

THE HISTORICAL PHONOLOGY OF KRIANG, A KATUIC LANGUAGE

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Abstract

This paper presents an analysis of the historical phonology of the Kriang language (< Katuic < Austroasiatic). Kriang is spoken primarily in Sekong province, Laos and may be divided into two primary dialects which I call Kriang Kaleum and Kriang Tha Taeng. A synchronic analysis of Kriang phonology is provided based both on my own field work and on the data provided by previous researchers. A description of the historical phonological development from Proto-Katuic to modern Kriang follows emphasizing especially the development of prenasalized consonants, long/geminate consonants and vocalic register in the modern language. Of particular interest is the non-canonical register assignment pattern evident in certain Kriang varieties.

Keywords: Kriang, Ngeq, Prenasalization, Gemination, Register, Registrogenesis
ISO 639-3 codes: ngt

1 Introduction

The Kriang are an Austroasiatic people of southern Laos who speak a language belonging to the Katuic language family. Sidwell (2005) classifies the Kriang language [ngt] as a language under his Ta'oi sub-group of Katuic. Kriang people are also called Ngkriang or Ngeq/Nyeq, the latter of which is a somewhat pejorative exonym derived from the Kriang word for 'no'. Some Kriang people have accepted this exonym and use it themselves but others prefer the endonym Kriang, which, anecdotally at least, has its origin in the people's habit of eating the fruit of the jambolan tree (*syzygium cumini*) during times of famine (Baird and Shoemaker 2008). The jambolan fruit is called /kəllaj ŋkriaj/ in Kriang.

The goal of this paper is to take a step forward in the documentation and phonological analysis of the Kriang language. First, a synchronic phonological description of the Kriang language is presented based on my own field work and the work of other researchers. Then, building on that foundation, the historical phonology of Kriang is investigated with special attention given to consonant prenasalization, consonant gemination and registrogenesis.

1.1 Available data and previous descriptions

Up to now, only two resources on Kriang phonology have appeared in publication, both of which are quite limited in scope (R. Smith 1973a; Theraphan 2001). Supplementary observations on Kriang phonology are found in Huffman's (1985) article on vocalic restructuring in register languages and in his unpublished notebooks, which have only recently been made available online thanks to the efforts of Paul Sidwell and Doug Cooper (Huffman 1971a).¹ Kriang grammar is similarly poorly documented, with only one article on reduplication (R. Smith 1973b) and brief notes on the grammaticalization of the Kriang *acquire* verb in Enfield's (2003) crosslinguistic investigation of the issue.

As for the Kriang lexicon, the largest contribution has been R. Smith's (1970) unpublished dictionary, which contains almost 4000 unique etyma and has been digitized for sealang.net's Mon-Khmer Languages Project. Theraphan's (2001) comparative phonological investigation of Katuic and Bahnaric includes substantial lexicons of Kriang and the closely related Chatong language, both of which are also available in

¹ See <http://sealang.net/archives/huffman>

digital form on sealang.net.² For unpublished resources, I had at my disposal Huffman’s (1971b, 1979b) word lists for two different Kriang varieties, one of which has been digitized on sealang.net, my own two original Kriang data sets (Gehrmann 2014b; 2014c) and an extensive unpublished lexicon of Kriang that I was subsequently involved in developing (Gehrmann et al. 2016).

Finally, a useful non-linguistic publication is Baird and Shoemaker’s (2008) *People, Livelihoods, and Development in the Xekong River Basin, Laos*, from which information about the geographic location and sociolinguistic situation of Kriang speakers can be gleaned.

1.2 Dialectology

Kriang has two primary dialects. The first, which I will call Kriang Kaleum (KK)³, is spoken in the mountainous region along the course of the Sekong River in western Kaleum district, Sekong province, Laos. The second, which I will call Kriang Tha Taeng (KTT) is spoken along the main road between the Tha Taeng district center and the provincial capital of Sekong (see the map in Figure 1). These two dialect communities are not geographically contiguous and have developed differently in some respects. From the data available, it would appear that KK, which is spoken in the Kriang homeland area, has developed in isolation and diversified internally, whereas KTT has been affected by close, prolonged contact with Alak, a Central Bahnaric language.

Kriang is spoken primarily in western Sekong province, Laos, but smaller Kriang communities are found outside of this area as well in Salavan and Champasak provinces. The variety of Kriang spoken in these communities is almost without exception descended from KK, although there are a few KTT villages just over the border from Tha Taeng district in Pak Song district, Champasak province. North of Tha Taeng city, in Salavan district, Salavan province, there is a small group of Kriang villages. Kriang speakers in this area refer to their language as *Kriang Khong* or *Kriang Tat*, reflecting the names of local villages *Ban Kiang Khong* and *Ban Kiang Tat Sung* respectively. Their speech is the same as KK with only slight lexical differences (Feikje van der Haak, personal communication). KK speakers are also found in lowland Champasak province along the road north and south of Pakse, but they typically live in mixed villages and the long term survival of the language in this area is in doubt.

A certain degree of internal diversity exists within the KK dialect as it is spoken in Kaleum district as well. Baird and Shoemaker (2008) note that, people divide Kriang into two dialect groups up in the ancestral homeland - one being spoken higher up in the mountains and the other down by the Sekong river. Furthermore, while Theraphan (2001) was doing field work in Kaleum district and working with a Kriang speaker from a mountain village, she was warned by certain townsfolk that this man spoke a strange variety of Kriang, different from the “pure” Kriang variety spoken in Kaleum town. Theraphan provides examples of lexical and pronunciation differences between the mountain dialect, which she calls *Kriang of Hat Wi Village*, and the town dialect, which she calls *General Kriang*, as shown in Table 1.

Table 1: *Lexical differences between two varieties of KK (Theraphan 2001)*

Hat Wi Kriang	General Kriang	
/paha:c/	/hanʔen/	‘sand’
/ha:w/	/sɔk/	‘ascend, climb’
/suaj/	/harpu:/	‘mango’
/ku:/	/kɔw/	‘I, me’
/mi:/	/maj/	‘you’
/dɜ:ʔ/	/dɔ:ʔ/	‘put away’
/bɔɾ/	/pan/	‘wait’
/bɔ:n/	/be:n/	‘get’
/taŋow/	/taŋaw/	‘sit’

² See <http://sealang.net/monkhmer>

³ Note that Kriang Tha Taeng speakers refer to Kriang Kaleum as *Kriang Koh* ‘Mountain Kriang’, as do many Kriang speakers in Champasak province.

Figure 1: Linguistic map of Sekong province and surrounding provinces (adapted from Doãn Hiệu 2010)



1.3 Methodology

The phonological description of Kriang below is based primarily on my own field research but I have reviewed all of the available lexical data and phonological analyses from other researchers as well. Any difference between their analyses and my own are duly noted.

The following data sets and descriptions of Kriang were consulted in working on this project:

- Kriang Kaleum
 - Gehrmann (2014b): 834-item word list representing Kriang Koh of Phon Xai village, Ba Chiang Chaleum Souk district, Champasak province, Laos
 - Theraphan (2001): 1069-item word list and accompanying phonological sketch representing Kriang of Hat Vi village, Kaleum district, Sekong province, Laos
 - Huffman (1971a, 1971b): 677-item word list and accompanying phonological sketch representing Ngeh of Bak village, Kaleum district, Sekong province, Laos
 - R. Smith (1970, 1973a): 3988-item dictionary and brief phonemic analysis representing Ngeq as spoken in scattered villages around Pakse
- Kriang Tha Taeng
 - Gehrmann (2014c): 766-item word list representing Kriang of Chakam village, Tha Taeng district, Sekong province, Laos
 - Gehrmann et al. (2016): 2446-item lexicon representing Kriang of Chakam village, Tha Taeng district, Sekong province, Laos

- Huffman (1979b, 1985): approximately 1000-item word list and brief description of long vowel restructuring representing Kriang of Baeng village, Lamam district, Sekong province, Laos

My analysis of the historical phonological development and classification of Kriang was aided greatly by the two Kriang word lists that I collected in 2014. Both of those word lists were collected with the express purpose of finding Kriang etyma that are cognate with items in Sidwell’s (2005) Proto-Katuic (PK) lexicon. Because those two Kriang word lists are cross-referenced with Sidwell’s PK etyma, it was a simple matter to compare the new Kriang data with other Katuic data sets.

2 Phonological description

In this section, a description of the synchronic phonology of Kriang is presented. The two major dialects of Kriang have practically identical underlying phonological structures, and so the following description accounts for both KK and KTT. Still, it should be noted that I have personally done more work on KTT than KK, so the description and examples below reflect KTT unless otherwise noted.

The canonical Kriang word may be monosyllabic or disyllabic. In disyllabic words, the second syllable, or the main syllable, is stressed and equivalent in its phonotactics to monosyllables. The unstressed first syllable of a disyllabic word, or the presyllable, is deficient in comparison to the main syllable in that its inventory of permissible initial and final consonants is severely limited and in that it does not carry a phonemic vowel. The Kriang phonological word shape may be summarized as follows:

$$(P_1(P_2)).C_1(C_2)V(:)(F)$$

A presyllable must contain a P_1 onset but a P_2 coda is not required. If no P_2 coda is present, an epenthetic central vowel [ɐ] is inserted between P_1 and the main syllable onset C_1 . If a P_2 coda is present, then the epenthetic vowel is inserted between P_1 and P_2 . An additional constraint which affects the main syllable is that short vowels must be followed by a final consonant, or put another way, main syllable vowel length is only contrastive in closed syllables and is predictably long in open syllables.

Of the eighteen possible Kriang word shapes, sixteen are attested in the data. Examples can be found in Table 2. Note that although the presyllable vowel [ɐ] is indeed predictable and non-phonemic, I include it in my phonemic transcription to make clear the correct syllabification of the data and to clearly differentiate words that have a nasal presyllable initial consonant (e.g. /məniŋ/ ‘don’t’) from words that have a prenasalized main syllable initial consonant (e.g. /mpɪn/ ‘in a moment’).

Table 2: *Examples of Kriang syllable types (Gehrmann et al. 2016)*

Monosyllable		Open Presyllable		Closed Presyllable	
C_1V :	/ca:/ ‘to eat’	P_1C_1V :	/təmɔ:/ ‘stone’	$P_1P_2C_1V$:	/hɛrɸu:/ ‘mango’
C_1C_2V :	/tri:/ ‘mushroom’	$P_1C_1C_2V$:	/kɛtru:/ ‘dove’	$P_1P_2C_1C_2V$:	<i>not found</i>
$C_1V:F$	/kə:n/ ‘small’	$P_1C_1V:F$	/tɛkɔ:l/ ‘eight’	$P_1P_2C_1V:F$	/tɛrlɔ:ŋ/ ‘bone marrow’
$C_1C_2V:F$	/cra:s/ ‘to harrow’	$P_1C_1C_2V:F$	/sɛkrɔ:k/ ‘to snore’	$P_1P_2C_1C_2V:F$	<i>not found</i>
C_1VF	/tip/ ‘bury’	P_1C_1VF	/cɛkɪl/ ‘to recognize’	$P_1P_2C_1VF$	/kɛrlaj/ ‘sibling-in-law’
C_1C_2VF	/plaj/ ‘thatch grass’	$P_1C_1C_2VF$	/kɛkloh/ ‘to pound rice’	$P_1P_2C_1C_2VF$	/pɛkrɔʔ/ ‘to scatter around’

2.1 Consonants

Table 3 lists the inventory of main syllable initial consonant phonemes in Kriang.

