

# Consonantal tone in Jeh phonemics <sup>1</sup>

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## 0. Introduction.

The Jeh language of the Mon-Khmer family is spoken by approximately 9000 people in a narrow stretch of land next to the Laos border in northern Kontum province, Viet Nam. This paper presents the southern Dak Wàk dialect spoken in the Dak Sut area. Southern and northern Jeh are mutually intelligible, but the northwestern, Dak Bùng dialect and other dialects near the Laos border appear to be barely intelligible with the northern and southern dialects, though maintaining Jeh as their language name.

A distinctive phenomenon in Jeh is the limited high tone, which is interpreted as a consonant (cf. sec. 1). Deep vowel quality (cf. sec. 5. 1), which parallels the laryngealization of Sedang and the breathiness of

1 The analysis here described is the result of one year of study on the Jeh language, 1963-1964, under the auspices of the Summer Institute of Linguistics,

I am indebted to Richard Watson, whose 'Pacoh Phonemes' in *Mon-Khmer Studies I*, pp. 135-148, served as a guide to this paper, David D. Thomas has given much appreciated advice in this analysis. Patrick Cohen assisted with suggestions and an analysis of presyllables. Richard S. Pittman also gave valuable suggestions as to the organization of this paper. A special word of gratitude is here given to Sak of Dak Tráp and Nhor of Dak Rajèel, who served as main informants during this time.

Halang,<sup>2</sup> nearby languages, is another characteristic of southern Jeh. Jeh also has limited phonemic nasalization.

### 1. Consonantal Tone.

Mon-Khmer languages, for the most part, are not tonal, but in Jeh phonemic high tone has been discovered<sup>3</sup>. Though distribution of this high tone is limited to phonetically open syllables, phonemically it is very peculiar, occurring in complementary distribution to word final consonants.

The high tone is actualized as a level tone followed by a sharp rise (e.g. [tɛː] 'to scythe'). The main vowel remains level for the duration of a regular short vowel, and there is never any friction or occlusion succeeding the sharp rise in pitch. When high tone occurs with vowel glides, the syllable peak remains level, and the sharp rise coincides with the off-glide (e.g. [tiá] 'down there'). (Grave [˘] accent represents deep vowel. cf. sec. 5.1)

Final rising tone in adjacent languages and some northern dialects of Jeh is manifested as a glottal fricative [h], which does not exist in word final position in southern Jeh (e.g. [tɛh], [tiáh]). So high tone in southern Jeh, patterning as a consonant, is interpreted as an allophone of *h* in word final position (e.g. *tɛh* [tɛ'] 'to scythe'; *tiáh* [tiá] 'down there').

The sharp rise in pitch can cause the vowel to be broken up by a non-constrative glottal stop, like Vietnamese 'ngã' [ŋaʔá] tone. This becomes an interesting commentary on Haudricourt's postulation of Vietnamese 'hỏi' and 'ngã' tones as having come from an original *h* or *s*<sup>4</sup>. Jeh is an example of where this process appears to be actually going on.

High tone in Jeh can also occur on word final consonant *y*, thus becoming [ý] as in [daý] 'loud'. However, in some northern dialects

2 Research on Sedang, a language in central Kontum, Vietnam; is being carried on by Kenneth and Marilyn Smith.

Research on Halang; a language in western Kontum, Vietnam, is being carried on by Jasses and Nancy Cooper.

3 See Smalley, William A., 'Sre Phonemes and Syllables', *JAOS* 92.218.222, for a Mon-Khmer language which he describes as having the feature of 'tone-length'.

