Aspects of Island Tigak Phonology

Sue Jenkins

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Abbreviations

cont.	continuative aspect
CRS	Compound Stress Rule
DR	Decontinuant Rule
n.	noun
N	Nasal or Nucleus (depending on context)
NAR	Nasal Assimilation Rule
NIR	Nasal Insertion Rule
OCP	Obligatory Contour Principle
ODR	Obstruent Devoicing Rule
PF	Phonetic Form
REDP	Reduplication
RSR	Root Stress Rule
SFR	Syllable Formation Rules
s.t.	something
Trnz	Transitive marker
UNR	Unordered Nasal Rule
UR	Underlying Representation
WISC	Word Initial Stress Constraint
.	Syllable boundary
+	morpheme boundary
#	word boundary

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1 Introduction

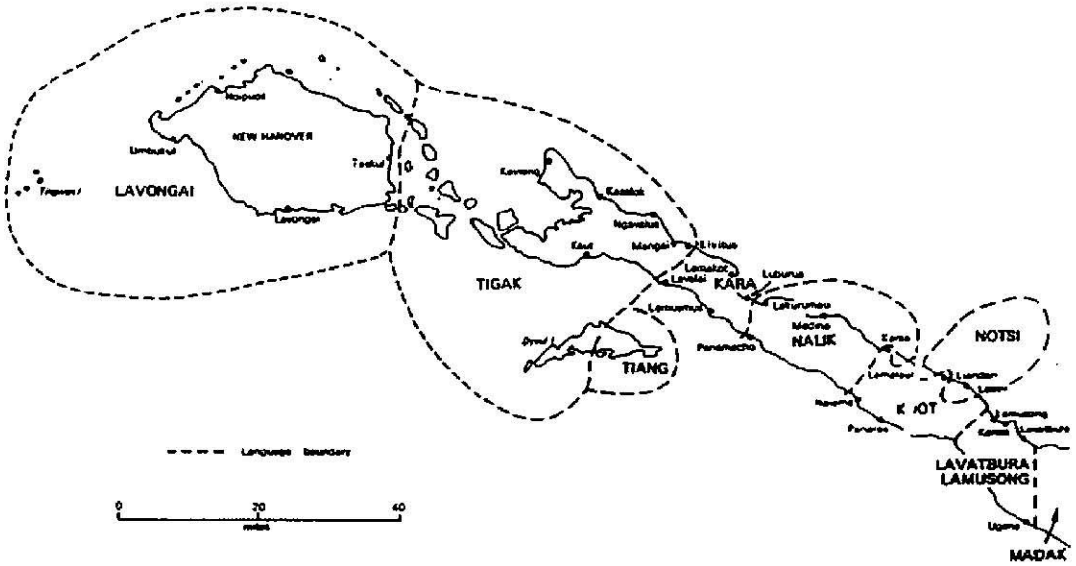
The purpose of this paper is to describe the major phonological characteristics of the Island dialect of the Tigak language of Papua New Guinea. In the next three sections I lay the foundation for the more dynamic aspects of Tigak phonology. In section 2 (The Tigak language and source of data) I give general background information about the language. I also indicate the sources of the data on which I have based this phonological analysis. Section 3 (Phonemic and orthographic inventories) contains lists of the Island Tigak phonemes and gives examples of the environments in which each phoneme occurs. The allophones of each phoneme are described in section 4 (Phonetic realizations of the phonemes) with examples and variations. Appendices provide additional details with matrices of distinctive features of the Tigak phonemes (Appendix A) and a sample text written phonetically, phonemically, and orthographically (Appendix B).

In the next three sections I discuss aspects of Tigak phonology which must be interpreted in the context of the entire language system. The analyses made are my own. I describe the syllable structure of Island Tigak in section 5 (Syllable patterns), emphasizing the problems and processes related to the long sequences of vowels which are common in the language. Stress patterns and their determining factors are discussed in section 5 (Stress

assignment). I also describe how stress placement is affected by affixation, reduplication, and compounding. The core of the paper is section 7 (Phonological processes and underlying representations). I discuss some of the important phonological processes operative in Island Tigak and the underlying forms (7.2) which must be postulated as the starting point for the various interpretations. The processes discussed include assimilation processes (7.1), final release processes (7.3), processes related to syllable structure (7.4), and reduplication (7.5).

2 The Tigak language and source of data

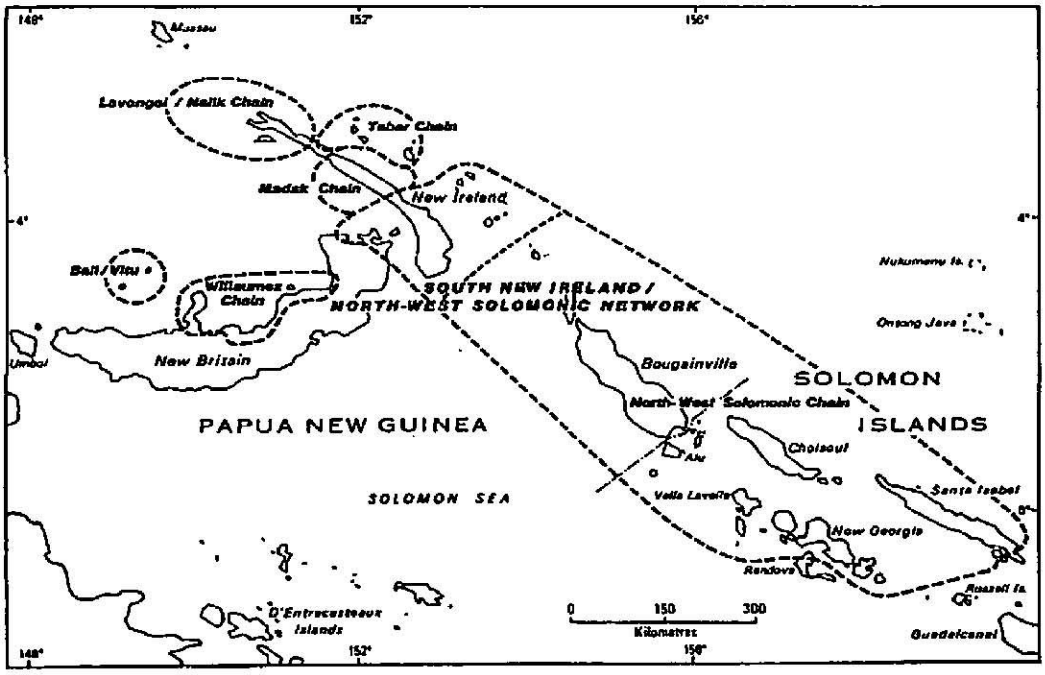
The Tigak language is spoken by approximately 12,000 people living on the northwestern tip of New Ireland, the western half of Djaul Island, and the Tigak Island group to the west of New Ireland in Papua New Guinea. (See Map 1.)



Map 1 Northern New Ireland languages

(Beaumont 1972: 16)

According to Ross (1988) Tigak is a member of the Lavongai-Nalik chain of the New Ireland network of the Western Oceanic languages of the Austronesian family.



Map 2 Location of the Meso-Melanesian cluster and its subgroups

(Ross 1988: 259, map 12)

The data on which the material in this paper is based was collected during periods of residence on Ungan Island and in Kavieng, the provincial capital of New Ireland. Ungan Island is centrally located in the Tigak Island group, and Kavieng is centrally located in the entire Tigak language area. (See Map 3 below.) These periods of residence in New Ireland occurred between 1987 and 1996. During those years I also worked with Tigak speakers living in Lae and Port Moresby and with island residents who came to the headquarters of the Summer Institute of Linguistics in Papua New Guinea for several weeks at a time. During the early years of my residence on Ungan Island I worked with many different speakers living on Ungan and the islands nearby.[1] I also worked briefly during 1996 with various speakers from the mainland of New Ireland.

[1] From 1991 until his death in 1996 my primary Tigak co-worker was Frank Pakamal of Ungan Island.

Map 3 Tigak Islands

The data itself consists of both transcribed spoken data and written texts from many different speakers and authors.

Clive Beaumont (1979) wrote a grammar of the central dialect, one of the four dialects he lists for Tigak.[2] The Island dialect is spoken by approximately half of the total Tigak population and is the subject of this paper. Island Tigak is the most conservative of the various Tigak dialects due to the natural geographic isolation afforded by its being located on the outlying islands. In the past this location meant that the Tigak Island dwellers had less

[2] Some native speakers divide the language into as many as seven dialects, but I question even the four that Beaumont claims. Papua New Guinea is a country of four million people with the total number of distinct languages spoken being over 850. Speakers of other languages surround each language group, so language is a relevant topic to Papua New Guineans. They have astute intuitions about languages and dialectical differences, but they also have many reasons for wanting to promote the importance and uniqueness of their own dialect.

consistent contact with other languages and dialects. Although the Island and Central dialects are close, neither particular vocabulary items nor particular points of grammar can be assumed to be the same in the two dialects. There are also phonological variations among the several dialects of Tigak. Most of the differences can be explained as normal processes of language change. Those differences resulting from contact with neighboring languages are beyond the scope of this paper.

3 Phonemic and orthographic inventories

Following is the phonemic inventory of Island Tigak and the orthographic symbols most commonly employed in the written form of the language.

/a b d e g i k l m n ŋ o p ɹ s t u β/
<a b d e g i k l m n ng o p r s t u v>
<A B D E G I K L M N Ng O P R S T U V>

The additional orthographic symbols <ch f h j w y> are also used for words borrowed from English, especially for proper names such as Charles, Frank, Hannah, and James, or for cultural loan words such as **hamma** 'hammer', **yist** 'yeast', and **wain** 'wine'. However, these symbols are not used in writing native forms. Table 1 below shows the manner and place of articulation for the Island Tigak consonants. Immediately following Table 1 is a list of examples showing the environments in which the consonants occur. The examples are written in the standard orthography.[3]

[3] Note that in the standard orthography the phoneme /β/ is written as <v> following the practice in the neighboring language, Tungag (Fast 1988), and the phoneme /ŋ/ is written as <ng> following the practice in Kuanua (or Tolai), the language used in the established church in the Tigak area.

