

A Hypothesis on the Origin of Preglottalized Sonorants in Kra-Dai

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Introduction

- A distinction between plain and preglottalized initial voiced stops is reconstructible within all primary branches of the Kra-Dai phylum at three places of articulation.
- This distinction may be hypothesized to be a secondary development within Kra-Dai, where the diachronic trajectories of what were originally medial voiced stops depended on whether or not the preceding vowel was schwa on analogy with a similar development in Proto-North Sarawak (Blust 2006, Norquest 2016).

Introduction

- While this plain versus glottalized opposition in the voiced obstruent series is quite robust within Kra-Dai, the same is not true for the sonorants, which in many languages show only a two-way contrast between voiced and voiceless.
- However, the Kam-Sui branch of Kra-Dai is particularly conservative in this regard, and a four-way phonation opposition (preaspirated, voiceless, voiced and preglottalized) can be reconstructed for all sonorants with the exception of the lateral.
- The Hlai branch of Kra-Dai can now also be postulated as having retained evidence for a series of preglottalized sonorants.

Introduction

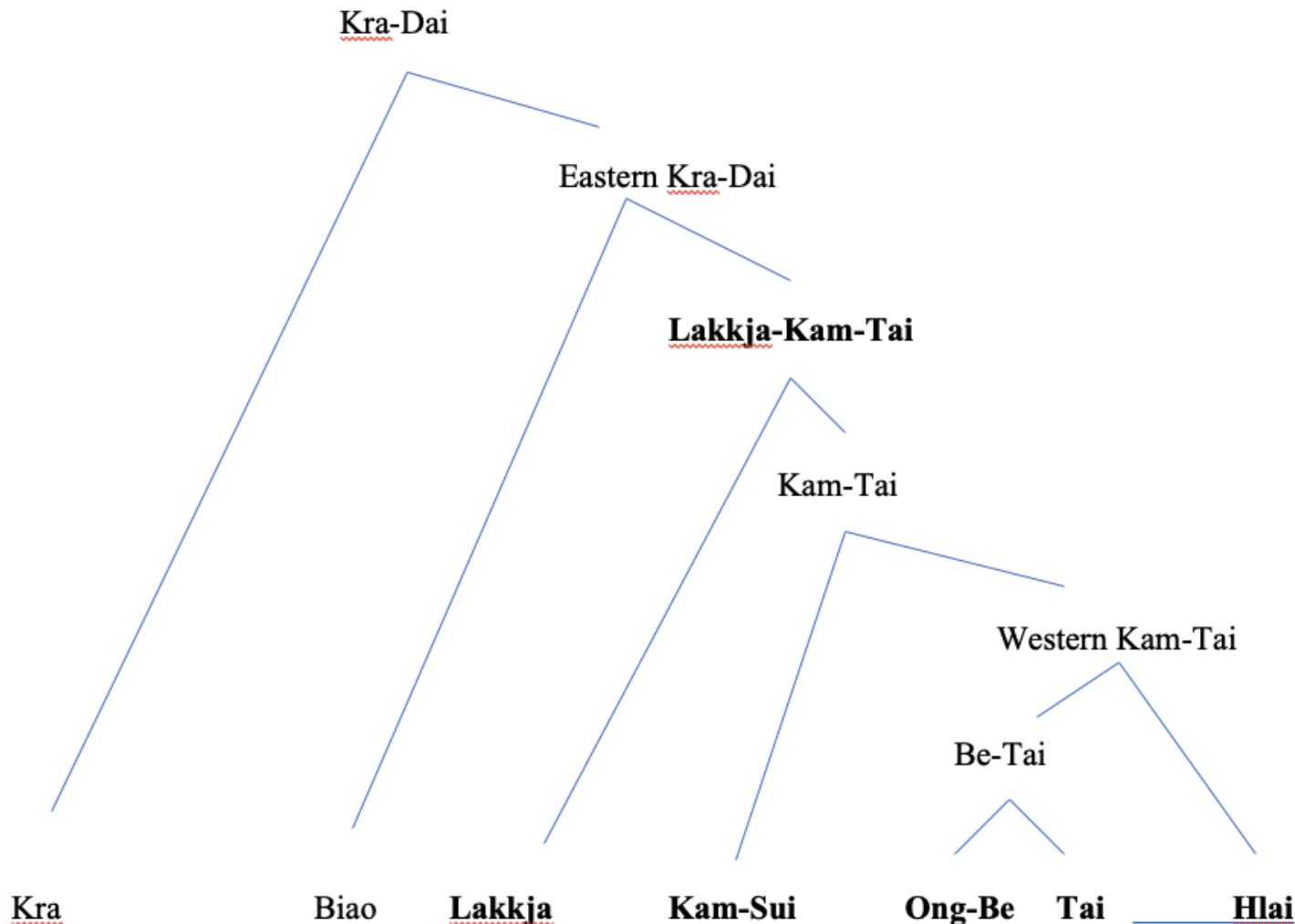
- While it has generally been assumed that these phonation differences reflect the different glottal states of the initial consonants of sesquisyllabic words before the presyllable was lost, the suggestion is put forward here that the preglottalized series of sonorants is not the result of conditioning by the presyllable initial.
- Rather, on analogy with the voiced stops, it occurs in an environment following schwa in which gemination occurred, followed by debuccalization of the first half of the geminate.

