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A PHONOLOGICAL COMPARISON OF GAMALE, SHERAM AND GHUSBANG – THREE KHAM VARIETIES[1]

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Abstract
This paper compares the phonologies of Gamāle, Sheram and Ghusbāng, three closely related southern varieties of Khām. The vowel and consonant inventories, suprasegmentals and phonotactics of each variety is described in turn, after which the phonologies are compared. The comparison identifies the front rounded vowels /y/ and /ø/ in Sheram and Ghusbāng as being linked to the Gamāle labial-palatal approximants, and also suggests that the loss of the syllable-final glottal in breathy voiced verbs is the origin of the pitch contour present in Takāle breathy voiced lengthened verbs.
Keywords: Tibeto-Burman, Kham languages, phonology, comparative linguistics
ISO 639-3 codes: kgj; kjl

1. Introduction

This article compares the phonology of Gamāle, Sheram and Ghusbāng, three closely related varieties of the Central Himalayan Khām languages which are spoken in the Rukum, Rolpā and Bāglung districts of Mid-Western Nepal. The findings are discussed in relation to the labial-palatal approximants in Gamāle Khām (ISO code kgj) and tone in Takāle Khām (ISO code kjl).

Gamāle is traditionally spoken in a group of villages along the Gām and Bhittri-Gām rivers, roughly in an area stretching from Guwākholagāũ in the east to Kuipadhārā and Tamāli in the west which is shaded in grey in Figure 1. Close to the west of this region are Khām speaking villages which Gamāle speakers regard as 'significantly different' or 'periphery'. Two of these are Sheram and Ghusbāng which are also shown in Figure 1. Speakers of Sheram have also migrated to the village of Phuliban located adjacent to Sheram on the western bank of the Lungri river. Takāle, the only Khām variety to have been studied in any depth to date (Watters 2002; 2004), is spoken in the district of Rukum, a good three days walking towards the north.

The following section analyses the vowels, consonants, suprasegmentals and phonotactics of each of the three Khām varieties in turn. The three phonologies are compared in Section 3. The study concludes with a discussion of how the front rounded vowels found in Sheram and Ghusbāng relate to the labial-palatal approximants in Gamāle, and how the syllable-final plosives in Sheram may shed light on the origin of one of the prosodic elements in Takāle.

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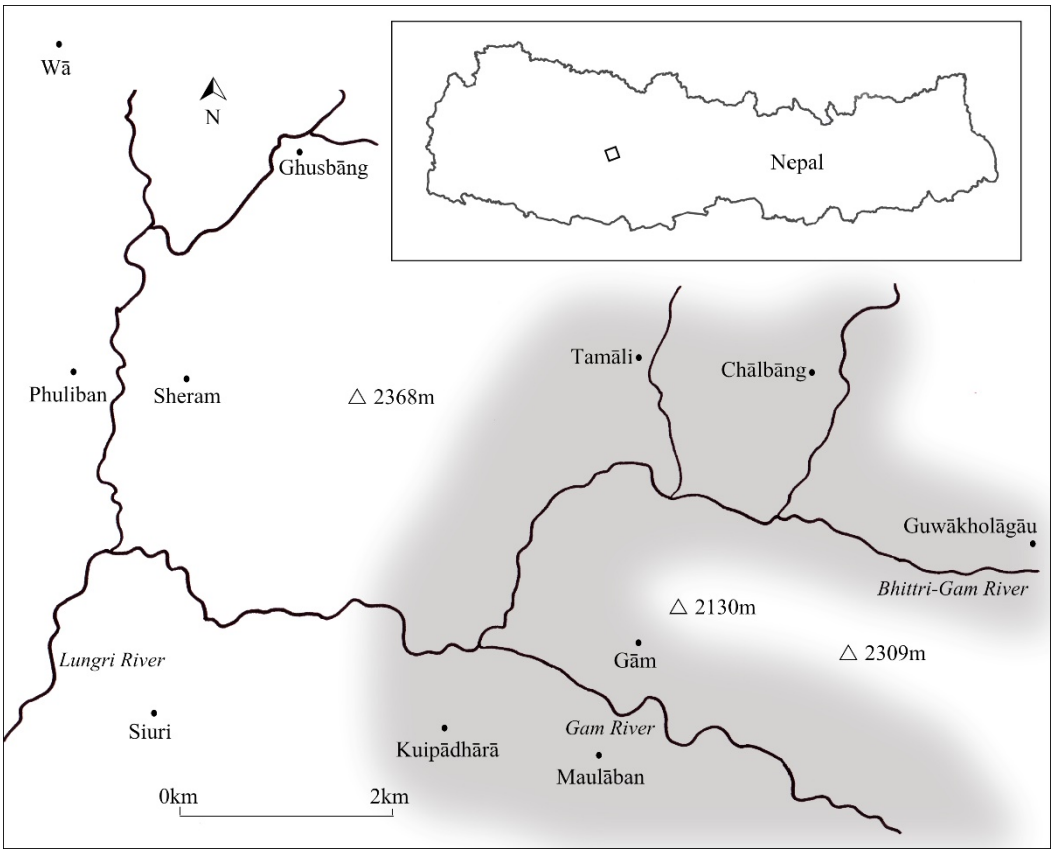
Figure 1: *Map of Gām, Sheram and Ghusbāng in Northeastern Rolpā*



2. Phonemic analysis

This section provides a description of the vowels, consonants, suprasegmentals and syllable structure of each of the three Khām varieties. For more detail of the phonology of Gamāle, and more extensive lexical evidence, cf. Wilde (2011; 2016).

The Sheram and Ghusbāng data for this study was collected in the villages of Sulichaur and Runibāng, Rolpā. Based on a corpus of 1,400 lexical items for Gamāle, 363 lexical items for Ghusbāng and 487 lexical items for Sheram were selected for elicitation. The words were chosen specifically for comparison with various phonological features found in Gamāle, including the syllable-initial voiceless nasals and lateral approximant, and, relevant for this paper, the labial-palatal approximants and the syllable-final glottal.

The phonemic analysis is mostly based on monosyllabic Tibeto-Burman cognates. Khām languages in general have borrowed heavily from Nepali. Though in most cases loan words have been modified to correspond to the Khām sound system, some differences in the syllable structure can still occur, particularly in multisyllabic words. These have not been accounted for in this paper.

2.1 Phonology of Gamāle Khām

2.1.1 Vowels

The following eight contrastive vowels have been identified:

Table 1: *Contrastive vowels in Gamāle Khām*

	Front	Central	Back
Close	i		u
Close-mid	e	ə	o
Open-mid	ɛ		
Open		ɐ	

Evidence for these vowel contrasts are shown in (1a-g).

(1a) /i/ /kiʔ-/ ‘plough’
(1b) /e/ /keʔ-/ ‘put in a slit, crack’
(1c) /ɛ/ /pɛʔ-/ ‘throw’
(1d) /ə/ /kəʔ-/ ‘cover (with a lid)’
(1e) /ɐ/ /kɐʔ-/ ‘hit dried inner fibre of a nettle or hemp plant in order to soften them’
(1f) /u/ /ku-/ ‘steal’
(1g) /o/ /koʔ-/ ‘peel’

Likewise, contrastive nasalisation has been identified on all vowels (2a-g).

(2a) /ĩ/ /kʰĩ-/ ‘obey’
(2b) /ẽ/ /kʰẽ-/ ‘finish’
(2c) /ɛ̃/ /kɛ̃ʔ-/ ‘put vermilion on (someone else)’
(2d) /ə̃/ /pə̃j-/ ‘tell’
(2e) /ɐ̃/ /gɐ̃dɐ/ ‘baby of a [pɐhɐ]-frog’
(2f) /ũ/ /gũ-/ ‘guard’
(2g) /õ/ /krõ-/ ‘join together’

Conditioned nasalisation is found on vowels which precede a nasal syllable-coda (3a), or follow voiceless nasals (3b-c).

(3a) /muŋ/ [mũŋ] ‘property of a deceased person’
(3b) /m̥o-/ [m̥õ] ‘suck up; lap up’
(3c) /m̥we/ [m̥wẽ] ‘shadow; reflection’

In words of Tibeto-Burman origin in Gamāle Khām [u]-offglides are cases of the nominalising/adjectivising suffix <-w(o)>, and thus the offglide has been interpreted as a /w/-coda (4a-e). The [i]-offglides in Tibeto-Burman cognates have been interpreted as /j/-codas in accordance with the rest of the phonotactics (5a-c). (For further discussion on the interpretation of diphthongs in Tibeto-Burman cognates versus Nepali loan words, cf. Wilde 2016:133.)