Table 3: *Main syllable initial consonant inventory of Kriang*⁴

Plain					Prenasalized					Long				
b	d	ɟ			mb	nd	ɲɟ			-	-	-	-	
p	t	c	k	ʔ	mp	nt	ɲc	ɲk	ɲʔ	-	-	-	-	-
(p ^h)	(t ^h)		(k ^h)		-	-	-	-	-	-	-	-	-	-
m	n	ɲ	ŋ		-	-	-	-		mm	nn	ɲɲ	ŋŋ	
w	l	j			-	(nl)	-			-	ll	-		
	r					(nr)					rr			
	s		h		ns		ɲh			-	-	-	-	-

There are three subcategories of main syllable initial consonants in Kriang: plain, prenasalized and long. All three categories occur both unpreceded in monosyllables and preceded by a preyllable in disyllabic words. Only sonorants may be long consonants and there is no difference between long nasals and prenasalized nasals, but I prefer to analyze these consonants as long nasals because they share the same doubled duration that is characteristic of /l/, /r/ (see Section 3.3). Word initial prenasalized consonants in monosyllables are quite common, as this structure is directly descended from Proto-Katuic (PK) syllabic nasal preyllables (e.g. PK *ʔmpa:ŋ ‘maggot’ > /mpa:ŋ/, PK *ʔŋha:ŋ ‘bone’ > /ŋha:ŋ/) (see Section 3.2)⁵. Word initial long sonorants, however, are innovations in Kriang and are comparatively rare (see Section 3.3). Aspirated stops are very rare outside of loan word vocabulary. The prenasalized sonorants /nl/, /nr/ are vanishingly rare and are in free variation with long sonorants /l/, /r/ in some etyma. This suggests that the contrast between prenasalized /nl/, /nr/ and long /l/, /r/ liquids is in the process of being neutralized, though contrast remains for now as demonstrated in Table 4. The prenasalized voiced palatal /ɲɟ/ stop only occurs in disyllables.

Table 4: *Examples of plain, prenasalized and long initial contrast in KTT (Gehrmann et al. 2016)*

b	/bɔk/	‘pull out’	d	/dɨk/	‘gourd’	ɟ	/kɛɟok/	‘suck’	ʔ	/ʔa:j/	‘older sibling’
mb	/mbɔk/	‘rotten’	nd	/ndɨk/	‘rice chaff’	ɲɟ	/tɛɲɟoh/	‘drip’	ɲʔ	/ŋʔa:j/	‘grow up’
p	/pa:ŋ/	‘time period’	t	/ta:p/	‘to weave’	c	/cɔŋ/	‘set fire’	k	/kɔ:/	‘brick’
mp	/mpa:ŋ/	‘maggot’	nt	/nta:p/	‘type of tree’	ɲc	/ɲcɔŋ/	‘shrimp’	ɲk	/ŋkɔ:/	‘bamboo tube’
m	/mu:/	‘which?’	n	/naw/	‘brother-in-law’	ɲ	/ɲa:m/	‘weep’	ŋ	/ŋɔ: ɲa:j/	‘whose?’
mm	/mma:/	‘word’	nn	/mah nnaw/	‘right now’	ɲɲ	/ɲɲɔ:m/	‘soft’	ŋŋ	/ŋŋa:/	‘newborn’
l	/lɛ:ŋ/	‘to taste, try’	r	/ro:p/	‘to love’	s	/soʔ/	‘sarong’	h	/ha:ŋ/	‘to warm up’
nl	/nlɛ:p/	‘not married’	nr	/nrɔ:p/	‘to surrender’	ns	/nsoʔ/	‘rotten’	ɲh	/ŋha:ŋ/	‘bone’
ll	/lla:ŋ/	‘pipe (for water)’	rr	/rroh rro:ŋ/	‘things’						

⁴ Theraphan (2001) does not include long /l/, /r/, /ŋ/ or prenasalized /ɲɟ/. She also includes voiced /g/ but it does not appear in her lexical data. Huffman (1971a) includes a series of lax stops /pʰ, tʰ, cʰ, kʰ, ɟʰ/ because he analyses Kriang as pre-registral. He does not include long /rr/, /ŋŋ/ or prenasalized /ɲɟ, ɲʔ, ɲh/. Smith (1973a) includes a long /jj/, examples of which from his dictionary correspond with /j/ in other dialects.

⁵ Proto-Katuic reconstructions are from Sidwell (2005).

Examples of contrast between plain, prenasalized and long main syllable initials are presented in Table 4. The following instances of allophonic variation may be observed in KTT main syllable initials. In cases where other authors noted the same variation, I have included a citation.

- /c, ɲ/ are phonetically alveolopalatal [t̪, ŋ̪]
- /j/ is phonetically a prestopped approximant [ʝ] (Huffman 1971a, Theraphan 2001)⁶
- /ns/ is phonetically a prenasalized alveolopalatal aspirated stop [nʰt̪ʰ] (R. Smith 1973a, Theraphan 2001)
- /p, t, c, k/ have delayed VOT before lax register vowels [p̚, t̚, t̚, k̚] (Huffman 1971a)
- /p, t, c, k/ are stiff voiced before tense register vowels [ʔp, ʔt, ʔt̪, ʔk] (Huffman 1971a)⁷
- /b, d/ are often but not always slack voiced before lax vowels [b̚, d̚]⁸

Main syllable onsets may contain a two consonant cluster consisting of a C₁ voiceless stop /p, t, c, k/ or fricative /s/ followed by a C₂ medial sonorant /r/ or /l/. The C₁ voiceless stops may also be prenasalized but /nsr/ was not found. Table 5 lists the inventory of permissible clusters in Kriang.

Table 5: *Main syllable initial consonant cluster inventory of Kriang*⁹

Plain				Prenasalized			
pr	tr	cr	kr	mpr	ntr	ɲcr	ŋkr
pl			kl	mpl			ŋkl
	sr				-		

Examples of contrast between plain and prenasalized main syllable initial clusters are presented in Table 6.

Table 6: *Examples of plain and prenasalized initial cluster contrast in KTT (Gehrmann et al. 2016)*¹⁰

pr	/prah/ 'sky'	tr	/traŋ/ 'trim, prune'	cr	/crɯ:ʔ/ 'deep'	kr	/kra:ɲ/ 'securely'
mpr	/mprah/ 'beat to death'	ntr	/ntreŋ/ 'body louse'	ɲcr	/ɲcrɯ:c/ 'cricket'	ŋkr	/ŋkra:ŋ/ 'carry on shoulder'
pl	/pliat/ 'turn inside out'					kl	/kliaŋ/ 'lining of stomach'
mpl	/mpla:t/ 'traditional rice dish'					ŋkl	/ŋkli:ŋ/ 'sound of large gun'

The main syllable final consonant inventory, shown in Table 7, is equivalent to the main syllable initial inventory minus the stop voicing contrast and with the addition of glottalized sonorants.

⁶ Theraphan transcribes /j/ as a preglottalized approximant [ʔj] rather than as a prestopped approximant. Smith transcribes it as a voiced stop and makes no special mention of its properties beyond that.

⁷ There is no IPA standard for transcribing stiff voice stops. I use the glottalized symbol with voiceless stops.

⁸ There is no IPA standard for transcribing slack voice stops. I use the voiceless symbol with voiced stops.

⁹ Theraphan (2001) only includes two prenasalized clusters, /ntr, ŋkr/. She also includes /gl/ but it does not appear in her lexical data. Huffman (1971a) does not include /sr/. R. Smith (1973a) does not include /sr/ or /cr/, the latter of which seems to have merged with /tr/ in the dialect that he researched. He also transcribes /mpr, ntr/ as /mbr, ndr/ occasionally in his dictionary but the contrast is doubtful (R. Smith 1970).

¹⁰ Examples for /kl/ ≠ /ŋkl/ are taken from R. Smith (1970)

Table 7: Main syllable final consonant inventory of Kriang

Plain					Glottalized			
p	t	c	k	ʔ	-	-	-	-
m	n	ɲ	ŋ		mʔ	nʔ	(ɲʔ)	ŋʔ
w	l	j			wʔ	lʔ	jʔ	
	r				-			
	s		h		-			-

The articulation of final /s/ varies from [j] to [ɛ], as is typical for languages of the region (cf. Gehrman and Conver 2015:lviii; Sidwell 2005:34). The contrast between final /s/ and /h/ is neutralized following front vowels and I analyze the final fricative in this environment phonemically as /h/. Following close front vowels, final /h/ usually sounds more like /s/ but there is no contrast.

Vowel length is contrastive before final glottal stop, necessitating its inclusion as a final consonant segment (e.g. /jʉʔ/ ‘afraid’; /ɣu:ʔ/ ‘sour’). Vowel length is also contrastive before the final glottal fricative (e.g. /pih/ ‘to snatch’; /pi:h/ ‘poison’) but short vowels are much more common in both of these environments.

Final glottalized sonorants are contrastive with respect to their plain counterparts, but they are much less common. Only 1% (14 out of 1021) of sonorant finals are glottalized in Gehrman et al. (2016) but in R. Smith’s (1970) dictionary, 9% (273 out of 2614) of sonorant finals are glottalized. This is surely due to the inclusion of a much greater number of elaborate expressions in R. Smith (1970), since the majority of instances of glottalized sonorants are found in such vocabulary in Kriang. Note that /ɲʔ/ is not actually attested in any of the sources available but we may invoke symmetry and predict that it probably does exist in a handful of words. Table 8 demonstrates contrast between final plain and glottalized sonorants.

Table 8: Examples of plain and prenasalized final sonorant contrast in KTT (Gehrman et al. 2016)¹¹

-m	/lɔ:m/	-n	/tɛmpu:n/	-ɲ	/cəŋ/
	‘liver’		‘to follow		‘armspan’
-mʔ	/le:mʔ/	-nʔ	/kɛmba:nʔ/	(-ɲʔ)	<i>-ɲʔ not found</i>
	‘wild animal’		‘to disturb		-ŋʔ
					/cəŋʔ cənəŋʔ/
					‘hopping (as a frog)’
-w	/hiw/	-l	/kɛndə:l/	-j	/waj/
	‘to calm down’		‘heel’		‘to mow (grass)’
-wʔ	/kɛmpriwʔ/	-lʔ	/kɛŋɣə:lʔ/	-jʔ	/lawə:jʔ/
	‘to blink’		‘to stand on tip toe’		‘slow’
					-rʔ
					/plo:kɛtiar/
					‘to slip’
					/pliarʔ/
					‘flash of lightning’

As stated above, Kriang presyllables are made up of two consonantal segments and a non-phonemic, epenthetic central vowel [ɐ]. Table 9 demonstrates the most common presyllables in Kriang. While other presyllable initial consonants are permissible, they are almost always found in expressive vocabulary (e.g. /tʰɛmma:t tʰɛŋŋɔ:l/ ‘really’), loan words (e.g. /mɛlɛŋ/ ‘cancer’ < Lao) or words derived through reduplication of the main syllable initial (e.g. /dɛndə:jʔ/ ‘walk back and forth’).