	Bilabial	Alveolar	Velar
Plosive	p b	t d [4]	k g
Nasal	m	n	ŋ
Fricative	β	s	
Approximate		ɹ	
Lateral		l	

Table 1. Island Tigak consonants

(1) /p/ **paga** *'clear'*
kapu *'large lizard'*
taap *'holy'*
sapsapit *'hair cut'*
pakpeak *'fem.animal'*

/b/ **ba** *'blind'*
bak *'catch crab'*
babat *'wall'*

/m/ **masut** *'bush'*
mume *'aunt/uncle'*
kum *'with'*
namkai *'forgive'*
malmal *'tired'*

/β/ **vo** *'irrealis mrkr.'*
tavasot *'trochus shell'*
kavkavak *'to castrate'*
visviis *'to fight'*

/t/ **tug** *'stand'*
teteng *'one who'*
ot *'thing'*
patmanui *'clan'*
tiptiip *'heavy'*

/d/ **dal** *'slide'*
dadagai *'file'*
ngannganda *'rain stops'*

/n/ **nos** *'straight ahead'*
naina *'women'*
laman *'water'*
ngannngan *'chew'*
namnamisai *'imagine'*

/s/ **sinug** *'sit down'*
sasakul *'change'*
nos *'straight ahead'*
kuskuus *'story'*
saksui *'meet(by chance)'*

/k/ **kik** *'parrot'*
veko *'not'*
tapak *'lightning'*
bisket *'cookie'*
kalkaal *'housepost'*

/g/ **gaan** *'day/time'*
mugina *'his back'*
galgale *'sweep'*

/ŋ/ **ngur** *'mouth'*
longina *'today'*
asang *'fish gill'*
rungmasi *'mercy'*
ngannngan *'chew'*

[4] Beaumont (1979) reported no /d/ in the central dialect, but /d/ is a distinctive phoneme in Island Tigak. See 4.1 below for examples and discussion.

/ɹ/ **ɾo** *'good'*

tamaɾa *'our father'*

nguɾ *'mouth'*

maɾmarai *'buy'*

imɾin *'to drill'*

/l/ **l̥ago** *'hungry'*

sal̥in *'path'*

pal̥ *'part/side'*

kul̥mua *'custom'*

elakl̥aak *'above'*

Table 2 below shows the relative areas of vowel articulation. Examples of the vowels in various environments follow in (2).

	Front	Back
High	**i**	**u**
Mid	**e**	**o**
Low		**a**

Table 2. Island Tigak vowels

(2) /i/ **i̥s** *'nose'*
i̥ni *'sore'*
kati̥ *'to tow'*
li̥ng *'sound'*
papani̥au *'Moorish idol'*
sau i̥ *'to drive'*

/u/ **ur** *'banana'*
u̥lina *'woman'*
anu̥ *'man'*
vuu̥l *'canoe'*
lu̥ai *'calm'*
iu̥s *'rest'*

/e/	**eng** *'hey!'*	/o/	**ong** *'yes'*
	elau *'run'*		**oro** *'lie down'*
	eve *'where'*		**lo** *'to (loc.)'*
	pepe *'butterfly'*		**asot** *'sell'*
			igaiom *'ask you'*
		/a/	**ang** *'this one'*
			alu *'again'*
			matana *'opening'*
			ulan *'moon'*

Diphthongs are common in Island Tigak, as shown in (3) below.

(3)				
	ai	**aisog** *'work'*	**kail** *'call'*	**sakai** *'one'*
	au	**auneng** *'this way'*	**asaut** *'bread'*	**akau** *'always'*
	ao	**aong** *'very'*		
	aa		**laak** *'enter'*	
	ei		**papalageis** *'quickly'*	**lei** *'to cut'*
	eu			**kapeu** *'deepwater'* [5]
	ee			**uee** *'starfruit'* [5]
	eo			**leo** *'fragrant'*
	ea		**gaveak** *'no'*	**baumlea** 'big man'
	ii		**piin** *'shell'*	
	iu		**giung** *'sea cow'*	**piu** *'dog'*
	ie	**ien** *'fish'*		
	io		**siol** *'goatfish'* [5]	
	ia	**ias** *'sun'*	**liang** *'stone'*	
	oi		**poiso** *'how much'*	**koi** *'black'*
	ou	**oum** *'pandanus'* [5]		
	oo		**pook** *'food'*	

[5] This is the only example found so far.

ui			l**ui** *'house'*
uu		g**uu**p *'dark/night'*	
ue	**ue** *'crocodile'* [5]		
ua	**ua**m *'leaf'*	b**ua**n *'smoke'*	ve**ua** 'shark'

The geminate vowels shown in the list above represent long vowels that contrast with short vowels. The examples in (4) below demonstrate this contrast.

(4)	p**i**n *'deflate'*	p**ii**n *'shell'*
	u**e** *'crocodile'*	u**ee** *'starfruit'*
	g**u**p *'parrot fish'*	g**uu**p *'night/dark'*
	p**o**k *'tap/knock'*	p**oo**k *'food'*
	n**a**g *'I'*	l**aa**k *'enter'*

Of all possible two vowel sequences, the only ones missing from the set of diphthongs and long vowels given above are ***/ae oe oa uo/**.[6] Considering the large number of diphthongs in the language, I have chosen to interpret the long vowels as geminate sequences to correspond with the diphthongs, which I also interpret as vowel sequences. The reasons for this interpretation will be stated in sections 5 and 6 below in which syllable patterns and stress are discussed.

4 Phonetic realizations of the phonemes

In this section I discuss the phonetic realizations of the Island Tigak phonemes given in Section 3 above. (Distinctive feature matrices of Island Tigak phonemes are found in Appendix A.)

[6] The missing pairs may be due to morphophonemic processes that obscure their presence. For example, the sequence **/ae/** -> **[ai]** when the **/a-/** is prefixed to an initial **/e/**, as in **/emug/** *'behind'* -> **/a+emug/ [aimuk] <aimug>** *'last'*.

4.1 Consonant allophones

Below is a list of the allophones of each set of phonemes, with a description and examples. Voiceless plosives occur in all environments.

/p t k/ → [p˺ t˺ k̚˺] in syllable coda positions.

(5) [gʊp̚˺] *'triggerfish'* [sɑp̚˺.sʌpɪt˺] *'haircut'*
[ɔt̚˺] *'thing'* [k̟ɛt̚˺.k̟ɛtɪp˺] *'codfish'*
[k̟ɪk̟˺] *'parrot'* [tɑk̟˺.tɕʌk̟ʰ] *'strong'*

[k̟ʰ] occurs in word final position following a back long vowel or a vowel sequence in which the second vowel is back (as shown in (6) below). This aspiration can be very strong and some speakers even affricate [k̟ʰ] as [k̟x̟].

(6) [poˈk̟ʰ] *'food'* [k̟iʌk̟ʰ] *'come down'*

[p t k̟] occur in syllable onset positions.

(7) [pɑgɑ] *'clear'* [k̟apu] *'lizard'* [pɑk̟˺pɕʌk̟ʰ] *'female'*
[to] *'wave'* [mʌtʌnʌ] *'opening'* [tʊk̟˺tʌpongi] *'begin'*
[k̟ono] *'beach'* [buk̟i] *'like'* [k̟ɛt˺k̟ɛtɪp˺] *'codfish'*

/b d g/ → [b d g] in syllable onset positions (i.e. #__, V__V, and __C).

(8) [b̲uk̟˺] *'want'* [bɑbʌt˺] *'wall'* [buk̟˺bugʌ] *'long'*
[d̲ɑl] *'coral'* [dʌd̲ɑgɑi] *'file'* [ŋʌnŋʌndo] *'rain stops'*
[gɑɑn] *'time'* [muginʌ] *'his back'* [gʌlgɑle] *'sweep'*

[g] occurs in free variation with [ɣ] in word initial position and [b] ~ [β] (under conditions described below and illustrated by the first example in (12)).

(9) [gɑβɕʌk̟ʰ] ~ [ɣɑβɕʌk̟ʰ] *'no'*
[b̲uk̟˺b̲ugʌ] ~ [βuk̟˺β̲ ugʌ] *'long'*

Phonetically voiced plosives do not occur in syllable coda position, except for /g/ which is voiced in this position only when followed by a vowel. The orthography reflects the underlying voiced velar plosive. (See example (10) below.) It may be that /b d/ also were found in the same environment at some point in the language's history, but the absence of that environment in the modern language neutralizes the voicing contrast between /b d/ and /p t/ in syllable codas.

(10) <**tugtapong**> [**tuk̚ˈtʌpong**] *'to begin'*

<**nag tug**> [**nɑk̚ˈ tuk̚ˈ**] *'I stand'* <**nag inang**> [**nɑg inʌŋ**] *'I go'*

<**sinug**> [**sinuk̚ˈ**] *'sit'* <**ga lasinugi**> [**gɑ lɑsinugi**] *'he put it (down)'*

In word-initial position of nouns /b d g/ are often pre-nasalized even when spoken in isolation, but I attribute this to the effect of the article **taN** which almost always precedes a noun. The nasal of the article assimilates to the point of articulation of the following plosive. (See the examples in (12) below.) The velar plosives /k g/ are very backed in all their allophones, almost to the point of being uvular.

The nasals, fricatives, approximate, and lateral /**m n ŋ β s ɹ l**/ occur in all environments as [**m n ŋ β s ɹ~ɾ l**].[7] The nasal [**n**] is suffixed to some particles that normally end with a vowel when such a particle occurs before another vowel. This nasal is also indicated orthographically, as shown in (11) below.

(11) <**veko kalapang**> '*not know*' <**vekon inang**> '*not go*'

The approximate /ɹ/ is realized alternatively as a flap [**ɾ**] intervocallically, as in <**giro**> [**giɾo**] '*thank you*'. The fricative /β/ and approximate /ɹ/ also have allophones [**b**] and [**d**],

[7] I have not yet found an example of [β] in word-final position.

respectively, in word-initial position following the article /taN/.[8] (See (12) below.) The word-final nasal of the article /taN/ assimilates to the point of articulation of a voiced obstruent immediately following the nasal. It is deleted before all other consonants and is realized as [ŋ] before all vowels. This two-way assimilation process is discussed in more detail below in 7.1, and the underlying representation of the article is discussed in 7.2.

(12)	**<tang vuul>**	**/taN βuul/**	**[tʌm bu:l]**	*'canoe'*
	<tang rei>	**/taN rei/**	**[tʌn dei]**	*'wind'*
	<tang gaan>	**/taN gaan/**	**[tʌŋ gɑ:n]**	*'time/day'*
	<ta masut>	**/[taN masut/**	**[tʌ mɑsʊt]**	*'bush'*
	<ta naina>	**/taN naina/**	**[tʌ nɑinʌ]**	*'women'*
	<ta ngur>	**/taN ŋur/**	**[tʌ ŋʊɹ]**	*'mouth'*
	<ta piu>	**/taN piu/**	**[tʌ piu]**	*'dog'*
	<ta to>	**/taN to/**	**[tʌ to]**	*'wave'*
	<ta kal>	**/taN kal/**	**[tʌ ḳʌl]**	*'tide'*
	<ta lui>	**/taN lui/**	**[tʌ lui]**	*'house'*
	<ta siva>	**/taN siva/**	**[tʌ siβʌ]**	*'place/village'*
	<tang ini>	**/taN ini/**	**[tʌŋ ini]**	*'sore'*
	<tang ur>	**/taN ur/**	**[tʌŋ ʊɹ]**	*'banana'*
	<tang anu>	**/taN anu/**	**[tʌŋ ɑnu]**	*'man'*

4.2 Vowel allophones

All single vowels occur in open (lax) and close (tense) allophones, depending on the environment. The following list describes the occurrence of each allophone for each vowel. /i/ occurs as **[i]** in word final position.