4 Haudricourt, A-G. 'De l'origine des tons en Vietnamien', *Journal Asiatique*, Vol. 242, No. 1 (1954), pp. 69-82.

this phone is manifested as *y* plus the fricative *h* (e.g. [dayh] 'loud'). So high tone, though coinciding with final *y* in southern Jeh, can still be interpreted as an allophone of *h* dayh S [daý], N [dayh] 'loud'. Distributionally, [ý] is interpreted as a close-knit sequence of two phonemes (*y* and *h*) that patterns as a unit consonant (cf. sec. 3.2)

FIG. 1 CHART OF CONSONANT PHONEMES

	<i>bilabial</i>	<i>alveolar</i>	<i>alveopalatal</i>	<i>velar</i>	<i>glottal</i>
vl. stops	p	t	ch	k	ʔ
vd. stops	b	d	j	g	
nasals	m	n	nh	ng	
liquids	w	l/r	y		
fricative-tonal		s			h

FIG. 2 CHART OF VOWEL PHONEMES

	<i>front</i>	<i>central</i>	<i>back</i>	
high glide	ia		ua	
high	i		u	
low	e	a	o	

Suprasegmental : Length (aa)  
 Deepness (à)  
 Nasalization (ạ)

In one local northern dialect (Dak Trap), high tone has a wider distribution. Word final voiceless stops do not exist in this dialect. Such phones do retain the same point of articulation as voiceless stops in the southern dialect but are manifested rather as nasal consonants with rising tone (e. g. [tram̩] *trap* 'muddy'; [waŋ̩] *wak* 'boy's name'). Thus in the Dak Trap dialect, final nasal consonants with high tone are interpreted as word final allophones of initial voiceless stops.

2. Phonemes.

See Figures 1 and 2.

3. Consonant Interpretation.

3.1 Consonant Clusters.

In Jeh there is a strong two-consonant cluster pattern, stop plus

liquid (e. g. *pr*, *kl*). Aspirated stops (e. g. *ph*) are interpreted as clusters, patterning after the non-suspect stop plus liquid pattern.<sup>5</sup>

### 3.2 Suspect Sequences

Phonemes /ʔ/ and /h/ differ distributionally from all other phonemes in Jeh, occurring in sequences [wʔ], [yʔ], and [ý] in word final position. These sequences, however, are not posited as clusters on the grounds that no non-suspect clusters occur in word final position. Rather, a suggestion from Pike appears to be the preferred interpretation for such phonemes (/ʔ/,/h/). He suggests that 'two separate, legitimate phonemes may be joined together in a special type of close-knit sequence which as a unit acts in further distribution like a single phoneme'.<sup>6</sup> Thus, [wʔ], [yʔ] and [ý] are interpreted as close-knit sequences of two separate phonemes which act as unit consonants in distribution. Particularly the sequence [ý] demonstrates the validity of such an interpretation because the two phonemes [y] and high tone [-] occur not merely in a close-knit sequence but simultaneously. Examples :

*chàwʔ* 'nonsense' : *chàw chàw* 'grasshopper'

*taayʔ* 'correct' : *taay* 'slowly'

*chooyh* [t͡sɔ́-y] 'sand' : *chooy* 'to plant rice'

*puayh* [puáy] 'calf of leg' : *pùah* [pùá] 'flexible'

This interpretation is also applied to the following suspect sequences: preglottalized and pre-aspirated nasals and liquids (*hng* has not been found), preglottalized stops *ʔb* and *ʔd*, pre-nasalized stops *m̃b*, *nd*, and *ngg* and lengthened consonants. That two consonants occur in a sequence is not sufficient argument that they should fit the non-suspect stop plus liquid pattern. The peak of these suspect sequences is the final consonant; whereas it is the initial consonant in the strong pattern. So when the peak of the sequence occurs finally, it is interpreted as a close-knit sequence of two phonemes acting distributionally as a unit phoneme. Examples :

5 That the aspirated stops can be contrastively broken up, as in sec. 6, shows further that they follow the stop plus liquid pattern. However, presyllables do not occur before aspirated stops except in loan words (e.g. *kathaang* 'ladder').

