Kuot phonology is of low to medium complexity. There are thirteen consonants and six vowels; a few of the phonemes only have full phoneme status in some contexts, but elsewhere have allophonic relations to other phonemes. Syllables can be V, CV, VC or CVC. The morphology is essentially agglutinating, but there are some phonological and morpho-phonological processes that apply across morpheme boundaries. Stress is not predictable from general principles (i.e., it is lexical), and is manifested primarily as duration. It is distinct from pitch which functions separately to signal intonational information, where several clause types have their own characteristic pattern, including one for negated clauses. This chapter also deals briefly with phonological aspects of children’s and child-directed speech, hesitation, emphasis, other speech sounds and foreign sounds. It concludes with a discussion of areal phonology, as features of Kuot phonology are shared with some unrelated neighbouring languages.

Throughout this chapter, square brackets ([ ]) indicate phones or phonetic representation, i.e. pronunciation, while forward slashes (/ /) indicate phonemes or phonemic representation, i.e. the underlying system of distinctive sounds (for other uses of square brackets and slashes, which appear in glossing; see Principles of glossing).

### 3.1 Phoneme inventory

The thirteen consonants are given in Table 1 with allophones in parentheses.

<table>
<thead>
<tr>
<th></th>
<th>labial</th>
<th>dental/alveolar</th>
<th>velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>stops, voiceless</td>
<td>p (~v/β)</td>
<td>t (~r)</td>
<td>k (~ɣ)</td>
</tr>
<tr>
<td>stops, voiced</td>
<td>b (~mb)</td>
<td>d (~nd)</td>
<td>g (~ng)</td>
</tr>
<tr>
<td>nasals</td>
<td>m</td>
<td>n (l)</td>
<td>η</td>
</tr>
<tr>
<td>fricatives</td>
<td>f</td>
<td>s</td>
<td></td>
</tr>
<tr>
<td>lateral</td>
<td></td>
<td>l</td>
<td></td>
</tr>
<tr>
<td>trill</td>
<td></td>
<td>r</td>
<td></td>
</tr>
</tbody>
</table>

Some contrasts are shown in the following:

1. stops, voicing
   - *posok* white
   - *bposok* lung, liver
   - *tutur* ankle bone
   - *dudur* owl
   - *kamin* yam
   - *gamin* eight

2. nasals
   - *-m* 3pO.fut, verb class IIa
   - *-n* 3dO.fut, verb class IIa
   - *-ŋ* 3sO.fut, verb class IIa
The last group, /n/, /l/ and /r/, are not fully distinct in all contexts; this will be discussed in 3.2.2.4 and 3.2.2.5 below.

The six vowels are given in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>front</th>
<th>central</th>
<th>back</th>
</tr>
</thead>
<tbody>
<tr>
<td>high</td>
<td>i</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>mid</td>
<td>e</td>
<td>ə</td>
<td>o</td>
</tr>
<tr>
<td>low</td>
<td></td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

The following set illustrates the vowel contrasts:

(5)  li-  3rd person dual subject affix (verb class II and III)
     le-  3rd person dual object prefix
     la  relator
     la  day
     -lo  talk, tell, make sound (cl IIa verb)
     lu  hole

The next several sections will be devoted to the production, distribution and processes of the phonemes, starting with consonants and going on to vowels.

### 3.2 Consonants

This section describes the production and phonetic variability of consonants. Their distribution is also given. Initial and final position refer to the syllable; the term medial indicates intervocalic position.

The beginning of stems of verb class II count as medial rather than initial, as they are never bare, but are obligatorily prefixed with subject prefixes, all of which have the form V or CV. This is supported by the existence of a stem -pto ‘hear’ – an initial cluster /pt/ is not allowed in Kuot, but the /p/ syllabifies with the prefix, leaving /ta/ as a separate syllable.

#### 3.2.1 Production and distribution of consonants

The voiceless stops are /p/, /t/, and /k/. They are unremarkable in terms of production: /p/ is bilabial, /t/ can be apico-dental or apico-alveolar, and /k/ is dorso-velar or occasionally dorso-uvular in the environment of a back vowel.
All three are unaspirated. They are unreleased in final position. Some examples are:

(6)  
\[
\begin{align*}
kit & \quad [kɪt]\quad \text{fire} \\
tes & \quad [tɛs]\quad \text{salt} \\
piek & \quad [pjek]\quad \text{baldness; bald person} \\
kap & \quad [kap]\quad \text{stick to move hot mumu stones}
\end{align*}
\]

All three can occur initially, medially and finally.

They are subject to lenition when occurring intervocally (with some restrictions for /t/); this will be described in 3.2.2.

/k/ is occasionally pronounced [x] in very emphatic pronunciation.

The voiced stops are /b/, /d/, and /g/. They are produced in the same places and using the same articulators as the voiceless stops. They are optionally prenasalised. The nasal is usually homorganic, but not necessarily so; the factors involved are unclear at this stage. Nasalisation is more common in intervocalic position, but may occur with initial as well as medial voiced stops:

(7)  
\[
\begin{align*}
kabirɔna & \quad [kabirɔna] \sim [kambirɔna]\quad \text{middle} \\
sapda & \quad [sɔpda] \sim [sɔpda]\quad \text{type of song} \\
bakbak & \quad [bɛkˈbak] \sim [ɲbɛkˈɲbɛk]\quad \text{hip} \\
pa-la ga pa-la & \quad [palangavala]\quad \text{1px-go and 1px-go ‘we went and went’}
\end{align*}
\]

Elderly speakers prenasalise more than younger speakers, particularly in initial position.

The voiced stops do not occur in syllable-final position, but are found only initially and medially.

The nasals /m/, /n/, and /ŋ/ are bilabial, apico-dental or apico-alveolar, and dorso-velar, respectively. They occur in initial, medial and final position. Examples of words with nasals are given in (8):

(8)  
\[
\begin{align*}
nur & \quad \text{coconut (fruit)} \\
bunu & \quad \text{black sand} \\
maua & \quad \text{fruit bat} \\
ŋof & \quad \text{nostril} \\
\end{align*}
\]

\[
\begin{align*}
bilan & \quad \text{hand, arm} \\
kimanent & \quad \text{ground} \\
baam & \quad \text{leaf} \\
sona & \quad \text{magic} \\
kuŋ & \quad \text{heron}
\end{align*}
\]

The fricatives /s/ and /f/ are apico-dental and labio-dental respectively; /ʃ/ can also be bilabial ([f]). They are never voiced. They occur in all positions. There are reasons to believe that they were not part of the phonology of an earlier stage of Kuot; this will be discussed in 3.2.3 below. Words showing /f/ and /s/ in the various positions are:

(9)  
\[
\begin{align*}
sobuk & \quad \text{sugar cane} \\
basok & \quad \text{lung/liver} \\
ŋos & \quad \text{feel sticky hot} \\
ʃagun & \quad \text{punt, punting pole} \\
afɔrɔt & \quad \text{rain} \\
moŋ & \quad \text{very high tide}
\end{align*}
\]

The lateral /l/ is apico-dental or apico-alveolar and is never palatalised or velarised but always has a clear quality. It occurs initially and medially, but is re-

---

1 It is possible to get a released final stop at the end of a sentence; this appears to be an effect of the speaker releasing the obstruction in order to breathe, rather than a true allophonic variation.
alised as [n] in final position; see 3.2.2.4 below. It sometimes alternates with [n] in initial position (especially in grammatical morphemes but also in some other words); this is partly dialectal and partly idiolectal and will also be discussed in 3.2.2.4 below. In other stems /l/ is stable, e.g.:

(10)  -lum fall (verb cl II)  fəlo bamboo section/joint, cup  
     (vs. -num ‘walk’, verb cl II)  kala chase (verb cl I)

The trill /r/ is apico-alveolar. It occurs in medial and final position (but only medially in northern Kuot), e.g.:

(11)  parabira morning  iakur vine, rope  
     -buru roast (verb cl IIb)  ibir run (verb, cl I)

The relationship between /r/ and /l/, and the situation in northern Kuot will be described in 3.2.2.2 below.

Consonant distributions are summarised in Table 3.

<table>
<thead>
<tr>
<th>#</th>
<th>V</th>
<th>V</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>p, t, k</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>b, d, g</td>
<td>+</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>m, n, ŋ</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>f, s</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>l</td>
<td>+</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>r</td>
<td>–</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

3.2.2 Processes and other types of variability applying to consonants

Certain consonants are subject to phonological (/p/, /k/) and morpho-phonological (/t/) processes which are discussed here, as are the contexts for non-application of the processes. This section also deals with the variation between [n] and [l], and the variation between [n], [l] and [r].

3.2.2.1 Lenition and voicing of /p/ and /k/ intervocally

When occurring between vowels, /p/ and /k/ are lenited and voiced, and are then pronounced as the corresponding voiced fricatives [v ~ ɣ] and [ɣ]. This rule applies across all types of boundaries (affix, clitic, word). For instance, the words parip ‘faeces’ and kakok ‘snake’ are pronounced as in (12) a. and b. when in isolation, or when consonants precede or follow. But if preceded and followed by vowels, the result is as given in (13), from a narrative about a snake who gave birth to a human girl:

(12)  a. parip [parip’] faeces  b. kakok [kayok’] snake

(13)  [ebatejarǝu’tayə’yok’  ɡəba’jomirjevarvǝ]  
     eba te-i-arǝ u-tta kakok  
     FUT get.up-3fS-stm2 3f-ANAPH snake(f)
The initial /k/ of kakok and the initial and final /p/s of parip are lenited as a result of their position between vowels. The final /k/ of kakok is not lenited due to the following consonant (/g/).

The process occurs whenever /p/ and /k/ are found between vowels. However, there are a number of stems where non-lenited /p/ and /k/ occur medially, e.g. uppau [upau] '(piece of) meat' and nakkap [nakap] ‘up’. These are treated as double consonants phonologically, whereby the adjacent consonant blocks the lenition. This is in parallel with strings arising from syntactic combination, such as the following:

(14) a. aia-p am [ajayam]
   grand.relation/forefather-nsg 3m.PossII.3p
   ‘his grandchildren/foreparents’

b. aia-p pam [ajapam]
   grand.relation/forefather-nsg 1px.PossII.3p
   ‘our grandchildren/forefathers’

Other support for treating these occurrences as double are words such as kǝkkep ‘knee-cap, ten toea, shell breast ornament’ which also has the form kǝpkep (corresponding to kapkap in some other parts of New Ireland). This is presumably a case of assimilation of place of articulation of the /p/ to the following /k/, and other cases may have the same history, or simply be instances of two consecutive identical consonants. Intervocalic occurrences of /pp/ and /kk/ in stems are significantly less common than /p/ and /k/ (pronounced [v~β] and [ɣ]).

