except / š /) which were identified in MS as occurring rarely, / c, c^h, z, ŋ, h(ɦ) /, do not occur in BS. / h / and / ɣ / are separate phonemes in BS (and / h / is a voiceless glottal spirant), whereas the two phones [h] and [ɣ] are allophones of a single phoneme in MS. / ʔ / occurs in final position in mid and low tones only. No other consonants occur in final position.

Consonant Clusters : The same system applies to both dialects.

Moulmein Sgaw Consonants

Second Consonant	Initial Consonant
w	p t t^h d n k k^h s s^h θ j ɲ l r
l	p p^h b m k k^h
ɣ	p p^h b m s s^h
r	p b t t^h k θ
j	p^h m

Bassein Sgaw Consonants

Second Consonant	Initial Consonant
w	p b m t t^h d n k k^h s s^h θ j ɲ l
l	p p^h b m k k^h
ɣ	p p^h b s^h
r	p t k θ
j	p p^h

Jones notes that the cluster / ɲw / occurs only as a variant of / jw /.

Syllabic Nuclei : The two varieties have identical systems, as follows :

i	y	u
e	ə	o
ɛ	a	ɔ

Jones mentions that all nuclei except / e / occur in both open and closed syllables. / e / occurs only in open syllables. Syllables are closed if they have mid or low tone and are terminated by a glottal stop. In MS, the glottal stop with high tone has an allophone of glottal construction and the syllable is open.

Tones: Jones notes that, phonemically, MS and BS differ only in that all three tones in MS have two allophones each, depending on the presence of final / ʔ / or its absence, whereas in BS differs slightly from MS in relative pitch, as is indicated in the following diagram.

	MS Tones						**BS Tones**				
TONE / LEVEL	High		Mid		Low		High	Mid		Low	
	/˴/	/˴ʔ/	/˗/	/˗ʔ/	/˪/	/˪ʔ/	/˴ʔ/	/˗/	/˗ʔ/	/˪/	/˪ʔ/
H	˴	˴					˴				
M		˴	˗	˗				˗	˗	˪	
L					˪	˪					˪

2.3.2 Suriya Ratanakul

Suriya Ratanakul, 1986. *Thai-Sgaw Karen Dictionary.* Suriya presents a phonological study of Sgaw Karen spoken at Ban Huay Bong, Tambon Mae Na Con, Mae Caem District, Chiangmai Province. The phonemic systems of this dialect are presented briefly below.

Consonant Phonemes: There are 24 single consonant phonemes. All of which only occur initially in the syllable, except / ʔ / which can occur initially and as the final consonant in this dialect.

	Labial	Alveolar	Palatal	Velar	Glottal
Plosives					
Vl.unasp.	p	t	c	k	ʔ
Vl.asp.	p^h	t^h		k^h	
Vd.	b	d	j		
Nasal					
Vd.	m	n	ɲ	ŋ	
Fricative					
Vl.unasp.		s (θ)		x	h
Vl.asp.		s^h			
Vd.		z (j)		ɣ	
Lateral					
Vd.		l			
Trill					
Vd.		r			
Approximants					
Vd.	w (v)				

Suriya notes that the phonemes enclosed in parentheses, / θ /, / j /, and / v / are free variation of / s /, / z /, and / w / respectively. However, / j / is an isolated phoneme because in many words / z / can not occur in free variation of / j /. Final / ʔ / can occur only with low-level and high tone.

Consonant Clusters: There are five consonant phonemes: / w, l, ɣ, r, j /, that can occur as the second element of consonant clusters as follows:

Second Consonant	Initial Consonant
w	b d n c c^h k k^h s s^h l ʔ
l	p p^h b m k k^h
ɣ	p p^h b m c k k^h s^h
r	p p^h b k k^h s^h
j	p p^h m s

Vowel phonemes : There are 9 vowel phonemes as in the table below.

i	ɨ	u
e	ə	o
ɛ	a	ɔ

Suriya notes that, phonemically, the length of vowels is not contrastive in this language.

Tones: There are three contrastive tonemes. The open syllable can bear only two tones; low-level and mid level, while the closed syllable with final / ʔ / can bear only two tones; low- level and high tone.

Description	Tone Stick	Phonetic Transcription
low-level	˩	[21]
mid-level	˧	[33]
high	˥	[45]

Suriya mentions that there is a high-falling tone, which is a free variation of a low-level tone, when occurring in some syllables with final glottal / ʔ /. Besides, phonetically, there is a low-rising tone, which is in free variation of the low-level or mid-level tone, when occurring in the interrogative or emphatic sentences.

The previous studies of **Pwo Karen** include *Karen Linguistic Studies : Description, Comparison, and Text* by Robert B. Jones (1961) and *A Phonological Study of Pwo Karen at Huay-Hom-Nok Village* by Naruemon Chuensukon (1995).

2.3.3 Robert B. Jones: Pwo Karen

Robert B. Jones, 1961. *Karen Linguistic Studies : Description, Comparison, and Texts.* Jones presents two varieties of Pwo Karen (Moulmein and Bassein) spoken in Myanmar. The phonemic systems of the two varieties of Pwo Karen are presented briefly below.

Consonant Phonemes : Single consonants, except as noted, are the same for both to the Moulmein and the Bassein dialects of Pwo.

p	t	c	k	s			ʔ
p^h	t^h		k^h	s^h	θ	x	(h)
b	d					ɣ	
w		j		š			
m	n	(ɲ)					
	l	r					

The two phonemes enclosed in parentheses, (h) and (ɲ), do not occur in Bassein Pwo (BP) and occur rarely in Moulmein Pwo (MP). Aspirated consonants are more heavily in MP than in BP. In final position, / ʔ / has a stop allophone with mid and low tones in MP and low tone in BP. It has an allophone of constriction with the high tone in both dialects. Moreover, in final position, / n / is nasalization from the preceding nucleus. Non of other consonants occur in final position.

Consonant Clusters : The same system applies to both dialects.

Second Consonant	Initial Consonant
w	p b m t^h d n k k^h ʔ s s^h θ x j l
j	(p) p^h b
r	p t t^h k (θ)
l	p p^h b m k k^h

Parentheses in the table indicate that the cluster / θr / occurs only in BP and the cluster / pj / occurs only in MP.

Syllabic Nuclei : the two varieties have the following syllabic nuclei :

Moulmein Pwo Syllabic Nuclei

Plain Nuclei			Nasalised Nuclei			Stopped Nuclei		
i	y	u		yn			y?	
e	ə	o	en	ən	on	e?	ə?	o?
ɛ	a	ɔ	ɛn	an	ɔn	ɛ?	a?	
						ai?	au?	

All nuclei are somewhat shorter when terminated by glottal stop.

Bassein Pwo Syllabic Nuclei

Plain Nuclei			Nasalised Nuclei			Stopped Nuclei		
i	y	u					y?	
e	ə	o	en	ən	on	e?	ə?	o?
ɛ	a	ɔ	ɛn	an	ɔn	ɛ?	a?	ɔ?
ai		au						

All mid and low vowels are diphthongised with nasalisation.

In comparison with Moulmein vowels, Bassein vowels are all in approximately cardinal position. Note also that, in this dialect, diphthongs occur only as plain nuclei, whereas in Moulmein, they occur only as stopped nuclei. The vowels /ɛ, ɔ, ə / are rare.

Tones: There are three phonemic tones in MP: high, mid, and low. In BP, there are only two phonemic tones: high and low. In both dialects, each tone has two allotones, depending on the presence or absence of final / ʔ /. Besides the allophonic features of final / ʔ /, the low tone itself has fairly strong pharyngeal constriction in MP. The relative pitches and contours of the various allophones of the tones are indicated in the diagram. Note that the presence of a final / ʔ / tends to raise the pitch of the tone.

	MP Tones						**BP Tones**			
TONE / LEVEL	High		Mid		Low		High		Low	
	/˝/	/˝ʔ/	/¯/	/¯ʔ/	/ˋ/	/ˋʔ/	/˝/	/˝ʔ/	/ˋ/	/ˋʔ/
H		↘						↘		
M	↗		—	—			↗			
L					↘	—			↘	—

2.3.4 Naruemon Chuensukon

Naruemon Chuensukon, 1995. *A Phonological Study of Pwo Karen at Huay-Hom-Nok Village.* Naruemon presents a phonological study of Pwo Karen spoken at Huay-Hom-Nok Village, Tambon Tha-Mae-Lob, Mae-Tha District, Lamphun Province. The phonemic systems of this dialect are presented briefly below.

Consonant phonemes: There are 23 single consonant phonemes. All of which only occur initially in the syllable, except / w, j, l, r / which can occur initially and as the second element in the consonant cluster. Moreover, there is no final consonant in this dialect.

	Labial	Alveolar	Alveolar-Palatal	Palatal	Velar	Glottal
Plosives						
Vl.unasp.	p	t	c		k	ʔ
Vl.asp.	p^h	t^h	c^h		k^h	
Vd.	b	d				
Nasal						
Vd.	m	n		ɲ		
Fricative						
Vl.		s	ʃ		x	h
Affricates						
Vl.unasp.				tɕ		
Vl. Asp.				$tɕ^h$		
Lateral						
Vd.		l				
Trill						
Vd.		r				
Approximants						
Vd.	w [w]~[v]			j	ɰ [ɰ]~[ɣ]	

Vowel phonemes : There are 24 vowel phonemes as in the table below.

Plain Vowels	Nasal Vowels	Glottal Vowels
i ɯ u		uʔ
e ə o	ə̃	eʔ əʔ oʔ
ɛ a ɔ	ɔ̃	aʔ ɔʔ
ɯi əi əu ai au		aiʔ auʔ

Naruemon notes that all vowels are basically pronounced with medium length. However, the glottal vowels tend to be phonetically shorter than their plain

counterparts and can bear only two tones: low-falling and high-level tones, except /u?/ which occurs in syllable with low-falling tone only.

Tones: There are five contrastive tonemes. The plain and nasal vowels can bear all five of them while the glottal vowels can bear only two tones; low-falling and high-level.

Description	Tone Stick	Phonetic Transcription
low-falling		[^{21}]
mid-level		[^{33}]
high-level		[^{55}]
high-falling		[^{51}]
Low-rising		[^{25}]

2.4 Robert B. Jones: Proto-Karen

Robert B. Jones, 1961. *Karen Linguistic Studies : Description, Comparison, and Texts.* Jones reconstructed the Proto-Karen from the studies of six varieties of Karen : two varieties of Sgaw Karen (Moulmein and Bassein), two varieties of Pwo Karen (Moulmein and Bassein), the northern variety of Pa-O spoken around Taunggyi, and the Palaychi spoken in Tawbyagyi Village in Burma.

He describes the Karen Language as monosyllabic, with five to seven tones and some subgroups having phonemic nasalization. Otherwise the syllables can be considered open. All have the final glottal, but this can be conveniently analyzed as a tonal modification. It has a nine-vowel system with various modifications as just mentioned. The language is repleat with particles, which are attached finally to phrases, clauses and sentences to indicate the mood of the speaker, the nature of the

subject matter, or the degree of the imperative. Along with these are many expressive couples in most parts of speech.

The Proto-Karen are presented briefly as follows:

Proto-Karen Consonant Phonemes: There are 20 single consonant phonemes as follows:

p		c	k	x	ʔ
p^h	t^h	c^h	k^h	ɣ	
b	d				
w	s	j			
m	n		ŋ		
	l	r			

Proto-Karen Consonant Clusters: There are 4 second consonant phonemes / w, j, r, l,/ occurs with initial consonants as consonant clusters as follows :

Second and third Consonant	Initial Consonant
w	p^h (ʔ)b t^h d c c^h k k^h x ʔ s l m n
j	c^h k l m n r
l	p^h b c^h k^h
r	p^h c^h k^h x
lw	p^h k^h
rw	p^h (k^h)

Proto-Karen Final Consonants: There are three types of final consonant as follows:

Final stops : ʔ t t^h k k^h d d^h g g^h
Final nasals : m n ŋ
Final laryngeals : ʕ h q

Proto-Karen Vowel phonemes : There are 9 single vowel phonemes /i, e, ɛ, y, ə, a, u, o, ɔ / and 4 diphthongs / ei, ai, əi, au / , as follows :

	Front		Central		Back	
	unround	round	unround	round	unround	round
Close	i		y			u
Half-Close	e		ə			o
Half-Open	ɛ					(ɔ)
Open			a			

Diphthongs ei ai əi au

Proto-Karen Tone phonemes : There are two phonemic tones : high and low tone as follows:

TONE / LEVEL	High	Low
	/ ˊ /	/ ˋ /
H		
M		
L		

Jones notes that loss of aspiration of an initial stop is frequently connected with change of final stop, change of tone, or both. Since changes in tone are usually connected with changes in final stops and laryngeals, all these final stops, the "real" and the " hypothetical," have fallen together with various other laryngeal finals, / ʔ /, or are lost altogether, but differing effects on tones and vowels. Final stops other than /ʔ/ occur only in Pa-O.

CHAPTER III

METHODOLOGY

3.1 Preparation

In the preliminary stage of this study the literature relating to the Karen languages is reviewed. The fieldwork area is also studied in detail to get a general knowledge of its geography, history, society, culture and way of life.

A word list has been set up by using the following sources:

(1) Southeast Asian Word List Mahidol University Field Methods (revised 1990): 281 words.
(2) The Oxford-Duden Pictorial Thai & English Dictionary : 655 words.

The word list consists of 936 words used in daily life. It covers the following lexical fields:

(1) Nature, Geography
(2) Utensils, Household Appliances
(3) Parts of the Human Body
(4) Plants and Animals
(5) Food and Cooking
(6) Clothes and Ornaments
(7) Weather, Direction, Time
(8) Numerals
(9) Kinship Terms, Pronouns
(10) The names of things used in daily life
(11) Action
(12) Senses and Emotions
(13) Communication, Transportation
(14) Quantity, Quality
(15) Entertainment, Recreation
(16) Diseases, Symptoms

In addition to the word lists, pictures are have been prepared to facilitate the eliciting of data.

3.2 Field Work

3.2.1 Survey of the Field Work Area

A preliminary survey was made in November 1996. Its aim was to examine areas suitable for the researcher to stay in. They were not to be too far from the provincial administrators. The preliminary survey also helped the researcher get acquainted with the people in the research area. Since at the time of the survey the Pa-O lived along the Thai-Myanmar border several factors such as accommodation and facilitation needed to be taken into consideration.

3.2.2 Data Collecting

The data were first collected in February 1997. The lexical items in the word list were read out to the informant both in Standard Thai and in Northern Thai. The informant was asked, "What do you call this thing?" The informant pronounced the word in his local dialect three times. The author then imitated the word pronounced by the informant and asked the informant if the imitated pronunciation was acceptable.

Apart from direct questions and pictures, real objects were used along with the question "What is this?" The informant was also asked to describe the pictures and tell a story. The next step was to transcribe the words into the International Phonetic Alphabet and to record them on a cassette tape. After all words in the word list had been elicited, they were organized alphabetically in note cards and filed in a rhyme book by using the Linguist's Shoebox Program Computerization. In September 1997 and March 1999, the collected data were rechecked.

3.3 Criteria in Choosing the Informants

Native speakers of Pa-O who were to be used as informants had to meet the following criteria:

1. The informants must be Pa-O who are native of the village of Huay Salop.
2. The informants must have a complete set of articulators so that they can pronounce the sounds clearly and fluently.
3. The informants must know some Thai, but must use Pa-O in their daily lives.
4. The informants must be over 15 years of age i.e. have sufficient experience in using their own language and a responsible attitude toward the researcher. The informants must have enough time to work with the researcher.

5. Occupation and education do not use to be the criteria in choosing the informants because all of them are agriculturists and, with high education, it may have an influence from other languages.

3.4 Source of Data

The data used in this study were collected in the village of Huay Salop (บ้านห้วยซลอบ), Tambon Huay Pha (ตำบลห้วยผา), Muang District (อำเภอเมือง), Mae Hong Son Province (จังหวัดแม่ฮ่องสอน) from utterances of Pa-O native speakers as follows:

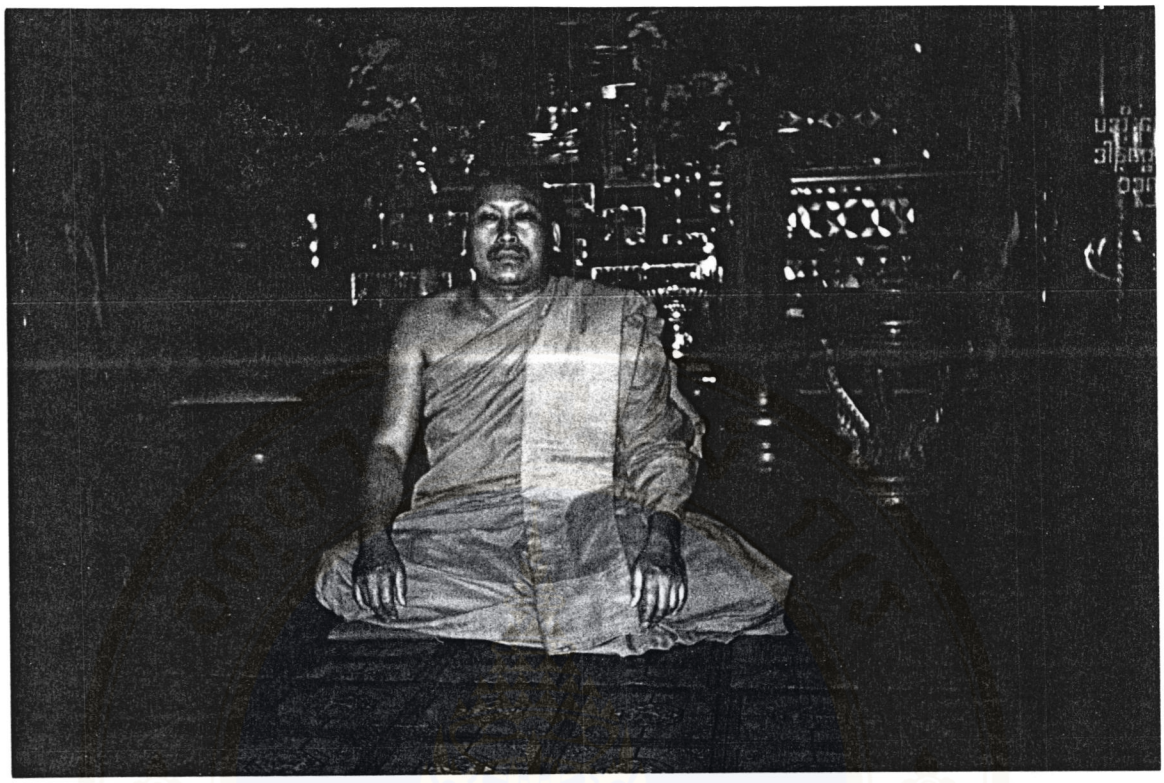
- Phra Canyano (พระจันญาโณ), a thirty-year-old, was my main informant. He was born in the village of Huay Salop (บ้านห้วยซลอบ). He is able to speak Central and Northern Thai. He become a monk at Wat Nong Kham (วัดหนองคำ), Tambon Chang-Moi (ตำบลช้างม่อย), Muang District (อำเภอเมือง), Chiang Mai Province (จังหวัดเชียงใหม่) for five years.

- Mr. Prasoet Kamoldecha (นายประเสริฐ กมลเดชา) or Thungyi (ทุ่นจี่) in Pa-O, a forty-three-year-old, was my co-informant. He was born at Ban Rong Muang Village (บ้านรองเมือง), Mae Sariang District (อำเภอแม่สะเรียง), Mae Hong Son Province (จังหวัดแม่ฮ่องสอน). When he was about ten years old, he migrated with other Pa-O to the village of Huay Salop. He is able to read and write Thai. He has been a secular headman or *phu yai ban* the village of Huay Salop since 1996.

- Mr. Khunphua Rakkhrue (นายขุนผั้ว รักเครือ), a thirty-year-old, was my co-informant. He came from Taunggyi near the Shan State in Burma when he was a young man. He can read and write Thai very well. He used to work in Bangkok (กรุงเทพมหานคร) as an employee at a furniture shop.

- Mr. San Congleng (นายซัน จงเหล่ง), a fifty-year-old, was my first informant. He came from Taunggyi, Burma, in 1974. He lives at Doi Wa-wi Mountain (ดอยวาวี), Mae Soi District (อำเภอแม่สอย), Chiang Rai Province (จังหวัดเชียงราย). He can speak northern Thai.

My word-list was first used on Mr. San Congleng (นายซัน จงเหล่ง), but all of my data are based primarily on Phra Canyano (พระจันญาโณ). However, I checked all the data with Mr. Thungyi (นายทุ่นจี่) and also elicited some conversation and a few short stories from him in order to get more words.



1. Phra Canyano at Wat Nong Kham.

2. Mr. Praseot Kamoldecha with his Family and the Researcher.

Figure 10 : Main Informants

3.4 Descriptive Approach

The phonological approach used in this study is Tagmemics, which sees phonology as a hierarchy of ranks. The phonological hierarchy is postulated with such ranks of the intonation group, the phonological word, the syllable and the phoneme. The unit of each rank has a structure stated in terms of the rank below (except for the lowest rank, the phoneme) and the function stated in terms of the rank above (except for the highest one, the intonation).

The phonological hierarchy can be diagrammed as follows:

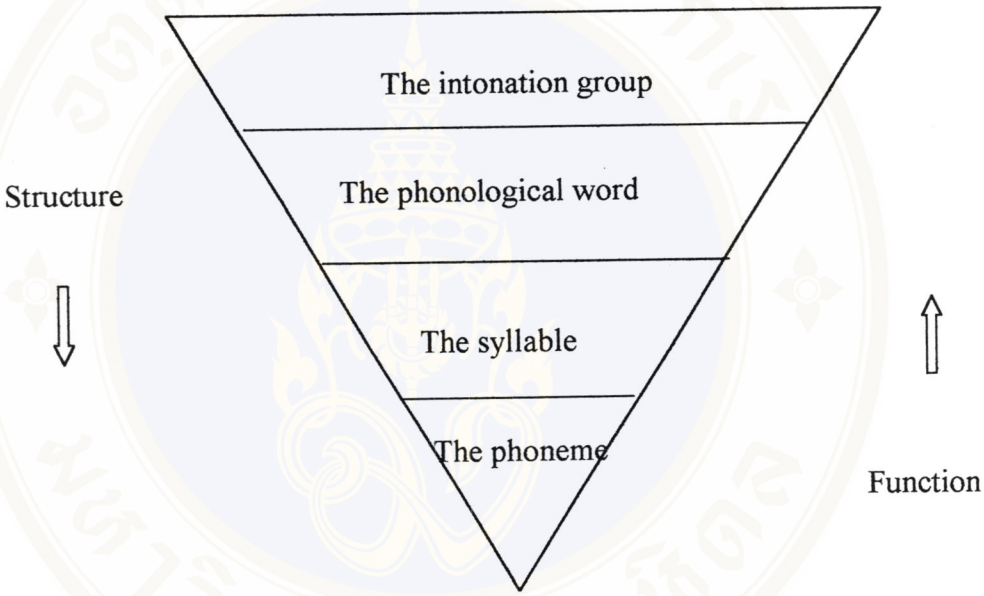


Figure 11 :The Phonological Hierarchy

CHAPTER IV

THE INTONATION GROUP

4.1 Definition

The intonation group is the unit over which the intonation contour occurs. Pitch, length and stress form the intonation contour, a supra-segmental feature which is distinguishing characteristic of the phonological phrase or units higher in the phonological hierarchy (Lowe 1983:181)

The intonation group is the unit of the highest rank of the phonology as here presented, so its function in higher units is not discussed. The structure of the intonation group is stated in terms of final contours.

In Huay Salop Pa-O language, no particular types of intonation can be mentioned. Only tones of final syllable of the sentence and particles of statements seem to create different intonation types. So, the final contour can be falling or rising depending on the tone of the final syllable of the sentence as in the following examples :

4.1.1 Affirmative Sentences

The intonation of the affirmative sentence has a falling pitch or a rising pitch according to the tone of the final syllable at the end of the sentence.

/ k^hwi^4 ʔam^1 dɛn ^{4} /
I eat rice

"I eat rice."

/ k^hwi^4 lwa$^{i\,3}$ lu^4 t^hi^4 /
I go wash water

"I am going to have a bath."

/ k^hwi^4 kjɔk^1 na^3 \ /
I l i k e y o u

"I like you."

/ k^hwi^4 lo^4 $k^h\text{ɔ}m^3la^3$ /
I dry clothes
" I dry clothes."

/ k^hwi^4 pla^4 $m\text{ɛ}ʔ^4$ /
I wash face
" I wash my face."

