CHAPTER 5

PHONOLOGICAL DESCRIPTION OF KIM MUN, LAOS VARIETY

5.1 Inventory of Phonemes

This section will provide an analysis and description of the phonemes in the

Lao variety of Kim Mun and will be organized by consonants, vowels, and

tones.   A distribution of phonemes will follow.

5.1.1 Consonants

The Lao variety of Kim Mun has twenty-one distinctive consonants with four

major places of articulation which can be slightly modified according to

specific places of articulation, i.e. labial includes bilabial and labiodental

segments, pre-palatal includes dental and alveolar segments, palatal includes

alveolo-palatal and palatal segments as well as the alveolar sibilant[17], and

post-palatal includes velar and glottal segments.   The consonantal inventory

is represented in Table 6 and will be exemplified in the following sections.[18]

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[17] The alveolar sibilant sounds like the English /s/ which is produced through an alveolar constriction and groove in the alveolo-palatal area with an alveolar release (cf. Ladefoged/Maddieson 1996: 146f)

[18] The major places of articulation labeled pre-palatal and post-palatal are phonological categories not phonetic categories.

Table 6. Inventory of Consonantal Phonemes in Lao Kim Mun

Place ⟍ Manner	Labial	Pre-Palatal	Palatal	Post-Palatal
Plosives	p	t	ȶ	k
	b	d	ȡ	g
Fricatives	f	θ	s	h
	v	ð		
Nasals	m	n	ȵ	ŋ
Approximants		l	j	w

As already mentioned in Section 4.3.2.2, the Chinese symbols are used

following Mao (2004) for alveolo-palatal stops in both the Lao and the

Vietnam data.   Evidence of contrast is provided in Appendix B.

5.1.1.1 Plosives

There are sets of voiced and voiceless plosives in all four possible major

places of articulation for a total of eight plosives.   Initial bilabial, alveolar,

and alveolo-palatal plosives in Lao Kim Mun have stiff voice.   This means

they exhibit audible sharp vowel onsets as typical for laryngeal constriction

when following both voiced and voiceless segments.   Only voiceless plosives

occur syllable-final and are unreleased in this position, see Figure 3.   There

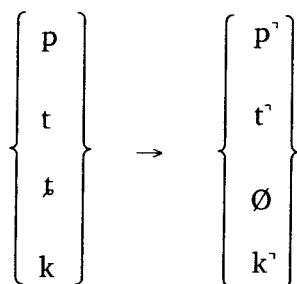is no alveolo-palatal unreleased final stop.

$$\left\{\begin{array}{c} p \\ t \\ \textit{ƚ} \\ k \end{array}\right\} \rightarrow \left\{\begin{array}{c} p^{\text{›}} \\ t^{\text{›}} \\ \emptyset \\ k^{\text{›}} \end{array}\right\}$$

Figure 3. Final Plosives in Lao Kim Mun

The alveolo-palatal plosive deviates from this pattern, as it does not occur syllable-final. There are two possible reasons for this behavior, one of which is that the stop might not be clearly audible in this position because the alveolo-palatal release is the strongest audible feature for this place of articulation. The other reason is that alveolo-palatal segments are phonologically ambiguous. They can be analyzed as a single alveolo-palatal stop, a palatalized alveolar stop, or as a sequence of alveolar stop and palatal approximant. For the latter two possible readings, the release into an approximant or fricative would be missing because of the word-final unreleased realization of plosives.

For the present analysis, the ambiguity is supported in that the two alveolar plosives never appear in a consonant cluster preceding either the palatal or labiovelar approximant whereas both the bilabial plosives and the velar plosives exhibit this behavior (cf. Section 5.2.3). Kim Mun nasals provide clearer evidence on this issue (cf. Section 5.1.1.3). The alveolo-palatal nasal

stop can only be interpreted as a single, non-palatalized phonological unit since the other nasal stops do not form clusters or undergo palatalization. Thus the phonological principle of symmetry allows the same interpretation for the alveolo-palatal oral stops.

The glottal stop also occurs syllable final. In this environment the glottal stop is a phonetic feature of certain tones (cf. Section 5.1.3) and has no phonemic status as a consonant. Therefore syllables that end with the glottal stop will still be considered open syllables rather than closed. The glottal stop also occurs syllable initial as a predictable vowel onset, as in #187 'duck' [ʔaːp⁻⁵³]. Since there is no contrast, the syllable-initial glottal closure before vowels is interpreted as the phonetic feature of abrupt onset of voicing (cf. Bussmann 1996).

The contrastive plosives with examples and their exact phonetic description are listed below.

/p/ stiff voiceless bilabial plosive [p* ~ p˺]
Examples:
/pəj⁵³/ 'to know'
/pɛ²¹/ 'white'
/tɔp³¹/ 'bean'.
The stiff voiceless bilabial stop is not released if in syllable-final position.

/b/ stiff voiced bilabial plosive [b̬]

Examples:

/blan³³/ 'to play'

/bjɛt³¹/ 'tongue'

/bjo³¹/ 'to float'

/t/ stiff voiceless alveolar plosive [t* ~ t˺]

Examples:

/təj³³/'tail'

/tu²¹/ 'turtle'

/sɛt³⁵/ 'to itch'

The stiff voiceless alveolar stop is not released if in syllable-final position.

/d/ stiff voiced alveolar plosive [d̬]

Examples:

/dəj²¹/ 'porcupine'

/du⁵³/ 'to be deep'

/dɔp²¹/ 'to taste'

/ȶ/ stiff voiceless alveolo-palatal plosive [tʲ*]

Examples:

/ȶe³³/ 'paper; cord'

/ȶɛŋ³³/ 'frog'

/ȶup³⁵/'to pound (garlic)'

/ɗ/ stiff voiced alveolo-palatal plosive [ɗʲ]
Examples:
/ɗim³³/ 'thorn'
/ɗu²¹/ 'scissors'
/ɗam²¹/ 'dark'

/k/ voiceless velar plosive [k ~ k˺]
Examples:
/kim³¹/ 'forest'
/kəj³⁵/ 'to hammer'
/tɔk²¹/ 'cup'
The stiff voiceless velar stop is not released if in syllable-final position.

/g/ voiced velar plosive [g]
Examples:
/guŋ³¹/ 'sky'
/gju³¹/ 'to wither'
/gaj¹³/ 'cover'
As a summary, both voiced and voiceless plosives in Lao Kim Mun exhibit the laryngeal setting stiff voice. Thus stiff voice is not distinctive and more likely to be an areal feature as the incidences of stiff voice in neighboring Tai languages suggest. Voiceless stops also occur syllable-final, in which case they have no audible release.