Note that no lengthening is associated with the doubling of consonants.

The application of the lenition rule is universal across all types of boundaries, with three exceptions: child-directed speech; some verb stems; and some types of CV reduplication. These will be discussed in 3.2.2.3 after the section on lenition of /t/, and in 3.8.

3.2.2.2 Lenition and voicing of /t/, and the status of /r/

The phoneme /t/ requires a different analysis from the other two voiceless stops (/p/ and /k/) because of its behaviour in final position where it contrasts with /r/. First, in initial position, it lenites to [r] following a vowel, e.g.:

(15) u-tie tinin [urjen'mn]
   3f-there dance.group(f)
   ‘that dance group’

So far it is parallel to /p/ and /k/, and [r] in initial position is an allophone of /t/. But in final position, /t/ does not normally lenite:

(16) karǝt aŋ [karǝtan] (*[karǝran])
    betel.nut 3m.PossII.sg
    ‘his betel nut’
As we saw in (14), a following possessive marker causes /p/ (or /k/) to lenite, as indeed any following vowel, but this is not the case for /t/.

Only one productive morpheme causes a final /t/ to lenite: the non-singular suffix -(i)p:

(17) kit kit-ip [kirˈɪp]
    fire fire-nsg

There is also a non-productive ending that is now but a lexically determined alternation in future variants of some stems in verb class II and III, which also causes a final /t/ in the non-future form to become [r], e.g.:

(18) lop-i-at eba lop-i-arig
    give.birth-3FS-stm2 FUT give.birth-3FS-stm2,fut
    ‘she gives/gave birth’  ‘she will give birth’

These are the only two contexts where a final /t/ in Kuot is lenited.

An important difference from /p/ and /k/ and their allophones is that while /t/ and [r] are also in an allophonic relation in initial position, they contrast in final position:

(19) kur  wall
    kut  big food parcel for mumu

We thus have to treat /r/ as a separate phoneme from /t/.

Since separate phonemes are set up for the sounds [t] and [r], they are written ‘t’ and ‘r’ in medial position (e.g. butamat [butamat] ‘clan’ (not *butamat), and buruma [boruma] ‘laplap’). However, in some stems initial /t/ does not lenite, and this is indicated orthographically by ‘tt’ (e.g. u-tta [uta] ‘3f-ANAPH – that woman (mentioned earlier)’).

As mentioned above, stem-initial position in stems of verb class II counts as medial on account of being obligatorily prefixed. Here [r] will be considered /r/, e.g. in -riva ‘run (of liquid)’.

**Northern Kuot** differs from southern Kuot as regards the position of [r], which is not allowed in word-final position in that dialect. The [r] then has almost the same distribution as [v~β] and [ɣ], with one qualification, namely that the distribution of final [r] makes reference to the word while the distribution of [v~β] and [ɣ] make reference to the syllable. It may be possible to treat [r] in northern Kuot as a lenited variant of /t/ (and non-lenited medial /t/ in that dialect would be treated as /tt/, parallel to /pp/ and /kk/). Note however that /t/ in northern Kuot is still not entirely parallel to /p/ and /k/, as final /t/ does not lenite before a vowel except if that vowel is part of the non-singular suffix, just as in the southern dialect.

A stem ending in /r/ in southern Kuot has two correspondence patterns with stems in northern Kuot; either the northern variant ends in /n/ instead of /r/, or it has an extra vowel:
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(20) southern Kuot northern Kuot

kiner kinen climbing rope; noose for catching shark
uor uorǝ reef drop-off

We will leave the correspondence of /r/ and /n/ till 3.2.2.5 below. The more common pattern is that of an additional vowel. It would be tempting to conclude that the three stops were initially parallel with regard to occurrence and lenition, and that the southern dialect has then dropped the final vowel after [r] in many words, resulting in a phonemic contrast between /r/ and /t/ in final position. However, if we look at the distribution of vowels following [r] in the northern dialect on stems that end in /r/ in the southern dialect, it appears that the northern dialect is the one that has been innovative. Consider:

(21) southern Kuot northern Kuot

nur nuru coconut (fruit)
iakur iakuru vine, rope
burbur burburu stone wall
muir muiri seaweed (sp.)
girgir girgiri rattle to attract sharks
kier kierǝ spear
sagǝ sagǝǝ egg
kar kara shell (sp.), shell scraper; car
uor uorǝ reef drop-off
korkor korkorǝ crow

Two facts emerge from the examples given. First, we get /u/ after a syllable with /u/, /i/ after a syllable with /i/, and /ǝ/ or /a/ after any other syllable, with a tendency for /a/ after /a/ and /ǝ/ after mid-vowels.2 Words which have a final syllable /rV/ in southern Kuot do not show this vowel distribution (e.g. buri ‘swamp’, in both southern and northern Kuot), nor is it a pattern of final vowels following lenited /p/ or /k/.

Second, the extra vowel appears only word-finally, not syllable-finally, as shown by the last word(s) in each set. That is, we do not get *buruburu or *girigiri, but burburu and girgiri, etc. This is different from all other statements about Kuot phonology that refer to boundaries; these always make reference to the syllable or to particular morphemes, not to the word (cf. also 3.2.2.4 below).

Taken together, these factors indicate that it is the northern dialect which has started adding vowels after word-final /r/, using an echo vowel, rather than the southern dialect having deleted final vowels after /r/.

3.2.2.3 Non-lenition of voiceless stops

There are three circumstances where regular stop lenition does not occur. One is morphologically defined: in reduplication of an initial syllable; one is semanti-

---

2 It should be noted here that the final vowel in the last set is different from the vowel added for the non-singular, where the suffix takes the form -up after syllables with /o/ (uor, korkor) (or /u/, as in the first set), and -ip in all other cases; see further 3.3.4.
cally defined: with verb stems meaning ‘break’ and some others; and one is pragmatic: in child-directed speech.

Reduplication is productive with verbs of class I (with a sense of multiple or extended action). In adjectives it is not productive, but occurs in some forms of many of the stems (e.g., in some persons but not in others, or in nominalisation etc.). What concerns us here is the reduplication of an initial CV syllable beginning in a voiceless stop. A syllable /pa/, for instance, with reduplication becomes /papa/ and following the rules of lenition the second /p/ should be lenited ([pava]). However, this does normally not occur but rather the second instance of the stop remains non-lenited ([papa]), as seen in these examples:

(22) pulai puppulai roll, lie (verb cl I)
kan- kakkan- big (adj)
talinim/tatalinim oldness (inanimate, from adj. total-)

Reduplication of initial CV syllables with voiceless stops can thus be formulated as CV → CVCCCV (rather than CV → CVCV).

Initial voiceless stops in some stems are optionally left non-lenited even when appearing intervocalically. This concerns particularly verbs meaning to ‘break’ or ‘shatter’, where it is probably sound symbolic, but it also occurs in some other stems, e.g.:

(23) ma-ppusuk=ien [mapusuyien] 3pO-break=3fS
‘she breaks them’ (used of something hard with liquid in, such as eggs; also of crushing lice with nails)
ma-kkirak=men [mak¹rakmen] 3pO-chip=3pS
‘they chip/crack them’ (e.g. of stones or plates)
ma-ttarat=men [mat⁵ratmen] 3pO-spread=3pS
‘they spread them’ (e.g. of firewood (to reduce heat) or of bamboo (to dry in the sun))

A third context where lenition often is not applied is in child-directed speech, which also contains other simplifications (see ??child-directed speech), for example:

(24) a-ko=nanj! normal: [aɣɔnaj] child-directed: [akɔnanj]
3mO-throw=2sS.fut
‘throw it (away)!’
lak-? normal: [laχi] child-directed: [laki]
where.is=3m
‘where is he/it(m)’?

The loan word rais (from English ‘rice’ via Tok Pisin), is also often pronounced [tais] in child-directed speech, reflecting the Kuot phonological system where /r/ is not a possible initial speech sound, although adults will say [rais] in normal speech.
3.2.2.4 /n/ vs. /l/ – allophony and phonemic contrast

This section will discuss the variability and non-variability of /n/ and /l/ (and [n] and [l]) in their various positions. It will be seen that the distinction is stable in medial position, but has some variability in stem-final position which makes reference to the syllable, and also some variability in initial position which makes reference to other factors.

The phonemic differentiation between /l/ and /n/ is the clearest where they occur in intervocalic (medial) position in the middle of stems, e.g. in these two stems from verb class II:

(25) -pinɔ dance
    -piλɔ be ripe, ready to eat

Verb class II is a closed class, and is thought to be the oldest verb class in the language (cf. 1.1.2.1), so the fact that it contains minimal pairs such as these is an indication that the phonemic distinction between /l/ and /n/ in intervocalic position is not recent in the language.

As noted earlier, the stem-initial position in this verb class is never word-initial, since the stems are bound forms with obligatory subject prefixes, and in this respect stem-initial segments are intervocalic rather than initial. The presence of two minimal pairs for /n/ vs. /l/ in stem-initial position in this verb class thus provides support for the statement that the differentiation between /n/ and /l/ in intervocalic position is quite clear (while the situation in word-initial position is another matter):

(26) -num walk -na return
    -lum fall -la go

For one noun, age-based variation in medial position was reported: suanǝbǝlat/ suaλǝbǝlat ‘stick for putting out fire in mumu’ where the pronunciation with [n] is used by older speakers and [l] by younger speakers.

As stated above, /l/ is not possible in final position, and segments pronounced [l] intervocalically are realised as [n] when final, the two sounds being in an allophonic relation in this position:

(27) gun [gon] gun-up [golop] breadfruit

It would appear that resyllabification takes place, giving the non-singular form /gu.lup/ (see also (30) below).

Many words ending in /n/ in the singular have deviant non-singular forms (e.g. sg: muan, nsg: muap; see further 5.2), but of those that do form non-singular by addition of the non-singular suffix -(i)p (which assimilates to -up in some contexts), about half were given with the [n] retained in the non-singular, and the other half with [l]. However, although there is a tendency for particular words to have either [n] or [l], both are possible for all words ending in [n] in the singular and taking the non-singular ending, for instance:

(28) kapuon [kaβʷǝn] kapuon-up [kaβʷǝnup] ~ [kaβʷǝlup] goatfish
There is no clear pattern to the distribution of [n] vs. [l] in the words that do show a preference, in terms of stress or surrounding phonemes, except for a tendency for words containing /l/ elsewhere to retain a final [n] when the non-singular is added.

