

Analysis of the tones in the Guangka subdialect of De'ang

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In recent years more and more research has been carried out on Mon-Khmer tones, including some minor research on the genesis and evolution of tones in these languages. However, the scope of these investigations has been inadequate: little has been written regarding Mon-Khmer micro-linguistic comparison, and the number of careful descriptions is still inadequate. The rules of tonogenesis and tonal evolution in Mon-Khmer remain unexplained.

This paper will, by microanalysis of the Guangka dialect of De'ang (Mon-Khmer), uncover its tonogenetic history. This discussion not only has important implications for Mon-Khmer phonological research, but can shed light on tonogenesis and rules of development in typologically similar languages.

1. Synchronic description and analysis of Guangka tones

De'ang belongs to the Wa-De'ang branch of Mon-Khmer; it is spoken by 15,462 speakers (1990) of the De'ang nationality in Southwest Yunnan. The majority of them live in two areas of the Dehong Dai-Jingpho autonomous prefecture: the Santaishan area of Luxi county and the Junnong area of Zhenkang county in the Lingcang Special Administrative Area. The rest are scattered throughout the cities and counties of Lianghe, Longchuan, Yingjiang, Ruili, Wanting, Baoshan, Gengma, Yongde, et al.

Guangka is a subdialect of the Rumai dialect of De'ang, spoken by the De'ang nationality in Guangka village, Mengxiu township, Ruili municipality. Guangka village has De'ang, Han Chinese, Jingpho and Dai nationalities, all of whom follow Buddhism. Most of the De'ang here are bilingual in one of the other local languages, usually Dai or Chinese.

Within Mon-Khmer, Guangka is one of the languages with a relatively well developed tone system. Guangka has three tones; almost every syllable has a fixed tone, and there are many tonal minimal pairs. As a result of the closeness of the relationship between tones and the initials and rhymes, we first consider the initial and rhyme systems.

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Guangka has 42 initials, including the following 32 single consonant initials:

p	t	ts	tɕ	k		
ph	th	tsh	tɕh	kh		
b	d		dʒ	g		
m	n		ɲ	ŋ		
m̥	n̥		ɲ̥	ŋ̥		
	l	r				
	l̥	r̥				
f		s		x	h	
v			ʒ			

There are ten consonant cluster initials:

pl	phl	bl	kl	khl	gl
	phr	tr	kr	chr	

The initial /n/ may function as a full syllable, in which case it is preceded by [ʔ-]. The number of initials in Guangka is average for a Mon-Khmer language. Most stops, affricates, nasals, laterals, and trills distinguish voicing; in clusters, only /-l, -r/ may appear in the second position.

Guangka has 119 rhymes, including eleven monophthongs without tense-lax or length oppositions; there are 22 diphthong rhymes, and 86 rhymes with consonant codas. The codas include /-m, -n, -ŋ, -p, -t, -k, -ʔ, -h/. The number of Guangka rhymes is also average for a Mon-Khmer language. Nevertheless, the system is simpler than that of Mon-Khmer languages with tense-lax or length oppositions. The codas are relatively abundant, and all occur with all of the vowels. This is a characteristic shared by most Mon-Khmer languages.

Guangka has three tones, with the following pitch patterns:

High level	55	ŋai ⁵⁵	'hit'	va ⁵⁵	'stockings'
High falling	51	ŋai ⁵¹	'fire'	va ⁵¹	'dry over fire'
Falling rising	412	ŋai ⁴¹²	'eye'	va ⁴¹²	'younger bro. or sis.'

Both mono- and polysyllabic words rely on tones to distinguish lexical items:¹

ky ⁵⁵ piau ⁴¹²	'bag'	ky ^{31*55} piau ⁵¹	'frighten'
si ⁵⁵ ta ⁴¹²	'tail'	si ^{31*55} ta ⁵¹	'tongue'

Note: The falling rising tone is accompanied by glottal constriction. Some syllables with final -ʔ are in fact pronounced with a 53 tone (a slight fall), as in *ʒaʔ⁵⁵[53]* 'shoulder,' *saʔ⁵⁵[53]* 'to weigh.'

¹In this paper, "/" indicates that the tone on the left is generally pronounced as the tone on the right in a polysyllabic word, "*" indicates tonal free variation, [] indicates actual phonetic value. "--" indicates lack of a cognate.

Not all rhymes occur with all tones: unchecked syllables² occur with all three tones, checked syllables occur only with the high level tone, and /-h/ coda syllables occur only with the high falling tone. That is:

	Unchecked	Checked	-h coda
High level	+	+	-
High falling	+	-	+
Falling rising	+	-	-

The three tones do not have the same frequency. In 969 randomly selected single-syllable words, the high level tone appeared most frequently, with 430 instances, the high falling tone had 353 instances, the falling rising tone 186.