(4a) /iw/ /tĩw/ ‘short’
(4b) /ew/ /ɳe̯w(o)/ ‘sweet’
(4c) /ɐw/ /zjɐw/ ‘fodder; food’
(4d) /əw/ /də̯w/ ‘difficult’
(4e) /ow/ /gjo̯w/ ‘big’

(5a) /ɐj/ /mwɐ̯j/ ‘wound’
(5b) /əj/ /səj/ ‘fruit’
(5c) /oj/ /roj/ ‘thing’

2.1.2 Consonants
The following consonant phonemes have been identified:

Table 2: *Contrastive consonants in Gamāle Khām*

	Bilabial	Alveolar	Palatal	Velar	Glottal
Plosive	p p^h b	t t^h d		k k^h g	ʔ
Affricate		ts ts^h dz			
Fricative		s z			h
Nasal	m m̥	n n̥		ŋ	
Rhotic		r			
Approximant		l ɬ	j ɥ ɥ̊	w ʍ	

Plosives are found to contrast stem-initially in the bilabial (6a-c), alveolar (7a-c) and velar (8a-c) positions. The alveolar plosives are articulated with the tongue blade on the alveolar ridge.

(6a) /p/ /poʔ-/ ‘bind; wrap’
(6b) /p^h/ /p^hoʔ-/ ‘weigh; measure (capacity)’
(6c) /b/ /boʔ-/ ‘pull by the ear’

(7a) /t/ /tɐʔ/ ‘intestines’
(7b) /t^h/ /t^heʔ-/ ‘hear; listen’
(7c) /d/ /dɐʔ-/ ‘sting (wasp, nettle)’

(8a) /k/ /kɐʔ-/ ‘hit dried inner fibre of a nettle or hemp plant in order to soften them’
(8b) /k^h/ /k^hɐ/ ‘crumb; speck of dirt’
(8c) /g/ /gɐʔ-/ ‘sew loosely’

The following three affricates (9a-c) and three fricatives (10a-c) are contrastive syllable-initially.

(9a) /ts/ /tsɐŋ-/ ‘burn’
(9b) /ts^h/ /ts^hɐ-/ ‘graze’
(9c) /dz/ /dzɐ/ ‘utensil (kitchen)’

(10a) /s/ /sɐʔ-/ ‘dry up (of water)’
(10b) /z/ /zɐ/ ‘child’
(10c) /h/ /hɐr-/ ‘cry’

When preceding a palatal approximant or a front vowel, velar plosives tend to be articulated as palatals (11a-b), whereas alveolar affricates (12a-b) and fricatives (13a-b) tend to be pronounced as postalveolars. The same phenomenon is also found with affricates and fricatives in more northern Khām varieties (Watters 2002:19–20) and the more distantly related Magar (Grunow-Hårsta 2008:50–51).

(11a) /k^h/ > [c^h] /k^hil-/ [c^hil] ‘spit’
(11b) /k^hj/ > [c^hj] / [ç] /k^hjekɐ/ [c^hjekɐ] or [çekɐ] ‘ABL’

(12a) /ts^h/ > [tʃʰ] /ts^hil-/ [tʃʰil] ‘knead’
(12b) /dz/ > [dʒ] /dzi̯/ [dʒi̯] ‘blood; urine’

(13a) /s/ > [ʃ] /siŋ/ [ʃiŋ] ‘liver’
(13b) /z/ > [ʒ] /ziʔ-/ [ʒiʔ] ‘thatch’

In Gamāle there are three contrastive voiced nasals (14a,c,e) and two voiceless nasals (14b,d).

(14a) /m/ /mo̰-/ ‘fry (corn, nuts)’
(14b) /m̥/ /m̥o-/ ‘suck up; lap up’
(14c) /n/ /nɐʔ-/ ‘hold something with a cloth or leaf to prevent being burnt or stung’
(14d) /n̥/ /n̥ɐ-/ ‘go’
(14e) /ŋ/ /ŋɐ-/ ‘look after’

The voiced rhotic /r/ is pronounced as an alveolar trill [r] or flap [ɾ].

(15) /r/ /rɐ̰-/ ‘come’

Gamāle has two contrastive lateral approximants /l/ and /ɬ/ (16a-b) and five contrastive central approximants (17a-e).

(16a) /l/ /luŋ/ ‘stone; rock’
(16b) /ɬ/ /ɬu-/ ‘be long’

(17a) /j/ /jɐ̰-/‘fall off (e.g. ripe fruit or leaves from a tree)’
(17b) /ɻ/ /ɻɐ/ ‘sense; consciousness; spirit’
(17c) /ɻ̊/ /ɻ̊ɐ/ ‘moon’
(17d) /w/ /wɐʔ-/ ‘scoop up (water, food)’
(17e) /ʍ/ /ʍɐ/ ‘tooth’

2.1.3 Suprasegmentals
Gamāle contrasts between modal (18a) and breathy (18b) phonation.

(18a) /tso-/ ‘boil (liquid)’
(18b) /tso̤-/ ‘hit’

Vowel length is non-contrastive. For the most part also pitch is non-contrastive. A pitch distinction was encountered with any certainty only once in the corpus (19a–b).

(19a) /kuŋ^{32}/ ‘yoke (for cattle)’
(19b) /kuŋ^{53}/ ‘hole’

2.1.4 Phonotactics
There are three types of syllable onsets in Gamāle Khām: vowel onset (20a), simple consonant onset (20b), and complex consonant onset. The second slot in the consonant cluster onset can be occupied by the voiced approximants /j, w, l, r and ɻ/ (21a-e). Cases where the initial consonant is followed by a sequence of two approximants are uncommon (21f).

(20a) /ɐʔ-/ ‘hit’
(20b) /pɐʔ-/ ‘break’

(21a) /kjɐʔ-/ ‘cut with a small sickle’
(21b) /kwɐʔ-/ ‘hit with the tip of a sickle’
(21c) /kle(ʔ)-/ ‘arrive’
(21d) /kreʔ-/ ‘cut branches off a tree’
(21e) /zɻɐ̰ʔ/ ‘scarecrow’
(21f) /kljɐŋ/ ‘body’

A prothetic vowel, such as the possessive prefix /ə-/ '3SG' in (22a), often links to a complex syllable onset which has an initial /r/. In some cases the cluster can be pronounced independently (22b), or the initial /r/ can be dropped altogether (22c).

(22a) <ə-rmi> → /ər.mi/ '3SG-tail' ('its tail')
(22b) /rjɐ/ 'kind of wild goat-antelope, Serow'
(22c) /(r)ɥe/ 'husband'

The syllable coda can be occupied by the sonorants /m, n, ŋ, j, w, l and r/ and the glottal stop /ʔ/ as shown in examples (23a-h) respectively.

(23a) /nɐm/ 'ground'
(23b) /lɐn/ 'blacksmith'
(23c) /pɐŋ/ 'ripen'
(23d) /mwe̤j/ 'wound'
(23e) /tsɐw/ 'good'
(23f) /zɐl-/ 'pour from one vessel into another'
(23g) /gwɐr-/ 'cheat'
(23h) /kwɐʔ-/ 'hit with the tip of a sickle'

A summary of the distribution of the Gamāle Khām consonants is presented in the following table (C_1 = syllable-initial position, C_2 = second position in syllable-initial consonant clusters, C_3 = third position in syllable-initial consonant clusters, C_{coda} = syllable coda):

Table 3: *Summary of the distribution of Gamāle Khām consonants*

	Position in syllable			
	C_1	C_2	C_3	C_{coda}
k	✓			
kʰ	✓			
g	✓			
t	✓			
tʰ	✓			
d	✓			
p	✓			
pʰ	✓			
b	✓			
ts	✓			

	Position in syllable			
	C_1	C_2	C_3	C_{coda}
tsʰ	✓			
dz	✓			
s	✓			
z	✓			
m	✓			✓
m̥	✓			
n	✓			✓
n̥	✓			
ŋ	✓			✓
r	✓	✓		✓

	Position in syllable			
	C_1	C_2	C_3	C_{coda}
l	✓	✓		✓
ɬ	✓			
w	✓	✓		✓
ʍ	✓			
ɥ	✓	✓		
ɥ̊	✓			
j	✓	✓	✓	✓
h	✓			
ʔ				✓

2.2 Phonology of Sheram Khām

2.2.1 Vowels
The following eight contrastive vowels have been identified:

Table 4: *Contrastive vowels in Sheram Khām*

	Front		Central	Back
	Unrounded	Rounded		
Close	i	y		u
Close-mid	e	ø	ə	o
Open-mid				
Open			ɐ	

Evidence for these vowel contrasts are shown in (24a-h).

(24a) /i/ /ki/ ‘feces’
(24b) /y/ /jyt-/ ‘meet’
(24c) /e/ /ke-/ ‘arrive’
(24d) /ø/ /jøt-/ ‘sell’
(24e) /ɐ/ /kɐ̣/ ‘dog’
(24f) /ə/ /kəp-/ ‘cover (with a lid)’
(24g) /o/ /kok-/ ‘move’
(24h) /u/ /kut/ ‘hand’

The front rounded vowels in Sheram are generally restricted to following /j/ or its voiceless counterpart /ç/. However, the palatal should not be seen as conditioning the following vowel, since other front (25a-b), central (25c) and back (25d-e) vowels also occur in this position (except for central /ə/).