Table 9: Presyllable inventory of Kriang

Cɐ.-	pɐ	tɐ	cɐ	kɐ	hɐ	sɐ	ʔɐ	lɐ
Cɐr.-	per	tɛr	cɛr	kɛr	hɛr			
Cɐl.-				(kɛl)				

In general, Kriang has been very conservative when it comes to presyllable initials, preserving the PK presyllables faithfully (cf. Gehrman and Conver 2015:lxiii-lxv). Note however that /sɐ.-/ often corresponds to /hɐ.-/ between dialects, indicating an incomplete shift of *sɐ > /hɐ/.

¹¹ Examples for /m/ ≠ mʔ/, /ŋ/ ≠ ŋʔ/ and /r/ ≠ rʔ/ are taken from R. Smith (1970) and have been altered to match the phonemic spelling employed in this paper for KTT.

The interpretation of the presyllable coda is quite complicated and will be addressed in detail in Sections 3.2 and 3.3. In my analysis, only /r/ and /l/ may stand in the presyllable coda slot. /l/ is extremely rare in this position but does occur (e.g. /kəlʔə:k/ ‘roof of mouth’ vs. /kərʔaj/ ‘jaw’).

2.2 Vowels

We have seen above that Kriang consonantism is essentially stable across the dialects that have been researched. Kriang vocalism, on the other hand, has undergone a greater degree of differential development due to the influence of register. Kriang varieties have variously been described as pre-registral (Huffman 1971a), registral (Theraphan 2001) and post-registral (R. Smith 1973a; Huffman 1979b, 1985). The issue of registrogenesis in Kriang is complex and varied. Not only does the actual expression of register differ to a certain degree across the varieties that have been researched, but the various researchers who have worked on Kriang have approached the issue from different perspectives as well.

We will begin with my own analysis of KTT, the vowel inventory of which is shown in Table 10.

Table 10: *Vowel inventory of Kriang Tha Taeng*

ia / ǰa	(ia) / (ǰa)	ua / ǰa			
i: / ǰi:	ǰi: / ǰi:	u: / ǰu:	ǰi / ǰi	ǰi / ǰi	u / ǰu
(e:) / ǰe:	ǰə: / ǰə:	o: / ǰo:	- / ǰe	ǰə / ǰə	o / ǰo
ɛ: / -	a: / ǰa:	ɔ: / ǰɔ:	ɛ / -	a / ǰa	ɔ / ǰɔ

Register contrast is neutralized in the mid front and open front vowels for native vocabulary, but /e:/ has been reintroduced through loan words from Lao. The central diphthongs /ia/ and /ǰa/ are quite rare, appearing mostly in loan words and expressive vocabulary. This inventory is a bit misleading, in that it makes KTT look like a prototypical, stable register language. In fact, KTT’s register system shows signs of breaking down. Table 11 offers a closer phonetic transcription of the phonemes listed in Table 10.

Table 11: *Phonetic transcription of Kriang Tha Taeng vowel phonemes*

ǰi: ^a / ǰi: ^a	ǰi: ^a / ǰi: ^a	ǰu: ^a / ǰu: ^a			
ǰi: / ǰi:	ǰi: / ǰi:	ǰu: / ǰu:	ǰi / ǰi	ǰi / ǰi	ǰu / ǰu
e: / ǰe:	ǰɜ: / ǰɜ:	o: / ǰo:	- / ǰe	ǰɜ / ǰɜ	o / ǰo
ɛ: / -	a: / ǰa:	ɔ: / ǰɔ:	ɛ / -	a / ǰa	ɔ / ǰɔ

We see that tense close vowels have lowered in vowel height relative to their lax counterparts. Tense diphthongs also commence with a lowered vowel relative to the lax diphthongs. In both of these cases, the tense close vowels have F1 measurements that are consistently 50-100 Hz greater than those of lax close vowels. In the mid and open vowel height levels, it is the lax register vowels that are restructuring. They have developed significant on-glides and the lax mid long vowels are well on their way to introducing a new series of diphthongs with mid vowel targets. Long mid vowels /e:/ and /o:/ already have allophones [ǰiə] and [ǰuə] respectively before certain finals.

This description of KTT vocalism lines up well with Huffman’s (1985) description of Ngeq of Baeng village. This is not surprising since Baeng village lies just 10 kilometers down the road from Chakam village, where the speakers that I worked with live. Huffman seems to have considered this Kriang variety as being a *restructured register language* (cf. Huffman 1976), in which former register pairs have drifted away from one another phonetically and are now better analyzed as two different vowel phonemes with differing vowel qualities. For example, my /o:/, /o:/ correspond to Huffman’s /oo/ and /uoo/. Additionally, Huffman lists only lax register close vowels, which would seem to indicate that register is not contrastive for close vowels. He devotes no prose to this issue so we are left to guess at the meaning but, as discussed below in Section 3.4, close vowels are closely associated with lax register in my KTT data as well and tense register close vowels appear only in a few restricted environments.

While Huffman and I can agree that these systematic, register-induced vowel changes in KTT are beginning to render vowel phonation redundant, I do not think it is appropriate to consider KTT a fully

restructured register language – at least not yet and not for the variety that I researched. The reasons for this are three-fold. Firstly, vowel phonation differences still do exist in this language and even though the historical lax register vowels are not always produced with breathy or slack voice phonation, they usually are. The tense register vowels, conversely, never are. We cannot account for this without reference to a tense and lax register. Secondly, the two registers condition different allophones in the initial stops (tense: stiff voiced - lax: lightly aspirated, sometimes slack). If we do not have vowel phonemes associated with tense and lax register, there is no explanation for why some vowel phonemes condition one type of initial stop phonation and some vowel phonemes condition another. One could attempt to circumvent this problem by considering these differences of stop phonation themselves to be phonemic. However, this would introduce new problems because register contrast exists after initials other than voiceless stops in KTT as well, however marginally (e.g. /mo:n/ ‘acne’ vs. /mɔ:t/ ‘enter’). We would have to introduce a typologically marked and historically unmotivated split between tense and lax /m/ in order to account for the difference of vowel phonation in these words if we were to try to attach vowel phonation to initials. Thirdly and perhaps most tellingly, the Kriang speakers that I worked with recognized that their language has two registers and were quite comfortable talking about the language within that framework. For these reasons, I conclude that it is more appropriate to continue to treat KTT as a marginal register language, while recognizing the significant distributional abnormalities of register in the language (see discussion in Section 3.4 below).

R. Smith’s (1973a) phonemic analysis of lowland KK around Pakse mostly ignores register. He does, however, mention that close vowels and diphthongs are lax with the exception of very few examples of tense close vowels. He transcribes these tense close vowels with lowered onsets as /ei, ou/, which reflects a common pathway of tense close vowel restructuring through onset lowering (cf. Huffman 1976, 1985; Gehrman 2015). R. Smith does not discuss the etymologically lax register open and mid vowels as lax vowels with raised onsets. Instead, he transcribes them as on-glided vowel phonemes and does not associate them with their historical tense register counterparts. This amounts to a post-registral interpretation of the language’s vocalism.

R. Smith’s Kriang vowel inventory is presented in Table 12. I have arranged his synchronic phonemes into their proper historical register pairs. Not every phoneme listed in Table 12 is discussed in R. Smith’s (1973a) phonemic analysis, but the missing phonemes do appear in entries in his (1970) dictionary. Phonemes that appear very rarely in the dictionary are in parentheses.

Table 12: *R. Smith’s (1970, 1973a) vowel inventory of Kriang*

i: ^a	i: ^Λ	u: ^a			
(^ə i:) / i:	i:	(^ə u:) / u:	i	i	u
e:	Λ: / (ⁱ Λ:)	o: / (^u o:)	e	Λ / ⁱ Λ	o / ^u o
ɛ:	a: / ^Λ a:	ɔ: / ^Λ ɔ:	ɛ	a / ^Λ a	ɔ / ^Λ ɔ

Note the lack of register contrast in diphthongs and many monophthong vowel positions. As already mentioned, register contrast is nearly lost in close long vowels since the tense vowels /^əi:/ and /^əu:/ are so rare. This trend continues into the mid long vowels, where only a handful of examples of the on-glided, historically lax /ⁱΛ:, ^uo:/ phonemes are to be found in R. Smith’s dictionary. The other on-glided vowel phonemes remain robustly attested, but I find many examples of words in tense register in R. Smith’s dictionary that are in lax register in KTT. Since the Kriang variety researched by R. Smith was spoken in lowland Champasak, I suspect that this variety was being spoken in relocated and/or mixed villages. It is not surprising then that the register system would be breaking down – register is commonly the first feature to be lost in such circumstances.

In contrast to Huffman’s analysis of KTT of Baeng village discussed above, he holds back from treating KK of Ban Bak as a true register language Huffman (1971a; 1971b). Instead, Huffman considers this Kriang variety to be pre-registral. He describes a simple, nine-vowel system doubled for length but not register and one diphthong series. He introduces a tense-lax (fortis-lenis) opposition for voiceless stops and accounts for lax vowel phonation as a conditioned change predictable from initial lax stop consonants. He does mention, in keeping with what we have seen above, that open and mid vowels after lax stops have raised on-glides. Importantly, he highlights some of the peculiarities of Kriang register distribution including the tendency for lax register to follow the voiced palatal initials /j/ and /ɟ/ and the occasional register contrast following

consonants other than voiceless stops - /j/ and /h/ specifically. The fact of the matter is that register in all varieties of Kriang is only very marginally contrastive after consonants other than voiceless stops, leading to much confusion if one does not have a sufficiently large lexical database to draw from. In fact, vowel height has played a key role in determining the assignment of register in Kriang and I will go into more detail on this topic below in Section 3.4.

Theraphan’s (2001) analysis of Kriang vocalism is similar to my own except that she includes an extra level of vowel height contrast for central and back vowels, as shown in Table 13. Her open back vowels /ɒ:, ɔ/ correspond to /ɔ:, ɔ/ in other varieties, as do her open-mid back vowels /ɔ:, ɔ/ with few exceptions. Her open-mid central vowels /ʌ:, ʌ/ correspond to /ə:, ə/ in other varieties but her close-mid central vowels /ɜ:, ɝ/ correspond with both tense register /i:, i/ and lax register /ɛ:, ɛ/ in KTT. Theraphan’s /ɜ:, ɝ/ seem to represent then both raised mid lax vowels and lowered close tense vowels. Theraphan’s lexicon contains no examples of register contrast for this phoneme.

