Phonological Sketch of Western Subanon

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- 1. Introduction
- 2. Phonetics

Table 1 Consonant phones in Western Subanon

<u>Table 2 Vowel phones in Western Subanon</u>

3. Phonemic analysis

Table 3 Consonant phonemes of Western Subanon

Table 4 Vowel phonemes of Western Subanon

4. Phonological processes and rules

<u>Table 5 Western Subanon phonemes and their allophones</u>

- 5. Distribution of sounds
- 6. Recommended practical orthography

Table 6 Recommended practical orthography for Western Subanon

- 7. Remaining questions
- 8. Appendix

1. Introduction

The following is intended to be a sketch of the phonological system of Western Subanon [ISO 639-3: suc], an Austronesian language of Mindanao Island in the Philippines. The analysis is based on elicitation with a single speaker of the Malayal dialect. On this basis, a best-guess preliminary analysis is offered, including notes on remaining areas of uncertainty.

2. Phonetics

Consonant phones that were recorded during elicitation sessions for Western Subanon are presented in Table 1.

The labial series is realized with little variation, with the exception of the approximant [w], which alternates with [u] in careful pronunciations: [go'tow] ~ [go'to.u'] 'person'. The labiodental [v] appears only once in the corpus, in a recent loanword: [ti'vi] 'television.'

Table 1 Consonant phones in Western Subanon

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Palatal(ized)	Velar	Uvular	Glottal
Stop	рb		td			(d ^j)	kg	q	γ
Affricate					(d3)				
Fricative		(v)		S				χ	h
Trill				(r)					
Lateral				l					
Glide	\mathbf{w}^2					j			
Nasal	m		n_	n		ŋ	ŋ	N	

The coronal series exhibits more variation between dental and alveolar places of articulation. The coronal oral stops are most consistently realized as dental, while the others in the series are typically alveolar, unless followed by a dental stop: [gondow] 'day'. The phone [r] is found only in loanwords; e.g. [go † merIqo] 'America,' [rimos] 'breadfruit' (from Tagalog), and can be strongly trilled even when the segment in the original language would have been a tap. The postalveolar affricate occurs rarely and appears to originate either from loanwords or the effects of rapid speech: [go * d \hat{s} a] 'elephant' (cf. Malay and Indonesian *gajah*, ultimately from Sanskrit). This sound reportedly also varies with the palatalized voiced alveolar stop variant, [d i ,] among some speakers in rapid speech

The palatal variants $[d^j]$ and [n] appear only in rapid speech when followed by the palatal glide: $[d^j$ alom] 'inside' and [n]u'g] 'coconut'. In careful speech, the sounds are pronounced as the corresponding coronal stop plus a high front vowel: [dialom], [niug]. The consonant [n] is phonetically uvular [n]. The voiced [n] is most consistently realized as velar, not uvular. The segment [n] is velar, although the uvular [n] is the only nasal that appears before [n]. In rapid speech, [n] can be somewhat spirantized, [n], intervocalically (but this spirantization is not long in duration when it occurs). Syllable-finally before a pause, [n] is always unreleased. By contrast, [n] may or may not be released at the end of a word. It is released in all other contexts.

2

¹ Reportedly pronounced [ti'bi] by the older generation

² Labiovelar approximant

Glottal stop occurs intervocalically, syllable-finally, and word-initially before vowels. Word-initially before vowels it is predictable and therefore not considered phonemic in this environment. The segment [h] rarely occurs.

Voiceless stops [t] and [q] are always unreleased syllable-finally, while voiced stops [d] and [g] may be released at the end of a word. Labial stops may or may not be released word-finally. Voiced stops tend to be slightly pre-voiced, and in careful pronunciations can sound vaguely like implosives.

Vowel phones that were recorded during elicitation sessions for Western Subanon are presented in Table 2. Their pronunciation closely matches the specified pronunciations for the IPA symbols given. Vowels will be discussed in more detail in the phonemic analysis section.

Table 2 Vowel phones in We	estern Subanon
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	Front			Back	
Close	i		÷		u
Ciose		I		σ	
Close-mid	e				0
Open-mid		3			Э
Open			a	а	

3. Phonemic analysis

The consonant phonemes of Western Subanon are presented in Table 3. Vowel phonemes are given in Table 4. A list of allophones of each phoneme, with examples, appears in Table 5. Minimal and near minimal pairs for some contrasts are given in the appendix.