(25a) /i/ /jɨŋ/ ‘ox (castrated)’
(25b) /e/ /jel-/ ‘winnow’
(25c) /ɐ/ /jɐ-/ ‘give’
(25d) /o/ /jo/ ‘husband’
(25e) /u/ /ju/ ‘yam’

Contrastive nasalisation has been identified in four vowels (26a-d). Nasalisation is expected to be found in conjunction with all vowels; the lack of /ỹ/, /ø̃/, /ə̃/ and /ũ/ is likely to be due to gaps in the data.

(26a) /ĩ/ /hĩ/ ‘pus’
(26b) /ẽ/ /ẽ-/ ‘defecate’
(26c) /ɐ̃/ /hɐ̃-/ ‘go’
(26d) /õ/ /mõ̰-/ ‘fry’

Conditioned nasalisation is found in vowels preceding a nasal consonant coda (27a), or following a voiceless nasal onset (27b).

(27a) /ʍɐn/ [ʍɐ̃n] ‘lower’
(27b) /n̥ək-/ [n̥ə̃k] 'look'

All potential vowel sequences with an [i]-offglide (28a-c), or an [u]-offglide (29a-c) in Tibeto-Burman cognates have been interpreted as VC-sequences. This corresponds with the syllable structure described in Section 2.2.4. The /w/-codas are cases of the nominalising/adjectivising suffix <-w(o)>

(28a) /ej/ /sej/ ‘fruit’
(28b) /əj/ /pəj-/ ‘cut down (tree)’
(28c) /ɐ̃j/ /sɐ̃j-/ ‘laugh’

(29a) /ɐw/ /kʰinɐw/ ‘what kind’
(29b) /ɐw/ /tsɐw/ ‘good’
(29c) /ow/ /jow/ ‘sweet; sour’

The interpretation of the vowel sequences /yɐ/ and /yɐ̣/ is uncertain. The epenthetic glide in (30a,c) seems to signal a syllable break between the vowels, though the CCV-structure of (30b,d) would have a closer correspondence to the synchronic phonotactics.

(30a) CV.V /jyɐ/ [jy(w)ɐ] ‘sense; consciousness’
(30b) CCV /jqɐ/ ‘sense; consciousness’
(30c) CV.V /jy̯ɐ̯/ [jy̯(w̯)ɐ̯] ‘thigh’
(30d) CCV /jqɐ̯/ ‘thigh’

2.2.2 Consonants
The following consonant phonemes have been identified:

Table 5: *Contrastive consonants in Sheram Khām*

	Bilabial	Alveolar	Palatal	Velar	Glottal
Plosive	p p^h b	t t^h d		k k^h g	
Affricate		ts ts^h dz			
Fricative		s z			h
Nasal	m (m̥)	n n̥		ŋ	
Rhotic		r			
Approximant		l ɬ	j ç (ů)	w (ʍ)	

Plosives contrast in the bilabial (31a-c), alveolar (32a-c) and velar (33a-c) positions. The alveolar plosives are articulated with the tongue blade on the alveolar ridge.

(31a) /p/ /pɐk-/ ‘break (TR)’
(31b) /p^h/ /p^hək-/ ‘pay; measure’
(31c) /b/ /bɐ̯k-/ ‘share; divide’

(32a) /t/ /tət-/ ‘cut (cloth)’
(32b) /t^h/ /t^hət-/ ‘listen’
(32c) /d/ /dɐ-/ ‘do’

(33a) /k/ /kəp-/ ‘cover (with a lid)’
(33b) /k^h/ /k^hɐp/ ‘jawbone’
(33c) /g/ /gəp/ ‘needle’

The velar plosives tend to be fronted when preceding a front vowel (34a) or a palatal approximant (34b-c).

(34a) /k^h/ > [c^h] /k^hik-si-/ [c^hiksi] ‘apply oil to’
(34b) /kj/ > [cj] /kjek/ [cjek] ‘type of frog’
(34c) /gj/ > /ɟj/ /gjɐ̯ŋ/ [ɟjɐ̯̃ŋ] ‘neck’

The following three affricates (35a-c) and three fricatives (36a-c) are contrastive.

(35a) /ts/ /tsok/ ‘cheekbone’
(35b) /ts^h/ /ts^hɐk-/ ‘suck up; lap up’
(35c) /dz/ /dzɐt-/ ‘make’

(36a) /s/ /sɐt/ ‘type of comb’
(36b) /z/ /zok-/ ‘run’
(36c) /h/ /hɐt-/ ‘take out’

Sheram has three voiced nasals (37a,c,e) and two voiceless nasals (37b,d).

(37a) /m/ /mɐnuŋ/ 'cat'
(37b) /m̥/ /m̥oŋ/ 'moustache'
(37c) /n/ /nɐp/ 'nasal mucus'
(37d) /n̥/ /n̥ɐ/ 'fermented grain mass'
(37e) /ŋ/ /ŋɐ/ '1SG[PRO]'

The voiced rhotic /r/ is pronounced as an alveolar trill [r] or flap [ɾ].

(38) /r/ /rək-/ 'weave'

Sheram has two contrastive lateral approximants: /l/ and /ɬ/ (39a-b).

(39a) /l/ /lɐ/ 'afternoon; day'
(39b) /ɬ/ /ɬɐ/ 'leaf'

At least four contrastive central approximants were encountered: /j/, /ç/, /w/ and /ʍ/ (40a-d).

(40a) /j/ /jɐ-/ 'give'
(40b) /ç/ /çek/ 'fried grain'
(40c) /w/ /wɐ/ 'axe'
(40d) /ʍ/ /ʍɐ/ 'tooth'

A possible fifth approximant, the voiceless labial-palatal /ů̧/, was found in two words (41a-b). It is possible that these are loan words from Gamāle, as speakers report that it is more common to use the synonyms in (42a-b). The voiced labial-palatal /ų/ was not found in the data.

(41a) /ů̧/ /ů̧ɐ/ 'monkey'
(41b) /ů̧/ /ů̧ɐ/ 'moon'

(42a) /jug/ 'monkey'
(42b) /dzun/ 'moon' (Nepali)

2.2.3 Suprasegmentals
Modal and breathy phonation are contrastive (43a-b), whereas vowel length and pitch are not.

(43a) modal /ble/ 'lip'
(43b) breathy /blɐ̰-/ 'fly'

2.2.4 Phonotactics
The syllable onset can be a simple vowel (44a), a single consonant (44b), or a consonant cluster. The second slot in the consonant cluster can be occupied by the voiced approximants /r/ (45a), /l/ (45b), /j/ (45c) and /w/ (45d), though the most common are /j/ and /w/.

(44a) #V /ɐp-/ 'hit'
(44b) #C /pɐk-/ 'break (TR)'
(45a) #Cr /prɐki/ 'tomorrow'
(45b) #Cl /plɐt-/ 'take off (something wrapped)'
(45c) #Cj /pjet-/ 'milk (a cow)'
(45d) #Cw /bwɐ-/ 'walk'

The voiceless unaspirated plosives /p/, /t/ and /k/ also occur in syllable-final position, as shown in (33a-c), (32a-b) and (31a-c) respectively. Additionally, the following six sonorants can occupy the syllable coda: /m/, /n/, /ŋ/, /r/, /l/ and /j/ (46a-f). The phoneme /w/ is found syllable-finally as the reduced form of the nominalising/adjectivising suffix <-w(o)> 'NMLZ' (46g).

(46a) m# /jem/ 'road; path'
(46b) n# /min/ 'name'
(46c) ŋ# /dʊŋ (gul)/ 'King cobra; Ophiophagus hannah'
(46d) r# /sir/ 'tick'
(46e) l# /gəl/ 'Eurasian wild boar; Sus scrofa'
(46f) j# /kəj-/ 'chew'
(46g) w# /jow/ 'sweet/sour'

A summary of the distribution of the Sheram Khām consonants is presented in the following table (C_1 = syllable-initial position, C_2 = second position in syllable-initial consonant clusters, C_{coda} = syllable coda):

Table 6: *Summary of the distribution of Sheram Khām consonants*

	Position in syllable		
	C_1	C_2	C_{coda}
k	✓		✓
k^h	✓		
g	✓		
t	✓		✓
t^h	✓		
d	✓		
p	✓		✓
p^h	✓		
b	✓		
ts	✓		

	Position in syllable		
	C_1	C_2	C_{coda}
ts^h	✓		
dz	✓		
s	✓		
z	✓		
m	✓		✓
(m̥)	(✓)		
n	✓		✓
n̥	✓		
ŋ	✓		✓
r	✓	✓	✓

	Position in syllable		
	C_1	C_2	C_{coda}
l	✓	✓	✓
ɬ	✓		
w	✓	✓	✓
(ʍ)	(✓)		
(ʟ̥)	(✓)		
j	✓	✓	✓
ç	✓		
h	✓		

2.3 Phonology of Ghusbāng Khām

2.3.1 Vowels

The following eight contrastive vowels have been identified:

Table 7: *Contrastive vowels in Ghusbāng Khām*

	Front		Central	Back
	Unrounded	Rounded		
Close	i	y		u
Close-mid	e	ø	ə	o
Open-mid				
Open			ɐ	

Evidence for these vowel contrasts are as follows:

(47a) /i/ /tsi-/ 'tear'
(47b) /y/ /jy-/ 'leak'
(47c) /e/ /ɥe-/ 'sell'
(47d) /ø/ /jø-/ 'shave; sheer'
(47e) /ɐ/ /bɐ-/ 'walk'
(47f) /ə/ /dzə̯-/ 'pour from one container into another'

(47g) /o/ /go-/ ‘swell’
(47h) /u/ /du-/ ‘collect’

The vowels /y/ and /ø/ only occur in syllable-final position following the palatal approximant /j/ (47b,d) or the glottal fricative /h/ (48). Even so, since also other front, central and back vowels follow these two consonants, as (49a-e) and (50a-e) show, there is evidence to posit the phonemic status of /y/ and /ø/ *in this environment*.