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[8] Although the bilabial fricative /β/ and the approximate /ɹ/ have allophones of **[b]** and **[d]**, respectively, there are contrastive examples with each pair which require the use of both **<v b>** and **<r d>** in the orthography. For example, **<balang>** *'be drunk'* contrasts with **<valang>** *'dog that eats excretment'* and **<dok>** *'olive shell'* contrasts with **<rok>** *'to fold'*.

(13) [ˈi.ni̱] ~ [ˈɪ.ni̱] *'sore'*

[i] ~ [ɪ] In stressed open syllables.

(14) [ˈβi.li] ~ [ˈβɪ.li] *'do it'*

[ɪ] occurs elsewhere.

(15) [ˈlɪŋ] *'sound'* [ˈu.lɪ.mʊn] *'whale'*

/e/ occurs as [ɛ] in all positions, but varies with [e] in word initial and word final positions and in stressed open syllables.

(16) [ˈɛ̱.βe̱] ~ [ˈɛ.βɛ] ~ [ˈe̱.βɛ] ~ [ˈe̱.βe̱] *'where'*

[ˈŋe̱.ŋɛt] ~ [ˈŋɛ̱.ŋɛt] *'answer'*

/ɑ/ occurs as [ʌ] in all positions and varies with [ɑ] only in stressed syllables.

(17) [ˈtɑ.mʌ] ~ [ˈtʌ̱.mʌ] *'father'*

[ˈɑ̱.sʌ̱n] ~ [ˈʌ̱.sʌn] *'name'*

/u o/ occur as [u o] in open syllables and as [ʊ ɔ] in closed syllables.

(18) [ˈɑ.nu] *'man'* [ˈmʌ.sʊt] *'bush'*

[ɹo] *'good'* [ɔŋ] *'yes'*

The [+low] geminate vowel always occurs as an open vowel [ɑ:] and the [-low] geminate vowels always occur as the close vowels [i: e: o: u:].

(19)	/kaskaas/	[ka̱ska̱:s]	*'enough/able'*
	/eβiis/	[ɛβi̱:s]	*'hit each other'*
	/uee/	[we̱:]	*'starfruit'*
	/pook/	[po̱:k]	*'food'*
	/guup/	[gu̱:p]	*'dark/night'*

5 Syllable patterns

The reality of the syllable as a phonological unit is not universally accepted (Bell and Hooper 1978). In Tigak, however, the syllable is a prominent and well-defined unit. In order to determine syllable structure in a language, one must first determine the language-specific basis of a syllable (Lowe 1983). Tigak does not have phonemic tone, so the Tigak syllable is not a tone-bearing unit. Neither is the Tigak syllable a timed unit, since some syllables are of longer duration than others. (See 7.4 below for a discussion of the difference in the duration of stressed versus unstressed syllables.) The one obligatory element in a Tigak syllable is a vowel. Thus, the vowel nucleus is the basis for defining a Tigak syllable. (For background on theories of syllable structure, see Clements and Keyser 1983, Hooper 1972, Itô 1986 and 1989, and van der Hulst and Smith 1982.)

Determining that vowels form the nuclei of syllables does not settle the question of Tigak syllable structure. The large number of diphthongs (many of which are unambivalent sequences such as /eo/ and /ea/) and the contrast in long and short vowels demonstrated in section 3 above form many sequences of two or more vowels in Tigak. There are also many single syllables with two vowels, such as **kais** *'left'* and **vaum.lea** *'chief'*. (Even the **lea** sequence in **vaumlea** is a single syllable to the native speaker.) Beaumont (1979) interpreted a sequence of two vowels as a complex syllable nucleus. I agree with his interpretation. Applying Occam's razor, the sequence interpretation of diphthongs and long vowels is more economical. The alternative interpretation would force the postulation of an extremely large set of additional phonemes made up of long vowels and diphthongs.[9] However, such an interpretation requires that a two-vowel sequence be accepted as a single syllable nucleus.

[9] Additional evidence for this interpretation is found in section 6 below with reference to what constitutes a heavy syllable, and in section 7.5 with reference to reduplication patterns.

Thus, a Tigak syllable nucleus may consist of either one or two vowels, giving us the following four syllable types:

N, NC, CN, CNC.

All of the above are variants of the basic pattern (C)N(C) in which N represents Nucleus, not Nasal, and in which the syllable nucleus consists of either one or two vowels. Onsets and codas consist of at most one consonant.

(20)				
	N	**a.lu** *'again'*	**ai.mug** *'last'*	**lu.ai** *'calm'*
	NC	**ot** *'thing'*	**aong** *'very'*	
	CN	**ga.ra.ma** *'men's house'*	**ai.no** *'before'*	**piu** *'dog'*
	CNC	**gaan** *'day/time'*	**gaus** *'rope'*	**ma.sut** *'bush'*

According to this interpretation any sequence of exactly two vowels forms a single syllable nucleus. In VCV sequences the syllable break is before the consonant (**/sa.kai/** *'one'*). In CC sequences the syllable break is between the consonants (**/sak.sa.kai/** *'each'*).

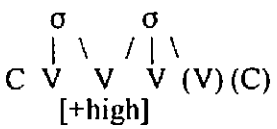
In sequences of three vowels, the syllable break follows the first high vowel with the corresponding semivowel as the onset of the following syllable. (See (53) below for the statement of the glide insertion rule.)

(21)			
	/pouak/	**[pou.^{w}ʌk]**	*'two'*,
	/aius/	**[ɑi.^{j}us]**	*'rest'*
	/papaniau/	**[pɑ.pɑ.ni.^{j}ɑu]**	*'Moorish idol fish'*

This syllable division rule takes precedence over the diphthong pairs. The single monomorphemic exception to the above rule is in the case of the first two vowels in the sequence both being high. In this case the syllable break follows the second high vowel, with the corresponding epenthetical semivowel as the onset of the following syllable (**/kui.e/** → **[kui.^{j}e]** *'mitre shell'*).

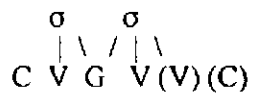
All sequences of four vowels occur across morpheme boundaries and involve the sequence /Vi+ai/. The syllable break is at the morpheme boundary with the epenthetical palatal semivowel [j] forming the onset for the following syllable (/tui+ai/ → **[tui.^{j}ai]** '*to bow*'). The insertion of a glide onset in sequences of three or more vowels is predictable, so the glide need not be posited in the underlying forms. One could, however, consider a high vowel at the syllable boundary in these sequences to be ambisyllabic, according to the schema in (22) below.

(22)



In such cases the intervocalic high vowel could be interpreted as an ambisyllabic glide serving as both coda and onset to consecutive syllables. The diagram in (22) would then become (23) below in which G represents a glide in the position of the high vowel in (22) above.

(23)



The frequency and diversity of vowel sequences in Tigak (many of which form the nuclei of closed syllables) do not provide evidence in favor of positing glide phonemes. However, the few examples of word initial vowel sequences beginning with a high vowel (as in (24) below) do provide some evidence for underlying glide phonemes.

(24)	**<ien>**	**[jɛn]**	*'fish'*
	<ue>	**[we]**	*'crocodile'*

But these examples can also be adequately described as cases of a complex syllable nucleus in an NC syllable type. Adding support to the complex nucleus interpretation are such examples as in (25).

(25)	**<kais>**	**[kais]**	*'left'*
	<aong>	**[aoŋ]**	*'very'*
	<iai>	**[jai]~[i.^{j}ai]**	*'wood/tree'*

These examples demonstrate single syllable vowel sequences (all three), vowel sequences with no high vowel (**aong**), or (in the last case) an alternative pronunciation following the syllable division rules given above. They fit the interpretation of diphthongs as complex syllable nuclei without the necessity of positing glide phonemes. The last example above also shows that an initial high vowel is not always a glide onset.

Whether one analyzes the medial high vowels discussed above to be ambisyllabic glides or as complex nuclei with a glide inserted, the result indicates the preference of Tigak speakers for a CN syllable pattern. Although the other three alternative patterns occur, the CN pattern is the most frequent one. The glide insertion process shown above creates syllables of this preferred pattern. The examples **la-.'pou.ak** *'second'* and **vug-.'vu.ga** *'(very)long'* given in (26) of section 6 below support the complex nucleus interpretation by demonstrating that closed syllables are not heavy, but syllables with a complex nucleus are, and that syllables with a complex nucleus behave differently under stress assignment from either closed syllables or open syllables with simple nuclei. (Additional phonological processes that produce this CN syllable pattern will be discussed in section 7.4 below.)

The syllable patterns demonstrated above support the phonetic divisions of a syllable into onset and core, with the core (also called the rhyme) further divided into nucleus and coda (Pike and Pike 1947). Pulgram's principles of syllable structure (1970) are also supported by the Tigak data. Based on the parallelism in word and syllable structure constraints, Pulgram proposed the primacy of open syllables and the minimal coda –

maximal onset principles. The Tigak preference for open syllables and its syllable division rules (stated above) follow both principles. [10]

6 Stress assignment

Tigak is a stress accent language. (See Hyman 1975.) The basic stress pattern for Island Tigak words is for stress to fall on the first syllable of a word, unless there is a long vowel or diphthong (forming a complex nucleus) in the second syllable. In the latter case the complex nucleus attracts the stress. Because stress is predictable, it is not indicated orthographically. (See Hayes 1981 and Liberman and Prince 1977 for theories of stress assignment.) Table 3 below gives examples of the basic stress assignment for Island Tigak.

With single vowel nucleus

1. **'tug** *'to stand'*
2. **'ku.tat** *'prawn'*
3. **'ka.mus** *'to finish'*
4. **'ti.vu** *'grandparent/child'*
5. **'u.li.mung** *'whale'*
6. **'ta.pu.ngan** *'to awake'*

With complex vowel nucleus

7. **ma.'naas** *'hot'*
8. **sa.'kai** *'one'*
9. **'viis** *'hit'*
10. **ta.'paak** *'leprosy'*
11. **ku.'ruul** *'complete'*
12. **'pou.ak** 'two'

Table 3 Island Tigak stress patterns

This stress rule could be described as 'first or heavy stress,' whereby the first syllable is stressed unless it is followed by a heavy syllable.[11] Coda consonants are not assigned weight for stress assignment, so only syllables with long vowels or diphthongs are heavy. Ohsick

[10] Pulgram's third principle that any irregularity occurs in the coda rather than in the onset does not apply to the Tigak data, since no irregularities in syllable structure have been observed.