The alveolo-palatal plosives identified in the data are usually transcribed as affricates in other Mainland Southeast Asian languages. However, in the Lao variety of Kim Mun there is little friction in the production of the

alveolo-palatal segments, therefore they are analyzed as plosives in this study rather than affricates.   Furthermore, there are no reported stiff alveolo-palatal plosives or affricates in the literature; however the alveolo-palatal plosives in the Lao Variety of Kim Mun are produced with a sharp vowel onset, which is characteristic of a laryngeal setting associated with stiff voice (cf. Section 4.5.2.1.2).

5.1.1.2 Fricatives

There are two sets of voiced and voiceless fricatives in the labial and pre-palatal places of articulation, as well as a voiceless alveolar sibilant and a voiceless glottal fricative, for a total of six fricatives.   Consonants with this manner of articulation occur only syllable-initial.   The contrastive fricatives with examples and their exact phonetic description are listed below.

/f/ voiceless labiodental fricative [f]
Examples:
/fəj^{13}/ 'to sleep'
/fun^{53}/ 'to give'
/faː^{33}/ 'father'
The voiceless labiodental fricative occurs only twenty-three times in the wordlist and its environment is largely restricted to preceding the open central vowel /a/.   This limited occurrence is explained through the reconstructed Proto-Mienic labiodental and alveolar fricatives *f and *s that

have merged to the voiceless interdental fricative /θ/ in Mun (L-Thongkum 1993: 181). The words in which the voiceless labiodental fricative is found therefore are likely to be loanwords or underwent some newer sound change.

/v/ voiced labiodental fricative [v]
Examples:
/van¹³/ 'cloud'
/toŋ³¹van¹³/ 'sugar'
/wɔm⁵³vəj¹³/ 'boiling water'

The voiced labiodental fricative rarely occurs in the data, only five times in three different morphemes. In four instances it precedes the open central vowel /a/ like its voiceless counterpart, and in one instance it precedes the mid central vowel /ə/. Furthermore, the occurrence is limited to the rising tone /13/. Since the voiced labiodental fricative contrasts with its voiceless counterpart in the words /wɔm⁵³vəj¹³/ 'boiling water' vs. /fəj¹³/ 'to sleep' as well as /van¹³/ 'cloud' vs. /fan³³/ 'to shoot', it cannot be ignored as a phoneme of its own.

/θ/ voiceless dental fricative [θ]
Examples:
/θim³⁵/ 'needle'
/θi⁵³/ 'he/she/it'
/θəj³⁴¹/ 'to sit'

/ð/ voiced dental fricative [ð]

Examples:

/ɬə.ðaj³³/ 'tools'

/ɗu²¹ðɛm³¹/ 'knife'

/ðɛŋ³³ðo²¹/ 'to be smooth'

The voiced dental fricative occurs only four times in the data, but with three

occurrences in contrastive environments.

/s/ voiceless alveolar fricative [s]

Examples:

/sin¹³/ 'to shiver'

/səj³³/ 'child'

/si³⁵/ 'weather'

/h/ voiceless glottal fricative [h]

Examples:

/həj¹¹/ 'easy'

/hu³⁵/ 'to be thick'

/hɔp³⁵/ 'to suck'

To summarize the occurrence of fricatives in Lao Kim Mun, there are four

voiceless fricatives. Two of them, the labiodental and the dental one, have

voiced counterparts that are contrastive but rarely occur. Generally,

voiceless fricatives appear to be favored.

5.1.1.3 Nasals

The Lao Kim Mun variety shows four nasals, one for each major place of articulation. Except for the alveolo-palatal nasal, which is found only as a syllable onset, all nasals occur in syllable-initial and syllable-final position. Examples of all four nasals with subsequent description are listed below.

/m/ bilabial nasal [m]
Examples:
/min³⁵/ 'face'
/maː³¹/ 'to grind'
/məj³⁵/ 'oil'

/n/ alveolar nasal [n]
Examples:
/ni¹¹/ 'to be heavy'
/nɛŋ³³/ 'to squeeze'
/bin⁵³/ 'to be drunk'

/ɳ/ alveolo-palatal nasal [ɳʲ]
Examples:
/ɳin³³/ 'to eat'
/ɳe³¹/ 'to think'
/ɳo³¹/ 'you (2s)'

As mentioned in Section 5.1.1.1, alveolo-palatal segments are ambiguous and could be analyzed as palatalized or as a sequence of segments following the palatal approximant instead of a separate place of articulation.   However,

since there is no evidence of the clusters [mj, ŋj] (cf. Section 5.2.3), there is no motivation for the alveolo-palatal nasal to be interpreted as palatalized or followed by a palatal approximant.   Therefore, the alveolo-palatal place of articulation for nasals is distinctive in Lao Kim Mun.

/ŋ/ velar nasal [ŋ]
Examples:
/ŋɔŋ^{33}bu^{11}/ 'buffalo'
/ŋo^{341}sap^{31}laːn^{31}/ '50 (persons)'
/pɔŋ^{33}/ 'to be full'
The velar nasal occurs one hundred forty-six times in the data, and with the exception of three instances, it is always syllable final.   In syllable-final position it is preceded by any possible vowel, whereas in syllable-initial position it is found only with back vowels (close-mid /ɔ/ twice and open-mid /o/ once).   Since it contrasts with the other three nasals in this position, it is considered a phoneme.

As a summary, Lao Kim Mun nasals are found both syllable-initial and syllable-final. Like its oral counterpart, the alveolo-palatal nasal stop only occurs syllable-initial.   The velar nasal mainly occurs syllable-final.

5.1.1.4 Approximants

There are three approximants in three places of articulation. The labiovelar and palatal ones are central approximants and the alveolar approximant is a lateral. These contrastive approximants with examples are listed below.

/w/ voiced labial approximant [w]
Examples:
/wa³⁴¹/ 'urine'
/pow³³/ 'axe'
/bwe¹³/ 'to dream'
The labiovelar approximant occurs syllable-initial, medial, and final.

/l/ voiced alveolar lateral approximant [l]
Examples:
/lut³⁵/ 'peel'
/lu³⁵/ 'to be big'
/lɔm³⁵/ 'to stab'
The alveolar lateral approximant occurs sillable-inital and medial but not as a final.

