

HAROI PHONEMES¹

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0. INTRODUCTION

Haroi is a language of the Chamic branch of the Malayo-Polynesian family spoken by 10-15,000 Montagnards in Phú Yên, Bình Định, and Phú B²ôn provinces of South Viet Nam. It is more closely related to the central Chamic languages, Rade and Jarai, than to the coastal Chamic languages Cham, Roglai, and Chru.

Chamic languages generally have a rather simple vowel system of nine or ten vowels. The complex 32 vowel system of Haroi, however, is more similar to the Mon-Khmer languages. Possibly the nearness of the

Haroi to the Bahnar and other Mon-Khmer groups would explain this. Some in fact have referred to the Haroi as Bahnar Cham², but a study of the sound system and vocabulary clearly shows that Haroi certainly belongs to the Chamic language family, but that it has more Bahnaric loanwords than either Rade or Jarai have, which gives some justification to the name.

This paper is based on the speech of the Haroi from Sơn Hòa district in southern Phú Yên province.

1. VOWEL PHONEMES

As shown in Figure 1, Haroi has 11 simple vowels, each of which can be short (unmarked) and long (marked `), giving 22 simple vowels plus 10 glided vowels plus 10 nasalised vowels which gives a total of 42 vowel phonemes. The nasalised vowels, however, are very rare, with only two examples of each nasal vowel, except that preceding final p, t, and k, all vowels are nasalised. Figure 1 shows that in both the simple vowels and glided vowels nasalisation appears on all the vowels except the front and high vowels. Because there are so few nasalised vowels, in this analysis they will be treated as peripheral to the basic pattern of 32 vowels.

	FRONT				CENTRAL				BACK			
	S.		Gl.		S.		Gl.		S.		Gl.	
	sh.	l.	sh.	l.	sh.	l.	sh.	l.	sh.	l.	sh.	l.
ORAL												
HIGH CL	i	ì	ia	ìa	ɨ	ɨ̃	ɨa	ɨ̃a	u	ù	ua	ùa
HIGH OP	ɪ	ɪ̃							ʊ	ʊ̃		
MID	ê	ễ	êa	ễa	ə	ə̃			ô	ỗ	ôa	ỗa
LOW	e	ẽ			a	ã			o	õ		
NASAL												
HIGH CL							ɨ̃a				ù̃a	
HIGH OP												
MID			ẽa	ẽ̃a	ə̃						õ̃a	õ̃̃a
LOW	ẽ					ã				õ		

Figure 1.

The full set of 11 simple vowels is found for the short vowels before final h and ʔ, and for the long vowels before ng and in open syllables. All five short glided vowels occur before final ʔ, the five long glided vowels before ng.

1.1. VOWEL DESCRIPTIONS

For an analysis of which vowels appear with which final consonants, see Figure 5.

- /i, ð, ia, ða/ /i/ is a high front close unrounded vowel [i].
 /ð/ is phonetically similar to /i/ but longer.
 /ia, ða/ are /i, ð/ respectively glided to a neutral central vowel.
- /ɪ, ð/ /ɪ/ is a high front open unrounded vowel [ɪ], whereas the long /ð/ has a slight off-glide [ɪ^e].
- /ê, ê, êa, êa/ /ê/ is a mid front unrounded vowel [e]. /ê/ is phonetically similar to /ê/ but longer. /êa, êa/ are /ê, ê/ respectively glided to a neutral vowel.
- /e, è/ /e/ is a low front unrounded vowel [e]. /è/ is phonetically similar to /e/ but longer.
- /ɨ, ɨ, ɨa, ɨa/ /ɨ/ is a high close central unrounded vowel [ɨ].
 /ɨ/ is phonetically similar to /ɨ/ but longer.
 /ɨa, ɨa/ are /ɨ, ɨ/ respectively glided to a neutral central vowel.
- /ə, è/ /ə/ is a mid central unrounded vowel [ə]. /è/ is phonetically similar to /ə/ but longer.
- /a, à/ /a/ is a low central unrounded vowel [a]. /à/ is phonetically similar to /a/ but longer.
- /u, ù, ua, ùa/ /u/ is a high close back rounded vowel [u].
 /ù/ is phonetically similar to /u/ but longer.
 /ua, ùa/ are /u, ù/ respectively glided to a neutral central vowel.
- /ʊ, ù/ /ʊ/ is a high open back rounded vowel with a slight onglide [ʊ^u]. /ù/ is phonetically similar to /ʊ/ but longer.
- /ô, ô, ôa, ôa/ /ô/ is a mid back rounded vowel [o]. /ô/ is phonetically similar to /ô/ but longer.
 /ôa, ôa/ are /ô, ô/ respectively glided to a neutral central vowel.
- /o, ò/ /o/ is a low back rounded vowel [ɔ]. /ò/ is phonetically similar to /o/ but longer.