[11] I have no examples of roots with a long vowel farther to the right than the second syllable. If such roots are found, I predict that stress will be assigned as in (28) below, according to the Word Initial Stress Constraint (WISC) also stated below.

(1978) specifies that long syllables can be heavy as well as closed syllables. In fact, her hierarchy of stressability states that long syllables are more likely to attract stress than closed syllables (which in turn are more likely to attract stress than short syllables). Tigak stress assignment supports this hierarchy. Syllables with a complex nucleus (i.e. a diphthong or long vowel) outrank both closed syllables and short open syllables in attracting stress. (See Hyman 1985 and Tranel 1991 for other discussions of syllable weight.) Within a complex nucleus the stress appears to fall primarily on the first of the two vowels in that nucleus.

Of course, a logical question is whether the complex (or long) nucleus is attracting the stress or the stress is lengthening the nucleus. The examples given in (28) below demonstrate that long syllables are not always stressed (as in **'sak+.sa.kai** *'each'*), even when the long syllable is also closed (as in **'a+.ku.ruul** *'completely'*). The first two examples in Table 3 (**'tug** *'to stand'* and **'ku.tat** *'prawn'*) also show that stressed syllables are not always long and that closed syllables do not attract stress over short open syllables. Thus, it is not stress that produces the lengthening to form a complex nucleus, but the complex nucleus (in the appropriate position within the word) that attracts stress. [12]

Affixation and reduplication also affect stress. With prefixation and reduplication[13] stress remains on the first syllable of the root, as in the following:

(26) **a+.'ka.mus** *'finished'* **e+.'viis** *'hit each other'*
ma.+'tug *'lie down'* **la+.'pou.ak** *'second'*
vis.+'viis *'fight'* **vug+.'vu.ga** *'(very)long'*
(**a-** and **la-** *'causative'*, **e-** *'reciprocal'*, **ma-** *'antonym'*)

[12] Stress does, however, affect vowel quality, as noted above in section 4.2 where vowel allophones are listed.
[13] Since reduplication copies a syllable to the left of the root, I will include it as a type of prefixation and not specify it as a separate process here.

It would appear from the examples in (26) that stress is assigned before affixation.[14] The forms in these examples are all as expected under such a rule (or level) ordering. Based on these forms, the domains of the processes of stress and prefixation might be formulated as in the Root Stress Rule given as (27) below.

(27) Root Stress Rule (RSR):
[prefix[stem stress]]

If the stressed root syllable becomes the third (or later) syllable from the beginning of the word, the stress shifts forward to the first syllable, as illustrated in (28). The underlined segments indicate the stress placement before affixation.

(28) **'la+.ma+.tu.g+i** *'lay s.t. down'* **'la+.ma.naa.s+i** *'heat s.t.'*
'a+.ku.ruul *'completely'* **'sak+.sa.kai** *'each'*
'e+.vis+.viis *'fight each other'* **'a+.si+.si.li.k+i** *'make s.t. very close'*

The forms in (28), however, are not what is predicted by the formulation in (27). If (27) is taken as the default stress assignment process, how does one account for this shift? These examples show that prefixes are not extrametrical (cf. Hayes 1982), since they do fall within the domain of stress assignment. However, this does not explain why stress does not simply shift leftward by one syllable with each prefixation. I would posit a general constraint against stress falling beyond the second syllable from the beginning of a word. This Word Initial Stress Constraint (WISC) would require that stress shift forward to the first syllable when prefixation causes the root stress to fall on the third or subsequent syllable.

A more explanatory hypothesis is that stress is assigned under a cyclic rule that operates on the outcome of each morphological process. (cf. Katamba 1993 and Kenstowicz

[14] As expected with stress assigned to the first (or the first heavy) syllable, suffixation does not affect stress assignment. Thus, **'ka.mus -> 'ka.mu.s-i** *'finish-Trnz'* or **a-.'ka.mu.s-i** *'completely'*.

1994 for general discussions of lexical phonology and Inkelas 1990 and Kiparsky 1979 for discussions of cyclicity.) This cyclic application would operate on the examples in (28) as illustrated in (29) below (represented as in Cohn 1989).

(29) Stress assignment process

Stem ->stress assigned by RSR (27)	* [tug][15]	* [ku.ruul]
Prefix ->stress assigned by RSR, unless a clash[16] occurs	- * [ma+[tug]]	* * [a+[ku.ruul]]
Prefix ->stress assigned by RSR, unless a clash occurs	* - * [la+[ma+[tug]]]	
Final stress ->left-most stress marked	* * - * * * [ma+[tug]]	* * * [la+[ma+[tug]]] [a+[ku.ruul]]
	ma.'tug *'lie down'*	**'la.ma.tug** *'put/place'* **'a.ku.ruul** *'completely'*

Evidence that a particular prefix does not have inherent stress assigned is found by comparing the examples in (30) below.

(30) **'ka.mus** *'finish'* **a+.'ka.mus** *'finished'*

ku.'ruul *'complete'* **'a+.ku.ruul** *'completely'*

'tug *'stand'* **ma+.'tug** *'lie down'* **la+'tug** *'stand s.t. up'*

but **'la+.ma+.tug** *'put/place'*

The same prefix (a-) behaves differently in **a+.'ka.mus** and **'a+.ku.ruul**. Evidence for the cyclic operation of stress assignment is provided by the last set of words in (30) above. The prefix **la-** only becomes stressed when its addition causes the root stress to be more than one syllable from the beginning of the word. The root assigned stress does not change in

[15] The square brackets here do not denote phonetic representation, but rather the levels or order of rule application.

[16] A clash would be a violation of the Word Initial Stress Constraint.

ma+.'tug and **la+'tug**, indicating that stress was assigned before the prefixation. However, with a second prefixing cycle the original root stress falls too far from the beginning of the word, violating the WISC. In this case, the stress assignment cycle must be reapplied to produce word initial stress in **'la+.ma+.tug**.

Two groups of words seem to contradict the stress assignment process stated above. One is a set of prefixed words, and the other is the set of compounds. Two prefixes do apparently attract stress. Both of these prefixes (**ve-** '*related pair*' and **ta-** '*stative*') are non-productive, each being limited to a small closed class of lexical items.

(31) **'ti.vu** '*grandparent/child*' **'ve+.ti.vu** '*grandparent/grandchild pair*'
'sa.va.t-i '*open s.t.*' **'ta+.sa.vat** '*state of being open*'

The fact that words with these two prefixes behave as unprefixed lexical items indicates that they have become grammaticalized as part of the root lexical item.[17] Such forms have been reanalyzed by the speakers as unaffixed lexemes, and as such they follow the RSR. The set of compound words follows its own rule, the Compound Stress Rule (CSR), given below.

(32) Compound Stress Rule (CSR): Compound words are always stressed on the first syllable, even when the second syllable is heavy.

Compounds are formed by prefixing the first syllable of one word to another word. Only a few words are used to produce compounds. One of the compound producing words is **pa.saal** '*walk*'. Examples follow in (33).

(33) **pa.'saal** '*walk*'
'ngan *eat*' **'pa+.ngan** '*eat while walking*'
'liu '*pass by*' **'pa+.liu** '*walk past*'

[17] The morpheme **ta** is still used as a marker for past tense in the neighboring Tungag language. In that language it is inserted as an independent tense marker before the main verb as shown in Fast's (1988:37) example (189): **nem ta pʌsal ane Vaungaung** '*We went to Vaungaung*'.

This cursory survey of stress behavior in Island Tigak is far from complete. I have not attempted to analyze stress behavior in serial verbs because of a lack of data. I have not speculated on the occurrence of secondary stress for the same reason. Stress is primarily on the first heavy syllable of a word, with the constraint against (primary) stress occurring more than two syllables from the beginning of the word. The processes presented above are reasonable and explanatory of the observed stress patterns. What seem to be contradictory examples are explained by the rules and ordering of application given above. Thus, the difference between **'tapak** '*lightning*' and **ta'paak** '*leprosy*' is explained by the heavy syllable in the latter. The difference between **la+'tug** '*stand s.t. up*' and **'la+ma+tug** '*put/place*' is explained by the constraint on the distance of stress from the beginning of the word (WISC). The separate rule for compounds allows us to identify compounds as such in some apparently exceptional cases. For example, the compound **'pa+.liu** '*walk past*', following the CSR, contrasts with the intensifier **pa.'liu** '*very much*', which follows the RSR.

7 Phonological processes and underlying representations

Island Tigak is a typically phonologically simple Austronesian language. Most of the phonological processes at work in the language are very common processes in spoken language (such as the lengthening of vowels before voiced segments or word final devoicing, discussed in (7.2)). Other processes are language specific (such as the word final velar obstruent release phenomenon, discussed in (7.3)). In this section I will discuss assimilation processes (7.1), underlying forms and the processes producing phonetic alternations (7.2), word (or syllable) final processes (7.3), processes related to syllable structure (7.4), and reduplication (7.5).

7.1 Assimilation processes

An interesting morphophonemic assimilation process occurs in Island Tigak involving the (definite/indefinite) article[18] and its following noun. The article shows the following alternations: **ta[m]** ~ **ta[n]** ~ **ta[ŋ]** ~ **ta**.[19] These alternations are illustrated in (34) below.

(34) **ta[m] babat**	**ta[n] dok**	**ta[ŋ] guup**	**ta masut**
'wall'	*'olive shell'*	*'night'*	*'bush'*
		ta[ŋ] ot	**ta ngur**
		'thing'	*'mouth'*
		ta[ŋ] ini	**ta piu**
		'sore'	*'dog'*
			ta lui
			'house'
			ta suna
			'clam shell'

These alternations can be described in terms of assimilation and deletion. The nasal assimilates to the point of articulation of a voiced obstruent that follows it and is deleted before a voiceless obstruent, lateral, or nasal. If the underlying representation (UR) for the article is /taŋ/, the following nasal assimilation/deletion rule (35) describes the process.

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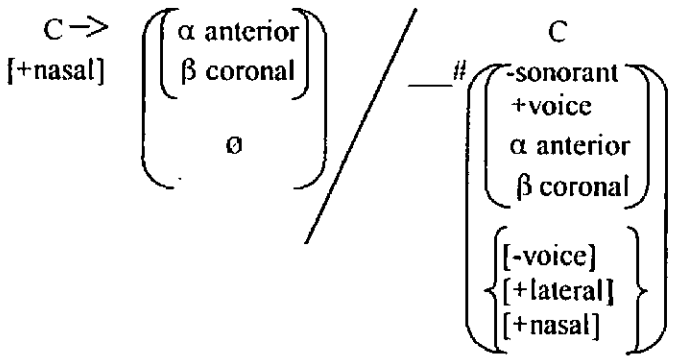
[18] Beaumont (1979) lists three articles for the Central Tigak dialect on the mainland of New Ireland. These are **ta** *'indefinite'*, **tang** *'definite'*, and **a**. The Island dialect does not make this distinction between definite and indefinite. The prefix **a-** does occur in Island Tigak, but as a nominalizer. In fact, I question the use of the term 'article' for these forms. They are more like noun markers. The reasons for this judgment are, however, beyond the scope of this paper, and I will continue to use the term for simplicity.

[19] I am using standard orthographic symbols except for the particular segments under discussion.

(35) Nasal Assimilation Rule (NAR)



The rule in (35) permits [**taŋ**] to surface unchanged before vowels and the voiced velar obstruent [**g**].

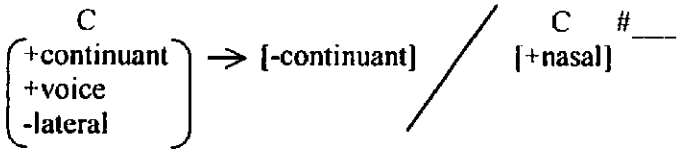
The examples given in (36) below illustrate another process that occurs in conjunction with the nasal assimilation process. The voiced, non-lateral continuants [**β ɹ**] which occur in word initial position in some nouns in isolation become the voiced plosives [**b d**] whenever a nasal precedes.

(36) [**β**]**uul** *'canoe'* **ta[m b]uul** *'a/the canoe'*

[**ɹ**]**ei** *'wind'* **ta[n d]ei** *'a/the wind'* [20]

This process is also an assimilation in which the continuants involved are assimilating to the [-continuant] feature of the preceding nasal. This rule can be stated as in (37) below.

(37) The Decontinuant Rule (DR)



Because the decontinuant rule must be applied before the nasal assimilation rule can apply and the nasal assimilation rule applies to its output, these are ordered rules with a feeding

[20] Refer back to (12) for orthographic forms.

order. Table 4 below illustrates the application of these two rules.

UR	**#taŋ#lui#**	**#taŋ#anu#**	**#taŋ#βuul#**	**#taŋ#rei#**
DR	---	---	**#taŋ#buul#**	**#taŋ#dei#**
NAR	**#ta#lui#**	---	**#tam#buul#**	**#tan#dei#**
PF	**ta lui**	**taŋ anu**	**tam buul**	**tan dei**

UR	**#taŋ#βuul#**	**#taŋ#rei#**
NAR	---	---
DR	**#taŋ#buul#**	**#taŋ#dei#**
PF	*** taŋ buul**	*** taŋ dei**

Table 4 Derivations with ordered rules

An alternate form for the nasal assimilation rule would produce a pair of unordered rules of the non-bleeding type. This unordered form of the nasal assimilation rule is given below as (38). With this rule there is one more feature specification required in the environment, but in this form the two rules (DR and UNR) do not have to be ordered.

(38) Unordered Nasal Rule (UNR)

$$\begin{matrix} C \\ [+\text{nasal}] \end{matrix} \rightarrow \begin{pmatrix} [\alpha\ \text{anterior} \\ \beta\ \text{coronal}] \\ \\ \emptyset \end{pmatrix} \Big/ \underline{\quad}\ \#\ \begin{matrix} C \\ \left(\begin{matrix} [-\text{nasal} \\ -\text{lateral} \\ +\text{voice} \\ \alpha\ \text{anterior} \\ \beta\ \text{coronal}] \end{matrix}\right) \\ \left\{\begin{matrix} [-\text{voice}] \\ [+\text{lateral}] \\ [+\text{nasal}] \end{matrix}\right\} \end{matrix}$$

Table 5 gives derivations that demonstrate that the order of application of these two rules is irrelevant.

UR	#taŋ#βuul#	#taŋ#rei#
UNR	#tam#βuul#	#tan#rei#
DR	#tam#buul#	#tan#dei#
PF	tam buul	tan dei

UR	#taŋ#βuul#	#taŋ#rei#
DR	#taŋ#buul#	#taŋ#dei#
UNR	#tam#buul#	#tan#dei#
PF	tam buul	tan dei

Table 5 Derivations with unordered rules

7.2 Underlying representations

The discussion of the assimilation rules in 7.1 above assumed that certain nouns have underlying forms that begin with the continuants /β ɹ/. Evidence for these underlying forms is found in the variation in pronunciation of these forms when they occur in isolation as opposed to when they occur with the article (as shown in (36) above). This variation alone, however, is not conclusive evidence for either form as an underlying form. Other noun pairs show a contrast between initial [β ɹ] and the corresponding [b d]. Some of these contrasts are given in (39) below.

(39)

|b|alang	*'be drunk'*	**|β|alang**	*'dog that eats excretment'*
|b|ang	*'rocky'*	**|β|ang**	*'deafened by noise'*
|b|abat	*'wall'*	**|β|avat**	*'two men'*
|d|ok	*'olive shell'*	**|ɹ|ok**	*'to fold'*
|d|ak	*'fallen coconut'*	**|ɹ|ak**	*'sharpen'*
|d|ik	*'kind of shark'*	**|ɹ|ik**	*'shove'*

In the cases of these contrastive pairs, the [β ɹ] do not vary with [b d]. Where there is no contrast [β ɹ] → [b d] in the appropriate environment, as stated by the DR in (37) above.

For these reasons I propose underlying forms with the continuants in those cases which show the alternation demonstrated in (36) above, but underlying forms with the actual phonetic output for those cases which show no alternation due to the contrast. Thus, the phonetic forms indicated in (39) above would become the phonemic (or underlying) representations for the contrastive lexemes, but /β ɹ/ would be the underlying representations for the initial consonants in (36).

The major question of Island Tigak underlying forms involves the article, which I assumed above to have the underlying form /taŋ/. There are other possibilities. The most feasible alternatives for an underlying representation (UR) for the article are /ta/, /taŋ/, or /taN/.[21] I will evaluate each in turn, in the context of feature geometry theory. (See, for example, Broe 1992, Clements 1985, 1993, Clements and Hume 1993, Odden 1991, Padgett 1991, Pulleyblank 1989, Sagey 1991, Selkirk 1984, and Steriade 1987b for feature geometry theory.)

7.2.1 The article as /ta/

If the underlying form of the article were /ta/, I would have to postulate the epenthesis of the homorganic nasal before voiced plosives and that of /ŋ/ before vowels. In terms of feature geometry, this difference in the inserted segment appears arbitrary.[22] If one bases the

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[21] I do not consider the phonetic forms [tam] and [tan] which occur only before labial and alveolar voiced plosives,respectively, as reasonable underlying forms because of their very restricted distribution and the fact that native speakers do not write the article using either of those forms.

[22] There are instances of nasal epenthesis in the language. The negative and several aspect markers append /n/ before a vowel initial verb. (See the discussion in section 7.4 below.)

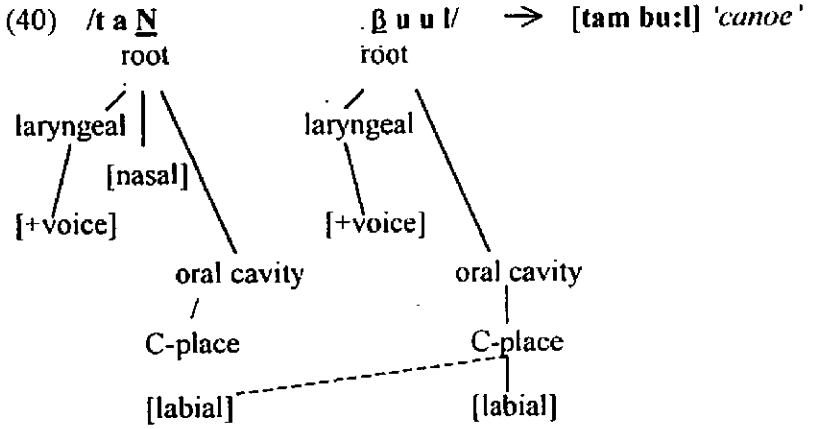
/veko/ --> [vekon],	/po/ --> [pon],	/pe/ --> [pen]
NEGATIVE	PERFECTIVE	ITERATIVE

If the article were following the same pattern, I would expect the form [tan] before vowel initial nouns instead of [taŋ]. The behavior of these verbal elements is contrary to the argument I will put forth for the article form. I cannot resolve that except to say that the verbal and nominal forms are subject to different rules.

assimilation on the spreading of place features from the plosives to the inserted nasal, why do the place features of the vowel not spread by the same rule? (See the feature diagram (40) in 7.2.2 below for the spreading of features once the nasal segment is in place and the discussion following (40) concerning vowel place features.)

7.2.2 The article as /taN/

Using the underspecified nasal /N/ for the article seems appropriate for the cases in which the article precedes voiced plosives. Example (40) below illustrates how the assimilation process would spread the place feature of the plosive to the left to the nasal, which is unspecified for place.



However, considering the arguments advanced by Hume (1992) for assigning front vowels the place feature [coronal],[23] the process in (40) would not be operative before

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[23] In fact, other linguists before Hume have noted the correlation of place features between vowels and consonants. Hyman (1975:31-32) discusses the acoustic property of low tonality which labial and velar consonants and back vowels have in common, and the property of high tonality that dental/alveolar and palatal consonants have in common with front vowels. Correlations in behavior also motivated Chomsky and Halle to refine and change the distinctive features of Jakobson and others.

vowels. If the same assimilation process operates on the UR /taN/, the surface form [**taŋ**] which appears before all vowels should show the alternation between [**tan**] and [**taŋ**], as in (41) below. [24]

(41) ***[tan ini]** *'sore'* versus **[taŋ ur]** *'banana'*

Instead of [**tan**] surfacing before front vowels, the form [**taŋ**] occurs before all vowels.

For the cases in which the nouns begin with segments other than voiced plosives or vowels, the /N/ would remain unspecified, and thus, would not surface. This would yield the forms in the last column of (34) above.

7.2.3 The article as /taŋ/

Taking the UR as /**taŋ**/ requires an assimilation rule similar to (40) above, whereby the place feature of a voiced plosive is spread leftward to the nasal of the article. This causes the original place feature of the nasal ([dorsal]) to delink. This interpretation produces a problem similar to the one produced by positing /taN/ as the UR. Why does the assimilation process occur only before the voiced plosives? The problem is harder to solve for /**taŋ**/ than for /taN/, since it requires that a segment delete before all phones except voiced plosives and vowels, not just that it does not surface because it is unspecified. The Obligatory Contour Principle (OCP) (McCarthy 1986) could be invoked as the reason for deleting /ŋ/ before a nasal, as this would prevent having identical specifications adjacent on the same tier. Cross-linguistically, nasals are less common before voiceless segments than before voiced ones, so perhaps that is related to the deletion before the voiceless phonemes. But what about the lateral /l/? The nasal of /**taŋ**/ deletes before /l/ as well as before nasals, but /l/ has no

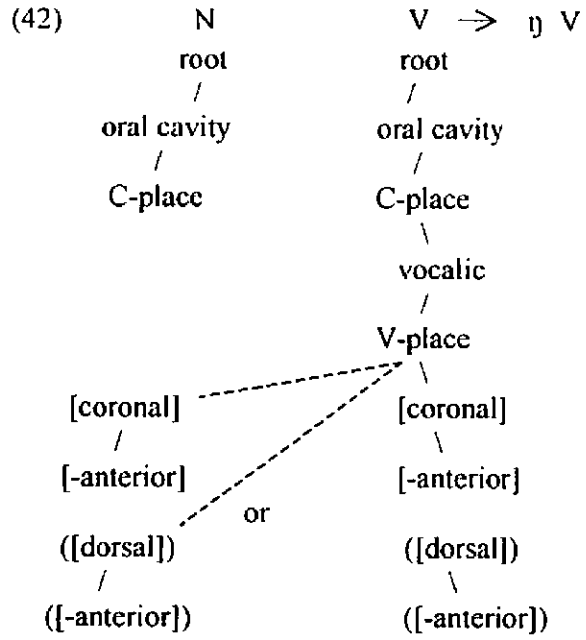
[24] See section 7.2.4 below for an alternative analysis.

common feature with the nasals except for voicing. The case of the voiced plosives shows that adjacent voicing does not invoke the OCP causing nasal deletion. Thus, there is no obvious motivation for the nasal deletion before the phoneme /l/ if the underlying form of the article is /taŋ/.

7.2.4 Evaluation of the choices

Positing /ta/ as the UR seems the least appropriate choice because of the disparity between the epenthetical segments for plosives and vowels. The arguments for and against /taŋ/ and /taN/ appear almost equal. With either choice, the exclusion of the non-plosives from the assimilation processes must be explained. Such an exclusion is easier with the underspecified nasal /N/ (it is not realized phonetically if the place node of the following segment does not spread to it). However, with this choice, there is the problem of the lack of place assimilation from the vowels. The choice of /taŋ/ as the UR eliminates this problem.

I suggest one possible alternative for the assimilation process which tips the balance in favor of /taN/. This alternative is based on the assimilation resulting from the spreading of the place feature [-anterior] in the case of the vowel initial nouns. This process is diagramed below as (42) and results in [ŋ] before a vowel.



In this process only one of the place feature nodes [coronal] or [dorsal] would represent the vowel under V-place. Either one will have a terminal node [-anterior]. This is the node which would spread leftward to the underspecified nasal. The appropriate place node would then be interpolated under the C-place node of /N/. Although it is a close call between /taŋ/ and /taN/ as the UR, the process in (42) seems to favor the choice of /taN/ as the UR of the Island Tigak article.[25]

7.3 Devoicing and final release

Another distributional characteristic of Island Tigak is that only the voiceless form of obstruents occurs in coda positions. Table 6 below gives some examples.

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[25] Another variation may support the choice of /taŋ/ as the UR. Sometimes before a nasal initial noun, the article has a 'nasal' quality. This nasality disappears in careful speech, except for one form. Even in careful speech one hears the alternation [tɑ mɪʌs] ~ [tɑŋ mɪʌs] *'shell money'*. Perhaps this is the UR surfacing, or perhaps it is a transfer from the synonymous form [tɑŋ gogonɑn] *'shell money'*

Present	Past	UR	
na[k]	**na[g]+a**	**/nag/**	*'1st, singular'*
me[k]	**me[g]+a**	**/meg/**	*'1st, dual'*
nu[k]	**nu[g]+a**	**/nug/**	*'2nd, singular'*
mu[k]	**mu[g]+a**	**/mug/**	*'2nd, dual'*
mi[k]	**mi[g]+a**	**/mig/**	*'2nd, plural'*
ri[k]	**ri[g]+a**	**/rig/**	*'3rd, plural'*

Intransitive		Transitive		UR
bu[k]	*'want'*	**bu[k]+i**	*'want-it'*	**/buk/**
ulpu[k]	*'turn around'*	**ulpu[k]+i**	*'turn-it around'*	**/ulpuk/**
tu[k]	*'stand'*	**la-tu[g]+i**	*'cause-it to stand'*	**/la-tug/**

Table 6 Island Tigak pronoun and verb forms

None of the voiced obstruents occur word finally, but the only alternation observed is that between **[k]** and **[g]**. Evidence that this is word final devoicing is found by comparing the pronoun forms above with the verb forms. If this were a case of intervocalic voicing (a possibility if only the pronoun forms are considered), the verb forms should show the voiced velar plosive [g] before the transitive marker /-i/. The occurrence of both the voiceless **[k]** and the voiced **[g]** in this position indicates that intervocalic voicing is not operative, and that the underlying form for a verb may be voiced or voiceless word finally. This is an idiosyncratic feature of each lexeme that must be discovered in the context of suffixed forms. The underlying forms for the pronouns are all voiced word finally, but become voiceless when they occur without suffixation by the application of the obstruent devoicing rule (given as (43) below).

(43) Obstruent Devoicing Rule (ODR)

$$\begin{matrix} C \\ [\text{-sonorant}] \end{matrix} \rightarrow [\text{-voice}] \Big/ \_\_ \begin{pmatrix} \# \\ C \end{pmatrix}$$

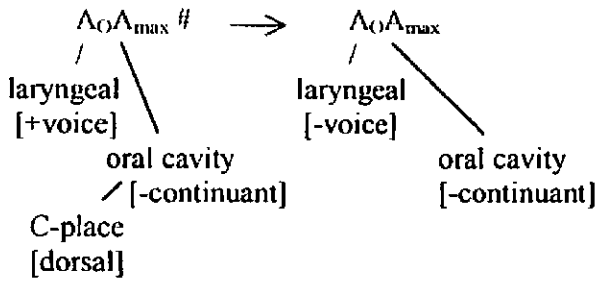
This is a strengthening process to protect the vulnerable word final position. The same process operates in non-final coda positions as well. The derivations in Table 7 illustrate the devoicing rule and its application under affixation, reduplication, and compounding. Notice that the syllable formation rules given in section 5 above (listed as SFR in Table 7 below) are applied before the ODR.

UR	#nag#	#nag+a#	#buk#	#buk+i#	#βug+βuga#	#tug+bat+i
SFR	#nag#	#na.ga#	#buk#	#bu.ki#	#βug.βu.ga#	#tug.ba.ti#
ODR	#nak#	---	---	---	#βuk.βu.ga#	#tuk.bat-i#
PF	nak	naga	buk	buki	βukβuga	tukbati

Table 7 Derivations using obstruent devoicing rule

The ODR can be considered as an application of Steriade's (1982:8) 'condition (8)' that disallows distinctive voicing in syllable codas. In Island Tigak this condition is manifested in the devoicing of plosives in syllable coda position. The ODR ((43) above) can be given in terms of feature geometry by (44) below (following Steriade 1993a [26] and Clements and Hume 1993). According to Steriade a noncontinuant has two sets of features, one set for the closure slot (A_O) and one set for the release slot (A_{max} or A_f, depending on the type of release).

(44)



This devoicing rule applies only to plosives (as indicated by the lack of a [nasal] node on the

[26] See especially page 402 of Steriade for definitions and symbols.

root and by the [-continuant] feature node of the oral cavity). The C-place features are actually redundant as only the velar plosives show this alternation. The voiced labial and coronal plosives and the labial fricative (/b d β/) do not occur in any position that could derive from a coda (i.e. they do not occur finally in the pronominal or verbal constructions which can be suffixed). The [-voice] feature in the outcome of the rule is an interpolated feature node based on the delinking of the [+voice] node in the input.[27] That this process is not simply a prohibition against release in word final position will be seen by the alternations in the release phase of the velar plosive (as shown in Table 8 below).

Although the voiceless plosives which surface in coda position are generally unreleased, there is one environment in which the voiceless velar plosive is heavily aspirated or even affricated. Compare the examples in Table 8 below.

	Unreleased codas				
/kik/	[kik˺]	*'parrot'*	/ki-g/	[ki·k˺]	*'my leg'*
/ka-g/	[ka·k˺]	*'my'*	/guup/	[gu·p˺]	*'night'*

	Released codas			
/pook/	[po:k^{h}]	~	[po:k^{x}]	*'food'*
/kiak/	[kiʌk^{h}]	~	[kiʌk^{x}]	*'come down'*

Table 8 Island Tigak coda alternations

As seen in Table 8, the Island Tigak plosives may take the form of any one of several representations. These possible representations are given below in (45), according to the syllable position in which the plosive occurs.

[27] The feature [-voice] is a necessary consequence of not having [+voice] unless [voice] is taken as a privative feature, in which case the absence of a [voice] node would imply a voiceless segment.

(45) Onset:

(a) plosive with unaugmented release

$A_O A_{max}$
/
[±voice]

Coda:

(b) unreleased plosive (c) aspirated plosive ~ (d) affricated plosive

A_O	$A_O A_{max}$	$A_O A_f$
/	/ / \	\ /
[-voice]	[-voice] [spread]	[-voice]

In (a) above the release is not enhanced by voicing or spread glottis. In (b) there is simply no release slot realized. In (c) the release is characterized by aspiration (indicated by spread glottis), and in (d) the release is a voiceless fricative (A_f). The questions with respect to these forms are what determines when the final plosive is released or unreleased, and when released what determines the manner of release? As illustrated in Table 8, all of the final plosives are voiceless and the unreleased forms follow both long and short vowels. Only the velar plosive is released word finally and then only following certain vowels sequences (apparently a subset of the set of long vowels and diphthongs). My first hypothesis was that the release followed a two-vowel nucleus, in which the second vowel was [+back], according to the following rule:

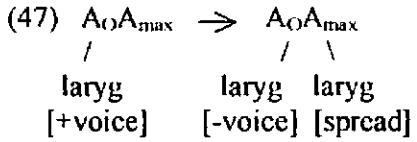
(46) /k/ → [k^h] ~ [k^x] / V V [+back] ___ #

The motivation for (46), however, is unclear to me. What other features encourage release? Another hypothesis I formulated was that there is a constraint against an unreleased segment when there are two adjacent dorsal nodes word finally. This was motivated by the fact that there is no aspiration with a labial following a back vowel ([gu:p'] '*night*'). However, neither is there aspiration of the velar following a single back vowel ([ka·k'] /ka+g/ '*my*'),

even when that vowel is slightly lengthened (a common process before a voiced segment). Perhaps a sequence of continuants (in the form of vowels) motivates the release at the end of the word. This could be due to an articulatory difficulty in discontinuing the air flow completely following the openness of the vowel sequence.[28]

Another hypothesis concerning the word final alternations is based on the devoicing phenomenon discussed above. Is it possible that the UR of [k^h] (or [k^x]) in the forms exhibiting the aspiration (or affrication) is actually /g/? If the surface form [kiʌk^h] comes from /kiag/, the question arises as to how voicing becomes aspiration. The process could be represented as in (47) below (ignoring irrelevant feature structure).

(47)



If this representation is accurate, perhaps the delinking of the feature [+voice] leaves a floating laryngeal feature that then surfaces as the laryngeal feature [spread] on the release producing aspiration.

7.4 Processes related to syllable structure

As stated in section 5 above the most frequent syllable pattern in Island Tigak is CN. The pattern CNC is also very frequent.[29] Although long vowel sequences do occur within words, the tendency is toward a CN(C) syllable structure and the avoidance of vowel sequences across word boundaries or of more than two vowels consecutively within a word. One of the phonological processes used to break up these sequences between words is a nasal

[28] Another possibility is that the combination of the two [dorsal] and two [continuant] nodes contribute to the aspirated release.

[29] From the discussion above in section 5, the nucleus N of a syllable is equivalent to V(V), so the patterns CN and CNC could also be represented with CV(V) and CV(V)C, respectively.

insertion rule. The negative and several aspect markers append /n/ before a vowel initial verb. (See footnote 22 above.)

(48)	(a) **ga veko paga**	but	**nag vekon inang**
	'it [is] not clear'		*'I [am] not going'*
	(b) **ga po kuusiri**	but	**ga pon inang**
	he had told us'		*'he had gone'*
	(c) **gi pe saleng**	but	**rig pen ima**
	'he [is] still hunting'		*'they [are] still coming'*

This rule can be formulated as (49) below.

(49) Nasal Insertion Rule (NIR)

$\emptyset \rightarrow$ [n] /V __ # V

The NIR is a synchronic rule apparently resulting from an earlier nasal deletion rule and subsequent reanalysis of the forms involved. The older forms of these morphemes included the final alveolar nasal. The very old speakers of Island Tigak still use the nasal-final forms even before consonant initial words, as in (50) below.

(50)	**vekon sinug**	*'not present'*
	rig pon polongani	*'they heard [it]'*

The underlying representation for these speakers is **/CVn/**. Most speakers accept either form, but most give the form without the nasal as the basic form when questioned. In natural speech the forms most often occur as given in (48) above. Thus, the underlying representation for modern speakers is a **/CV/** pattern. Since most current speakers view the forms without the final nasal as basic, I hypothesize that an earlier nasal deletion rule eliminated the final nasal before consonant initial forms, and speakers subsequently reanalyzed the process as one of inserting the nasal before vowels (as in the case of the English indefinite article *a/an*).

Another process (vowel elision) eliminates geminate vowel sequences across word boundaries. The third person singular non-past subject agreement form is **gi**. The subject agreement markers in Island Tigak are unstressed. When this form precedes a verb with intial /i/, **gi** merges with the verb and loses one of the vowels.

(51) **gi 'i.nang** → **'gi.nang** *'he goes/is going'*

The vowel deletion rule describing this process is given as (52) below.

(52) Vowel Deletion Rule

$$V \rightarrow \emptyset \,/\, \_\_ \; V$$
$$\begin{bmatrix} \alpha \text{ features} \\ \text{-stress} \end{bmatrix} \qquad \begin{bmatrix} \alpha \text{ features} \\ \text{+stress} \end{bmatrix}$$

Related to vowel elision is vowel reduction in unstressed syllables. The vowel phonemes /i e a o u/ of Island Tigak commonly occur as the allophones [ɪ ɛ ʌ ɔ ʊ] in unstressed syllables. (See section 4.2 above for examples.) The vowel elision process discussed above is the extreme result of vowel reduction. Long (or geminate) vowels are not produced as the reduced allophone, and this fact is often the means of identifying the presence of a long vowel when there is no contrast in an identical environment. (Of course, a long vowel, or complex nucleus, most often occurs in a stressed syllable, so the unstressed environment is seldom present.) In some dialects of Tigak the vowel reduction is more pronounced. The unstressed vowels are often reduced to [ə] so that the underlying phoneme is indeterminable. This process has resulted in alternations in spelling in which <e> replaces other vowels, especially the [-high] vowels. Island Tigak has maintained the vowel distinctions more clearly than the other dialects of Tigak.

The reduction of unstressed vowels and the elision of adjacent identical vowels discussed above provide evidence that Tigak is a stress-timed language (such as English) as

opposed to a syllable-timed language (such as Spanish). In Tigak stressed syllables (even those with a simple, single vowel nucleus) are longer in duration than unstressed syllables.[30]

The glide insertion rule (discussed above in section 5 and illustrated in (21)) is also related to syllable structure. The rule can be stated as in (53) below.

(53) Glide Insertion Rule

$$\emptyset \rightarrow \begin{bmatrix} C \\ \text{-consonantal} \\ \text{-syllabic} \\ \alpha \text{ back} \end{bmatrix} \Big/ \begin{matrix} V & V \\ \begin{bmatrix} \text{+high} \\ \alpha \text{ back} \end{bmatrix} & \end{matrix} \_\_ V$$

The inserted glide serves to break up sequences of more than two vowels by becoming the onset of the syllable following the high vowel that is second in the sequence. This process produces syllables of one of the two preferred syllable patterns in Tigak (CN and CNC).

Two other processes which seem to be related to preserving a preferred syllable structure involve alternations between /u/ and /β/. In some open syllables of the pattern /CVu/, the /u/ becomes the fricative /β/ (<v>) before a vowel initial suffix, as in (54) below.

(54) /li**u**/ *'pass by s.t.'* <li**u**>
/li**u**+ai/ *'continue on'* (intransitive) → **[li.βai]** <li**v**ai>
/a+li+li**u**+an/ *'long period'* (nominal) → **[a.li.li.βan]**[31] <a**li**li**v**an>

This desonorization breaks up long vowel sequences and produces one of the two preferred syllable types. This process is different from the glide insertion discussed above which inserts **[w]** after the /u/ in a sequence of three vowels, as in **/pouak/ [pou.^{w}ak]** *'two'*. With the limited number of examples of each it is difficult to see the motivation for the two difference processes. Each process produces a preferred syllable pattern by breaking up a

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[30] Of course, since a complex nucleus attracts stress according to the Root Stress Rule given as (27) above, the inherently longer syllable is most often the stressed one.

[31] Reduplication is often used for intensification, as in this example. It also is used for nominalization, as in (57) below.

long vowel sequence, but why is one or the other not used in all the cases of /VuV/? The only obvious difference between the environments of the two processes is a difference in the height of the preceding vowel. The desonorization process only occurs when a high vowel precedes the /u/. On the other hand, the insertion of the glide [w] only occurs when a non-high vowel precedes the /u/. Since all of the examples of the desonorization process I have found involve suffixes with an intial /a/, the rule may be stated as follows in (55):

(55) Desonorization Rule

$$\begin{bmatrix} V \\ +\text{high} \\ +\text{back} \end{bmatrix} \rightarrow \begin{matrix} C \\ [-\text{sonorant}] \end{matrix} \Big/ \begin{bmatrix} V \\ +\text{high} \\ -\text{back} \end{bmatrix} \_ \begin{bmatrix} V \\ +\text{low} \\ +\text{back} \end{bmatrix}$$

The motivation for this process could be to produce a greater contrast in the sequence transitioning from one vowel to another with opposite feature values when the medial vowel has features in common with both other vowels. The glide insertion rule given as (53) above can be specified for the labial-velar glide as in (56) below.

(56) Labial-velar Glide Insertion

$$\emptyset \rightarrow \begin{bmatrix} C \\ -\text{consonantal} \\ -\text{syllabic} \\ +\text{back} \end{bmatrix} \Big/ \begin{bmatrix} V \\ -\text{high} \\ +\text{back} \end{bmatrix} \begin{bmatrix} V \\ +\text{high} \\ +\text{back} \end{bmatrix} \_ \; V$$

Comparing (55) and (56) reveals that the /u/ is preceded by vowels of opposite features in the two cases. The sequence in (56) of a [- high] vowel followed by a [+ high] vowel is a common diphthong sequence and forms a complex nucleus in many Tigak syllables. In this case the complex nucleus is maintained and the preferred syllable pattern produced by inserting the glide.

A reverse process converts the fricative /β/ (<v>) to /u/ in reduplicated forms. This sonorization process is illustrated below in (57) and could be formalized by the rule in (58).

(57) **/taβ/** *'give'* → **[tau̲.ta.β+ai]** **<tau̲tav̲ai>** *'gift'*

(58) Sonorization Rule

$$\begin{bmatrix} C \\ -\text{sonorant} \\ +\text{continuant} \\ +\text{voiced} \end{bmatrix} \rightarrow \begin{bmatrix} V \\ +\text{high} \\ +\text{back} \end{bmatrix} \; / \; \underline{\quad} \; C \quad [\text{reduplication}]$$

The motivation behind the sonorization process could be the preference for open syllables over closed syllables, especially when that syllable is prefixed to one with an onset.

However, there are examples of consecutive consonants that form the coda and onset, respectively, of consecutive syllables. Most of these examples are reduplicated forms (see 7.5 below), but there are also monomorphemic forms of this type.

(59) **/REDP+sakai/** **[sak.sa.kai]** *'one'* → *'each'*
/REDP+kapis/ **[kap.ka.pis]** *'plant'* → *'planting'*
/mallak/ [32] **[mal.lak]** *'area around house'*

A better explanation for this sonorization process, which is also linked to the glide insertion process, is that it is not actually sonorization at all, but another example of desonorization. If the underlying form of (57) above is actually **/tau/** for the verb root, then the conversion of /u/ to /β/ follows the desonorization rule given as (55) above, but without the specifications on the preceding vowel. The revised rule would be (60) below.

(60) Revised Desonorization Rule

$$\begin{bmatrix} V \\ +\text{high} \\ +\text{back} \end{bmatrix} \rightarrow \begin{bmatrix} C \\ [-\text{ sonorant}] \end{bmatrix} \; / \; V \; \underline{\quad} \; + \; \begin{bmatrix} V \\ +\text{ low} \\ +\text{ back} \end{bmatrix}$$

If this is the correct analysis, the question as to why desonorization occurs in some cases and glide insertion in other cases is more easily answered. Desonorization only occurs across morpheme boundaries, whereas glide insertion occurs in monomorphemic forms. The morpheme boundary (+) specifies this requirement in (60) above.

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[32] **/mallak/** contrasts with **/malak/** *'yellow/orange'*.

7.5 Reduplication patterns

Reduplication serves many grammatical functions in Island Tigak, both inflectional and derivational.[33] Among the inflectional functions reduplication is used to indicate a continuative aspect or to intensify, as in (61) below.

(61) **ga sinug** *'he sat(down)'* **ga sinsinug** *'he sat (for a period of time)'*
vuga *'long'* **vugvuga** *'very long'*

Derivationally, reduplication is used to change the grammatical category of a lexeme from a verb to a noun, as in (62).

(62) **kapis** *'to plant'* (verb) **kapkapis** *'plant'* (noun)

The most common reduplication pattern is the copying of the word initial CV or CVC sequence to the left (i.e. prefixing a copy of the initial CVC sequence). Examples of this reduplication pattern are given below in the first two columns of Table 9. The root is underlined in each example.

Consonant initial roots		Vowel initial roots
CV copy	CVC copy	Internal CV copy
1. **ba+bat** *'wall'*	11. **kal+kalag** *'letter'*	21. **a+gu+gulis** *'movement'*
2. **go+gon** *'clean'*	12. **kul+kul** *'change clothes'*	22. **a+in+ino+ai** *'leader'*
3. **go+gong** *'wear belt'*	13. **sin+sinug** *'sit(cont.)*	23. **a+u+li+lit** *'surround'*
4. **ku+kuvulan** *'group'*	14. **kas+kaas** *'able'*	
5. **vi+vilai** *'custom'*	15. **kus+kuus** *'story'*	
6. **a+ko+kos** *'choose'*	16. **lak+laak** *'be high up'*	
7. **a+li+li** *'cause to go'*	17. **vis+viis** *'fight (n)'*	
8. **a+ro+romat** *'very, very'*	18. **a+kal+kalit** *'school (n)'*	
9. **a+si+silik** *'very near'*	19. **a+ruk+ruk** *'shake'*	
10. **la+ru+ru** *'drive away'*	20. **a+vung+vung+ai** *'long period'*	

Table 9. Island Tigak reduplicated forms

[33] I will give examples to demonstrate some reduplication functions, but the syntactic details are beyond the scope of this paper.

In most cases this CV(C) pattern represents a partial reduplication, although some monosyllabic words are completely copied (as in 12 in Table 9 above). The last examples in each column (6-10, 18-20, and 23) have a causative prefix (either **a-** or **la-**). The reduplicated portion becomes the first syllable of the word (or the second syllable in those cases with a causative prefix, indicating that reduplication occurs before prefixation). Comparing the first two columns of Table 9, the choice of the CV or CVC pattern does not seem to be conditioned phonologically or grammatically. It appears to be an idiosyncratic feature of each lexeme. In fact, some lexemes show variation with different speakers, as shown below.

(63) **a+<u>vi</u>+vikon** ~ **a+<u>vik</u>+vikon** *'threathen'* (lit: *'cause to be frightened'*)

Examples 14-16 of Table 9 illustrate a vowel shortening process that occurs when the root being copied has a long (geminate) vowel as its nucleus. The nucleus of the reduplicated syllable is a single (or short) vowel. These examples illustrate a pattern of 'almost' complete reduplication in that the monosyllabic root is copied, but with only a simple nucleus rather than the complex nucleus of the root.

The third column of Table 9 gives examples of an infixed reduplication. This infixation only occurs when the root being reduplicated begins with a vowel. The pattern for the reduplication in these cases is either CV (as in 21 and 23) or VC (as in 22), and the reduplicated portion is made up of the second and third segments in the root. This reduplicated syllable is infixed after the initial vowel of the root, even when the infixation separates a word initial diphthong (as in 22 above). This infixation between the segments of

a diphthong supports the interpretation of these diphthongs as sequences of two vowels, as presented in section 5 above.

There are also (a few) cases in which the reduplicated syllable is a CVV pattern (i.e. a syllable with a complex nucleus), as in (64) below.

(64) **kau+kavalai** *'background'*

In 7.4 above I discussed the possibility that the underlying representation for such roots is /CVu.../ and that the /u/ within the root becomes /β/ (<v>) by application of the desonorization rule given in (60) above. If this is the case, then reduplication also occurs before the desonorization rule is applied, since the reduplicated portion retains the underlying form. According to the theory of lexical phonology, reduplication is one of the earliest processes in the cycle of phonological processes. However, reduplication of prefixes can also occur, in which case the prefixation must occur first.

(65) **polok** *'grow'* → **la+polok** *'raise'* (lit: *'cause to grow'*)
→ **la+ la+polok** *'be fruitful/have many children'*
(lit: *'cause to cause to grow'*)

The reduplication of this prefix is the only example I have found in Tigak, and it is not a productive process, being limited to only a few verbs.

Stress is assigned in reduplicated forms according to the rules stated in section 6 above. The reduplicated portions are treated in the same way as all other prefixes for purposes of stress assignment.

8 Conclusion

Oceanic languages are widely considered to be phonologically simple in having a small inventory of phonemes and few complex consonant sequences, in a preference for open

syllables, in having predictable stress, and in straight forward phonological processes. [34] Tigak is a typical Oceanic language in these respects.

There are, of course, phonological processes occurring in Island Tigak speech other than the ones discussed above. The other processes are normal and common processes across languages. The processes described within this paper are the more unusual, language-specific ones found in Island Tigak. For example, the desonorization process is not what one would expect according to Hyman (1975: 178). He states 'It is more natural for stops to spirantize intervocalically...than it is for spirants to become stops...' The parallel statement for Island Tigak would be that sonorization would be more natural than the desonorization which actually occurs. Thus, Island Tigak has developed a more unusual process than the expected one in this particular instance. This desonorization pattern is continued in the decontinuation of /β ɹ/ to [b d] given by (37) and discussed in section 7.1 above. Aside from these few unusual processes, the Tigak language displays very typical Oceanic phonology.

[34] See Lynch, Ross, and Crowley (forthcoming) for a summary of Oceanic language characteristics.

Appendix A

Feature matrices

Consonant Feature Matrix for Island Tigak

	p	b	t	d	k	g	m	n	ŋ	β	s	l	r
syllabic	−	−	−	−	−	−	−	−	−	−	−	−	−
consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+
sonorant	−	−	−	−	−	−	+	+	+	−	−	+	+
nasal	−	−	−	−	−	−	+	+	+	−	−	−	−
lateral	−	−	−	−	−	−	−	−	−	−	−	+	−
anterior	+	+	+	+	−	−	+	+	−	+	+	+	+
coronal	−	−	+	+	−	−	−	+	−	−	+	+	+
high	−	−	−	−	+	+	−	−	+	−	−	−	−
low	−	−	−	−	−	−	−	−	−	−	−	−	−
back	−	−	−	−	+	+	−	−	+	−	−	−	−
continuant	−	−	−	−	−	−	−	−	−	+	+	+	+
strident	−	−	−	−	−	−	−	−	−	−	+	−	−
retroflex	−	−	−	−	+	+	−	−	−	−	−	−	−
voice	−	+	−	+	−	+	+	+	+	+	−	+	+

Vowel Feature Matrix for Island Tigak

	i	e	u	o	a
syllabic	+	+	+	+	+
consonantal	−	−	−	−	−
sonorant	+	+	+	+	+
high	+	−	+	−	−
low	−	−	−	−	+
back	−	−	−	+	+
round	−	−	−	+	+

(Long vowels and diphthongs also have the feature [+long].)

Appendix B

Sample Island Tigak text

A visit to the doctor

by Samuel Bala

['dakˀ.tʌ | 'na.gʌ 'to.gʌn 'ma.lʌ.pɐn ‖ nʌkˀ 'βu.tʊŋ lo 'ma.mʌ.nʌ 'βʊŋ ‖ tʌ 'pa.tʊkˀ gi 'ma.sʌkˀ ‖ tʌŋ 'ne:kˀ 'a.lu gi 'ma.sʌkˀ e nʌkˀ 'bʊkˀ 'luʌkʰ ‖ 'ki.sʌŋ nʌkˀ 'βe.ko 'luʌkʰ 'ɹo.kɔl ‖ nʌkˀ sa 'tu.tʊtˀ.kai ne nʌkˀ sa 'βɛ.kɔn a'luʌkʰ 'ɹo.kɔl ‖ 'kɛ.mʌ.tʌn 'gaˑn gi 'lu.lu.ʷai.sɪtˀ tʌŋ 'ne:kˀ ‖ lo tʌ 'ki·kˀ 'a.lu | 'ga.rɛ tʌŋ 'dɪŋ 'la.βu ‖ ga po 'ka.mau | e ga po 'to.gɔn 'nʌn 'lo.no ‖ tʌ 'ku.li.tɪkˀ gi 'gɔtˀ aoŋ 'tʌ.nʌ ‖ nʌkˀ 'bu.ki nʊkˀ ŋa.'βiɛ.si i.nʌ gi 'ai.ʲus ‖ e gi 'pɪn ‖]

/dakta | naga togan malapen ‖ nag βutuŋ lo mamana βuŋ ‖ taN patug gi masak ‖ taN neig alu gi masak e nag buk luak ‖ kisaŋ nag βeko luak ɹokol ‖ nag sa tututkai ne nag sa βekon aluak ɹokol ‖ kematan gaan gi luluaisit taN neig ‖ lo taN kig alu | gare taN diŋ laβu ‖ ga po kamau | e ga po togon nan lono ‖ taN kulitig gi got aoŋ tana ‖ nag buki nug ŋaβiesi ina gi aius ‖ e gi pin ‖/

<Dakta, naga togan malapen. Nag vutung lo mamana vung. Ta patug gi masak. Ta neig alu gi masak e nag buk luak. Kisang nag veko luak rokol. Nag sa tututkai ne nag sa vekon aluak rokol. Kematan

gaan gi luluaisit ta neig. Lo ta kig alu, gare tan ding lavu. Ga po kamau, e ga po togon nan lono. Ta kulitig gi got aong tana. Nag buki nug ngaviesi ina gi aius. E gi pin.>

'Doktor, I'm sick. I shake every night. My head hurts. My stomach also hurts and I want to vomit. But I haven't really vomited. I just keep on heaving and don't really vomit. Sometimes I am nauseated. On my leg, too, here is a big swelling. It is ready to open and it has pus in it. I feel very bad because of it. I want you to cut it open so that it will get well. Then it will go down.'

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