/ $m\text{ə}^1$ $s\text{ɛ}ŋ^3$ lam^2 /
Mother come home
" Mother comes home."

/ $waŋ^3$ $taʔ^4ba?^1$ $taʔ^4k^hleʔ^1$ /
He hit mosquito
" He hit a mosquito."

/ k^hwi^4 $d\text{ɔ}ʔ^4$ lit^1 /
I read book
" I read a book."

4.1.2 Negative Sentences

The intonation of the negative sentence has a falling pitch or a rising pitch according to the tone of the final syllable at the end of the sentence.

/ k^hwi^4 ki^3 $t\text{ə}^3$ $ha^{u\,4}$ $ta^{u\,2}$ /
I leg Poss.mk. good not
" My leg is not good."

/ ni^4 ho^1 k^ho^2 $ta^{u\,2}$ /
We belly hungry not
" We are not hungry."

/ ni^4 ho^1 k^ho^2 $ta^{u\,2}$ $d\text{ə}n^2$ /
We belly hungry not yet
" No, we are not yet hungry."

/ $waŋ^3$ $ʔam^1$ $ta^{u\,2}$ $t^hɔʔ^4ja^3$ /
He eat not pig flesh
" He does not eat pork."

/ k^hwi^4 $c^hɔn^4$ $ta^{u\,2}$ $c^hi^4lit^1$ /
I smoke not cigarette
"I do not smoke cigarette."

4.1.3 Interrogative Sentences

4.1.3.1 The content question

The intonation of the content question has a falling pitch pitch or a rising pitch according to the tone of the final syllable at the end of the sentence.

/ waŋ^{3} ma^{3} t^{h}aʔ^{4} ma$^{i\,3}$ /
He do what
"What does he do ?"

/ paʔ^{4} ma$^{i\,3}$ lwa$^{i\,3}$ c^{h}e^{3} /
Who go market
"Who goes to the market?"

/ na^{3} ʔoŋ^{4} ʔə^{1} ma$^{i\,3}$ /
You live where
"Where do you live?"

/ ʔi^{2} ma^{3} na$^{i\,1}$ ma$^{i\,3}$ /
Will do how
"How will (we) do?"

/ ma$^{i\,3}$ k^{h}a^{3} ʔi^{2} lwa$^{i\,3}$ /
when will go
"When will (you) go?"

4.1.3.2 The Polar question

The intonation of the polar question has a falling pitch according to the tone of the question particle (q.p.) / nɛ^{4}, nɛ^{4}hɔŋ^{2} / at the end of the sentence.

/ waŋ^{3} ʔwaʔ^{1} lɛn^{2} t^{h}i^{4} nɛ^{4} /
He drink already water q.p.
" Did he drink water?"

/ lo^{3}pe^{1} lwa$^{i\,3}$ da^{1} lɛn^{2} t^{h}a^{4} nɛ^{4} /
Child walk can already or q.p.

" Can the child walk or not?"

/ waŋ^{3} ja^{1} t^{h}i^{4} da^{1} nɛ^{4}hɔŋ^{2} /
He swim water can q.p.

" Can he swim?"

/ na^{3} k^{h}jaŋ^{3} na^{1} taʔ^{4} k^{h}jaŋ^{3} da^{1} nɛ^{4}hɔŋ^{2} /
You sing one song(cN) can q.p.

" Can you sing a song ?"

4.1.4 Imperative Sentences

The intonation of the imperative sentence has a falling pitch or a rising pitch according to the tones of the final syllable at the end of the sentence.

/ ʔoŋ^{4} t^{h}əŋ^{3} /
Be stand

" Stand up."

/ ʔoŋ^{4} laŋ^{2} /
Be sit

" Sit down."

/ sɛŋ^{3} lam^{2} /
Return home

" Return home."

/ lwa$^{i\,3}$ ʔam^{1} dɛn^{4} /
Go eat rice

" Go and eat rice."

/ lɔn^{4} ʔoŋ^{4} laŋ^{2} ʔaʔ^{4}jo^{4} /
Come be sit here

" Come and sit here."

4.1.5 Imperative Negative Sentences

The imperative negative marker / $la^{3}ta^{u\,2}$ / is placed at the end of sentence, then, the intonation of the imperative negative sentence has a falling contour.

/ $bəŋ^{4}$ $ta?^{4}k^{h}a^{4}$ $la^{3}ta^{u\,2}$ /
Open door forbid
" Do not open the door."

/ $c^{h}ɔn^{4}$ $c^{h}i?^{4}lit^{1}$ $la^{3}ta^{u\,2}$ /
Smoke cigarette forbid
" Do not smoke cigarette."

/ $sa?^{4}ti?^{1}$ $c^{h}ɔn^{4}$ $c^{h}i?^{4}lit^{1}$ $la^{3}ta^{u\,2}$ /
Please smoke cigarette forbid
" Do not smoke cigarette, please."

/ $p^{h}om^{2}$ $k^{h}aŋ^{3}p^{h}a^{3}$ $nə?^{1}$ $cjɔŋ^{3}$ $la^{3}ta^{u\,2}$ /
wear shoes into temple forbid
"Do not wear shoes into the temple"

/$sa?^{4}ti?^{1}$ $p^{h}om^{2}$ $k^{h}aŋ^{3}p^{h}a^{3}$ $nə?^{1}$ $cjɔŋ^{3}$ $la^{3}ta^{u\,2}$ /
Please wear shoes into temple forbid
"Please, do not wear shoes into the temple.

The intonation group patterns are predictable according to the tone of final syllables. In addition, the intonation contour may be distinguished in order to express attitudes and emotions of the speakers.

CHAPTER V

THE PHONOLOGICAL WORD

5.1 Definition

The phonological word is the unit above the syllable in the phonological hierarchy. It is made up of syllables and functions in the phonological phrase.

The phonological word is distinguishing by nuclear stress in languages where every word has a nuclear syllable made prominent by a strong primary stress. The phonological word is then known as a stress group (Lowe 1983: 183).

5.2 Structure

The syllabic pattern of Pa-O language is basically monosyllabic. There are also a small number of disyllabic words and an even rarer number of trisyllabic and polysyllabic words. Based on a placement of various stress types, i.e. zero stress or unstressed (u), weak stress (w), and strong stress (s), these small classes of words are further classified into 3 sub-types.

5.2.1 Monosyllabic Word

A monosyllabic word is a word with only one syllable. The strong stress usually occurs on that syllable. Its structure is [ˈs].

Examples :

/ pi^{4} /	[ˈ$pi:^{\cdot\ 21}$]	" skin"
/ $p^{h}a^{3}$ /	[ˈ$p^{h}a:^{\ 33}$]	" ashes"
/ $beŋ^{3}$ /	[ˈ$be\cdot ŋ^{33}$]	" lie down"

---

* [v·] = longer than a short vowel
[v:] = much longer than a short vowel

/ tom^{4} /	[ˈtoːm^{21}]	" keep"
/ tʰɛʔ^{1} /	[ˈtʰɛʔ^{45}]	" paper"
/ doŋ^{3} /	[ˈdoːŋ^{33}]	" hit by hand"
/ cu^{4} /	[ˈcuː^{21}]	" hand"
/ cʰut^{1} /	[ˈcʰut^{45}]	" bone"
/ kim^{1} /	[ˈkiːm^{45}]	" like"
/ kʰaŋ^{3}/	[ˈkʰaːŋ^{33}]	" foot"
/ ʔɛn^{3} /	[ˈʔɛːn^{33}]	" narrow"
/ me^{2} /	[ˈmeː^{42}]	" tail"
/ nɛn^{2}/	[ˈnɛːn^{42}]	" breast"
/ ŋaʔ^{4} /	[ˈŋaʔ^{21}]	" laugh"
/ sɯn^{3} /	[ˈsɯːn^{33}]	" liver"
/ jɔʔ^{4} /	[ˈjɔʔ^{21}]	" monkey"
/ hɔ^{3} /	[ˈhɔː^{33}]	" read"
/ lam^{2} /	[ˈlaːm^{42}]	" house"
/ rja^{2} /	[ˈrjaː^{42}]	" hot"
/ wan^{3} /	[ˈwaːn^{33}]	" dish"

5.2.2 Disyllabic Word

A disyllabic word is a word with two syllables. It can be classified according to its structure into 2 sub-types.

5.2.2.1 Disyllabic Word of the First Type

This sub-type is composed of a presyllable which has an unstress followed by a major syllable. The strong stress is on the last syllable. Its structure is [u.ˈs].

Examples:

/pə juŋ^{2}/	[pə^{33} ˈjuːŋ^{42}]	" smile"
/pə tʰo^{4}/	[pə^{33} ˈtʰoː^{21}]	" spit"
/pə lɛŋ^{3}/	[pə^{33} ˈlɛːŋ^{33}]	" bottle(cN**)"
/tə kɔŋ^{4}/	[tə^{33} ˈkɔːŋ^{21}]	" hill"

** cN = Numeral classifier

/tə ŋɛ^{3} /	[tə^{33} ˈŋɛː^{33}]	" tooth"
/tə luŋ^{3} /	[tə^{33} ˈluˑŋ^{33}]	" roundness"
/tʰə sa^{2}/	[tʰə^{33} ˈsaː^{42}]	" animal"
/kə tu^{3} /	[kə^{33} ˈtuː^{33}]	" head"
/kə lɔŋ^{4} /	[kə^{33} ˈlɔˑŋ^{21}]	" pen"
/ʔə pat^{4}/	[ʔə^{33} ˈpat^{21}]	" week"

The presyllable of this sub-type can not occur as a free form and has no lexical meaning of its own.

5.2.2.2 Disyllabic Word of the Second Type

This sub-type is composed of two syllables. The weak stress falls on the first syllable and the strong stress is on the last syllable. Its structure is [ˌw.ˈs].

Examples:

/ pleŋ^{4} ʔɔʔ^{1}/	[ˌpleˑŋ^{21} ˈʔɔʔ^{45}]	" armpit"
/ pʰrɔŋ^{2} tɛŋ^{4} /	[ˌpʰrɔˑŋ^{42} ˈtɛˑŋ^{21}]	" pen"
/ beŋ^{3} tʰa^{3}/	[ˌbeˑŋ^{33} ˈtʰa^{33}]	" sleep"
/ bwaˑ^{1} caŋ^{3}/	[ˌbwaˑː^{45} ˈcaˑŋ^{33}]	" monk"
/ cu^{4} deŋ^{4} /	[ˌcuː^{21} ˈdeˑŋ^{21}]	" wrist"
/ kiˑ^{3} tʰjaʔ^{4} /	[ˌkiː^{33} ˈtʰjaʔ^{21}]	" thigh"
/ kʰaŋ^{3} pʰa^{3}/	[ˌkʰaˑŋ^{33} ˈpʰaː^{33}]	" shoes"
/ saʔ^{1} re^{3}/	[ˌsaʔ^{45} ˈreː^{33}]	" glad"

The first syllable of this sub-type can occur as a free form and has a lexical meaning of its own while the last syllable can not occur as a free form.

5.2.3 Trisyllabic Word

A trisyllabic word is a word with three syllables, which is rare in Pa-O language. According to the structure, they are divided into 4 sub-types as follows:

(I) [u. u. ˈs]

Examples:

/tə kə liˑ^{4}/	[tə^{33} kə^{33} ˈ liː^{21}]	" tick"
/ʔə tə nɛŋ^{2}/	[ʔə^{33} tə^{33} ˈnɛˑŋ^{42}]	" sob"

II) [u. ˌw. ˈs]
Examples:

/ tə p^he^1 ra^3/	[$tə^{33}$ ˌ $p^he:^{45}$ ˈ $ra:^{33}$] " rose-apple"
/ tə k^ho^1 p^hun^3/	[$tə^{33}$ ˌ $k^ho:^{45}$ ˈ $p^hu\cdot n^{33}$] " powder"
/ ʔə sɔm^3 p^hra^2/	[$ʔə^{33}$ ˌ $sɔ\cdot m^{33}$ ˈ $p^hra:^{42}$] " blue color"

(III) [ˌw. u. ˈs]
Examples:

/ $k^hwaʔ^1$ tə $nəʔ^1$/	[ˌ $k^hwaʔ^{45}$ $tə^{33}$ ˈ $nəʔ^{45}$] " chill"
/ʔɔn^3 tə kɛŋ^3/	[ˌ $ʔɔ\cdot n^{33}$ $tə^{33}$ ˈ $kɛ\cdot ŋ^{33}$] "incline"

(IV) [ˌw. ˌw. ˈs]
Examples:

/cam^3 ma^1 ri^4/	[ˌ $ca\cdot m^{33}$ ˌ $ma:^{45}$ ˈ $ri:^{21}$] " body"
/$ka^{u\,3}$ neŋ^1 si^4/	[ˌ $ka^{u\,33}$ ˌ $ne\cdot ŋ^{45}$ ˈ $si:^{21}$] " rose"
/k^ham^3 p^ha^3 ham^3/	[ˌ $k^ha\cdot m^{33}$ ˌ $p^ha:^{33}$ ˈ $ha\cdot m^{33}$] " earth"

5.3 Note on Phonological Word

In addition to three types of word mention above, there are groups of words consisting of four to five syllables. Some syllables have independent meanings and some do not. Therefore, it should be analyzed into two classes, compound words and polysyllabic words.

5.3.1 Polysyllabic Word

Polysyllabic word comprises of a free morpheme which is a syllable that has its independent meaning and occurrence together with bound morphemes which are syllables that do not have any meaning and can not occur independently. The symbol " ? " below represents the syllables which are bound morphemes.

Examples :

/tə reŋ^4 suk^1 sjak^1 /	[$tə^{33}$ ˌ $re\cdot ŋ^{21}$ ˌ suk^{45} ˈ $sjak^1$] " disordery "
disorder ? ?	
/ $t^hə$ $ʔə^1$ $t^hə$ c^ha^4 /	[$t^hə^{33}$ ˌ $ʔə:^{45}$ $t^hə^{33}$ ˈ $c^ha:^{21}$] " sick "
? ? ? pain	

5.3.2 Compound Words

Compound word comprises of at least two free morphemes which are syllables that have their independent meanings and occurrences together with or without bound morphemes (?) which are syllables that do not have independent meaning and occurrence.

Examples :

/seŋ^{3} rɔn^{4} seŋ^{3} ra^{3} t^{h}i^{4} / [ˌseˈŋ^{33} ˌrɔˈn^{21} ˌseˈŋ^{33} ˌra:^{33} ˈt^{h}i:^{21}] "fruit juice"
tree ? fruit water

/ p^{h}u^{2} po^{4} we^{2} po^{4} / [ˌp^{h}u:^{42} ˌpo:^{21} ˌwe:^{42} ˈpo:^{21}] "cousin"
elder child younger child

CHAPTER VI

THE SYLLABLE

6.1 Definition

The syllable is a unit of pronunciation typically larger than a single sound and smaller than a word. It is defined as the rank whose unit functions in the phonological word, and its structure is stated in terms of phonemes (Crystal 1992:338).

6.2 Structure

In Huay-Salop Pa-O language, the structure of syllable is described in terms of a nucleus formed by a single vowel accompanied simultaneously by a tone and peripheral formed by one to three consonants.

There are two types of syllable structure in Huay-Salop Pa-O language, open syllable and closed syllable.The open syllable consists of one to three initial consonants, a single vowel, and a tone $C(C)(C)V^{T}$, and closed syllable consists of one or two initial consonants, a single vowel, a final consonant, and a tone $C(C)V^{T}(C)$.

6.3 Types of Syllables

There are three types of syllables in Pa-O : presyllable, major syllable and minor syllable.

6.3.1 Presyllable

The presyllable consists of a single consonant followed by a vowel which is usually has the neutral vowel [ə] in free variation with the open central vowel [a]

with the phonemic realization /ə/. This syllable type bears the original high rising or low falling tones with final glottal stop [ʔ], which its nuclei is considerably shorter when followed by a stop.

In unstressed syllables, the final glottal stop [ʔ] is dropped, but the nucleus retains its proper allophones of position and length. The high rising tone of this syllable type has a somewhat lower allophone. Similarly, the low falling tone has a somewhat higher allophone under the same conditions

The presyllable occurs on the first syllable of disyllabic words. In this study, one dot after a vowel symbol [vˑ] means longer than a short vowel, two dot after a vowel symbol [vː] means much longer than a short vowel.

The structure of the presyllable is: [Cə]

Examples:

/pə tɛŋ^{3}/	[pə^{33} ˈ tɛˑŋ^{33}]	"look upward"
/pə c^{h}u ^{1}/	[pə^{33} ˈ c^{h}uː ^{45}]	"launder"
/pə ma^{i3}/	[pə^{33} ˈ ma^{i}ː ^{33}]	"who?"
/pə si^{4}/	[pə^{33} ˈ siː ^{21}]	"wash"
/pə ra ^{3}/	[pə^{33} ˈ raː ^{33}]	"monk"
/p^{h}ə bo^{3} mɯ ^{1}/	[p^{h}ə^{33}ˌ boˑ ^{33} ˈ mɯː ^{45}]	"union"
/bə si^{3} mɯ^{1}/	[bə^{33} ˌ siː ^{33} ˈ mɯː ^{45}]	"hail"
/tə li^{3}/	[tə^{33} ˈ liː ^{33}]	"wind"
/tə sa^{3}/	[tə^{33} ˈ saː ^{33}]	"salt"
/tə wa^{3}/	[tə^{33} ˈ waː ^{45}]	"land leech"
/t^{h}ə kɔn^{2}/	[t^{h}ə^{33} ˈ kɔˑn^{42}]	"bed"
/t^{h}ə sa^{2}/	[t^{h}ə^{33} ˈ saː ^{42}]	"animal"
/t^{h}ə ru^{1}/	[t^{h}ə^{33} ˈ ruː ^{45}]	"eel"
/kə tɔŋ^{4}/	[kə^{33} ˈ tɔˑŋ^{21}]	"forehead"
/kə lu^{3}/	[kə^{33} ˈ luː ^{33}]	"hair"
/kə lɔŋ^{4}/	[kə^{33} ˈ lɔˑŋ^{21}]	"pen"
/ʔə bɛʔ^{4}/	[ʔə^{33} ˈ bɛʔ^{21}]	"fat"
/ʔə dən^{4}/	[ʔə^{33} ˈ dəˑn^{21}]	"thickness"
/ʔə cwa^{i} ^{2}/	[ʔə^{33} ˈ cwa^{i}ː ^{42}]	"fang"
/sə lɔp^{2}/	[sə^{33} ˈ lɔp^{42}]	"public rest-house"
/jə lam^{4}/	[jə^{21} ˈ laˑm^{21}]	"opium"

	p	p^h	b	t	t^h	d	c	c^h	k	k^h	ʔ	m	n	ŋ	j	s	h	l	r	w
pə				+			+					+	+		+	+		+	+	
p^hə			+										+							
bə																+				
tə	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
t^hə	+			+			+	+	+	+	+	+				+		+	+	
də																				
cə																				
c^hə																				
kə				+														+		
k^hə				+					+				+							
ʔə	+	+	+	+	+	+	+	+	+	+		+	+			+	+	+	+	
mə																				
nə																				
ŋə																				
jə																		+		
sə	+			+				+		+									+	
hə																				
lə																				
rə																				
wə																				

Table 1: The co-occurrence of a consonant with [ə] in the presyllable with the single initial consonants of a major syllable.

\+ : occurrence
(blank) : non-occurrence

The co-occurrence of a consonant with [ə] in the presyllable with the single initial consonants of major syllables in table1 shows that

1. No consonants in the presyllables occur with identical consonants in the major syllables.
2. The presyllables / pə, p^hə, bə, tə, t^hə, kə, k^hə, ʔə, jə, sə / occur with initial consonant in major syllables.
3. Only the presyllables / də, cə, c^hə, mə, nə, ŋə, hə, lə, rə, wə / never occur with initial consonant in major syllables.
4. The presyllable / bə / is followed by / s / only.
5. The presyllable / jə / is followed by / l / only.
6. The consonant phonemes / ŋ, w / follow the presyllable / tə / only.
7. The consonant phoneme / h / follows the presyllable / tə, ʔə / only.

6.3.2 Major Syllable

A Major syllable consists of a single consonant or consonant clusters, a single vowel , a tone, and an optional final consonant (which can be stops or nasals) . It always takes a strong stress because it is the nucleus of the phonological word. Its occurrence is obligatory in monosyllabic word and in the last position of polysyllabic word, that is, every word must have one major syllable.

The structure of the major syllable in this Pa-O dialect is $C_1(C_3)(C_4)V_1{}^T(C_2)$***. There are two subtypes of the major syllable, open major syllable and closed major syllable as follows :

6.3.2.1 Open major syllable

The structure of the open major syllable in the Huay-Salop Pa-O dialect is consisting of one to three initial consonants, a single vowel, and a tone (C_1 (C_3) (C_4) $V_1{}^T$)

This syllable type bears all tones : high rising, high falling, mid level, and low falling tones . Without final consonant, all nuclei (vowels) are considerably longer than any other types of syllables.

Pattern I : $\mathbf{C_1V_1{}^T}$

Examples :

/ pi^4 /	[ˈ pi: ^{21}]	"people skin"
/ p^ha^4 /	[ˈ p^ha: ^{21}]	"father"
/ ba^1/	[ˈ ba: ^{45}]	"bean"
/ t^ha^4 /	[ˈ t^ha: ^{21}]	"gold"
/ $də^1$ /	[ˈ də: ^{45}]	"cook"
/ ce^4 /	[ˈ ce: ^{21}]	"unloose"
/ c^ha^3 /	[ˈ c^ha: ^{33}]	"star"
/ ke^4 /	[ˈ ke: ^{21}]	"tiger"
/ k^ha^1 /	[ˈ k^ha: ^{45}]	"bitter"
/ $ʔe^3$ /	[ˈ ʔe: ^{33}]	"feces"
/ $mə^1$ /	[ˈ mə: ^{45}]	"mother"
/ ni^3 /	[ˈ ni: ^{33}]	"day"
/ $ŋə^1$ /	[ˈ ŋə: ^{45}]	"cry"
/ $sɯ^3$ /	[ˈ sɯ: ^{33}]	"louse"

*** C_1 = The initial consonant; V_1 = The single vowel
C_2 = final consonant; T = Tone
C_3 = The second member of consonant clusters; ( ) = Optional occurrence
C_4 = The third member of consonant clusters

/ ju^{2} /	[ju: ^{42}]	"rat"
/ $hɔ^{3}$ /	[hɔ: ^{33}]	"read"
/ la^{4} /	[la: ^{21}]	"moon, month"
/ ri^{4} /	[ri: ^{21}]	"ask"
/ wa^{1} /	[wa: ^{45}]	"bamboo"
/ $ba^{i\,3}$ /	[ba^{i}: ^{33}]	"cheek"
/ $ta^{u\,2}$ /	[ta^{u}: ^{42}]	"not"
/ $ka^{u\,3}$ /	[ka^{u}: ^{33}]	"flower"
/ $ʔa^{u\,1}$ /	[$ʔa^{u}$: ^{45}]	"to be"
/ $ma^{i\,3}$ /	[ma^{i}: ^{33}]	"question marker"
/ $ŋa^{u\,2}$ /	[$ŋa^{u}$: ^{42}]	"language"
/ $sa^{i\,3}$ /	[sa^{i}: ^{33}]	"sand"
/ $ha^{u\,4}$ /	[ha^{u}: ^{21}]	"good"
/ $la^{i}i^{2}$ /	[la^{i}: ^{42}]	"wide"
/ $ra^{i\,3}$ /	[ra^{i}: ^{33}]	"cut"

Pattern II :$C_1C_3V_1^T$

Examples :

/ pra^{3} /	[pra: ^{33}]	"arrow"
/ $p^{h}li^{4}$ /	[p^{h}li: ^{21}]	"gondola"
/ $p^{h}ri^{3}$ /	[p^{h}ri: ^{33}]	"tongue"
/ $p^{h}wi^{4}$ /	[p^{h}wi: ^{21}]	"light"
/ dja^{3} /	[dja: ^{33}]	"floor"
/ $c^{h}ja^{1}$ /	[c^{h}ja: ^{45}]	"sour"
/ $c^{h}wa^{3}$ /	[c^{h}wa: ^{33}]	"long"
/ kju^{1} /	[kju: ^{45}]	"dance"
/ kwi^{3} /	[kwi: ^{33}]	"chameleon"
/ $k^{h}je^{4}$ /	[k^{h}je: ^{21}]	"gibbon"
/ $k^{h}ru^{3}$ /	[k^{h}ru: ^{33}]	"dig"
/ $ŋja^{3}$ /	[ŋja: ^{33}]	"far"
/ $ŋwi^{2}$ /	[ŋwi: ^{42}]	"shell"
/ swi^{3} /	[swi: ^{33}]	"blood"
/ lwi^{2} /	[lwi: ^{42}]	"smell"
/ rja^{2} /	[rja: ^{42}]	"hot"
/ rwi^{2}/	[rwi: ^{42}]	"root"
/ $pja^{u\,1}$ /	[pja^{u}: ^{45}]	"fun"
/ $bwa^{i\,3}$ /	[bwa^{i}: ^{33}]	"light(adj)"
/ $bwa^{i\,4}$ /	[bwa^{i}: ^{21}]	"full"
/ $twa^{\,i3}$ /	[twa^{i}: ^{33}]	"to whip"
/ $k^{h}la^{u\,4}$ /	[$k^{h}la^{u}$: ^{21}]	"to shout"
/ $k^{h}wa^{i\,3}$ /	[$k^{h}wa^{i}$: ^{33}]	"to turn"
/ $mwa^{i\,1}$ /	[mwa^{i}: ^{45}]	"yes"
/ $lwa^{i\,3}$ /	[lwa^{i}: ^{33}]	"to go"
/ $cwa^{i\,2}$ /	[cwa^{i}: ^{42}]	"fang"

Pattern III:$C_1C_3C_4V_1^T$: There are only four major syllables occurred in this study.
Examples :

/ p^hrwi^3 /	[p^hrwi^{33}]	"to plane"
/ k^hrwi^4 /	[k^hrwi^{21}]	"rich"
/ k^hrwa^3 /	[k^hrwa^{33}]	"to saw"
/ ʔə p^hrwi^3 /	[ʔə^{33} p^hrwi^{33}]	"rope"

	i	e	ɛ	ɯ	ə	a	u	o	ɔ	a^i	a^u
p	+	+				+		+	+	+	
p^h		+			+	+	+	+	+		
b	+		+	+	+	+			+	+	
t											+
t^h	+			+		+	+	+	+		
d	+	+			+	+					+
c	+	+				+	+		+	+	+
c^h	+	+				+	+				
k	+	+				+				+	+
k^h	+		+			+	+	+			
ʔ	+	+		+	+	+	+	+			+
m	+	+		+	+	+	+			+	
n	+	+			+	+					+
ŋ					+	+		+			+
s	+	+		+		+		+		+	
j		+				+	+	+			
h				+					+		+
l	+					+	+	+		+	+
r	+	+		+	+	+	+			+	
w		+				+				+	

Table 2 : The co-occurrence of single initial consonants and vowels of open major syllable.

