0. Introduction

1. Consonant Phonemes

2. The Phonological Word

3. Vowel Phonemes

0. Introduction

Cua is a Mon-Khmer language, spoken by approximately 10,000 people in the Trà Bông District of Quảng-Ngãi Province, northwest of Quảng-Ngãi City, in South Viet-Nam. The language data in this paper represents the Trà-Bông Valley dialect, slightly different from the High Mountain dialect which includes a larger geographic area and considerably more speakers, but which remains inaccessible to the researchers because that area is not government-controlled. The research for this paper has been carried on intermittently for a year and a half (beginning October, 1964), as informants have been available.

1. Consonant Phonemes

1.1 Problems of Interpretation

1.1.1 Aspirated Stops

Whether to consider the aspirated voiceless stops ph, th, and kh as clusters or units has been determined by the non-suspect pattern established in the presyllable and the main syllable. A simple CV comprises the non-suspect presyllable, thus pressuring the aspirated

---

1 I am indebted to David D. Thomas for his assistance in the analysis of Cua phonology and preparation of this paper, and am deeply grateful for the excellent informant help given by 3 related men from Trà Bae village, Đinh Đô, Đinh Quang and Đinh Mộc.
steps to function as a unit phoneme, as all three aspirates occur in the presyllable consonant position. The main syllable non-suspect maximum CCVC pattern only permits these aspirated stops to be interpreted as units (klwəl 'curly'). Also, h does not occur as the 2nd consonant in a cluster except after the voiceless stops.

1.1.2 Postglottalized Consonants and Other Sequences Occurring

Word Finally

There are no well-established clusters which occur in word-final position, and the sequences -wq, -yq, -yh, and -lh occur in that position only. They do not function as allophones of a phoneme, so, on the basis that q and h function somewhat differently than other phonemes (one is always present when nasalization occurs; both function as the only word-final consonant following the front high-mid vowel), it would seem least complicated to interpret these sequences as complex units, functioning only word-finally. Several neighboring Mon-Khmer languages also have these same complex unit phonemes, except that final -lh, seems to be unique to the Cua language.

1.1.3 Word-Initial Preglottalized Consonants and Voiceless Nasals

The absence of well-established stop plus stop and stop plus nasal patterns could influence towards a unit interpretation of voiceless nasals and preglottalized nasals and stops. But the existing stop plus liquid pattern (tr, dr, pl, vl, kl, gl) would permit the cluster interpretation of hr, hl, hw, and hy, and also qw and qy, considerably reducing the phoneme inventory. Because of this interpretation, and the fact that h and q function somewhat differently than other phonemes, it is also reasonable

---

2 Some have preferred to interpret these as allophones, e.g.

 quiero functions as (b-) initially,
   (-wq) finally;

quiero functions as (j-) initially,
   (yq) finally;

quiero functions as (s-) initially,
   (-yh) finally;

quiero functions as (r-) initially,
   (-lh) finally.
to interpret voiceless nasals (hm, hn, hnh, and hng) and preglottalized nasals (qn, qng, qnh) as clusters rather than units.

Preglottalized stops qb and qd fill the slot which, in the predominant syllable pattern, is filled by one consonant phoneme. So qb and qd have been interpreted as complex unit phonemes:

(qblæk) /blâk/ 'to sprout',
(taqbyay) /tabay 'tell a story',
(mâk aqdrâng) /mâk adrâng 'longhouse doorway'.

1.2. Consonant Descriptions and Contrasts

1.2.1 Consonants Occurring Word or Main-Syllable Initially (see chart 1)

/p/ is a voiceless bilabial stop
pâk 'language' / phâk 'hole' / vâk 'to peck'/
bâk sâk 'lose sleep over something'

/l/ is a voiceless alveolar stop
taal 'string on crossbow' / thaal 'thirsty',
katuđ 'fill-in dirt' / duh 'to need' / kaduh
'skin, hide' / kachuh 'way of singing'

/ch/ is a voiceless alveopalatal affricated stop
chung chaq 'lizard' / jaq 'to burn' / saq
'dishes' / taq 'to send'

/k/ is a voiceless velar stop
kâl 'chop, cut' / khâl 'classifier for people',
koot 'child' / goot 'to cut hair' / oot 'they'

/q/ is a glottal stop, symbolized by word medially, unmarked word initially before vowels, and - initially before consonants, except for preglottalized b and d.
dh 'classifier for animals' / kô 'wait'
pâriil 'give birth' / jît pariil 'hail'
ba-uul 'live with' / jîq pakuul 'leprosy'

/ph/ is a voiceless bilabial aspirated stop
phoq jît 'end of rain' / pôq 'carry on back'

/th/ is a voiceless alveolar aspirated stop
thèep 'more' / teêp 'wise'

/ç/ /ch/ is pronounced very lightly, like its Vietnamese correspondent.
/kh/ is a voiceless velar aspirated stop
   ḍ khalook ‘legendary mt. animal’ / kalook ‘seed, drop, pill’
/v/ is a voiced bilabial stop (b)
   vaal ‘two’ / baal ‘together’ / paal ‘pale’
/d/ is a voiced alveolar stop
   ḏih ‘myself, alone’ / ḏih ‘different’ ;
   pada ‘surprise’ / pāda ‘slap with open hand’ /
   para ‘to rub on, shampoo’ ;
   dool ‘to fillet’ / tool ‘blind’
/i/ is a voiced alveopalatal affricated stop
   pla jōok ‘foot’ / achook ‘to go with’ ; kajōh ‘to crave’ / kadōh ‘bark, pod, husk, skin of vegetable’ ; kajōw ‘demon-possessed’ / kadrōw ‘six’ ; jaawq ‘steel spear’ / yaawq to count’
/g/ is a voiced velar stop
   grt ‘to play’ / kurt ‘bat’ ; gō ‘I, me’ / ḍ ‘classifier for animal’ ;
   grum ‘very’ / sa rangum ‘to overeat’
/b/ is a preglottalized voiced bilabial stop
   biit ‘to think’ / viit ‘to fill, be full’
/d/ is a preglottalized voiced alveolar stop
   kadōok ‘to be washed away’ / kadōok ‘straw mat’
/m/ is a voiced bilabial nasal
   māk ‘hole’ / pāk ‘language’ ; muh ‘nose’ /
   vuh ‘to roast, burn off’ ; jamuul ‘to dibble soil’ / hmuul ‘grass ornaments on sacrifice pole’
/n/ is a voiced alveolar nasal
   panooot ‘a portion, half’ / ahnoot ‘climb up’ /
   pangooot ‘hungry’ va naaw ‘kind of rice’ / nhaaw ‘to wash’ ; sanīh ‘suddenly learn’ / salīh ‘exchange’

/ŋ/ is a voiced alveopalatal nasal
   nhaaw ‘to wash’ / va naaw ‘kind of rice’ ;

4 /i/ is pronounced so lightly that in rapid speech its phonetic quality is often palatalization only.
CUA PHONEMES

kanhuq ‘to threaten’ / tanguq ‘obsessed with an idea’;
nhury ‘to giggle’ / nhur ‘house’
/ng/ is a voiced velar nasal
tanguh ‘to moan’ / tanuh va ‘rice chaff’;
tanguq ‘obsessed’ / kanhuq ‘threaten’;
nguryq ‘noisy’ / hngury ‘day’; ngurl ‘forehead’ / ngur, ‘much’; ngurl ‘bird frightener’ / gurh ‘stumble’
/l/ is a voiced alveolar lateral
låk ‘wine’ / råk ‘to crow’
/r/ is a voiced alveolar flap
reh ‘to chew bone’ / leh ‘take off clothes’
/w/ is a voiced bilabial rounded vocoid
rawiit ‘encircle’ / viit ‘to fill’;
wa ‘to bend’ / wo ‘expression of disdain’
/y/ is a voiced palatal vocoid
yow ‘finished’ / ti ‘yaw ‘left hand’
/s/ is a voiceless alveopalatal fricative
suit ‘to eat lice’ / hiip ‘to smell’;
sièp ‘bird’ / théep ‘more’; sòwah ‘to comb’ / chòwah ‘sand’
/h/ is a glottal fricative
hiil ‘to snore’ / siil ‘to dig’ / iil ‘chicken’

1.2.2 Consonants Occurring Word Finally

The preceding list of phonemes, with the exception of the voiced and aspirated stops, s, r, and nh, and the addition of the following, occur in word-final position:

/lh/ - a voiceless lateral; lyh/ - a voiceless alveopalatal fricative; /wq/
- a voiced bilabial rounded vocoid followed by glottal stop; and lyq/;
- a voiced palatal vocoid followed by glottal stop.

5 It is interesting to note that of the 1700 word dictionary used for this data, only 8% of the final consonants are nasals. Comparing this language with other Mon-Khmer languages (most of which have a much higher percentage of nasal finals), it would appear that Cua usually makes a shift to a voiceless stop at the same point of articulation as the nasal ending in these other languages.

6 In word-final position the contrast between /nh/ and /ng/ is neutralized. The phonetic manifestation is ng, except following ê, when ng may vary with nh.
\[p\] koop 'turtle'
\[t\] koot 'child'
\[ch/\] gahooch 'to whistle'
\[k/\] kook 'bracelet'
\[q/\] kooq 'white'
\[m/\] ahnoom 'swathe, cover'
\[n/\] tanoon 'loincloth'
\[ng/\] vålh kanoong 'a snake'
\[l/\] gål 'drum'
\[lh/\] gålh 'swollen'
\[h/\] parah 'reserve'
\[yh/\] parayh 'to pluck with finger'
\[y/\] öl jaray 'type of tree'
\[w/\] öl paraw 'type of tree'
\[wq/varawq 'unusual'
\[yq/\] rangwayq 'musical instrument'

2. The Phonological Word
2.1 Word Pattern

The word is composed of one non-obligatory presyllable and the obligatory main syllable, which receives the heavier stress.

2.1.1 Presyllable

CV is the only pattern, thus becoming cr vt of the word.

2.1.2 Main Syllable

The two established patterns for the simple word are:

C₂V₂±C₅ and C₃ C₄ V₂±C₅.

2.2 Phoneme Distribution Within the Word

2.2.1 Within the Presyllable

The only vowel occurring in the presyllable is a neutralized central a, which has phonetic variance as it is assimilated to the points

\[ch/\] in word-final position possesses the quality of an i- onglide, preceding central and back vowels. There appears to be some free variation of -ch, with -k usually after front vowels, and -t following back vowels.
of articulation of its surrounding environment. All the stops may fill the C1 position (pa, ta, cha, ka, va, da, ja, ga) except that d has not yet been found and b and the aspirated stops are infrequent. The only nasal occurring in the presyllable is ma. The other phonemes which occur are ra, sa, ha, and (q) a.

2.2.2 Within the Main Syllable

2.2.2.1 C2 V2 ± C5: Any consonant may occur in C2 position except the four phonemes which are restricted to word final position only (lh, yh, yq, and wq). The V2 slot may be filled by any vowel (see Section 3). The C5 category is composed of the non-aspirated voiceless stops, all nasals except nh, and w, l, y, h, q, and the four restricted phonemes just mentioned. Word examples of this type are:

CV -lu ‘clever’, CVC - (munq) luk ‘ancestors’; with presyllables, as follows:

CV cv CV-kalu ‘type of singing’, cvCVC - jalu ‘dark’

2.2.2.2 Consonant Clusters (C3 C4): The second phoneme in a sequence is more restricted than the first, so we shall state the clusters on the basis of the C4 fillers. All four nasals occur in that position, preceded only by h and q (except m has not yet been found preglottalized). The other four phonemes which classify as C4 fillers are r, l, y, and w. r may be preceded by C3 alveolars, dr, dr and tr and hr and nasal mr. (There has been more open transition noted between the mr sequence than in any other cluster). Occurring before l are the bilabial and velar stops pl, vl, kl, gl, and hl. Before y, all non-aspirated stops except velar stops occur: py, vy, by, ty, dy, jy (ch has not been found yet), and qy and hy. All three velar stops and ng occur before w: kw, khw, gw ngw as well as qw and hw. Also, there has been found one occurrence of labialized pw, in the word kapwaq ‘to seize, pounce on’. h is the only C3 phoneme which occurs with all C4 phonemes. The most frequently occurring clusters, in order, are; hl, dr: kl, tr, hr, and pl. Some examples of words demonstrating the C3 C4 V2 C5 pattern are:

CCV -hla ‘leaf’ CCVC - hlah ‘mouthwash’; and with presyllables;
cvCCV - ahra ‘squirm’, cv CCVC - kahlah ‘peel bark’

2.3 Distribution and Frequency

2.3.1. Of Presyllables

43% of the words collected to date have presyllables, some of which function as affixes. ka- occurs twice as frequently as the next frequent presyllables, which are ta- and a-. Presyllable a- has the widest range of distribution. ha- is the most restricted occurring only before r.

2.3.2 Between Pre- and Main Syllable

Main-syllable initial consonants n, l, and r, occur with the widest range of presyllables. Clusters which can occur with presyllables are hm, hn, hng, hr, hl, hy, tr, and dr, all of which occur with a; dr is also preceded by ka, pa, ma and sa, tr by ka- (one word), and hag and hr by ta. The contrastive separation of a consonant cluster proves the phonemic existence of the presyllable, such as:

bla ‘answer’, bala ‘jest, joke’
vluk ‘drown’, valuk ‘lake’
klaat ‘fog’, kalaat ‘hunk of meat’
trāk ‘eggplant’, tarāk ‘unison call in prayer chant’

3. Vowel Phonemes

3.1 Problems of Interpretation

There are nine different well-established points of articulation. One extra contrast at the mid-front tongue position (i) is very restricted in distribution, and occurs infrequently, yet it is contrastive with its bordering phonemes, and does not function as an allophone.8 The high and mid, front (except i) and back vowels glide to the low central vowel. See Chart II.

3.2 Vowel Descriptions and Contrasts

\(/i/\) is a high front unrounded vowel (i) (often varying with \(\i\) in the environment of p,t and l).

8 The possibility does exist that further data may allow this vowel to be interpreted as an allophone of \(\i\), but the few words found thus far are not convincing. Other than symmetry in the vowel system, little would be gained by interpreting \(i, \i\i, e\) before \(h\) and \(q\) as \(/ih, \i\es, \i\eh/\) and \(/iq, \eq/\), respectively. And what symmetry would be gained in the vowel system would be lost in the distribution of the final voiced consonants.
environment of p, t, and l).

\( \text{sit} \) ‘little while, bit’ / \( \text{siit} \) ‘long time; to sew’

/ii/ is phonetically the same as the preceding vowel, but longer

/i/ is a high-mid front unrounded vowel (e\( ^\wedge \) )

\( \text{ramiq} \) ‘awfully’ / \( \text{miq} \) ‘mother’ / \( \text{d\( \text{\textasciitilde} \)mg} \) ‘olden times’

/ë/ is a low-mid front unrounded vowel (e)

\( \text{tan\( \text{\textasciitilde} \)ng} \) ‘stubborn’ / \( \text{kan\( \text{\textasciitilde} \)ng} \) ‘teeth’;

\( \text{kap\( \text{\textasciitilde} \)h} \) ‘woven walls’ / \( \text{pek va} \) ‘to pound rice’ / \( \text{piq} \) ‘fingerprint’

/ëë/ is phonetically the same as the preceding vowel, but longer

\( \text{se\( \text{\textasciitilde} \)t} \) ‘to cook’ / \( \text{hla seet} \) ‘type of leaf’ / \( \text{siit} \) ‘long time; sew’

/e/ is a low front unrounded vowel (\( \varepsilon \) )

\( \text{\( \acute{\text{o}} \) ji kech} \) ‘kind of frog’ \( \text{se\( \text{\textasciitilde} \)ep kech} \) ‘parrot’ / \( \text{k\( \text{\textasciitilde} \)ch} \) ‘bite’

/ee/ is phonetically the same as the preceding vowel, but longer

/u/ is a high central unrounded vowel (\( \i \) )

\( \text{ramurt} \) ‘weak’ / \( \text{tamurt} \) ‘taut’

\( \text{dur} \) ‘that, there’ / \( \text{do} \) (sal) “protect from sun”

/uu/ is phonetically the same as the preceding vowel, but longer

/o/ is a mid central unrounded vowel (\( \mathcal{\mathfrak{o}} \) )

\( \text{poq} \) ‘to carry on back’ / \( \text{po\( \text{\textasciitilde} \)\( \text{\textasciitilde} \)q} \) ‘large shelter, / \( \text{hmurq} \) ‘(n)ever’

/o\( \text{\textasciitilde} \)/ is phonetically the same as the preceding vowel, but longer

\( \text{aro\( \text{\textasciitilde} \)l} \)h ‘choose’, \( \text{torvl} \) ‘reply’ / \( \text{lurvl} \) ‘soft, tender’

/a/ is a low central unrounded vowel (a)

\( \text{nhaw} \) ‘corn tassels’ / \( \text{nhaw} \) ‘to wash (hands, face)

/aa/ is phonetically the same as the preceding vowel, but longer

\( \text{takaat} \) ‘to come to’ / \( \text{takoot} \) ‘tie a knot’

/u/ is a high back rounded vowel (u)

\( \text{tuq} \) ‘to simmer’ / \( \text{gay tuuq} \) ‘hammer’ / \( \text{t\( \text{\textasciitilde} \)q} \) ‘hot’

/uu/ is phonetically the same as preceding vowel, but longer

/o/ is a mid back rounded vowel (o) \( \text{l\( \text{\textasciitilde} \)k} \) ‘finger’ / \( \text{l\( \text{\textasciitilde} \)k} \) ‘debt’

/o\( \text{\textasciitilde} \)/ is phonetically the same as the preceding vowel, but longer

\( \text{hl\( \text{\textasciitilde} \)k\( \text{\textasciitilde} \)o} \) ‘smell bad’ / \( \text{hl\( \text{\textasciitilde} \)wul} \) ‘rice chaff’ / \( \text{v\( \text{\textasciitilde} \)lh} \)

\( \text{ahlool} \) ‘type of snake’
/â/ is a more central and slightly higher, less rounded vowel (varying to A) than its related long vowel /oo/.

\textit{tavâk} 'cheek' / \textit{tavak} 'bamboo sprouts' / \textit{daak tavook} 'river' 

/oo/ is a low back rounded vowel (o.), phonetically long

\textit{lia}l is a high front unrounded vowel glided to a neutral central vowel

\textit{kadiap} mat 'to close eyes' / \textit{kadêap} 'onion' ; \textit{kasiat jôok} 'tip-toe' / \textit{kasiit} 'nine' ; \textit{viat} 'put into' / \textit{viit} 'fill'

\textit{lêa}l is a mid front unrounded vowel glided to a neutral central vowel

\textit{sêap} 'raise young' / \textit{sêep} 'bird'

\textit{lual} is a high back rounded vowel glided to a neutral central vowel

\textit{duah} 'string bear' / \textit{dôl} (\textit{daak}) 'carry water' ; \textit{sarhuuk} 'cross over' / \textit{play} \textit{kanhuuk} 'a fruit'

\textit{lôa}l is a mid back rounded vowel glided to a neutral central vowel

\textit{kârdaq} 'devil who causes epilepsy' / \textit{ahlôd} 'harvested rice field

\subsection*{3.3 Suprasegmental Features}

\subsubsection*{3.3.1 Nasalization}

\textit{Cua} has contrastive nasalization, but it does not occur frequently. Such words are usually initiated with \textit{h}, and end with a voiceless stop (\textit{t}, \textit{k}, \textit{ch}, \textit{q}), or \textit{h}. The vowels which have been found with nasalization so far are: \textit{ê}, \textit{e}, \textit{w}, \textit{uw}, \textit{a}, \textit{aa}, and \textit{oo}. Open syllables rarely occur with nasalization, but there are instances with vowels \textit{e} and \textit{a}.

\begin{itemize}
  \item \textit{sanum} \textit{hê} '3 years ago', \textit{hâ huî} 'open mouth' ; \textit{hôoch} 'overflow' / \textit{gahooch} 'to whistle', \textit{hêq} 'fat' / \textit{heq} 'finished'.
\end{itemize}

\subsubsection*{3.3.2 Length}

All vowels except \textit{i} have contrastive length, although not all contrast in all environments. The length contrast is frequent with all vowels except \textit{ê}, which, with very few examples, is found to be contrastive before only four final consonants. Glides are found to be only long. All vowels are phonetically long in open syllables (except \textit{i}, which occurs only in closed syllables before \textit{q} and \textit{h}). Length is contrastive before \textit{h} and \textit{q}, although rare.

\footnote{\textit{Present} Cua orthography distinguishes between /a/ and /oo/ although they are basically the same phoneme, because \textit{â} already exists in Vietnamese orthography, and \textit{oo}, representative of its phonetic sound, will aid beginning readers. (With the exception of a few people, most Cua remain illiterate).}
### 3.4 Distribution of Vowel Phonemes

Glancing at the occurrences of \( u \) and \( o \), one could wonder whether they are allophones of the same phoneme. The higher \( u \) may be preceded by nasal consonants but \( o \) never is; however, with several other consonants they do contrast in minima environments. The low central vowels \( a \) and \( aa \) occur with the largest inventory of final consonants.

<table>
<thead>
<tr>
<th>bilabial</th>
<th>alveolar</th>
<th>alveo-palatal</th>
<th>velar</th>
<th>glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>stops</td>
<td>vl.</td>
<td>p</td>
<td>t</td>
<td>ch</td>
</tr>
<tr>
<td>vl. asp.</td>
<td>ph</td>
<td>th</td>
<td></td>
<td>kh</td>
</tr>
<tr>
<td>vrd.</td>
<td>v</td>
<td>d</td>
<td>j</td>
<td>g</td>
</tr>
<tr>
<td>vrd. pregl.</td>
<td>b</td>
<td>d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nasals</td>
<td>m</td>
<td>n</td>
<td>nh</td>
<td>ng</td>
</tr>
<tr>
<td>liquids vl.</td>
<td></td>
<td>lh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vrd.</td>
<td>w</td>
<td>l,r</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>fricative</td>
<td>wq</td>
<td>s/yh</td>
<td></td>
<td>h</td>
</tr>
<tr>
<td>post-glottal.</td>
<td>yq</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CHART I. CONSONANT PHONEMES**

<table>
<thead>
<tr>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glide</td>
<td>Glide</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>i</td>
<td>ia</td>
</tr>
<tr>
<td>High-Mid</td>
<td>i</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>ëa</td>
<td>o</td>
</tr>
<tr>
<td>Low-Mid</td>
<td>ë</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>e</td>
<td>a</td>
</tr>
</tbody>
</table>

Suprasegmental: Length (double vowel)
Nasalization ( 

**CHART II. VOWEL PHONEMES**

\(*\)