In addition to the above three tones, Guangka has a 31 tone. This tone only appears in the first (weakened) syllable of polysyllabic words, and in borrowings from Chinese. When the weakened syllable of a polysyllabic word serves as a prefix, the tone is not clear; but in careful speech, the tone is pronounced as either 55 or 31; in the weakened syllable of compound words the original tone can change into a 31 tone or a 55 tone, as in the following:

ba ^{55*31} bu ⁵⁵	'radish'
si ^{55*31} ta ⁵¹	'tongue'
tho ^{55*31} doŋ ⁵¹	'cowpea'
(bean) (long)	
pei ^{55*31} va ⁵¹	'relative'
(o. sis.) (y. sib.)	
pom ^{51/55*31} ɒ ⁵¹	'dinner'
(meal) (evening)	
ŋai ^{51/55*31} seŋ ⁵⁵	'electric light'
(light) (pearl)	

In recent borrowings from Chinese the high falling tone freely varies with 31:

thon ^{51*31} zen ^{51*31}	'member' (Ch: túán yuán ³)
ren ^{51*31} min ^{51*31}	'people' (Ch: rén mín)

In addition to the Guangka fixed tone syllables, there are some monosyllables and polysyllables that allow variation, e.g.,

²In this paper, 'checked syllable' refers to *cu shengyun* -- a syllable ending in a stop, and 'unchecked' refers to *shu shengyun* -- non-stop final syllables.

³Chinese words are transcribed in standard *Hanyu pinyin*.

51*55	u ^{51*55}	'one'	lui ^{51*55}	'white'
51*412	ta ^{51*412}	'eight'	tem ^{51*412}	'nine'
	ta ^{51*412}	'husband'	za ^{51*412}	'wife'
	phi ^{55*412}	'honeybee'	te ⁵⁵ i ^{51*412}	'person'
51*55*412	ron ^{51*55*412}	'red'	ton ^{51*55*412}	'yellow'

The tone patterns of disyllabic words are generally fixed. The tone of the first syllable varies according to the tone of the second syllable. Non-compound words mainly fall into the following categories:

1. 55 + 412:	k ⁵⁵ aŋ ⁴¹²	'bone'	si ⁵⁵ ta ⁴¹²	'tail'
2. 55*31 + 55:	ba ^{55*31} bu ⁵⁵	'radish'	ty ^{55*31} goi ⁵⁵	'chin'
3. 55*31 + 51:	si ^{55*31} ta ⁵¹	'tongue'	k ^{55*31} dɒh ⁵¹	'forehead'

Owing to the existence of these intrinsic patterns, Guangka tone sandhi follows these same patterns. For example:

bai ^{412/55} (appearance)	bai ⁴¹² (appearance)	'appearance'
sim ^{412/55} (bird)	kram ⁴¹² (branch)	'sparrow'
kɔn ^{51/55} (son)	bɜ ⁴¹² (sheep)	'lamb'
taŋ ^{51/55} (tree; CL)	hoi ⁴¹² (tree; firewood)	'tree'
nah ^{51/55*31} (comb)	dɛ ⁵⁵ (small)	'bamboo comb with teeth on both sides'
taŋ ^{51/55*31} (tree)	ŋiɔ ⁵¹ (unhusked rice)	'rice plant'
pom ^{51/55*31} (rice)	tuh ⁵¹ (to pestle)	'rice-paste cake'

There are only a few examples of the last syllable undergoing tone sandhi, most of which are instances of tone 412 or 55 changing to 51:

peu ⁵⁵ dian ^{412/51} (mother's brother, father's sister)	'mother's eldest brother, father's sister's husband' (big)
kun ⁵⁵ ma ^{55/51} (father) (mother)	'parents'

There are even fewer instances of both syllables changing tone:

pom ^{51/55} teu ^{412/51}	'food'
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After borrowings from Chinese enter Guangka, they divide into different categories. Yunnanese Chinese has *Yangping*, *Yinping*, *Shangsheng*, and *Qusheng* 4 tones, which are reflected in borrowings into Guangka as follows:

Chinese:		<i>Yinping</i>	<i>Yangping</i>	<i>Shangsheng</i>	<i>Qusheng</i>
Guangka:		High level	Low falling	High falling	High level
Guangka	Chinese <i>Yinping</i>		Guangka	Chinese <i>Yangping</i>	
khai ⁵⁵	kaī	‘open’	thon ³¹	túan	‘unite _{1/2} ’
tsoŋ ⁵⁵	zhōng	‘central _{1/2} ’	tɕeʔ ³¹	jié	‘unite _{2/2} ’
ʒaŋ ⁵⁵	yāng	‘central _{2/2} ’	ɕoʔ ³¹	xué	‘study’
koŋ ⁵⁵	gōng	‘company _{1/2} ’	kʏʔ ³¹	gé	‘leather _{1/2} ’
su ⁵⁵	sī	‘company _{2/2} ’	ʒen ³¹	yuán	‘member’
Guangka	Chinese <i>Shangsheng</i>		Guangka	Chinese <i>Qusheng</i>	
taŋ ⁵¹	dǎng	‘party’	xui ⁵⁵	huì	‘meeting’
tshaŋ ⁵¹	chǎng	‘factory’	tɛn ⁵⁵	diàn	‘electricity’
tsu ⁵¹	zǔ	‘group’	ɕɛn ⁵⁵	xiàn	‘county’
kiɔ ⁵⁵ su ⁵¹	jiāo shuǐ	‘glue’	min ⁵⁵	mìng	‘life _{2/2} ’
kuan ⁵¹	guǎn	‘manage’	kan ⁵⁵ pu ⁵⁵	gàn bù	‘cadre’

Most of the words borrowed from Chinese with the *Yangping* tone are pronounced with the low falling tone, but can freely vary with the high falling tone. In the speech of young people and those whose level of Chinese is better than average, some *Shangsheng* words are pronounced with a falling rising tone. Thus, kian⁴¹² jiǎn ‘subtract,’ and kuan⁴¹² guǎn ‘manage.’

From the above phenomena, we can see a number of characteristics of Guangka tones: 1. The tones in most words (including mono- and polysyllables) are already fixed and form tonal oppositions which are phonemic. Chinese borrowings are pronounced according to the Guangka tonal system. These phenomena demonstrate that tones have appeared in the Guangka phonological system. 2. The checked and unchecked rhymes do not form an opposition in the high falling and falling rising tones, but only in the high level tone. Thus there is limited opposition between the tones of the checked and unchecked syllables. Guangka still has a few words without fixed tone. In polysyllables, the number of tonal co-occurrences is restricted, according to a few patterns. These points demonstrate that Guangka tones undergo a limited amount of synchronic and diachronic variation, and reflect the lack of full tonal development.

⁴In modern standard Mandarin, *Yinping* is a level tone, *Yangping* is rising, *Shangsheng* is falling-rising, and *Qusheng* is falling.

2. The tones of Guangka compared with those of related dialects and languages

In order to further understand the characteristics of the origin and evolution of Guangka tones, we compare it to its related dialects and languages. All of the materials presented, with the exception of the *JianZhi* series (Chinese Nationality Press) and theses, are data gathered by the authors.

2.1 Comparison with related dialects

De'ang has three dialects: Bulei, Liang, and Rumai (to which Guangka belongs). The principal dialects that are being compared with Guangka here are the Chayeqing subdialect of Rumai, the Yunqian subdialect of Bulei, and the Xiaochanggou subdialect of Liang.

Chayeqing has high level and high falling tones. It also has vowel length distinctions, which appear in a few coda-bearing syllables, and diphthong-final syllables.

Yunqian does not have tones, but distinguishes vowel length with some rhymes. Among these, when /ε, a, ɔ, u/ occur with consonant codas they always carry a length distinction; only the diphthongs /ai, au, ɔi/ distinguish length; when the vowels /i, u, u/ are followed by /n, t, r/ they distinguish length. The remaining rhymes carry no length distinction, although some are pronounced long and some short.

Xiaochanggou also lacks tones, but has length opposition. Vowel length is distinguished among monophthong finals and there is a partial opposition among those syllables with consonant codas.

The correspondence of Guangka and Chayeqing tones varies with the presence or absence of stop coda. The correspondence of unchecked syllables is more complicated than that of checked syllables.

The correspondence of checked tones: In Guangka and Chayeqing, checked syllables only appear in the high level tone, so the correspondence is relatively strict. This demonstrates that the checked syllable tone category of these two subdialects has not divided, but remains fixed within a single tone. Examples:

	Guangka	Chayeqing	
-p	khlep ⁵⁵ hap ⁵⁵	khlep ⁵⁵ hɒp ⁵⁵	'house, home' 'fill, stuff into'
-t	pɛt ⁵⁵ vat ⁵⁵	ma ⁵⁵ *31pɛt ⁵⁵ vat ⁵⁵	'duck' 'stomach'
-k	hɣk ⁵⁵ lɛk ⁵⁵	hɣk ⁵⁵ lɛk ⁵⁵	'hair' 'iron'
-ʔ	zaʔ ⁵⁵ deʔ ⁵⁵	zaʔ ⁵⁵ deʔ ⁵⁵	'shoulder' 'small'

Tonal correspondence in /-h/ coda syllables: /-h/ final syllables belong to the unchecked syllable tone category, and have the high falling tone. However, in Chayeqing most are pronounced with a high level tone, although a few have the high falling tone:

Guangka	Chayeqing	
khoh ⁵¹	khoh ⁵⁵	‘dry’ (adj.)
poh ⁵¹	poh ⁵⁵	‘flower’
dzoh ⁵¹	dzoh ⁵⁵	‘fall from a height’
dih ⁵¹	dih ⁵⁵	‘read’
дох ⁵¹	дох ⁵⁵	‘taro’
ky ^{55*31} toh ⁵¹	ky ^{55*31} toh ⁵⁵	‘valley’
mɛm ^{55*31} ky ^{55*31} ɲiah ⁵¹	mɛm ^{55*31} ky ^{55*31} ɲiah ⁵⁵	‘funny’
geh ⁵¹	geh ⁵⁵	‘fall over’
uh ⁵¹	uh ⁵⁵	‘stinking’

The correspondence of unchecked syllable tones: Guangka unchecked syllables can occur with high level, high falling, and falling rising tones; Chayeqing has high level and high falling tones, but no falling rising tone. The tones correspond as follows:

Guangka	Chayeqing
High level	High level
High falling	High falling
Falling rising	

Examples:

Guangka (high level)	Chayeqing (high level)	
fɻ ⁵⁵	fɻ ⁵⁵	‘rake’
kho ⁵⁵	kho ⁵⁵	‘stir-fry’
mai ⁵⁵	mai ⁵⁵	‘hot’
kai ⁵⁵	kai ⁵⁵	‘hard-working’
rɔŋ ⁵⁵	ɻɔŋ ⁵⁵	‘small valley’
am ⁵⁵	am ⁵⁵	‘third daughter’
han ⁵⁵	han ⁵⁵	‘goose’

Guangka has some high falling tone words that correspond to Chayeqing high level words. Most of these syllables in Chayeqing and Yunqian end in a stop. From this we infer that these Guangka words are derived from stop-final words. We cite the following:

Guangka (high falling)	Chayeqing (high level)	Yunqian	
bo ⁵¹	bo ⁵⁵	but	'knife'
moi ⁵¹	moi ⁵⁵	mɔiʔ	'mouth'
pu ⁵¹	puʔ ⁵⁵	pu:t	'blow'
khai ⁵¹	khaiʔ ⁵⁵	khaiʔ	'sand'
se ⁵¹	seh ⁵⁵	sɔʔ	'salt'
Guangka (high falling)	Chayeqing (high falling)		
oi ⁵¹	oi ⁵¹		'three'
biei ⁵¹	biei ⁵¹		'weather'
si ^{55*31} ηai ⁵¹	khɿ ^{55*31} ηai ⁵¹		'sun'
ɛm ⁵¹	ɛm ⁵¹		'water'
dziɛn ⁵¹	kv ^{55*31} dziɿn ⁵¹		'sow' (v.)
Guangka (falling rising)	Chayeqing (high falling)		
khu ⁴¹²	khu ⁵¹		'wind'
plɔn ⁴¹²	plɔn ⁵¹		'sky'
klai ⁴¹²	klai ⁵¹		'rain'
no ⁴¹²	no ⁵¹		'mountain'
dɔn ⁴¹²	n ^{55*31} dɔn ⁵¹		'road'
diaŋ ⁴¹²	daŋ ⁵¹		'big'

The correspondence of Guangka and Chayeqing tones is basically high level to high level and high falling to high falling. In addition, Guangka has developed the falling rising tone, which also corresponds to the Chayeqing high falling tone.

The other two subdialects do not have tones. Their phonological structures have the following clear differences from Guangka: all of them clearly have more finals than Guangka: Yunqian has 185 finals, Xiaochanggou has 159, Chayeqing has 137, but Guangka has only 119. However, there is little difference in the number of initials. It is clear that the simplification of Guangka finals is related to the appearance of tones.

From comparing dialects, we can see the following characteristics of De'ang tonal evolution: 1. Tonogenesis bears an important relationship to the simplification of the final system. 2. There is only one stop-final tone, which has still not divided. Unchecked syllables have already divided into two or three tones, so they have developed further than stop-final syllables. 3. The evolution of tones in the two subdialects is cognate. Essentially, the stop-final tone of Guangka corresponds to the stop-final tone of Chayeqing; the unchecked high level tone corresponds to the high level tone, and the falling tone corresponds to the falling tone. The high falling tone on some Guangka words is due to the disappearance of

stop finals. In order to understand the development of the three unchecked syllable tones in Guangka, and how they divided, it is necessary to further examine related languages. The tones of these two subdialects, having split off from a common origin, are at different stages of development.

2.2 Comparison with related languages

To further elucidate the processes of Guangka tonogenesis and diachronic change, we examine the development of tones in its related languages.