1.2. VOWEL CONTRASTS

ORAL

Simple

Glided

Front

ami? 'mother'	laml? 'recently'	lamia? 'put away'	ñlap 'barren'
si? 'near'	sì? 'to hoe'		
lê? 'and yet'	čĕk 'pineapple'	kêa? 'to shepherd'	tĕal 'stool'
le? 'fall'	?è? 'to spit out'		

Central

s+? (-laph+k) 'disorderly'	s+? 'kind of snake'	s+ā? 'to stuff'	s+ā? 'to invite'
bē? 'to stretch'	la?ə? 'cold'		
pa? 'to braid'	pā? 'four'		

Back

bu? 'to heap'	bù? 'hair'	hanua? 'right (side)'	čanua? 'household'
khū? 'pot'	čakhù? 'to get up'		
sô? 'whisper'	yô? 'down'	sôa? 'to scoff at'	kôah 'to scratch'
ako? 'head'	kô? 'white'		

NASAL

Front

hĕ 'similar'	ĕa? 'to urinate'	sĕa 'squirrel'
--------------	------------------	----------------

Central

	čarĕaw 'medicine'
ñĕs 'to hobble'	
čarĕw 'crossbow'	

Back

	masôah 'fox'	kathûa 'kind of fish'
ha?ôy 'Haroi song'		tôai 'guest'

2. CONSONANT PHONEMES

see Figure 2 on next page

	<i>bilabial</i>	<i>dental</i>	<i>alveo- palatal</i>	<i>velar</i>	<i>glottal</i>
voiceless stops	p	t	č	k	ʔ
voiceless stops, asp.	ph	th		kh	
voiced stops	b	d			
nasals	m	n	ɲ	ŋ	
liquids			r/l		
fricatives			s		h
semivowels	w		y		
semivowels, preglottalised	ʔw		ʔy		

Figure 2.

2.1. INTERPRETATION

Aspirated stops are interpreted as single phonemes because they occur in clusters with *w* and *y* (for examples see Section 3.2.) where only non-suspect single consonants occur, and there are no other three-consonant clusters found in the language. It should be noted, however, that, like consonant clusters, the aspirates do not appear in word-final positions, but they do appear as neutralised allophones of the unaspirated stops in presyllable-initial position (see Section 2.2.).

Preglottalised ʔw, and ʔy are also interpreted as complex single phonemes because ʔy appears in a syllable-initial cluster with *r*, ʔyràŋ 'leopard', where only single consonants occur. ʔw is considered a single phoneme for reasons of symmetry.

Preaspirated hm, hn, hɲ, hŋ, hr, hl, hw, and hy, on the other hand, are interpreted as clusters of *h* plus *m*, *n*, *ɲ*, *ŋ*, *r*, *l*, *w*, or *y* because they do not appear in any consonant clusters nor in presyllable-initial or word-final positions, where only single consonants occur.

2.2. CONSONANT DESCRIPTIONS

- /p/ is a simple voiceless bilabial stop [p], with the allophone [p^h] in the presyllable if the main syllable begins with *r* plus a high close vowel. [p^herùayʔ] 'enter (stomach)'.
- /t/ is a simple voiceless dental stop [t̪].
- /č/ is a simple voiceless alveopalatal stop [tʃ] with the allophone [tʃ^h] in presyllables before liquids. [tʃ^hlɪʔan] 'road'.
- /k/ is a simple voiceless velar stop [k], with the allophone [k^p] word final following *u* and *ô*, [əpô^kp] 'gobyfish', and the allophone [k^h] in the presyllable if the main syllable begins with *r*

plus a high close vowel. [kʰr+ʔ] '*vulture*'.