Table 13: *Theraphan’s (2001) vowel inventory of Kriang*¹²

ia	ia	ua			
i:	i:	u:	i	i	u
e:	ə:	o:	e	ə	o
ɛ:	ʌ:	ɔ:	ɛ	ʌ	ɔ
	a:	ɒ:		a	ɒ

3 Historical phonology

In this section, I provide an overview of the historical development of Kriang phonology from Proto-Katuic to modern Kriang varieties. As above, I focus on KTT while commenting on differences between the dialects wherever they appear.

3.1 Comparison with Proto-Katuic segmental inventory

Table 14 presents the segmental inventory of PK as reconstructed by Sidwell (2005).

Modern Kriang vocalism is largely unchanged from PK but it has experienced a reduction in diphthong inventory (See Table 15). PK *ie and *uo monophthongize to Proto-Kriang *i: and *u: merging with PK close monophthongs *i: and *u: respectively. PK central diphthongs *ia and *iə both monophthongize as well with PK *ia fronting to Proto-Kriang *i: (a merger with PK *i: and *ie) and PK *iə merging variously with PK central short vowels *i and *ə (the patterning of the split is unclear at this time). All of these changes pre-date registrogenesis in Kriang.

Table 14: *Proto-Katuic reconstruction (Sidwell 2005)*

Initial Consonants	Final Consonants	Vowels
*ɓ *d̥ *f		
*b *d *j *g		
*p *t *c *k *ʔ	*p *t *c *k *ʔ	*ia *ia *ua
*m *n *ɲ *ŋ	*m *n *ɲ *ŋ	*ie *iə *uo
*w *l *j	*w *l *j	*i: *i: *u:
*r	*r	*i *i *u
*s	*s	*e *ə *o
	*h	*ɛ *a *ɔ

¹² Theraphan does not indicate register in her vowel chart but she states in prose that Kriang is registral.

Table 15: *Vowel development from Proto-Katuic to modern Kriang and Chatong (ignoring register)*¹³

PK	PKriang	Kriang	Chatong	PK	PKriang	Kriang	Chatong
*ia	*ia	ia	ia	*ua	*ua	ua	ua
*ie	*i:	i:	i:	*uo	*u:	u:	u:
*ia				-			
*i:				*u:			
*e:	*e:	ε:	ε:	*o:	*o:	o:	o:
*ε:	*ε:			*ɔ:	*ɔ:	ɔ:	ɔ:
*i:	*i:	i:	i:				
*ə:	*ə:	ə:	ə:				
*a:	*a:	a:	a:				

Registrogenesis in Kriang accompanied the phonemic merger of PK voiced and voiceless initial stops. The PK voiced stops conditioned lax register and the PK voiceless stops conditioned tense register. I have already discussed above in Section 2.2 why I find it preferable to describe KTT as a language with a phonemic tense/lax vowel phonation contrast that conditions preceding stop consonant phonation rather than as a language with a phonemic tense/lax consonant phonation contrast that conditions the phonation type of following vowels. Nevertheless, the difference is subtle in Kriang since etymological voiced and voiceless stops remain phonetically distinct as demonstrated in Table 16 and register contrast is only marginal after initials other than /p, t, c, k/ (see Section 3.4 for details).

Table 16: *Initial oral stop development from Proto-Katuic to modern Kriang*

Proto-Katuic	Kriang	
*b	/b/	[b]
*dʰ	/d/	[d]
*f	/j/	[j]

Proto-Katuic	Kriang	
*b	/p/	[pʰ] before lax V
*p		[ʔp] before tense V
*d	/t/	[tʰ] before lax V
*t		[ʔt] before tense V
*tʰ	/c/	[cʰ] before lax V
*c		[ʔc] before tense V
*g	/k/	[kʰ] before lax V
*k		[ʔk] before tense V

In all register Katuic languages, the phonemic merger of the old voiced stop series with the voiceless stop series leads to the PK implosive series becoming better analyzed as a voiced stop series in terms of synchronic phonology. In many cases, however, this new voiced stop series retains a measure of glottalization, whether truly implosive or only preglottalized. Examples of this can be found in Pacoh (Watson 1964) and Kui Ntua (Bos and Sidwell 2015). Kriang voiced stops, however, have completely lost their glottalization and this helps to explain how these same voiced stops have devoiced and conditioned lax register in Chatong (cf. Theraphan 2001, Gehrman 2015).

The inventory of main syllable final consonants is unchanged from PK, with the exception of a modest number of glottalized final sonorants. Unlike in Ta'oi, which has restructured PK final oral and nasal stops to glottalized sonorants along predictable patterns related to its tense, creaky register (cf. Ferlus 1974; Diffloth 1989), glottalized finals do not appear to be native to Kriang and their distributional pattern does not differ in any systematic way from that of non-glottalized sonorant finals. Indeed, glottalization of sonorant finals is not even consistent across the Kriang varieties documented, as Table 17 demonstrates. In light of this, I consider glottalized finals in Kriang to be irregular developments introduced through loan words in some cases and in other cases through the decomposition of etymological stop finals.

¹³ Chatong data is based on Theraphan (2001).

Table 17: *Examples of glottalized final sonorants across Kriang and Ta'oi*

Ngeh (R. Smith 1970)	Ngeh (Huffman 1971b)	Kriang (Gehrmann et al. 2016)	Ta'oiq (Conver et al. 2016)
/mhi:lʔ/	/ɲəhi:lʔ/	/həjəl/	/ha:lʔ/
'light (weight)'	'light (weight)'	'light (weight)'	'light (weight)'
/təɖl:lʔ/	/təɖr:lʔ/	/təde:l/	/təɖ:lʔ/
'shallow'	'shallow'	'shallow'	'shallow'
/du:lʔ/	/du:lʔ/	/tə:l/	/dɔ:l/
'to float'	'float'	'float'	'float'
/lawɑ:jʔ/	/ləwɑ:c/	/ləwɑ:jʔ/	/ləwɑ:jʔ/
'gradually'	'slow, late'	'slow'	'slowly'
/mʌ:jʔ/	/mə:jʔ/	/mə:jʔ/	/mɔ:jʔ/
'one'	'one'	'one'	'one'
/jɛl/	/jilʔ/		/jəl/
'easy'	'easy'		'easy'
/le:mʔ/	/le:mʔ/		/le:mʔ/
'tiger'	'tiger'		'tiger'
/trʌ:m/	/ɲcrəmʔ/		/ɲcrəmʔ/
'to prepare'	'prepare'		'get ready'
/taŋʌjʔ/		/təŋə:jʔ/	/təŋə:jʔ/
'until'		'until'	'until'
/kawʌɑ:j/		/kəwə:jʔ/	/kəwə:jʔ/
'to wave the arms'		'beckon, summon'	'beckon, wave'
/kəŋʌlʔ/		/kəŋjə:lʔ/	/kəŋcə:lʔ/
'tiptoe'		'stand on tip toe'	'stand on tip toe'

As noted above in Section 2, PK presyllable initials have remained stable in Kriang with the exception of an incomplete merger of *sə- and *hə- type presyllables to /hə-/. Presyllable codas, however, require a different interpretation in Kriang than the one that Sidwell (2005) sets forth.

3.2 Prenasalized consonants

Sidwell (2005) interprets the PK presyllable as consisting of at least one segment, the presyllable initial (P₁), and an optional presyllable coda consonant (P₂). No presyllable vowel contrast is reconstructed. P₂ may be *r, *l or a nasal *N, which is underspecified for place of articulation and assimilates to the place of articulation of the main syllable initial. As in modern Kriang, if no P₂ is present, an epenthetic central vowel will be inserted between P₁ and the main syllable onset (e.g. PK *tbool [t̃ə.bo:l]; 'eight') but if both P₁ and P₂ are present, the epenthetic vowel is inserted between the two presyllable consonants (e.g. PK *t̃kɔj [t̃əŋ.kɔ:j] 'horn'). One exception to the PK presyllable epenthesis rule is the presyllable sequence *ʔN.-. In this case, no vowel epenthesis occurs and the presyllable nasal coda itself becomes the sonorant peak of the presyllable. The result is a syllabic nasal presyllable (e.g. *ʔntaak [ʔŋ.ta:k] 'tongue').

Kriang disyllabic words have a similar structure. A phonetic prenasal [m, n ɲ, ŋ], a prelateral [l] or a prerhotic [r] may occur between the presyllable initial the main syllable initial as illustrated in Table 18.

Table 18: *Disyllabic examples of prenasals, prelaterals and prerhotics (KTT) (Gehrmann et al. 2016)*

	P_{em}.C	P_{en}.C	P_{ep}.C	P_{en}.C	P_{el}.C	P_{er}.C
p_vC.C	-	/pəntu:r/ 'star'	/pəp̄cuh/ 'entrust'	/pəŋkra:ʔ/ 'watch over'	-	/pərla:j/ 'medicine'
t_vC.C	/təmbə:ŋ/ 'answer'	/təndəh/ 'chop with axe'	/təp̄joh/ 'drip'	/təŋʔa:ŋ/ 'dry by the fire'	-	/tərbat/ 'sticky'
c_vC.C	/cəmbiat/ 'ring'	/cəntəl/ 'support'	-	/cəŋkə:p/ 'hoof'	-	/cərməh/ 'name'
k_vC.C	/kəmbo:r/ 'lime (mineral)'	/kəndə:l/ 'heel'	/kəp̄cu:r/ 'needle'	-	/kəlʔə:k/ 'roof of mouth'	/kərna:ʔ/ 'path, road'
s_vC.C	/səmpah/ 'appear'	/sənd̄i:r/ 'wall of house'	/səp̄jə:r/ 'teenager'	/səŋkriʔ/ 'hide'	-	/səruaj/ 'sign'
h_vC.C	/həmpat/ 'extinguish'	/həntəh/ 'drop'	-	-	-	/hərwə:j/ 'spirit'

A few distributional patterns are observable in Table 18. As in PK, the place of articulation of prenasals is predictable based on the place of articulation of the main syllable initial. The prenasals are homorganic to the main syllable initial except before glottal main syllable initials /ʔ, h/, in which case prenasals are always velar. Examples of heterorganic nasal sequences do exist but only in loan words from Lao (e.g. /kəmnot/ 'fix', /səmlap/ 'for'). The distribution of the prelateral [l] is highly restricted, as it occurs before main syllable initial /l/ in almost all cases.¹⁴ The distribution of the prerhotic [r], on the other hand, is completely unrestricted with respect to the main syllable initial.

Prerhotics clearly and unambiguously occupy a presyllable coda slot as /r/, since they could not possibly be interpreted as part of the main syllable onset. Prelaterals that occur before main syllable consonants other than /l/, as few in number as they are, also must occupy the P₂ slot as /l/. The interpretation of phonetic prenasals, on the other hand, is less obvious. It is already suspicious that the place of articulation of prenasals is always predictable from the place of articulation of main syllable initials, leading one to theorize that the phonetic prenasals might actually be better interpreted as phonemic prenasalization of the main syllable initial than as a segment in the presyllable. Both interpretations are possible looking only at disyllables but further evidence pertaining to the segmental status of prenasals can be found in monosyllabic words with prenasals. Table 19 provides examples of such words.