The distribution of the Kra-Dai phylum



- The Kra-Dai family is composed of four major branches: (1) Kra, (2) Kam-Sui, (3) Hlai, and (4) Tai (3 branches); the smaller Be group is also shown.
- Lakkja and Biao are not shown, but are located to the east of the Tai group towards the Pearl River Delta.

The Kra-Dai Phylogenetic Tree (Norquest 2015)



- Although the hypothesis presented here is valid for the entire Kra-Dai phylum, the scope of the data provided in this presentation includes everything under the scope of Lakkja-Kam-Tai.
- We have very little data on the Biao languages – one full wordlist for the standard language, but only a handful of forms for the other (at least three major) languages, which hinders comparative work.
- I haven't done sufficient work on the Kra branch to have good control of the data – this is a future goal.

The plain ~ preglottalized contrast in Kra-Dai initial voiced stops

A distinction between plain and preglottalized initial voiced stops is reconstructible within the Kra-Dai phylum at three places of articulation, with a fourth (retroflex) occurring in the latter series:

Plain	Preglottalized
*b, *d, *ʝ	*ʔb, *ʔd, *ʔɖ, *ʔʝ

Reflexes of plain initial voiced stops after non-schwa vowels in Lakkja-Kam-Tai

*Kra-Dai ?	*Lakkja	*Kam-Sui	*Ong-Be	*Tai	*Hlai
*b	*b	*b	*v	*b	*ɓ
*d	*d	*d	*ɦ	*d	*ɗ
*j	*d	*zj	*ʒ	*j	*tɕ

	<u>M. Chinese</u>	<u>*Lakkja</u>	<u>*Kam-Sui</u>	<u>*Ong-Be</u>	<u>*Tai</u>	<u>*Hlai</u>
‘goose’	---	---	---	*vu:n X	*bu:nh	*ɓu:nh
‘copper’	銅 *dɔwŋ	*doŋ	*dɔŋ	*ɦo:ŋ	*do:ŋ	*ɗu:ŋ
‘money’	錢 *dzjen	*di:n	*zjen	*ʒe:n	*je:n	*tɕi:n

* Middle Chinese data are taken from Baxter & Sagart (2014).

Reflexes of plain initial voiced stops after non-schwa vowels in Kra-Dai

Pre-Kra-Dai	*Lakkja	*Kam-Sui	*Ong-Be	*Tai	*Hlai
*b	*p	*p	*p	*p	*p ^h
*d	*t	*t	*t	*t	*t ^h
*j	*ts	*c	(*ts)	*c	*tɕ ^h

	<u>*RAn</u>	<u>*Lakkja</u>	<u>*Kam-Sui</u>	<u>*Ong-Be</u>	<u>*Tai</u>	<u>*Hlai</u>
‘grandparent’	*apu	---	---	---	*pu:	*p ^h u:ʔ
‘mouth’	*baqbaq	---	*pa:k	*pa:k	*pa:k	---
‘to fall’	*-tuq	---	*tɔk	*tɔk	*tok	*t ^h ok
‘chest, liver’	*dəbdəb	*tap	*tap	*t[a]p	*tap	---
‘sharp’	*ʈajəm	---	---	---	---	*tɕ ^h ə:m