The Xiyun dialect of Wa has three tones: low level (11), mid-level (33), and high level (55); this division is closely related to vowel constriction. Zhou Zhizhi, in "Preliminary research into the tones of Xiyun Wa,"⁵ compared Xiyun and the Aishuai dialect of Wa, uncovering the relationship between tonal separation and the system of vowel constriction, pointing out that Xiyun's low level tone corresponds to Aishuai's clear (unconstricted) vowels; the mid level tone corresponds to Aishuai's constricted vowels; and the high level tone corresponds to Aishuai's secondarily constricted vowels (in Aishuai, vowels after aspirated consonants and h- all undergo secondary constriction). We cite the following:

Xiyun (low level tone)	Aishuai (clear vowel)	
num ¹¹	num	'year'
nɔi ¹¹	mɔi	'cattle'
mɔt ¹¹	muat	'sore' (n.)
khaŋ ¹¹	kiaŋ	'rat, mouse'
thai ¹¹	tai	'cotton'
phi ¹¹	pi	'forget'
phE? ¹¹	pe?	'sheep'
thaŋ ¹¹	diaŋ	'pot scraper'

Xiyun (mid level tone)	Aishuai (constricted vowel)	
tE? ³³	tɛ?	'earth'
tap ³³	sɨ dap	'frost'
kyak ³³	krak	'water buffalo'
kuh ³³	goih	'porcupine'
puh ³³	poih	'barking deer'
kvŋ ³³	ka <u>u</u> ŋ	'field'
tom ³³	tɔm	'egg'
lai ³³	lɛi	'squirrel'
ʔia ³³	ʔi <u>a</u>	'chicken'

⁵Minzu Yuwen, 1988.3.

Xiyun (high level tone)	Aishuai (secondary constriction)	
khi ⁷⁵⁵	khǐ?	'moon'
hak ⁵⁵	hək	'skin'
le ⁷⁵⁵	lɛ?	'rain'
maik ⁵⁵	mhaik	'sand'
phɔn ⁵⁵	phuən	'five'
ɣaŋ ⁵⁵	raŋ	'tooth'
ŋim ⁵⁵	ŋhɪm	'fingernail, toenail'

In addition, Aishuai s- initial syllables have the same tone correspondence as secondarily constricted vowels.

Xiyun (high level tone)	Aishuai (s- initial)	
so ⁷⁵⁵	sɔ?	'dog'
sum ⁵⁵	səm	'plant' (v.)

The Guanshuang dialect of Plang has four tones: high level (55), high falling (51), low rising (13), low falling (31). Among them, the high level and the low rising tones mostly appear with stop-final syllables; the high falling tone and the low falling tone mostly appear with open final syllables. Most of the tones of Guanshuang are fixed, with a relatively large number of minimal pairs. However, quite a few of the unchecked final tones are unstable: the high level and the high falling tones can freely vary with each other, as can the low rising and the low falling. This demonstrates that within Guanshuang, the tones on stop-final syllables are already fixed, but those of open-final syllables are still not completely stable. In a few Guanshuang words tones differentiate grammatical function, which is fairly unusual within Mon-Khmer.

The genesis and development of tones in Guanshuang are related to both vowel constriction and presence or absence of aspiration in the initial. Between Aishuai and Wa, stop-final tone correspondences are as follows:

Guanshuang (high level tone)	Aishuai (constricted vowel)
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(Guanshuang initials include voiceless stops, voiceless affricates, aspirated stops, aspirated affricates, and consonant clusters.)

Guanshuang (low rising tone)	Aishuai (secondarily constricted vowel)
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(Guanshuang initials include aspirated voiced fricatives, devoiced fricatives, aspirated laterals, devoiced laterals, and aspirated consonant clusters with -l-.)

Guanshuang (low rising tone) **Aishuai** (clear vowel)

(Guanshuang initials include voiced affricates, nasals, laterals, and stops)

Examples:

Guanshuang (high level tone) **Aishuai** (constricted vowel)

teʔ ⁵⁵	tɛʔ	‘earth’
krak ⁵⁵	krak	‘water buffalo’
pliʔ ⁵⁵	pliʔ	‘fruit’
khɿt ⁵⁵	phɿt	‘run after’
tʃɔʔ ⁵⁵	ŋhɔʔ	‘paddy (rice)’
sɔʔ ⁵⁵	sɔʔ	‘dog’
hɿk ⁵⁵	hauk	‘hair’

(Low rising tone) (secondarily constricted vowel)

vhek ¹³	vhai̯k	‘dark’
vhaʔ ¹³	vhaʔ	‘monkey’
lut ¹³	bhlɔ̯t	‘sink, cave in’
laʔ ¹³	lhaʔ	‘leaf’
ʒak ¹³	zɯ̯ zha̯uk	‘ear’
ʒuot ¹³	zhɔ̯t	‘crazy’
n ^{55*31} khlaʔ ¹³	khlaʔ	‘pants’