/pʰ/ is an aspirated voiceless bilabial stop [pʰ].

/tʰ/ is an aspirated voiceless dental stop [tʰ].

/kʰ/ is an aspirated voiceless velar stop [kʰ].

/ʔ/ is a glottal stop [ʔ].

/b/ is a voiced bilabial preglottalised stop [ɓ].

/d/ is a voiced dental preglottalised stop [ɗ].

/m/ is a simple bilabial nasal [m].

/n/ is a simple dental nasal [n].

/ɲ/ is a simple alveopalatal nasal [ɲ].

/ŋ/ is a simple velar nasal [ŋ] with the allophone [ŋ̠] word final following u and ô. [sùŋ̠] '*axe*'.

/r/ is a voiced alveolar flap [ɾ] which fluctuates freely with the trill [ʀ].

/l/ is a voiced alveolar lateral [l].

/s/ is a voiceless alveopalatal fricative [ɬ] alternating freely with the affricate [tʃ]. It has the allophone [ɣh] which appears word final.³

/h/ is a voiceless glottal fricative [h]. In certain words there is a metatheses of the h. [həm+ɑ], [əhm+ɑ] '*field*', [həroi]. [əhroi] '*Haroi*'.

/w/ is a voiced bilabial rounded vocoid [w]. In syllable-initial position it alternates freely with a slightly fricative allophone [v]. In word-final position it is a non-syllabic vocoid [u]. [asau] '*dog*'.

/ʔw/ is a preglottalised bilabial rounded vocoid [ʔw] with the allophone [wʔ] which appears only word final. [ph+awʔ] '*full*'.

/y/ is a voiced alveopalatal vocoid [y]. Word-medially between two vowels it has a fricative allophone [ʒ]. [pəžam] '*to be honest*'. Word-final it has a lax non-syllabic allophone [i]. [əʒoi] '*body*'.

/ʔy/ is a preglottalised voiced alveopalatal vocoid [ʔy]. It alternates freely with [ʔtʷ]. It has the allophone [yʔ] which only appears word-final. [bôayʔ] '*to operate on*'.

/-wh/ is a labialised voiceless fricative [wh] which occurs only word-finally.

2.3. CONSONANT CONTRASTS

In mainsyllable-initial position:

p-	pà?	'four'
t-	ta?	'to cut up'
č-	ča?	'to grow'
k-	kà?	'not yet'
ʔ-	ʔà?	'raven'
ph-	kaphà?	'window'
th-	čatha?	'smooth'
kh-	kha?	'to restrain someone'
b-	ba?	'to carry in carrying cloth'
d-	dah	'then'
m-	ma?	'to take'
n-	anà?	'child'
ñ-	čaña	'to ask'
ng-	nga?	'to make'
r-	rà?	'greedy'
l-	là?	'bee food'
s-	sà?	'fishtrap'
h-	hà?	'to tear up'
w-	awà?	'spoon'
y-	paya?	'prayer for protection'
ʔw-	ʔwa?	'to wipe'
ʔy-	ʔyà?	'to carry in hand'

In mainsyllable-final position:

short vowels

-p	sap	'voice'
-t	dat	'small'
-k	phak	'sound of breaking stick'
-ʔ	pa?	'to weave (bamboo)'
-m	kram	'to sink'
-n	kan	'epileptic'
-ng	khang	'stiff'
-l	asal	'grain'
-s	abas	'ouch!'
-h	mamah	'to chew'
-w	tlaw	'three'
-y	čapay	'ricewine'
-ʔw	laʔw	'time, turn'

long vowels

sàp	'to scold'
dòt	'only'
lapàk	'bamboo spear'
pà?	'four'
kràm	'bamboo'
akàn	'fish'
khàng	'burning hot'
sàl	'type of gongs'
pès	'to beckon'
màh	'gold'
tlàw	'to laugh'
kapày	'rabbit'
kalàʔw	'cockroach'

continued overleaf

short vowels			long vowels	
-ʔy	braʔy	'to squirt'	ʔyràʔy	'to insult'
-wh	prôwh	'to blow'	prôwh	'to spit out'
--	--	--	sa	'one'

2.4. CONSONANT CLUSTERS

There are five types of consonant clusters in Haroi. One type has the modifying consonant before the cluster centre (h in preaspirated consonants), four types have the modifying consonants following the cluster centre (y in palatalised consonants, w in labialised consonants, and clusters with r and l).