Reflexes of medial voiced stops after non-schwa vowels in Kra-Dai

*Kra-Dai	*Lakkja	*Kam-Sui	*Ong-Be	*Tai	*Hlai
*C-b	*w̥	*C-b	*ʔb	*C-b	*ʋ
*C-d	*l̥	*C-ʔd	*r̥	*C-d	*r
*C-d̥	*j̥ (< *r̥)	*C-ʔd̥	*r	*C-d̥	*r
*C-ɟ	*l̥	*ʔj	*j̥	*ʔj	*hj

	<u>*Kra-Dai</u>	<u>*Lakkja</u>	<u>*Kam-Sui</u>	<u>*Ong-Be</u>	<u>*Tai</u>	<u>*Hlai</u>
‘thin’	*C-bá:ŋ	*w̥a:ŋ	*C-ba:ŋ	*ʔbjaŋ	*C-ba:ŋ	---
‘bone’	*Cudó:k	---	*C-ʔda:k	*r̥u:k	*C-dwo:k	*Curu:k
‘boat’	*Cudá:	*j̥wa:	*C-ʔdrwa:	*rwa:	*C-dwa:	*Cura:
‘borrow’	*C-ɟá:m	*l̥a:m	*ʔja:m	---	*ʔju:m	---

Reflexes of medial voiced stops after schwa in Kra-Dai

*Kra-Dai	*Lakkja	*Kam-Sui	*Ong-Be	*Tai	*Hlai
*Cəʔb	*ʔb	*ʔb	*ʔb	*ʔb	*ɓ
*Cəʔd	*l̥	*ʔd	*r̥	*ʔd	*ɗ
*Cəʔd̥	*l̥	*ʔd̥	*r̥	*ʔd	*ɗ
*Cəʔʃ	*j̥	*ʔʃ	*j̥	*ʔʃ	*tɕ

*Kra-Dai *Lakkja *Kam-Sui *Ong-Be *Tai *Hlai

‘village’	*Cəʔbá:nʔ	*ʔbá:nʔ	*ʔbá:nʔ	---	*ʔbá:nʔ	---
‘winnow basket’	*Cəʔdónʔ	*l̥ónʔ	*ʔdónʔ	*r̥o:n X	*ʔdónʔ	*ɗónʔ
‘to stand’	*Cəʔjún	*j̥u:n	*ʔjun	*j̥un	*ʔju:n	*tɕu:n

Proto-North Sarawak Voiced Stop Fortition after Schwa

(a)	<u>Gloss</u>	<u>PMP</u>	<u>PNS</u>
	ash	*qabu	*abuh
	3pl	*(si-)ida	*idah
	rain	*qujan	*ujan
	digging stick	*tugal	*tugal
(b)	<u>Gloss</u>	<u>PMP</u>	<u>PNS</u>
	sugarcane	*təbuh	*təb:uh
	faint	*mədan	*məd:an
	blink	*kəjəp	*kəj:əp
	sleep	---	*məg:əl

*Please note that traditional PMP phonemes are interpreted in the following way: *j = [d], *z = [ʒ], *g = [g], *R = [R], *y = [j], and *e = [ə].

Reflexes of Proto-North Sarawak voiced geminate stops

PNS	*bː	*dː	*jː	*gː
Bintulu	ɓ	ɗ	ɟ	ɡ
Kenyah				
Kenyah (Long San)	ɓ	ɗ	f	ɟ
Kenyah (Long Dunin)	b/ɓ	d/ɗ	s	ɟ
Kenyah (Long Wat)	b	d	ɟ	ɡ
Kenyah (Long Anap)	p	t	c	k
Kelabitc				
Kelabit (Bario)	b ^h	d ^h	d ^h	ɡ ^h
Kelabit (Long Napir)	f	s	s	k
Kelabit (Pa' Mada)	p	t	t	k
Kelabit (Tring)	p	c	c	k
Berawan-Lower Baram				
Berawan (Long Terawan)	p	c	c	k