+ : occurrence
(blank) : non-occurrence

The co-occurrence of single initial consonants and vowels of the major syllable in table 2 shows that :

1. All consonant phonemes can be the initial consonant of major syllable.
2. All vowel phonemes can occur in major syllable.
3. /a / is the vowel phonemes that has the widest distribution in major syllable.
4. /ɛ / is the vowel phonemes that has the narrowest distribution in major syllable.
5. /ʔ / is the consonant phonemes that has the widest distribution in major syllable.
6. /t/ is the consonant phonemes that has the narrowest distribution in major syllable.
7. /t / only occurs with glide vowel /a^{u}/ .

	i	e	ɛ	ɯ	ə	a	u	o	ɔ	a^i	a^u
pj											+
dj						+					
cj						+					
c^hj						+					
kj						+	+				
k^hj		+							+		
ŋj						+					
rj						+	+				
pl						+					
p^hl	+	+									
kl		+									
k^hl											+
pr						+	+				
p^hr	+	+				+					
kr									+		
k^hr	+						+		+		
p^hw	+										
bw	+					+				+	
tw										+	
t^hw	+					+					
cw	+									+	
c^hw	+					+					
kw	+									+	
k^hw	+					+				+	
ʔw	+										
mw										+	
ŋw	+					+					
sw	+										
lw	+									+	
rw	+					+					
p^hrw	+										
k^hrw	+					+					

Table 3 : The co-occurrence of initial consonant clusters and vowels of open major syllable.

+ : occurrence

(blank) : non-occurrence

The co-occurrence of initial consonant clusters and vowels of open major syllable in Table 3 shows that :

1. There are 7 vowel phonemes / i, e, a, u, ɔ, a^i, a^u / that occur after consonant clusters.
2. The vowel phonemes, which never occur with consonant clusters, are /ɛ, ʉ, ə, o/.
3. The vowel phoneme, which has the widest distribution with consonant clusters in major syllable, is /i/.
4. The vowel phoneme which has the narrowest distribution with consonant clusters in major syllable is /a^u/.
5. There are 32 initial consonant clusters /pj, dj, cj, c^hj, kj, k^hj, ŋj, rj, pl, p^hl, kl, k^hl, pr, p^hr, kr, k^hr, p^hw, bw, tw, t^hw, cw, c^hw, kw, k^hw, ʔw, mw, ŋw, sw, lw, rw, p^hrw, k^hrw/ that occur with the vowel phonemes.
6. The consonant clusters which has the widest distribution with vowel phoneme in major syllable is /p^hr, k^hr, bw, k^hw/.
7. The consonant clusters which has the narrowest distribution with vowel phoneme in major syllable is /pj, dj, cj, c^hj, ŋj, pl, kl, k^hl, kr, p^hw, ʔw, mw, sw, p^hrw/.
8. Only two consonant phonemes /p^hrw, k^hrw/ can occur with the second and the third member of consonant clusters /rw/.

6.3.2.2 Closed major syllable

The structure of the closed major syllable in the Huay Salop Pa-O dialect is consisting of one or two initial consonants, a single vowel, a final consonant, and a tone $C(C)V^{T}C$.

The closed major syllable can be divided into two subtypes according to its final consonants: final stops and final nasals.

Subtype I) The closed major syllable with final stops / p, t, k, ʔ /

The closed major syllable with final voiceless stops / p, t, k, ʔ / bears only two tones: high rising and low falling tones in this dialect. It is the voiceless final consonant that conditions the vowel immediately preceding it to be shorter. According to Jones (1961: 71), all nuclei are considerably shorter when follow by a stop. This syllable type bears the shortest nuclei.

Subtype I I) The closed major syllable with final nasals / m, n, ŋ /

The closed major syllable with final voiced nasals / m, n, ŋ / type bears all tones: high rising, high falling, mid level, and low falling tones. It is the voiced final consonant that conditions the vowel immediately preceding it to be longer. This syllable type bears longer nuclei than the closed major syllable with final stops, but shorter than the open one.

Pattern I : $C_1V_1{}^{T}C_2$

When final consonant **(C_2)** are stops / p, t, k, ʔ /

Examples :

/ tət^{1} /	[tət^{45}]	"rub"
/ kut^{1} /	[kut^{45}]	"nine"
/ cok^{1} /	[cok^{45}]	"suck"
/ kak^{1} /	[kak^{45}]	"jaw"
/ ʔok^{1} /	[ʔok^{45}]	"volume (cN)"
/ dɔʔ^{4} /	[dɔʔ^{21}]	"say"
/ deʔ^{1} /	[deʔ^{45}]	"wing"
/ tap^{4} /	[tap^{21}]	"smooth"
/ cop^{4} /	[cop^{21}]	"play"

When final consonant **(C_2)** are nasals / m, n, ŋ /

Examples :

/ tɛm^{2} /	[tɛ˙m^{42}]	"write"
/ t^{h}om^{1} /	[t^{h}o˙m^{45}]	"put on (shoes)"
/ c^{h}ɛm^{2} /	[c^{h}ɛ˙m^{42}]	"stamp foot"
/ bən^{3} /	[bə˙n^{33}]	"same"
/ t^{h}an^{1} /	[t^{h}a˙n^{45}]	"come out"
/ dən^{4} /	[də˙n^{21}]	"thick"
/ bəŋ^{3} /	[bə˙ŋ^{33}]	"take off"
/ t^{h}oŋ^{4} /	[t^{h}o˙ŋ^{21}]	"drum"
/ dəŋ^{1} /	[də˙ŋ^{45}]	"short"

Pattern II : C_1 C_3V_1 ^{T} C_2

When final consonant **(C_2)** are stops / k, t, ʔ /

Examples:

/ k^{h}rɔt^{1} /	[k^{h}rɔt^{45}]	"scrape"
/ bjak^{4} /	[bjak^{21}]	"basket"
/ twak^{1} /	[twak^{45}]	"count"
/ kjɔk^{1} /	[kjɔk^{45}]	"like"
/ sjeʔ^{1} /	[sjeʔ^{45}]	"insects"
/ ljaʔ^{1} /	[ljaʔ^{45}]	"rip out"
/ kleʔ^{1} /	[kleʔ^{45}]	"turtle"
/ k^{h}waʔ^{1} /	[k^{h}waʔ^{45}]	"cold"
/ ʔwaʔ^{4} /	[ʔwaʔ^{21}]	"drink"
/ lwaʔ^{4} /	[lwaʔ^{21}]	"fall off"

When final consonant **(C_2)** are nasals / m, n, ŋ /

Examples :

/ p^{h}lam^{2} /	[p^{h}la˙m^{42}]	"wash"
/ p^{h}rom^{3} /	[p^{h}ro˙m^{33}]	"fruit (cN)"
/ k^{h}rom^{3} /	[k^{h}ro˙m^{33}]	"brittle"
/ k^{h}lam^{4} /	[k^{h}la˙m^{21}]	"garden"
/ p^{h}ran^{4} /	[p^{h}ra˙n^{21}]	"poor"
/ pləŋ^{3} /	[plə˙ŋ^{33}]	"wheat"
/ cjɔŋ^{1} /	[cjɔ˙ŋ^{45}]	"fly"
/ k^{h}leŋ^{2} /	[k^{h}le˙ŋ^{42}]	"hunt"
/ k^{h}rɔŋ^{4} /	[k^{h}rɔ˙ŋ^{21}]	"to steam"

	i	e	ɛ	ɯ	ə	a	u	o	ɔ	a^i	a^u
p	+	+	+			+		+	+		
p^h	+	+	+		+	+	+	+	+		
b		+	+	+	+	+		+	+		
t		+	+	+	+	+	+	+	+		
t^h			+	+	+	+	+	+	+		
d		+	+	+	+	+	+	+	+		
c	+	+	+		+	+	+	+	+		
c^h	+	+	+		+	+	+	+	+		
k	+	+	+	+	+	+	+	+	+		
k^h	+		+	+	+	+	+	+	+		
ʔ		+			+	+	+	+	+		
m	+	+	+	+	+	+	+	+	+		
n	+	+	+	+	+	+	+	+	+		
ŋ				+	+	+			+		
s	+	+	+	+	+	+	+	+	+		
j	+	+			+	+		+	+		
h			+		+	+		+	+		
l	+	+	+		+	+	+	+	+		
r	+				+	+			+		
w		+			+	+					

Table 4 : The co-occurrence of single initial consonants and vowels of closed major syllable.

+ : occurrence

(blank) : non-occurrence

The co-occurrence of single initial consonants and vowels of closed major syllable in Table 4 shows that :

1. All the consonant phonemes can be the initial consonant of the closed major syllable.
2. All single vowel phonemes can occur in closed major syllable.
3. All glide vowels /a^{i}, a^{u}/ never occur in closed major syllable.
4. / a / is the vowel phoneme that has the widest distribution.
1. / ʉ / is the vowel phoneme that has the narrowest distribution.
6. / k, m, n, s/ are the consonant phonemes that has the widest distribution.
7. /w/ is the consonant phoneme that has the narrowest distribution and only occurs with vowel phoneme /e, a / and /ə/

	p	p^{h}	b	t	t^{h}	d	c	c^{h}	k	k^{h}	ʔ	m	n	ŋ	s	j	h	l	r	W
1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Table 5 : The co-occurrence of single initial consonants and tones of major syllable.

\+ : occurrence
(blank) : non-occurrence

The co-occurrence of single initial consonants and tones of major syllable in Table 5 shows that :

1. All the consonant phonemes can occur with all tones of the closed major syllable.

	i	e	ɛ	ɯ	ə	a	u	o	ɔ	a^i	a^u
pj											+
bj						+					
t^hj						+					
dj		+									
cj									+		
kj						+			+		
k^hj						+		+			
ɲj		+									
ŋj									+		
sj		+				+					
lj						+					
rj						+					
pl		+			+			+	+		
p^hl		+	+			+		+	+		
kl		+									
k^hl		+			+	+		+	+		
pr							+				
p^hr	+	+				+		+	+		
kr									+		
k^hr		+				+		+	+		
pw						+					
tw						+					
cw						+					
kw						+					
k^hw						+					
ʔw						+					
jw						+					
lw						+					

Table 6 : The co-occurrence of initial consonant clusters and vowels of closed major syllable.

\+ : occurrence

(blank) : non-occurrence

The co-occurrence of initial consonant clusters and vowels of the closed major syllable in Table 6 shows that :

1. There are 8 vowel phonemes / i, e, ɛ, ə, a u, o, ɔ / that occur after consonant clusters in the closed major syllable.
2. The vowel phonemes, which never occur with consonant clusters in the closed major syllable, are / ɯ, a^{i}, a^{u} /.
3. The vowel phoneme, which has the widest distribution with consonant clusters in the closed major syllable, is / a /.
4. The vowel phonemes which has the narrowest distribution with consonant clusters in the closed major syllable are / i, ɛ, u /.
5. There are 27 initial consonant clusters / bj, t^{h}j, dj, cj, kj, k^{h}j, nj, ŋj, sj, lj, rj, pl, p^{h}l, kl, k^{h}l, pr, p^{h}r, kr, k^{h}r, k^{h}h, pw, tw, cw, kw, ʔw, jw, lw / that occur with the vowel phonemes in the closed major syllable.
6 The initial consonant clusters / p^{h}l, k^{h}l, p^{h}r/ are the phonemes that have the widest distribution.
7 Almost the initial consonant clusters / bj, t^{h}j, dj, cj, nj, ŋj, lj, rj, kl, pr, kr, pw, tw, cw, kw, k^{h}w, ʔw, jw, lw / have the narrowest distribution.

6.3.3 Minor Syllable

A minor syllable consists of an initial single consonant or consonant cluster, a single vowel, an optional final consonant, and a tone. It bears a weak stress which has the lower intensity of volume and the shorter duration of vowel length than the major syllable. It occurs as the first, second, or penultimate syllable in the word of two syllables or in the polysyllabic word. The minor syllable can be either an opened or a closed syllable. It bears tones and characteristics like major syllable excepts the position and the stress. Here the minor syllable is marked by the underline (‿).

The structure of the minor syllable in Pa-O language is $C_1(C_3)V_1^T(C_2)$.

6.3.3.1 Open minor syllable

Pattern I : $C_1V_1^T$

Examples:

/ pe^1 na^{u3} /	[pe:^{45} ˌ na^{u}:^{33}]	"younger brother sibling"
/ p^hu^2 k^ho^4 /	[p^hu:^{42} ˌ k^ho:^{21}]	"younger brother "
/ ba^1 jɔn^4 /	[ba:^{45} ˌ jɔ˙n^{21}]	"cow pea"
/ ti^3 poŋ^3 /	[ti:^{33} ˌ po˙ŋ^{33}]	"penis"
/ de^3 su^3 /	[de:^{33} ˌ su:^{33}]	"toad"
/ ki^3 leŋ^2 /	[ki:^{33} ˌ le˙ŋ^{42}]	"knee"
/ ka?^{4}tu^3 pi^4 /	[kə ˌ tu:^{33} ˌ pi:^{21}]	"scalp"
/ ?ə^1 ma^{i3} /	[?ə:^{45} ˌ ma^{i}:^{33}]	"where?"
/ se^4 na^3 /	[se:^{21} ˌ na:^{33}]	"understand"
/ ja^3 du^3 /	[ja:^{33} ˌ du:^{33}]	"muscle"
/ ra^{i2} sa^2 /	[ra^{i}:^{42} ˌ sa:^{42}]	"farmer"

Pattern III : $C_1C_3V_1^T$

Examples:

/ rja^2 $k^hiŋ^3$ /	[rja: ^{42} ˌ $k^hi˙ŋ^{33}$]	"summer"
/ ta?^{4} k^hja^3 t^ha^3 /	[tə ˌ k^hja:^{33} ˌ t^ha:^{33}]	"sneeze"
/ c^hja^4 mə^1 /	[c^hja:^{21} ˌ mə:^{45}]	"hen"
/ c^hja^4 t^hi^2 /	[c^hja:^{21} ˌ t^hi:^{42}]	"rooster"
/ ŋan^4 pja^3 t^hi^4 /	[ŋa˙n^{21} pja:^{33} ˌ t^hi:^{21}]	"fish soy"
/ pja^u?^{4} ?ə?^{1}/	[pja^u?^{21} ˌ ?ə?^{45}]	"lightning"
/ bwa^{i1} caŋ^3 /	[bwa^{i}:^{45} ˌ ca˙ŋ^{33}]	"monk"
/ kwa^{i4} sa^3 /	[kwa^{i}:^{21} ˌ sa:^{33}]	"rabbit"

6.3.3.2 Closed minor syllable

Pattern I : $C_1V_1{}^TC_2$

Examples:

/ p^hit^1 t^hu^3 /	[p^hit^{45} ˈ $t^hu{:}^{33}$]	"housefly"
/ c^hut^1 $rɛ^3$ /	[c^hut^{45} ˈ $rɛ{:}^{33}$]	"rib"
/ kik^4 pai^3 /	[kik^{21} ˈ $pai{:}^{33}$]	"big cricket"
/ $weʔ^4$ t^hu^3 /	[$weʔ^{21}$ ˈ $t^hu{:}^{33}$]	"fly"
/ $dɔʔ^4$ kja^2 /	[$dɔʔ^{21}$ ˈ $kja{:}^{42}$]	"answer"
/ $moʔ^1$ $ʔe^3$ /	[$moʔ^{45}$ ˈ $ʔe{:}^{33}$]	"cloud"
/ cam^3 $p^heŋ^3$ /	[$ca{\cdot}m^{33}$ ˈ $p^he{\cdot}ŋ^{33}$]	"butterfly"
/ lam^2 $ŋaŋ^2$ /	[$la{\cdot}m^{42}$ ˈ $ŋa{\cdot}ŋ^{42}$]	"roof"
/ k^ham^2 $k^hreŋ^3$ /	[$k^ha{\cdot}m^{42}$ ˈ $k^hre{\cdot}ŋ^{33}$]	"thunder"
/ $ŋan^4$ pja^3 t^hi^4 /	[$ŋa{\cdot}n^{21}$ $pja{:}^{33}$ ˈ $t^hi{:}^{21}$]	"fish soy"
/ $k^haŋ^3$ $lɔŋ^4$ $p^hoŋ^3$ /	[$k^ha{\cdot}ŋ^{33}$ ˌ $lɔ{\cdot}ŋ^{21}$ ˈ $p^ho{\cdot}ŋ^{33}$]	"calf"
/ $beŋ^3$ $maŋ^2$ /	[$be{\cdot}ŋ^{33}$ ˈ $ma{\cdot}ŋ^{42}$]	"dream"
/ $ʔeŋ^3$ $cɛŋ^3$ /	[$ʔe{\cdot}ŋ^{33}$ ˈ $cɛ{\cdot}ŋ^{33}$]	"galanga"
/ $mɔŋ^1$ $kleŋ^1$ /	[$mɔ{\cdot}ŋ^{45}$ ˈ $kle{\cdot}ŋ^{45}$]	"hat"

Pattern II : $C_1C_3V_1{}^TC_2$

Examples:

/ $pleŋ^4$ $ʔɔʔ^1$ /	[$ple{\cdot}ŋ^{21}$ ˈ $ʔɔʔ^{45}$]	"armpit"
/ $p^hleʔ^1$ sin^2 /	[$p^hleʔ^{45}$ ˈ $si{\cdot}n^{42}$]	"water lettuce"
/ $p^hrɔŋ^2$ $tɛŋ^4$ /	[$p^hrɔ{\cdot}ŋ^{42}$ ˈ $tɛ{\cdot}ŋ^{21}$]	"pen"
/ $k^hjaŋ^1$ $rəŋ^4$ /	[$k^hja{\cdot}ŋ^{45}$ ˈ $rə{\cdot}ŋ^{21}$]	"basket"
/ $k^hwaʔ^1$ $k^hiŋ^3$ /	[$k^hwaʔ^{45}$ ˈ $k^hi{\cdot}ŋ^{33}$]	"winter"
/ $lwaʔ^1$ t^hi^1 /	[$lwaʔ^{45}$ ˈ $t^hi{:}^{45}$]	"ugly"
/ $lwaʔ^1$ $ŋa^3$ /	[$lwaʔ^{45}$ ˈ $ŋa{:}^{33}$]	"lazy"

6.4 Stress in Syllable

Stress is defined in terms of intensity (volume) and duration of vowel length. It functions in syllable rank. In Pa-O language stress is predictable by the types of syllables and its position in phonological word. Therefore, the syllable stress needs not to be marked overtly at the phonemic level.

6.4.1 Types of Stress and Syllable Stress Symbols

Stress can be divided into two groups. They are stress and non-stress.

6.4.1.1 Stress : strong stress and weak stress

A stressed syllable is the syllable whose stress is heavier and has greater length (in the volume) than an unstressed one. The stress in Huay Salop Pa-O dialect can be predicted from the syllable structure. Therefore, the word stress is non-phonemic. There are three phonetic levels of stress: strong stress, weak stress, and un-stress

I). Strong stress (Primary Stress)

A strong stress syllable is the syllable that has more volume and greater length (usually on the vowel) than the weak stress syllable. It is the only stress that occurs on the peak of the major syllable. This strong stress is obligatory in a phonological word (a stress group) and [ˈ _] is used to represented it.

Examples:

/ doŋ^{3} /	[ˈdoˑŋ^{33}]	“hit by hand”
/ cu^{4} /	[ˈcuː^{21}]	“hand”
/ cʰut^{1} /	[ˈcʰut^{45}]	“bone”
/ kim^{1} /	[ˈkiˑm^{45}]	“like”
/ kʰaŋ^{3}/	[ˈkʰaˑŋ^{33}]	“foot”
/ʔɛn^{3} /	[ˈʔɛˑn^{33}]	“narrow”
/ ti^{3} poŋ^{3} /	[ˌtiː^{33} ˈpoˑŋ^{33}]	“penis”
/ ja^{3} du^{3} /	[ˌjaː^{33} ˈduː^{33}]	“muscle”
/ ra^{i2} sa^{2} /	[ˌraːˑ^{42} ˈsaː^{42}]	“farmer”
/ moʔ^{1} ʔe^{3} /	[ˌmoʔ^{45} ˈʔeː^{33}]	“cloud”
/ cam^{3} pʰeŋ^{3} /	[ˌcaˑm^{33} ˈpʰeˑŋ^{33}]	“butterfly”
/ pʰrɔŋ^{2} tɛŋ^{4} /	[ˌpʰrɔˑŋ^{42} ˈtɛˑŋ^{21}]	“pen”
/ kʰjaŋ^{1} rəŋ^{4} /	[ˌkʰjaˑŋ^{45} ˈrəˑŋ^{21}]	“basket”
/ ʔeŋ^{3} cɛŋ^{3} /	[ˌʔeˑŋ^{33} ˈcɛˑŋ^{33}]	“galanga”
/ mɔŋ^{1} kleŋ^{1} /	[ˌmɔˑŋ^{45} ˈkleˑŋ^{45}]	“hat”

II). Weak Stress (Secondary Stress)

A weak stress syllable is the syllable that has less volume and length than the strong stress syllable. It occurs on any minor syllable and is marked by [ˌ _].

Examples:

/ ba^{1} $jɔn^{4}$ /	[ˌ $ba:^{45}$ ˈ $jɔ˙n^{21}$]	"cow pea"
/ de^{3} su^{3} /	[ˌ $de:^{33}$ ˈ $su:^{33}$]	"toad"
/ ki^{3} $leŋ^{2}$ /	[ˌ $ki:^{33}$ ˈ $le˙ŋ^{42}$]	"knee"
/ $c^{h}ja^{4}$ $mə^{1}$ /	[ˌ $c^{h}ja:^{21}$ ˈ $mə:^{45}$]	"hen"
/ bwa^{i1} $caŋ^{3}$ /	[ˌ $bwa^{i}:^{45}$ ˈ $ca˙ŋ^{33}$]	"monk"
/ kwa^{i4} sa^{3} /	[ˌ $kwa^{i}:^{21}$ ˈ $sa:^{33}$]	"rabbit"
/ $p^{h}it^{1}$ $t^{h}u^{3}$ /	[ˌ $p^{h}it^{45}$ ˈ $t^{h}u:^{33}$]	"housefly"
/ $c^{h}ut^{1}$ $rɛ^{3}$ /	[ˌ $c^{h}ut^{45}$ ˈ $rɛ:^{33}$]	"rib"
/ kik^{4} pa^{i3} /	[ˌ kik^{21} ˈ $pa^{i}:^{33}$]	"big cricket"
/ $lwaʔ^{1}$ $ŋa^{3}$ /	[ˌ $lwaʔ^{45}$ ˈ $ŋa:^{33}$]	"lazy"

B). Unstress

An unstressed syllable is the syllable that has no stress at all. It has less volume and length than the weak stress syllable. It occurs on only presyllable [Cə] and it is marked by [_].