/j/ voiced palatal approximant [j]
Examples:
/pjɔm³³/ 'to blow'
/jaːŋ³¹/ 'to walk'
/ne³³/ 'this'
The palatal approximant occurs as the medial consonant in clusters as well as in syllable-initial and syllale-final position.

To give a short summary of the occurrence of the three approximants in Lao

Kim Mun, they all occur syllable-initial and are used as the medial consonant

in clusters.   The alveolar lateral approximant cannot occur syllable-final.

This position appears to be reserved for oral and nasal stops and the central

approximants.

5.1.2 Vowels

The Lao variety of Kim Mun has three front vowels, two mid vowels, and

three back vowels for a total of eight distinctive vowel qualities.   Each of

these vowels show environmentally conditioned variation in length,

dependent on the word structure discussed in Section 5.2.   Only for the open

central unrounded vowel /a/ is duration contrastive in a few instances.

With the long open central vowel there is a total of nine distinctive vowels,
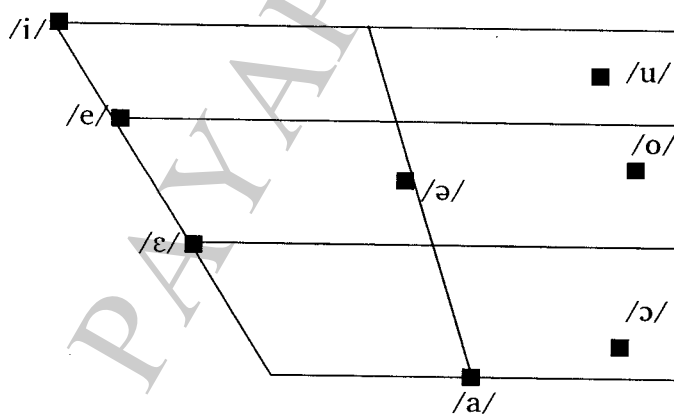
as shown in Figure 4.

Figure 4. Distribution of Phonemic Vowels in Lao Kim Mun

The environmental conditions for long and short vowels are discussed in Section 5.1.2.4. Evidence of contrast is provided in Appendix C.

There are no diphthongs identified for the Lao variety of Kim Mun. The only possible vowels that could fill the V₂ position in Lao Kim Mun are the ambiguous closed front and back vowels [i] and [u]. The interpretation of these vowels as labiovelar and palatal syllable final approximants /j/ and /w/ is called for in this analysis because there are other closed syllables, formed with unambiguous voiceless plosives and nasals.

The following sections provide examples and a description for each vowel.

5.1.2.1 Front Vowels

/i/ close front unrounded vowel [i ~ ɪ]
Examples:
/im⁵³/ 'to be bitter'
/min³⁵/ 'face'
/θi⁵³/ 'he/she/it'
The close front unrounded vowel /i/ shows four instances of realization as a near-close near-front unrounded [ɪ] in closed syllables ending on voiceless stops. Examples for the occurrence of this allophone are [p*ɪt˥⁵³sap˥³¹] 'eighty', [ɓʊŋ²¹ɓɪt˥³¹t*ɔʔ³⁴¹] 'lightning', [wɪt˥⁵³] 'to dig', and [ɗʲɪp²¹məjʔ²¹] 'to wink'.

/i/ → [ɪ]/ _C [-continuant] [-sonorant] #
  [i] elsewhere

/e/ close-mid front unrounded vowel [e ~ eʲ]

Examples:

/fe^{53}faːn^{13}/ 'west'

/ɬe^{33}/ 'paper, cord'

/pje^{33}doŋ^{53}/ 'hair'

The close-mid front unrounded vowel /e/ does not occur in closed syllables, it is restricted to open initial and medial syllables of compound words, e.g. [ɓḷạw^{31}ɬʲ*e^{53}tiw^{33}] 'wine'. If the open syllable occurs in final position, or in monosyllabic words without final consonants, it is realized with a palatal-off glide [eʲ], as in [ɬʲ*eʲ^{33}] 'paper, cord' or [t*e^{35}p*jeʲ^{33}] 'to cut hair'. Evidence of this is found in words like [p*jeʲ^{33}] 'head' vs. [p*je^{33}ḍɔŋ^{412}] 'hair' or [p*je^{33}ḍʲạːn^{33}] 'bald'.

/e/ → [eʲ]/ _#

    [e] _.CV(C)#

/ɛ/ open-mid front unrounded vowel [ɛ]

Examples:

/pɛ^{21}/ 'white'

/θɛn^{53}/ 'betelnut'

/sɛt^{35}/ 'to itch'

The open-mid front unrounded vowel /ɛ/ is strongly restricted to closed syllables with orally articulated consonants as in [θɛn^{412}] 'betelnut', [ɓjɛt$^{\rceil31}$] 'tongue' and [p*ɛw^{33}] 'wrong', as well as syllables that end with the tonal

feature glottal stop, as in [p*ɛʔ²¹] 'white'. There are only a few instances of this vowel occurring in open syllables and with final approximants.

The strong restrictions for each of the close-mid and open-mid front vowels /e/ and /ɛ/ seem to suggest that these vowels are merging, with the open-mid only occurring in closed syllables.   If this merge does get completed, the Lao Kim Mun vowel system will look more similar to the one recorded by Mao (2004) in the Guangxi variety of Kim Mun.   The allophonic variation would most likely look about like this:

/e/ → [e]/ _.CV(C)#
    [eʲ]/ _#
    [ɛ]/ _ C#

As long as there is contrast of close-mid and open-mid /e/ and /ɛ/ in open word-final syllables and with final approximants, like in /a³³pe⁵³laːn³¹/ '100 persons' vs. /pɛ²¹/ 'white' or /te³⁵pje³³/ 'to cut (hair)' vs. /pɛ²¹/ 'brother (elder of f)', the open-mid unrounded front vowel must be interpreted as an individual phoneme.

/ə/ mid central unrounded vowel [ə]
Examples:
/məj⁴³/ 'bee'
/kjət²¹/ 'to laugh'
/səm⁵³/ 'gold'

The mid central unrounded vowel appears in any possible environment. In minor syllables it occurs as an extra short reduced vowel [ə̆] where it is not contrastive, see Section 5.1.2.4 on vowel length below.