Table 3 Consonant phonemes of Western Subanon

	Labial	Dental/Alveolar	Alveopalatal/Palatal	Velar/Uvular	Glottal
Stop	p b	t d		q g	?
Nasal	m	n		ŋ	
Affricate			d \mathfrak{F}^3		
Fricative	V^3	S			h
Trill		r^3			
Lateral		1			
Approximant	W		j		

³ Only in loanwords.

By current analysis, there are 15 consonant phonemes in the native inventory, as well as 3 consonant phonemes that only appear in loanwords. Voicing is only contrastive in the oral stop series, as shown by minimal pairs such as $/t\alpha pi?/$ 'plank' vs. $/d\alpha pi?/$ 'spank'. Voiced and voiceless stops contrast in initial, medial, and final positions. The voiceless stops are unreleased syllable-finally, while voiced stops may or may not be released in these environments. Additionally, /d/ has an allophone $[d^j]$ that appears before /j/ and a vowel (apparently underlyingly /iV/).

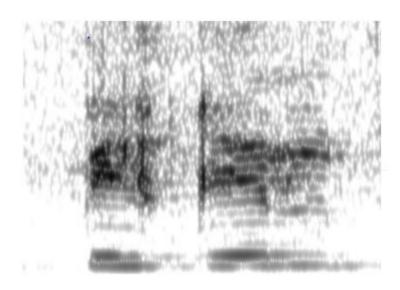


Figure 1. The second and third syllables of mokpikilpikil, showing that the invervocalic stop /q/ (orthographic <k>) displays no velar pinch.

The uvular /q/ (orthograpic <k>) has the most allophonic variants, as it can be realized as a fricative $[\chi]$ intervocalically in rapid speech. Interestingly, the velar [k], which might be predicted to behave similarly to the voiced dorsal /g/, does not appear to occur as an allophone of /q/. To be certain, more spectrographic analysis would be required, but thus far, spectrograms of /q/ in all environments reveal the lack of a velar pinch before or after this consonant, suggesting that it is indeed uvular (see Figure 1).

The nasal stops /m/, /n/, and /n/

are fully contrastive medially and finally; however, /n/ and /ŋ/ appear to have limited distribution initially. All allophones of the nasals can be accounted for by the nasal assimilation rule, which will be discussed in the next section (and therefore will not be included in Table 5).

The only fricative with full distribution within the permitted maximal syllable (see section 5) is /s/, which appears not to have allophonic variants. The glottal fricative /h/ occurs rarely and, in all but one instance, intervocalically. The speaker suggested that /h/ and /q/ might not contrast, given the fact that /q/ is commonly accompanied by loud uvular frication or is completely spirantized as / χ /. However, a rare instance of word-initial /h/ provides a near minimal pair contrast: /qɑlis/ 'sword' vs. /hɑmis/ 'Thursday'. It is worth noting that *hamis* is likely a borrowing from Malay or a nearby language (cf. Malay /xamɪs/ 'Thursday'), as are other /h/-initial words, e.g., /huliu/ 'July' from Spanish *julio*.

The only native liquid /l/ is contrastive in all environments. Additionally, in less recently borrowed words that contain /r/ in the donor language, this segment is typically replaced by /l/, as in $/d3\alpha$ lum/ 'needle', mostly likely from Malay or Indonesian *jarum*.

The approximants /w/ and /y/⁴ appear word-initially in very few examples: /yon/ 'he/she/it,' /wqqol/ 'cry,' and /wqqwqq/ 'witch.' Most often, these glides appear intervocalically or word-finally, as in /koyon/ 'that,' /bqbuy/ 'pig,' /gqwqm/ 'ocean,' and /gondow/ 'day.' Glides can also appear in the syllable onset after a consonant: /dwoy=mu/ 'your spouse,' /djalom/ 'inside.'

There are three non-native "phonemes" in Western Subanon: /v/, /r/, and /d3/. It is interesting to note, that the affricate appears to be penetrating the native phonology among young speakers, who use /d3/ before a vowel in free variation with segments pronounced consistently as $/d^{ij}/$ or /di/ by older speakers (as reported by our consultant, who has this variation). Further, in older borrowings (or in loans pronounced by older speakers), the variants /v/ and /r/ can be replaced by /b/ and /l/ respectively. A more thorough investigation with multiple speakers is required.

	Front		Back
Hig	i		u
h			_
Mid	3		0
Low		а	

Table 4 Vowel phonemes of Western Subanon

There are five vowels, distinguished on the axes of height (high, mid, low) and backness (back, front). The vowel /a/ is the only low vowel and tends to be more front than the other back vowels. There is little, if any, noticeable variation in the pronunciation of /a/. Spectrographic analysis would likely show that some instances are slightly more or less front.

The mid vowels are noticeably lower than canonical /e/ and /o/; hence, the decision to use ϵ and ϵ as the symbol representing this phoneme, though ϵ and ϵ in the practical orthography. An interesting piece of evidence supporting the claim that Western Subanon mid vowels are lower than the standard IPA values for ϵ and ϵ and ϵ are replaced in Subanon. In every instance observed thus far, Spanish ϵ and ϵ are replaced with ϵ and ϵ in Subanon loanwords, instead of with the Subanon mid vowels. For example, compare Subanon /guspital/ 'hospital' and /tinidur/ 'fork' with Spanish *hospital* and *tenedor*. This suggests that the Spanish mid vowels are heard by Subanon speakers as high enough to fit the Subanon high vowel category. However, it is

⁴ Note that in keeping with Philippine tradition in language description, we use /y/ for the glide rather than the corresponding IPA symbol /j/.

also possible that these words were borrowed through Tagalog or Chavacano and underwent these changes before reaching Western Subanon.

The back vowel /o/ has an allophonic variant /o/, which appears before /w/. Similarly, the front ϵ has an allophone /e/ that was observed in only one (native) lexeme [qo'longe'ŋe] 'pinky'. It seems likely that the /ŋ/ might cause the tensing of the vowel, just as it undoes the laxing of /i/ in other contexts (see the Section 4 on Vowel Tensing and Vowel Laxing).

Similarly, the high vowels are somewhat lower than classic /i/ and /u/, and they both have lax allophones, [1] and [σ], which appear in closed syllables. The variant /1/ also frequently appears in open syllables before /q/, although this varies from one utterance to the next. Additionally, the [\dagger] allophone of /i/ appears after /q/.

4. Phonological processes and rules

In addition to the allophonic conditions described above and shown in Table 5, there are several rules that operate within and across morphemes. This discussion includes as many potential processes as the data currently suggest; all points merit deeper investigation.

Vowel Laxing:
$$V[high] \rightarrow [-lax] / _C\{C, \#\}$$

This is a subphonemic process stating that high vowels become lax in unstressed closed syllables. This was stated in Table 5 in the distribution of allophones, but is restated here to show how this rule interacts with Vowel Tensing.

Vowel Tensing:
$$V \rightarrow [tense] / \eta$$

This is a subphonemic process stating that vowels are tense in the environment of /ŋ/. This is observed in forms such as [qo'longe'ne] 'pinky' and [toli'ntin] 'back'. This latter example crucially shows that Vowel Tensing applies *after* Vowel Laxing. Thus, the first instance of /i/ becomes lax in a closed syllable, but the laxing of the second /i/ is undone by the Vowel Tensing rule because of /ŋ/.

Long Stressed Vowel:
$$V \rightarrow V^* / {}^{\dagger}C_{-}$$
.

This process states that vowels lengthen in stressed, open syllables. This is the only acoustic correlate of stress that has thus far been identified, and the length difference is often extremely subtle; hence its representation with a half-length syllable here. A great deal more work is needed on stress and its correlates, including vowel length.