The cluster centre may be a simple or an aspirated consonant. Not all consonants can function as cluster centres and those that can do not occur with every modifying consonant as shown in Figure 3.

CLUSTER CENTRE	CLUSTER MODIFIER				
	h	y	w	l	r
m	hm	-	-	-	-
n	hn	-	-	-	-
ñ	hñ	-	-	-	-
ng	hng	-	-	-	-
r	hr	-	-	-	-
l	hl	-	-	-	-
w	hw	-	-	-	-
y	hy	-	-	-	-
p	-	py	-	pl	pr
t	-	-	-	tl	tr
č	-	-	čw	-	-
k	-	-	kw	-	kr
ph	-	phy	-	-	-
th	-	-	thw	-	-
kh	-	-	khw	-	-
b	-	by	-	bl	br
ʔy	-	-	-	-	ʔyr
s	-	-	sw	-	-

Figure 3.

2.5. CONSONANT CLUSTER CONTRASTS

hm-	hmaw	'to have'
hn-	kahnàl	'equal'
hñ-	hahñep	'open-eyed'
hng-	hnga?-hngòm	'crowded'
hr-	čahrà?	'to throw a long object'
hl-	hlam	'very'
hw-	hwə?y	'afraid'
hy-	hyə?-hyə?	'walking stalkingly'
pl-	plah	'to stick into'
tl-	tlàh	'recovered'
bl-	blah	'to learn by oneself'
pr-	prah	'to stir'
tr-	trôh	'escaped'
kr-	krah	'ring'
br-	brah	'red (guavas)'
?yr-	?yràng	'panther'
py-	pyong	'light-weighted'
phy-	phyèng-phyàng	'expressive of relief'
by-	byèng-byòng	'out of shape'
čw-	čwe?	'gossip'
kw-	kwew	'point (of sickle)'
thw-	thwang	'in a long line'
khw-	khwèn	'classifier for rings'
sw-	swen	'crazy'

3. PHONEME DISTRIBUTION

Haroi words are made up of a main syllable which may be preceded by one or two unstressed presyllables.

3.1. PRESYLLABLES

The presyllables have the pattern C_1a . Only the vowel /a/ [ə] which has the allophone [ɨ] following an alveopalatal consonant, appears in a presyllable. /čakay/ [čɨkay] 'foot'. A presyllable beginning with the consonant m loses the vowel except before an initial m or n in the main syllable. /malaw/ [mɨlaw] 'embarrassed', /mamih/ [memih] 'sweet'.

The consonant position in the presyllable can be filled by p, t, č, k, ?, h, m, n, l, or r. On the restrictions in relation to word patterns (occurring as the only presyllable in two-syllable words, or in first or second syllable in three-syllable words) see Figure 4. The two

presyllables of a three-syllable word cannot begin with the same consonant, but the syllable preceding the main syllable may have the same initial consonant as the main syllable. The presyllables *na-* and *ra-* are only found with main syllables beginning with the same consonants as the presyllable. *nano* 'cylindrical', *raray* 'great-great-grandchild'.

Presyllables:

<i>first of two</i>	<i>second of two</i>	<i>only one</i>
C_1V-	$-C_1V-$	C_1V-
pa-	-	pa-
ta-	-	-
ča-	-ča-	ča-
ka-	-ka-	ka-
a-	-a-	a-
ha-	-ha-	ha-
ma-	-ma-	ma-
-	-	na-
-	-la-	la-
-	-	ra-

Figure 4.