Reflexes of PNS geminate voiced stops by type of change

PNS	*b:	*d:	*j:	*g:
Shortening				
Kenyah (Long Wat)	b	d	ɟ	g
Implosion				
Kenyah (Long San)	ɓ	ɗ	ɟ	ɡ
Kenyah (Long Dunin)	ɓ/b	ɗ/d	s	ɡ
Bintulu	ɓ	ɗ	ɟ	g
Aspiration				
Kelabit (Bario)	b ^h	d ^h	ɟ ^h	g ^h
Devoicing				
Kelabit (Pa' Mada)	p	t	t	k
Kenyah (Long Anap)	p	t	c	k
Kelabit (Tring)	p	c	c	k
Berawan (Long Terawan)	p	c	c	k

Possible trajectories of change for an intervocalic voiced geminate

Preglottalization > Implosion

-b:- > -ʔb- > -ɓ-

Partial devoicing > Full devoicing

-b:- > -bp- > -p-

Aspiration > (Devoicing > Frication)

-b:- > -b^h- (> -p^h- > -f-)

Sabahan Voiced Stop Fortition after Schwa

(a)

<u>Gloss</u>	<u>PMP</u>	<u>Kadazan</u>	
cloud	*Rabun	gavun	(*b > v)
housepost	*hadiri	to-igi	(*d > Ø)
paddy	*paɟaj	paaj	(*ɟ > Ø)
indicate	*tujuɟ	tuu?	(*j > Ø)

(b)

<u>Gloss</u>	<u>PMP</u>	<u>Kadazan</u>	
stab	*təbək	tobok	(< *təb:ək)
hiccough	*sədu	sodu	(< *səd:u)
sting, smart	*hapəɟəs	podos	(< *pəd:əs)
pinch	*kəjut	kodut	(< *kəd:ut)

Proto-North Sarawak Voiceless Obstruents after Schwa

	<u>Gloss</u>	<u>PMP</u>	<u>PNS</u>		<u>Gloss</u>	<u>PMP</u>	<u>PNS</u>
(a)	fathom	*dəpa	*dəpa	(c)	stick, adhere	*dəkət	*dəkət
	four	*əpat	*əpat		bracelet	*ləku	*ləkuʔ
	blowpipe	*səput	*səput				
(b)	design, tattoo	*bətik	*bətik	(d)	full, satiated	*bəsUR	*bəsUR
	bamboo sp.	*bətun	*bətun		flesh, muscle	*həsi	*əsi
	fart	*qətut	*ətut		rice mortar	*əsun	*əsun

Proto-North Sarawak Sonorants after Schwa

	<u>Gloss</u>	<u>PMP</u>	<u>PNS</u>		<u>Gloss</u>	<u>PMP</u>	<u>PNS</u>
(a)	fat, grease	*ləmu	*ləmu	(d)	ankle	*bəŋil	*bəŋil
	weak	*ləmaq	*ləmaʔ		deaf	*dəŋəl	*dəŋəl
	sweet	*əmis	*əmis				
(b)	correct	*kəna	*kəna	(e)	vulva, vagina	*təli	*təli
	six	*ənəm	*ənəm		three	*təlu	*təlu
	full (container)	*pənuq	*pənuʔ		buy	*bəli	*bəlih
(c)	sea turtle	*pəŋu	*pəŋu	(f)	husked rice	*bəRAS	*bəRAS
	to swallow	*təŋəl	*təŋəl		core of tree	*təRAS	*təRAS
	fat, grease	*məŋak	*məŋak		k.o. tree	*təRƏp	*təRƏp

The four-way phonation distinction in Kra-Dai sonorants

Preaspirated	Voiceless	Plain	Preglottalized
*hm, *hn, *hn̩, *hn̩̊	*m̥, *n̥, *n̥̩, *n̥̩̊	*m, *n, *n̩, *n̩̊	*ʔm, *ʔn, *ʔn̩, *ʔn̩̊
*hl, *hr, *hR	*l̥, *r̥, *R̥	*l, *r, *R	*ʔl, *ʔr, *ʔR
*hw, *hj	*w̥, *j̥	*w, *j	*ʔw, *ʔj

Phonation, register and the origin of the four-way contrast

Preaspirated		Voiceless		Plain		Preglottalized					
*hm	>	m̥ ^H	*m̥	>	m ^H	*m	>	m ^L	*ʔm	>	ʔm ^H