Examples:

/ pə $juŋ^{42}$ /	[$pə^{33}$ ˈ $ju˙ŋ^{42}$]	"smile"
/ tə $kɔŋ^{21}$ /	[$tə^{33}$ ˈ $kɔ˙ŋ^{21}$]	"hill"
/ tə $ŋɛ^{33}$ /	[$tə^{33}$ ˈ $ŋɛ:^{33}$]	"tooth"
/ tə sa^{3} /	[$tə^{33}$ ˈ $sa:^{33}$]	"salt"
/ tə wa^{3} /	[$tə^{33}$ ˈ $wa:^{45}$]	"land leech"
/ $t^{h}ə$ $kɔn^{2}$ /	[$t^{h}ə^{33}$ ˈ $kɔ˙n^{42}$]	"bed"
/ $t^{h}ə$ sa^{2} /	[$t^{h}ə^{33}$ ˈ $sa:^{42}$]	"animal"
/ kə tu^{33} /	[$kə^{33}$ ˈ $tu:^{33}$]	"head"
/ ʔə pat^{21} /	[$ʔə^{33}$ ˈ pat^{21}]	"week"
/ ʔə $bɛʔ^{4}$ /	[$ʔə^{33}$ ˈ $bɛʔ^{21}$]	"fat"
/ ʔə $cwa^{i\,2}$ /	[$ʔə^{33}$ ˈ $cwa^{i}:^{42}$]	"fang"
/ sə $lɔp^{1}$ /	[$sə^{33}$ ˈ $lɔp^{21}$]	"public rest-house"

The syllable structure can be predicted and it is non-phonemic, therefore, it is unnecessary to write any stress mark on the syllable in phonemic writing.

6.5 Function

The syllables function in the phonological word. They have two main functions in the phonological word : as Nucleus and Periphery.

6.5.1 Nuclear Syllable

The nuclear syllable is a major syllable and always takes strong (primary) stress. It always occupies on monosyllabic word or on the last position in the word. It is marked by [ˈ_].

Examples:

[ˈ s]

/ cu^{4} /	[ˈcu:^{21}]	" hand"
/ kim^{1} /	[ˈkiˑm^{45}]	" like"
/ k^{h}aŋ^{3}/	[ˈk^{h}aˑŋ^{33}]	" foot"

[u.ˈ s]

/ tə kɔŋ^{4} /	[tə^{33} ˈkɔˑŋ^{21}]	" hill"
/ t^{h}ə sa^{2} /	[t^{h}ə^{33} ˈsa:^{42}]	" animal"
/ kə tu^{3} /	[kə^{33} ˈtu:^{33}]	" head"

[ˌw.ˈ s]

/ ki^{3} leŋ^{2} /	[ˌki:^{33} ˈleˑŋ^{42}]	"knee"
/ c^{h}ja^{4} mə^{1} /	[ˌ c^{h}ja:^{21} ˈmə:^{45}]	"hen"
/ c^{h}ut^{1} rɛ^{3} /	[ˌc^{h}ut^{45} ˈrɛ:^{33}]	"rib"

[u. u. ˈs]

/tə kə li^{4}/	[tə^{33} kə^{33} ˈli:^{21}]	" tick"
/ʔə tə nɛŋ^{2}/	[ʔə^{33} tə^{33} ˈnɛˑŋ^{42}]	" sob"

[u. ˌw. ˈs]

/ tə p^{h}e^{1} ra^{3}/	[tə^{33} ˌp^{h}e:^{45} ˈra:^{33}]	"rose-apple"
/ tə k^{h}o^{1} p^{h}un^{3}/	[tə^{33} ˌk^{h}o:^{45} ˈp^{h}uˑn^{33}]	"powder"

[ˌw. u. ˈs]

/cjɔŋ^{3} sə ra^{3}/	[ˌcjɔˑŋ^{33} sə^{33} ˈra:^{33}]	"teacher"
/ k^{h}waʔ^{1} tə nəʔ^{1}/	[ˌk^{h}waʔ^{45} tə^{33} ˈnəʔ^{45}]	"chill"

[ˌw. ˌw. ˈs]

/ka^{u3} neŋ^{1} si^{4}/	[ˌka^{u}:^{33} ˌneˑŋ^{45} ˈsi:^{21}]	"rose"
/k^{h}am^{3} p^{h}a^{3} ham^{3}/	[ˌk^{h}aˑm^{33} ˌp^{h}a:^{33} ˈhaˑm^{33}]"earth"	

6.5.2 Peripheral Syllable

The syllables in this class function as the periphery of the phonological word. Every peripheral syllable can occur in any position, except the final one, of a phonological word. It can be divided into two sub-classes : weakly stressed peripheral syllable and unstressed peripheral syllable.

6.5.2.1 Weakly Stressed Peripheral Syllable

A weakly stressed peripheral syllable has a weak stress and it is defined as a minor syllable, which always takes a secondary stress. It usually occupies on the first position of disyllabic word or on any position except the last one of polysyllabic word. It is marked by [ˌ_].

Examples:

/ bəŋ^{2} kʰaŋ^{4} /	[ˌbəːŋ^{42} ˈkʰaːŋ^{21}]	"knee"
/ pʰrɔŋ^{2} bi^{3} /	[ˌpʰrɔːŋ^{42} ˈbiː^{33}]	"hen"
/ cʰut^{1} rɛ^{3} /	[ˌcʰut^{45} ˈrɛː^{33}]	"rib"
/ pʰi^{4} bwa^{4} /	[ˌpʰiː^{21} ˈbwaː^{21}]	"nun"
/ pleŋ^{4} ʔɔʔ^{1} /	[ˌpleːŋ^{21} ˈʔɔʔ^{45}]	"rib"

6.5.2.2 Unstressed Peripheral Syllable

An unstressed peripheral syllable has a non-stress and it is defined as a presyllable, which always takes a zoro stress. This kind of syllable has phonemic /ə/ with phonetic realisation [ə] as the vowel of the syllable and it carries the neutral tone. It usually occupies on the first position of disyllabic word or on any position except the last one of polysyllabic word. It is marked by [_].

Examples:

/ pə si^{4} /	[pə^{33} ˈ siː^{21}]	"to wash"
/ tʰə kɔn^{2} /	[tʰə^{33} ˈ kɔːn^{42}]	"bed"
/ kə lu^{3} /	[kə^{33} ˈluː^{33}]	"hair"
/ kə lɔŋ^{4} /	[kə^{33} ˈlɔːŋ^{21}]	"pen"
/ ʔə sak^{1} /	[ʔə^{33} ˈsak^{45}]	"age"
/ tə pʰe^{1} ra^{3}/	[tə^{33} ˌpʰeː^{45} ˈraː^{33}]	"rose-apple"
/ kʰwaʔ^{1} tə nəʔ^{1}/	[ˌkʰwaʔ^{45} tə^{33} ˈnəʔ^{45}]	"chill"
/ tʰə ʔə^{1} tʰə cʰa^{4} /	[tʰə^{33} ˌʔəː^{45} tʰə^{33} ˈcʰaː^{21}]	"sick "

6.6 Syllable Boundary and Syllable Break

6.6.1 In Phonetic Transcription

Stress shows the beginning of a syllable. That is, the strong stressed sign [ˈ] shows the beginning of a major syllable, the weakly stressed sign [ˌ] shows the beginning of a minor syllable. As of the zero stress, there is no sign to show the beginning of the unstressed syllable, the presyllable, but the initial consonant of the syllable does. Since all Pa-O dialect syllables end with a vowel or a final consonant, if a vowel or a final consonant (together with any tone) appears, it shows that the preceding syllable ends, and that a following consonant or a consonant cluster mark the beginning of the next syllable; for example:

Major Syllable	V	ˈC	[ˌcʰut^{45}	ˈrɛ^{33}]	"rib"
Minor Syllable	V	ˌC	[ˌcjɔŋ^{33}	sə ˈra^{33}]	"teacher"
Presyllable	V	C	[kə ˈ	lu^{33}]	"hair"

6.6.2 In Phonemic Transcription

Stress is predictable by the syllable position in the phonological word and by the syllable structure: the final syllable in a phonological word is the major syllable, the non-final syllable in /Cə/ structure is the presyllable, and the non-final syllable in a phonological word is the minor syllable. Therefore, stress needs not to be marked in the phonemic transcription. The vowel together with any tone still shows the end of the preceding syllable and the consonant following shows the beginning of the next syllable as well.

CHAPTER VII

THE PHONEMES

7.1 Definition

A phoneme is defined as the rank whose unit functions in the syllable. It is the lowest rank of the hierarchy, which is capable of differentiating one word from another. The phoneme has no stable structure, because it is an actual-sound unit of language so it varies in particular dialect or any person, but the phonetic forms of phoneme may be described.

7.2 Function

There are both segmental and suprasegmental phonemes in the Huay Salop Pa-O language. In this study, a segmental phoneme is stated in terms of consonant and vowel and a suprasegmental phoneme is stated in terms of tone. Therefore, on the basis of their function in the syllable, there are 3 classes of phonemes: consonants, vowels and tones.

7.3 Consonants

Consonants are sound made by a closure or narrowing in the vocal tract so that the airflow is either completely blocked, or so restricted that audible friction is produced. Consonant articulations are relatively easy to feel, and as a result are most conveniently described in term of place and manner of articulation. In addition, a routine phonetic description of consonants would involve information about the mode of vibration of the vocal cords, and it is often necessary to specify the duration of the sound, the airstream mechanism involved and the direction of airflow. From a phonological point of view, consonant are those units, which function at the margin of syllables, either singly or in clusters (Crystal 1991:74).

There are 20 consonant phonemes in the Pa-O language as spoken in the village of Huay Salop: / p, p^h, b, t, t^h, d, c, c^h, k, k^h, ʔ, m, n, ŋ, s, j, h, l, r, w /. All of

Them can occur in the initial position. The phonemes / p, t, k, ʔ, m, n, ŋ / can also occur in the final position. The phonemes / l, r, w, j / can also occur in the second element of cluster, and only the phoneme / w / can occur in the third element of cluster.

In the following chart, each of the consonants will be grouped according to their manners and points of articulation. They are divided into six groups: plosive, fricative, nasal, lateral, trill, and semi-vowel as shown in the following chart.

Points of articulation / Manners of articulation		Bilabial	Alveolar	Palatal	Velar	Glottal
Plosive	unasp.vl.	p	t	c	k	ʔ
	asp.vl.	p^h	t^h	c^h	k^h	
	vd.	b	d			
Fricative	unasp.vl.		s			h
Nasal	vd.	m	n		ŋ	
Lateral	vd.		l			
Trill	vd.		r			
Semi-vowel	vd.	w		j		

Table 7 : Consonant Phoneme Chart

7.3.1 Classification of Consonants

In Huay Salop Pa-O dialect, consonants can be classified according to their function in the syllables into four sub-classes: initial consonants, final consonants, second member and third member of consonant clusters.

7.3.1.1 Initial Consonants

Initial consonants are the consonant that can occur in the initial position of the syllable. They are all of 20 consonant phonemes found in this language: / p, p^h, b, t, t^h, d, c, c^h, k, k^h, ʔ, m, n, ŋ, s, j, h, l, r, w /.

Examples:

p-	/pok^1/	"dull"
p^h-	/p^həŋ^3/	"pot"
b-	/bak^1/	"chop"
t-	/tɛm^2/	"write"
t^h-	/t^hi^4/	"water"
d-	/dən^4/	"thick"
c-	/cu^4/	"hand"
c^h-	/c^hɛŋ^3/	"coat"
k-	/kɔŋ^4/	"mountain"
k^h-	/k^həʔ^1/	"over flow"
ʔ-	/ʔeŋ^3/	"bite"
m-	/me^3/	"fire"
n-	/nɛn^2/	"breast"
ŋ-	/ŋan^1/	"narrow"
s-	/sɯn^3/	"liver"
j-	/ju^2/	"rat"
h-	/hən^4/	"hear"
l-	/lam^2/	"house"
r-	/rət^1/	"sing"
w-	/wa^1/	"bamboo"

	i	e	ɛ	ɯ	ə	a	u	o	ɔ	a^i	a^u
p	+	+	+		+	+		+	+		
p^h	+	+	+		+	+	+	+	+		
b	+	+	+	+	+	+		+	+		
t	+	+	+	+	+	+	+	+	+	+	+
t^h	+		+	+	+	+	+	+	+		
d		+	+	+	+	+	+	+	+		+
c	+	+	+		+	+	+	+	+	+	
c^h	+	+	+		+	+	+	+	+	+	
k	+	+	+	+	+	+	+	+	+		+
k^h	+		+	+	+	+	+	+	+		
ʔ	+	+			+	+	+	+	+		
m	+	+	+	+	+	+	+	+	+	+	
n	+	+	+	+	+	+	+	+	+	+	+
ŋ				+	+	+			+		
s	+	+	+	+	+	+	+	+	+	+	
j	+	+			+	+		+	+		
h			+		+	+		+	+		+
l	+	+	+		+	+	+	+	+		
r	+	+			+	+			+		
w		+			+	+					

Table 8 : The co-occurrence of single initial consonants and vowels in syllables.

+ : occurrence

(blank) : non-occurrence

The co-occurrence of single initial consonants and vowels of the syllable in Table 8 shows that:

1. All consonant phonemes can be the initial consonants.
2. All vowel phonemes can occur in syllables.
3. / ə, a / are the vowel phonemes that has the widest distribution in syllables.
4. /au / is the vowel phonemes that has the narrowest distribution in syllables.
5. / t, n / are the consonant phonemes that has the widest distribution in syllables.
6. / w / is the consonant phonemes that has the narrowest distribution in syllables. It only occurs with / e, ə, a /

Initial Consonant	TONE											
	Open Syllable				Closed Syllable							
					Final Stops / p, t, k, ʔ /				Final Nasals / m, n, ŋ /			
	1	2	3	4	1	2	3	4	1	2	3	4
p	+	+	+	+	+			+	+	+	+	+
p^h	+	+	+	+	+			+	+	+	+	+
b	+	+	+	+	+			+	+	+	+	+
t	+	+	+	+	+			+	+	+	+	+
t^h	+	+	+	+	+			+	+	+	+	+
d	+	+	+	+	+			+	+	+	+	+
c	+	+	+	+	+			+	+	+	+	+
c^h	+	+	+	+	+			+	+	+	+	+
k	+	+	+	+	+			+	+	+	+	+
k^h	+	+	+	+	+			+	+	+	+	+
ʔ	+	+	+	+	+			+	+	+	+	+
m	+	+	+	+	+			+	+	+	+	+
n	+	+	+	+	+			+	+	+	+	+
ŋ	+	+	+	+	+			+	+	+	+	+
s	+	+	+	+	+			+	+	+	+	+
j	+	+	+	+	+			+	+	+	+	+
h	+	+	+	+	+			+	+	+	+	+
l	+	+	+	+	+			+	+	+	+	+
r	+	+	+	+	+			+	+	+	+	+
w	+	+	+	+	+			+	+	+	+	+

Table 9 : The co-occurrence of single initial consonants and tones in open syllables and closed syllables.

\+ : occurrence

(blank) : non-occurrence

The co-occurrence of single initial consonants and in syllables in Table 9 shows that:

4. All single initial consonant phonemes can occur in open syllables and closed syllables.
5. All single initial consonant phonemes can occur with all tones in open syllables and closed syllables with final nasals / m, n, ŋ /.
3. Closed syllables with final stops / p, t, k, ʔ / never occur with tone / 2, 3 /

7.3.1.2 Final Consonants

Final consonants are the consonants that can occur in the final position of the syllable. They are / p, t, k, ʔ, m, n, ŋ /

Examples:

-p	/ cop^4 /	"to play"
-t	/ pɔt^1 /	"to brush"
-k	/ pok^1/	"dull"
-ʔ	/ mɛʔ^4 /	"eye"
-m	/ lam^2 /	"house"
-n	/ nɛn^2 /	"breast"
-ŋ	/ ŋaŋ^2 /	"back"

7.3.1.3 Second Member of the Consonant Cluster

The second member of consonant clusters occupies the second position of syllable-initial cluster. They are / l, r, w, j /.

The co-occurrence of them is restricted to four patterns of consonant cluster as follows:

Pattern I : -l-cluster (C_1 l)
C_1 are / p, p^h, k, k^h /
C_3 is /l/
They make 4 -l- clusters /pl, p^{h}l, kl, k^{h}l/.

Examples:

pl-	/pleŋ^4/	"shoulder"
p^{h}l-	/p^{h}lɔʔ^1/	"to vomit"
kl-	/kleʔ^1/	"turtle"
k^{h}l	/k^{h}ləŋ^4/	"to roast"

Pattern II: -r- cluster (C_1 r)
C_1 are / p, p^h, k, k^h /
C_3 is /r/
They make 4 -r- clusters / pr, p^{h}r, kr, k^{h}r /.

Examples:

pr-	/pra^3/	"arrow"
p^{h}r-	/p^{h}ri^3/	"tongue"
kr-	/krɔʔ^1/	"shave"
k^{h}r-	/k^{h}rɔt^1/	"to scrape"

Pattern III:-w- cluster ((C_1 w)

C_1 are / p^h, b, t, t^h, c, c^h, k, k^h, ʔ, m, ŋ, s, j, l, r, /

C_3 is /w/

They make 15 -w- clusters / p^hw, bw, tw, t^hw, cw, c^hw, kw, k^hw, ʔw, mw, ŋw, sw, jw, lw, rw, /.

Examples:	p^hw-	/p^hwi^3/	"light (adj)"
	bw-	/bwa^4/	"white"
	tw-	/$twak^1$/	"count"
	t^hw-	/t^hwi^3/	"dog"
	cw-	/$cwaŋ^3$/	"float"
	c^hw-	/c^hwa^3/	"long"
	kw-	/kwi^3/	"chameleon"
	k^hw-	/$k^hwaʔ^1$/	"cold"
	ʔw-	/$ʔwaʔ^4$/	"drink"
	mw-	/mwi^2 can^3 t^ha^3/	"very much"
	ʔw	/$ŋwi^2$/	"shell"
	sw-	/swi^3/	"blood"
	jw-	/$jwaʔ^4$/	"wait"
	lw-	/$lwaŋ^2$/	"run"
	rw-	/rwi^2/	"root"

Pattern IV: -j- cluster (C_1 j)

C_1 are / p, b, d, c, c^h, k, k^h, n, ŋ, s, l, r/

C_3 is /j/

They make 12 -j- clusters / pj, bj, dj, cj, c^hj, kj, k^hj, nj, ŋj, sj, lj, rj /.

Examples:

pj-	/$pjauʔ^1$/	"fun"
bj-	/$bjak^1$/	"wet"
dj-	/$djeʔ^1$/	"wing"
cj-	/$cjɔŋ^1$/	"fly"
c^hj-	/c^hja^1/	"sour"
kj-	/$kjaʔ^4$/	"fasten"
k^hj-	/k^hje^4/	"gibbon"
nj-	/$njeʔ^1$/	"to press down"
ŋj-	/$ŋja^3$/	"far"
sj-	/$sjeʔ^1$/	"insects"
lj-	/$ljaʔ^1$/	"to rip out"
rj-	/rja^2/	"hot"

7.3.1.4 Third Member of the Consonant Cluster

The third member of consonant cluster occupies the third position of syllable-initial cluster. It is / w /. It occurs only with the second member of consonant cluster / r / and only with the syllable-initial consonants / p^h / and / k^h / in this language as follows:

Pattern I: -rw- cluster (C_1 rw)
C_1 are / p^h, k^h /
C_3 is /r/
C_4 is /w/
They make 2 -rw- cluster / p^hrw, k^hrw /.

Examples:

p^hrw-	/p^hrwi^3/	"to plane"
k^hrw-	/k^hrwi^4/	"rich"
k^hrw-	/k^hrwa^3/	"saw"

	-p	-t	-k	-ʔ	-m	-n	-ŋ
i	+	+	+	+	+	+	+
e			+	+		+	+
ɛ		+		+	+	+	+
ɯ		+	+	+	+	+	+
ə		+	+	+	+	+	+
a	+	+	+	+	+	+	+
u	+	+	+	+		+	+
o	+		+	+	+		+
ɔ	+	+	+	+		+	+
a^i							
a^u				+			

Table 10 : The co-occurrence of final consonants and vowels of the closed syllable.

\+ : occurrence

(blank) : non-occurrence

The co-occurrence of final consonants and vowels of the closed syllable in Table 10 shows that:

1. The consonant phonemes / p, t, k, ʔ, m, n, ŋ / can occur finally.
2. / ʔ, ŋ / are the final consonant phonemes that have the widest distribution.
3. / p / is the final consonant phoneme that has the narrowest distribution and only occurs with vowel phoneme / i, a, u, o / and / ɔ /
4. All single vowel phonemes / i, e, ɛ, ɯ, ə, a, u, o, ɔ / can occur with final consonants in the closed major syllable.
5. Only glided vowel / a^i / never occur with final consonants in the closed syllable.
6. / i, a / are the vowel phonemes that have the widest distribution.
7. / a^u / is the vowel phoneme that has the narrowest distribution.

C_1 \ $C_3(C_4)$	-j- (C_1j)	-l- (C_1l)	-r- (C_1r)	-w- (C_1w)	-rw- (C_1rw)
p	pj	pl	pr		
p^h		p^hl	p^hr	p^hw	p^hrw
b	bj			bw	
t				tw	
t^h				t^hw	
d					
c	cj			cw	
c^h	c^hj			c^hw	
k	kj	kl	kr	kw	
k^h	k^hj	k^hl	k^hr	k^hw	k^hrw
ʔ				ʔw	
m				mw	
n	nj				
ŋ	ŋj			ŋw	
s	sj			sw	
j				jw	
h					
l	lj			lw	
r	rj			rw	
w					

Table 11 : The co-occurrence of the first consonants (C_1) , the second Consonants(C_3) and the third consonant (C_4) in consonant clusters.

The co-occurrence of the first consonants (C_1), the second consonants (C_3) and the third consonant (C_4) in Table 11 shows that:

1) There are 4 consonant phonemes / j, l, r, w / that occur as the second member of consonant clusters and only consonant phoneme / w / can occur as the third member of consonant clusters.
2) The consonant phonemes / l, r, j / can be both the first member of the cluster (C_1) and as the second member of the consonant cluster (C_2).
3) The first and the second members of the cluster cannot be the same phonemes, there is no /jj /, / ll /, / rr / and / ww / cluster in this study.
4) In -l- and -r- clusters, only bilabial plosives and velar plosives / p, p^h, k, k^h / occur as the first member of the cluster of this kind.
5) Only / k, k^h / occurs with all of the consonant clusters / j, l, r, w /.
6) Only / p^h, k^h / occur with third member of consonant cluster / w /.
7) In -w- clusters, almost consonant phonemes, except / p, d, n, h, w / occur as the first member of the consonant clusters.

	i	e	ɛ	ɯ	ə	a	u	o	ɔ	a^i	a^u
pj											+
dj						+					
cj						+					
c^hj						+			+		
kj						+	+				
k^hj		+				+			+		
ŋj						+					
rj						+	+				
pl	+	+				+					
p^hl	+	+									
kl		+									
k^hl									+		+
pr						+	+				
p^hr	+	+				+			+		
kr									+		
k^hr	+						+		+		
p^hw	+										
bw	+					+				+	
tw										+	
t^hw	+					+					
cw	+									+	
c^hw	+					+					
kw	+									+	
k^hw	+					+				+	
ʔw	+										
mw	+									+	
ŋw	+					+					
sw	+										
jw						+					
lw	+					+				+	
rw	+					+					
p^hrw	+										
k^hrw	+					+					

Table 12 : The co-occurrence of initial consonant clusters and vowels of the syllable.

+ : occurrence

(blank) : non-occurrence

The co-occurrence of initial consonant clusters and vowels of the syllable in Table 12 shows that:

1. There are 7 vowel phonemes / i, e, a, u, ɔ, a^{i}, a^{u} / that occur after consonant clusters.
2. The vowel phonemes, which never occur with consonant clusters, are / ɛ, ʉ, ə, o /.
3. The vowel phoneme, which has the widest distribution with consonant clusters in the syllable, is / i /.
4. The vowel phoneme which has the narrowest distribution with consonant clusters in the syllable is /a^{u} /. It only occurs with consonant clusters / pj, k^{h}l /.
5. There are 33 initial consonant clusters /pj, dj, cj, c^{h}j, kj, k^{h}j, ŋj, rj, pl, p^{h}l, kl, k^{h}l, pr, p^{h}r, kr, k^{h}r, p^{h}w, bw, tw, t^{h}w, cw, c^{h}w, kw, k^{h}w, ʔw, mw, ŋw, sw, jw, lw, rw, p^{h}rw, k^{h}rw/ that occur with the vowel phonemes.
6. The consonant cluster, which has the widest distribution with vowel phoneme in major syllable, is / p^{h}r /.
7. The consonant clusters which have the narrowest distribution with vowel phoneme in major syllable are /pj, dj, cj, ŋj, kl, kr, tw, ʔw, sw, jw, p^{h}rw/.
8. Only two consonant phonemes / p^{h}rw, k^{h}rw / can occur with the second member of consonant clusters /rw/.
9. / k^{h}rw / can occur with vowel phoneme / i, a / whereas / p^{h}rw / can occur with only vowel phoneme / i /.

7.3.2 Consonant Formational Statement

All consonant phonemes in the Huay Salop Pa-O language are produced with egressive airstream mechanism.

7.3.2.1 Plosives

Plosive is a term used in phonetic classification of consonant sounds on the basis of their manner of articulation. It refers to a sound made when a complete closure in the vocal tract is suddenly released, the air pressure which has built up behind the closure rushes out with an explosive sound (Crystal 1991:266).

/p/ is a voiceless unaspirated bilabial plosive phoneme which is realized as follows:

[p] a voiceless unaspirated bilabial plosive. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ pɔk^{1} /	[˩ pɔk^{45}]	"low"
/ pɛn^{2} /	[˩ pɛˑn^{42}]	"vagina"
/ pla^{3} /	[˩ pla:^{33}]	"to chop"
/ pat^{4} /	[˩ pat^{21}]	"kick"
/ po^{4} /	[˩ po:^{21}]	"child"
/ cop^{4} /	[˩ cop^{21}]	"to play"
/ tap^{4} /	[˩ tap^{21}]	"smooth"
/ kip^{4} /	[˩ kip^{21}]	"to pinch, pick up"
/ pla^{3} /	[˩ pla:^{33}]	"to chop"
/ pru^{3} /	[˩ pru:$^{3\,3}$]	"betel"
/ pja^{u1} /	[˩ pja^{u}:^{45}]	"fun"

/ p^{h}/ is a voiceless aspirated bilabial plosive phoneme which is realized as follows:

[p^{h}] a voiceless aspirated bilabial plosive. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ p^{h}ə^{1} /	[˩ p^{h}ə:^{45}]	"low"
/ p^{h}at^{1} /	[˩ p^{h}at^{45}]	"read"
/ p^{h}u^{2} /	[˩ p^{h}u:^{42}]	"younger sibling"
/ p^{h}əŋ^{3} /	[˩ p^{h}əˑŋ^{33}]	"pot"
/ p^{h}li^{4} /	[˩ p^{h}li:^{21}]	"gondola"
/ p^{h}ri^{3} /	[˩ p^{h}r:i^{33}]	"tongue"

/ p^hlam^2 /	[ˈ p^hla·m^{42}]	"to wash"
/ p^hrwi^3 /	[ˈ p^hrwi:^{33}]	"to plane"

/b/ is a voiced unaspirated bilabial plosive phoneme which is realized as follows:

[b] a voiced unaspirated bilabial plosive. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ bak^1/	[ˈbak^{45}]	"chop"
/ bɛŋ^2 /	[ˈbɛ·ŋ^{42}]	"spend"
/ ba^{i3} /	[ˈba^{i}:^{33}]	"cheek"
/ bən^3 /	[ˈbə·n^{33}]	"to take off"
/ bɛʔ^4 /	[ˈbɛʔ^{21}]	"fat"
/ bʉ^4 /	[ˈbʉ:^{21}]	"paddy"
/ bwa^4 /	[ˈbwa:^{21}]	"white"
/ bwa^{i3} /	[ˈbwa^{i}:^{33}]	"full"
/ bjak^4 /	[ˈbjak^{21}]	"basket"

/t/ is a voiceless unaspirated alveolar plosive phoneme which is realized as follows:

[t] a voiceless unaspirated alveolar plosive. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ tək^1/	[ˈtək^{45}]	"cupboard"
/ ta^{u2} /	[ˈta^{u}:^{42}]	"not"
/ tɔm^3 /	[ˈtɔ·m^{33}]	"with, and"
/ tap^4 /	[ˈtap^{21}]	"smooth"
/ tom^4 /	[ˈto·m^{21}]	"keep"
/ p^hat^1/	[ˈ p^hat^{45}]	"to read"
/ tət^1/	[ˈtət^{45}]	"rub"
/ dʉt^1/	[ˈdʉt^{45}]	"to wipe"
/ sɔt^1/	[ˈsɔt^{45}]	"eight"
/ twa$^{i\,3}$/	[ˈtwa^{i}:^{33}]	"to whip"
/ twak^1/	[ˈtət^{45}]	"to count"

/ t^h/ is a voiceless aspirated alveolar plosive phoneme which is realized as follows:

[t^h] a voiceless aspirated alveolar plosive. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ t^hut^1/	[ˈ t^hut^{45}]	"flow"
/ t^hɛŋ^2 /	[ˈ t^hɛ·ŋ^{42}]	"to blink"

/ t^hi^3 /	[$^{\|}t^hi:^{33}$]	"to see"
/ $t^hɔʔ^4$ /	[$^{\|}t^hɔʔ^{21}$]	"pig"
/ $t^hɔŋ^4$ /	[$^{\|}t^hɔ{\cdot}ŋ^{21}$]	"walk"
/ t^hwi^3 /	[$^{\|}t^hwi:^{33}$]	"dog"
/ $ki^3\ t^hjaʔ^4$ /	[$ki:^{3\|}t^hjaʔ^{21}$]	"thigh"

/d/ is a voiced unaspirated alveolar plosive phoneme which is realized as follows:

[d] a voiced unaspirated alveolar plosive. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ dɯt^1/	[$^{\|}$dɯt^{45}]	"to wipe"
/ da^{u2} /	[$^{\|}$da^{u}:^{42}]	"liquor"
/ di^3 /	[$^{\|}$di:^{33}]	"egg"
/ dɔʔ^4 /	[$^{\|}$dɔʔ^{21}]	"say"
/ dən^4 /	[$^{\|}$də$\cdot$n^{21}]	"thick"
/ dje?^{1} /	[$^{\|}$dje?^{45}]	"wing"
/ dja^3 /	[$^{\|}$dja:^{33}]	"floor"

/c/ is a voiceless unaspirated palatal plosive phoneme which is realized as follows:

[c] a voiceless unaspirated palatal plosive. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ cok^1/	[$^{\|}$cok^{45}]	"suck"
/ cɔ^2 /	[$^{\|}$cɔ:^{42}]	"spoon"
/ cɔn^3 /	[$^{\|}$cɔ$\cdot$n^{33}]	"straight"
/ cu^4 /	[$^{\|}$cu:^{21}]	"hand"
/ ca^{i4} /	[$^{\|}$ca^{i}:^{21}]	"chew"
/ cwi^1 /	[$^{\|}$cwi:^{45}]	"to hook"
/ cja^1 /	[$^{\|}$cja:^{45}]	"to pare"
/ cwa^{i2} /	[$^{\|}$cwa^{i}:^{42}]	"fang"
/ cjɔŋ^3 /	[$^{\|}$cjɔ$\cdot$ŋ ^{33}]	"temple"

/c^h/ is a voiceless aspirated palatal plosive phoneme which is realized as follows:

[c^h] a voiceless aspirated palatal plosive . It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:	/ c^het^1/	[$^{\|}c^het^{45}$]	"to spray"
	/ $c^hɛm^2$ /	[$^{\|}c^hɛ{\cdot}m^{42}$]	"to stamp foot"
	/ c^ha^3 /	[$^{\|}c^ha:^{33}$]	"star"
	/ $c^həʔ^4$ /	[$^{\|}c^həʔ^{21}$]	"hard"

/ c^hom^4 /	[$^|c^ho{\cdot}m^{21}$]	"brittle"
/ c^hwi^1 /	[$^|c^hwi{:}^{45}$]	"crab"
/ c^hja^4 /	[$^|c^hja{:}^{21}$]	"chicken"
/ c^hja^1 /	[$^|c^hja{:}^{45}$]	"sour"

/k/ is a voiceless unaspirated velar plosive phoneme which is realized as follows:

[k] a voiceless unaspirated velar plosive. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ kəʔ^1/	[$^|$kəʔ^{45}]	"full"
/ ka^2 /	[$^|$ka:^{42}]	"to step across"
/ kɔn^3 /	[$^|$kɔ·n^{33}]	"trousers"
/ kʉʔ^4 /	[$^|$kʉʔ^{21}]	"piece (cN)"
/ ke^4 /	[$^|$ke:^{21}]	"tiger"
/ pok^1 /	[$^|$pok^{45}]	"dull"
/ kak^1 /	[$^|$kak^{45}]	"jaw"
/ lak^4 /	[$^|$lak^{21}]	"sharp"
/ kleʔ^1 /	[$^|$kleʔ^{45}]	"turtle"
/ krɔʔ^1 /	[$^|$krɔʔ^{45}]	"to shave"
/ kwi^3 /	[$^|$kwi:^{33}]	"chameleon"
/ kja^3 /	[$^|$kja:^{33}]	"skilful"

/ k^h/ is a voiceless aspirated velar plosive phoneme which is realized as follows:

[k^h] a voiceless aspirated velar plosive. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ k^haʔ^1/	[$^|k^haʔ^{45}$]	"shoot"
/ k^ham^2 /	[$^|k^ha{\cdot}m^{42}$]	"rain"
/ k^hɛn^3 /	[$^|k^hɛ{\cdot}n^{33}$]	"chili"
/ k^haʔ^4 /	[$^|k^haʔ^{21}$]	"direction"
/ k^hʉm^4 /	[$^|k^hʉ{\cdot}m^{21}$]	"hold"
/ k^hlen^2 /	[$^|k^hle{\cdot}n^{42}$]	"to hunt"
/ k^hrɔŋ^1 /	[$^|k^hrɔ{\cdot}ŋ^{45}$]	"purple"
/ k^hwaʔ^1 /	[$^|k^hwaʔ^{45}$]	"cold"
/ k^hje^4 /	[$^|k^hje{:}^{21}$]	"gibbon"

/ʔ/ is a voiceless glottal plosive phoneme which is realized as follows:

[ʔ] a voiceless glottal plosive. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ ʔeʔ^{1}/	[˩ʔeʔ^{45}]	"tear"
/ ʔʉ^{2} hʉ^{4} /	[˩ʔʉː^{42} ˩hʉː^{21}]	"stupid"
/ ʔu^{3} /	[˩ʔuː^{33}]	"to bark"
/ ʔɔp^{4} /	[˩ʔɔp^{21}]	"squat"
/ ʔeŋ^{4} /	[˩ʔeˑŋ^{21}]	"ginger"
/ paʔ^{1} /	[˩paʔ^{45}]	"to break"
/ tʰɛʔ^{4} /	[˩tʰɛʔ^{21}]	"to fall"
/ ʔeʔ^{4} /	[˩ʔeʔ^{21}]	"to chop"
/ sʉʔ^{1} /	[˩sʉʔ^{45}]	"to cut"
/ hɛʔ^{1} /	[˩hɛʔ^{45}]	"to call"
/ ʔwi^{3} /	[˩ʔwiː^{33}]	"delicious"
/ ʔwaʔ^{4} /	[˩ʔwaʔ^{21}]	"to drink"

7.3.2.2 Fricatives

Fricative is a term used in the phonetic classification of consonant sounds on the basis of manner of articulation: also sometimes called spirant, it refers to sounds made when two organs come so close together that the air moving between them produces audible friction. There is no complete closure between the organs (in which case a plosive articulation would be produced): there is simply a stricture (Crystal 1991:143)

/s/ is a voiceless unaspirated alveolar fricative phoneme which is realized as follows:

[s] a voiceless unaspirated alveolar fricative. It occurs in the initial position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ sʉʔ^{1}/	[˩sʉʔ^{45}]	"cut"
/ se^{2} /	[˩seː^{42}]	"horse"
/ sʉn^{3} /	[˩sʉˑn^{33}]	"liver"
/ səʔ^{4} /	[˩səʔ^{21}]	"plantation"
/ sɛŋ^{4} /	[˩sɛˑŋ^{21}]	"dry"
/ swi^{3} /	[˩swiː^{33}]	"blood"
/ sjeʔ^{1} /	[˩sjeʔ^{45}]	"insect"

/h/ is a glottal fricative phoneme which is realized as follows:

[h] a glottal fricative. It occurs in the initial position of the syllable.

Examples:

/ hɛʔ^{1}/	[˩hɛʔ^{45}]	"call"
/ hʉ^{2} /	[˩hʉː^{42}]	"collide with"
/ hɔ^{3} /	[˩hɔː^{33}]	"read"

/ ha^{u4} /	[˧ha ^{u}ː^{21}]	“good”
/ hat^{4} /	[˧hat^{21}]	“spicy”
/ hən^{4} /	[˧hə˙n^{21}]	“hear”

7.3.2.3 Nasals

Nasal is a term used in the phonetic classification of speech sounds on the basis of manner of articulation: it refers to sounds produced while the soft palate is lowered to allow an audible escape of air through the nose. Both consonants and vowels may be articulated in this way. Nasal consonants occur when there is a complete closure in the mouth, and all the air thus escapes through the nose (Crystal 1991: 229)

/m/ is a voiced bilabial nasal phoneme which is realized as follows:

[m] a voiced bilabial nasal. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ mə^{1}/	[˧məː^{45}]	“mother”
/ me^{2} /	[˧meː^{42}]	“tail”
/ me^{3} /	[˧meː^{33}]	“fire”
/ meʔ^{4} /	[˧meʔ^{21}]	“turmeric”
/ məŋ^{4} /	[˧mə˙ŋ^{21}]	“bad”
/ kim^{1}/	[˧ki˙m^{45}]	“like”
/ pʰom^{2} /	[˧pʰo˙m^{42}]	“to wear”
/ cʰom^{3} /	[˧cʰo˙m^{33}]	“mortar”
/ tom^{4} /	[˧to˙m^{21}]	“to keep”
/ mwa^{i1} /	[˧mwa^{i}ː^{45}]	“yes”

/n/ is a voiced alveolar nasal phoneme which is realized as follows:

[n] a voiced alveolar nasal. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:	/ nəʔ^{1}/	[˧nəʔ^{45}]	“enter”
	/ nɛn^{2} /	[˧nɛ˙n^{42}]	“breast”
	/ ni^{3} /	[˧niː^{33}]	“day”
	/ naʔ^{4} /	[˧naʔ^{21}]	“knife”
	/ ni^{4} /	[˧niː^{21}]	“two”
	/ tʰan^{1}/	[˧tʰa˙n^{45}]	“come out”
	/ pɛn^{2} /	[˧pɛ˙n^{42}]	“vagina”
	/ ŋan^{3} /	[˧ŋa˙n^{33}]	“narrow”
	/ pʰran^{4} /	[˧pʰra˙n^{21}]	“poor”
	/ njeʔ^{1} /	[˧njeʔ^{45}]	“to press down”

/ŋ/ is a voiced velar nasal phoneme which is realized as follows:

[ŋ] a voiced velar nasal. It occurs in the initial and final position of the syllable and occurs as the first element of the consonant cluster.

Examples:

/ ŋɔk^{1}/	[ˈŋɔk^{45}]	"nod"
/ ŋo^{2}/	[ˈŋoː^{42}]	"fry"
/ ŋən^{3}/	[ˈŋəˑn^{33}]	"neck"
/ ŋaʔ^{4}/	[ˈŋaʔ^{21}]	"laugh"
/ ŋɯm^{4}/	[ˈŋɯˑm^{21}]	"yawn"
/ dəŋ^{1}/	[ˈdəˑŋ^{45}]	"short"
/ laŋ^{2}/	[ˈlaˑŋ^{42}]	"sit"
/ rɔŋ^{3}/	[ˈrɔˑŋ^{33}]	"color"
/ tʰɔŋ^{4}/	[ˈtʰɔˑŋ^{21}]	"walk"
/ ŋwi^{2}/	[ˈŋwiː^{42}]	"shell"
/ ŋja^{3}/	[ˈŋjaː^{33}]	"far"

7.3.2.4 Lateral

Lateral is a term used in the phonetic classification of consonant sounds on the basis of manner of articulation: it refers to any sound where the air escapes around one or both sides of a closure made in the mouth, as in the various types of "l" sound in English. Air released around only one side of the tongue produces unilateral sounds; around both sides bilateral sounds (Crystal 1991:195)

/l/ is a voiced alveolar lateral phoneme which is realized as follows:

[l] a voiced alveolar lateral. It occurs in the initial position and as the second element of the consonant cluster.

Examples:

/ leʔ^{1}/	[ˈleʔ^{45}]	"burn"
/ lam^{2}/	[ˈlaˑm^{42}]	"home"
/ laŋ^{3}/	[ˈlaˑŋ^{33}]	"flow"
/ lak^{4}/	[ˈlak^{21}]	"clever"
/ lɛn^{4}/	[ˈlɛˑn^{21}]	"to scare"
/ ljaʔ^{1}/	[ˈljaʔ^{45}]	"to rip out"
/ kleʔ^{1}/	[ˈkleʔ^{45}]	"turtle"
/ pʰlam^{2}/	[ˈpʰlaˑm^{42}]	"to wash"
/ pləŋ^{3}/	[ˈpləˑŋ^{33}]	"wheat"
/ kʰləŋ^{4}/	[ˈkʰləˑŋ^{21}]	"to roast"

7.3.2.5 Trill

Trill is a term used in the phonetic classification of consonant sounds on the basis of their manner of articulation: also known as a "trilled" consonant or a roll, "trill" refers to any sound made by rapid tapping of one organ of articulation against another (Crystal 1991:361).

/r/ is a voiced alveolar trill phoneme which is realized as follows:

[r] a voiced alveolar trill. It occurs in the initial position and as the second element of the consonant cluster.

Examples:

/ rət^{1}/	[˩rət^{45}]	"sing"
/ re^{2} /	[˩re:^{42}]	"rattan"
/ ra^{i3} /	[˩ra^{i}:^{33}]	"cut"
/ rɔʔ^{4} /	[˩rɔʔ^{21}]	"stab"
/ rɔn^{4} /	[˩rɔˑn^{21}]	"silver"
/ rju^{1}/	[˩rju:^{45}]	"cool"
/ rwi^{2} /	[˩rwi:^{42}]	"root"
/ krɔʔ^{1}/	[˩krɔʔ^{45}]	"to shave"
/ p^{h}ra^{2} /	[˩p^{h}ra:^{42}]	"old-age"
/ pra^{3} /	[˩pra:^{33}]	"arrow"
/ p^{h}ran^{4} /	[˩p^{h}raˑn^{21}]	"poor"

7.3.2.6 Semi-Vowels

Semi-vowels is a term used in the classification of consonant sounds on the basis of their manner of articulation, It refers to a sound functioning as a consonant but lacking the phonetic characteristics normally associated with consonants (such as friction or closure); instead, its phonetically that of a vowel; though, occurring as it dose at the margin of a syllable, its duration is much less than that typical of vowel (Crystal 1992:313).

/w/ is a voiced bilabial semi-vowels phoneme which is realized as follows:

[w] a voiced bilabial semi-vowels. It occurs in the initial position and as the second or third element of the consonant cluster.

Examples:

/ waʔ^{1}/	[ˈwaʔ^{45}]	“fell down”
/ waŋ^{2} /	[ˈwaˑŋ^{42}]	“blow”
/ wa^{3} /	[ˈwaː^{33}]	“husband”
/ waʔ^{4} /	[ˈwaʔ^{21}]	“snow”
/ waŋ^{4} /	[ˈwaˑŋ^{21}]	“strike by rod”
/ twak^{1}/	[ˈtwak^{45}]	“to count”
/ cwa^{i2} /	[ˈcwaˑ^{42}]	“fang”
/ tʰwi^{3} /	[ˈtʰwiː^{33}]	“dog”
/ bwa^{i4} /	[ˈbwaˑ^{21}]	“full”
/ pʰrwi^{3} /	[ˈpʰrwiː^{33}]	“to plane”

/j/ is a voiced palatal semi-vowels phoneme which is realized as follows:

[j] a voiced palatal semi-vowels. It occurs in the initial position and as the second element of the consonant cluster.

Examples:

/ jəŋ^{1}/	[ˈjəˑŋ^{45}]	“to wave”
/ ju^{2} /	[ˈjuː^{42}]	“rat”
/ ja^{3} /	[ˈjaː^{33}]	“flesh”
/ jəʔ^{4} /	[ˈjəʔ^{21}]	“to pant”
/ jən^{4} /	[ˈjəˑn^{21}]	“quiet”
/ bjak^{1}/	[ˈbjak^{45}]	“wet”
/ rja^{2} /	[ˈrjaː^{42}]	“hot”
/ dja^{3} /	[ˈdjaː^{33}]	“floor”
/ kjaʔ^{4} /	[ˈkjaʔ^{21}]	“to fasten”

7.3.3 Consonant Phoneme Contrast

All consonants described above are phonemically contrastive in Pa-O. The suspect pairs of consonants, which are contrastive in identical environments (IE), are shown below together with some examples:

7.3.3.1 Initial Consonants

Examples:

/p/ - /p^h/	/ pɔt^1 /	"brush"
	/ p^hɔt^1 /	"sweep"
/p/ - /b/	/ pa$ŋ^4$ /	"branch"
	/ ba$ŋ^4$ /	"spear"
/b/ - /p^h/	/ ba^3 /	"cut by knife"
	/ p^ha^3 /	"ashes"
/b/ - /m/	/ bo$ŋ^4$ /	"add fuel"
	/ mo$ŋ^4$ /	"raw"
/b/ - /w/	/ ba^1 /	"bean"
	/ wa^1 /	"bamboo"
/t/ - /t^h/	/ tɛ$ŋ^2$ /	"province"
	/ t^hɛ$ŋ^2$ /	"blink"
/t/ - /d/	/ tau^2 /	"no, not"
	/ dau^2 /	"liquor"
/d/ - /t^h/	/ dɔ$ʔ^4$ /	"say"
	/ t^hɔ$ʔ^4$ /	"pig"
/d/ - /n/	/ di^3 /	"egg"
	/ ni^3 /	"day"
/d/ - /l/	/ dɛn^4 /	"cooked rice"
	/ lɛn^4 /	"to scare"
/d/ - /r/	/ dɔ$ʔ^4$ /	"say"
	/ rɔ$ʔ^4$ /	"stab"

/c/ - /ch/	/ cəŋ^{4} /	"tie, buckle"
	/ c^{h}əŋ^{4} /	"trunk (cN)"
/k/ - /k^{h}/	/ ka^{1} /	"chin"
	/ k^{h}a^{1} /	"bitter"
/k/ - /ʔ/	/ kɔn^{3} /	"trousers"
	/ ʔɔn^{3} /	"expose to the sun"
/k^{h}/ - /ʔ/	/ k^{h}wi^{3} /	"seed"
	/ ʔwi^{3} /	"delicious"
/k^{h}/ - /h/	/ k^{h}am^{3} /	"gold"
	/ ham^{3} /	"ground"
/m/ - /n/	/ mun^{3} /	"drunk"
	/ nun^{3} /	"push"
/m/ - /ŋ/	/ mə^{1} /	"mother"
	/ ŋə^{1} /	"cry"
/m/ - /w/	/ ma^{4} /	"false"
	/ wa^{4} /	"bee-hive"
/n/ - /ŋ/	/ naʔ^{4} /	"knife"
	/ ŋaʔ^{4} /	"laugh"
/n/ - /j/	/ naʔ^{4} /	"knife"
	/ jaʔ^{4} /	"old and out of use"
/s/ - /t^{h}/	/ sɔŋ^{4} /	"side"
	/ t^{h}ɔŋ^{4} /	"walk"
/s/ - /h/	/ sən^{4} /	"strengthen"
	/ hən^{4} /	"hear"
/h/ - /l/	/ hoʔ^{1} /	"belly"
	/ loʔ^{1} /	"bury"
/r/ - /l/	/ ru^{1} /	"snake"
	/ lu^{1} /	"ghost"

7.3.3.2 Final Consonants

Examples:

/ʔ/ - /p/	/ ʔɔʔ^{4} /	"vomit"
	/ ʔɔp^{4} /	"squat"
/ʔ/ - /t/	/ c^{h}uʔ^{1} /	"to plant"
	/ c^{h}ut^{1} /	"bone"
/ʔ/ - /k/	/ ʔoʔ^{1} /	"to break"
	/ ʔok^{1} /	"volume (cN)"
/t/ - /k/	/ kut^{1} /	"nine"
	/ kuk^{1} /	"fin"
/m/ - /n/	/ ŋam^{3} /	"fear"
	/ ŋan^{3} /	"narrow"
/m/ - /ŋ/	/ c^{h}om^{3} /	"mortar"
	/ c^{h}oŋ^{3} /	"clump (cN)"
/n/ - /ŋ/	/ mən^{4} /	"same"
	/ məŋ^{4} /	"bad"

7.4 Vowels

Vowels can be defined in terms of both phonetics and phonology. Phonetically, They are sounds articulated without a complete closure in the mouth or a degree of narrowing which would produce audible friction; the air escapes evenly over the center of the tongue. If air escapes solely through the mouth, the vowels are said to be oral; if some air simultaneously released through the nose, the vowels are nasals. In addition to this, in a phonetic classification of vowels, reference would generally be made to two variables; the first in which easily describable, the second much less so: (a) the position of the lips-whether rounded, spread, or neutral; (b) the part of the tongue raised, and the height to which it moves. From a phonological point of view, vowels are those units, which function at the center of the syllables (Crystal 1992:376)

In Huay Salop Pa-O language, there is no contrast between short and long vowels, therefore, the length of vowels is not phonemic.

The length of vowels in this language is predictable by syllable types. The closed syllable with final voiceless stops / p, t, k, ʔ / bears the shortest nuclei. It is the voiceless final consonant that conditions the vowel immediately preceding it to be shorter. Respectively, It is the voiced final consonant that conditions the vowel immediately preceding it to be longer. Therefore, the closed syllable with final voiced nasals / m, n, ŋ / bears longer nuclei than the closed syllable with final stops, but shorter than the open one.

There are 9 single vowels and two glided vowels function as the syllable nucleus. The vowels are / i, e, ɛ, ɯ, ə, a, u, o, ɔ, a^{i}, a^{u} / as follows:

Tongue position / Tongue height	Front	Central	Back
Closed	i	ɯ	u
Half-closed	e	ə	o
Half-open	ɛ		ɔ
Open		a	
Glided Vowel	a^{i}		a^{u}

Table 13 : Pa-O vowel phonemes

7.4.1 Classification by Movement of the Tongue

The vowel phonemes can be divided into two sub-classes: single vowel and glide.

7.4.1.1 Single Vowel

All 9 single vowels are oral vowels, which occur as syllable nucleus. They are / i, e, ɛ, ɯ, ə, a, u, o, ɔ /.

Examples:

i-	/ di^{3} /	[˩ $di:^{33}$]	"egg"
e-	/ me^{2} /	[˩ $me:^{42}$]	"tail"
ɛ-	/ $c^{h}ɛŋ^{3}$ /	[˩ $c^{h}ɛ˧ŋ^{33}$]	"coat"
ɯ-	/ $k^{h}ɯm^{4}$ /	[˩ $k^{h}ɯ˧m^{21}$]	"hold"
ə-	/ $nəm^{3}$ /	[˩ $nə˧m^{33}$]	"smell"
a-	/ kak^{1} /	[˩ kak^{45}]	"jaw"
u-	/ $ʔu^{3}$ /	[˩ $ʔu:^{33}$]	"bark"
o-	/ $p^{h}o^{2}$ /	[˩ $p^{h}o:^{42}$]	"cow"
ɔ-	/ $kɔŋ^{4}$ /	[˩ $kɔ˧ŋ^{21}$]	"mountain"

7.4.1.2 Glided Vowels

There are 2 glides: / a^{i}, a^{u} /.

Examples :

a^{i}-	/ $ka^{i\,1}$ /	[˩ $ka^{i}:^{45}$]	"diligent"
a^{u}-	/ $ka^{u\,3}$ /	[˩ $ka^{u}:^{33}$]	"flower"

7.4.2 Formational Statement of Main vowels

7.4.2.1 Single Vowels

Single vowels or monophthong is a term used in the phonetic classification of vowel sound on the basis of their manner of articulation. It refers to a vowel where there is no qualitative change in quality during a syllable (Crystal 1992: 105).

In Huay Salop Pa-O language, all vowels are basically pronounced with medium length. There is no contrast between short and long vowels, therefore, the length of vowels is not phonemic. Single vowels will be discussed together as follows:

/i/ is a closed front unrounded vowel phoneme which is realized as follows:

[i] a closed front unrounded vowel. It occurs in syllables with all tones.

Examples:

/ $c^hi?^1$ /	[$^{\|}c^hi?^{45}$]	"squeeze"
/ $pi\eta^2$/	[$^{\|}pi{\cdot}\eta^{42}$]	"bake"
/ di^3 /	[$^{\|}di{:}^{33}$]	"egg"
/ $k^ha\eta^3$ /	[$^{\|}k^ha{\cdot}\eta^{33}$]	"foot"
/ kip^4 /	[$^{\|}kip^{21}$]	"pinch"
/ t^hi^4 /	[$^{\|}t^hi{:}^{21}$]	"water"

/e/ is a half-closed front unrounded vowel phoneme which is realized as follows:

[e] a half-closed front unrounded vowel. It occurs in syllables with all tones.

Examples:

/ $be?^1$/	[$^{\|}be?^{45}$]	"fat"
/ $ne\eta^1$/	[$^{\|}ne{\cdot}\eta^{45}$]	"tea"
/ me^2 /	[$^{\|}me{:}^{42}$]	"tail"
/ de^3 /	[$^{\|}de{:}^{33}$]	"frog"
/ $c^he?^4$ /	[$^{\|}c^he?^{21}$]	"few"
/ ce^4 /	[$^{\|}ce{:}^{21}$]	"unloose"

/ɛ/ is a half-open front unrounded vowel phoneme which is realized as follows:

[ɛ] a half-open front unrounded vowel. It occurs in syllables with all tones.

Examples:

/ $p^h\varepsilon?^1$/	[$^{\|}p^h\varepsilon?^{45}$]	"page (cN)"
/ $b\varepsilon\eta^2$ /	[$^{\|}b\varepsilon{\cdot}\eta^{42}$]	"spend"
/ $c^h\varepsilon\eta^3$ /	[$^{\|}c^h\varepsilon{\cdot}\eta^{33}$]	"coat"
/ $m\varepsilon?^4$ /	[$^{\|}m\varepsilon?^{21}$]	"eye"
/ $d\varepsilon n^4$ /	[$^{\|}d\varepsilon{\cdot}n^{21}$]	"cooked rice"

/ʉ/ is a closed central rounded vowel phoneme which is realized as follows:

[ʉ] a closed central rounded vowel. It occurs in syllables with all tones.

Examples:

/ $t^hʉʔ^1$ /	[$^|t^hʉʔ^{45}$]	"pull up"
/ $hʉ^2$ /	[$^|hʉ:^{42}$]	"collide with"
/ $bʉn^3$ /	[$^|bʉ˙n^{33}$]	"to dip up"
/ $tʉk^4$ /	[$^|tʉk^{21}$]	"fight in war"
/ $k^hʉm^4$ /	[$^|k^hʉ˙m^{21}$]	"hold"

/ə/ is a mid central unrounded vowel phoneme which is realized as follows:

[ə] a mid central unrounded vowel. It occurs in syllables with all tones.

Examples:

/ $rət^1$ /	[$^|rət^{45}$]	"sing"
/ $də^1$ /	[$^|də:^{45}$]	"to cook"
/ $məŋ^2$ /	[$^|mə˙ŋ^{42}$]	"gong"
/ $nəm^3$ /	[$^|nə˙m^{33}$]	"smell"
/ $c^həʔ^4$ /	[$^|c^həʔ^{21}$]	"hard"
/ $bən^4$ /	[$^|bə˙n^{21}$]	"same"

/a/ is an open central unrounded vowel phoneme which is realized as follows:

[a] an open central unrounded vowel. It occurs in syllables with all tones.

Examples:

/ kak^1 /	[$^|kak^{45}$]	"jaw"
/ c^han^2 /	[$^|c^ha˙n^{42}$]	"cup"
/ ma^3 /	[$^|ma:^{33}$]	"do"
/ pat^4 /	[$^|pat^{21}$]	"kick"
/ $baŋ^4$ /	[$^|ba˙ŋ^{21}$]	"spear"

/u/ is a closed back rounded vowel phoneme which is realized as follows:

[u] a closed back rounded vowel. It occurs in syllables with all tones.

Examples:

/ t^hut^1 /	[$^|t^hut^{45}$]	"flow"
/ p^hu^2 /	[$^|p^hu:^{42}$]	"younger sibling"
/ $ʔu^3$ /	[$^|ʔu:^{33}$]	"bark"
/ mun^4 /	[$^|mu˙n^{21}$]	"drunk"
/ cu^4 /	[$^|cu:^{21}$]	"hand"

/o/ is a half-closed back rounded vowel phoneme which is realized as follows:

[o] a half-closed back rounded vowel. It occurs in syllables with all tones.

Examples:

/ pok^1 /	[$^|pok^{45}$]	"dull"
/ p^ho^2 /	[$^|p^ho:^{42}$]	"cow"
/ $doŋ^3$ /	[$^|do˙ŋ^{33}$]	"hit by hand"
/ cop^4 /	[$^|cop^{21}$]	"play"
/ $boŋ^4$ /	[$^|bo˙ŋ^{21}$]	"add fuel"

/ɔ/ is a half-open back rounded vowel phoneme which is realized as follows:

[ɔ] a half-open back rounded vowel. It occurs in syllables with all tones.

Examples:

/ pɔt^{1}/	[ˈpɔt^{45}]	"brush"
/ t^{h}ɔŋ^{2}/	[ˈt^{h}ɔˑŋ^{42}]	"pound with pestle"
/ hɔ^{3}/	[ˈhɔː^{33}]	"read"
/ p^{h}ɔʔ^{4}/	[ˈp^{h}ɔʔ^{21}]	"vomit"

7.4.2.2 Glided Vowels

There are two glides in Huay Salop Pa-O language. They are / a^{i}, a^{u}/ as follows:

/a^{i}/ is a low open central vowel gliding off to a high front unrounded vowel phoneme which is realized as follows:

[a^{i}] a low open central vowel gliding off to a high front unrounded vowel. It occurs in syllables with all tones

Examples:

/ ka$^{i\,1}$/	[ˈka^{i}ː^{45}]	"diligent"
/ cwa$^{i\,2}$/	[ˈcwa^{i}ː^{42}]	"fang"
/ k^{h}wa$^{i\,3}$/	[ˈk^{h}wa^{i}ː^{33}]	"turn"
/ ka$^{i\,4}$/	[ˈka^{i}ː^{21}]	"fluid"
/ bwa$^{i\,4}$/	[ˈbwa^{i}ː^{21}]	"full"

/a^{u}/ is a low open central vowel gliding off to a high back rounded vowel phoneme which is realized as follows:

[a^{u}] a low open central vowel gliding off to a high back rounded vowel. It occurs in syllables with all tones.

Examples:

/ ʔa$^{u\,1}$/	[ˈʔa^{u}ː^{45}]	"to be"
/ pja^{u}ʔ^{1}/	[ˈpja^{u}ʔ^{45}]	"fun"
/ ta$^{u\,2}$/	[ˈta^{u}ː^{42}]	"not"
/ ka$^{u\,3}$/	[ˈka^{u}ː^{33}]	"flower"
/ ha$^{u\,4}$/	[ˈha^{u}ː^{21}]	"good"

7.4.3 Vowel Phoneme Contrast

All vowels described above are phonemically contrastive in Pa-O. The suspect pairs of vowels, which are contrastive in identical environments (IE), are shown below together with some examples:

Examples:

/i/ - /e/	/ di^{3} /	"egg"
	/ de^{3} /	"frog"
/i/ - /ʉ/	/ t^{h}i^{1} /	"umbrella"
	/ t^{h}ʉ^{1} /	"heavy"
/e/ - /ɛ/	/ meʔ^{4}/	"turmeric"
	/ mɛʔ^{4} /	"eye"
/e/ - /ə/	/ beŋ^{3} /	"lie down"
	/ bəŋ^{3} /	"take off"
/ʉ/- /u/	/ rʉ^{1} /	"born"
	/ ru^{1} /	"snake"
/ʉ/ - /ə/ - /a/	/ mʉ^{1} /	"sun"
	/ mə^{1} /	"mother"
	/ ma^{1} /	"for wind to blow"
/a/ - /ɛ/	/ nan^{3}/	"suck"
	/ nɛn^{3}/	"breast"
/a/ - /ɔ/	/ saʔ^{1} /	"mind"
	/ sɔʔ^{1} /	"add"
/u/ - /o/	/ k^{h}u^{3} /	"dig"
	/ k^{h}o^{3} /	"couple of shoes (cN)"
/o/ - /ɔ/	/ k^{h}oŋ^{3} /	"egg-plant"
	/ k^{h}ɔŋ^{3} /	"prawn"
/a^{i}/ - /a^{u}/	/ ka^{i3} /	"fluid (adj)"
	/ ka^{u3} /	"flower"

7.5 Tonemes

There are four contrastive tonemes in Pa-O language spoken at Huay Salop village, three contour tones: high rising, high falling, and low falling, and one level tone: mid level. The open syllables and closed syllables with final nasals / m, n, ŋ / can bear all four of them while the closed syllables with final stops / p, t, k, ʔ / occur only with the high rising and the low falling tones. Pa-O tones function, together with vowels, as the syllable-nucleus.

Phonemic Notation	Description	Tone Stick	Phonetic Transcription
/1/	high-rising		[^{45}]
/2/	high-falling		[^{42}]
/3/	mid-level		[^{33}]
/4/	low-falling		[^{21}]

Table 14 : Pa-O Tonemes

7.5.1 Formational Statement of Tone

/1/ [^{45}], a high-rising tone. Its tonal figure starts below high-level and then moves up quickly to high-level. It occurs with the open syllable and the closed syllable.

Examples:

/ do?^{1} /	[˩do?^{45}]	"cover"
/ pɔt^{1}/	[˩pɔt^{45}]	"brush"
/ ʔam^{1}/	[˩ʔaːm^{45}]	"eat"
/ kʰrɔŋ^{1}/	[˩kʰrɔːŋ^{45}]	"purple"
/ tʰɯ^{1} /	[˩tʰɯː^{45}]	"heavy"
/ mə^{1} /	[˩məː^{45}]	"mother"

/2/ [^{42}], a high-falling tone. Its tonal figure starts from high-level and then moves down quickly to low-level. It occurs only with the open syllable and the closed syllable with final nasals / m, n, ŋ /.

Examples:

/ kʰam^{2}/	[˩kʰaːm^{42}]	"rain"
/ nan^{2}/	[˩naːn^{42}]	"breast"
/ məŋ^{2}/	[˩məːŋ^{42}]	"gong""
/ ci^{2}/	[˩ciː^{42}]	"permeate"
/ me^{2}/	[˩meː^{42}]	"tail"
/ daᵘ ^{2}/	[˩daᵘː ^{42}]	"liquor"

/3/ [^{33}], a mid-level tone. Its tonal figure starts from mid-level, and continues and ends at the same range. It occurs only with the presyllable, open syllable and the closed syllable with final nasals / m, n, ŋ /.

Examples:

/ ham^{3}/	[˩haːm^{33}]	"ground"
/ min^{3}/	[˩miːn^{33}]	"name"
/ beŋ^{3}/	[˩beːŋ^{33}]	"lie down"
/ di^{3}/	[˩diː^{33}]	"egg"
/ lo^{3}/	[˩loː^{33}]	"person"
/ tʰwi^{3}/	[˩tʰwiː^{33}]	"dog"
/pə cʰu /	[pə ˩ cʰuː]	"launder"
/pə si/	[pə ˩ siː]	"wash"
/pə ra/	[pə ˩ raː]	"monk"

/4/ [^{21}] ,a low-falling tone. Its tonal figure starts slightly below mid-level and then moves down softly to low-level. It occurs with the open syllable and the closed syllable.

Examples:

/ cop^4/	[ˈcop^{21}]	"play"
/ tʰɔʔ^4/	[ˈtʰɔʔ^{21}]	"pig"
/ lɔn^4 /	[ˈlɔːn^{21}]	"came
/ kɔŋ^4 /	[ˈkɔːŋ^{21}]	"mountain"
/ se^4 /	[ˈseː^{21}]	"know"
/ tʰi^4 /	[ˈtʰiː^{21}]	"water"

7.5.2 Toneme Contrast

All four tonemes are contrastive in identical environment (IE) as shown bellows:

Examples:

/1/ - /2/	/ ju^1 /	"think"
	/ ju^2 /	"rat"
/1/ - /3/	/ pʰa^1 /	"stove"
	/ pʰa^3 /	"ashes"
/1/ - /4/	/ waʔ^1 /	"fell down"
	/ waʔ^4 /	"snow"
	/ wa^1 /	"bamboo"
	/ wa^4 /	"husband"
/2/ - /3/	/ pʰra^2 /	"old-age"
	/ pʰra^3 /	"man (cN)"
/2/- /4/	/ pʰu^2 /	"younger sibling"
	/ pʰu^4 /	"rinse"
/3/ - /4/	/ bən^3 /	"oily"
	/ bən^4 /	"same"
/1/ - /2/ - /3/ - /4/	/ wa^1 /	"bamboo"
	/ wa^2 /	"bird"
	/ wa^3 /	"bee-hive"
	/ wa^4 /	"husband (inf)"

CHAPTER VIII

CONCLUSIONS AND SUGGESTIONS FOR FURTHER STUDIES

8.1 Conclusions of Huay Salop Pa-O dialect.

Pa-O language phonology has the following characteristics:

8.1.1 Intonation

There are two types of intonation contour in Huay Salop Pa-O dialect: falling contour and rising contour. The pitch on the last syllable of the utterance characterizes them. There is no significant particular intonation pattern because tones of final particles seem to cause falling and rising of the intonation.

8.1.2 Phonological Word

The phonological word consists of one to three syllables. The main structure is monosyllabic word. Only few disyllabic words are founded while trisyllabic words are rare in this language. There are three types of the phonological word: strong stressed [ˈs], weak stressed [ˌw] and zero-stressed or unstressed [u]. The strong stressed syllable has more volume and greater length than the weak stressed syllable while the unstressed syllable has less volume and length than any other types. The strong stressed syllable occurs in monosyllabic word and in the last syllable of disyllabic and trisyllabic word while the weak stressed and the unstressed syllables can occur everywhere except at the end of the word.

8.1.3 Syllable

Syllable structure of this Pa-O dialect is $C_1(C_3)(C_4)V_1^T(C_2)$.

According to their structures, there are two types of structures: open syllable and closed syllable. Types of syllables are presyllable, major syllable and minor syllable. Presyllable and minor syllable occurs only in disyllabic and polysyllabic word. The presyllable consists of only /ə/ and has a neutral tone. The major and minor syllables consist of all vowel phonemes and also all tonemes.

There are two classes of syllables in terms of their function: nuclear syllable and peripheral syllable. The nuclear syllable is defined as major syllable, which occurs in monosyllabic word and occurs in the last position of disyllabic and polysyllabic words. The peripheral syllable is defined as presyllable and minor syllable, which never occur in monosyllabic word and in the last position of disyllabic and polysyllabic words.

8.1.4 Phonemes

As for the phonemes, according to their function, there are three classes of phonemes in syllables: consonants, vowels, and tones.

There are 20 consonant phonemes: / p, p^h, b, t, t^h, d, c, c^h, k, k^h, ʔ, m, n, ŋ, s, j, h, l, r, w /, which occur in the initial position. The phonemes: /j, r, l, w /, which are the second elements of consonant clusters, the phonemes /w/, which is the third element of consonant clusters, and the phonemes /p, t, k, ʔ, m, n, ŋ /, which occur in the final position. The final stops: / p, t, k, ʔ / occur with only high- rising and low-falling tones, while the final nasals: /m, n, ŋ / occur with all tones.

There are 9 single vowel phonemes: / i, e, ɛ, a, ʉ, ə, u, o, ɔ, /, and two glides: /a^i, a^u /. In Huay Salop Pa-O language, there is no contrast between short and long vowels. The length of vowels in this language is predictable conditioned by the syllable structure by syllable types, therefore, the length of vowels is non-phonemic. The closed syllable with final voiceless stops / p, t, k, ʔ / bears the shortest nuclei. It is the voiceless final consonant that conditions the vowel immediately preceding it to be shorter. Respectively, It is the voiced final consonant that conditions the vowel immediately preceding it to be longer. Therefore, the closed syllable with final voiced nasals / m, n, ŋ / bears longer nuclei than the closed syllable with final stops, but shorter than the open one.

There are four tonemes: high rising [^{45}], high falling [^{42}], mid-level [^{33}], and low falling [^{21}], which occur in the Huay Salop Pa-O language. The open syllable and the closed syllable with final nasals can bear all tones of these while the closed syllable with final stops occur with only high- rising and low-falling tones.

8.2 Remarks on Pa-O Language at Huay Salop Village.

Because of having their old settlement near Shan State in Burma, there are many loan words from Shan.

With comparison to their Proto-Karen, Huay Salop Pa-O dialect is an older, purer tongue than other Karenic groups. It retains their Proto-Karen consonant phonemes, especially the final stops / p, t, k, ʔ / the final nasals / m, n, ŋ / while in other Karen languages, they have been lost of final consonants and developed to be glottal vowels and nasal vowels. However, it lost of some of final stops, / t^h, k^h, d, d^h, g, g^h /, and all of final laryngeals, / ʕ, h, q /, likes other Karen languages.

Besides, a feature of double initial consonant clusters is going to be lost in this Huay Salop Pa-O dialect. During my fieldwork, I found only four words /p^hrwi^3, k^hrwi^3, k^hrwa^3, ʔə p^hrwi^3 /, which comprise of double initial consonant clusters / rw /. And only some children can pronounce these words whereas all of the adults still can do.

Phonemically, vowels of the Karenic language are not differentiated in vowel length. In Huay Salop Pa-O language, there is no contrast between short and long vowels, therefore, the length of vowels is non phonemic. The length of vowels in this language is predictable by syllable types. The closed syllable with final voiceless stops / p, t, k, ʔ / bears the shortest nuclei. It is the voiceless final consonant that conditions the vowel immediately preceding it to be shorter. Respectively, It is the voiced final consonant that conditions the vowel immediately preceding it to be longer. Therefore, the closed syllable with final voiced nasals / m, n, ŋ / bears longer nuclei than the closed syllable with final stops, but shorter than the open one. This feature can be found also in Jones' studies.

In the Pa-O language spoken at Huay Salop Village, the high central vowel, /y/, was not founded. Notes on the data collecting at Taunggyi of R.B.Jones (1961:116), the high central vowel, /y/, is more likely to be the high back unrounded vowel, /ɯ/, or the mid central vowel, /ə/, at Huay Salop Village as follows :

Taunggyi Dialect	Huay Salop Dialect	
/ mŷ /	/ mɯ^1 /	"sun"
/ mŷ /	/ mə^1 /	"female"

As for tonemes, there are four phonemic tones in Taunggyi dialect: high, high falling, mid, and low (R.B.Jones 1961:72). In Huay Salop dialect, there are also four phonemic tones: high rising, high falling, mid, and low falling. The high rising and the low falling tones in Huay Salop dialect represent the high and the low tones in Taunggyi dialect. The closed syllables with final stops / p, t, k, ʔ / occur only with the high rising and the low falling tones. In unstressed position, final glottal is dropped, the high rising tone of closed syllables has a somewhat lower allophone. Similarly, the low falling tones has a somewhat higher allophone under the same condition.

In Proto-Karen, there are only two tones; high and low tone. Note that loss of final stops and laryngeals is frequently connected with the development of tones.

Tones in Huay Salop Pa-O dialect are analyzed by CECIL program. In the figure below, (?) represents final stops / p, t, k, ʔ /, (1) represents high rising tone, (2) represents high falling tone, (3) represents mid level tone, and (4) represents low falling tone.