6 Pike, Kenneth L., *Phonemics: A Technique for Reducing Languages to Writing* (University of Michigan), pp. 147, 148.

*hnam* 'year' *nggàl* 'large drum' *?le?* 'short'

### 3.3 Rising tone

Rising tone in the southern Jeh dialect is interpreted as an allophone of /h/ in word final position because (1) it occurs only on open syllables in complementary distribution with final consonant phonemes and (2) it corresponds to the final /h/ phoneme of some northern dialects which have free variation between rising tone and word final fricative [h] (cf. sec. 7.1).

### 3.4 sr- cluster

The sequence *sr* is manifested phonetically as a retroflexed alveopalatal fricative [s̠] alternating freely with a retroflexed affricate [t̠s̠]. Phonetically it appears to be a unit phone, but phonemically it is interpreted as a cluster *sr*. It rarely occurs and varies to cluster *kh* in the Plày Talaat dialect. Examples:

*sriam* [ts̠iəm] 'brittle', *chiam* 'to feed' *kriam* 'crossbow string'

*kasreeng* [kat̠s̠e.ŋ] 'to aim' *kheeng* 'coals'.

## 4. Vowel Interpretation.

### 4.1 Basic system

Except for /e/, which has maintained a four-way contrast of short, long, deep, and long deep, vowels in Jeh have a three-way contrast of short, long, and deep. The deep form tends to be short in the high vowel *i*, *u* and central vowel *a* and long in the low vowel *o*. Central vowel *a* has a fourth contrast of long deep only for derogatory words. High back vowel *u* has a four-way contrast only when followed by liquids *l*, *y*. However, *u* in the Plày Talaat dialect has only a three-way contrast.

### 4.2 Distribution of vowels

Not all vowel contrasts occur in every environment. Short vowels can occur neither on open syllables nor before rising tone /h/.

## 5. Suprasegmental Features.

### 5.1 Deep vowel<sup>7</sup>

The deep vowel quality is produced by relaxing the faucal pillars, lowering the larynx, and giving increased pressure from the diaphragm. The result is a deep, somewhat gruff, voice quality. Pitch is usually lower than that of the clear form. Deepness, when occurring with short vowels, changes the vowel height, forcing it up in most instances. This accounts for the peculiar similarity of the /i/ and /è/, which have nearly identical vowel heights but which are completely different phonemes (cf. sec. 7. 2 for examples).

### 5.2 Length

Length can occur with all five vowels but not with glides. The vowel heights of /e/ and /è/ are lowered by length (cf. sec. 7. 2 for examples).

### 5.3 Nasalization

Nasalization is rare, though presumably can occur with any vowel. It occurs in a very limited environment — only in closed syllables and only after /h/ and /ʔ/. It does not affect vowel height. Examples:

*həy* 'enough', *həy* 'we (incl)', *həol* 'happy'  
*hool* 'to tow' ʔūul 'to groan' ʔuul 'to seep'  
 ʔòòʔ 'to suppress', ʔòòʔ 'pumpkin'.

## 6. Distribution of Phonemes.

The word in Jeh can be defined as having one main syllable, which may be preceded by an unstressed, but occasionally morphologically significant, presyllable. The existence of a presyllable in Jeh is established by the fact that a consonant cluster (e. g. *tr*) of the main syllable can be contrastively broken up, the first consonant (*t*) occurring in the presyllable and the second consonant (*r*) occurring in the main syllable.<sup>8</sup>

7 Deep vowel in Jeh parallels very closely the description of the 'second register' of the pitch range of Cambodjan by E. J. A. Henderson in 'The Main Features of Cambodian Pronunciation', *Bulletin of the School of Oriental and African Studies* (University of London), Vol. XIV, Part I, pp. 151ff. The grave accent (˘) is used as the phonetic symbolization for deep vowel in this paper.

8 If such a contrast were non-existent, Jeh could be interpreted as an agglutinative monosyllabic language. The *a* would serve only as an open transition between the C in the presyllable and the C in the main syllable. The contrast is proportionately rare in Jeh, having been found only with five C<sub>3</sub>C<sub>4</sub> clusters: *pl*, *tr*, *th*, *kl*, *kh*. For a detailed analysis of Jeh presyllables from a different standpoint, see Patrick D. Cohen, 'Presyllables and Reduplication in Jeh', in this same volume.