5.1.2.2 Central Vowels

/a/ open central unrounded vowel [a̱]
Examples:
/man³⁵/ 'who?'
/ma³¹gɔŋ¹³/ 'to be bad'
/fat²¹/ 'to see'
As Pullum and Ladusaw (1996) point out, IPA still has no symbol for this vowel which is transcribed with a symbol of its own, the small capital [ᴀ], by many Sinologists and Russian linguists. In this study, the lower-case [a̱] is being used for the central a-variant, which is quite common in Asia (cf. IPA 1999 for Thai, Cantonese, Korean, Japanese, and Hindi).

/aː/ long open central vowel [a̱ː]
In the Lao data there are three instances of contrast between long and short open central vowels that cannot be explained by the vowel-length conditioning word structure. These are the words /han¹¹/ 'to hate' vs. /haːn¹¹/ 'sweat', /daw³³/ 'salt' vs. /daːw³³/ 'long', and /man¹¹/ 'slow' vs. /maːn¹¹/ 'ghost'. The only feature they share is the final consonantal sonorants. Even though this contrast does get neutralized as soon as the

syllable is compounded with other following morphemes, the long open

central vowel has to be included in the phoneme inventory.

5.1.2.3 Back Vowels

/u/ close back rounded vowel [ʊ]
Examples:
/buj³⁵/ 'rice husk'
/tuŋ³¹ɗɔm¹³/ 'pillow'
/pu³⁴¹/ 'hand'

/o/ close-mid back rounded vowel [ɔ� ~ ɔ̰ʷ]
Examples:
/mə.nɔj³⁵mot²¹ɬəj²¹/ 'the sun sets'
/hɔ³³ɗo²¹/ 'to be correct'
/pje³³doŋ⁵³/ 'hair'
The close-mid back vowel is lowered, resembling more of an open-mid back

vowel.   Like the close-mid front vowel /e/, the close-mid back vowel /o/ is

restricted to open initial and medial syllables of compound words, as in

[t*ɔ̰³⁴¹sɔ̰ʷ³⁵⁴] 'smoke'.   In word-final open syllables, or in monosyllabic

words without final consonants, it is realized with a labiovelar off-glide [ɔ̰ʷ],

as in [p*lʊŋ³¹ɓlɔ̰ʷʔ³⁴¹] 'butterfly', [ɓʊŋ²¹ɓɪt⌐³¹t*ɔ̰ʷʔ³⁴¹] 'lightning' or [t*ɔ̰ʷʔ³⁴¹]

'fire'.

/o/→ [ɔ̰ʷ]/ _#
[ɔ̰]/ _.CV(C)#

/ɔ/ open-mid back rounded vowel [ɒ]

Examples:

/pɔŋ³³/ 'to be full'

/nɔm⁵³/ 'seed'

/θɔ²¹/ 'to be few'

The open-mid back vowel is pronounced more like a near-open back vowel.

Unlike the aforementioned close-mid back vowel /o/, the open-mid rounded

back vowel does not display the same behavior as its front counterpart.   It is

found in every possible environment.

5.1.2.4 Vowel Length

This section describes allophonic vowel length in Lao Kim Mun. Semantically

reduced minor syllables in Lao Kim Mun contain a non-contrastive extra-

short schwa, such as in [ɓə̆.glɔj⁴¹²] 'shadow', [mə̆.nɒj³⁵⁴] 'sun', and [kə̆.daŋ³³]

'eggplant'. They will be discussed in Section 5.2.2.

With the exception of the open central vowel /a/, vowel length is not

contrastive in Lao Kim Mun and therefore not marked in the data.   The

general word pattern shows initial and medial syllables with short vowels,

and a long vowel in the final syllable.   If such a word-pattern conditioned

syllable-final vowel is combined with other syllables so that it is no longer

final, the vowel undergoes neutralization, as Shintani (1990: viii) describes it

in the Hainan Island variety, and changes from long to short. There is one

exception in the data to this rule, i.e. [t*ɔːŋ³¹vạn²¹³] 'sugar', with a long

vowel in the first syllable.   Interestingly, for 'white sugar'

[t*ɔŋ³¹vạn³³p*ɛʔ²¹] the vowel length does alternate from long to short.

There are no further data available that would offer any possible explanation

for this exception.

Table 7 demonstrates the alternation of long to short vowels.

Table 7. Alternation of Long to Short Vowels in Lao Kim Mun

'sun' vs 'the sun rises'	[mə̌.nɒːj³⁵⁴] ⟶ [mə̌.nɒj³⁵saːw¹³]
'wind' vs 'storm'	[ɗʲaːw²¹³] ⟶ [ɗʲaw³³kjaʔ⁵³]
'earth, soil' vs 'mud'	[niː³⁵⁴] ⟶ [ni³⁵p*am ʔ²¹]

When a syllable is moved from final syllable to initial or medial syllable, not

only neutralization of vowel length but also tone neutralization can take

place.   This will be discussed in the following section.

5.1.3 Tones

Kim Mun languages, including the varieties under study, show lexically

distinctive tone with varying pitch patterns.   For Lao Kim Mun, eight tones

have been identified, i.e. two level tones, five contour tones, and one

complex tone, with the latter tonal annotation following Yip (2002).   The

two level tones have a falling and a rising equivalent.   Tonal alteration does

occur for the high falling, mid rising, and low rising tones.   For an overview,

see Table 8.

Table 8. Lao Kim Mun Tone Schema

Tone	Chao Tone Number	Example
Mid	/33/	/təj³³/ 'tail'
Low	/11/	/tup³⁵məj¹¹/ 'to pound (rice)'
High Falling	/53/	/pəj⁵³/ 'to know'
Mid Falling	/31/	/məj³¹/ 'you' (2ⁿᵈ sg)
Low Falling	/21/	/məi²¹/ 'eye'
Mid Rising	/35/	/məj³⁵/ 'oil'
Low Rising	/13/	/fəj¹³/ 'to sleep'
Mid Rising-Falling	/341/	/məj³⁴¹/ 'bee'

The Lao Kim Mun tones and their phonetic features will be presented in the

following three sections.

5.1.3.1 Level Tones

The two level tones in Kim Mun are mid and low tones.   Level tones never

occur with final plosives.   In word-final syllables, the low level tone exhibits

a word-final glottal stop.

/33/ mid level tone [33]
Examples:
/tim³³daːi³¹/ 'deer'
/pu³³/ 'to burn'
/bin³³/ 'coffin'
The mid tone is pronounced with modal voice.