The Aishuai clear-vowel words that correspond to Guanshuang low rising tone words mostly end in -ʔ, with a few -p, -t, -k codas, the explanation being that within Aishuai there is a tendency for place of articulation of these codas to recede and weaken; in addition, a few words in Guanshuang have lost even the final -ʔ. E. g.,

Guanshuang (low rising tone) **Aishuai** (clear vowel)

niʔ ¹³	neʔ	‘meat’
preʔ ¹³	praiʔ	‘weather’
ar ^{55*31} muat ¹³	muat	‘sore’ (n.)
mi ¹³	meʔ	‘husband’
leŋ ¹³	le̯t	‘lick’

The tones of Guanshuang unchecked syllables correspond to Aishuai Wa in the following ways:

Guanshuang (high falling tone) **Aishuai** (constricted and secondarily constricted vowels)

(Guanshuang initials include voiceless, aspirated, and devoiced consonants)

Guanshang (low falling tone) **Aishuai** (clear vowel)

(Guanshuang initials include nasals and voiceless consonants) Examples:

Guanshuang (high falling tone) **Aishuai** (constricted vowel)

tom ⁵¹	tɔ̃m	'egg'
plai ⁵¹	plai	'liquor'
thu ⁵¹	thu	'chopsticks'
han ⁵¹	han	'goose'
raŋ ⁵¹	raŋ	'tooth'
miam ⁵¹	ŋhjm	'fingernail, toenail'
ʒa ⁵¹	ʒa	'give birth to son; month of rest after giving birth'

(low falling tone) (clear vowel)

num ³¹	num	'year'
mɔi ³¹	mɔi	'cattle'
ŋɔi ³¹	ŋɔi	'waist'
kaŋ ³¹	kaŋ	'rat, mouse'
tai ³¹	tai	'flower'
pui ³¹	pui	'person'

The correspondence of *-h* finals between Aishuai and Guanshuang is like that of checked syllables; viz., appearing with high level and low rising tones, with a few words having multiple pronunciations:

Guanshuang (high level tone) **Aishuai** (stop-final syllable, constricted vowel)

kroh ⁵⁵	krɔh	'dry'
tvrh ⁵⁵	tuɰjh	'breast'
surh ⁵⁵	suah	'charcoal'
a ⁵⁵ *31murh ⁵⁵	muɰjh	'love'

(low rising tone) (stop-final syllable, clear vowel)

ɲuar ¹³	ɲuah	'expensive'
kirh ¹³	kih	'salt'
lih ¹³ *31	lih	'descend'
liarh ¹³ *31	liah	'six'

From this we can see that the genesis and separation of tones in Xiyun Wa and Guanshuang Plang are closely related to the opposition of constricted and clear

vowels. Due to the relationship between the secondary constriction of vowels and the natural classes of initials in Aishuai, tonal correspondences are still related to the categories of initials. The difference between Xiyun and Guanshuang is that the separation of tones in Xiyun is only related to the presence or absence of vowel constriction and the categories of initials: basically, constricted vowels become high vowels, while clear vowels become low vowels. However, Guanshuang tones are not merely related to vowel constriction and the categories of initials, but also to the presence or absence of stop codas. On the other hand, the separation of tones in Guangka De'ang is very different. By comparing cognates with Wa and Plang, it is evident that the separation was not related to the presence or absence of constriction, as within each Guangka tone, the cognates appear in Aishuai with both clear and constricted vowels. Thus, the question remains as to what factors are responsible for the tonal splits in Guangka.

From the characteristics of De'ang itself, and from comparison with Aishuai Wa, one finds the following general rule: words that in Guangka have the high level tone mainly appear in these languages with a voiceless initial; those that occur with high falling tone mainly appear with a voiced initial, of the few that correspond to voiceless initials, some of those initials derive from consonant devoicing. Guangka words with zero-initials or initial consonant clusters with *-l-*, *-r-* are in the same category as voiced-initial words. Within Mon-Khmer, syllables that start with a vowel are pronounced with a leading ʔ-. Although glottal stop is voiceless, these syllables correspond in the same way as voiced-initial syllables:

Guangka (high level, vl.)	Yunqian (vl., some vd.)	Aishuai (vl., some vd. asp.)	
kə ⁵⁵	ke	kɛ	'old (plants)'
thu ⁵⁵	thu	thɯ	'chopsticks'
phɯn ⁵⁵	phɯ:n	phɯn	'table'
tse ⁵⁵	tɕe	tɕɛ	'paper'
hiŋ ⁵⁵	--	hiŋ	'bell'
ŋem ⁵⁵	num	nhɯm	'young'
heŋ ⁵⁵	heŋ	rheŋ	'thousand'
(high falling, vd.)	(vd.)	(vd., some vl.)	
doŋ ⁵¹	doŋ	lɑŋ	'long'
ɲɔi ⁵¹	ɲɔ:i	ɲɔi	'waist'
gɔŋ ⁵¹	--	gɔŋ	'mountain'
ŋai ⁵¹	ŋar	ŋu	'fire'
bau ⁵¹	bo	puʔ	'carry on back'
plɔŋ ⁵¹	--	plɔŋ	'grass for roof'
iɻ ⁵¹	ia:r	ʔia	'chicken'
ai ⁵¹	vm ⁵¹	rɔm	'water'

There are a few forms which do not fit the abovementioned rules, for some of which we can find explanation. First, some high level tone words that are voiced are borrowings from Dai odd-number tone words:

Guangka	Dehong Dai	
veŋ ⁵⁵	veŋ ⁵	'breach' (v.)
dzɛm ⁵⁵	tɛm ⁵	'low'
khlan ⁵⁵	xwa:n ¹	'axe'

In addition, there are some recent borrowings from Dai even-number tone words that have gone into Guangka tone categories according to their Dai phonetic value:

Guangka	Dehong Dai	
rɔŋ ⁵⁵	hɔŋ ³³ (tone 6)	'small valley'
dzɯ ⁵⁵	tsu ³³ (6)	'name'
plɔŋ ⁵⁵	lɛŋ ⁵⁵ (2)	'bright'
mɔŋ ⁵⁵	mɔŋ ⁵⁵ (2)	'Dai nationality gong'

Some of the high falling words with voiceless initials are borrowings from Dai even-number tone words:

Guangka	Dehong Dai	
pɛ ⁵¹	pɛ ² (Western Dai)	'raft'
thuŋ ⁵¹	thuŋ ²	'bucket'
lɛm ⁵¹	lɛk ⁸	'deep'

Second, some voiceless-initial high falling words may have originally had voiced initials. In these cases, other languages preserve the original voicing:

Gloss	Guangka	
Dai nationality	tshɛm ⁵¹	dze? (Manbangsuo dial. of Khmu)
flow	lai ⁵¹	la (Aishuai Wa)

In addition, some of the voiceless high falling tone words are due to the loss of stop codas:

hu ⁵¹ (skin)	hɔk	Aishuai Wa
	hak ⁵⁵	Xiyun Wa
	hak ⁵⁵	Guanshuang Plang
khai ⁵¹ (sand)	khai?	Yunqian De'ang
	mhai ^{ik}	Aishuai Wa
ŋjo ⁵¹ (paddy rice)	ŋho?	Aishuai Wa
	ŋo? ⁵⁵	Xiyun Wa
	ŋo? ⁵⁵	Guanshuang Plang
	xɔk ³⁵	Meng'ang Plang

One further issue is that all Guangka syllables ending in -h occur with high falling tone, no matter what the voicing of the initial. This causes voiceless initial words to be pronounced with a high falling tone:

Guangka (vd.)	Aishuai	
rrh ⁵¹	riah	‘root’
ŋɔh ⁵¹	ŋuah	‘expensive’
nɔh ⁵¹	rhɔ̄m	‘heart’
klah ⁵¹ (vl.)	lajh	‘market’
keh ⁵¹	krj̄h	‘bear’ (n.)
tɔh ⁵¹	tuh	‘split off’ (v.i.)
tih ⁵¹	tj̄h	‘mushroom’
khɔh ⁵¹	krɔ̄h	‘dry’

The question of the origins of the Guangka falling rising tone is more complicated than that of the previous two. Because all kinds of phonetic characteristics appear in syllables with this tone, its origin is not obvious; however, by comparing related dialects and languages we can find some clues.

First, most falling rising tone words come from voiced-initial words, although there are a few from the voiceless category:

Guangka (falling rising)	Chayeqing (vd.)	Aishuai (vd.)	
bɤn ⁴¹²	bɤn ⁵¹	pon	‘get’
lɔm ⁴¹²	lɔm ⁵¹	lɔm	‘sharp’
ky ⁵⁵ nɛm ⁴¹²	ky ³¹ nam ⁵¹	num	‘hatch’ (v.)
im ⁴¹²	im ⁵¹	ʔim	‘raw’
(falling rising)	(vl.)	(vl.)	
mɤ ⁵⁵ khiw ⁴¹²	mɤ ^{55*31} khiw ⁵¹	mak khy	‘eggplant’
si ⁵⁵ tv ⁴¹²	khy ^{55*31} tv ⁵¹	tu tv	‘broad bean’

Some in Guangka are voiceless, while other languages preserve voicing:

Guangka (falling rising)	Chayeqing (vl.)	Aishuai (vd.)	
khim ⁴¹²	tɕhim ⁵¹	ŋhim	‘fingernail, toenail’
kham ⁴¹²	kham ⁵¹	gam	‘chaff, husk’
ɲam ⁴¹²	ɲam ⁵¹	nham	‘blood’
raŋ ⁴¹²	xaŋ ⁵¹	raŋ	‘tooth’

Second, some falling rising tones are due to the loss of the stop coda. In the following examples, Aishuai still preserves the stop codas:

Guangka (falling rising)	Aishuai (stop-coda)	
bɜ ⁴¹²	peʔ	'sheep'
mau ⁴¹²	si mauʔ	'stone'
plɔi ⁴¹²	pliʔ	'fruit'
seu ⁴¹²	sa <u>u</u> ʔ	'ill'
ʃeu ⁴¹²	la <u>u</u> ʔ	'rest'
kr ⁵⁵ taɪ ⁴¹²	hək tɛʔ	'earth'

Third, falling rising tones in Guangka mostly correspond to long vowels in languages with length distinctions. The assumption is that the falling rising tone arose from the loss of long vowels. However, in the high falling tone, there also appear a few cases of vowel length, the origin of which is still unknown:⁶

Guangka	Yunqian	
rɔi ⁴¹²	a rɔ:i	'flies'
kham ⁴¹²	kha:m	'chaff'
raŋ ⁴¹²	ra:ŋ	'tooth'
ŋam ⁴¹²	ŋa:m	'blood'

In short, most Guangka falling rising tone words split off from the high falling tone; the tone belongs to the voiced-initial tone class, and its separation is primarily due to the loss of stop-coda finals and of vowel length. However, because there are many counterexamples, it is difficult for us to reach a definite conclusion, we await further research progress.

3. Conclusions

3.1 *Guangka De'ang as a tonal language*

The primary indicator of the phonemic status of tones is that every syllable has a fixed pitch pattern, and there are many minimal pairs. Tones have already appeared and split in Guangka.

The evolutionary typology of tones in Asian languages can be divided into the following stages: no tones, emerging tones, developing tones, and fully developed tones. According to what we know at present, only the first three stages are represented in Mon-Khmer languages, and Guangka belongs to the developing

⁶Wang Jingliu, Chen Xiangmu "Research and explanation of the 56 letters of Xishuangbanna Old Dai script," *Journal of Nationality Studies*, 1982. The article compares prefixes of Dai, Thai and Wa. This article has served as a great inspiration for the present research into Mon-Khmer tones.

tone variety. If tones develop to this stage, they can cause great changes in the rest of the phonological system.

3.2 *Tonal splits in Guangka*

The essential factors responsible for the separation of Guangka tones are the presence or absence of stop codas and the voicing of initials; in addition, vowel length played a role. The first split followed the difference between unchecked and checked finals; divisions according to voicing of initials and vowel length are secondary. In addition, the loss of checked codas gave rise to the phenomenon of tonal change.

3.3 *Comparison of tonogenesis in Guangka and related languages and dialects*

Guangka tonogenetic processes are basically the same as in the related dialect Chayeqing, because in both the first tonal division followed the type of syllable coda, then, within the unchecked codas, there was a split according to the voicing of initials. The difference is that Guangka also split off a falling rising tone, going one step further than Chayeqing. From this it is clear that the tones of Guangka and its related dialects have a common origin, the only difference being the stage of development.

As for the related languages Xiyun Wa and Guanshuang Plang, we can regard their tones as having a different origin. In Xiyun the division is only based on vowel constriction, and has no relationship to the coda. However, Guangka tones do not come from vowel constriction. Clearly, the tones in these two languages do not share a common origin. Moreover, Guanshuang tones have two conditions for their separations. The first is vowel constriction, and the second is the opposition of checked and unchecked codas. Although Guangka also had a tonal split based on the codas, this is not adequate to claim that the two tone systems have a common origin, because this phenomenon is found in many languages. In addition, Guangka checked-coda syllables still have not undergone a tonal split. But, Guanshuang checked-coda syllables have already divided into two separate tones. From this we can see that it is very difficult to show that the tone systems in these two languages share a common origin. If the above hypotheses are all correct, then we claim that Guangka tone system developed after De'ang language split off from Wa and Plang. On the other hand, the tones of each dialect of De'ang share a common origin.

3.4 *Significance of Guangka tone research*

From the present study it is clear that Mon-Khmer tone systems develop from lacking tones to having tones, from a few tones to many, and from simple tone systems to complex ones. This is an important rule of development in Mon-Khmer phonology. Understanding the characteristics of development of the emerging tone stage is no doubt necessary for continued progress in understanding Mon-Khmer phonological rules. In this way, Guangka represents one tendency of Mon-Khmer tone system development. The authors hope that this study will contribute to further understanding of the development of tone systems in other languages.

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