Table 19: *Prenasals in monosyllables (KTT) (Gehrmann et al. 2016)*

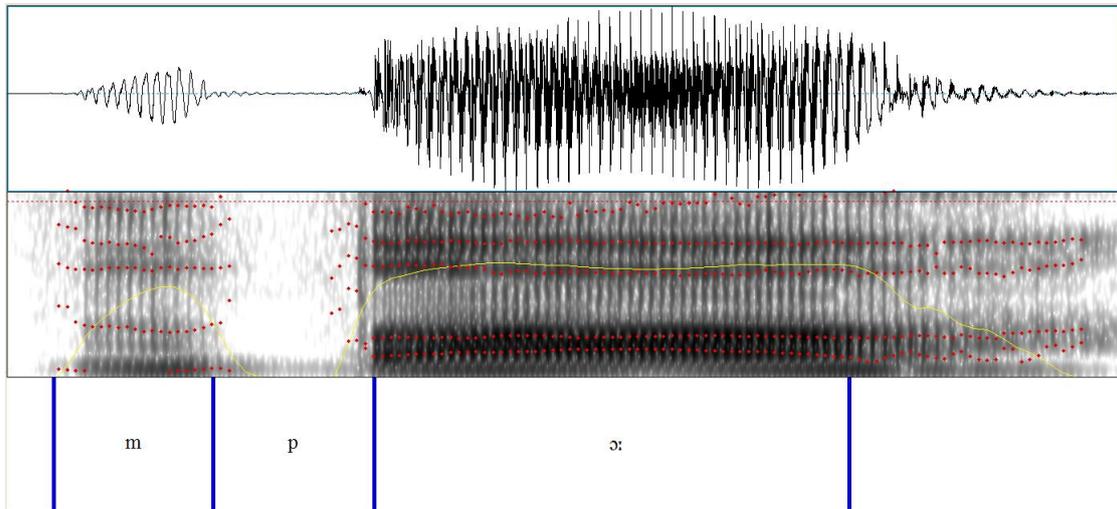
NC_{labial}	NC_{alveolar}	NC_{palatal}	NC_{velar}	NC_{glottal}
/mba:k/ 'goat'	/nd̄i:k/ 'rice bran'	-		
/mpa:k/ 'shoulder'	/nta:k/ 'tongue'	/p̄cəŋ/ 'shrimp'	/ŋkar/ 'skin'	/ŋʔa:j/ 'grow up'
	/nl̄e:j/ 'unmarried'			
	/nr̄u:h/ 'cry'			
	/nsial/ 'fishscales'			/ŋha:ŋ/ 'bone'

In these words, no audible glottal stop precedes the prenasal. The example in Figure 2 shows a gradual onset of vocal vibration rather than the abrupt onset and possible release noise that follows a complete glottal closure. With no phones that could be interpreted as P₁ consonants, the words in Table 19 cannot be analyzed as disyllables along the PK pattern (e.g. /ʔN.CVC/). A syllabic nasal interpretation remains possible but, since these prenasals do not have an onset consonant, introducing syllabic nasal presyllables would oblige us to introduce a new kind of presyllable with different phonotactic rules than the typical Kriang presyllable. In

¹⁴ A few exceptions exist, for example, /kəlʔə:k/ 'roof of mouth', /cəlti:l cəltə:l/ 'sway from side to side' (both from Gehrmann et al. (2016)), /kəlwa:/ 'echo' and /kəl̄nʔanʔ/ 'shallow' (both from Smith (1970)).

light of this, I have found it preferable to interpret words like those in Table 19 as monosyllables with prenasalized consonant onsets instead (e.g. /^hCVC/). Prenasalization is analyzed here as a feature of Kriang main syllable initials as shown in Table 3.

Figure 2: *The prenasal in monosyllabic word /mpɔː/ ‘dream’ (KTT) (Gehrmann et al. 2016)*



One potential argument against the prenasalized consonant analysis is the existence of words that begin with an apparent “prenasalized glottal consonant” (e.g. /ŋʔaːj/ ‘to grow up’, /ŋhaːŋ/ ‘bone’). Prenasalized glottal consonants are, of course, not possible since they cannot share the same place of articulation. There is no such thing as a *glottal nasal* consonant because the point of occlusion for glottal consonants is behind the velar opening in the vocal tract. Nevertheless, it is clear that in the broader Katuic language family, velar nasal consonants preceding glottal main syllable initials is the norm (cf. PK reconstructions in Sidwell (2005)). Though we cannot treat sequences of nasal consonant + glottal consonant as phonetically prenasalized consonants, these sequences clearly do fall under the same /^hC/ phonological construct that sequences of nasal consonant + oral consonant do in Kriang. I would suggest that a theoretically sound way to interpret the sequences of nasal consonant + glottal consonant is to consider them double articulations phonetically ([ŋh̥] and [ŋʔ]) while including them in a strictly phonological category of prenasalized consonants (/^hh/ and /^hʔ/) along with the true prenasalized consonants.

To summarize, we must continue to analyze prerhotics and prelaterals as phonemic segments occupying the presyllable coda slot but there is no need to include nasals as P₂ consonants. Based on the behavior of prenasals in monosyllabic words, we are justified in denying segmental status for all prenasals in Kriang. Instead, the etymological presyllable coda nasals are better interpreted as having been subsumed into the main syllable initial in all cases.

3.3 Long/geminate consonants

Kriang has developed duration contrast for main syllable initial consonants in both monosyllabic and disyllabic words. Only sonorant initials may be long (/mm, nn, ɲɲ, ŋŋ, ll, rr/). Examples are shown in Table 20.

In monosyllables, the long sonorant initials of Kriang are more than twice as long on average as their short counterparts. The waveforms and spectrograms in Figures 3 through 6 demonstrate the difference in duration between long and short sonorant initials in monosyllabic KTT words.

Table 20: Examples of sonorant length contrast in KTT (Gehrmann et al. 2016)

Monosyllable		Disyllable	
Long	Short	Long	Short
/mma:t/	/mɨ:t/	/kəmmuar/	/kəmə:/
‘person’	‘vulture’	‘termite’	‘year’
/mma:/	/mu:/	/təmmək/	/təməh/
‘words, speech’	‘which?’	‘evil spirit’	‘ask a question’
/nna:/	/na:/	/tənniaŋ/	/təniaŋ/
‘friend’	‘way, direction’	‘really’	‘bamboo flooring’
/nnu:r pri:t/	/ni:m/	/cənni:ŋ/	/cəni:w/
‘cluster (of banans)’	‘seem, appear’	‘lean against’	‘hungry’
/ŋŋo:m/	/ŋa:m/	/kəŋŋu:m/	/kəŋo:m/
‘young (plants)’	‘cry’	‘tie up hair in a bun’	‘smile’
/ŋŋi:ŋ/	/ŋe:ŋ/		
‘before, in front’	‘notice, look at’		
/ŋŋa:/	/ŋa:j/	/təŋŋi:/	/təŋaj/
‘new born baby’	‘who?’	‘shake head’	‘day’
/rroh rro:ŋ/	/ro:ŋ/	/kərrək/	/pəri:h/
‘things’	‘unfinished building’	‘cow’	‘expand, spread out’
/rra:s/	/ru:s/	/hərra:ʔ/	/həra:k/
‘finger’	‘forest (re-growing after burn)’	‘water left over after soaking rice’	‘peacock’
/lla:ŋ/	/la:ŋ/	/kəllə:ŋ/	/kəla:ŋ/
‘pipe, tube’	‘instance, time’	‘seed’	‘hawk’
		/pəlle:/	/pəlu:/
		‘flare up’	‘betel’

Figure 3: Short sonorant /m/ in monosyllabic word /mo:n/ [mo:n] ‘acne’ - [m] = 71ms

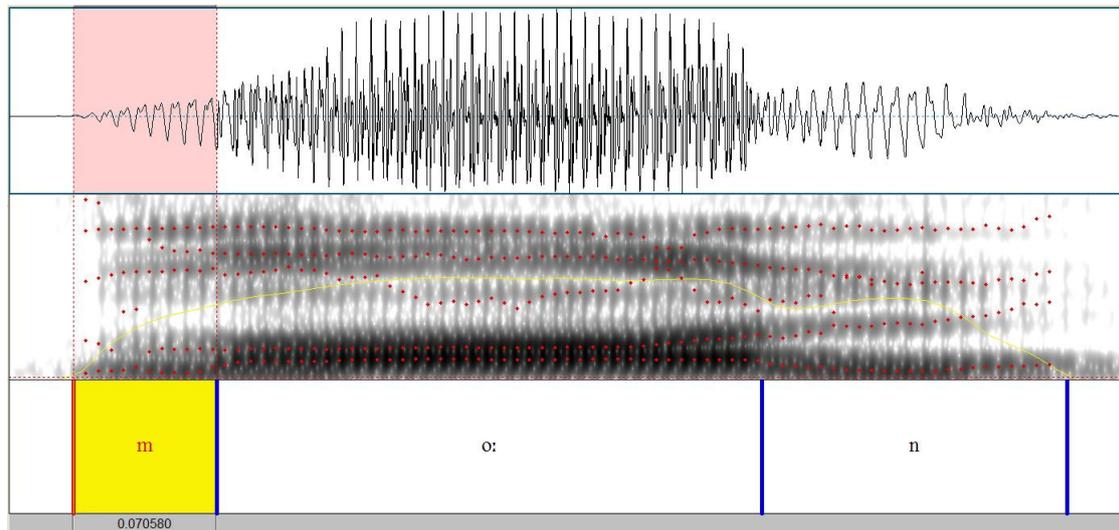


Figure 4: Long sonorant /m/ in monosyllabic word /mma:/ [m:a:] ‘word’ - [m:] = 195ms

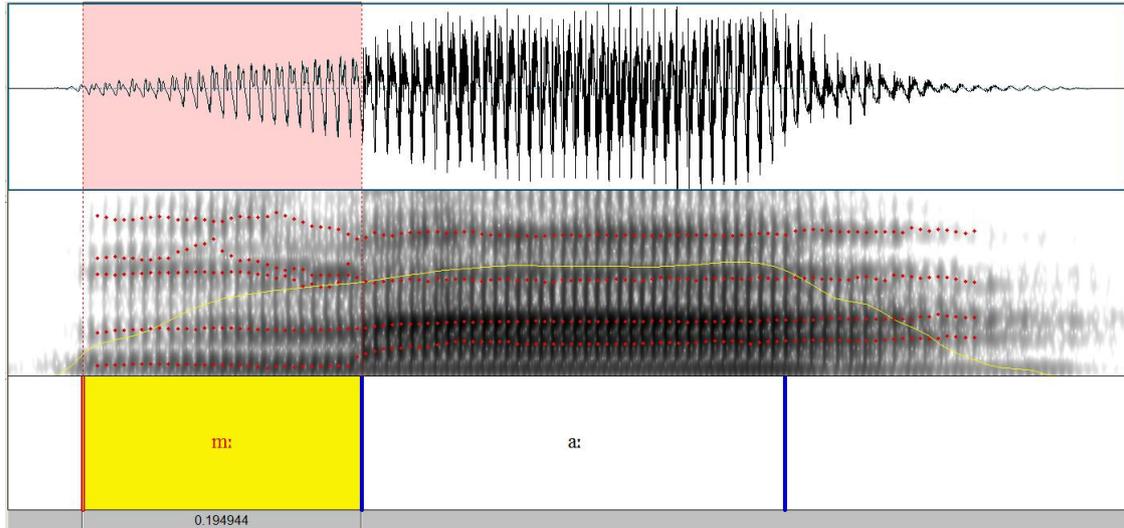


Figure 5: Short sonorant /ŋ/ in monosyllabic word /ŋɛ:ŋ/ [ŋɛ:ŋ] ‘notice, look at’ - [ŋ] = 69ms