- (a) *t^h-m > *hm
- (b) *t-m > *m̥
- (c) *d-m > *m
- (d) ??? > *ʔm

Phonation and the origin of the four-way contrast

- (a) *t^h-m > *hm
- (b) *t-m > *m̥
- (c) *d-m > *m
- (d) *Cə̃m- > *ʔm

Examples of the four-way contrast

	*Kra-Dai	*Lakkja	*Kam-Sui	*Ong-Be	*Tai	*Hlai
‘dog’	*k ^h [u]má:	*k ^h -mwa:	*k-hma:	*m̩a:	*m̩a:	*hma:
‘ditch’	*[t]-m̩ ^ʷ á:ŋ	---	*T-m̩ja:ŋ	*m̩aŋ	*m̩aɰŋ	---
‘ant’	*r-móɬ	*mot	*r-mət	*mu:ʔ	*moc	*hmuɬ
‘bear’	*kəʔm̩ ^ʷ új	*k-Nu:j	*ʔmje:	---	*m̩wi:	*ʔmuj

Preservation of preglottalized sonorants in Proto-Hlai

Proto-Kra-Dai

Proto-Hlai

(a)	*hm		>	*hm	
	*m̥		>	*hm	
	*m	>	*m̥	>	*hm
(b)	*ʔm		>	*m̥	

Reflexes of medial sonorants after schwa in Kra-Dai

*Kra-Dai	*Lakkja	*Kam-Sui	*Ong-Be	*Tai	*Hlai
*Cəm	*m̥	*ʔm	*m̥	*m̥	*ʔm
*Cən	*n̥	*ʔn	*n̥	*n̥	*ʔn
*Cəŋ	*ŋ̥	*ʔŋ	*ŋ̥	*ŋ̥	*ʔŋ
*Cəŋ	*ŋ̊	*ʔŋ	*ŋ̊	*ŋ̊	*ʔŋ
*Cəl	*l̥	*ʔl	*l̥	*l̥	*ʔl
*Cər	*j̥	*ʔr	*ʃ	*Cr	*hr
*CəR	(*j̥)	*ʔR	(*ʃ)	(*R̥)	(*hr)
*Cəw	*w̥	*ʔw	*w̥	*ʔw	(*ʔw)
*Cəj	*j̥	*ʔj	*j̥	*ʔj	(*ʔj)

Examples of medial sonorants after schwa in Kra-Dai

	<u>*Kra-Dai</u>	<u>*Lakkja</u>	<u>*Kam-Sui</u>	<u>*Ong-Be</u>	<u>*Tai</u>	<u>*Hlai</u>
‘thick’	*tsəʔná:	*ts-Na:	*ʔna:	*ᵑa:	*ᵑa:	*ʔna:
‘cold’	*kəʔnít	*k-Ni:t	*ʔnit	*ᵑi:t	*ᵑit	---
‘stupid’	*Cəʔná:ŋh	*ʔna:ŋh	*ʔna:ŋh	*ᵑə:ŋ X	---	---
‘gills’	*Cəʔr ^v á:k	---	*ʔna:k	*ᵑa:k	*ᵑwək	*ʔna:k
‘taro’	*pəʔr ^v á:k	*ʔa:k	*ʔrja:k	*ʃa:k	*prwək	*hra:k
‘moan’	*gəʔrá:ŋ	*ʔa:ŋ	*ʔra:ŋ	---	*gra:ŋ	---
‘hungry’	*məʔjá:k	---	*m-ʔja:k	*ʔak	*ʔja:k	---
‘stupid’	*Cəʔwá:ʔ	---	*ʔwa:ʔ	---	*ʔwa:ʔ	---

Conclusion: Phonetic motivations

- **Iambic prosody:** encouraged lengthening and fortition in post-schwa medial environment
- **Reduction of schwa duration:** favored the ultimate deletion of schwa itself
- Glottal stop acted as a final syllabic nucleus place-holder before ultimate deletion of the presyllable
- Glottal stop was therefore a phonetic default which then became phonologized:

*tsəná: > *tsən:á: > *tsəʔná: > *tsɿná: > *ʔná: