

3. DESCRIPTION OF PHONEMES IN TERMS OF ARTICULATION

Each phoneme will now be described in terms of its articulatory and distinctive features. The analysis presented in section 2 reveals seven vowels and fourteen consonants. The semi-vowels, /w y/, will be added here, as shown in Chart F where boxed symbols represent the phonemic system reflected in section 1 with Series Generating Components of nasality (N) and labialization (W). The semi-vowels /w y/ acquire full phonemic status only through their lack of syllabicity in contrast with the syllabicity of /u i/.

Chart F: Chart of phonemes

p	t	k	kw	SGC: N, W	<table style="margin: 0 auto;"> <tr><td style="padding: 5px;">i</td><td></td><td style="padding: 5px;">u</td></tr> <tr><td style="padding: 5px;">e</td><td style="padding: 5px;">ə</td><td style="padding: 5px;">o</td></tr> <tr><td></td><td style="padding: 5px;">æ</td><td></td></tr> <tr><td></td><td style="padding: 5px;">a</td><td></td></tr> <tr><td style="padding: 5px;">y</td><td></td><td style="padding: 5px;">w</td></tr> </table>	i		u	e	ə	o		æ			a		y		w
i		u																		
e	ə	o																		
	æ																			
	a																			
y		w																		
b	d	g	gw																	
m	n	ŋ	ŋw																	
s																				
	z																			

3.1 Vowels

Three distinctive features (in addition to the vocalic-non-vocalic feature) are required to identify the seven vowel phonemes.

/a/ compact grave (low open central unrounded) occurs without limitation, and displays gemination.

/æ/ compact acute (low close front unrounded) occurs word initially and medially, but never syllable finally.

/i/ diffuse acute (high close front unrounded) occurs without limitation, and has two allophones as follows:

[i] high open, occurs only before a velar nasal, or a velar + velar nasal intra-syllabic cluster.

Example: [mɪŋa] 'my mother' [sɪkŋe] 'very'
 [mina] 'something' [sɪkə] 'shell'

[i] high close, occurs in all other environments.

The vowel /i/ may be either syllabic as in /i.ak/ 'love charm', or non-syllabic as in [i.ŋə] /yagâ/ 'water'. When [i] occurs between two vowels it is always non-syllabic, as in [uiapma] /uyapma/ 'my younger sibling'.

/u/ diffuse grave (high close back rounded) occurs without limitation except that it never follows a labialized velar. When [u] occurs between

a velar consonant and a syllabic vowel it is interpreted as non-syllabic labialization of the velar.

The vowel /u/ may be either syllabic as in /kupân/ 'smoke', or non-syllabic as in [uasap] /wasap/ 'dirt'. When [u] occurs between two vowels it is always non-syllabic, as in [kuuauən] /kuwawân/ 'as he was going (+ change of actor)'.

/e/ compact ± acute (mid close front unrounded) occurs without limitation, and displays gemination. Two allophones occur as follows:

[ɛ] mid open, occurs only after the fricatives /s z/ or the non-syllabic [i].

[e] mid close, never occurs in this environment. Illustrations follow:

[nzetɨgəmən] /zetgâmân/ 'immediately'

[iɛtnzit] /yetzit/ (name of a ghost)

/o/ compact ± grave tense (mid close back rounded) occurs without limitation.

/â/ compact ± grave lax (mid open central unrounded) occurs without limitation. Examples follow contrasting /e/, /æ/, /â/, and /aa/:

[sek] /sek/ 'sorcery'

[sæk] /sæk/ 'skirt'

[sək] /sâk/ 'tall grass'

[saak] /saak/ 'bridge'

3.2 Consonants

Fourteen consonants are established through one nine-way contrast, one three-way contrast, and three binary contrasts. The nine-way contrast involves the phonemes /d t n z g gw k kw ŋ/.

/dak/	'blood'	/zak/	'sprout'	/kak/	'He saw.'
/tak/	'It rained.'	/gak/	'greeting'	/kwak/	'white grass'
/nak/	'yam'	/gwak/	'insect'	/ŋak/	'a creak'

The three-way contrast involves the phonemes /p b m/.

/pem/	'what you left'	/bem/	'lizard'	/mem/	'bee'
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The three binary contrasts involve the pairs of phonemes /gw ŋw/, /ŋ ŋw/, and /s z/.