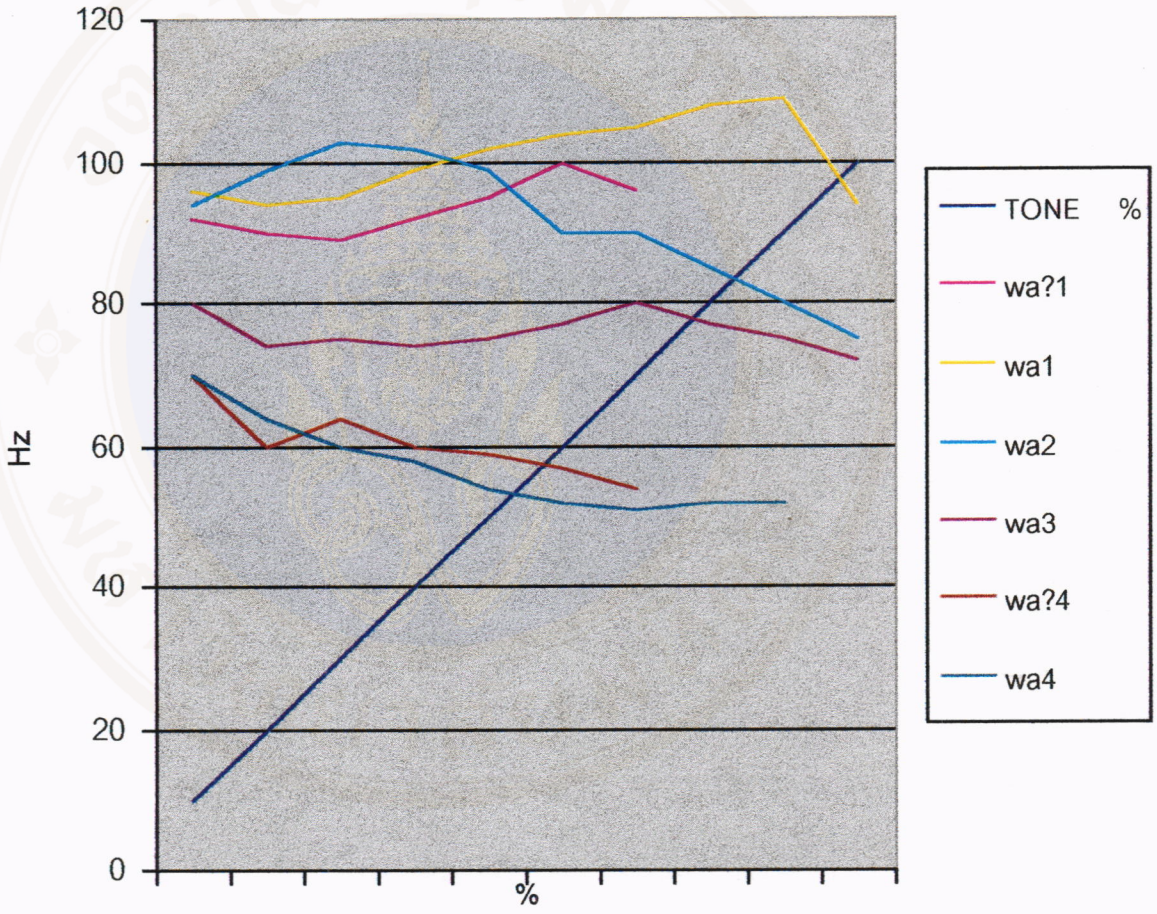


Figure 12 : The Huay Salop Pa-O tone analyzing.

8.3 Suggestions for Further Studies.

1. There are other Pa-O dialects spoken in Thailand, especially in the west. It would be interesting to study and compare them.

2. There are other Pa-O dialects spoken in Burma that have never been studied, especially the southern variety which is spoken around Thaton. It would be interesting to study and compare them with the northern variety, which is spoken around Taunggyi.

3. It would be interesting to make a comparison of the Pa-O dialects spoken in Thailand and Burma.

4. Besides a phonological study, other topics would be of interest e.g.; Pa-O Classifiers, Grammatical Studies, Sociolinguistic Study, etc.

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APPENDIX

The following Pa-O lexical items are listed with general meanings.

The entries are arranged in the following order.

1. The initial consonants are arranged according to their points of articulation, i.e. bilabial, dental, alveolar, palatal, velar, and glottal. Thus, the order of initial consonant is / p, p^h ,b ,t, t^h, d, c, c^h, k, k^h, ʔ, s, h, m, n, ŋ, l, r, w, j /.

2. The final consonants are arranged according to their points of articulation Thus, the order of initial consonant is / p, t, k, ʔ, m, n, ŋ /.

3. The order of vowels is / i, e, ɛ, ʉ, ə, a, u, o, ɔ, a^i, a^u /.

4. The order of tones is / 1, 2, 3, 4 /.

/ p /

/pi^{3} /	pinch by finger
/pi^{4} /	human skin, bark
/peŋ^{2}/	to bake
/pe^{1} /	small
/pe^{1} na$^{u\ 3}$/	younger brother sibling
/pe^{4} dan^{4} /	ruler
/pɛn^{2}/	vagina
/pə tɛŋ^{3} /	look upward
/pə t^{h}o^{4} /	spit
/pə c^{h}u^{1} /	launder
/pə kjɔk^{4} /	jump
/pə mu^{1} na$^{u\ 3}$ /	elder sister sibling
/pə ma$^{i\ 3}$ /	who
/pə nɛn^{1} /	soft
/pə si^{4} /	wash
/pə juŋ^{2}/	smile
/pə lɛŋ^{3} /	bottle (cN)
/pə ra^{3} /	monk
/pat^{4} /	to kick
/pak^{1} /	push
/paʔ^{1} /	to break
/pan^{4} na^{1} /	buffalo
/pan^{4} na^{1} ja^{3} /	buffalo meat
/paŋ^{3} ca^{2}/	crematory
/paŋ^{3} lɛ^{3} /	sea
/paŋ^{4} /	one side of shoes (cf)
/paŋ^{4} /	branch

/pa^{3} p^{h}oŋ^{2}/	they
/pa^{4} /	it
/pok^{1} /	dull
/po^{4} /	child
/po^{4} k^{h}o^{4} /	son
/po^{4} mu^{3} /	daughter
/pɔt^{1} /	brush
/pɔk^{1} /	low
/pɔ^{4} /	float
/pleʔ^{4} /	skink
/pleŋ^{4} /	shoulder
/pleŋ^{4} ʔɔʔ^{1} /	armpit
/ple^{3} saʔ^{1} /	satisfied
/pləŋ^{3} /	wheat
/pla^{3} /	chop
/pla^{4} /	bat
/plɔŋ^{1} /	corn
/pra^{3} /	arrow
/pru^{1} /	betel
/pja^{u}ʔ^{1} /	fun
/pja^{u}ʔ^{4} ʔəʔ^{1} /	lightning

/ p^{h} /

/p^{h}it^{1} t^{h}u^{3} /	housefly
/p^{h}i^{4} bwa^{4} /	nun
/p^{h}eʔ^{1} ki^{3} /	upside
/p^{h}eʔ^{1} la^{4} /	downside

/pʰɛt¹ piʔ¹ /	rubber
/pʰɛʔ¹ /	page (cN)
/pʰɛn¹ /	break wind
/pʰəŋ³ /	pot
/pʰə¹ /	low
/pʰat¹ /	read
/pʰaʔ⁴ /	split
/pʰə bo³ mɯ¹ /	union
/pʰə tʰo³ /	pass away (used for monk)
/pʰaŋ³ /	hemp
/pʰa¹ /	stove
/pʰa³ /	ashes
/pʰa⁴ /	father
/pʰa⁴ pʰra² /	grandfather
/pʰa⁴ tan⁴ /	parental older brother
/pʰa⁴ naŋ⁴ /	father's younger brother
/pʰa⁴ naŋ⁴ /	you (used with elder male)
/pʰa⁴ nau³ /	elder brother sibling
/pʰu¹ /	piece of clothes (cN)
/pʰu²/	younger sibling
/pʰu² po⁴ we² po⁴ /	cousin
/pʰu² kʰo⁴ /	younger brother
/pʰu² mu³ /	younger sister
/pʰu³ /	hole
/pʰu⁴ /	rinse
/pʰoʔ¹ /	bank up the fire
/pʰom²/	wear
/pʰoŋ¹ su³ /	those over there
/pʰo²/	cow

/pʰo^{2} mi^{3} /	bison
/pʰɔt^{1} /	sweep
/pʰɔt^{4} /	draw
/pʰɔʔ^{4} /	vomit
/pʰli^{3} /	melodious
/pʰli^{4} /	gondola
/pʰli^{4} tak^{1} /	paddle
/pʰleʔ^{4} /	intestine
/pʰleʔ^{1} sin^{2} /	water lettuce
/pʰle^{3} /	give
/pʰlɛʔ^{1} /	wound by knife
/pʰlam^{2} /	wash
/pʰloʔ^{1} /	animal skin
/pʰlɔʔ^{1} /	vomit
/pʰri^{3} /	tongue
/pʰreŋ^{2} /	black
/pʰre^{3} /	buy
/pʰran^{4} /	poor
/pʰra^{2} /	old-age
/pʰra^{3} /	man (classifier)
/pʰrom^{3} /	fruit (classifier)
/pʰrɔŋ^{2} /	mouth
/pʰrɔŋ^{2} bi^{3} /	lip
/pʰrɔŋ^{2} tɛŋ^{4} /	pen
/pʰra$^{u\ 2}$ /	Shan people
/pʰwi^{4} /	light
/pʰrwi^{3} /	plane

/ b /

/bi^{1} /	baht
/bi^{3} /	flat things (cN)
/beʔ^{1} /	fat
/beŋ^{3} /	lie down
/beŋ^{3} tʰəŋ^{3} /	wake up
/beŋ^{3} tʰa^{3} /	sleep
/beŋ^{3} maŋ^{2} /	dream
/beŋ^{4} /	scale
/bɛŋ^{2} /	spend
/bɛ^{2} /	goat
/bʉk^{1} /	large
/bʉn^{3} /	dip up
/bʉ^{4} /	paddy
/bʉ^{4} ʔɛn^{4} /	glutinous rice
/bʉ^{4} mə^{1} /	rice
/bəʔ^{1} /	stick
/bən^{3} /	oily
/bən^{4} /	same
/bəŋ^{2} kʰaŋ^{4} /	pan
/bəŋ^{3} /	take off
/bə^{4} /	thin
/bak^{1} /	chop
/baʔ^{4} si^{3} mʉ^{1} /	hail
/baŋ^{4} /	spear
/ba^{1} /	bean
/ba^{1} ma^{i3} /	which
/ba^{1} jɔn^{4} /	cow pea

/ba^{3} /	hit by knife
/ba^{3} ta$^{u\ 2}$ /	not yet
/ba^{4} /	animal (cN)
/boŋ^{4} /	add fuel
/bo^{3} di^{3} /	red union
/bo^{4} ta$^{i\ 4}$/	lotus
/bɔʔ^{1} lɛʔ^{4} /	dirty
/bɔʔ^{4} /	near
/ba$^{i\ 3}$ /	cheek
/ba$^{i\ 3}$ tu^{3} /	zygoma
/bwa^{4} /	white
/bwa$^{i\ 1}$ pə ra^{3} /	Buddha image
/bwa$^{i\ 1}$ bon^{4} /	abbot
/bwa$^{i\ 1}$ caŋ^{3} /	monk
/bwa$^{i\ 1}$ sjaŋ^{3} /	novice
/bjak^{4} /	basket
/bwa^{i4} /	full

/ t /

/ti^{3} poŋ^{3} /	penis
/tɛm^{2} /	write
/tɛŋ^{2} /	province
/tɯk^{4} /	fight in war
/təp^{1} /	rub
/tək^{1} /	cupboard
/təŋ^{4} /	lap
/tə ʔɯ^{3} /	hiccough

/tə plɛt^{4} /	slide
/tə p^{h}e^{1} ra^{3} /	rose-apple
/tə p^{h}əŋ^{4} /	fence
/tə p^{h}ut^{1} /	worn out
/tə p^{h}u^{3} /	road
/tə p^{h}roŋ^{4} /	flutter
/tə p^{h}rwi^{3} /	rope
/tə baʔ^{1} /	hit by hand
/tə ba^{3} /	one
/tə t^{h}ɛʔ^{4} /	drop
/tə t^{h}ɛʔ^{4} laŋ^{3} /	fall down
/tə t^{h}a^{4} /	bridge
/tə t^{h}un^{3} /	post
/tə dən^{4} /	rough
/tə daʔ^{1} /	cut (the tree)
/tə dɔk^{1} /	tap
/tə dɔŋ^{4} /	stair
/tə dwi^{2} /	cucumber
/tə cwa$^{i\,2}$ /	one hundred
/tə c^{h}i^{4} /	ten
/tə c^{h}uʔ^{1} /	pestle
/tə c^{h}ja^{4} /	sneeze
/tə kɛŋ^{3} /	winding
/tə kə de^{4} /	one billion
/tə kə jaŋ^{3} /	song
/tə kə li^{4} /	tick
/tə kɔk^{1} /	glass
/tə kɔŋ^{3} /	bend
/tə kɔŋ^{4} /	hill

/tə kwak^{4} /	cubic
/tə k^{h}a^{4} /	door
/tə k^{h}o^{2} p^{h}un^{3}/	powder
/tə k^{h}o^{4} /	sweets
/tə k^{h}ja^{3} t^{h}a^{3} /	sneeze
/tə k^{h}leʔ^{1} /	mosquito
/tə k^{h}lo^{3} /	stuff
/tə k^{h}raŋ^{4} /	empty
/tə k^{h}ra^{2} /	forest
/tə k^{h}ru^{3}/	clothe
/tə k^{h}rɔʔ^{1} /	mango
/tə k^{h}ra$^{u\ 3}$ /	scratch
/tə ʔi^{2} /	plant
/tə ʔi^{2} mʉ^{1} /	grass
/tə ʔi^{3} /	rubbish
/tə ʔo^{2} /	cloud
/tə ʔo^{2} mok^{4} /	mist
/tə mak^{1} /	brother or sister's in law
/tə mɔk^{1} /	comb
/tə ni^{3} /	crush
/tə nek^{1} /	pungent
/tə nɛŋ^{2} /	sob
/tə nat^{1} /	gun
/tə ŋa^{3} /	tooth
/tə ŋja^{3} /	red
/tə siŋ^{4} /	one hundred thousand
/tə si^{2} /	yellow
/tə si^{1} /	medicine
/tə si^{1} p^{h}loŋ^{3} /	tablet

/tə san^{2} /	one million
/tə sa^{3} /	salt
/tə sa^{3} nəm^{2} /	sugar
/tə sa^{1} /	new
/tə so^{4} /	sweat
/tə sɔŋ^{1} /	ten thousand
/tə he^{4} /	cough
/tə ham^{4} /	yawn
/tə li^{3} /	wind
/tə li^{4} /	tasteless
/tə leʔ^{1}/	to smell
/tə reŋ^{4} /	one thousand
/tə reŋ^{4} suk^{1} sjak^{1} /	disorderly
/tə re^{3} /	pretty
/tə rə^{1} /	swing
/tə ra^{3} ni^{3} /	two days after tomorrow
/tə ru^{3} ni^{3} /	day after tomorrow
/tə rja^{3} /	hundred
/tə rja^{ᵘʔ}^{4} /	spherical
/tə wən^{3} /	round and flat
/tə waʔ^{1} /	land leech
/tə jam^{3} /	cavila fruit
/tə ja^{3} c^{ʰ}e^{3} /	streaked lightning
/tap^{4} /	smooth
/tan^{4} /	big
/top^{1} /	strike by hand
/tom^{4} /	keep
/tɔm^{3} /	with, and
/tɔŋ^{3} pɛŋ^{2} /	bag

/tɔŋ^{3} /	copper
/tɔŋ^{3} pe^{4} /	sachet
/ta$^{u\ 2}$ /	not
/twak^{1} /	count
/twa$^{i\ 3}$ /	whip

/ t^{h} /

/t^{h}i^{1} /	umbrella
/t^{h}i^{2} /	masculine
/t^{h}i^{3} /	see
/t^{h}i^{3} saʔ^{1} /	sympathize
/t^{h}i^{4} /	water
/t^{h}i^{4} t^{h}ɛ^{3} /	waterfall
/t^{h}i^{4} c^{h}əʔ^{1} /	ice
/t^{h}i^{4} k^{h}əʔ^{1} /	flood
/t^{h}i^{4} k^{h}lɔŋ^{4} /	river
/t^{h}i^{4} nɔŋ^{4} /	lake
/t^{h}ɛʔ^{1} /	paper
/t^{h}ɛʔ^{4} /	fall
/t^{h}ɛŋ^{2} /	blink
/t^{h}ʉʔ^{1}/	pull up
/t^{h}ʉ^{1} /	heavy
/t^{h}ə thi^{3} /	banana
/t^{h}ə kɔn^{2} /	bed
/t^{h}ə ʔə^{1} t^{h}ə c^{h}a^{4} /	sickness
/t^{h}ə ʔoŋ^{4} tə^{4} /	bench
/t^{h}ə ma^{3} /	work

/tʰə mai³ /	what
/tʰə sa² /	animal
/tʰaʔ¹ /	needle
/tʰaʔ¹ cʰɔʔ⁴ /	have fever
/tʰaʔ⁴ pe¹ /	fish
/tʰaʔ⁴ pə twi² /	scorpion fish
/tʰaʔ⁴ cə pan³ /	pilot fish
/tʰaʔ⁴ kʰu⁴ /	cap (fish)
/tʰaʔ⁴ li³ /	serpent-head (fish)
/tʰaʔ⁴ ru¹ /	eel
/tʰan¹ /	come out
/tʰaŋ³ mi³ /	hoof
/tʰaŋ⁴ /	sharp
/tʰa³ /	drawing
/tʰa⁴ /	gold
/tʰa⁴ cʰeŋ³ /	wall
/tʰa⁴ nɛ⁴ /	or not
/tʰut¹ /	flow
/tʰu³ /	take
/tʰom¹ /	put on (shoes)
/tʰoŋ⁴ /	drum
/tʰo¹ /	box (hit by fist)
/tʰo⁴ /	tall
/tʰɔʔ⁴ /	pig
/tʰɔʔ⁴ ja³ /	pork
/tʰɔŋ² /	pound with pestle
/tʰɔŋ⁴ /	walk
/tʰɔ⁴ /	ready
/tʰwi³ /	dog

/t^hwi^4/	right (side)
/t^hwa^1/	to swing

/ d /

/di^3/	egg
/de^3/	frog
/de^3 ʔu$ŋ^4$ ʔa$ŋ^4$/	bull-frog
/de^3 su^3/	toad
/dɛn^4/	cooked rice
/d~~ɯ~~t^1/	wipe
/dən^4/	thick
/də$ŋ^1$/	short
/$də^1$/	cook
/dan^4/	aluminum
/da^1/	can
/duʔ^1/	close
/dɔʔ^1/	open
/doʔ^1/	cover
/do$ŋ^1$/	to drum
/do$ŋ^3$/	hit by hand
/do$ŋ^4$/	village
/do$ŋ^4$ $c^hɔŋ^1$/	village
/dɔʔ^4/	say
/dɔʔ^4 kja^2/	answer
/$da^{u\,2}$/	liquor
/djeʔ^1/	wing
/dja^3/	floor

/ c /

/cim^{3} /	squeeze in fist, massage
/ci^{2} /	permeate
/ceʔ^{4} sa^{2} /	soldier
/ceʔ^{1} /	squeeze
/ce^{3} /	paper
/ce^{4} /	unloose
/ce^{1} /	left
/cɛŋ^{4} /	stinging pain
/cɛŋ^{1} /	corner
/cəŋ^{3} ca^{3} /	make decision
/cəŋ^{4} /	tie, buckle
/caʔ^{1} /	new
/caʔ^{4} /	being
/cam^{3} pʰeŋ^{3} /	butterfly
/cam^{3} ma^{1} ri^{4} /	body
/ca^{4} /	sell
/cu^{4} /	hand
/cu^{4} bɔŋ^{4} /	upper arm
/cu^{4} tap^{1} /	fist
/cu^{4} tʰom^{3} /	fist
/cu^{4} deŋ^{4} /	wrist
/cu^{4} deŋ^{4} tu^{3} /	wrist bone
/cu^{4} cɛ^{3} /	little finger
/cu^{4} coŋ^{4} /	middle finger
/cu^{4} kən^{2} /	bracelet
/cu^{4} kʰo^{3} /	back of the hand
/cu^{4} mi^{3} /	finger nail

/cu^{4} mɛʔ^{4}/	knuckle
/cu^{4} mə^{1}/	thumb
/cu^{4} nɛŋ^{3}/	elbow
/cu^{4} nɛ^{3}/	ring finger
/cu^{4} noŋ^{4}/	index finger
/cu^{4} sə^{3}/	ring
/cu^{4} ja^{3}/	palm
/cu^{4} lɔŋ^{3}/	lower arm
/cop^{4}/	play
/cok^{1}/	suck
/cɔn^{3}/	straight
/cɔŋ^{3}/	run (used with vehicle)
/cɔ^{2}/	spoon
/cɔ^{2} rəŋ^{4}/	fork
/ca$^{i\,4}$/	chew
/ca$^{i\,4}$ ʔʉ^{4}/	worn out
/ca$^{u\,3}$/	wet
/cwi^{1}/	hook
/cwi^{3}/	lead by the hand
/cwaŋ^{3}/	float
/cwa$^{i\,2}$/	fang
/cjɔŋ^{1}/	to fly
/cjɔŋ^{3}/	temple
/cjɔŋ^{3} sə ra^{3}/	teacher

/ c^h /

/$c^hiʔ^1$/	squeeze
/$c^hiʔ^4$ lit^1/	cigarette
/c^hi^3/	urine (informal)
/c^hi^4 $pa^{i\,4}$/	eleven
/c^het^1/	spray
/$c^heʔ^1$/	prick
/$c^heʔ^4$/	few
/c^he^1 jo^4/	nurse
/c^he^3/	market
/$c^hɛm^2$/	stamp foot
/$c^hɛŋ^3$/	coat
/$c^həʔ^1$/	freeze
/$c^həŋ^3$/	vehicle (cN)
/$c^həŋ^4$/	trunk (cN)
/$c^haʔ^1$/	sew
/$c^haʔ^4$/	hard
/c^han^2/	cup
/$c^haŋ^2$/	heap (cN)
/$c^haŋ^4$/	elephant
/$c^haŋ^4$ cu^3/	elephant trunk
/$c^haŋ^4$ $cwa^{i\,2}$/	elephant tusk
/c^ha^3/	star
/c^ha^4/	burning stinging pain
/c^hut^1/	bone
/c^hut^1 $rɛ^3$/	ribs
/$c^huʔ^1$/	to plant
/c^hu^4/	pestle

/cʰom^{3}/	mortar
/cʰom^{4}/	salty
/cʰoŋ^{3}/	clump (cN)
/cʰɔk^{1}/	ambiguous sex
/cʰɔn^{3}/	hair of body
/cʰɔn^{4}/	to smoke
/cʰa$^{i\,4}$ kʰja^{4}/	later on
/cʰwi^{1}/	crab
/cʰwa^{3}/	long
/cʰja^{1}/	sour
/cʰja^{4}/	chicken
/cʰja^{4} tʰi^{2}/	rooster
/cʰja^{4} mə^{1}/	hen

/ k /

/kip^{4}/	pinch, pick up
/kik^{4} pa$^{i\,3}$/	big cricket
/kik^{4} rit^{1}/	small cricket
/kim^{1}/	like
/kim^{3} ra$^{i\,3}$/	scissors
/kin^{3}/	pinch by nail
/ki^{3}/	leg
/ki^{3} tʰjaʔ^{4}/	thigh
/ki^{3} leŋ^{2}/	knee
/ke^{4}/	tiger
/kɛn^{4}/	middle
/kʉʔ^{4}/	piece (cN)

/kə tɛŋ^{4} pɔk^{1} /	window
/kə tu^{3} /	head
/kə tu^{3} pi^{4} /	scalp
/kə tu^{3} paʔ^{1} /	female turban
/kə tu^{3} pwak^{1} /	male turban
/kə tu^{3} tə ŋɯʔ^{4} /	dizziness
/kə tu^{3} c^{h}a^{4} /	headache
/kə tɔŋ^{4} /	forehead
/kə la^{3} t^{h}ɛŋ^{4} /	chair
/kə lu^{3} /	hair
/kə lɔŋ^{4} /	pencil
/kak^{1} /	jaw
/kak^{1} c^{h}ɔn^{3} /	beard
/kaʔ^{1} /	to full
/kaʔ^{1} ri^{2} /	last
/ka^{1} /	chin
/ka^{2} /	step across
/ka^{3} /	car
/ka^{4} /	step across
/kut^{1} /	nine
/kuk^{1} /	fin
/kom^{3} /	buttock
/koŋ^{3} /	hat
/kɔk^{1} /	glass
/kɔn^{3} /	trousers
/kɔn^{3} tɔ^{1} /	beg pardon
/kɔŋ^{4} /	mountain
/ka$^{i\ 1}$ /	diligent
/ka$^{i\ 3}$ /	fluid

/ka$^{i\,4}$ t^{h}o^{3} /	pass away
/ka$^{u\,3}$ /	flower
/ka$^{u\,3}$ pan^{3} taŋ^{3} /	orchid
/ka$^{u\,3}$ mɔk^{1} ti^{4} tə wa^{3} /	jasmine
/ka$^{u\,3}$ neŋ^{1} si^{4} /	rose
/kleʔ^{1} /	turtle
/krɔʔ^{1} /	shave
/kwi^{3} /	chameleon
/kwaŋ^{1} /	to fly
/kwa$^{i\,3}$ /	to stir
/kwa$^{i\,4}$ sa^{3} /	rabbit
/kjaʔ^{1} /	pare (with knife)
/kjaʔ^{4} /	fasten
/kja^{3} /	skilful
/kju^{1} /	dance
/kjɔk^{1} /	love