Table 5 Western Subanon phonemes and their allophones

Phonem e	Phones	Environment	Example	
	р¬	Syllable-finally, optionally	[ga'top] ~ [ga'top] gatop 'roof'	
р	р	Elsewhere	[popu'la] popula 'infant, fetus'	
la la	b¬	Syllable-finally, optionally	[gantib] ~ [gantib] gantib 'storehouse'	
b	b	Elsewhere	[baˈbʊj] babuy 'pig'	
	tై	Syllable-finally	[po'qot] poqot 'fish species'	
t	t_	Elsewhere	[tu̯ ˈtu̯ŋ] tutung 'burning'	
	d̅	Syllable-finally, optionally	[gu'lod] gulod 'worm'	
d	d ^j	Before /j/	[d ^j anon] <i>dianon</i> 'to him/her/it'	
-	d_	Elsewhere	[di̪ˈlɑʔ] <i>dila'</i> 'tongue'	
	q¬	Syllable-finally	[baˈsaq] basaq 'mud'	
	q̂χ	Intervocalically, optionally	$[aq\hat{\chi} \circ n]$ agon 'me' (rapid speech)	
q	χ	Intervocalically, optionally, free variation with $[q\hat{\chi}]$	[a χ o n] aqon 'me' (rapid speech)	
=	q	Elsewhere	[qanon] qanon 'eat (object focus)'	
_	g¬	Syllable-finally	[sigbot] sigbot 'grass'	
g	g	Elsewhere	[gɔʾbi] <i>gobi</i> 'night'	
γ	γ	In all observed instances	[gɔluʔan] <i>golu'an</i> 'windy'	
m	m	In all observed instances	[mo'to] moto 'smart'	
	n_	Before /t/	[bɔntʊd] bontud 'mountain'	
n	'n	Before /j/	[ʃijuˈg] <i>niug</i> 'coconut'	
-	n	Elsewhere	[dg now] danow 'lake'	
ŋ	ŋ	In all observed instances	[Ŋiˈsi] <i>ngisi</i> 'name'	
S	S	In all observed instances	[sɑmpɑq] sampaq 'smack'	
h	h	In all observed instances	[lom i sa' han] lomisahan 'table'	
	d ^j	In loans from Malay, Indonesian (used by older generation)	[d ^j a'lum] jalum 'needle' (cf. Indon./Malay jarum)	
d3⊂	d3	In loans from Malay, Indonesian (younger generation)	[dʒɑʾlum] <i>jalum</i> , 'needle'	
v	٧	Observed only once	[ti̯'vi] tivi 'television (reportedly pronounced [tiˈbi] by older Subanon speakers)	
r	r	In Spanish loans	[gubje 'rnu] gubjernu 'government' (Sp. gobierno)	
I	ı	In all observed instances	[lɔmbʊʔ] lombu' 'fat'	
W	W	In all observed instances	[ginɑ'wɑ] <i>ginawa</i> 'breathe'	
j	j	In all observed instances	[ga'jam] <i>gayam</i> 'dog'	
a	a	Very little variation, if any	[tgˈŋu] tangu 'fang'	
_	e	Observed only once	[qo'lonqe'ŋe] qolonqenge 'pinky'	
3	3	Elsewhere	[tgˈnɛ] tene 'insides'	
0	0	Before /w/	[tɪgdow] tigdow 'coldness'	
0	Э	Elsewhere	[t̪o̪ˈlo] tolo 'burp'	
:	I	Unstressed closed syllables (except before /ŋ/)	[toli intin] tolinting 'back'	
i	ŧ	In the environment of /q/	[qɨˈmɑ] <i>qima ʻ</i> clam	
•	i	Elsewhere	[mi'tom'black'	
u	υ	In unstressed, closed syllables (except before /ŋ/)	[bɔmbʊ†] bombul 'feather'	

u Elsewhere [buˈŋɑ] bunga 'fruit'

Nasal Assimilation: $N \rightarrow [\alpha \text{ place}] / _C[\text{-continuant}] \alpha \text{ place}]$

This rule states that any nasal assimilates to the place of a following oral stop. The rule operates strictly within morphemes, as evidenced by the almost complete lack of heterorganic nasal-stop clusters in the data. There a few examples of such heterorganic clusters across morpheme boundaries such as in the word for 'to hammer' /mɔŋduqsul/, which is derived from /duqsul/ 'hammer,' and /pimɔŋdapi?/ 'to cause one to hit,' which is derived from /dapi?/ 'hit.' Similarly, Nasal Assimilation does not operate in compound words: /tulugɑnbɑtɑ?/ 'ovary' (from tulugan 'place to sleep' and bata' 'child').

Voicing Assimilation:
$$C \rightarrow [-vce] / _[-vce]$$

This rule states that a consonant will devoice before another voiceless consonant. The rule appears to work across morpheme boundaries. Compare /mɔgbɑstɑ/ 'to read' and /mɔqsɔgɔw/ 'to cry', derived from verb roots /basta/ and /sɔgɔw/. Voicing assimilation can also occur across word boundaries in rapid speech: /sɔqpiqilanqu/ sog piqilanqu 'in my mind'. However, this type of assimilation does not operate in reduplication: /bulɑqbulɑq/ 'flower'.