/11/ low level tone [11]

Examples:

/saːm^{11}/ 'blood'

/θuj^{11}/ 'to move'

/ni^{11}/ 'to be heavy'

The low tone is pronounced with breathy voice and shows word final

glottalization. The word final glottalization might be an artifact of the

accompanying breathy phonation, which in turn can be interpreted as a form

of dissimilation to make the distinction between the low tone and the low

falling tone clearer.

5.1.3.2 Contour Tones

There are five contour tones in Kim Mun, three falling and two rising tones.

Contrary to the level tones, contour tones do occur with syllable-final

plosives, with the exception of the low rising tone. Similar to the low tone,

there is word-final glottalization of the high falling and low falling tones, but

not for every syllable type. Three of the contour tones i.e. high falling, mid

rising, and low rising tones exhibit tone alteration.

/53/ high falling contour tone [53 ~ 412]

Examples:

/ban^{31}ɖe^{53}/ 'hammer'

/səm^{53}/ 'gold'

/θin^{53}taw^{13}/ 'star'

The high falling tone is pronounced with modal voice. Non-final syllables bearing this tone exhibit a lengthened rhyme. In monosyllabic words ending on vowels the tone is glottalized, shortening the syllable. With word-final oral plosives /p/ and /t/ the vowel remains long, as in [ɲʲɛːp⁻⁵³] 'flower petal'.

In word-final open syllables or word-final syllables ending on consonantal sonorants, like nasals and central approximants, the high falling tone is in free variation with the high falling-rising allotone [412], with lower pitch and a subsequent minor raise instead of a glottal stop, as in [guj⁴¹²] 'clothing'. During the recording of the wordlist when the language informant would repeat a word three times, he would sometimes alternate between the high falling tone /53/ and the high falling-rising allotone [412].

/53/→ [53 ~ 412]/ _(C [+sonorant]) #
     [53] elsewhere

/31/ mid falling contour tone [31]
Examples:
/dum³¹nɔj³⁵/ 'noon'
/ɲe³¹/ 'to think'
/tap³¹/ 'to bite'
The mid falling tone is pronounced with modal voice.

/21/ low falling contour tone [21]

Examples:

/dəj²¹/ 'porcupine'

/tu²¹/ 'turtle'

/dup²¹/ 'skin'

The low falling tone has a slightly creaky or stiff voice. There is word final glottalization, often shortening the syllable. In addition to the bilabial and alveolar final stops that occur with high falling and mid falling tones, the low falling tone also occurs with a final velar stop /k/.

/35/ mid rising contour tone [35 ~ 354]

Examples:

/laːŋ³⁵/ 'ropes'

/du⁵³kuk³⁵/ 'monkey'

/ni³⁵pam²¹/ 'mud'

The mid rising tone is pronounced with modal voice and has a slight drop in pitch on final syllables ending with vowels or consonantal sonorants, such as in #005 [la̤ː³⁵⁴] 'moon'. The mid rising tone occurs on syllables with all three possible final plosives /p, t, k/. In this environment, the final drop in pitch is missing.

/35/→ [354]/ _C [+sonorant]#

   → [354]/ _#

   [35] elsewhere

/13/ low rising contour tone [13 ~ 213 ~ 33]

Examples:

/bu¹³/ 'to tell'

/nam¹³/ 'to be cold'

/oj¹³/ 'to love'

The low rising tone is pronounced with modal voice. In non-word final syllables, there is what Shintani (1990) calls tone neutralization where only the target pitch level is produced. This is probably the outcome of non-final vowel shortening. Evidence of this is found in examples like [gjaŋ²¹³] 'tree' vs. [gjaŋ³³ɡʋp⁻²¹] 'tree bark', or [ɟʲaːw²¹³] 'wind' vs. [ɟʲaw³³kja ʔ⁵³] 'storm'. After syllable-initial voiced plosives, there is a slight raise in pitch of the vowel onset, as in [t*ʋŋ³¹ɟʲʋm²¹³] 'pillow'. As noted in 4.5.2.1.2, this phenomenon has been observed for voiceless stiff plosives in Korean (Ladefoged and Maddieson 1996). Since syllable-initial stops in Lao Kim Mun have stiff voice too, the higher fundamental frequency at the vowel onset is regarded an articulatory artifact of the voiced stiff vowels. It is not observed for the voiceless stiff plosives. An explanation for this discrepancy is lacking.

/13/→ [213]/ C[-sonorant +voiced]_

   → [33]/ _.(C)(C)V(C)#

    [13] elsewhere

5.1.3.3 Complex Tones

There is one complex tone in Lao Kim Mun, the convex tone /341/. The convex tone refers to a mid rising-falling tone (Yip 2002).

/341/ mid rising-falling tone [341]
Examples:
/klim³⁴¹/ 'to lick'
/wɔm⁵³nɔ³⁴¹/ 'stream'
/to³⁴¹so³⁵/ 'smoke'
The mid rising-falling tone is pronounced with modal voice, and begins at about the pitch level of the mid tone and rises slightly lower than the high falling tone before dropping in pitch to that of a low tone. The mid rising-falling tone has word final glottalization. Word-final syllables that generally show non-contrastive length are shortened, which is a result of glottal constriction (Yip 1995).

5.1.3.4 Tone Summary

The tonal behavior for Kim Mun can be summarized as follows:

Table 9. Tonal Impact on the Lao Kim Mun Syllable

Tone	Impact on Syllable
Mid /33/	Modal voice Long and short vowels = > No impact on vowel length
Low /11/	Breathy voice Word-final glottalization Mostly long vowels = > Tendency to lengthen vowels
High Falling /53/	Modal voice Postglottalization on open syllables and final sonorants = > Shorter rhyme. Absence of glottal stop = > Longer rhyme. Long and short vowels = > No impact on vowel length
Mid Falling /31/	Modal voice Mostly long vowels = > Tendency to lengthen vowels
Low Falling /21/	Slightly creaky voice Word-final glottalization Mostly short vowels = > Tendency to shorten vowels
Mid Rising /35/	Modal voice Long and short vowels = > No impact on vowel length
Low Rising /13/	Modal voice Long and short vowels = > No impact on vowel length
Mid Rising-Falling /341/	Modal voice Word-final glottalization Always short vowels = > Shortens vowels

Tones in Lao Kim Mun are accompanied with predictable phonation types. The mid, high falling, mid falling, mid rising, low rising, and mid rising-falling tones show non-distinctive modal voice. The low tone exhibits breathy voice. The low falling tone is pronounced with a slightly creaky voice. The creaky voice may be an outcome of a following glottal stop. Furthermore, only the mid rising-falling tone occurs with only short vowels.