As noted before, since [ɱ] is interpreted as the presyllable /ma/ in two-syllable words, in words such as [tʰɪmɸɪŋ] it is also interpreted as /ma/ thus giving the three-syllable word /čamaphɪŋ/ 'cord', instead of a closed presyllable and main syllable /čamɸɪŋ/.⁴

3.2. MAIN SYLLABLE

Main syllables are composed of $C_2V_1 \pm V_2C_5$ or $C_3C_4V_1 \pm V_2C_5$. Initial vowels are always preglottalised so the initial glottal is not written. All 32 vowel contrasts can occur in closed main syllables. Short vowels, however, cannot occur in open syllables, so only 16 vowel contrasts are possible in open syllables.

C_2 main syllable initial position can be filled by any consonant. C_3 cluster-initial position can be filled by p, t, č, k, ph, th, kh, b, ʔy, and s. The modifying C_4 cluster-second position can then be filled by l, r, y, or w. Or, if C_4 is filled by m, n, ñ, ng, r, l, w, or y, C_3 will be filled by h, modifying these consonants. (For possible combinations see Section 2.4.) C_5 can be filled by p, t, k, m, n, ng, l, ʔ, ʔw, ʔy, h, wh, s, w, and y.

V_1 can be filled by any simple vowel. V_2 can be filled only by a and only when V_1 is a high close vowel or \hat{e} , or \hat{o} .

3.3. VOWEL AND CONSONANT COMBINATIONS

There are few restrictions as to which vowel can follow which syllable-initial consonant, or consonant cluster. There are no high close front vowels, simple or glided, after y and its combinations hy , py , by , or after the palatal nasals \tilde{n} and $h\tilde{n}$. Parallel to this, no high back vowels, simple or glided, are found after w and its combinations hw , kw , khw , \check{w} , and sw . The glided vowel \dot{a} cannot follow simple voiceless stops. There seem to be historical reasons for this.⁵

The restrictions on the possible combinations of vowels and final consonants are shown in Figure 5.

The bilabial rounded vocoid w and its combinations wh and $w?$ are not found after rounded vowels, glided or unglided, except for simple \hat{o} , nor do they occur after high and mid central vowels.

The alveopalatal vocoid y and its combinations yh and $y?$ are not found after front vowels, glided or unglided.

The combination wh does not occur after any front vowel which parallels yh not occurring after back vowels, except for u . wh does not follow glided vowels.

The very infrequent high open vowels i and u do not allow any bilabial final consonants, u also cannot be followed by alveopalatal consonants.

Figure 5 overleaf.

	Bilabial C					Coronal C						Back C				
	p	m	w	wh	[w?]	t	n	l	y	[yh]	[y?]	k	ng	h	ʔ	#
i	2	2	1	-	1	3	7	9	-	-	-	4	4	13	6	-
ĩ	2	2	1	-	1	7	3	1	-	-	-		22	1	13	20
ɪ	-	-	-	-	-				-	-	-		3	6	1	-
ĩ	-	-	-	-	-	3	4		-	-	-		4	1	2	6
ê	1	3	1	-		1	4	3		-		3	5	16	3	-
ê	1	1		-		3	1	1	10	-	9	2	15	2		1
e	7		3	-		6	2	2	-	-	-	5	12	34	26	-
è	1			-		7	5	5	-	-	-	7	14	3	1	20
†		3	-	-	-			1	11	1		3	22	8	12	-
†	2	3	-	-	-		3		2			1	3	1	1	9
ə		1	-	-	-		3		2		1	2	11	8	19	-
ə	1	2	-	-	-			5	6	7	1	1	10		1	10
a	6	31	32		14	13	14	20	21	2	2	5	35	50	46	-
à	6	8	22		3		12	17	11		8	9	38	11	31	49
u	1	6	-	-	-	8	4	6	3	1	8	8	30	26	12	-
ù	1	4	-	-	-	3	7	4	16	3	1		20	6	11	16
u	-	-	-	-	-	-	-	-	-	-	-			4	3	-
ù	-	-	-	-	-	-	-	-	-	-	-	1	2	1	5	5
ô	2	5	1	1		8	10	4	4	-	6	4	17	21	10	-
ô	2	8	4	8	12	1	4	9	4	-	2	1	24	3	10	14
o		5	-	-	-	10	9	3	19	-	10	10	31	26	19	-
ò		7	-	-	-		1	8	7	-		7	23	5	23	33
ia				-					-	-	-				1	-
ĩa	1			-					-	-	-		1			1
êa			1	-					-	-	-	1	2	1	12	-
êa		4	5	-	3		1	2	-	-	-		14	3	1	10
†a	4	15	14	-	8	2	7	3	4		1	1	10	22	15	-
†a	2	5	11	-	1		9	12	10		6	2	22	2	6	31
ua	1	3	-	-	-	4	3	3	3			1	5	3	12	-
ùa		1	-	-	-		2	6	1				4		1	17
ôa			-	-	-	2	6	6	5	1	11		3	2	7	-
ôa			-	-	-		2	2	8		3		4	8		11