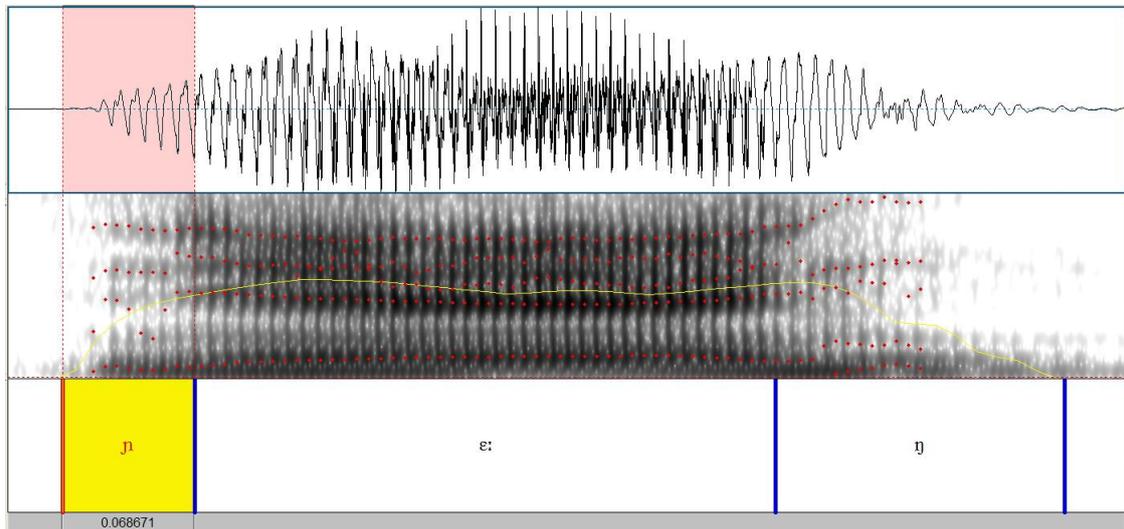
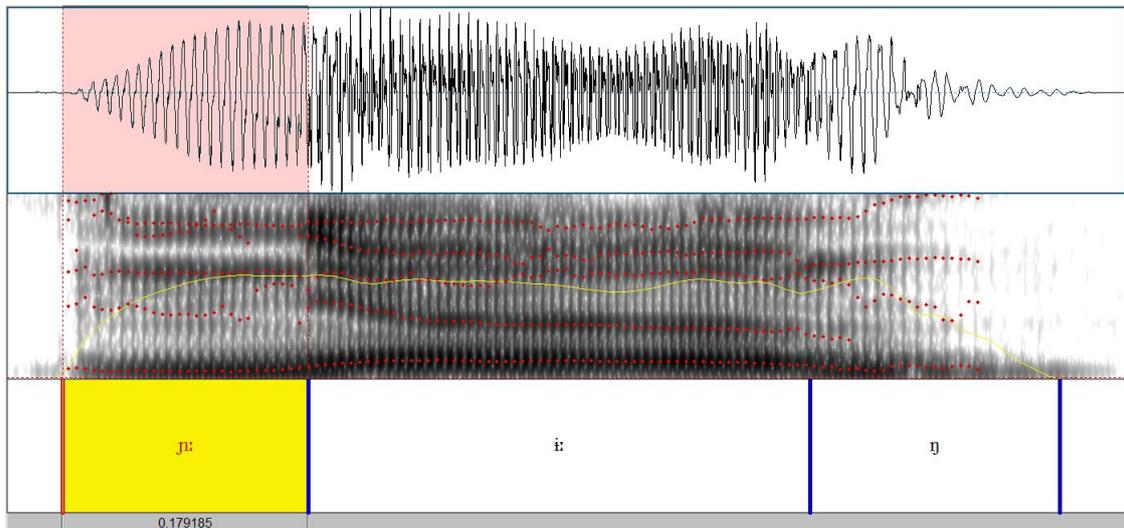


Figure 6: Long sonorant /ŋɲ/ in monosyllabic word /ŋɲi:ŋ/ [ŋ:i:ŋ] ‘before, in front’ - [ŋ:] = 179ms



The long sonorant initials of Kriang are not quite twice as long on average as their short counterparts in disyllables. The waveforms and spectrograms in Figures 7 through 10 demonstrate the difference in duration between long and short sonorant initials in disyllabic KTT words.

Figure 7: Short sonorant /l/ in disyllabic word /kala:ŋ/ [kəla:ŋ] ‘hawk’ - [l] = 67ms

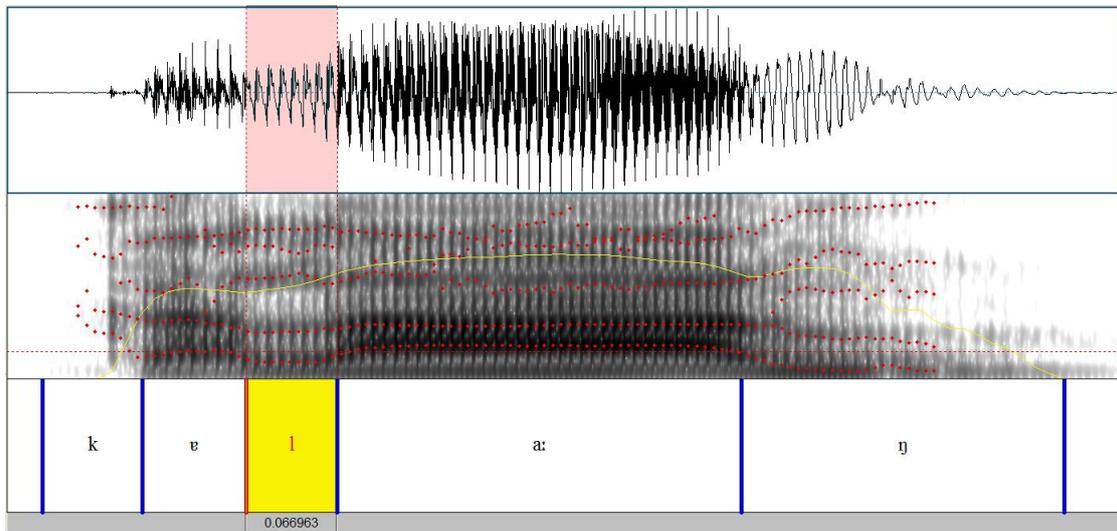


Figure 8: Long sonorant /l/ in disyllabic word /kallɔ:ŋ/ [kəl:ɔ:ŋ] ‘seed’ - [l:] = 112ms

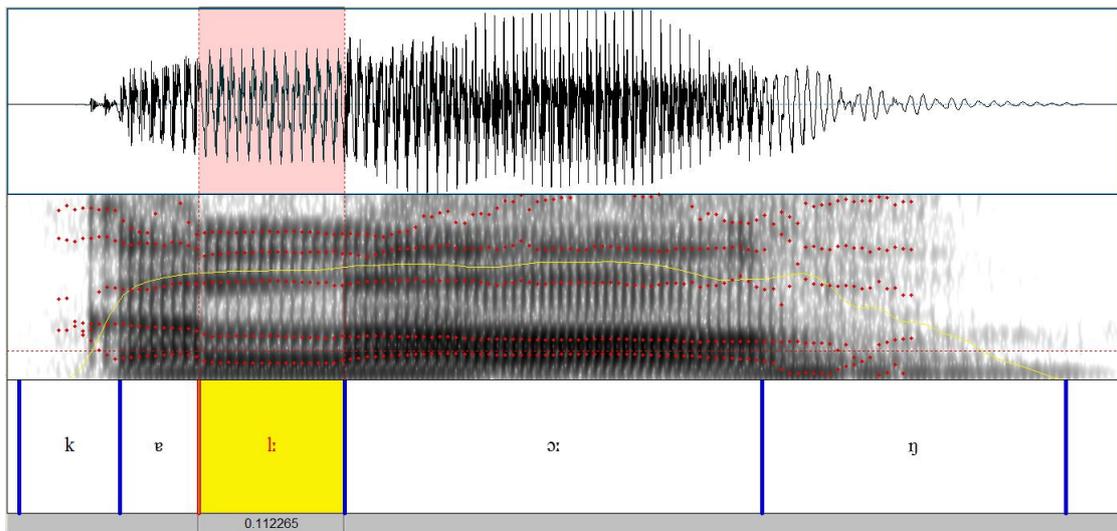


Figure 9: Short sonorant /m/ in disyllabic word /kamɔː/ [kəmɔː] ‘year’ - [m] = 76ms