A summary of all the tones and allotones in the Lao variety is provided in

Table 10. The abbreviation Ms. stands for monosyllabic and Son. stands for

sonorants. Evidence of tonal contrast is also provided in Appendix D.

Table 10. Lao Kim Mun Tonal Summary

Tones/Allotones		Syllable Structures	Syllable Positions	Types of Codas	Examples		
L e v e l	Mid /33/	V	Initial		#247	flesh	/a^{33}ɗaːj^{53}/
		C$_1$V	Initial		#321	smell	/si^{33}daːŋ^{53}/
			Medial		#297	ring (finger)	/mun^{33}se^{33}gɛŋ^{13}/
			Final		#195	spider	/kjiŋ^{53}n̪aː^{33}/
		C$_1$C$_2$V	Initial		#210	hair	/pje^{33}doŋ^{53}/
			Medial		#104	green bean	/tə.bwe^{33}miŋ^{53}/
			Final		#100	pumpkin	/gjaŋ^{33}kwaː^{33}/
	Low /11/	C$_1$V	Initial		#351	to forget	/n̪o^{11}kɔ^{33}/
			Final		#176	buffalo	/ŋɔŋ^{31}bu^{11}/
			Ms		#361	medicine	/maː^{11}/
		C$_1$VC$_3$	Initial	Son	#041	sea	/koj^{11}lu^{35}/
			Ms	Son	#305	to move	/θuj^{11}/
C o n t o u r	High Falling /53/	C$_1$V	Initial		#320	to hear	/tu^{53}nuŋ^{33}/
			Medial		#236	fingernail	/pu^{341}dɔ^{53}waj^{13}/
			Final		#312	hammer	/ban^{33}ɖe^{53}/
			Ms		#304	candle	/ɬo^{53}/
		C$_1$C$_2$V	Initial		#090	watermelon	/kwa^{53}θaːj^{53}/
			Final		#212	eyebrow	/məj^{21}jap^{35}pje^{53}/
		VC$_3$	Ms	p/m	#187	duck	/aːp^{53}/
		C$_1$VC$_3$	Initial	p/t/m/n/ŋ	#227	heart	/θim^{53}taːw^{31}/
			Medial	p/t/m/n/ŋ	#028	morning	/bu.dom^{53}tɔn^{13}/
			Final	p/t/m/n/ŋ	#330	to drink	/hɔp^{35}wɔm^{53}/
			Ms	p/t/m/n/ŋ	#390	to dig	/wit^{53}/
		C$_1$C$_2$VC$_3$	Initial	Son	#223	chin	/klaŋ^{53}ŋam^{341}/
			Final	Son	#489	naked	/ɬe^{33}blan^{53}/

Tones/Allotones	Syllable Structures	Syllable Positions	Types of Codas		Examples	
-Allotone [412]	C_1V	Ms		#186	chicken	$[t^{j*}e^{j412}]$
	C_1C_2V	Ms		#200	snail	$[kwe^{j412}]$
	C_1VC_3	Final	m/n/ŋ	#031	tomorrow	$[saŋ^{31}ɖɔm^{412}]$
		Ms	m/n/ŋ	#139	to steam	$[sa:ŋ^{412}]$
	$C_1C_2VC_3$	Final	n/ŋ	#008	shadow	$[b̥ə̆.glɔj^{412}]$
		Ms	n/ŋ	#177	horn	$[kjɔŋ^{412}]$
Mid Falling /31/	C_1V	Initial		#491	to be bad	$/ma^{31}gɔŋ^{13}/$
		Medial		#258	we	$/pan^{31}ti^{31}doj^{31}/$
		Final		#248	fat	$/məj^{35}pi^{31}/$
	C_1C_2V	Initial		#380	to swim	$/kjo^{31}wɔm^{53}/$
		Final		#069	branch	$/gjaŋ^{13}gwa:^{31}/$
		Ms		#462	to be dirty	$/klu^{31}/$
	VC_3	Ms	p	#141	to bake	$/up^{31}/$
	C_1VC_3	Initial	p/t/m/n/ŋ	#089	pineapple	$/dum^{31}daw^{341}pjo^{33}/$
		Medial	p/t/m/n/ŋ	#091	apple	$/mak^{21}pom^{31}pjo^{33}/$
		Final	p/t/m/n/ŋ	#074	flower	$/gjaŋ^{33}fa:ŋ^{31}/$
		Ms	p/t/m/n/ŋ	#067	forest	$/kim^{31}/$
	$C_1C_2VC_3$	Initial	t/n/ŋ	#204	butterfly	$/pluŋ^{31}blo^{341}/$
		Ms	t/n/ŋ	#470	to be spicy	$/bja:t^{31}/$
Low Falling /21/	C_1V	Initial		#309	knife	$/ɖu^{21}ðɛm^{31}/$
		Ms		#458	white	$/pɛ^{21}/$
		Ms		#021	hail	$/pjɔ^{21}/$
	C_1C_2V	Ms	p/t/k/Son	#369	to kneel	$/kwe^{21}/$
	C_1VC_3	Medial	p/t/k/Son	#102	carrot	$/tə.bak^{21}pjo^{33}/$
		Final	p/t/k/Son	#404	to exchange	$/tiŋ^{31}wan^{21}/$
		Ms	p/t/k/Son	#465	to be dark	$/ɖam^{21}/$
	$C_1C_2VC_3$	Ms	p/t/ŋ/j	#341	to smile	$/kjət^{21}/$
Mid Rising /35/	C_1V	Initial		#043	mud	$/ni^{35}pam^{21}/$
		Medial		#054	earthquake	$/guŋ^{31}ni^{35}tɔŋ^{341}/$
	C_1VC_3	Initial	p/t/k/Son	#211	forehead	$/min^{35}dup^{21}/$
		Medial	p/t/k/Son	#212	eyebrow	$/məj^{21}jap^{35}pje^{53}/$
		Final	p/t/k	#046	pebble	$/gjaw^{53}θaj^{53}n̪ɔt^{35}/$
		Ms	p/t/k	#362	to itch	$/sɛt^{35}/$

Tones/Allotones		Syllable Structures	Syllable Positions	Types of Codas	Examples		
	-Allotone [354]	C₁V	Final		#093	peanut	[t*ɔ̆.ɓweʲ³³ni³⁵⁴]
			Ms		#459	red	[θi³⁵⁴]
		C₁C₂V	Ms	Son	#293	trousers	[kwa̰:³⁵⁴]
		C₁VC₃	Final	Son	#222	gums	[ɲʲa³¹lɒŋ³⁵⁴]
			Ms	Son	#208	face	[min³⁵⁴]
		C₁C₂VC₃	Final	Son	#203	fly	[kjiŋ⁵³gjəm³⁵⁴]
			Ms	Son	#229	liver	[gjan³⁵⁴]
	Low Rising /13/	C₁V	Final		#500	where	/jam⁵³ti¹³/
		C₁VC₃	Final	Son	#285	roof	/pjaw³³tuŋ¹³/
			Ms	Son	#384	to hit	/pa:n¹³/
		C₁C₂VC₃	Final	Son	#194	tadpole	/tɛŋ³³plɔŋ¹³/
			Ms	Son	#478	to be blunt	/plun¹³/
	-Allotone [213]	C₁V	Ms		#278	name	[ɓʊ²¹³]
		C₁VC₃	Final	Son	#056	cliff	[gjaw⁵³ɓɛŋ²¹³]
			Ms	Son	#376	to pull	[ɗan²¹³]
		C₁C₂VC₃	Final	Son	#155	tree shade	[gjaŋ³³glɔm²¹³]
			Ms	Son	#068	tree	[gjaŋ²¹³]
	-Allotone [33]	C₁VC₃	Medial	Son	#113	white sugar	[t*ɔŋ³¹van³³p*ɛʔ²¹]
		C₁C₂VC₃	Initial	Son	#155	tree shade	[gjaŋ³³glɔm²¹³]
C o m p l e x	Mid Rising-Falling /341/	C₁V	Final		#431	all	/θɔŋ³³ɗɯ³⁴¹/
			Ms		#254	urine	/wa³⁴¹/
		C₁C₂V	Final		#204	butterfly	/pluŋ³¹blo³⁴¹/
		C₁VC₃	Final	Son	#143	to set table	/bin³³tɔŋ³⁴¹/
			Ms	Son	#145	to dip	/nam³⁴¹/
		C₁C₂VC₃	Ms	Son	#188	fish	/bjaw³⁴¹/

The interaction of Lao Kim Mun tones and phonotactics will be described

under the Lao Kim Mun syllable structure in Sections 5.2.5 through 5.2.7.

5.2 Syllable and Word Structure

This section will provide an overview of the syllable structure of the Kim

Mun variety in Laos. Lao Kim Mun words are made up by one major syllable

or a combination of one possible minor syllable and up to four major

syllables.[19] The most frequent word length is one to two syllables.

Syllables can be open and closed. The Lao Kim Mun word structure is

$(C.)C_1(C_2)V(C_3)T$, with the non-distinctive vowel in the possible word-initial

minor syllable not being marked.

5.2.1 Major Syllables

There are no phonotactic restrictions discovered on major syllables or their

combinations to compound words. There are three open and three closed

syllables, with single initial consonants or consonant clusters formed with

voiceless plosives and central and lateral approximants. The syllable-final

position is restricted to nasals and central approximants. Closed syllables

with initial clusters have no syllable-final plosives but only sonorant

consonantal finals. For the most basic syllable template V the vowel is

preglottalized and as such, it follows the CV pattern on the phonetic

---

[19] This analysis is limited to a wordlist with minimal access to native speakers, therefore a more detailed analysis of the syllable and word structure using criteria such as Kroeger (2005) is for future Kim Mun studies.

level.   Table 11 provides a general overview of the Lao Kim Mun major

syllable structure.

Table 11. Lao Kim Mun Syllable Template

Syllable Types	Onset	Rhyme		Examples		
		Nucleus	Coda			
Open Syllable		V		/$a^{33}la:n^{31}$/	1 person	#407
	C_1	V		/$ŋa:^{31}$/	tooth	#221
	C_1C_2	V		/klu^{31}/	to be dirty	#462
Closed Syllable		V	C_3	/$a:p^{53}$/	duck	#187
	C_1	V	C_3	/$tɔk^{21}$/	cup	#151
	C_1C_2	V	C_3	/$klum^{35}$/	lungs	#228

The most common syllable template is the C_1VC_3T, occurring a total of 460

out of 817 times in the data.   The next most common syllable pattern is

C_1VT, occurring 184 times.

5.2.2 Minor Syllables

Lao Kim Mun has minor syllables.   These are also referred as to pre-syllables,

sesquisyllables, or reduced syllables.   Minor syllables are semantically and

phonologically reduced syllables that can precede certain major

syllables.   According to Matisoff (2003), minor syllables in Tibeto-Burman

languages were productive morphemes at some point but lost their

distinctive meaning over time.   In Mien, Purnell (1965) documents three

kinds of minor syllables.   One of them, labeled as "neutral minor syllables",

which exhibits "unstable tone and no independent meaning" (1965: 14),

seems to be present in Lao Kim Mun occurring on cognates. Their shape is restricted to a number of oral and nasal stops followed by a shortened schwa with no distinctive tone. The pitch level of pre-syllables is that of about mid range. There are three instances of shortened syllables with the close back vowel /u/, i.e. /bŭ.dom⁵³tɔn¹³/ 'morning', /bŭ.gɔŋ⁵³haːw³¹/ 'thunder' and /bŭ.ʈɔŋ⁵³/ 'nose'.

Semantically, there may be three different minor syllable domains discovered in the data of Lao Kim Mun.

bə̆- used with darkness
/bə̆.ɗam²¹/ 'night'
/bə̆.gloj⁵³/ 'shadow'

tə̆- used with vegetables
/tə̆.bwe³³miŋ⁴¹²/ 'green bean'
/tə̆.bak²¹pjo³³/ 'carrot'
/tə̆.bwe³³ni³⁵/ 'peanut'
/tə̆.bwe³³n̪aː³¹/ 'soybean sprout'

kə̆- used with body parts
/kə̆.ɗap³¹di³³/ 'armpit'
/kə̆.daːj³³/ 'buttocks'

Further examples not grouped into semantic domains include:

/mə̆.nɔj³⁵/ 'day'

/mə̆.nɔm³¹/ 'ear'

/də̆.maj³³nup³⁵/ 'to be weak'

/sə̆.blaːw³¹/ 'termite'

/ʈə̆.bɛŋ³¹kɔt³⁵/ 'cave'

/ʈə̆.ðaj³³/ 'tool'

/ʈə̆.kun⁵³/ 'spoon'

/ʈə̆.kon⁵³kjaːŋ⁵³/ 'soy sauce'

/kə̆.dun³¹/ 'house lizard'

/kə̆.daŋ³³/ 'eggplant'

5.2.3 Consonant Clusters

There are three types of consonant clusters found in the Lao Kim Mun data,

consisting of an initial bilabial or velar stop following an approximant as

illustrated in Table 12.