Figure 5.

4. SUMMARY OF WORD PATTERN

The word can be summarised as follows:

\pm presyllable₁ C₁a \pm presyllable₂ C₁a + main syllable C₂V₁ \pm V₂C₅
or C₃C₄V₁ \pm V₂C₅.

MAIN SYLLABLE	PRESYLLABLES		
	none	C ₁ a-	C ₁ aC ₁ a-
C ₂ V ₁	ni 'here'	hana 'to roast'	malawa 'Iguana'
C ₂ V ₁ V ₂	hêa 'to cry'	kačôa 'firstborn'	malayta 'lizard'
C ₂ V ₁ C ₅	pà? 'four'	kačèng 'messy'	kalamoh 'foam'
C ₂ V ₁ V ₂ C ₅	tôah 'to drain'	čakêang 'give birth'	takarɬay 'dragon'
C ₃ C ₄ V ₁ C ₅	prah 'to stir'	katleh 'to break off'	mačaprùy 'yesterday'
C ₃ C ₄ V ₁ V ₂ C ₅	plɬah 'to split'	čatrɬang 'guard tower'	čalathu?y 'lined up'
C ₃ C ₄ V ₁	pla 'blade'	katra 'in three days'	takabla 'fearful'
C ₃ C ₄ V ₁ V ₂	krôa 'turtle'	matrua 'sale'	makaprua 'to diverge'

Figure 6.

5. STRESS

In Haroi the main syllable is stressed and the presyllable is unstressed. In the case of two presyllables, the first is slightly heavier stressed than the second presyllable.

NOTES

1. The first author prepared the original draft of the article in 1970, and the second author revised and updated it in 1975.

We are indebted to Dr David Thomas for helpful suggestions during the analysis and in the writing of this paper.

2. Schrock, 1966, p. 219.

3. Word-final *yh* can be considered an allophone of either /s/ or of *hy*. The contrast is neutralised in this position. In this paper word-final *yh* is interpreted as an allophone of /s/ for historical and cross-language reasons (cf. Lee, 1966). In an alternative analysis *yh* could be interpreted as an allophone of initial *hy*, in which case /s/ would not occur in word-final position. This analysis would have to reconsider whether to interpret *hy* as a consonant cluster, or as a single phoneme. If our present view would be continued, this analysis would give a new syllable pattern with a final consonant cluster. (*y* cannot be considered as filling the glided position of the syllable nucleus like *a* because it can follow a glided vowel. *sôayh* 'sober'.) If *hy* and its word-final allophone *yh* are interpreted as one phoneme, and the other preaspirated consonants are also considered to be one phoneme, then final /-wh/ can be an allophone of *hw* also. This would also parallel the present treatment of [ʔw] and [-wʔ], and [ʔy] and [-wʔ].

4. There are two lexical items that could give reasons for reconsideration: [kənθi] 'pulse', and [pəktra] 'red spurlfoal'. But at the present we feel that in *kanthi* the *n* can likewise be treated as a syllabic *ŋ* (cf. /nano/, also pronounced [ŋno] 'cylindrical') giving /kanathi/. This leaves only *paktra* to be investigated. It is suspected to be an unassimilated loan word.

5. In this volume Lee shows that Haroi *ɬa* glides after aspirated stops can be traced back to Proto-Chamic unpreglottalised voiced stops plus simple *a*. The systemic absence of *ɬa* after unaspirated stops might be connected with this development.

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