/gwen/	(class marker)	/sikut/	'It was.'	/ŋân/	'yes'
/ŋwen/	'tadpole'	/zikut/	'He pulled it up/out.'	/ŋwâm/	'breast'

3.2.1 *Distributional Features of Consonants*

The labialized phonemes /kw gw ŋw/, the voiceless sibilant /s/, the voiced sibilant /z/, as well as the semivowels /w y/ occur only in syllable initial position. All other consonants /p t k m n ŋ/ (and all vowels except /æ/) occur without limitation.

If this skew distribution is taken as an occasion for positing an archiphoneme of nasality and a redundant feature of labialization, the consonant inventory is reduced to seven, as noted in section 1. Then the phonetic clusters [mb], [nd], [ng], [nz] are interpreted as nasality plus closure or sibilance: N + P - [mb] - /mp/; N + T - [nd] - /nt/; N + K - [ŋk] - /ŋk/; N + S - [nz] - /ns/.

But since morphemes which occur following nasal final stems have *n*, *k*, or *s* initial basic allomorphs (never *t* or *p* initial allomorphs), interpreting the unit [mb] as a sequence /mp/ appears artificial. For example, the second person singular and second person dual/plural possessive suffixes /-ka/ and /-sa/ display the following morphophonemic changes when occurring with a nasal final stem:

/kamun + ka/ - /kamunda/ 'your (singular) dog'
/kamun + sa/ - /kamunza/ 'your (dual/plural) dog'

In these examples, as in all others which could be cited from the language, the basic allomorph /-ka/ becomes /-da/ following an alveolar nasal. A voiceless stop and a nasal occur contiguously across word boundaries as in the following example:

/komam pakap/ ('cane' + 'bring them') 'Bring the canes.'

3.2.3 *Description of Consonants*

3.2.3.1 *Nasal Consonants*

A schematic representation displays the nine nasal consonants, as in Chart G.

(1) Some nasals occur without limitation.

/m/ diffuse grave continuant (voiced bilabial)

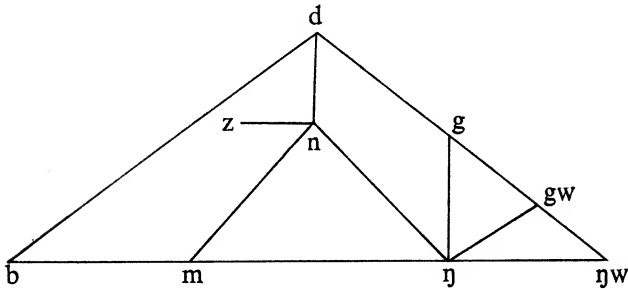
/n/ diffuse acute continuant lax (voiced alveolar)

/ŋ/ compact grave continuant tense (voiced velar)

(2) Some nasals occur only as syllable onsets.

/b/ diffuse grave interrupted (pre-nasalized voiced bilabial stop)

Chart G: Nine Nasal consonants

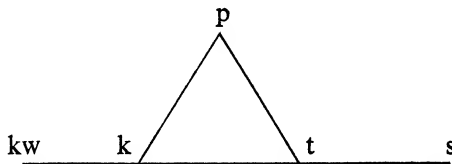


- /d/ diffuse acute interrupted (pre-nasalized voiced alveolar stop)
- /g/ compact grave interrupted tense (pre-nasalized voiced velar stop)
- /gw/ compact grave interrupted lax (pre-nasalized voiced labialized velar stop)
- /ŋw/ compact grave continuant lax (voiced labialized velar)
- /z/ diffuse acute continuant tense (pre-nasalized voiced grooved alveolar fricative)

3.2.3.2 Oral Consonants

The schematic representation in Chart H displays five oral consonants.

Chart H: Five oral consonants



(1) *Interrupted Oral Consonants.* The central interrupted consonants (see Chart H) occur without limitation, but /kw/ occurs only syllable initially.

- /p/ diffuse grave (voiceless bilabial stop)
- /t/ diffuse acute (voiceless alveolar stop)
- /k/ compact grave tense (voiceless velar stop)
- /kw/ compact grave lax (labialized voiceless velar stop)

(2) *Continuant Oral Consonant /s/*

- /s/ diffuse acute (voiceless grooved alveolar fricative) occurs only syllable initially.

4. DISTRIBUTION OF PHONEMES IN TERMS OF SYLLABLES

Syllable is defined for Wantoat as a phonological unit characterized by distinctive stress/tone, and is thereby set off from any adjoining sequences. Such a stress/tone is accompanied by a definite chest pulse to further distinguish the syllable. The crest of a syllable is a single vowel, optionally preceded and/or followed by a consonant margin.

The following formula represents all observed syllables in Wantoat: (C) V (C).

4.1 *Distribution of Consonants*

Consonants may occur singly either syllable initially or finally, or in clusters inter-syllabic. The formula $C_a C_b$ represents all the inter-syllabic clusters in which C_a is any of the six consonants which may occur syllable finally, C_b is any labialized nasal, pre-nasalized or sibilant consonant. The syllable break follows the first consonant in these clusters. The matrix in Chart I displays this distribution and all co-occurrence restrictions.

Chart I: Matrix of co-occurrence restrictions⁹

	g	ŋ	z	d	n	s	m	b
k	×	×	×					
p			×	×	×	×	×	×
t			×	×	×			
m			×	×	×			
n			×	×				
ŋ			×					

Examples: $C_a \cdot C_b$ /ap.so/ 'come'
 /iak.ŋa/ 'leaves'
 /pakap.zon/ 'You all bring them.'
 /put.da/ 'Let us two break it.'

⁹ Many co-occurrence restrictions are part of the morphophonemics of the language. For detailed exemplification see Davis, "Wantoat Verb Stem Classes and Affixation", *Verb Studies in Five New Guinea Languages* (= *S.I.L. Publications in Linguistics and Related Fields*, No. 10) (Norman, Oklahoma), 131-180.

4.2 *Distribution of Vowels*

Vowels may occur singly or in clusters of two, and constitute the crest of the syllable in which they occur. Clusters of vowels are divided by a syllable break. Intersyllabic co-occurrence restrictions are shown in Chart J. Any Vowel except /æ/ (as noted in 3.1) may occur without restriction as to position within the syllable.

Chart J: Matrix of inter-syllabic vowel clusters

V	(V)						
	æ	i	â	a	u	e	o
u				×			
a				×	×		×
e			×	×	×	×	
i			×	×	×		
o		×	×	×			
â ([ə])			×				
æ	×		×				

Examples: /taok/ 'cloth' /to.ikɲa/ 'his owner'
 /saak/ 'bridge' /sa.ikɲa/ 'slick'
 /peek/ 'variety of tree'

5. PROSODIC FEATURES

The present analysis of the prosodic features is tentative pending further investigation of the interrelation of tone, stress and higher level phonology with intonation patterns.

5.1 There are three geminate vowels since phonetic length is interpreted as a sequence of two identical vowels. So the prosodic feature of quantity is not phonemic in Wantoat. This conclusion is further verified by evidence from the Awara¹⁰ dialect in which all geminate vowels of Wantoat are separated by a consonant, usually a liquid. Examples follow:

Wantoat: [sa:k] /saak/ 'bridge' Awara: [sa.lak] /salak/ 'bridge'
 Wantoat: [ta:n] /taan/ 'mountain' Awara: [ta.wan] /tawan/ 'mountain'

¹⁰ A phonemic analysis of the Awara dialect has not yet been undertaken.

5.2 The prosodic features of pitch and force work together to produce a feature of 'accent'. The syllable with the strongest force receives high pitch. Only two pitch patterns occur on di-syllabic words ('', '') and three patterns on three syllable words ('-', '- ', '-'). Four syllable words combine the pitch/stress patterns which occur on di-syllabic words in various sequences, e.g. ('' '') and ('' '').

Neither high pitch, low pitch nor stress is predictable by any outside criterion. No words have yet been observed which are minimally different in terms of either pitch or stress. Many words when pronounced in isolation fluctuate in their pitch/stress pattern.

The present tentative conclusion about these two features is that pitch is non-phonemic, being predictable in terms of stress, and that stress is unpredictable and is without any morphological significance.

Summer Institute of Linguistics

Davis, Donald R. 1969. "The distinctive features of Wantoat phonemes." *Linguistics* 47: 5-17.