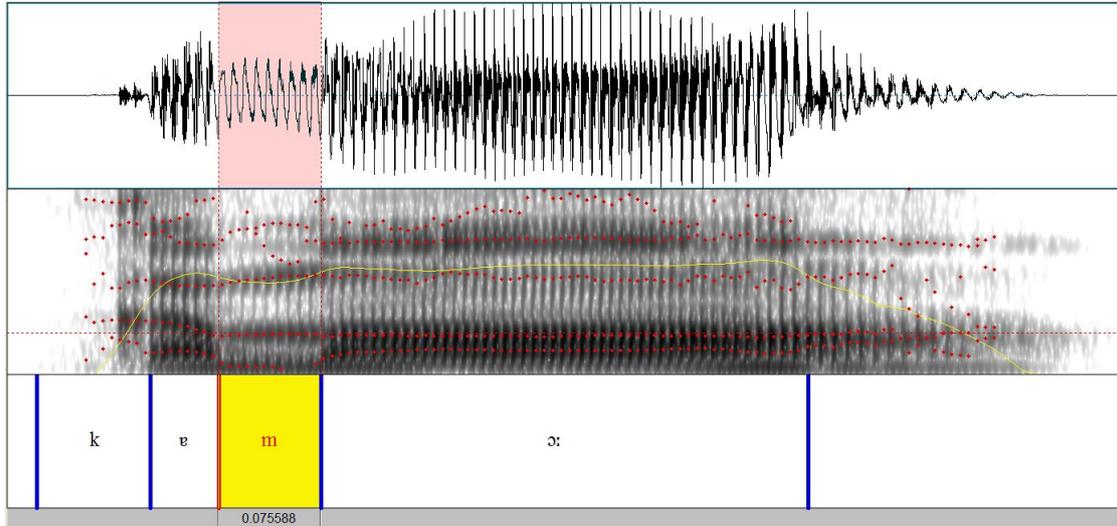
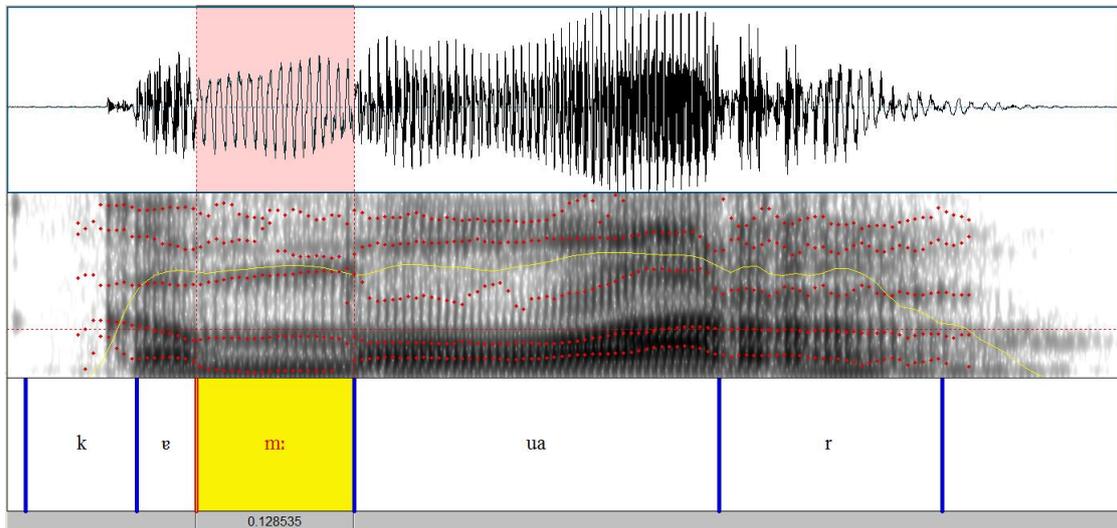


Figure 10: Long sonorant /mm/ in disyllabic word /kammuar/ [kəm.uar] ‘termite’ - [m:] = 129ms



Again, there is no initial glottal release preceding long sonorant initials (see the Figures 4 and 6), so we cannot analyze [m:a:t] ‘person’ as /ʔm.ma:t/. We could analyze the long initial nasals as prenasalized nasals, but there is no formal difference between prenasalized nasals and long nasals in the Kriang context. Given their exact parallels with long /l/ and /r/, I prefer to include the long nasals with the other two long sonorants. Note, however, that there remains a marginal contrast between the prenasalized liquids (/nl/ and /nr/) and the long liquids (/l/ and /r/) respectively, but the prenasalized /nl, nr/ are extremely rare and occasionally in free variation with /l, r/. In all probability then, historical *nl and *nr have mostly shifted to modern /l/ and /r/ in Kriang.¹⁵

Initial long sonorants in monosyllables are quite rare in Kriang. Comparing KTT initial long sonorants with cognate etyma in other languages indicates that they have recently been introduced in Kriang through the deletion of presyllable initials before geminate sonorants that cross the syllable boundary between the presyllable and the main syllable. We may take as a straightforward example the KTT word /mma:t/ ‘person’ and its cognate in KK (R. Smith 1970) /kamma:t/ ‘people’. The following quote from Theraphan (2001) provides further confirmation of this analysis (the translation from Thai is my own):

¹⁵ I have only three examples of /nl/ - /nlɛ:p/ ‘unmarried’ and /nluaj/ ‘wild tomato’ from Gehrman et al. (2016) and /kantaː kanlaː/ ‘requesting’ from R. Smith (1970). I have only two examples of /nr/ - /nrɔːh/ ‘cry’ and /nrɔːp/ ‘surrender’ from Gehrman et al. (2016).

As for clusters of the type NN-, the first N used to be the coda of a presyllable which subsequently saw its initial consonant and vowel deleted. In some cases, both forms are attested (e.g. ʔamma:t~mma:t ‘person’, ʔammɔ:ŋ~mmɔ:ŋ ‘porch’, ʔammon~mmon ‘acne’). Theraphan (2001:133)

Examples of P₁ loss clearly contributed to the phonemicization of long initial sonorants in Kriang, but borrowing from Bahnaric languages seems to have been a factor as well. Intriguingly, there are numerous examples of Kriang long initial sonorants corresponding with preglottalized sonorant initials in Bahnaric languages. Some examples of this can be found in Table 21, which compares Kriang words that have long sonorant initials with their cognates in other Katuic and Bahnaric languages (see in particular /mah nnaw/ ‘right now’ and /cɛʔ ŋŋa:/ ‘baby’). Kriang long sonorants also correspond generally in both disyllables and monosyllables with preglottalized sonorants in the Ta’oi variety described by Theraphan (2001) (see, for example, /lla:ŋ/ ‘pipe’ in Table 21). Sidwell and Jacq (2003) demonstrate how Nyaheun has developed long sonorant initials from Proto-West Bahnaric preglottalized initials, which constitutes a parallel development with Kriang. This is somewhat counter-intuitive and preglottalized sonorants in the closely related West Bahnaric language Jru’ have been described as being half as long in duration as plain sonorant initials (Jacq 2002b). How extra short, preglottalized sonorants develop into extra long, non-glottalized sonorant initials is unclear, but it is an area ripe for further investigation.

As is evident from the examples in Table 21, Kriang is not alone in showing sonorant consonant length contrast. This phenomenon is widespread in Katuic, being found in all of the other Kriang language data available, in the three Pacoh languages for which I have data - Cado (Gehrmann 2014a), Pacoh (Watson et al. 1979) and Taôih (Nguyễn et al. 1986) - in two Katu languages of Laos - Triw and Kantu (Theraphan 2001) - and in one West Katuic language - Kui (Prasert 1978). In the Bahnaric languages of the region, long sonorant initials are recorded in two Central Bahnaric languages - Alak (Theraphan 2001) and Tampuan (Crowley 2004) – and in two West Bahnaric languages - Nyaheun (Ferlus 1998) and Sapuan (Ferlus 1969-1970, Jacq and Sidwell 1999). Finally, Surin Khmer, also called Northern Khmer, has this feature as well (Chantrupanth 1978). Preglottalized sonorant initials are widespread in West Bahnaric (see Sidwell and Jacq 2003) and North Bahnaric (see K. Smith 1972). To summarize the historical development of presyllable codas in Kriang then, the only presyllable coda consonants that remain as such in modern Kriang are /r/ and, very rarely, /l/. Nasals that previously stood in the presyllable coda slot have been absorbed by the main syllable initials resulting in either contrastively prenasalized main syllable consonant initials (e.g. /kɛmpu:j/ [kɛ.^mpu:j] ‘bamboo rat’) or contrastively long initials (e.g. /kɛmmuar/ [kɛ.m.uar] ‘termite’). The evidence supporting this reanalysis of former presyllable codas is found in the possibility of monosyllables beginning with unprecedented prenasalized consonants (e.g. /mpɔ:/ [m^pɔ:] ‘dream’) and long sonorants (e.g. /mma:/ [m:a:] ‘word’). Rhotics and laterals that previously stood in the presyllable coda became absorbed into the main syllable initial whenever they were geminate (e.g. /kɛlla:j/ [kɛ.l:aj] ‘fruit’; /kɛrraj/ [kɛ.r:aj] ‘reconcile’). Again, this is evidenced by the possibility of monosyllables beginning with long /ll, rr/ (e.g. /lla:ŋ/ [l:a:ŋ] ‘pipe’, /rra:s/ [r:a:ɛ] ‘finger’).

Table 21: Comparison of KTT long sonorant initials with cognate etyma in other languages

Kriang TT (Gehrmann et al. 2016)	Cognates in Other Languages	Source
/mma:t/ 'person'	- KK /kamma:t/ 'people'	(R. Smith 1970)
/mma:/ 'seed (for planting)'	- Ta'oih /mma:/ 'race, strain' - Chatong /mma:/ 'seeds (kept for cultivating)' - Pacoh /mma:/ 'strain of seed'	(Nguyễn et al. 1986) (Theraphan 2001) (Watson et al. 1979)
/mma:/ 'topic, story, word'	- KK /mma:/ 'reason, excuse' - Pacoh /mma:/ 'category, sort'	(R. Smith 1970) (Watson et al. 1979)
/mmɔ:ŋ/ 'front porch'	- Nyaheun /mmɔ:ŋ/ 'door'	(Ferlus 1998)
/mah nnaw/ 'right now'	- KK /mah nnaw/ 'right now' - Jeh /ʔna:w/ 'recently' - Bahnar /ʔna:w/ 'new, recent' -cf. Proto-Bahnaric *ʔna:w 'new'	(R. Smith 1970) (Gradin and Thông 1979) (Banker et al. 1979) (Sidwell 2011)
/nnar/ 'wing'	- Pacoh (Wat) 'nнар' - Ta'oih (Ng) 'nнар'	(Watson et al. 1979) (Nguyễn et al. 1986)
/nnu:k/ 'catch fish w/ basket'	- KK /nnu:k nniar/ 'nets on frames' - Kantu /ʔanuak/ 'dip up fish'	(R. Smith 1970) (Theraphan 2001)
/nnu:r/ 'cluster (bananas)'	- Triw /tannu:r/ 'cluster (bananas)' - Kantu /cannu:r/ 'cluster (bananas)'	(Theraphan 2001) (Theraphan 2001)
/ŋɔ:m/ 'soft, young (plants)'	- Halang /ʔɔ:m/ 'damp'	(Cooper and Cooper 1976)
/ŋɔ:ŋ/ 'in front of, before'	- Ngeq /ŋɔ:ŋ/ 'before' -cf. Proto-Katuic *ŋu:ŋ 'before ahead'	(Huffman 1971b) (Sidwell 2005)
/cɛʔ ŋɔ:/ 'baby'	- Alak /kɔ:n ŋɔ:/ 'newborn baby' - Jru /ʔɔ:/ 'baby, infant' - Jeh /kɔ:n ʔɔ:/ 'newborn baby'	(Theraphan 2001) (Maier 1981) (Theraphan 2001)
/lla:ŋ/ 'pipe'	- KK /talla:ŋ/ 'trough' - Kriang /ʔalla:ŋ/ 'water pipe' - Chatong /kalla:ŋ/ 'water pipe' - Triw /kalla:ŋ/ 'water pipe' - Kantu /kalla:ŋ/ 'water pipe' - Pacoh /kəlla:ŋ/ 'tube' - Ta'oi /taʔla:ŋ/ 'water pipe' - Nyaheun /da:k llɔ:ŋ/ 'water that flows through pipe'	(R. Smith 1970) (Theraphan 2001) (Theraphan 2001) (Theraphan 2001) (Theraphan 2001) (Theraphan 2001) (Watson et al. 1979) (Theraphan 2001) (Ferlus 1998)
/rru:h/ 'cry, yell'	- KK /rru:h/ 'roar' - Nyaheun /ʔruoh/ 'call out' -(possibly) Cua /ʔaruh/ 'ring a bell'	(R. Smith 1970) (Ferlus 1998) (Maier and Burton 1981)

3.4 Registrogenesis

As has been discussed above, the primary impetus driving the introduction of contrastive breathy vowel phonation in Kriang was the devoicing of PK voiced stops (*D). These PK voiced stops conditioned breathiness on following vowels and then merged with PK voiceless stops (*T). The contrast between voiced and voiceless initial stop phonation was thereby restructured into a contrast of vowel phonation in a process that we might call **D - *T convergence* (cf. Gehrmann 2015). Table 22 provides some straightforward examples comparing KTT with two conservative languages from the Katu branch of Katuic which have not undergone *D devoicing and registrogenesis - Triw and Kantu.