/ k^{h} /

/k^{h}iŋ3 /	season, time
/k^{h}i ^{3}/	common barking deer
/k^{h}ɛn^{3} /	chili
/k^{h}ɛ^{3} /	Chinese
/k^{h}ɯm^{4} /	hold
/k^{h}əʔ^{4} /	pour out
/k^{h}əm^{4} c^{h}o1 /	playing game
/k^{h}əŋ^{1} ma$^{i\,3}$ /	how many
/k^{h}ə^{4} min^{3} /	surname

/kʰaʔ^{1} /	shoot
/kʰaʔ^{4}/	turn up side down
/kʰaʔ^{4} tɯʔ^{4} /	west
/kʰaʔ^{4} tan^{4} /	north
/kʰaʔ^{4} kɔn^{3} /	east
/kʰaʔ^{4} na$^{u\ 4}$ /	south
/kʰam^{2} /	rain
/kʰam^{2} kʰa^{1} kʰiŋ^{3} /	rainy season
/kʰam^{2} kʰreŋ^{3} /	thunder
/kʰam^{2} loʔ^{4} /	to rain
/kʰam^{3} /	gold
/kʰam^{3} pʰa^{3} /	world
/kʰam^{3} pʰa^{3} ham^{3} /	earth
/kʰaŋ^{3} /	foot
/kʰaŋ^{3} pʰa^{3} /	shoes
/kʰaŋ^{3} pʰa^{3} cʰop^{1} /	cut shoes
/kʰaŋ^{3} pʰa^{3} kip^{4} /	slippers
/kʰaŋ^{3} tu^{3} /	ankle
/kʰaŋ^{3} də^{3} /	heel
/kʰaŋ^{3} cʰop^{1} /	sock
/kʰaŋ^{3} ʔɔʔ^{1} /	inside of knee
/kʰaŋ^{3} mi^{3} /	claw, toe nail
/kʰaŋ^{3} noŋ^{4} /	toe
/kʰaŋ^{3} ja^{3} /	sole of foot
/kʰaŋ^{3} lam^{2} /	address
/kʰaŋ^{3} lɔŋ^{4} /	shin
/kʰaŋ^{3} lɔŋ^{4} pʰoŋ^{3} /	calf
/kʰa^{1} /	bitter
/kʰuŋ^{1} /	table

/kʰu^{2} /	put on (hat)
/kʰu^{4} ʔɛn^{4} /	glutinous rice
/kʰoŋ^{3} /	egg-plant
/kʰoŋ^{3} cʰja^{3} /	tomato
/kʰo^{3} /	couple of shoes (cN)
/kʰo^{4} /	male
/kʰo^{4} baŋ^{3} /	young man
/kʰo^{4} baŋ^{3} jwɛʔ^{1} /	young man
/kʰo^{4} kʰɛ^{3} /	sweet corn
/kʰɔm^{3} la^{3} /	cloths
/kʰɔn^{3} pi^{3} /	urine (fm)
/kʰɔn^{3} tan^{4} /	feces (fm)
/kʰɔŋ^{3} /	prawn
/kʰleŋ^{2} /	hunt
/kʰləŋ^{4} /	roast
/kʰlam^{4} /	garden
/kʰloŋ^{2} /	log (cN)
/kʰlɔt^{1} /	rub
/kʰlɔn^{2} kip^{4} /	chop-sticks
/kʰlau^{3} /	scratch
/kʰlau^{4} /	shout
/kʰri^{3} /	crossbow
/kʰram^{2} /	country
/kʰru^{3} /	dig
/kʰrom^{3} /	brittle
/kʰrɔt^{1} /	scrape
/kʰrɔŋ^{1} /	purple
/kʰrɔŋ^{4} /	steam
/kʰrɔ^{2} /	poor

/kʰwi³ /	seed
/kʰwi⁴ /	I (fm)
/kʰwi⁴ tʰa³ /	mine
/kʰwi⁴ sɔn² /	I (used with monk by man)
/kʰwi⁴ sɔn² mu³ /	I (used with monk by woman)
/kʰwe⁴ ja³ /	rabbit
/kʰwaʔ¹ /	cold
/kʰwaʔ¹ tə nəʔ¹ /	chill
/kʰwaʔ¹ kʰiŋ³ /	winter
/kʰwaʔ⁴ /	sweep
/kʰwaŋ³ /	fly
/kʰwa⁴ /	axe
/kʰwaⁱ ³ /	turn
/kʰwaⁱ ⁴ sa³ /	rabbit
/kʰrwi⁴ /	rich
/kʰrwa³ /	to saw
/kʰje⁴ /	gibbon
/kʰjaŋ³ /	song (cN)
/kʰjaŋ¹ rəŋ⁴ /	basket
/kʰjaŋ³ siʔ¹ /	lion
/kʰjoʔ¹ /	sambar deer
/kʰjɔ³ /	smooth

/ ʔ /

/ʔi² /	will
/ʔeʔ¹ /	tear
/ʔeʔ⁴ /	chop

/ʔeŋ^{3} /	bite
/ʔeŋ^{4} /	ginger
/ʔeŋ^{4} cɛŋ^{3} /	galanga
/ʔe^{3} /	feces (informal)
/ʔɯ^{1} /	similar
/ʔɯ^{2} hɯ^{4} /	stupid
/ʔəŋ^{4} rap^{1} kwak^{4} /	sub-district
/ʔə pat^{4} /	week
/ʔə pat^{4} jo^{4} /	this week
/ʔə bə^{4} /	thin thing
/ʔə dən^{4} /	thickness
/ʔə dəŋ^{1} /	shortage
/ʔə siŋ^{4} /	rotten thing
/ʔə sak^{1} /	age
/ʔə sɔm^{3} pʰra^{2} /	pale blue
/ʔə la$^{i\ 2}$ /	width
/ʔə lwi^{2} /	smell
/ʔə^{1} /	at
/ʔə^{1} tʰan^{3} /	outside
/ʔə^{1} ki^{4} /	above
/ʔə^{1} ko^{4} /	inside
/ʔə^{1} ʔə ŋɛ^{3} su^{3} /	over there
/ʔə^{1} ma$^{i\ 3}$ /	where
/ʔə^{1} su^{3} /	there
/ʔə^{1} jo^{4} /	here
/ʔə^{1} laʔ^{4} /	beneath
/ʔam^{1} /	eat
/ʔa^{1} /	stuff
/ʔa^{4} /	many

/ʔuŋ^{2} pruŋ^{3} /	they
/ʔuŋ^{4} ʔup^{4} /	talk
/ʔu^{2} /	vegetable
/ʔu^{3} /	to bark
/ʔu^{4} /	blow
/ʔok^{1} /	volume (cN)
/ʔoʔ^{1} /	break
/ʔoʔ^{1} laŋ^{3} /	bend down
/ʔoŋ^{4} /	live
/ʔoŋ^{4} tʰəŋ^{3} /	stand up
/ʔoŋ^{4} laŋ^{3} /	sit down
/ʔo^{2} /	to fry
/ʔo^{3} /	pick out
/ʔo^{4} wan^{3} /	cup
/ʔo^{1} /	pare (with hand)
/ʔɔp^{4} /	squat
/ʔɔʔ^{4} /	vomit
/ʔɔn^{1} pʰeŋ^{3} /	forget
/ʔɔn^{3} /	expose to the sun
/ʔɔn^{3} tə kɛŋ^{3} /	incline
/ʔɔŋ^{3} ʔɛ^{3} /	baby
/ʔa$^{u\ 1}$ /	be
/ʔa$^{u\ 3}$ lo^{3} /	need
/ʔwi^{3} /	delicious
/ʔwaʔ^{4} /	drink

/ s /

/siŋ^{4} /	rotten
/si^{1} kja^{3} /	god
/si^{4} /	die
/si^{4} p^{h}oŋ^{1} jo^{4} /	you (you&they)
/si^{4} rik^{4} /	cigarette
/seŋ^{1} pɛn^{4} /	plank
/seŋ^{1} paŋ^{4} /	branch of tree
/seŋ^{1} k^{h}loŋ^{2} /	log
/seŋ^{1} mɯ^{1} /	tree
/seŋ^{1} ra^{3} /	fruit
/seŋ^{1} rɔn^{4} seŋ^{1} ra^{3} t^{h}i^{4} /	fruit juice
/seŋ^{4} /	dry
/se^{2} /	horse
/se^{4} /	know
/se^{4} na^{3} /	understand
/se^{1} /	always
/sɛʔ^{1} /	chip
/sɛŋ^{3} /	come back
/sɛŋ^{3} lɔn^{4} /	return
/sɛŋ^{4} /	dry
/sɯʔ^{1} /	cut
/sɯ^{1} /	chapel
/sɯn^{3} /	liver
/sɯ^{3} /	louse
/sən^{2} /	dull
/sən^{4} /	strengthen
/sə lɔp^{2} /	public rest-house

/sə ra^{3} won^{3} /	physician
/saʔ^{1} /	mind
/saʔ^{1} pe^{1} /	disappointed
/saʔ^{1} tə kʰəʔ^{1} /	selfish
/saʔ^{1} ka$^{i\,2}$ /	sad
/saʔ^{1} ʔaŋ^{2}/	chest
/saʔ^{1} re^{3} /	glad
/saʔ^{1} ra^{3} /	heart
/saʔ^{1} rja^{2} /	angry
/saʔ^{4} /	plantation
/saʔ^{4} ten^{2} /	nausea
/saŋ^{3} pʰɔ^{3} /	papaya
/saŋ^{1} pʰɔ^{3} /	boat
/saŋ^{1} pʰɔ^{4} cjɔŋ^{1} /	airplane
/sa^{4} tʰan^{3} /	inhale
/sa^{4} tʰa^{3} /	breath
/sa^{4} nə^{3} /	exhale
/sut^{1} /	boil
/sun^{1} /	mushroom
/su^{4} /	six
/som^{1} /	three
/so^{1} /	firewood
/sɔt^{1} /	eight
/sɔʔ^{1} /	add
/sɔn^{4} /	learn
/sɔŋ^{4} /	side
/sa$^{i\,3}$ /	sand
/sa$^{i\,3}$ phun^{3} /	pebbles
/swi^{3} /	blood

The co-occurrence of single initial consonants and vowels of the major syllable in table 2 shows that :

1. All consonant phonemes can be the initial consonant of major syllable.
2. All vowel phonemes can occur in major syllable.
3. /a / is the vowel phonemes that has the widest distribution in major syllable.
4. /ɛ / is the vowel phonemes that has the narrowest distribution in major syllable.
5. /ʔ / is the consonant phonemes that has the widest distribution in major syllable.
6. /t/ is the consonant phonemes that has the narrowest distribution in major syllable.
7. /t / only occurs with glide vowel /a^{u}/ .

/swi^{4} /	Kaffir lime
/sjeʔ^{1} /	insects

/ h /

/hɛʔ^{1} /	call
/hʉ^{2} /	collide with
/hən^{4} /	hear
/hat^{4} /	spicy
/ham^{3} /	ground
/ham^{3} pʰun^{3} /	dust
/ham^{3} bɔʔ^{1} /	mud
/ham^{3} bjak^{1} /	mud
/ham^{3} ʔun^{4} /	mud
/han^{2} ni^{3} /	today
/han^{3} ʔo^{1} /	food
/han^{3} lʉ^{1} /	white greens
/han^{3} lʉ^{1} klo^{3} /	greens
/han^{3} lʉ^{1} luŋ^{3} /	cabbage
/hoʔ^{1} /	belly
/hoʔ^{1} twaŋ^{2} /	diarrhea
/hoʔ^{1} cʰa^{4} /	stomach-ache
/hoʔ^{1} kʰo^{2} /	hungry
/hoʔ^{1} kʰleʔ^{4} /	flatulent
/hɔ^{3} /	read
/ha$^{u\ 4}$ /	good

/ m /

/min^{1} /	if
/min^{3} /	name
/min^{4} /	ripe
/min^{4} beŋ^{3} /	sleepy
/mi^{1} /	condiment
/mi^{3} /	nail
/meʔ^{4} /	turmeric
/me^{2} /	tail
/me^{3} /	fire
/me^{3} tʰaʔ^{1} /	flash-light
/me^{3} kʰrɛt^{4} /	match
/me^{3} ʔu^{3} /	charcoal
/me^{3} lɛŋ^{4} can^{4} /	electricity
/me^{3} la^{3} /	electricity bulb
/me^{3} loʔ^{1} /	firefly
/me^{3} raʔ^{4} tʰa^{3} /	train
/me^{3} rwi^{1} /	smoke
/mɛʔ^{4} /	eye
/mɛʔ^{4} pʰloŋ^{1} /	eyeball
/mɛʔ^{4} pʰloŋ^{1} phreŋ^{2} /	iris
/mɛʔ^{4} bi^{3} /	eyelid
/mɛʔ^{4} cʰɔn^{3} /	eyelash
/mɛʔ^{4} ku^{3} /	eyebrow
/mɛʔ^{4} ku^{3} cʰɔn^{3} /	hair of eyebrow
/mɛʔ^{4} kʰu^{3} /	eyeball (used with children)
/mɛʔ^{4} man^{3} /	glasses
/mɛʔ^{4} ŋwa^{3} /	face

/mɛn^{1} /	true
/mɛn^{4} /	want
/mɛŋ^{3} /	aim
/mɯŋ^{4} /	fast
/mɯ^{1} /	sun
/mɯ^{1} pleʔ^{4} /	sunset
/mɯ^{1} tə ʔə^{3} /	rainbow
/mɯ^{1} t^{h}ɯ^{3} /	at noon
/mɯ^{1} t^{h}aŋ^{3} /	sunrise
/mɯ^{1} ca^{1} ni^{3} /	day before yesterday
/mɯ^{1} kɯʔ^{1} na^{3} /	midnight
/mɯ^{1} k^{h}eʔ^{4} /	night
/mɯ^{1} ha^{4} k^{h}o^{3} /	evening
/mɯ^{1} le^{4} /	late morning
/mɯ^{1} la$^{u\,4}$ k^{h}o^{3} /	morning
/mɯ^{1} ra$^{u\,3}$ ni^{3} /	tomorrow
/mən^{4} /	same
/məŋ^{2} /	gong
/məŋ^{4} /	bad
/məɭ /	feminine
/mə^{1} /	mother
/mə^{1} p^{h}ra^{2} /	parental mother
/mə^{1} naŋ^{4} /	parental younger sister or mother's younger brother
/mat^{1} /	pin
/ma^{1} /	for wind to blow
/ma^{2} /	wife
/ma^{3} /	do
/ma^{3} ŋa$^{u\,2}$ tek^{1} /	sing

/ma^{3} si^{3} /	kill
/ma^{3} sa^{3} /	corpse
/ma^{4} /	false
/mun^{3} /	drunk
/mun^{4} /	life
/mu^{3} /	female
/mu^{3} pe^{1} na$^{u\,3}$ /	younger sister sibling
/mu^{3} nam^{3} /	young woman
/mu^{3} lam^{4} pe^{1} /	young woman
/moʔ^{1} ʔe^{3} /	cloud
/moʔ^{1} lɔŋ^{2} /	sky
/moŋ^{4} /	raw
/mɔk^{1} pʰra^{2} /	lime
/mɔk^{1} cɔk^{1} /	orange
/mɔk^{1} cɔk^{1} tʰi^{4} /	vinegar
/mɔk^{1} keŋ^{3} ka^{3} /	guava
/mɔk^{1} keŋ^{4} /	pineapple
/mɔk^{1} klaŋ^{3} /	jack-fruit
/mɔk^{1} ʔun^{4} /	coconut
/mɔk^{1} mu^{1} /	areca
/mɔŋ^{1} kleŋ^{1} /	hat
/mɔŋ^{1} kʰɔŋ^{4} /	to steam
/ma$^{i\,3}$ /	(?) question marker
/ma$^{i\,3}$ kʰa^{4} /	when
/mwi^{2} can^{3} tʰa^{3} /	much very
/mwa^{i1} /	yes

/ n /

/ni$ʔ^{1}$ $p^{h}u^{4}$ /	nose
/ni$ʔ^{1}$ $p^{h}u^{4}$ kɔŋ^{3} /	nose bridge
/ni$ʔ^{1}$ $p^{h}u^{4}$ $ʔe^{3}$ /	snot
/ni$ʔ^{1}$ $p^{h}u^{4}$ ŋwa^{4} /	nostril
/nim^{1} /	flinch
/ni^{1} /	loin cloth
/ni^{3} /	day
/ni^{4} /	two
/ni^{4} /	we
/ni^{4} bwa$^{i\,1}$ /	you (used with the monk)
/ni^{4} $c^{h}i^{4}$ /	twenty
/ni^{4} nam^{2} /	myself
/ni^{4} we^{2} /	you (used with elder person)
/ni^{4} waŋ^{3} som^{1} /	we (incl.)
/neŋ^{3} /	year
/neŋ^{1} /	tea
/ne^{4} /	some
/nɛn^{2} /	breast
/nɛn^{2} $t^{h}i^{4}$ /	breast milk
/nɛn^{2} ra^{3} /	nipple
/nɛ^{4} hɔŋ^{2} /	question particle(or not?)
/nɯt^{1} /	seven
/nəm^{3} /	to smell
/nəm^{3} seŋ^{4} /	bad smelling
/nəm^{3} su^{3} /	rancid
/nə^{1} /	sweet
/na$ʔ^{1}$ /	enter

/naʔ^{4} /	knife
/naʔ^{4} mʉŋ^{2} /	long-handled knife
/naʔ^{4} ljaᵘ^{3} /	long knife
/naŋ^{2} deŋ^{4} ci^{3} /	belt
/naŋ^{3} /	goddess
/na^{1} li^{3} /	clock
/na^{2} /	ear
/na^{3} /	you (familiar)
/nut^{1} /	sin
/nuk^{1} cʰak^{4} /	shake
/nuʔ^{1} cʰɔn^{3} /	mustache
/nun^{3} /	push
/noŋ^{3} /	horn
/nɔŋ^{4} /	swamp
/naⁱ^{1} maⁱ^{3} /	how?
/njeʔ^{1} /	press down

/ ŋ /

/ŋʉʔ^{4} /	look up
/ŋʉm^{4} /	yawn
/ŋən^{3} /	neck
/ŋə^{1} /	cry
/ŋə^{1} tʰa^{3} /	weep
/ŋat^{1} /	five
/ŋaʔ^{4} /	laugh
/ŋam^{3} /	fear
/ŋan^{3} /	narrow

/ŋan^{4} pja^{3} t^{h}i^{4} /	fish soy
/ŋaŋ^{2} /	back
/ŋaŋ^{2} deŋ^{4} /	waist
/ŋa^{1} ra^{i3} /	hell
/ŋa^{3} /	next
/ŋo^{2} /	to fry
/ŋɔk^{1} /	nod
/ŋa$^{u\ 2}$ /	language
/ŋa$^{u\ 3}$ /	cat
/ŋja^{3} /	far
/ŋjɔŋ^{3} /	a kind of leaf
/ŋwi^{2} /	shell

/ l /

/lit^{1} /	four
/lik^{1} p^{h}at^{1} /	book
/lik^{1} ʔok^{1} /	note book
/lim^{2} /	vagina
/liŋ^{3} ŋjɔŋ^{3}/	lizard
/li^{3} /	grandchild
/li^{3} k^{h}o^{4} /	nephew
/li^{3} mu^{3} /	niece
/li^{4} /	hour
/leʔ^{1} /	burn
/leʔ^{1} p^{h}u^{3} /	anus
/leŋ^{3} ma^{3} /	clever
/le^{2} /	kidney

/lɛʔ^{1} /	cremate
/lɛn^{2} /	already
/lɛn^{4} /	scare, tell a lie
/ləŋ^{1} /	bunch (cN)
/lak^{4} /	sharp
/lak^{4} lɛn^{4} /	clever
/laʔ^{4} /	usable
/lam^{2} /	house
/lam^{2} su^{1} /	husband (fm)
/lam^{2} lɔŋ^{2}/	roof
/laŋ^{1} /	great-grandchild
/laŋ^{2} /	sit
/laŋ^{3} /	flow
/la^{1} /	spit
/la^{3} /	leaf
/la^{4} /	moon
/la^{4} /	month
/lu^{1} /	ghost
/lu^{3} /	god
/lu^{3} kʰam^{2} /	heaven
/lu^{3} mu^{2} /	goddess
/lu^{4} /	thread
/loʔ^{1} /	bury
/loʔ^{4} /	all gone
/lom^{2} /	enough
/lom^{3} /	warm
/loŋ^{2} /	stone
/loŋ^{2} pʰun^{3} /	sand
/loŋ^{3} /	worm

/lo^{2} /	need
/lo^{3} /	person
/lo^{3} pe^{1} /	children
/lo^{3} k^{h}o^{4} /	man
/lo^{3} k^{h}rɔ^{2} /	poor person
/lo^{3} mu^{1} /	woman
/lo^{3} lam^{2} /	villager
/lo^{4} /	clothe
/lɔn^{4} /	come
/la$^{i\ 2}$ /	wide
/la$^{u\ 4}$ /	cockroach
/lwaʔ^{1} t^{h}i^{4} /	ugly
/lwaʔ^{1} ŋa^{3} /	lazy
/lwaʔ^{4} /	fall off
/lwaŋ^{2} /	run
/lwa$^{i\ 3}$ /	go
/lwa$^{i\ 4}$ /	mill
/ljaʔ^{1} /	rip out

/ r /

/ri^{2} /	bar (cN)
/ri^{3} /	flowing drop
/ri^{4} /	ask
/re^{2} /	rattan
/rɯ^{1} /	born
/rɯ^{2} /	fight
/rət^{1}/	sing

/rə^{2}/	tired
/raŋ^{3}/	anklet
/ra^{3}/	fruit
/ru^{1}/	snake
/rɔʔ^{4}/	stab
/rɔn^{2}/	hurriedly
/rɔn^{3}/	beam
/rɔn^{4}/	silver
/rɔn^{4} ŋa^{3}/	very
/rɔŋ^{3}/	color
/ra^{i2}/	rice field
/ra$^{i\,2}$ sa^{2}/	farmer
/ra$^{i\,3}$/	cut
/rwi^{2}/	root
/rwa^{3}/	saw
/rjan^{4}/	children of great-grandchild
/rja^{2}/	hot
/rja^{2} k^{h}iŋ^{3}/	summer
/rju^{1}/	cool

/ w /

/weʔ^{4} t^{h}u^{3}/	fly
/we^{2}/	elder sibling
/we^{2} k^{h}o^{4}/	elder brother
/we^{2} mu^{3}/	elder sister
/waʔ^{1}/	fell down
/waʔ^{4}/	snow

/wan^{3}/	dish
/waŋ^{1}/	throw
/waŋ^{2}/	fan oneself
/waŋ^{3}/	he, she
/waŋ^{3} saʔ^{1}/	ashamed
/waŋ^{4}/	to strike by rod
/wa^{1}/	bamboo
/wa^{2}/	bird
/wa^{2} pʰrɔŋ^{2}/	beak
/wa^{2} cʰɔn^{3}/	feather
/wa^{3}/	husband (inf)
/wa^{4}/	bee-hive
/wa$^{i\,4}$ nɛ^{3}/	district

/ j /

/jip^{4}/	wink
/jen^{4}/	quiet
/je^{3}/	police
/jəŋ^{1}/	wave
/jap^{1} saʔ^{1}/	harassed
/jaʔ^{1}/	pant
/jaʔ^{4}/	old and out of use, long
/jaʔ^{4} lam^{4}/	opium
/jaŋ^{2}/	again
/ja^{1} tʰi^{4}/	swim
/ja^{3}/	flesh
/ja^{3} du^{3}/	muscle

/ja^{4} k^{h}o^{2} /	sunshine
/ja^{4} k^{h}o^{2} t^{h}an^{3} /	for sun to shine
/ja^{4} seʔ^{4} /	hermit
/ju^{1} /	think
/joʔ^{4} /	monkey
/jo^{4} /	this
/jo^{4} p^{h}oŋ^{1} sɯ^{3} /	these
/jo^{4} k^{h}a^{4} /	now
/jo^{4} k^{h}a^{4} hɔn^{2} na$^{u\ 3}$ /	previously, earlier
/jɔʔ^{4} /	swell
/jwaʔ^{4} /	wait
/jwaʔ^{4} dən^{2} /	wait a moment

BIOGRAPHY

NAME	Miss Orranat Thanamteun
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