Antigemination:
$$C_1 \rightarrow \emptyset / C_1$$
__

This rule states that two identical consonants become one; i.e., they do not form geminates. This often applies across word boundaries, especially in rapid speech. For example, the word *nog* 'of' in the phrase *molaton nog ginang* 'crime' is reduced to just the vowel: /mɔlɑtɔnɔginɑŋ/.

G-deletion:
$$g \rightarrow \emptyset / ?(\#)$$
_

By this rule, /g/ is deleted across syllable or morpheme boundaries after a glottal stop. It is possible that all oral stops delete after a glottal stop, although there is currently too little evidence to make that claim. This is demonstrated in the formation of the word 'grandmother' from /ginq?/ 'mother' and /gulqŋ/ 'oldness': /ginq?ulqŋ/. It may also operate across word boundaries, potentially observed the sentence *lolingitan dun si' ina'* 'it will anger mother', where the word 'mother' has lost its initial /g/ after the proper noun marker /si?/. However, as the form /inq?/ was given as a vocative version of /ginq?/, it is possible that this is not an instance of the G-deletion rule. When asked why she used /inq?/ in the above sentence, the speaker indicated it was due to the presence of a glottal stop.

G-insertion:
$$\varnothing \rightarrow g / \#_V$$
 unless verb, function word

By this rule, an epenthetic /g/ is inserted at the beginning of underlyingly vowel-initial words that are neither verbs nor a function word. Since so little is currently

understood about the underlying forms of many words, it is difficult to say how this rule interacts with the G-deletion rule described above. As the environments are currently stated, they should not interact. An example of this rule can be found in /ginuman/ 'cup', derived from /inum/ 'drink' and /-an/ 'place of, thing used for'. Although as a verb, /inum/ is vowel-initial, a /g/ is inserted when a noun is derived from it. More investigation is needed into vowel-initial and /g/-initial words in this language.

Metathesis:
$$m0-\rightarrow 0m-/_+C[labial, -nasal]$$

This process applies to one particular morpheme, *mo*-, a denominal prefix deriving adjectives. Before labials, the prefix metathesizes, drawing the labial /m/ closer to triggering consonant. Compare /mɔ+gulɑŋ/ 'old' and /mɔ+tɪgdow/ 'cold' with /ɔm+bɔntɑd/ 'mountainous' and /ɔm+pɔlɔq/ 'short' (the corresponding nouns, before prefixation, mean 'oldness', 'coldness', 'mountain', and 'shortness' respectively).

Q-insertion:
$$\varnothing \rightarrow q / n_+1SG$$
 unless root is agent-focused verb

This rule is both phonologically and morphologically conditioned, and as such, a detailed description is beyond the scope of this paper. In prose, the first-person singular marker on object-focused verbs and possessive marker on nouns /-u/ becomes /-qu/ after /n/. Likewise, the second-person singular marker on object-focused verbs, /-a/ becomes /-qa/ after /n/. It is unclear whether this morpheme is best analyzed as a suffix or a separate word. If it is a separate word, it would be pronounced /?u/, and, because all vowel-initial words phonetically begin with a glottal stop, the rule should be restated as $? \rightarrow q$ (a phonetically better-motivated rule). This is discussed further in our description of Subanon morphology.

5. Distribution of sounds

Most questions about the distribution of sounds have been answered in previous sections. However, there are a few remaining observations worth noting. First, it appears that maximal syllable structure is CJVC, where J represents a glide (either /w/ or /j/). Examples of this onset are found in words like /djɑnon/ 'to him' and /dwojmu/ 'your spouse'. Any native phoneme except /h/ can close a syllable.

The following consonants are in limited distribution word-initially: /n/, /n/, /n/, /n/, /n/, and /n/. Further, few words begin with a vowel (or glottal stop, phonetically speaking). All vowel-initial words are function words (/aqon/ 'me') or verbs (/inongat/ 'to invite').

Across syllable-boundaries, all consonant clusters are possible except /?.g/, eliminated by the G-deletion rule stated above. The only instances of glottal stop followed

by any oral stop are in cases of (probably) reduplication: /da?da?an/ 'happiness' and /bata?bata?/ 'small'.

6. Recommended practical orthography

In the recommended orthography (presented in Table 6), the IPA representation of each phoneme is maintained, except for symbols not readily found on a keyboard and for /q/, represented orthographically by /k/. Thus, / α / is treated as any <a> available in a given font, / ϵ / becomes <e>, /d3/ becomes <j>, / η / becomes <n>, / α / becomes / α /, glottal stop becomes an apostrophe, and /j/ becomes <y> to avoid confusion with the affricate. The letters chosen tend to represent very similar sounds in neighboring languages.