Table 22: Examples illustrating the introduction of breathy vowels in Kriang through PK stop devoicing¹⁶

	KTT	Triw	Kantu		KTT	Triw	Kantu
*b	/p̥iːŋ/ 'full'	/biːŋ/ 'full'	/biŋ/ 'full'	*g	/sək̥iːr/ 'drum'	/cagir/ 'drum'	/ʔagurː/ 'drum'
*p	/p̥iːŋ/ 'grave'	/piːŋ/ 'grave'	/piŋ/ 'grave'	*k	/c̥ɛʔ kɔːn/ 'offspring'	/kɔːn/ 'offspring'	/kakaːn/ 'offspring'
*g	/k̥ɔk/ 'bent'	/ʔigok/ 'crooked'	/tiŋgok/ 'crooked'	*g	/kr̥im/ 'thunder'	/gr̥ɪm/ 'thunder'	/gr̥ɪm/ 'thunder'
*k	/kiːt/ 'to sharpen'	/kit/ 'to sharpen'	/kit/ 'to sharpen'	*k	/klaːŋ/ 'to braid'	/klaːŋ/ 'to braid'	/klaːŋ/ 'to braid'
*j	/m̥əːj̥ c̥it/ 'ten'	/jet/ 'ten'	/mjit/ 'ten'	*d	/s̥ət̥aː/ 'handspan'	/cadaː/ 'handspan'	/cidaː/ 'handspan'
*c	/ciːʔ/ 'small knife'	/ʔaciʔ/ 'small knife'	/ʔaciʔ/ 'small knife'	*t	/tiː/ 'hand'	/tiː/ 'hand, arm'	/tiː/ 'hand, arm'
*j	/c̥ɔːp/ 'horsefly'	/jɔːp/ 'horsefly'	/jaːp/ 'horsefly'	*d	/t̥ɛh/ 'hit w/ hammer'	/d̥ɛh/ 'strike downwards'	/d̥ɛh/ 'forge iron'
*c	/c̥ɔːm/ 'to know'	/c̥ɔːm/ 'to know'	/c̥aːm/ 'to know'	*t	/toh/ 'breast'	/toh/ 'breast'	/t̥oh/ 'breast'

For a language to truly be a *register language*, all vowels must be assigned to one register or another. If vowel phonation differences are predictable based on some other factor, then there is no cause to propose a split of a language’s vocalism into two registers. In my previous paper on registrogenesis in Katuic, I proposed the term *register spread* for the process by which vowel phonation becomes a phonemic feature of vowels that follow initial consonants other than etymological voiced and voiceless stops and demonstrated how register spreads along particular patterns, at least in that language family (Gehrmann 2015). The examples in Table 23 demonstrate that vowel register contrast has spread to environments following natural classes of initials other than voiceless stops in KTT.

Table 23: Examples of tense and lax register vowels following initials other than voiceless stops in KTT

b	/bak/ 'to cut, wound'	m	/moːn/ 'acne'	w	/waːj/ 'to mow grass'
	/b̥ɔk/ 'to pull out'		/m̥ɔːt/ 'enter'		/w̥aːk/ 'to draw a bowstring'
d	/dik/ 'PART (counter- expectation)'	n	/naw/ 'brother-in-law'	r	/ric/ 'to shake'
	/d̥ik/ 'gourd, pumpkin'		/n̥um/ 'young'		/r̥ɛt/ 'fasten tightly'
h	/h̥əːn/ 'happy'	ɲ	/t̥əh̥ n̥əh/ 'beauty'	l	/liŋ/ 'gums'
	/h̥əːm/ 'bathe'		/ɲ̥ɛh/ 'full, sated'		/li̯m/ 'tracks, footprints'
ʔ	/ʔot/ 'to abstain'	ŋ	/ŋiat/ 'to dive'	j	/jah/ 'with, and'
	/ʔom/ 'father'		/ŋ̥iːt/ 'to regain consciousness'		/j̥oh/ 'woven shirt'

Examples of register spread are found in the available KK data as well, as shown by the examples in Table 24.

¹⁶ Triw and Kantu data are from Theraphan (2001).

vocalic register split and have introduced marginal vowel phonation contrast, as demonstrated in Tables 23 and 24.

Figure 11: *The pattern of KTT register assignment*

		*b̥ *d̥ *j̥ *g̥ *j̥ *j̥	*b *d *m *n *ɲ *ŋ *l *r *w *h *ʔ	*ʔp *ʔt *ʔc *ʔk *s
Diphthongs	*ia, *ia, *ua	Lax	Lax	Tense
Close Vowels	*i(:) *i(:) *u(:)			
Mid Vowels	*ə(:) *o(:)			
Open Vowels	*ɛ(:) *a(:) *ɔ(:)		Tense	
		Register assigned by initial voicing	Register assigned by vowel height	Register assigned by initial voicing

We may assume that *j and *j̥, the latter of which is pronounced as a pre-stopped approximant [j̥] in modern Kriang and probably was in Proto-Kriang as well, were destined to condition lax register in all cases by virtue of them being both voiced sounds and close vocoids. This satisfies two conditions that lead to lax register assignment at the same time. The fact that *w did not likewise condition lax register in all cases despite also being a close vocoid may have to do with the fact that [w] is a back vocoid. As Gregerson (1976) discusses, the position of the tongue root (advanced vs. retracted) consistently correlates with the acceptance or rejection of vocalic phonation features. All things being equal, advanced tongue root positions are associated with lax register and retracted tongue roots positions with tense. This is a correlation, not a hard and fast rule and different register languages have different outcomes. Nevertheless, a front vowel is crosslinguistically more likely to accept laxer-than-modal phonation than a back vowel and we may invoke this tendency here to explain the discrepancy between register assignment following front *j and back *w.

As for the patterning of *s with the *ʔT consonants, the most likely scenario is that *s developed the same stiff voiced phonation as the fortis stop series did. As discussed above in Section 2.1, the PK implosive stops lost their preglottalized component in Kriang at some point during the gradual process of PK *D devoicing. This moved the etymological implosives away phonetically from the stiff voiced, tense register-inducing stops that developed from *T and moved them towards the voiced sonorants for the purposes of register assignment. The only voiceless oral obstruent that was left at this point, other than the stiff voiced *ʔT consonants, was *s. It is not hard to imagine then that the voiceless fricative was grouped together with the stiff voiced stops under a phonological category of *voiceless obstruent initials*, all of which became typified by stiff voiced phonation.

Proto-Kriang initials fell under three different laryngeal alignments. As we have seen, *D̥, *j̥ and *j̥ were *lax initials* and *ʔT and *s were *tense initials*. The remaining initials we may term the *modal initials* or perhaps more accurately the *neutral initials* since they include not only the modal voiced stops and modal voiced sonorants, but also the laryngeals *h and *ʔ, which cannot be said to be voiced or voiceless in the way that non-laryngeal consonants are. As KTT progressed through the register spread process, vowels following the neutral initials were assigned to the tense register if they were open vowels. Note that lax register open vowels had most likely already developed raised onsets at this point and so the open vowels after neutral initials would have more closely resembled the unaltered tense register open vowels than the lax register open vowels. Similarly, we may deduce from this pattern that the onsets of tense register mid vowels, close vowels and diphthongs were lowered relative to their lax counterparts, resulting in the vowels following neutral initials at these vowel height levels to more closely resemble the lax register vowels than the their corresponding tense register vowels.

Table 25 below illustrates the process of register assignment for vowels following the Proto-Kriang neutral initial using hypothetical examples. The examples on the left show how open vowels following neutral initials become tense register vowels while the examples on the right show how non-open vowels following neutral initials become lax register vowels.

Table 25: *The assignment of register following lax, neutral and tense initials in KTT*

	Proto-Katuic	Proto-Kriang	Kriang Tha Taeng		Proto-Katuic	Proto-Kriang	Kriang Tha Taeng
Lax Initials	*da:	*ɗa: [ɗʰa:]	/tə:/ [tʰə:]~[tʰa:]	Lax Initials	*di:	*ɗi: [ɗi:]	/tʰi:/ [tʰi:]~[tʰi:]
Neutral Initials	*ɗa:	*da: [da:]	/da:/ [da:]	Neutral Initials	*ɗi:	*di: [di:]	/di:/ [di:]~[di:]
Tense Initials	*ta:	*ʔta: [ʔta:]	/ta:/ [ʔta:]	Tense Initials	*ti:	*ʔti: [ʔti:]	/ti:/ [ʔti:]

The register assignment pattern discussed above for KTT is identical to the pattern that I found when researching a KK dialect spoken in lowland Champasak province, except that the lowland variety had merged all diphthongs to lax register (Gehrmann 2014b). The patterns of register assignment in R. Smith’s (1970, 1973b), Huffman’s (1971a, 1971b) and Theraphan’s (2001) KK data is more difficult to assess since I did not collect the data myself, but in all three of these varieties, register spread appears to have either (1) not yet progressed as far as it has in my KTT and KK data, or (2) have since been neutralized following initials other than PK *D and *T. If the second scenario is correct, then the register assignment pattern that I discovered in the KTT and KK varieties that I worked with (demonstrated in Figure 11) may be reconstructed back to Proto-Kriang. However, if the first scenario is correct, then the two varieties that I researched developed parallel register assignment patterns in isolation. I propose that the register assignment pattern in Figure 11 was actually a feature of Proto-Kriang, based on its appearance in two geographically discontinuous Kriang varieties, one from each of the major Kriang dialects. Also, this register assignment pattern parallels closely that of Proto-Ta’oi and Proto-Pacoh, raising the possibility of areal diffusion at some point in the past or even the possibility that the register systems of two or more of these Katuic languages are historically cognate.

4 Summary and conclusions

The goal of this paper has been to provide a synthesis of new and previously published sources related to the Kriang language. Two primary dialects, Kriang Kaleum and Kriang Tha Taeng, were proposed and the phonology of Kriang was described. Minor phonological differences between the various Kriang varieties that have been described in the literature, especially differences related to register, were highlighted wherever applicable. Finally, an analysis of the historical phonological development from Proto-Katuic to modern Kriang was put forth with special attention paid to consonant prenasalization, consonant gemination and registrogenesis. It is hoped that this paper will serve as a starting point for the further study of Kriang and for the continuing study of the historical phonology of the Katuic family in general.

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