(48) /hy/ /hy-/ ‘burn (TR)’

(49a) /ji/ /jn̩/ ‘ox (castrated)’
(49b) /je/ /jem/ ‘path; road’
(49c) /jɐ/ /jɐ-/ ‘give’
(49d) /jo/ /jo̯w/ ‘sweet; sour’
(49e) /ju/ /ju̯/ ‘monkey’

(50a) /hi/ /hĩ/ ‘nose’
(50b) /he/ /her-/ ‘sieve’
(50c) /hə/ /həj-/ ‘take out’
(50d) /hɐ/ /hɐ̯̃/ ‘face’
(50e) /ho/ /hoŋ/ ‘distant’

Contrastive nasalisation has been identified in four vowels (51a-d). All vowels are expected to have nasalised counterparts: the lack of /ỹ/, /ø̃/, /ə̃/ and /õ/ is likely to be due to gaps in the data.

(51a) /ĩ/ /hĩ/ ‘pus’
(51b) /ẽ/ /ẽ-/ ‘defecate’
(51c) /ɐ̃/ /hɐ̯̃/ ‘face’
(51d) /ũ/ /gũ-/ ‘guard’

Conditioned nasalisation is also found in vowels preceding a nasal consonant coda (52a), or following a voiceless nasal onset (52b).

(52a) /kuŋ/ [kũŋ] ‘hole'
(52b) /n̥əj/ [n̥ə̃j] ‘friend’

All potential vowel sequences in Tibeto-Burman cognates which have an [i]-offglide (53a-c), or an [u]-offglide (54a-d) have been interpreted as VC-sequences. This is consistent with the structure of the syllable coda as described in Section 2.3.4. The /w/-codas are cases of the nominalising/adjectivising suffix <-w(o)>

(53a) /ej/ /swej/ ‘fat’
(53b) /əj/ /gəj-/ ‘sing’
(53c) /ɐj/ /mɐ̯j/ ‘wound’

(54a) /iw/ /gjiw/ ‘heavy; grievous’
(54b) /ew/ /tunew/ ‘short’
(54c) /ɐ̃w/ /plɐ̃w/ ‘white’
(54d) /ow/ /gjo̯w/ ‘big’

2.3.2 Consonants

The following consonant phonemes have been identified:

Table 8: *Contrastive consonants in Ghusbāng Khām*

	Bilabial	Alveolar	Palatal	Velar	Glottal
Plosive	p pʰ b	t tʰ d		k kʰ g	
Affricate		ts tsʰ dz			
Fricative		s z			h
Nasal	m	n n̥		ŋ	
Rhotic		r			
Approximant		l (ɬ)	j (ç) ɥ (ů)	w (ʍ)	

Plosives contrast stem-initially in the bilabial (55a-c), alveolar (56a-c) and velar (57a-c) positions. The alveolar plosives are articulated with the tongue blade on the alveolar ridge.

(55a) /p/ /pəj-/ ‘tell’
(55b) /pʰ/ /pʰu/ ‘belly’
(55c) /b/ /bəj-/ ‘take for a walk’

(56a) /t/ /təj-/ ‘press’
(56b) /tʰ/ /tʰəj-/ ‘listen’
(56c) /d/ /dɐ-/ ‘do’

(57a) /k/ /kəssen/ ‘many’
(57b) /kʰ/ /kʰəŋ/ ‘leg’
(57c) /g/ /gə/ ‘needle’

The following three affricates (58a-c) and three fricatives (59a-c) are contrastive.

(58a) /ts/ /tsɐw/ ‘good’
(58b) /tsʰ/ /tsʰɐŋ-/ ‘burn (ITR)’
(58c) /dz/ /dzəj-/ ‘make’

(59a) /s/ /sɐpi/ ‘salt’
(59b) /z/ /zɐ/ ‘child’
(59c) /h/ /hɐr/ ‘cow’

Velar plosives tend to palatalise when preceding a front vowel or a palatal approximant (60), whereas affricates (61a-b) and fricatives (62a-b) tend to be pronounced as postalveolars in this position.

(60) /gj/ > [ɟj] /gjẹŋ/ [ɟjẽ̟ŋ] 'neck'

(61a) /tsʰ/ > [tʃʰ] /tsʰi̯ŋ/ [tʃʰi̯ŋ] ‘rope’
(61b) /dz/ > [dʒ] /dzi̯/ [dʒi̯] ‘blood; urine’

(62a) /s/ > [ʃ] /siŋ/ [ʃiŋ] ‘tree; firewood’
(62b) /z/ > [ʒ] /zim(d)zɐ/ [ʒim(d)zɐ] ‘small’

Three voiced nasals (63a-b,d) and one voiceless nasal (63c) have been identified. The lack of the voiceless bilabial nasal may be due to a gap in the data, though it should be noted that the voiceless bilabial nasal in the Gamāle word (64a) is pronounced as a voiced nasal in its Ghusbāng equivalent (64b).

(63a) /m/ /mɐnu/ ‘cat’
(63b) /n/ /nəm/ ‘sky’
(63c) /n̥/ /n̥əm/ ‘band for a load on forehead’
(63d) /ŋ/ /ŋəl-/ ‘fall to sleep’

(64a) /m̥/ /m̥oŋ/ ‘moustache’ (Gamāle)
(64b) /m/ /moŋ/ ‘moustache’ (Ghusbāng)

The intervocalic voiceless nasal /n̥/ splits to a voiced nasal and breathy voice on the following vowel. There also appears to be process of resyllabification to [n.V̤], as shown in (65a-b).

(65a) /n̥/→[n.V̤] /ɐ-n̥əj/ [ɐn.ˈɦə̰j] 1SG-friend (‘my friend’)
(65b) /n̥/→[n.V̤] /ɐ-n̥ɐ-ŋ/ [ɐn.ˈɦɐ̰ŋ] 1SG-go-1SG (‘I go’)

The rhotic (66) is articulated as an alveolar trill [r] or a flap [ɾ].

(66) /r/ /rɐ̤-/ ‘come’

Two potentially contrastive lateral approximants have been encountered (67a-b).

(67a) /l/ /lɐ/ ‘afternoon; day’
(67b) /ɬ/ /ɬɐ/ ‘leaf’

The voiceless lateral has preliminarily been considered to be a phoneme in the Ghusbāng consonant inventory, though its status is unclear. Even in its non-inflected form, it behaves in a somewhat similar manner to the voiceless nasal described in (65a-b). Moreover, there is a degree of inter-speaker variation in the articulation of the lateral: in addition to the fricative pronunciation, it is also realised as a breathy lateral [l̤], or a [ɦl̤]-sequence with the onset of the phonation preceding the onset of the lateral articulation (68a-b). Both of these free variants cause breathy voice on the following vowel. Interestingly, some Ghusbāng speakers conceive /ɬ/ to be a /sj/-sequence, irrespective of the lateral articulation.

(68a) /ɬ/ /ɬɐ/ [ɬɐ ~ (ɦ)l̤ɐ̤] ‘leaf’
(68b) /ɬ/ /ɬu/ [ɬu ~ (ɦ)l̤ṳ] ‘long; tall’

At least three central approximants are contrastive (69a-c).

(69a) /j/ /jɐ-/ ‘give’
(69b) /ɥ/ /ɥe/ ‘husband’
(69c) /w/ /wɐ/ ‘axe’

The status of the voiceless palatal approximant /ç/ as a fourth approximant is uncertain. On the one hand, one might expect to find a voiceless palatal approximant, since in Khām varieties related to Gamāle there is a tendency for voiced sonorants (except for the rhotic) to have voiceless counterparts. On the other hand, only one case of the voiceless palatal was found in the data (70a). Based on the corresponding words in Sheram (70b) and Gamāle (70c), where the onsets are voiceless approximants, /ç/ has been considered to be a possible phoneme in Ghusbāng also.

(70a) /ço/ ‘fried grain’ (Ghusbāng)
(70b) /çek/ ‘fried grain’ (Sheram)
(70c) /ɧoʔ/‘fried grain’ (Gamāle)

Likewise, a further two possible approximants have only been encountered in one word per phoneme: the voiceless labial-palatal /ɧ/ (71a), and the voiceless labial-velar /ʍ/ (71b). As above, /ɧ/ and /ʍ/ have

preliminarily been considered to belong to the Ghusbāng consonant inventory for phonological symmetry, and because they correspond to /ų̊/ and /ʍ/ in the same words in the central Gamāle variety (72a-b).