The resultant alphabet has 22 letters, which includes 3 letters for non-native phonemes.

Orthography	Phoneme	Orthography	Phoneme
A a	а	Ng ng	ŋ
Вb	b	0 0	Э
D d	d	Рр	р
Еe	3	K k	q
Gg	g	Rr	r
Нh	h	Ss	S
li	i	Τt	t
Jј	dʒ	U u	u
LI	I	Vv	V
M m	m	Υy	j
Νn	n	,	?

Table 6 Recommended practical orthography for Western Subanon

7. Remaining questions

There are many questions remaining in the realm of Western Subanon phonology. Chief among them is stress. The only acoustic correlate thus far identified with Subanon stress has been vowel length. However, it appears from preliminary observation (i.e., pre-Praat) that intonation plays an important role as well. According to our current theory, stress is assigned at both the phrase and word level. Word-level stress is reliably penultimate, with secondary stresses falling on every other syllable before that. Phrasal stress is on the final syllable, which sometimes draws secondary stress away from its would-be location according to word stress patterns. In any case, stress does not distinguish meaning, but as of yet, it is not possible to predict where stress falls in every case based on the patterns we have recognized. Other suprasegmental qualities, like intonation, need to be explored in greater detail as well.

All of the vowel phonemes, as well as /q/, should be examined in detail using spectrographic evidence to be certain of their quality. A linguist's ear alone cannot be relied upon to make such fine-grained distinctions. Vowel-initial and /g/-initial words need to be examined in multiple different morphological environments before this alternation can be properly understood.

The current understanding of loan phonology is lacking, partly due to the consultant's hesitancy to provide borrowed words at this level of elicitation. As elicitation continues, we expect that our understanding of the language's morphology will deepen, allowing us to make better statements about sounds alternations in general.

8. Appendix

Minimal pairs and near minimal pairs for important contrasts (in orthography)

Word 1	Word 2	Gloss	Contrast
pata'	bata'	pole vs. child	/p/ vs. /b/
paloy	baloy	rice vs. house	/p/ vs. /b/
gapuy	gabi	fire vs. taro	/p/ vs. /b/
tapi'	dapi'	plank vs. spank	/t/ vs. /d/
tubig	dupi'	water vs. rain	/t/ vs. /d/
pokot	pogot	net vs. fish species	/q/ vs. /g/
kaput	gapu'	trash vs. grandchild	/q/ vs. /g/
mamak	mama'	snake vs. like	/q/ vs. /?/
dokot	dokoʻ	attach vs. rooster	/t/ vs. /?/
basak	basa'	mud vs. wetness	/q/ vs. /?/
kalis	hamis	sword vs. Thursday	/q/ vs. /h/
ponu'	ponu	fill up vs. turtle	/?/ vs. Ø
baba'	baba	mouth vs. carry on shoulders	/?/ vs. Ø
dugu'	dugu	blood vs. room	/?/ vs. Ø
taman	tanan	until vs. because of	/m/ vs. /n/
lomu	lonu	kind of plant vs. smoothness	/m/ vs. /n/
gimang	ginang	notch in coconut trunk vs. work	/m/ vs. /n/
balun	balung	lunch food vs. carry on shoulders	/n/ vs. /ŋ/
lani	langit	nearness vs. heaven	/n/ vs. /ŋ/
nana'	nanga'	pus vs. backchanneling response	/n/ vs. /ŋ/
linow	lunow	lake vs. greenness	/i/ vs. /u/
gabi	gabu	taro vs. ashes	/i/ vs. /u/
gamit	gamut	use vs. root	/i/ vs /u/
golo	golu	relative vs. mortar	/o/ vs. /u/
dialom	dialum	inside vs. needle	/o/ vs. /u/
komot	kumot	hand vs. blanket	/o/ vs. /u/
ginuman	ginumon	cup vs. beverage	/a/ vs. /o/
legan	ligon	desire vs. size	/e/ vs. /i/
pes	pis	machete vs. empty rice husk	/e/ vs. /i/
deket	doko'	togetherness vs. rooster	/e/ vs. /o/
gote	gotow	excrement vs. person	/e/ vs. /o/