Examples :

*trah* 'to chop out' *tarah* '(of chicken) to squawk'  
*khey* 'month' *kahey* 'moon'

### 6.1 Presyllables pattern : C<sub>1</sub> V<sub>1</sub>

Presyllables occur before single consonants, strong consonant clusters, and preglottalized consonants (but before no other close-knit sequences).

6.1.1 V<sub>1</sub> has one filler : *a*. There is complete neutralization of the vowel in the presyllable except after *ʔ*. Following *j* and *s*, which are in complementary distribution in the presyllable (cf. sec. 6.1.2), this vowel becomes *i*. Glottal stop *ʔ* maintains a distinction between *a* and *i*, possibly due partly to the fact that men's names are preceded by *a* and women's names by *i*. Examples :

*ʔidrah* 'one-half year' *ʔadrah* 'to scare'  
*taba* 'branch' *pakaal* 'fence'

6.1.2 C<sub>1</sub> can be filled by voiceless stops *p*, *t*, *k*, *ʔ* by nasal *m*, and by alveolars *s*, *l* (e.g. *palek* 'to roll'). Voiced stops occur in C<sub>1</sub> only as alternating with voiceless stops or *m* (e.g. *bangaay* ~ *mangaay* 'person'). *j* is in complementary distribution to *s* in C<sub>1</sub>, occurring only before *k*, *ʔ*, *h*, *m* of the main syllable (e.g., *jihoom* 'lungs'). *s* precedes other consonants (e.g. *silang* 'face up'). *l*, though phonemically interpreted as a filler of C<sub>1</sub>, occurs phonetically inverted after V<sub>1</sub>. It occurs before every consonant except *ch* (e.g. *lapiat* [alpiat] 'tongue').

### 6.1.3 Reduplicative words

In a reduplicative word, presumably any consonant or consonant cluster, which occurs initially in the main syllable, can occur in the presyllable. Presumably any vowel can fill V<sub>1</sub> of a reduplicative word. And a syllable-final C can also occur. Examples :

*dodoʔ* 'to be in line' *drudruan* 'to fight'  
*pingpiang* 'spider' *ʔnaʔnam* '(of kettle) to sing'  
*truktrool* 'to jump up and down'

## 6.2 Main syllable pattern : $CV \pm C_5$ or $C_3C_4V \pm C_5$

V (main vowel) can be filled by any vowels in the chart. Short vowels cannot occur without  $C_5$ .

C (main consonant) has two classes of fillers :  $C_3$  and cC.

Class  $C_3$  fillers are composed of a single consonant, which may be any consonant in the chart.

Class cC fillers<sup>9</sup> are composed of all close-knit sequences except *yh*, *wʔ* and *yʔ* (cf. sec. 3.2). See Fig. 3 for complete distribution of cC.

$C_3$  (main consonant of cluster) can be filled by *m*, *s*, and by all stops except *j*.

$C_4$  (second consonant of cluster) can be filled by *r*, *l*, *h*. See Fig. 3 for complete distribution of consonant clusters.

$C_5$  (final consonant) can be filled by close-knit sequences *yh*, *wʔ*, *yʔ* and by any single consonant except voiced stops *b*, *d*, *j*, *g*, the palatals *nh*, *ch*, fricative *s*, and *r*.

## 6.3 Summary of word pattern in Jeh

The word can be summarized as follows :

$\pm$  presyllable ( $C_1V_1$ ) + main syl. ( $C_2V \pm C_5$ ) or ( $C_3C_4 \pm C_5$ ) or (cCV  $\pm C_5$ ).

## 7. Description of Phonemes.

### 7.1 Consonants

/p/ simple voiceless bilabial stops : [p].