(71a) /ų̊/ /ų̊i-/ ‘split’ (Ghusbāng)
(71b) /ʍ/ /ʍɐ/ ‘tooth’ (Ghusbāng)

(72a) /ų̊/ /ų̊i-/ ‘split’ (Gamāle)
(72b) /ʍ/ /ʍɐ/ ‘tooth’ (Gamāle)

2.3.3 Suprasegmentals
Two contrastive phonation types were identified: modal (73a) and breathy (73b).

(73a) modal /ŋɐ/ ‘1SG’
(73b) breathy /ŋɐ̤/ ‘fish’

Words such as (74a-b) were elicited with a significantly higher pitch. Whether this higher pitch is contrastive requires further study. Particularly its relation to lost obstruent codas will need to be taken into consideration (e.g. Matisoff 1989:148; 2003:313-314 concerning the influence of lost plosive finals on prosodic features). Vowel length was not found to be contrastive.

(74a) [jy^{5}-] or [jy^{53}-] ‘leak’
(74b) [le^{5}-] or [le^{53}-] ‘lick’

2.3.4 Phonotactics
The syllable onset can be a simple vowel (75a), a single consonant (75b), or a consonant cluster. The second slot in the consonant cluster can be occupied by the voiced approximants /r/, /l/, /j/, /ɥ/ and /w/ (76a-e), though the most common phonemes to occur in this slot are /j/ and /w/.

(75a) #V /o-/ ‘drink’
(75b) #C /go̤-/ ‘dig; bury’

(76a) #Cr /trɐŋ im-/ ‘turn over while sleeping’
(76b) #Cl /plɐ̃w(o)/ ‘white’
(76c) #Cj /bje̤/ ‘basket’
(76d) #Cɥ /nɥi/ ‘breast’
(76e) #Cw /gwə̤j-/ ‘make a hole’

The syllable coda has sonorants /m/, /n/, /ŋ/, /r/, /l/, /j/ and /w/ (77a-g). The /w/ coda in (76b) and (77g) is the reduced form of the nominalising/adjectivising suffix <-w(o)> ‘NMLZ’.

(77a) m# /də̤m-/ ‘heap up’
(77b) n# /gə̤n/ ‘hammer’
(77c) ŋ# /bɐ̤ŋ/ ‘splinter of wood which is burnt to produce light’
(77d) r# /sje̤r/ ‘old-aged’
(77e) l# /gul/ ‘snake’
(77f) j# /təj-/ ‘press’
(77g) w# /gjiw/ ‘heavy; grievous’

Though a syllable-final plosive is generally not permitted, four such cases were found in the data. Based on the overall phonotactics of Ghusbāng, these have been considered as loan pronunciations. (For a similar discussion on stem-final plosives in Gamāle, cf. Wilde 2011:286.)

(78a) /tsʰɐk-/ ‘drink (by pouring into mouth)’ (Nepali loan)
(78b) /tsok/ ‘cheek bone’
(78c) /kʰɐp/ ‘jawbone’
(78d) /tsop/ ‘pestle’

A summary of the distribution of the Ghusbāng Khām consonants is presented in the following table (C_1 = syllable-initial position, C_2 = second position in syllable-initial consonant clusters, C_{coda} = syllable coda):

Table 9: *Summary of the distribution of Ghusbāng Khām consonants*

	Position in syllable		
	C_1	C_2	C_{coda}
k	✓		
kʰ	✓		
g	✓		
t	✓		
tʰ	✓		
d	✓		
p	✓		
pʰ	✓		
b	✓		
ts	✓		

	Position in syllable		
	C_1	C_2	C_{coda}
tsʰ	✓		
dz	✓		
s	✓		
z	✓		
m	✓		✓
n	✓		✓
ɳ̊	✓		
ŋ	✓		✓
r	✓	✓	✓
l	✓	✓	✓

	Position in syllable		
	C_1	C_2	C_{coda}
(ɬ)	(✓)		
w	✓	✓	✓
(ʍ)	(✓)		
ɥ	✓	✓	
(ɧ̊)	(✓)		
j	✓	✓	✓
(ç)	(✓)		
h	✓		

3. Phonological comparison

This section compares the vowels, consonants, suprasegmentals and phonotactics of Gamāle, Sheram and Ghusbāng Khām described in the previous section. Various diachronic issues are raised when relevant to the comparison.

3.1 Vowels

There are two significant differences in the vowel inventories of the three Khām varieties: namely the front unrounded open-mid vowel /ɛ/, and the front rounded vowels /y/ and /ø/.

Firstly, phoneme /ɛ/ occurs in Gamāle, where it is presumably a reflex of Proto-Khām *-t still present in Sheram (cf. also Watters 2002:30; 2004:11). The loss of *-t has evolved somewhat consistently into /əj/ in Ghusbāng, similar to varieties of Western Parbate such as Takāle (79a-d). It would seem that the Gamāle /ɛ/ is the result of a further process whereby the central vowel /ə/ has been fronted by the palatal glide: /əj/ > /ɛ/.

		Sheram	Ghusbāng	Takāle	Gamāle	
(79a)	/ɛ/	/sət-/	/sə̯j-/	/sə̯j:-/	/sɛ̯ʔ-/	‘kill’
(79b)	/ɛ/	/ŋət/	/ŋə̯j/	/ŋə̯j/	/ŋɛ̯̃/	‘head’
(79b)	/ɛ/	/gwɐt-/	/gwə̯j-/	/gwɐ̯:-/	/gwɛ̯ʔ-/	‘make a hole’
(79d)	/ɛ/	-	-	/rə̯̃j:-/	/rɛ̯̃-/	‘appear’

Secondly, though the two front rounded vowels /y/ (80a-d) and /ø/ (81a-b) which occur in Sheram and Ghusbāng are not found in Gamāle, they correspond consistently to the Gamāle labial-palatal approximants. Conversely, in the equivalent Takāle syllables there is no [+FRONT, +ROUND] feature in the syllable onset, nucleus or coda.

		Sheram	Ghusbāng	Gamāle	Takāle	
(80a)	/y/	/hip-/	/hy-/	/ʯĩʔ-/	/hip-/	‘burn’
(80b)	/y/	/jyt-si-/	/jy-si-/	/ɥi̱-si/	/ju:-si-/	‘flatulate’
(80c)	/y/	/çy/	-	/ʯi/	-	‘Himalayan nettle’
(80d)	/y/	/jyɐ/	-	/ɥɐ/	-	‘sense; consciousness’
(81a)	/ø/	/jõ-/	/jə̃-/	/ɥẽ-/	/jen-/	‘shave, sheer’
(81b)	/ø/	/jøt-/	/ɥe/	/ɥeʔ-/	/jo:-/	‘sell’

3.2 Consonants

No differences were encountered in the obstruent or fricative series, apart from the syllable-final glottal stop. The Gamāle glottal stop coincides with the Sheram syllable-final plosives -p, -t and -k which are likely to represent the Proto-Khām form. The syllable-final glottal stop was not found in Ghusbāng, and the syllable-final plosive was found only rarely. These sound changes are discussed in more detail in Sections 3.4 and 4.2.

Sheram is similar to Gamāle with three voiced nasals (82a-c) and two voiceless nasals (83a-d). Ghusbāng has three voiced nasals /m, n and ŋ/, one voiceless nasal /n̥/. The lack of a voiceless bilabial nasal /m̥/ may be due to a gap in the data. As noted by Watters (2005:342,344), it is likely that most Gamāle voiceless sonorants originate from devoicing caused by a Proto-Khām syllable-initial *s-. This is related to the same sound change in Tibeto-Burman in general (Matisoff 2003:14-15,37).

		Sheram	Ghusbāng	Gamāle	
(82a)	/m/	/mɐnuŋ/	/mɐnu/	/mɐnuŋ/	‘cat’
(82b)	/n/	/nun/	/nɥi/	/n(ɥ)ẽ/	‘woman’s breast’
(82c)	/ŋ/	/ŋət/	/ŋə̱j/	/ŋə̱̃/	‘head’

		Sheram	Ghusbāng	Gamāle	
(83a)	/n̥/	/n̥ɐŋ-/	/n̥əj-/	/n̥e-/	‘snatch; take away’
(83b)	/n̥/	/n̥ɐ/	/nɐkən/	/n̥ɐ/	‘grain mass (when producing beer)’
(83c)	/n̥/	/nəm-/	-	/n̥əŋ-/	‘smell’
(83d)	/m̥/	/m̥oŋ/	/moŋ/	/m̥oŋ/	‘moustache’

As described in (65a-b) and (68a-b), there is a noticeable tendency in Ghusbāng for words with voiceless nasal and voiceless lateral onsets to revert to breathy voice when inflected. Apart from this process, the rhotic and lateral phonemes function similarly in all three varieties (84a-c). There is an affiliation between /ɬ/ in Southern Khām and /kʰ(j)/ in Western Parbate (84c-e) (cf. also Watters 2004:10).

		Sheram	Ghusbāng	Gamāle	Takāle	
(84a)	/r/	/rɐk-/	/rɐ-/	/rɐʔ-/	/rɐ:-/	‘scatter’
(84b)	/l/	/lo/	/lo/	/lo/	/lo/	‘cane mat’
(84c)	/ɬ/	/ɬɐ/	[ɬɐ ~ (ɦ)l̤ɐ̤]	/ɬɐ/	/kʰjɐ/	‘leaf’
(84d)	/ɬ/	/ɬu/	[ɬu ~ (ɦ)l̤ṳ]	/ɬu/	/kʰjo/	‘long; tall’
(84e)	/ɬ~h~ç/	/ç~hepɐ/	/hepɐ/	/ɬ~hepɐ/	/kʰepɐ/	‘male, man’

The voiceless palatal approximant /ç/ was found in three words in Sheram (85a-c), and in one word in Ghusbāng (85c). All of these cases are related to the Gamāle voiceless labial-palatal approximant /ʯ/.

		Sheram	Ghusbāng	Gamāle	
(85a)	/ç/	/çyk-/	-	/ʯiʔ-/	‘teach’
(85b)	/ç/	/çy/	-	/ʯi/	‘Himalayan nettle’
(85c)	/ç/	/çek/	/ço/	/ʯoʔ/	‘fried beans’

The voiceless approximant /ʍ/ is not common in Sheram or Ghusbāng. The voiced approximant /ɥ/ is found more frequently in Ghusbāng, but is missing altogether in Sheram. The voiceless counterpart /ů/ is rare in both varieties: words containing the labial-palatal /ů/ in Sheram are reported to be used less often than the synonyms and loan words mentioned in brackets in (86d-e).

		Sheram	Ghusbāng	Gamāle	Takāle	
(86a)	/ʍ/	/ʍɐ/	/ʍɐ/	/ʍɐ/	/hɐ/	‘tooth’
(86b)	/ʍ/	/ʍɐn/	-	/ʍɛ̃/	-	‘lower; beneath’
(86c)	/ů/	/hy-/	/ůi-/	/ůi-/	(/sẹ-/)	‘split’
(86d)	/ů/	/ůɐ/ (/dzun/)	(/sjɐwəj/)	/ůɐ/	(/sjᵾwəj/)	‘moon’
(86e)	/ů/	/ůɐ/ (/jʉg/)	(/jʉ/)	/ůɐ/	(/jʉ/)	‘monkey’

Cases such as (86d-e) in Sheram lead one to question whether phonemes occurring with particularly low frequency in Sheram and Ghusbāng could be loans from central Gamāle, or whether they are vestiges of contrasts which were more common but which are being lost in the synchronic phonology. These would include /m̥/, /ů/ and /ʍ/ for Sheram, and /ɬ/, /ç/, /ů/ and /ʍ/ for Ghusbāng. The question can not be answered in this paper, but each of those phonemes has been marked in brackets in the corresponding consonant charts in Section 2.

3.3 Suprasegmentals

All three Khām varieties contrast between modal and breathy phonation (87a-b).

		Sheram	Gamāle	Ghusbāng	
(87a)	modal	/jɐ-/	/jɐ-/	/jɐ-/	‘give’
(87b)	breathy	/jᵾ/	/jᵾ/	/jᵾ/	‘mouth’

There is a tendency for Sheram syllables which have a sonorant initial and a plosive final to correspond to a breathy voiced nucleus when the plosive is lost in Gamāle (88a-d).

	Sheram	Gamāle	Ghusbāng	
(88a)	/mok-/	/mõʔ-/	-	‘hide’
(88b)	/mjẽk-/	/mẽʔ-/	-	‘forget’
(88c)	/mwɐ(t)-/	/mwᵾʔ-/	-	‘lose’
(88d)	/jyt-si-/	/ɥi̱-si-/	/jy-si-/	‘flatulate’

Contrastive tone has not been encountered, though a more comprehensive analysis of Ghusbāng prosody would be needed to ascertain the affect that the loss of the syllable-final plosives may have had.

3.4 Phonotactics

For the most part the three Khām varieties have a similar syllable onset structure. The onset can be a simple vowel (89a), a single consonant (89b), or a consonant cluster. The second slot in the consonant cluster can be occupied by the voiced approximants /j/, /w/, /l/, /r/ and /ɥ/, though the most frequent occupants of this position are /j/ (89c) and /w/ (89d). Sheram and Ghusbāng do not feature triple-consonant onsets, and even in Gamāle these cases are rare (89e).

		Gamāle	Sheram	Ghusbāng	
(89a)	#V	/o-/	/o-/	/o-/	‘drink’
(89b)	#C	/gᵾ-/	/gᵾ-/	/gᵾ-/	‘dig; bury’
(89c)	#CC	/gjᵾŋ/	/gjᵾŋ/	/gjᵾŋ/	‘neck’
(89d)	#CC	/gwɐr-/	/gwɐr-/	/wɐr-/	‘say’
(89e)	#CCC	/kljɐŋ/	/kjɐŋ/	/kjɐŋ/	‘body’

Minor differences also occur in the syllable onset. Breaking of syllable clusters with an epenthetic /ə/ is found particularly in Ghusbāng (90a-b), though initial clusters do still exist even in that variety too, as examples (89c,e) and (90c) show. Variation in the initial clusters is also found (90d-e).

		Sheram	Gamāle	Ghusbāng	
(90a)	#CC > #CVC	/blet-/	/bleʔ-/	/bəle-/	‘break’
(90b)	#CC > #CVC	/pre/	/pre/	/pəre/	‘vagina’
(90c)	#CC	/kre-/	/kre-/	/kre-/	‘be hungry’
(90d)	#Cl ~ #Cj	/kjok-/	/klo̱ʔ-/	-	‘catch’
(90e)	#Cl ~ #Cj	/kjet-/	/kle̱(ʔ)-/	-	‘break (TR)’

The Proto-Khām syllable-initial *r- which is attested in some Gamāle nouns (as shown in 22a-c) has been lost in Sheram and Ghusbāng altogether (91a-c). This syllable-initial is also found in the related language Magar, and has been equated by Matisoff (2003:128) with a so-called Proto-Tibeto-Burman *r- prefix. The derivational function of *r- (at least with nouns) is questionable, and in Proto-Khām it is more likely to have functioned simply as the initial of a complex syllable onset.

		Gamāle	Sheram	Ghusbāng	
(91a)	*r-	/ə-rmi/	/ə-mi/	/ə-mi/	‘3SG-tail’ (‘its tail’)
(91b)	*r-	/(r)qɐ̱/	/jyɐ̱/ or /jqɐ̱/	/sjɐ/	‘thigh’
(91c)	*r-	/(r)qe/	/jo/	/qe/	‘husband’

A major difference in the syllable coda is that whereas Sheram permits the plosives /p, t and k/ in the coda, Gamāle has reduced these to a glottal stop, and Ghusbāng appears to have lost them altogether (92a-c).

		Sheram	Gamāle	Ghusbāng	
(92a)	p#	dụp-	dụʔ-	dụ-	‘strike with the head; butt’
(92b)	t#	sot	sweʔ	swe	‘fat’
(92c)	k#	bje̱k	be̱ʔ	bje̱	‘basket’

There is also some variation amongst the syllable final nasals. In numerous cases where Gamāle has a final velar /ŋ/, Sheram prefers the bilabial /m/ (93a-d).

		Gamāle	Sheram	Ghusbāng	
(93a)	/ŋ/~/m/	/iŋ-/	/im-/	/im-/	‘sleep’[2]
(93b)	/ŋ/~/m/	/ɐtsʰiŋ/	/ɐtsʰim/	/ɐtsʰiŋ/	‘today’
(93c)	/ŋ/~/m/	/hụŋ-/	/hum-/	-	‘slurp (drink)’
(93d)	/ŋ/~/n/	/gjiŋ/	/gjin/	/gjin/	‘1DL[PRO]’

[2] The /-m/-final in the Sheram and Ghusbāng stem for ‘sleep’ is likely to reflect the Proto-Khām form, instead of the /-ŋ/-final in the Gamāle stem. The following table compares the phenomenon in three (possible) cognates from two branches of Himalayan: Central Himalayan and Kiranti (the distinction following Bradley’s (1997) classification). The Central Himalayan languages are Kham (Gām and Sheram variants) and Chepang, and the Kiranti languages chosen are Khaling (Western Kiranti) and Limbu (Eastern Kiranti; the tentative distinction between Western and Eastern Kiranti following Ebert 2003). The data has been gleaned from the following sources: Chepang (Caughley 2000), Khaling (Jacques et al. 2015; 2016) and Limbu (Michailovsky 2002).

	Gām	Sheram		Chepang		Khaling	Limbu	
/ŋ/~/m/	iŋ-	im-	‘sleep’	ʔen/mʔ-	‘sleep, lying down’	ʔipt-si-	ips-	‘sleep’
/ŋ/~/m/	hụŋ-	hụm-	‘slurp (drink)’	ʔumhu-	‘eat (mouth closed)’	ɦəpt-	-	‘eat’
/ŋ/~/m/	ŋ̊əŋ-	nəm-	‘smell’	namh-	‘sniff, smell’	nəm-	nams-	‘smell’

4. Relevant findings

This section discusses two of the most relevant findings of the phonological comparison described above. Firstly, the relation between the front rounded vowels in Sheram and Ghusbāng and the labial-palatal approximants in Gamāle is considered, and secondly, the loss of Proto-Khām syllable-final plosives is suggested to be the origin of the TONE-2 LAX in Takāle.

4.1 Front rounded vowels and labial-palatal approximants

Labial-palatal approximants are not common in the Tibeto-Burman languages of Nepal. They do not occur in Magar (Grunow-Hårsta 2008), which is regarded to be the closest relative to Khām. Neither are they found in other Central Himalayan languages such as Chepang (Caughley 1982; 2000), apart from some idiolectal free variation (Ross Caughley, personal communication, 2008). The voiced labial-palatal has been reported in various West Bodish languages such as the Risiangku dialect of Tamang (Mazaudon 1973; 2003; Namkung 1996), the Marpha dialect of Thakali (Namkung 1996) and Nar-Phu (Mazaudon 1996), where it represents underlying diphthongs and triphthongs. Conversely, I have found no reference to a voiceless labial-palatal in the literature on the Tibeto-Burman languages of Nepal to date.

Against this background, the origin of the Gamāle labial-palatals comes into question. It has been hypothesised that these developed by the loss of possible bilabial plosive prefixes *p- or *b- or the bilabial plosive coda *-p (Watters 2002; 2004; 2005). However, since the Gamāle labial-palatal approximants correspond to the Sheram and Ghusbāng front rounded vowels /y/ and /ø/, they could simply a reflex of Proto-Khām front rounded vowels. Further research is required in this regard.

Front rounded vowels in Sheram and Ghusbāng are by no means common. Moreover, there is evidence to the effect that the use of these archaic vowels (or their reflexes) has been declining throughout the Khām area. For example, in recent decades the Takāle vowels /y/ and /ø/ in the verbs /y-si-/ ‘argue’ and /tsøl-/ ‘swim’, have merged with /i/ with /e/, resulting in the current verb stems /i-si-/ and /tsel-/ respectively. In the Sheram and Ghusbāng data collected for this paper, only two words were found with the vowel /ø/ (81a-b), and while the vowel /y/ is slightly more common, one questions whether the front rounded vowels are falling out of use here, too. Examples of the vowels have been shown in (24b), (30a-d), (47b), (74a), (76d), (80a-d), (85a-c) and (86c).) Further examples of /y/ are shown in (94a-f).

		Sheram	Ghusbāng	Gamāle	
(94a)	/y/	/jyᵾ/ or /jɥᵾ/	/sjɐ/	/(r)ɥᵾ/	‘thigh’
(94b)	/y/	/jyr dzɐt-/	-	/ɥi̯r dzeʔ-/	‘collect’
(94c)	/y/	/çy/	-	/ů̜i/	‘in that manner’
(94d)	/y/	/gəm jy-/	-	-	‘earth up (plants)’
(94e)	/y/	/jyt-/	-	-	‘meet’
(94f)	/y/	/dzyrjɐ/	-	-	‘yoke’

4.2 Proto-Khām syllable-final plosives and their reflexes

Watters (2004:11-12) was the first to observe the proto-rhymes *-p, *-t and *-k which are preserved in Sheram. The data collected during this research coincides with this observation. The loss of these finals results in a glottal constriction in Gamāle, and (usually) compensatory lengthening in Takāle (95a-d), excluding cases such as *-at > /-əj/ as in (95e). In Ghusbāng the final appears to be lost altogether.

		Sheram	Gamāle	Ghusbāng	Takāle	
(95a)	*-t	/blet-/	/bleʔ-/	/bəle-/	/bəle:-/	‘break; ruin’
(95b)	*-t	/brɐt-/	/brɐʔ-/	-	/pərɐ:-/	‘cut meat into pieces’
(95c)	*-k	/çyk-/	/ů̜iʔ-/	(/pəj-/)	/sju:-/	‘teach’
(95d)	*-k	/kok-/	/koʔ-/	-	/ko:-/	‘peel’
(95e)	*-t	/dzɐt-/	/dzɛʔ-/	/dzəj-/	/dzəj-/	‘make’

Whereas *-t and *-k have evolved into compensatory lengthening in Takāle, *-p has generally been preserved in that variety (96a-b). Conversely, in Gamāle even this final has changed to a glottal stop (96a-d), and, again, it seems to have been reduced further in Ghusbāng (96b-c).

		Sheram	Gamāle	Ghusbāng	Takāle	
(96a)	*-p	/kep-/	/keʔ-/	-	/kep-/	‘put away, put in a crack’
(96b)	*-p	/rụp-/	/rụʔ-/	/rụ-/	/rụp-/	‘sew’
(96c)	*-p	/krep/	/kreʔ/	/kərem/	/krem/	‘step over’
(96d)	*-p	/kwɐp-/	/kwɐʔ-/	-	-	‘hit with the tip of a sickle’

The loss of the syllable-final plosives in modal voiced syllables in Takāle is compensated by vowel lengthening (95a-d). Again, breathy phonation is unaffected when the coda is reduced in Gamāle or Ghusbāng, as seen in (96b). Therefore, one questions what affect has the loss of *-t and *-k had in breathy syllables in Takāle? Consider (97a-d):

		Sheram	Gamāle	Ghusbāng	Takāle	
(97a)	*-t	/brɨt-/	/prɨʔ-/	-	/rɨ:^{312}-/	‘whip, hit’
(97b)	*-t	/bo̱t-/	/bo̱ʔ-/	/bo̱-/	/bo̱:^{312}-/	‘uproot’
(97c)	*-k	/bɐ̱k-/	/bɐ̱ʔ-/	/bɐ̱-/	/bɐ̱:^{312}-/	‘share’
(97d)	*-t	/sət-/	/sɛ̱ʔ-/	/sə̱j-/	/sə̱j:^{312}-/	‘kill’

Lengthening is present in the Takāle breathy verbs in (97a-c) in the same manners as in the Takāle verbs with modal phonation in (95a-d). However, there is another crucial component to these breathy forms, something which Watters (2002:1, 37-40) refers to as ‘mid-falling’ TONE-2 LAX (or, T-2 LAX). Concerning T-2 LAX Watters (2005:343; emphasis mine) maintains:

> ‘*The melody opposition occurring in Taka Kham clearly predates the register split and may correlate with Benedict’s (1972) tones *A and *B for Proto-Tibeto-Burman (PTB).* Voice register was superimposed later and now divides the pitch range of Tones 1 and 2 into an upper and lower range. If it is missing in some dialects, it is because it has been lost.’

Furthermore Watters (2004:6; emphasis mine) states:

> ‘Again, unlike Bodish languages, the *tonal melodies cannot be attributed to lost finals*. Rather, it seems plausible that the ‘marked’ tone began as a simple heightened pitch, eventually spreading its features to cover the entire length of the root morpheme […].’

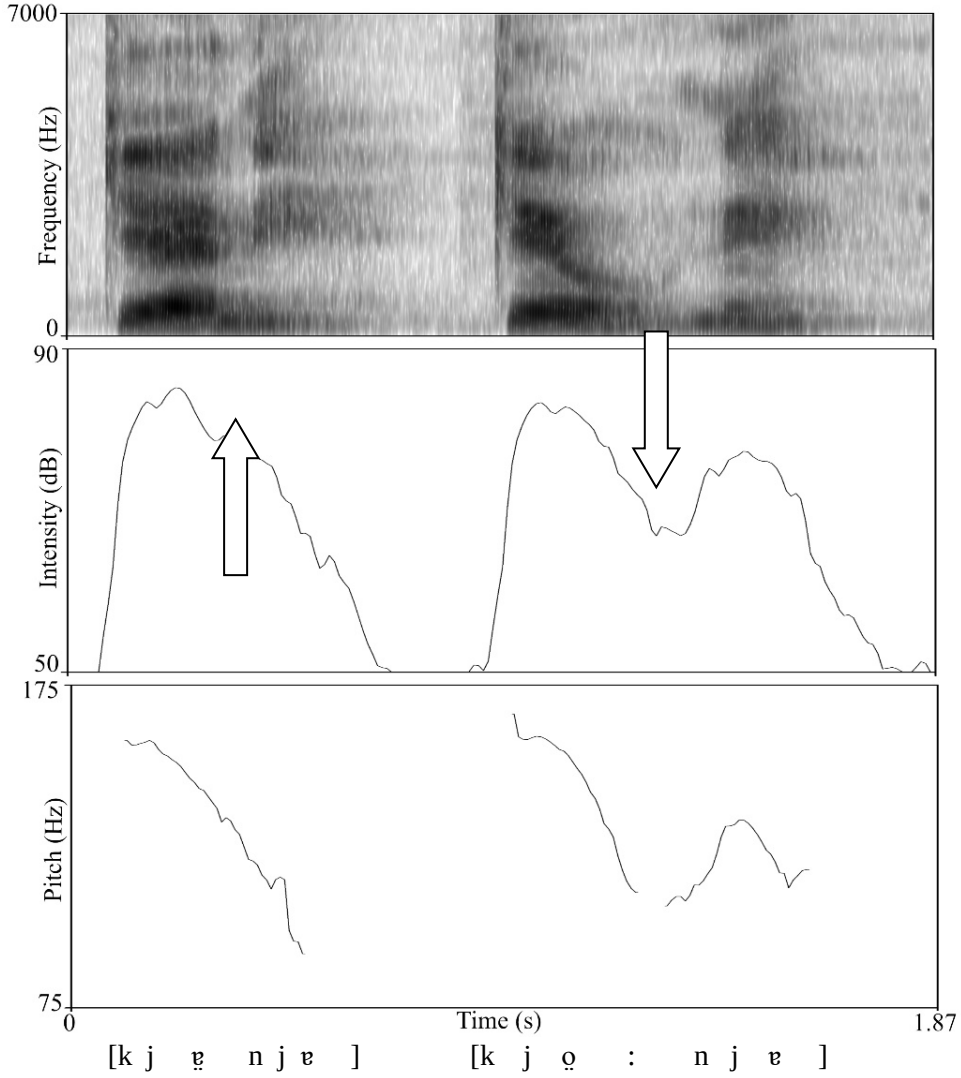
However, based on the evidence from Sheram, I would suggest that the length and pitch contour of T-2 LAX in breathy syllables should both be attributed to the relatively recent loss of Proto-Khām plosive finals, and is therefore not of Proto-Tibeto-Burman origin. This hypothesis is dealt with in more detail in the following section.

4.2.1 Re-analysis of Takāle Khām T-2 LAX

Figure 2 shows the spectrogram, intensity and pitch distinction between /kjɐ̱-njɐ/ ‘break-INF’ and /kjo̱:^{312}-njɐ/ ‘arrest-INF’, two Takāle verbs which have breathy phonation. The pitch contour of the second verb corresponds to what has been referred to as T-2 LAX, and is found in the Takāle examples (97a-d).

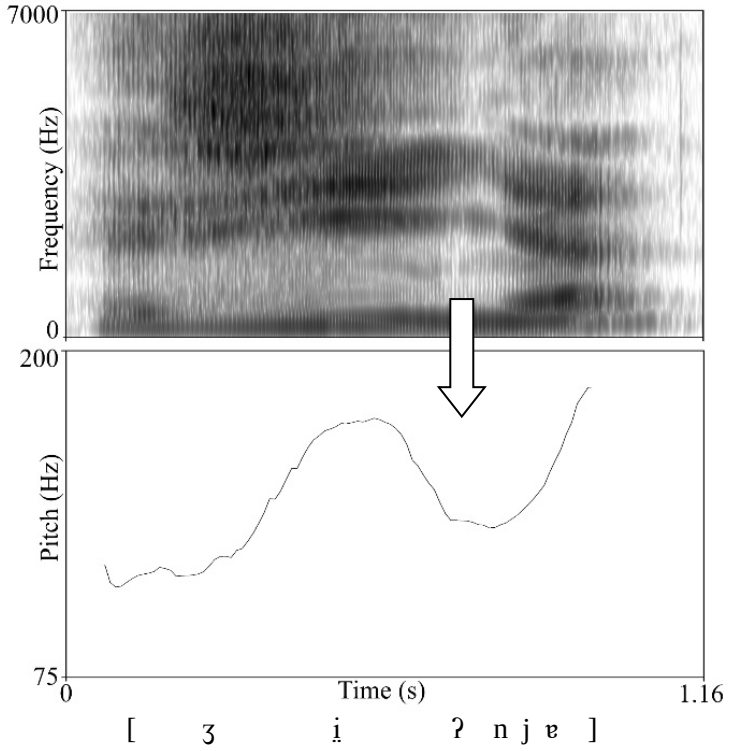
The pitch and intensity contours in these two verbs differ in two respects (marked with arrows in Figure 2). In the first verb the pitch and intensity show a gradual decrease throughout the utterance, whereas in the second, there is an acute dip towards the end of the first syllable. This again is followed by what appears to be a second peak.

Figure 2: *Spectrogram, intensity and pitch diagrams of the Takāle verbs /kjɐ̈-njɐ/ 'break-INF' and /kjo̤:[312]-njɐ/ 'arrest-INF'*



Though I have not observed a glottal constriction in this environment in Takāle, the pitch contour of the second Takāle verb resembles Gamāle syllables which have a glottal coda, as in Figure 3. In the case of the Gamāle verb, the pitch dips during the glottal constriction, signaling a 'diminution of energy' (Ladefoged & Maddieson 1996:76). The fundamental frequency present during the glottal constriction indicates that the closure is only partial (cf. Wilde 2016:134).

Figure 3: *Spectrogram and pitch diagrams of the Gamāle verb /zi̱ʔ-njɐ/ 'bite-INF'*



If there proves to be a correspondence between the Takāle T-2 LAX contour and the Gamāle glottal-final, there would be four implications. Firstly, the contour should be attributed to a lost syllable-final plosive. Secondly, derived from the first implication, this particular Takāle contour would not be traceable to an archaic Tibeto-Burman tone.

Thirdly, the loss of the syllable-final glottal must have necessarily developed through a stage of glottal constriction, since the contour would be a vestige of such a constriction. This third implication gains some support from Budha Magar (2011) who reports that the glottal stop is even articulated by some Takāle speakers. Moreover, the glottal appears in Budha Magar's data in the same position and in the same modal and breathy verbs as one would expect based on the data from Sheram and Gamāle.

The fourth implication would be that a reorganisation of Takāle suprasegmentals would be called for. The four-box tone system for Takāle (that is, two pitch contours intersecting with modal and breathy phonation, as explained in Watters 2002:37; cf. also Weidert 1987:260-262) would no longer be valid. What has been described as T-2 LAX tone within the four-box tone system would need to be reanalysed as a co-feature of length in breathy syllables. Takāle would therefore have three independent suprasegmental features: phonation type (98a-b), vowel length (99a-b; 100a-b) and tone (101a-b), though the historical development and status of the high/high-falling tone in (101b), noted by Watters (2002:18; 2004:5,299), also requires further study.

(98a) modal phonation /ki-/ 'bind'
(98b) breathy phonation /ki̱-/ 'shout'

(99a) modal phonation, no length /ki-/ 'bind'
(99b) modal phonation, length /ki:-/ 'plough'

(100a) breathy phonation, no length /ki̱-/ 'shout'
(100b) breathy phonation, length /ke̱:^{312}-/ 'break'

(101a) no tone /si:-/ 'sweep'
(101b) tone /si:^{53}-/ 'step on'

5. Conclusion and outlook

The comparison of the phoneme inventories of three closely related southern Khām varieties revealed significant differences regarding their vowel inventories and syllable coda structure. Front rounded vowels in Sheram and Ghusbāng can be linked directly to the Gamāle labial-palatal approximant, and the loss of the syllable-final glottal in breathy voiced verbs may be the origin of the pitch contour present in Takāle breathy voiced lengthened verbs, described previously as TONE-2 LAX (Watters 2002).

This latter point, however, requires further research. Comprehensive data from Sheram would be needed to provide a wider basis for the comparison of Sheram and Takāle verb stems. Also, it would be useful to compare breathy syllables as spoken by Takāle speakers who pronounce a glottal distinction (reported by Budha Magar 2011) with those speakers who merely maintain a distinction of length and pitch (reported by Watters 2002, and supported by my personal observations).

Additionally, two further questions need to be studied. Firstly, whether length is at all contrastive in Takāle nouns, and thus to what extent is the T-2 LAX pitch contour present in monosyllabic nouns with a breathy syllable. Contrastive length is consistent in Takāle verbs and is found in bare verb stems and all inflected verb forms. Conversely, length does not occur in bare Takāle noun stems, but it is always present when nouns are inflected (102a-b), or followed by a (non-stressed) clitic (102c).

(102a)	case:	[po] ‘place’	>	[po:-lə] ‘place-IN’
(102b)	number:	[re] ‘husband’	>	[re:-rə] ‘husband-PL’
(102c)	clitic:	[pã] ‘word’	>	[pã: zə] ‘word EMPH’

A second question is why (with some inevitable variation between village lects) is the TONE-2 LAX pitch contour present in all breathy voiced Takāle verb stems which have a sonorant coda (such as /rm̤³¹²-/ ‘lay upon’, /tl̤³¹²-/ ‘ache’). This may be due to the pitch contour being superimposed on syllables which are considered to be lengthened due to the sonority of the syllable-final sonorant.

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