Table 12. Initial Consonant – Medial Consonant Sequences in Lao Kim Mun

C_2 \ C_1	p	b	k	g
l	+	+	+	+
w		+	+	+
j	+	+	+	+

As can be observed from Table 12 there is a gap for the cluster

/pw/. However, since the data corpus is rather restricted and due to

symmetry, this cluster is likely to be part of Lao Kim Mun phonotactics.

5.2.4 Consonant – Vowel Sequences

There are no obvious restrictions on vowels following initial consonants and medial consonants. The strongest limitation is found with the velar nasal that precedes only close-mid and open-mid back vowels, and with the glottal fricative, which is not found with front vowels. Other than that, every place of articulation for vowels does occur with every place and manner of articulation for the consonants preceding them. Table 13 illustrates the consonant-vowel-sequences accounted for in Lao Kim Mun.

Table 13. Consonant – Vowel Sequences in Lao Kim Mun

$C_{1/2}$ / V	p	b	m	w	f	v	θ	ð	t	d	n	l	s	ʈ	ɖ	ɳ	j	k	g	ŋ	h
i	+	+	+	+			+		+	+	+	+	+	+	+	+	+				
e	+			+	+		+		+		+	+	+			+	+				
ε	+	+	+	+			+	+		+	+		+	+	+	+	+		+		
a	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+
ə	+	+	+		+	+	+		+	+		+	+			+	+				+
u	+	+	+		+		+		+	+	+	+	+	+	+	+	+	+	+		+
o	+		+				+	+	+	+		+	+	+	+	+	+	+		+	+
ɔ	+	+	+	+			+		+	+	+	+	+	+	+	+	+	+	+	+	+

It can be observed that the close-mid front vowel /e/ is the most restricted vowel. This is due to its limited occurrence in open syllables, only the open-mid front /ε/ can be followed by syllable-final consonants (cf. Section 5.1.2). The most restricted consonants are the voiced fricatives, with the labiodental one merely occurring with the two central vowels, and the voiced

dental fricative preceding only the open-mid front vowel and open central vowel /ɛ/ and /a/.

The only vowel without hardly any sequential limitations is the open central vowel /a/. It can occur after any consonant except the velar nasal /ŋ/, which is the most restricted consonant, usually occurring syllable final.

5.2.5 Syllable Onset – Tone Patterns

The mid tone /33/ is the most flexible tone as it can occur after every possible syllable onset. The three contour tones high, mid, and low falling also have almost no restrictions. The low level and low rising tones /11/ and /13/ show more limitations than the other tones, but without any noticeable pattern. The restrictions on the voiced fricatives /f/ and /ð/ and velar nasal /ŋ/ are caused by their rare occurrence in the data. With the exception of the voiceless dental fricative /θ/, the mid-rising falling tone /341/ does not occur after fricatives.

Table 14 illustrates the tonal distribution with initial consonants in Lao Kim Mun.

Table 14. Syllable Onset – Tone Patterns in Lao Kim Mun

C$_{1/2}$ / T	p	b	m	w	f	v	θ	ð	t	d	n	l	s	ɬ	ɗ	ȵ	j	k	g	ŋ	h
33	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
11	+	+	+		+		+			+	+	+	+	+	+	+					+
53	+	+	+	+	+		+		+	+	+	+	+		+	+	+	+	+		+
31	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+			+
21	+	+	+	+	+		+	+	+	+	+	+	+			+	+	+			
35	+	+	+	+			+		+	+	+	+	+	+	+	+	+				+
13	+	+		+	+	+		+	+	+	+	+	+	+			+		+		
341	+	+	+	+			+		+	+	+	+		+	+	+	+	+	+		

5.2.6 Vowel – Tone Patterns

There are no clear restrictions between vowels and tones in Lao Kim Mun.

Table 25 illustrates the nucleus tone patterns accounted for in Lao Kim Mun.

Table 15. Nucleus – Tone Patterns in Lao Kim Mun

V / T	i	e	ɛ	ə	a	u	o	ɔ
33	+	+	+		+	+	+	+
11	+	+		+	+	+	+	+
53	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+
35	+	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+
341	+		+	+	+	+	+	+

5.2.7 Coda – Tone Patterns

There are no clear restrictions between the coda and tones in Lao Kim Mun.

It can be observed that final plosives only occur with contour tones.   The

final velar plosive only occurs on the low falling and mid rising tones and rarely occurs in the data compared to the pre-palatal plosives /p, t/. Furthermore, each of the eight tones in Lao Kim Mun can occur on open syllables.   Table 26 illustrates the coda tone patterns accounted for in Lao Kim Mun.

Table 16. Coda – Tone Patterns in Lao Kim Mun

C_3 T	p	t	k	m	n	ŋ	j	w
33				+	+	+	+	+
11				+	+	+	+	+
53	+	+		+	+	+	+	+
31	+	+		+	+	+	+	+
21	+	+	+	+	+	+	+	+
35	+	+	+	+	+	+	+	+
13				+	+	+	+	+
341				+	+	+	+	+

5.3 Summary

To summarize the results of the phonological analysis for the Kim Mun variety in Laos, there are 21 distinctive consonants, nine vowels, and eight tones.

There is a higher functional load on oral and nasal stops than on fricatives or approximants.   Of the nine vowels, only the open central vowel /a/ has length distinction, however, with very few examples of contrast.   There is

environmentally conditioned length for the other vowels, implying that the Lao variety may be losing the length distinction.

The tonal system is rich, with two level, three falling, two rising, and one rising-falling tone. Tonal alteration does occur in Lao Kim Mun and final plosives only occur with contour tones.

The shortest possible syllable is made up by a preglottalized vowel. The maximal syllable is made up by a consonant cluster preceding a vowel with a voiceless plosive, a nasal, or a central approximant following the vowel. Consonant clusters are restricted to bilabial and velar plosives followed by approximants. Monosyllabic words with single initials in closed syllables are most frequent. There are a small number of minor syllables with oral and nasal stops.