*pat* 'to be extinguished' *bat* 'to remember'  
*mat* 'eye' *phat* 'to be plugged' *waat* 'to pull back.'

/t/ simple voiceless alveolar stops : [t].

*tiam* 'to temper iron' *kadiam* 'onion' *chiam* 'to feed' *toong* 'cl.  
for tools' *thoong* 'brass'

/ch/ simple voiceless alveopalatal affricate : [tʃ̥].

*cheh* 'to twist rope' *jeh* 'Jeh people' *teh* [to scythe] *keh* 'cup-  
board' *cheeng* 'to carry with'

9 There is also a rare occurrence of close-knit sequence preceding a member of  $C_4$ , but usually only as alternate pronunciations (e.g. *hmra* ~ *tamra* 'day after tomorrow' *ndruung* ~ *druung* 'cocoon').



Fig. 3 CONSONANT CLUSTERS AND WORD INITIAL CLOSE-KNIT SEQUENCES

Consonant clusters class cC

$\begin{matrix} C_3 \\ C_2 \end{matrix}$	r	l	h	nasal	dbl	C ? h	$\begin{matrix} c \\ C \end{matrix}$
p	pr	pl	ph	mb	bb	?b	b
t	tr		th	nd	dd	?d	d
k	kr	kl	kh		jj		j
b	br	bl		ngg	gg <sup>10</sup>		g
d	dr					?m hm	m
g	gr	gl			nn	?n hn	n
m	mr	ml				?hn hnh	nh
s	sr					?ng	ng
					//	?l hl	l
						?r hr	r
						?w hw	w
						?y hy	y

Fig. 4 EXAMPLES OF WORD PATTERNS <sup>11</sup>

Main Syllable

$\begin{matrix} +C_2 \\ -C_5 \quad +C_5 \end{matrix}$ 
 $\begin{matrix} +C_3C_4 \\ -C_5 \quad +C_5 \end{matrix}$ 
 $\begin{matrix} +cC \\ -C_5 \quad +C_5 \end{matrix}$

PRESYLLABLE	none	ma	pah	pra	praan	?ya	ndok
	C <sub>1</sub> V <sub>1</sub>	ta.ma	ta.pah	ma.dra	ta.praang		

strap over shoulder' *kheeng* 'burning coals'

/k/ simple voiceless velar stop : [k].

*kooy* 'to carry on head' *gooy tuh* 'breast nipple'

<sup>10</sup> Lengthened *g* occurs only in the Plây Talaat dialect.

<sup>11</sup> *ma* 'aunt'; *tama* 'flea'; *pah* 'to split'; *tapah* 'to be split'; *pra* 'to spread out, crisscross'; *madra* 'arbor'; *praan* 'strong'; *tapraang* 'to span'; *?ya* 'tobacco'; *ndok* 'to bounce'.

*khooy* 'to be used to' *?akuw* 'joint of bamboo' *?i?uw* 'common rafter'

/ʔ/ <sup>19</sup> glottal stop : [ʔ].

*ta?ua* 'to bellow' *hùa ho?* 'airplane' *?akuw* 'joint' *?i?uw* 'rafter' *kong do?* 'land snail' *dok* 'monkey'

/b/ simple voiced bilabial stop : [b].

*bok* 'to dig' *pok* 'to open' *mok* 'site' *tabaang* 'third night of Jeh month' *ka?baang* 'table' *bbàng* 'tie beam'

/d/ simple voiced alveolar stop : [d].

*dam* 'young man' *tam* 'with' *kanam* 'corpse'

/j/ lenis voiced alveopalatal affricate : [dʒ]. In rapid speech, it varies freely to a voiced alveopalatal vocoid [y].

*jaal* 'round fish net' *yaal* 'fourth night of Jeh month' *joh* 'to peck' *goh* 'clean' *choh* 'to cut out' *?ayoh* 'tribal shirt'

/g/ simple voiced velar stop : [g].

*gook* 'smoking pipe' *kook* 'goiter'

/m/ simple voiced bilabial nasal : [m]. In word final position it can vary to a syllabic nasal [bm].

*tama* 'flea' *taba* 'points on antler' *?imuw* 'here' *kakuw* 'to rely on' *mùt* 'to go in' *?mùt* 'to take in'

/n/ simple voiced alveolar nasal : [n]. In word final position it can vary to a syllabic nasal [dn].

12 In this paper symbols follow Vietnamese orthography where possible. Exceptions are :

[iə] and [uə] are written *ia* and *ua* :

double vowels indicate length.

The current orthography of Jeh is the same as the phonemic symbols except in the following cases ;

Word initial *ɲw* and *ɲy* are written as *u* and *i*.

Word final *wɲ* and *yɲ* are written as *ü* and *ĩ*.

Word final *yhɲ* is written *yh* after short vowels and *ih* after long vowels.

Word final *w* and *y* are written as *u* and *y* after short vowels and as *o* and *i* after long vowels

*i* is used after *e* (e.g. *dei* 'not') because there is no length contrast after *e*.

Word final *uw* is written as *ou*.

Glottal stop *ʔ* is written, word initial, = word medial, and ~ word final. It is left unwritten

before word initial vowels.

The phonemic sign // is used only for clarity or when in contrast to the phonetic sign [ ]. Elsewhere the phonemes are italicized.

*nuat* 'tumor' *duat* 'to pull out' *naam* 'a shed' *nhaam* 'to weep'  
*lana* 'sheet' *langa* 'sesame seeds', *ka niap* 'small fish' *lup liap* 'thirteenth night of Jeh month' *nah* 'side' *?nah* 'some' *nnaah* 'wine'

/nh/ simple voiced alveopalatal nasal : [n̄]. It is the only nasal that does not occur in word final position.

*lanhok* 'to jostle' *tanok* 'beach' *ngok* 'mountain' *jong jok* 'rainbow'

/ng/ simple voiced velar nasal : [ŋ]. In word final position it can vary to a syllabic nasal [gŋ].

*ngòh* 'ridge of a notch' *gòh* 'to ignite'. See /nh/, /n/.

/l/ voiced alveolar lateral : [l]. In word final position it becomes a neutralization of /l/ and /r/ and can vary to a syllabic liquid [dl].

*loh* 'to go out' *roh* 'thin' *taal* 'stock of crossbow' *taan* 'to weave' *bal* 'species' *ban* 'to raise'.

/r/ voiced alveolar flap : [ṛ].

*rok* 'cow' *lok* 'white colored wasp'.

/w/ voiced bilabial rounded vocoid : [w]. It alternates freely to a slightly fricative allophone [b] in syllable-initial position.

*wal* 'to go back' *bal* 'species' *?waal* 'to drill' *ka* 'fish' *kaw* 'to call'.

/y/ voiced alveopalatal vocoid : [y].

*kaya* 'ginger' *?ya* 'tobacco' *yaang* 'spirit' *jaang* 'work' *yaal* 'fourth night of Jeh month' *nhaal* 'bronze colored mineral' *ha* 'hip' *hay* 'we'.

/s/ alveolar fricative : [s]. In initial position it alternates freely with voiceless alveolar affricate [ts].

*saang* 'to finish' *haang* 'hot' *?aang* 'rabbet joint' *kathaang* 'ladder'.

/h/ voiceless glottal fricative : [h]. In initial position in isolation and following voiceless stops it is a glottal fricative.

*hèè?* 'slow' *sèè?* 'afternoon' *?èè?* 'yes'

[M, N, N̄, L, R, W, Y] In initial position in sequences it has allophones of voiceless nasals and liquids before their voiced counterparts.

*hmàn* [Mmàn] 'pants' *?màn* 'forbid'

*hnho?* [Ñnoɔ] 'sad' *dey nho?* 'not much'  
*hraay hrày* [Rra. y Rrày] 'to misplace' *raay* '(of rain) to stop'  
*hwaay* [Wwa:y] 'besides' *waay* 'to redeem'  
 [·] In final position /h/ is manifested as a rising tone. (cf. sec. 3.3)

*tìh* [tì:] 'big' *tì* 'hand'  
*puàh* [pùá] 'flexible' *sùà* 'to believe'  
*tìah* [tiá] 'down there' *sia* 'to miss'

## 7.2 Vowels

/i/ /ii/ /i/ is a high open front unrounded vocoid : [ɪ].

/ii/ is phonetically similar but longer.  
*hwil* 'to forget temporarily' ?*wiil* 'to coil'

/i/ is a high close front unrounded vocoid : [i].  
 ('deep' vowel, cf. sec. 5.1).

*hiw* 'to flow' *chìw* 'to go' *chim* 'bird' *sìm* 'species of duck'

/ia/ /iá/ /iá/ is a glide from /i/ to a neutral central vowel (schwa)

/iá/ is phonetically similar but deep.

*tiang* 'to fasten' *tìang* 'to sunbathe' *kachiat driang* 'to be killed instantly', *driiŋg* 'yellow'

/e/ is a mid front unrounded vocoid : [e].

*pet* 'duck' *pít* 'to plant' *jep* 'sandal' *jeep* 'shoulder basket' *jèp*  
 'to sew' *hnèp* 'happy' *kajip* 'centipede'

/ee/ is a low front unrounded long vocoid : [ɛː].

?*reeng* 'to look for' ?*riiŋg* 'spring pole snare' ?*rèeng* 'to look at'  
*reeng* 'hundred' *reng* 'close together'

/è/ is a high open front unrounded deep vocoid : [ɨ].

*tèng nèng* 'guitar' *tìng dra* 'one-half full'. See /e/.

/èè/ is a mid front unrounded long deep vocoid : [ɛ̃ː].

*pèeng* 'upper' *pìiŋg* 'snap trap'. See /e/.

/a/ /aa/ /a/ is a low open central unrounded vocoid :

[a]. /aa/ is phonetically similar but longer.

*wal* 'to return' *wàl* 'wall plate pole' *waal* 'to tell'.

/à/ is a low close central unrounded deep vocoid : [ə̃].

*ddàng* 'equal to' *ddong* 'to help'. See /a/.

/u/ /uu/ <sub>o</sub> /u/ is normally a mid close back rounded vocoid : [o].

It can vary freely to a high back rounded vocoid [u]. /uu/ is phonetically similar but longer.

*sal puk* 'field in fallow (first year)' *puuk* '(of stomach) to growl'  
*kung* 'horizontal' *kong* 'forearm' *juuy* 'deer' *jùuy* 'after'.

/ù/ is a mid close back rounded deep voicoid : [ò].

*chùk* 'to irrigate' *chuk* 'to slug' *kaduy* 'small of back' *dùy* 'to pull'

/ua/ /ùà/ <sub>o</sub> /ua/ is a glide from /u/ to a neutral central vowel (schwa).

/ùà/ is phonetically similar but deep.

*yuan* 'seed for wine' *yùan* 'we (excl.)' *jua?* 'to step on' *jùà?*  
'sour' *sasuang* 'to dart and dash' *suung* 'to scald'

/o/ /oo/ <sub>o</sub> /o/ is normally a low back rounded vocoid :

[ɔ]. It can vary freely to mid back position [o]. /oo/ is phonetically similar but longer.

*bong* 'to fall' *boong* 'to restore' *tabang* 'bamboo shoots' *chong*  
'to eat rice' *pachoong* 'to test'

/ò/ is normally a low back rounded long deep vocoid : [ɔ̃]. It

alternates freely with a low close central vowel [ə̃].

*pachoong* 'to test' *chòong* 'to file' *chàng dramang* 'midnight'

/./ indicates nasalization. It is contrastive only after /h/ and /?/.

(See examples in discussion of nasalization sec. 5.3)