That the [n] to [l] variation is productive is demonstrated by Tok Pisin loan words such as the following, where the non-singular forms are typically pronounced with [l]:

(29) sippun [sipun] sippun-up [sipolup'] spoon
sospen [sospen] sospen-ip [sospelip'] saucepan

The data presented thus far has shown that there is not a sharp differentiation between the phones [n] and [l] in final position, but is not sufficient to argue for either /n/ or /l/ as the underlying phoneme. A further example shows that [l] is disallowed not only word-finally but syllable-finally. The example is the word for ‘blood’ in two different pronunciations:

(30) general pronunciation: olbuan blood
archaic(?) pronunciation: onbuan blood

The variant given as archaic was reported to me as the pronunciation of a particular speaker’s grandmother and may simply represent intra-speaker variation without indicating that the form was in more general use in earlier times. My data has no syllable-final instances of [l] (although [n] does occur, e.g. kunmora ‘scorpion’ and matakinkin ‘snail (sp.)’), but what is interesting about example (30) is the equivalence of [n] and [l] in the same word when a vowel is inserted. Somewhat similarly, there is dialectal variation in the form of the following verb stem:

(31) southern Kuot: kakkǝn carry child on shoulder (V cl I)
northern Kuot: kakkale

Younger speakers make a distinction between /l/ and /n/ in final position in Tok Pisin and in loans from Tok Pisin (e.g., ‘wilwil’, ‘bicycle’) while elderly speakers frequently pronounce both as [n], and for instance the Kuot-speaking village Kabil on the east coast is usually pronounced [kabin] by the older group. (The village was established in the 20th century in Nochi-speaking territory, and the place name is presumably in the Nochi language.) Nevermann, publishing some of Walden’s notes from 1907–1909 (Walden & Nevermann 1941), uses the spelling “Kul” for the (former) village Kun in the north of the Kuot territory, suggesting that the northern dialect may have been less strict in disallowing a final [l].

A further set of words show a variation of [n] to [l] associated with the non-singular. This concerns some of the nouns in the special declensions, where the declension-identifying ending contains [n]; this is sometimes converted to [l] in the non-singular, e.g.:

(32) sg: kasonama nsig: kasolap mango tree
sg: lganam nsig: lagalup nut (sp.)
sg: marabuna nsig: marabulap nipple
Another context triggering the variation is the future forms of some verb stems in classes II and III. This variation is not productive, but in all cases where a non-future stem ends in [n] and has a future form involving an addition to the non-future form, the [n] becomes [l], e.g.:

(33)  
\[
\begin{align*}
\text{tarak-u-ban} & \quad \text{tarak-a-boluij} \\
\text{vomit-3mS-stm} & \quad \text{vomit-3mS.fut-stm}, \text{fut}
\end{align*}
\]
\(\text{class III}
\]
\‘he vomits/vomited’ \hspace{1cm} \‘he will vomit’

(34)  
\[
\begin{align*}
\text{me-in} & \quad \text{me-ili} \\
3pS-\text{stand} & \quad 3pS-\text{stand.fut}
\end{align*}
\]
\(\text{class II}
\]
\‘they stand/stood’ \hspace{1cm} \‘they will stand’

Since the morphological variation here is no longer productive, these examples serve to show that the phonological variation “frozen” in the forms is likely to be quite old in the language.

It should be pointed out that not all morphemes following a final [n] trigger the alternation; only the non-singular on nouns (and the obsolete future marking on some verbs) do so.3

In initial position, there is again an amount of variability, although most words beginning in [n] or [l] are stable. The variation here is different from that found in final positions, and depends on factors such as the grammatical class of the morpheme, and the dialect and age of the speaker. There is also inter-speaker variation among speakers of the same generation and dialect, and in some cases variation in the speech of an individual.

Grammatical morphemes, and to an extent lexical morphemes from closed classes, are more likely to be changeable than open-class lexical ones. There also appears to be more variability in the northern dialect, so that [l] in the southern dialect frequently corresponds to [n] in the north. For example, while speakers in the south mainly use the form laurup for the adverb ‘down’, this is often (but not always) rendered as naurup in the north. Particular other forms are prone to variation. Thus for instance namo/lamo ‘want, say, be about to; COMPLEMENTISER’ is subject to inter-speaker variation whereby one speaker of about 30 years of age in Bimun in the south consistently uses namo in all functions, while another Bimun speaker of the same age consistently uses lamu (the first is male and the second is female, but I have found no general gender correlation of this variation). One speaker of about 30 years of age, in Panaras in the north, consistently uses the form [ni] for the third person dual subject prefix in verb classes II and III which is normally li- (and [niəŋ] for the subject enclitic =liŋ of verb class I).

There is also intra-speaker variation, so that one speaker may vary within his or her speech, although this is rather limited. For example in one story by an elderly Bimun speaker, lamu occurs once in the sense ‘want/be about to’ while the

3 In this, final [n] behaves like final /t/, whose allophone [r] is triggered in precisely these contexts, but unlike /p/ and /k/ whose allophony is triggered in any intervocalic position.
same sense is expressed with \(nomo\) five times (in the same text, \(nomo\) also stands for ‘say’ ten times). The generational factor is present in the pronunciation of the place name Namatanai (further south in New Ireland), which older speakers often pronounce \([lamatanaj]\) whereas younger speakers use an initial \([n]\).4

The local preposition \(na\) ‘in, at’ is always pronounced as \([na] \sim [nə]\), but is likely to bear a relation to the first part of several inherently locative nouns which do not take a local preposition, e.g. \(ləbinim\) ‘beach’, \(lapuo\) ‘men’s house’, \(lakkuan\) ‘village’ and \(lauburien/laurien\) ‘shade’. Although the initial \([l]\) in these words is stable (in my experience) it seems likely that they are historically formed by \(na\) attaching to the beginning of a stem.5

In summary, the /\(n\)/ vs. /\(l\)/ distinction is fully contrastive in medial positions, allowing us to set up separate phonemes, whose presence in phonologically medial position in verb class II indicates some antiquity in the language. The distinction is rather more fluid at boundaries, although a syllable-final instance is always realised as \([n]\).

This raises the question of how to represent fluid or potentially fluid segments. It is assumed that there is a phonemic distinction but that there are some fluctuations in some morphemes for some speakers. For initial positions, most instances are stable and are represented by ‘\(n\)’ or ‘\(l\)’ as recorded for the particular morpheme. Note also that intra-speaker variation is rather limited, so that the system of each speaker appears to have either /\(n\)/ or /\(l\)/ in initial position for almost all morphemes. In other words, the variability in this position is smaller on the level of individual speakers than for the speech community as a whole. Variable segments are written reflecting the variation, so that for instance \(nomo/lomo\) and \(laurup/naurup\) are written as pronounced by the speaker from whom the example is taken. In the description of morphemes, one form is taken as basic for the sake of simplicity, and alternative pronunciations are indicated.

As regards \([n]/[l]\) in final position, there is a neutralisation of the contrast, and perhaps the best representation would be as an archiphoneme /\(L\)/. However, for the purposes of this thesis, the same principle as for initial position is followed, writing ‘\(n\)’ or ‘\(l\)’. Mostly it is ‘\(n\)’, but there are some effects for non-singular forms of nouns. Where the non-singular ending is segmentable, the stem will be written with final ‘\(n\)’ regardless of pronunciation (\(tinin-iap\) ‘dance group-nsg’ \([tiniliap]\)). In non-segmentable forms, such as those given in (32) above, the non-singular will be written with ‘\(l\)’ if that is how it was recorded.

4 Younger speakers are more literate and may be influenced by the spelling in this case.

5 There is also another word for ‘men’s house’, \(puoranəma\), where the first part is likely to be the same as /\(puo/ in lapuo.
3.2.2.5 \([n], [l] and [r]\)

As mentioned in 3.2.2.2 above, the northern dialect of Kuot does not allow word-final \([r]\), and sometimes has \([n]\) where the southern dialect has \([r]\), e.g.:

\(97\)

(35) southern Kuot | northern Kuot
---|---
kiner & kinen & climbing rope; noose for catching shark
namur & namun & early (used only with \(parabira\) ‘morning’) 
dudur & dudun & shake something rickety (verb cl I)
ker & ken & to husk (coconut or betel nut; verb cl I)
suar & suan & fill a bag or basket (verb cl I)
kosar & kosan & build, make (verb cl I)

As reflected in the proportions of examples, this variation is the most common in verbs, but occurs in words of other classes as well.\(^6\)

In another case, a medial \([l]\) in the southern dialect corresponds to \([r]\) in the north, namely the negator \(tǝle/tǝre\). Given the relation between \([n]\) and \([l]\), \([r]\sim[n]\) and \([r]\sim[l]\) can be seen as the same variation, rather than two separate relations of \([r]\) to other phones. However, it may be pointed out that in the first case, \([r]\) is in the southern dialect and \([n]\) in the north, while for \(tǝle\) the pronunciation with \([l]\) is the southern one and \([r]\) is from the northern dialect.

Within and across dialects, it has been established that the dental consonants are somewhat unstable, although there are patterns to most of the variation. Thus /t/ goes to \([r]\) in particular environments, and /l/ goes to \([n]\). In interdialectal variation a final /r/ in the south corresponds to /n/ or /rV/ in the north – this variation however is not predictable.\(^7\) These variations are taken as dialectal, and words will be written as pronounced in the instance transcribed.

One further process concerns consonants, namely the labialisation harmony of the non-singular morpheme triggered in part by final /p/ and /f/. This will be described in 3.3.4 below.

3.2.3 /f/ and /s/: newer phonemes in the language

Although not infrequent, /f/ is the least common of all consonants in a count of wordlist tokens, and is likely to be a late addition to the system. In some cases, the words appear to be loans, e.g.:

---

\(^6\) The last item, \(kosar\sim kosan\), was taken down by Ross as \(kosera\) (which he writes \(koseta\)), indicating that there may be some variability in the correspondences for particular words. His informant was from Kama in the northern Kuot-speaking area (Ross 1994: 565).

\(^7\) I am aware only of one variation involving /d/, namely in the directional stem \(-dǝŋ\) ‘down; northwest’, which in some morphological contexts has the form \(-rǝŋ\).
In other cases I have not been able to find cognate forms in neighbouring languages (although available materials are scarce so there may still be related forms to be uncovered for some of these), e.g.:

(37)  
<table>
<thead>
<tr>
<th>Kuot</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>afǝrǝt</td>
<td>Kara: phun</td>
<td>rain</td>
</tr>
<tr>
<td>fǝlo</td>
<td></td>
<td>bamboo section/joint, cup</td>
</tr>
<tr>
<td>lifur</td>
<td></td>
<td>palm tree (sp.; Tok Pisin limbum/libung)</td>
</tr>
<tr>
<td>fikanǝm</td>
<td></td>
<td>coal, ember</td>
</tr>
<tr>
<td>mǝf</td>
<td></td>
<td>very high tide</td>
</tr>
<tr>
<td>kuf</td>
<td></td>
<td>smell nice (verb cl I)</td>
</tr>
<tr>
<td>tǝf</td>
<td></td>
<td>be sick (southern Kuot; verb cl I)</td>
</tr>
<tr>
<td>jafjut</td>
<td></td>
<td>come out; pull out (verb cl I; of hair or feathers)</td>
</tr>
<tr>
<td>faka</td>
<td></td>
<td>make fire (verb cl I)</td>
</tr>
</tbody>
</table>

These examples are all from the open word classes (nouns and verb class I). Interestingly, there are no instances of /f/ in the closed word classes: verb classes II and III, adjectives, adverbs, locationals and directionals, nor in bound morphology such as pronominal forms.

As for /s/, it is a very common phoneme in the language, but similarly absent or infrequent in most of the closed word classes. There is no instance of /s/ in verb class II (the oldest in the language); only four instances in verb class III (all in the first part of the stem: siŋ-ǝlǝ ‘show’, sǝp-irǝ ‘flick sand or ground into someone’s eyes’, sip-ǝp ‘come loose’ and sirip-arǝ ‘remove smaller leaves from midrib of frond; remove thorns from pandanus leaf etc.’). In these classes, there is clearly an under-representation of the phoneme, given its frequency generally in the language. There are eight stems with /s/ among adjectives (kiris- ‘fatty of nuts’, tes- ‘salty’ (from Austronesian), sasarap- ‘wet’, isǝ- ‘rotten’, marakkes- ‘stinging’, sikǝ- ‘worm-eaten’, susukǝl- ‘never stops quarreling’, and musey- ‘makes skin itch’) – this is only a little lower than among nouns, but is within the limits of probability given the size of the class. Only two of 44 adverbs have /s/: maset ‘well’, and busit ‘always’. Among demonstratives, there is one bound stem -sik ‘DEM’ with /s/ – this stem has quite a different form from the rest of the paradigm. In the northern dialect, /s/ is also sometimes added to the end of locationals (e.g. takos = tako, ‘here’), but the stems as such contain no instances of /s/. Further, there is no /s/ in the pronominal morphology, nor in the possessive paradigm. Among numerals, aras ‘two’ has an /s/; this word is used in counting, but none of the words used as numeral determiners have /s/ (‘two’ in this series is narain). Some of this information is

---

8 For this word it may be noted that -ma signals one of the special declensions, and is likely to have been added to the stem (the non-singular is kifǝp, and there is also a feminine variant kifebun). The Madak and Lakuramau terms appear to go back to the same protoform *kusupe (Malcolm Ross, pers. comm.).
summarised in Table 4. The table gives the number of stems containing one or more instances of /s/ in each class. Nouns and verb class I are the only open classes and are shown both separately and added together.

Table 4: The frequency of /s/ in some Kuot word classes.

<table>
<thead>
<tr>
<th>Class</th>
<th>nouns</th>
<th>V I</th>
<th>N+V I</th>
<th>V II</th>
<th>V III</th>
<th>adj.</th>
<th>adv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of class</td>
<td>930</td>
<td>360</td>
<td>1290</td>
<td>110</td>
<td>71</td>
<td>76</td>
<td>44</td>
</tr>
<tr>
<td># stems w. /s/</td>
<td>140</td>
<td>120</td>
<td>260</td>
<td>0</td>
<td>4</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>% of class</td>
<td>15%</td>
<td>33%</td>
<td>20%</td>
<td>0%</td>
<td>5.5%</td>
<td>10.5%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

The distribution of /s/ and /f/ suggests that they came into the language at a stage when many parts of the grammar already had much the form we see today: pronominal forms and locatives were established, and verb class II closed but class III and adjectives still open (although the latter are both closed today).

Swadesh’s 100-word basic vocabulary list for Kuot gives nine words with /s/ (five nouns, three verbs of class I and one numeral), and one word with /f/ (noun).

It may also be mentioned that neither /s/ nor /f/ is voiced in intervocalic position, unlike the voiceless stops (which are the only other voiceless consonants in the language), and in contrast to /s/ and /f/ in neighbouring languages.

3.2.4 The roles of consonants in the grammar

Some of the consonants of Kuot, while appearing in many kinds of words, also have particular associations. Thus /t/ is common in the paradigm of locatives and directionals (from which demonstratives are also formed); and bilabials are associated with plural – /p/ for non-singular on nouns, and /m/ for third person plural verb agreement and adjective suffixes. /b/ signals non-singular inclusive in the cross-referencing morphology. Both /n/ and /l/ stand for dual on nouns and in verbal and adjectival cross-referencing, and /ŋ/ is part of the third person singular marking in cross-referencing (in other cases marked by vowels) and possessor marking. Of the remaining phonemes, /k/, /d/, /g/ and /r/ do not have systematic associations of this kind, and /s/ and /f/ do not participate in grammatical morphology.

3.3 Vowels

The six vowels of Kuot were set out in Table 2 above, and will be described here, as will the processes that apply to them.

/a/ This vowel has full phonemic status on the evidence of minimal pairs such as:

(38) gas possum marla star
    1. bush spirit; 2. story marla yawn (verb cl I); yawning

9 This column is based on an incomplete corpus.
However, /a/ is also a common allophone of /a/, and sometimes of /e/ and /o/, particularly in unstressed syllables. It has therefore often been difficult to establish whether a phone [ǝ] represents the phoneme /a/, or the phoneme /ǝ/, and this is an area where some inconsistencies remain in the analysis of Kuot phonology, as it has not been possible to check every single lexical item. Further, /ǝ/ has a low level of salience to many of the speakers (possibly in part because it has no separate written representation, instead being written with ‘a’), which makes it difficult to investigate. In other cases /ǝ/ vs. /a/ is a matter of analysis. Although /ǝ/ may be stressed it is never long, for instance in:

(39) sǝ'gar egg
    'tarǝnǝm opening in fence, stile

I have no examples of it in V or VC syllables.

/a/ is frequently realised as /ǝ/ in unstressed syllables. Many words also have variable pronunciation, where either /a/ or /ǝ/ is acceptable, e.g. in:

(40) ga ~ gǝ
    ulǝn ~ ulǝn moon

/a/ is the vowel that shows the clearest phonetic lengthening in stressed syllables, particularly in a non-final stressed syllable, mostly before /r/ but also before other continuants, for example in words like these:

(41) 'barǝnim reef at low tide; year
    'lasup stick for husking coconuts

That stress alone is not enough to cause lengthening is clear from the fact that /a/ in following words is not long, and is also a little more open in quality than in the words in (41):

(42) ku'dat wooden fence
    kǝ'lan arm

/e/ is realised as [e] ~ [ɛ]. There appears to be free variation between these, but with a tendency for [e] to appear in a final open syllable, and perhaps a tendency for [ɛ] in a non-final syllable, for instance:

(43) sige [sɪ'gɛː] spoon
    epo ['eːvɑ] mumu (northern dialect)
    mǝset [ma'sɛt] ~ [ma'sɛt] well (adv.)

/e/ almost never occurs in an unstressed syllable. Only in a very few words does there appear to be an unstressed /e/, for example:

(44) lekke [lɐke] front (adv.)
    udeboon [uɗe'boʊn] banana plant (generic for species of feminine gender)
    espan [es'pɑn] sun

Some nouns have inherent reduplication (i.e., appear to be the result of reduplication although it is not productive for the word in question). It is interesting to note that the syllable that bears the stress has /e/, while the other syllable does not:
Historically, it may be the case that /ǝ/ was in an allophonic relation not only with /a/ but also with /e/ and possibly /o/, but note that there is, at least synchronically, a phonemic opposition, as in mola ‘crowd’ vs. mela ‘in-law’. (Native speakers’ spelling of e.g. dǝdemǝ as ‘dadema’ may be taken as support for the suggestion that /e/ is phonemically ruled out in this position, and not simply pronounced at less than cardinal value.)

/i/ is pronounced [i] or [i]. The variation is largely free, and depends on factors such as speed of speech, although there is some correlation with stress, e.g.:

(46)  
ka'di  bamboo  kǝdǝbǝp  bamboo plants

When adjacent to another vowel, /i/ normally functions as a glide (see also 3.3.2 below), e.g.:

(47)  
i-ǝnomǝ  ['jǝnomǝ]  3fS-sit/live/stay – she sits (/lives/stays; sat/lived/stayed)  
afai  [a'faji]  raintree  
kei  [kejn]  type of basket

/u/, where syllabic, varies from [u] ~ [ʊ] ~ [y], in some lexemes even to [i]:

(48)  
dǝri  [dǝri] ~ [dri] ~ [diri]  sleep (verb class I)  
dus  [dus] ~ [dys]  stand (verb class I)  
nunǝmap  [nunǝ'map] ~ [nynǝmap]  life  
musgi  [mos'gju]  bird (sp.)  
pisguma  [pis'guma]  ant (sp.)

A contrast possibly analysable as length has been found in a very few monosyllables with /u/; see 3.3.1 below.

When adjacent to another vowel, /u/, like /i/, is usually realised as a glide (see also 3.3.2 below), e.g.:

(49)  
u-ǝbǝ  ['waba]  3mS-climb – he climbs/climbed (verb cl II)  
uuau  [u'wau]  cloud

/o/ is realised as [o] ~ [ɔ]. It is uncommon in unstressed syllables but not as rare as the other mid vowel, /e/. Like /a/, it is phonetically lengthened in a non-final stressed syllable before /r/ and in a stressed final open syllable, e.g. in:

(50)  
'korǝŋ  end  
sǝl  bamboo section/joint, cup

Examples of /o/ in unstressed syllables include:

(51)  
o'binǝm  canoe  
nirǝbu  coconut palm  
'kobon  idiot, crazy person  
'kabo  seed

According to my informant (Robert Sipa), /o/ is increasing in the pronunciation of younger speakers, with many forms that used to be pronounced with /ǝ/ now occurring with /o/, e.g. pukǝma [puyǝma] ~ [puyǝma] ‘hill, mountain’.
3.3.1 Length?

Only two minimal pairs have been found in the language whose contrast could perhaps be described as length, and only in one vowel. But instrumental analysis gives only weak support for this interpretation, and another possibility would be to say that the difference lies in one member of each pair having inherent stress (cf. 3.5 below). It has not been possible to explore all conceivable analyses for this distinction here.

All four lexemes concerned are from verb class I. In extremely clear pronunciation, they may be transcribed as follows:

(52)  
\[
\begin{align*}
\text{duk} & \quad [\text{du:k}\text{]} & \text{thunder} \\
\text{duk} & \quad [\text{dok}\text{]} & \text{break (of rope)} \\
\text{ut} & \quad [\text{u:t}\text{]} & \text{be like (constr. with prep. bo ‘on’)} \\
\text{ut} & \quad [\text{o:t}\text{]} & \text{be full (from food)}
\end{align*}
\]

However, the length and quality differentiation is not strongly supported, and the forms will be differentiated only through their meanings in the following.

The contrast has a very low functional load, occurring only in these pairs, and is also not perceptually very salient. In fact, the pairs were only discovered on inquiring about the apparent homonymy, but the difference was borne out by different speakers at different times and was consistent. Attempts to elicit more pairs were fruitless, as were attempts to find other minimal pairs in the data contrasting on this parameter, with /u/ or with other vowels.

The pair for *duk* was recorded with two different speakers in controlled syntactic contexts to investigate the nature of the difference. This was done as part of a recording session investigating stress, and in order to avoid exaggerated differentiation by the speakers the two sentences were not adjacent in the recording. The result for each with the third person singular feminine subject enclitic (referring to *iakur* ‘rope’ which is feminine for the sense ‘break’, and functioning as the Ø subject marker for ‘thunder’, i.e. ‘it is thundering’) is given Figure 1.10.

---

10 All recordings presented in this chapter were digitised with Speech Analyzer 1.5 (Summer Institute of Linguistics, Acoustic Speech Analysis Project), which was also used to produce the graphs. The pitch extractions shown in Figure 7, 10 and 13 were double checked in Waves™ (Entropic/Microsoft) and found to be stable.
Figure 1a: Intensity and pitch of a minimal length (?) pair (speaker: RS). Raw waveform, $F_0$ pitch and spectrogram.

Figure 1b: Intensity and pitch of a minimal length (?) pair (speaker: AT). Raw waveform, $F_0$ pitch and spectrogram.
The recording conditions were not optimal for phonetic analysis (on an open veranda in Bimun village) and pitch extraction has not worked in the first syllable in Figure 1b.

From the graphs, it seems clear that the length of each stem is equivalent relative to the following ending. However, for both speakers, it is the case that both syllables are longer in absolute time in the second word in each pair, that meaning ‘thunder’. This opens up the possibility that we are dealing with stress, as there is good reason to believe that stress in Kuot is manifested primarily through duration, and that high pitch is not a criterion for a stressed syllable (see 3.5 below), although we do also find greater pitch movement in the second member of the pair for both speakers. The subject enclitics of verb class I also frequently attract stress, and it could be the case that a situation with two stressed morphemes causes the whole grammatical word to be longer. A prosodic feature “tense” over the entire syllable could be another possibility, but has not been investigated.

### 3.3.2 Vowel sequences and sub-phonemic glides

Two identical adjacent vowels across a morpheme boundary merge and do not result in a long vowel, e.g.:

(53) \(na-arə-y!\) [naran]
2sS.fut-take-3sO.fut
‘take it!’

The following vowel sequences involving high vowels pronounced as glides are attested in stems (i.e. excluding combinations arising from affixation):

<table>
<thead>
<tr>
<th>off-glide</th>
<th>on-glide</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ei/</td>
<td>/ie/</td>
</tr>
<tr>
<td>kein</td>
<td>ie</td>
</tr>
<tr>
<td>basket</td>
<td>knife</td>
</tr>
<tr>
<td>beima</td>
<td>ubiem</td>
</tr>
<tr>
<td>dove (sp.)</td>
<td>sand</td>
</tr>
<tr>
<td>/ai/</td>
<td>/ia/</td>
</tr>
<tr>
<td>ainabun</td>
<td>iakur</td>
</tr>
<tr>
<td>old wallaby</td>
<td>lsokiar</td>
</tr>
<tr>
<td>saik</td>
<td>pianm</td>
</tr>
<tr>
<td>be lost (of things; V cl I)</td>
<td>village, place</td>
</tr>
<tr>
<td>lœi</td>
<td>/io/</td>
</tr>
<tr>
<td>lai</td>
<td>ionim</td>
</tr>
<tr>
<td>husband; grow/old man</td>
<td>deep sea</td>
</tr>
<tr>
<td>/oi/</td>
<td>/iw/</td>
</tr>
<tr>
<td>kokkoim</td>
<td>iunom</td>
</tr>
<tr>
<td>whistle (V cl I)</td>
<td>navel</td>
</tr>
<tr>
<td>boboima</td>
<td>leparabiut</td>
</tr>
<tr>
<td>crab (sp.)</td>
<td>musgiu</td>
</tr>
<tr>
<td>/au/</td>
<td>/ua/</td>
</tr>
<tr>
<td>/oau/</td>
<td>/uo/</td>
</tr>
<tr>
<td>auru</td>
<td>uonuot</td>
</tr>
<tr>
<td>eel (sp.)</td>
<td>danuot</td>
</tr>
<tr>
<td>kaus</td>
<td>/uan</td>
</tr>
<tr>
<td>alpinia (ginger sp.)</td>
<td>muan</td>
</tr>
<tr>
<td>kauma</td>
<td>muaa</td>
</tr>
<tr>
<td>bee (?) sp.)</td>
<td>fruit bat</td>
</tr>
<tr>
<td>/ou/</td>
<td>/lou/</td>
</tr>
<tr>
<td>lou</td>
<td>danuot</td>
</tr>
<tr>
<td>man’s sister</td>
<td>married couple</td>
</tr>
<tr>
<td>kouma</td>
<td>lapauro</td>
</tr>
<tr>
<td>taro leaf as vegetable</td>
<td>river</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Only one diphthong containing /ə/ has been found: in the word nəi ‘scorpion fish’ (although /ou/ is often pronounced [əʊ]), and only one case of /ui/ with /u/ as an on-glide: tuiŋ [twiŋ]; these are marginal enough not to have been included in (54). Of the remaining logical possibilities, /eu/, /iu/ and /ui/ are not attested among the off-glides, and /ue/ is not attested among the on-glides.

/au/ and /ou/ are given in parentheses because there is very little constriction, so that the last segment is [o] rather than [w].

Wherever possible, the sequence is given in three positions in the example: syllable-initial, in a closed syllable, and following a consonantal onset. It can be seen that off-glides do not make up syllables on their own, with the exception of /ai/.

Of the attested sequences, /ua/ is the most frequent, followed by /ai/ and /au/, while /oi/, /ou/, /io/ and /ua/ are the least common.

In arriving at the analysis that the vowel sequences in example (54) are not diphthongs or vowels + glides, the following definitions have been used (adapted from Clark & Yallop (1995: 74)):

DIPHTHONG: a single vowel phonemically but with two articulatory targets, making up the nucleus of a syllable in the same way a single vowel in the language would

VOWEL + GLIDE (or GLIDE + VOWEL): one of the sounds constitutes the peak of the nucleus, while the other, usually a high vowel, has less prominence (and in some cases also consonantal features)

The main argument against a vowel + glide analysis is the fact that vowel sequences produced through affixation are also pronounced as vowel + glide combinations, e.g.:

(55)  i-abɔ [jabɔ]  she climbs (but  i-la [i'la]  she walks)
       u-abɔ ['wabɔ]  he climbs (but  u-la [u'la]  he walks)

The underlying forms of the subject prefixes here are /i/ and /u/, but before another vowel they are pronounced as the glides [j] and [w].

Syllabification is both an argument against diphthongs and a potential argument for a glide analysis, in particular for the on-glides. Where a syllable is made up of a segment pronounced as a glide plus a vowel, the syllable is equivalent to one with a consonant and a vowel, and the following pairs are rhythmically very similar:

(56)  ionim  deep sea  maua  fruit bat
       bonim  name  molɔ  crowd

In sequences of more than two vowels, no more than three belong to the same syllable, but only one per syllable has full syllabic value:
Syllable structure is the only respect in which these segments resemble consonants. In all other aspects, they behave as vowels, as we shall see. I will argue that they are phonemically vowels, and that the glide qualities observed in some contexts are sub-phonemic.

It was mentioned above that two identical vowels merge when adjacent, without resulting in length (example (53)). The same is true of the segments under consideration here, as shown in the following example with the class III verb u-i, ‘see’:

(58) \[u-u-i\] [wi] and \[u-i-i\] [wi]

\[
\begin{align*}
\text{see-3mS-stm}_2 & \quad \text{see-3fS-stm}_2 \\
\text{‘he sees/saw’} & \quad \text{‘she sees/saw’}
\end{align*}
\]

Segments pronounced as glides further behave as vowels in terms of conditioning lenition. In the following example, the possessive (1st person possessor-3rd person feminine possessee) \(tu\) is pronounced with \([r]\) following a “glide” in \(poi\) ‘child’, and after a vowel, while after a consonant lenition is blocked giving \([t]\):

(59) \(poi\) \(tu\) [pojɾuŋ]

\[
\begin{align*}
\text{child(m/f)} & \quad \text{1s.PossII.3f} \\
\text{‘my daughter’} & \quad
\end{align*}
\]

\(ie\) \(tu\) [jeruŋ]

\[
\begin{align*}
\text{knife(f)} & \quad \text{1s.PossII.3f} \\
\text{‘my knife’} & \quad
\end{align*}
\]

\(naip\) \(tu\) [najpɾuŋ]

\[
\begin{align*}
\text{knife(f)} & \quad \text{1s.PossII.3f} \\
\text{‘my knife’} & \quad
\end{align*}
\]

Similarly, a final /k/ is pronounced \([ɣ]\) before a “glide” and a vowel alike, but as \([k]\) before a consonant:

(60) \(tətak\) \(iakur\) [tətə'jʌyor]

\[
\begin{align*}
\text{little rope/vine} & \quad \\
\text{‘a little rope’} & \quad
\end{align*}
\]

\(tətak\) \(ikunəm\) [tətə'jʌnəm]

\[
\begin{align*}
\text{little root} & \quad \\
\text{‘a little root’} & \quad
\end{align*}
\]

\(tətak\) \(kimuom\) [tətə'kimwəm]

\[
\begin{align*}
\text{little stick.of.firewood} & \quad \\
\text{‘a little stick of firewood’} & \quad
\end{align*}
\]

Moreover, a sequence ending in /u/ in a closed syllable triggers labialisation harmony in a following non-singular suffix just like it normally does (see further 3.3.4 below):
To further investigate the nature of the vowel sequences, a speaker was asked to pronounce some words very slowly. The results are somewhat ambiguous, but do seem to establish two things. The first is that at least some sequences are not diphthongs, since they can be split up, e.g.:

(62)  
<table>
<thead>
<tr>
<th>careful pron.</th>
<th>normal pron.</th>
</tr>
</thead>
<tbody>
<tr>
<td>danuot</td>
<td>/da.nu.ot/</td>
</tr>
<tr>
<td>muabari</td>
<td>/mu.a.ba.ri/</td>
</tr>
<tr>
<td>ləılom</td>
<td>/lə.i.lom/</td>
</tr>
</tbody>
</table>

The second result is that some of the closed syllables containing vowel sequences (CVVC) may indeed be regarded as single syllables rather than two separate syllables (CV+VC), as they were often not split up, even when consisting of more than one morpheme:

(63)  
| lakabuon       | [la.kə.bwon] | stick of firewood |
| me-abu-am      | [ma.ja.bwam] | 3pS-put-3pO – they put them |
| me-api-am      | [ma.ja.vjam] | 3pS-carry-3pO – they carry/carried them |

(The process whereby a me-+a becomes [moja] is discussed in 3.3.3 below.) It is possible that the number of syllables is also relevant here.

The pronunciations given in (55) were acceptable to speakers in slow tempo, but I was told that for instance the adjective kukku- ‘angry’ with the third person masculine suffix is properly [kʊ'kuɪ], rather than [kʊ'kuj] as it is heard in connected speech. This suggests that the process is less universal for off-glides.

Two adjacent vowels sometimes belong to different syllables, and if one of them has the word stress they are produced separately (this will be represented with a stop ()), e.g.:

(64)  
| pakkə.o       | [pa'ku.ɔ] | taro leaf |
| fanu.o        | [fa'nu.ɔ] | short side of house |
| ləle.umə      | [lə'le.uma] | termite |

Some of the sequences of two vowels have particular associations with simple vowels, e.g.:

(65)  
| /iɛ/ – /i/ | kier ~ kir | sharpened stick |
| /iɛ/ – /ɛ/ | -lien ~ -len | (irregular) dual on some person nouns |
| /ou/ – /o/ | kouma ~ koma | taro leaf as vegetable |
| /au/ – /o/ | maun ~ mon | (ma-un, 3p-RECIP) to them |

### 3.3.3 Processes applying to vowels

As stated above, two adjacent identical vowels merge without resulting in length, as in (53). All other regular processes applying to vowels are morphophonological, that is, particular morphemes such as “subject prefix” or “non-singular” are a necessary part of the specification of the conditions for the process to apply. For instance, the process whereby /a/ and a following /i/ merge to
[e] applies if the /a/ is (part of) a subject prefix, but not if it is (part of) an object prefix:

(66)  
\[
\begin{align*}
\text{eba} & \quad a-im\text{ʊŋ} \\
\text{FUT} & \quad 3\text{mS.fut-wake.up.fut}
\end{align*}
\]
\text{‘he will wake up’}

\[
\begin{align*}
a-i-lo & \\
\text{3mO-3fS-tell}
\end{align*}
\]
\text{‘she tells/told him’}

There are a number of morpho-phonological processes of vowel merger and one of glide insertion between the subject affixes of verb classes II and III (which are all of the form V- or CV-) and following stems beginning in vowels.

(67)  
\[
\begin{align*}
a + i & \rightarrow e \quad \text{ex.}\; pa-\text{ipə} & \text{[pevə]~[pejvə]} & \text{but}\; me-\text{ipə} & \text{[mejvə]} \\
1\text{pxS-come.ashore} & \text{‘we come ashore’} & \text{3pS-come.ashore} & \text{‘they come ashore’}
\end{align*}
\]

(68)  
\[
\begin{align*}
u + i & \rightarrow i \quad \text{ex.}\; u-\text{ipə} & \text{[iva]} & \text{and}\; i-\text{ipə} & \text{[iva]} \\
3\text{mS-come.ashore} & \text{‘he comes ashore’} & \text{3fS-come.ashore} & \text{‘she comes ashore’}
\end{align*}
\]

(69)  
\[
\begin{align*}
u + o & \rightarrow u \quad \text{ex.}\; u-\text{ot} & \text{[ut]} & \text{but}\; i-\text{ot} & \text{[jot]} \\
3\text{mS-lie} & \text{‘he/it.m lies’} & \text{3fS-lie} & \text{‘she/it.f lies’}
\end{align*}
\]

(70)  
\[
\begin{align*}
a + o & \rightarrow o \quad \text{ex.}\; a-\text{ot} & \text{[ot]} & \text{but}\; i-\text{ot} & \text{[jot]} \\
3\text{mS.fut-lie} & \text{‘he/it.m will lie’} & \text{3fS-lie} & \text{‘she/it.f will lie’}
\end{align*}
\]

(71)  
\[
\begin{align*}
\text{me} + o/a & \rightarrow \text{majo} \quad \text{ex.}\; me-\text{ot} & \text{[majot]} \\
\text{maja} & \text{3pS-lie} & \text{‘they lie’}
\end{align*}
\]

\[
\begin{align*}
\text{me-\text{abə}} & \text{[majabə]} & \text{but}\; \text{nu-\text{abə}} & \text{[nuabə]} \\
3\text{pS-climb.up} & \text{‘they climb up’} & \text{2\text{sS-climb.up}} & \text{‘you climb up’}
\end{align*}
\]

These processes apply universally among class II and III verbs, with some exceptions for /u/ + /o/ (69) and /u/ + /i/ (68). For the former, a few stems do not allow for the process to apply; in the case of /u/ + /i/, there is variability among the different subject prefixes, and in one case the /i/ of the stem appears unstable (as evidenced by the rule of /a/ + /i/ → [e]); examples will be presented in the following.

For /u/ + /o/ → [u], for five out of eighteen verb stems beginning in /o/ in my sample, the process does not take place, so that it does apply in the first stem but not in the second of the following two pairs (with class II verbs on the first line and class III verbs on the second line):
One stem, -olu ‘open; be open’, has optional application of the process in the transitive, but it is blocked in the intransitive, for instance:

(73)  
\[
\begin{align*}
\text{u-olu-a} & \quad [\text{ulwa}] \sim [\text{wolwa}] \quad \text{he opens it(m)} \\
\text{but u-olu} & \quad [\text{wolu}] (*[ulu]) \quad \text{it(m) is open}
\end{align*}
\]

In the case of /u/ + /i/ → [i], for most of the 24 stems beginning in /i/ the rule applies generally, so that the /u/ disappears in all person markers that have it (1sS tu-, 2sS nu-, 3mS u-, and 1pnS bu-), e.g.:

(74)  
\[
\begin{align*}
\text{kəm-tu-i} & \quad [\text{kəmi}] \quad \text{I give} \\
\text{kəm-nu-i} & \quad [\text{kəmi}] \quad \text{you (sg) give} \\
\text{kəm-u-i} & \quad [\text{kəmi}] \quad \text{he gives} \\
\text{kəm-bu-i} & \quad [\text{kəmbi}] \quad \text{we (incl) give}
\end{align*}
\]

In some cases it applies to the singular persons but not to the first person plural inclusive, for instance:

(75)  
\[
\begin{align*}
\text{tu-inie} & \quad [\text{tinje}] \quad \text{I go down} \quad \text{but} \quad \text{bu-inie} & \quad [\text{bujnje}] \quad \text{‘we go down’}
\end{align*}
\]

In one case, the application of the rule is optional in the singular but blocked in the plural form:

(76)  
\[
\begin{align*}
\text{tu-ia-am} & \quad [\text{tijam}] \quad \text{or} \quad [\text{tujam}] \quad \text{I upset them} \\
\text{nu-ia-am} & \quad [\text{nijam}] \quad \text{or} \quad [\text{nujam}] \quad \text{I upset them} \\
\text{u-ia-am} & \quad [\text{ijam}] \quad \text{or} \quad [\text{ujam}] \quad \text{I upset them}
\end{align*}
\]

but  
\[
\text{bu-ia-am} \quad [\text{bujam}] (*[bijam])
\]

Similar processes apply among the adjectives, when the third person ending is added to the stem; this is an obligatory ending (signalling number if non-third person markers are present), obscuring the stem form. On surface form, there are two groups of adjectives (apart from some irregular ones), those that end in /i/ for masculine and /u/ for feminine, and those that end in /e/ for masculine and /o/ for feminine, e.g.:

(77)  
\[
\begin{align*}
\text{[muri]} & \quad \text{he(it)(m) is good} \\
\text{[muru]} & \quad \text{she(it)(f) is good}
\end{align*}
\]

Since /i/ and /u/ are demonstrative forms for masculine and feminine respectively, we can say that these are the basic forms of the endings, and that the /e/ and /o/ of the second set are produced from an underlying stem that ends in /a/ (isa- ) by application of rules. We have already seen /a/ + /i/ → [e] in verb class II, and we would have to add a rule /a/ + /u/ → [o] for the feminine form. Both /au/ and /o/ are variations found in other places too. But rather than an underlying stem-final /a/ it has been decided to postulate an underlying /o/ for adjectives like isə -, because of the non-singular forms and nominalisations. For the words in (77), they are:

---

11 I do not have full paradigms for all stems, and there may be a few more where bu-deviates. For (75) information on second singular and and third singular masculine is missing.
The dual and plural endings in the first group are variously [in], [im] and [un], [um], and it is not possible to formulate rules for this variation (and the demonstrative forms li and mi do not provide support for one vowel over the other as basic). There is similar variation in the vowel preceding the nominalising suffix -nim. The fact that the second group is far more homogenous in terms of the vowels in these contexts ([ǝn], [ǝm], [ǝnim]) supports the idea that the vowel in this group is part of the stem. It was said above that [ǝ] is in allophonic variation with [a] in some positions. However, there is one adjective where there is consistently a clear [a] (while the other forms have [ǝ]):

(79) [gigine] he/it(m) is heavy 
[giginam] weight, heaviness 
[gigino] she/it(f) is heavy 
[giginan] they 2 are heavy 
[giginam] they (pl) are heavy

It seems reasonable therefore to say that the stems used in this section are:

(80) 
mur- good 
isǝ- rotten 
gigina- heavy

The first two represent larger categories, while the last is unique.

Our additional rules, then, will be:

(81) ǝ + i → e 
ǝ + u → o

For the endings, we have -i and -u in the singular, but allomorphy in the dual and plural: -in, -un and -n in the dual and -im, -um and -m in the plural.

3.3.4 Labialisation harmony

Labialisation harmony is a morpho-phonemic process conditioned by the non-singular suffix -(i)p in conjunction with rounded vowels or labial consonants. A large proportion of nouns have irregular non-singular forms, but within the regular non-singular formation, the system is as follows: After a stem ending in a vowel the non-singular suffix takes the form -p. After a stem ending in a consonant, it is -ip, except where the vowel of the last syllable is rounded (/o, u/) and/or the final consonant is labial (/p, m, f/); the suffix then takes the form -up, with a rounded high vowel instead of the unrounded one.12 For example:

12 van der Hulst and van de Weijer (1995) cite several cases of labial vowel harmony (p. 522–524) and one of labial consonants conditioning roundness, from Warlpiri (although other cases are said to exist; p. 529), but no mixed cases such as Kuot, where vowels and consonants combine to condition allomorphy, are mentioned.
(82) sg non-sg
  kar kar-ip ‘shell for shredding coconuts’
  kor kor-up ‘pig spear’
  kap kap-up ‘stick for moving stones in stone oven’

3.4 Syllables

Kuot syllables have the following forms, where a ‘V’ can be a simple vowel or a vowel sequence:

(83) simple vowel vowel + off-glide on-glide + vowel
V  o  3f.PossI  a-i  3m-near  ua  taro tuber
VC ut be swollen (V cl I) aip go past (V cl I) =ieŋ 3fS
CV ga and koi coconut shell bie shell, peeler
CVC kit fire kau̯n weed ties speech, language

VC is a less common structure than the others. Consonant clusters are permitted only as a result of a consonant-initial syllable following a consonant-final one: CVC.CVC.

The syllable types can be combined in any order to form a vast number of structures, the longest stem encountered having six syllables. Lexical stems are most often of CVCV or CVCVC form, but all of the following represent common types:

(84) CVCV
   kuma tear
   kuada buttock
   k̄̄d̄̄i bamboo

CVCVC
   dikkam fruit (sp.)
   danuot river
   kudat fence

CVCVCV
   karabo coconut shell
   kapuna dog
   kualappik old woman

CVCVCVC
   barasos mat (type)
   butamat clan
   lakabuon stick of firewood

CVCVCVCV
   kabirɔna middle
   kasonɔma mango tree
   parɔbira morning

CVCCVC
   sakmes spear
   korkɔr crow
   binbam rib

There is not the space here to exemplify every type of syllable combination, but this example shows some of the range of variation in syllable structure:
The longest words are found among nouns. The open verb class, class I, has overall longer stems than class II which is closed. I have not found any stems with more than one vowel sequence, although a grammatical word may have two:

\[(86)\]
\[
\begin{align*}
kaun=ie\eta \\
\text{weed=3fS}
\end{align*}
\]
‘she weeds/weeded’

### 3.5 Stress

Kuot stress is lexically determined, i.e., there are no general stress rules that make reference to syllables or moras, but the position of stress has to be known for each lexeme.\(^{13}\) Some endings frequently attract stress in combination with lexical stems, but particular stems retain stress even when such an ending is present.

Preliminary analysis yields the following generalization: Lexical stress in Kuot is manifested chiefly through duration, but is not associated with pitch.\(^{14}\) Rather, pitch appears to be used mainly to signal information about the clause. I will attempt to demonstrate this functional separation in the following, dealing with the expression of lexical stress in this section and clause intonation in the next (3.6).\(^{15}\)

To investigate the variation between stressed and unstressed syllables, some minimal and near-minimal stress pairs were recorded in controlled syntactic environments. A few of these will be illustrated here. They are given with raw

---

\(^{13}\) Ideally, stress should therefore be marked on all Kuot words given here. However, since the realisation of stress in Kuot is so different from that to which I was accustomed, it took me a long time to perceive stress correctly, and I am unwilling to trust my notes in this respect for all vocabulary collected during all but the last few months of fieldwork. It was therefore decided to omit stress marking altogether.

\(^{14}\) Another possible exponent of stress, namely greater approximation of the cardinal value for the syllabic vowel, is not unambiguously associated with stressed syllables in Kuot.

\(^{15}\) Interpreting the phonetic correlates of the perceptual category of stress is a notoriously controversial area (see for example Ladd (1996) for an introduction to the intricacies of this field). Instrumental analysis has been carried out in order to support and graphically illustrate the perceptual (auditory) analysis, and is not to be mistaken for phonetic analysis (which is beyond the scope of this thesis).
waveform (amplitude/intensity), raw pitch ($F_0$ frequency in Hz), and spectrogram. Words to be compared were recorded in the same session but not in adjacent blocks: pairs were broken up so as not to invite over-differentiation. As a result there are sometimes differences in volume between the two words, giving a slender waveform in some cases and a very black one in others. A further effect is that the overall speed of speech has sometimes changed, and therefore words to be compared have been adjusted to be graphically equal in length. The pairs were recorded with two speakers, both men in their thirties, but any two words compared below are by a single speaker.

The first word in Figure 2 is the noun $ŋa'ne$ ‘meat or vegetable to go with tubers or rice’, and the second is the adjective $'ŋane$ ‘strong-3m’. Both instances were recorded in utterance-final position, where the intonation pattern is the same as for words in isolation.

**Figure 2: $ŋa'ne$ vs. $'ŋane$. Raw waveform, $F_0$ pitch and spectrogram.**

The figure shows that while the pitch movement (the middle graph) is similar between the two words, relative intensity (waveform in top graph) varies considerably, and there is also some difference in relative duration.

In the following three figures, we will see two near-homonyms in three syntactic contexts. The words are $ka'ranim$ ‘reef, low tide; year’ and $'baranim$ ‘store; net for catching birds’. Figure 3 shows the two words in sentence-final position, taken out of a prepositional phrase, where it is again clear that the stressed syllable has relatively greater duration and intensity. The pitch extraction is not very clear for the first syllable of $karanim$, but the overall movement is still similar between the two words.
Figure 3: *ka'ranim* and *'baranim* in sentence-final position.

While the length of the last syllable is the same for the two words, the difference in duration of the stressed and the non-stressed syllable out of the first two is quite obvious, and there is some difference also in loudness. Pitch falls across both words, as in the previous example which was also sentence-final.

In the next figure, we see the two words in non-initial, non-final position. They occur in the syntactically unmarked position for a nominal functioning as an argument of the verb, namely following it. In Figure 4, the (constructed) environments were:

(87)  
\[
\begin{align*}
\text{dak}=\text{i} & \ \text{en} \ \text{karanim} \ o \ \text{urir} \\
\text{be.full}=3f & \ \text{S} \ \text{reef(f)} \ 3f.\text{PossI octopus(f)} \\
& \text{‘the reef is full of octopus’}
\end{align*}
\]

\[
\begin{align*}
\text{dak}=\text{o} & \ \text{n} \ \text{baranim} \ a \ \text{tinpis} \\
\text{be.full}=3m & \ \text{S} \ \text{store(m)} \ 3m.\text{PossI can.of.fish(m)} \\
& \text{‘the store is full of cans of fish’}
\end{align*}
\]
Figure 4: *ka'ranim* and *'baranim* in sentence-medial position.

The relative length of the two first syllables in each of the words is maintained. It is striking how similar the pitch contour is between the two words, and how different from that in Figure 3.

In the last figures of this set, Figure 5a and Figure 5b, the words are shown as recorded in a topicalised (fronted) phrase. The whole phrase is given for each, as the phrase forms a constituent with one single intonation pattern, with the following demonstrative *u-sik* for *karanim* which is feminine and *i-sik* for *baranim* which is masculine.
Intonation is high across the phrase, and there is a rise on the last syllable (although the /i/ in -sik is very short in the second instance), a common way of signalling topicalisation in Kuot (cf. 3.6 below). The relative difference in dura-
tion in the first two syllables of the words remains although the intonational prominence is on -sik.

In summary, pitch is used primarily for intonation (the topic of the next section), while word stress is achieved primarily through duration.

Stress shift is occasionally an exponent of a grammatical category. This is the case for future forms of some class II verbs (the future particle e(ba) would normally have to be present too), e.g.:

(88)  
i-abo [jaba] 3fS-climb – she climbs/climbed
i-aba [ja’ba] 3fS-climb.fut – she (will) climb

A further factor concerning stress is that some grammatical morphemes often, but not always, attract stress. In particular, this concerns the non-singular suffix -(i)p on nouns, and the subject enclitics of verb class I. As mentioned in 3.3.1, a possible analysis for the contrasting pairs duk ‘1. break (of rope), 2. thunder’, and ut ‘1. be full, 2. be like’ could be that one member in each pair carries inherent stress. It was shown for duk that the sense ‘thunder’ gave a longer word when carrying the subject enclitic than the sense ‘break’ (at least in the two instances recorded); this could be due to the combination of two stressed syllables. Interactions of these kinds are complex, and detailed analysis is beyond the scope of the present study.

3.6 Intonation

In many languages, yes/no questions and non-finality are signalled by pitch (typically by a rise at the end of the utterance). Kuot does this, but goes further, and has specific intonation patterns for several more clause types, where each of the specialised pitch contours, or tunes, pertains to a particular function or clause type. The most salient intonation patterns in Kuot are

- declarative, non-final (rising; including topicalised constituents)
- declarative, final (falling)
- negated clause
- question-word question
- yes/no question

Each of these will be illustrated by pitch curves generated from recorded narrative speech (including cited speech for questions). The genre imposes some limitations on data; for example I think that clarification questions and echo questions would differ from those reported below (but unfortunately I have no recorded conversational material). Within the genre, however, the observations appear quite stable. Pitch extractions were performed in response to the auditory impression that “there was something going on with intonation in negated clauses” (etc.), and the impression was borne out in the first few examples that
were analysed instrumentally. The results remained stable when checked against equivalent constructions from other speakers.\textsuperscript{16}

The transcription in figures is phonemic but with lenition applied, as this can influence pitch.

The pitch of a non-final clause rises, often quite sharply, on the last syllable of the intonation unit, while final clause intonation usually consists in a fall over the last few syllables, as seen in Figure 6, which shows the pitch extraction for example (89) with a rise on todǝŋ and a fall over the clitics =ieŋ=arǝ:

\begin{verbatim}
\begin{align*}
(89) \quad [\text{Li-la=rǝ} \quad \text{dus=liŋ}] \quad \text{todǝŋ, kale=ieŋ=arǝ}. \\
\end{align*}
\end{verbatim}

3dS-go=ASP stand=3dS down sing.out=3fS=ASP

‘They went (and) stood below, she called out.’

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure6}
\caption{Non-final and final intonation (female speaker: KD).}
\end{figure}

The next example and figure show first a topicalised constituent (u-tie, u-titmat u), then several non-final clauses and followed by a final clause, shown across three graphs (Figure 7). At this point in his story of how the Bimun people came to relocate from the mountains to the coast, the speaker has extremely sharp rises on the final syllables of the non-final intonation units. He has just explained about the police fetching the mountain dwellers to the coast (“here”), and then repeats the gist of it:

\begin{verbatim}
\begin{align*}
(90) \quad \text{U-tie, } [\text{u-titmat u}] \quad \text{lǝ me-rau inǝmǝniap u-me} \\
\quad \text{3f-there 3f-ANAPH DEM.3f RELR 3pS-afraid people.nsg 3f-about} \\
\quad \text{lǝ [mǝn busit me-me me-num] apmaidǝŋ na arubu} \\
\quad \text{RELR CONT always 3pS-HAB 3pS-walk downwards in night} \\
\quad [\text{u-me u-la ma-lagir] polis, ga mu-me-o tako.} \\
\quad \text{3mS-HAB 3mS-go 3pO-fetch=Ø police and come-3pS-stm here} \\
\quad \text{‘Alright, that’s it, (why) people were afraid of it, (that) they were always} \\
\quad \text{walking down at night, a policeman used to go get them, and they came here.’}
\end{align*}
\end{verbatim}

\textsuperscript{16} It was only possible to check a small number of utterances and only three to four examples were investigated for each type. Care was taken to vary speakers within each of the types to avoid any idiosyncratic use of intonation.
(A pause of 0.9 seconds has been cut out between the first and the second graph, and one of 0.05 between the second and the third.) It is interesting to note the “downstep” over the sequence of clauses, where from the middle of the first graph each clause maintains a fairly constant pitch; i.e., there is no declination within the intonation unit, but each has a somewhat lower mean frequency than the previous one, separated by pitch peaks.

The following example illustrates both fronting and negation. The first word, the name Samǝtmǝrun, has been topicalised, and there is a clear pitch peak on the last syllable. As for the negated clause following, it has a dip on the next to last syllable, followed by a rise on the last syllable – this is the characteristic pattern for negated clauses. The negator is tale, the most general negator in Kuot, but note that the intonation contour is not associated with the negator but with the negated clause as a whole:

(91) Samǝtmǝrun lǝ [tale u-me ubi].
S. RELR NEG 3mS-HAB work=Ø.
‘Samǝtmǝrun didn’t work.’
Another example from the same speaker in the same text, this time as quoted speech, shows the same pitch contour (towards the end of the example), but here we have a combination of negators, namely *karuk*, the negative existential, also meaning ‘no’, and a clause with *tǝle* negating the adjective *mur-* ‘good’:

(92) *Nomo “Karuk, tǝle=ka mu-mur-um.”*

\[\text{say no NEG=yet RED-good-3p}\]

‘He said “No, they’re not good yet.”’

From the speaker responsible for Figure 7, we also have an example of a negated verbless clause. The first part (*u-to pianǝm Bimun*) is topicalised (here marked by *ga*) and has non-final intonation with a peak on the last syllable. After that the pitch falls to the penultimate syllable of the utterance, to rise again on the last syllable:

(93) *U-to pianǝm Bimun ga tǝle pianǝm pay.*

\[3f\text{-here village/place(f) B. ‘and’ NEG village 1px.PossII.3s}\]

‘This place Bimun is not our place.’
Question-word questions (content questions or WH questions) too have their special intonation pattern, rising on the first syllable, flattening out and then falling again on the last syllable. The following two examples show how this pattern remains constant in spite of the different position of the question word itself in each of the utterances:

(94) “Mimi aka tie?”.  
2p who there  
“Who are you(pl) there?”

(95) “Mani lǝ i-ǝlì-bǝ-ǝ u?”.  
what(m) RELR 3fS-cry-3mO DEM.3f  
“What is she crying for/about?”

Both the above are by the same speaker, in the same narrative. The following example, by a different speaker, contains a question-word question with a similar contour to the previous two examples, as well as a yes/no question. Yes/no questions have a very distinctive sharp pitch rise on the last syllable (or, when present, on a final particle a which can be added when a positive answer is expected). The example is from a story of a man who finds an unknown boy at his homestead and tries to find out who he is:

(96) “Nunuo mani tuaŋ?  Nunuo poi tuaŋ?”.  
2s what 1s.PossII.3m 2s child 1s.PossII.3m  
“What are you of mine? Are you my son?”
TOPICS IN THE GRAMMAR OF KUOT

Figure 13: Question-word question and yes/no question intonation (male speaker: SS).

On the limited data presented here, the use of pitch in Kuot only partly conforms to the concept of “intonation language”; in Trask’s (1996) definition:

A language which is neither a tone language nor a pitch language; a language in which the universally present intonation constitutes the only linguistic use of pitch.

Part of his definition of intonation is

… Intonation is used for a variety of purposes: for marking grammatical boundaries (phrases and clauses), for signalling sentence types (e.g., statements and questions), and for conveying the speaker’s attitude (surprise, irony, anger, etc.).

From the examples given above, it would appear that pitch in Kuot is tied up with expressing clause type to the extent that other uses are largely blocked; in particular, as we have seen, stress is expressed by duration rather than pitch. Regarding paralinguistic meanings such as surprise and anger, the absence of observations may be a direct effect of the type of data: narrative monologue is likely to have significantly less emotive expression than dialogue. Cruttenden expresses doubt about the type of association between sentence type and tune that I have tried to demonstrate for Kuot:

In some languages (not English) […] the use of particular tunes is closely tied to functional sentence-types, e.g. where statement, yes/no question, and command regularly involve certain tunes. From most of the descriptions of intonation in languages other than English, one might imagine that this was the principal use of various tunes in intonation languages. It may indeed be true that many languages do use intonation less for attitudinal purposes than English, but the suspicion exists that an alignment of tunes with sentence-types is merely the easy way to investigate intonation and often more sophisticated attitudinal and discoursal uses remain undocumented. (Cruttenden 1986: 10)

I would argue that the patterns found in Kuot are valid at least for the narrative genre, but agree that more detailed analysis is needed, in several areas. It is likely that more patterns can be found, associated with other clause types (for example, imperative, prohibitive and relative clauses are areas yet to be investigated). Ladd (2001: 1383) makes the observation that languages may use the same tune in several functions (as in Kuot’s use of rising pitch for both topicalisation and other kinds of non-finality), and also points out that languages appear to vary in the number of tunes that they make use of. What seems extraordinary about Kuot is the degree of specialisation of tunes, perhaps especially in func-
tions that are also expressed lexically, such as question-word questions and negation. Investigation into further clause types and functions may show some recurrence of tunes, or it may expand the inventory of tunes even further.

Other related areas for further research include: the expression of prominence on particular constituents, such as new information and contrastive focus, and the interaction of such features with clause intonation; the expression of attitude; genre-related variation; and meta-linguistic parameters such as politeness (which, impressionistically, is expressed by speaking softly).

3.7 Other speech sounds, hesitation and emphasis

There are a number of phenomena that are not part of the phonology as such, but which nevertheless deserve mention here. They are brought together in this section.

An alternative but relatively infrequent way of expressing ‘yes’ (normally *aa*) is on an **ingressive pulmonic airstream**. There are two variants. First, it can be done with pursed lips; this produces a faintly whistling sound. Secondly, it can be done with relaxed lips and vocal tract and mid-open jaw position, with voicing from about halfway through (like saying /ħa/ or /ħə/ while breathing in).

A further sound that is not part of the phonological system is a **bilabial trill** ([B]). This is produced by pulling the corners of the mouth to the sides and a little bit down, and briefly emitting air between the lips. It has only one use: ‘no’ or ‘I don’t know’ between people who know each other, and is particularly favoured by children.

**Glottal stops** occur in some exclamations and in hesitation, without being part of the phonological system. Both the word for ‘yes’, *aa*, and a general exclamation of surprise or consternation, *e* (or *eh*), are frequently produced with glottal stops, either at the beginning or the end or both. An *eʔ* with a glottal stop also often signals self-repair – the speaker breaks off his or her utterance with *eʔ!/ and then starts the repair. Repairs have not yet been the subject of close study, but one common strategy in conversation is breaking off the utterance with *eʔ*, then repeating the inappropriate lexeme often followed by *gat* ‘again’ with question intonation, then filling in the correct word.

There are several patterns of **hesitation**. Most speakers have frequent brief pauses, sometimes between clauses, but also in between elements of the same clause or phrase (such as in the third graph of Figure 7). Some but not all speakers recorded have filled pauses, using vowels such as [ə] or [ɛ]. Longer pauses are very frequently filled by filler words while the speaker searches for the right lexeme; typically any phrase-initial grammatical material will be produced first, and then the filler takes the place of the lexical item, while the speaker searches for the correct word. The fillers are: an ambitransitive class III verb *mat-bɔ* for verbs and adjectives, with full agreement marking; and a noun *mare/maro* (masc./fem; dl: *marpien*, nsg: *marɔ*) for nominals, i.e., nouns and personal names. This noun is sometimes used as a normal noun with the sense ‘thing’, and is unique among Kuot nouns in having separate forms for masculine and
feminine singular, and there is even a special form *marǝn* for place names. Both the filler predicate and the filler nominal are then usually replaced by the right form, often with a copy of the intonation used with the filler. Sometimes the filler is left in place without correction or specification; in other cases the right word is filled in directly or after several intervening syllables.

**Emphasis** is a complex phenomenon, and no typology will be attempted here. Without further analysis, I will simply point to two salient expressions of it in Kuot: lengthening and articulatory energy. Emphasis is often expressed through lengthening of a segment. Usually, this is the segment with the most relevant semantic content for the context, but occasionally other segments in the structure receive lengthening. In the following example and figure, the speaker is telling of his grandfather who was a phenomenal bird catcher, and at this point comes to find his net full of birds. The elongated segment is the second syllable of *kukuom* ‘tree’ (possibly because it is phrase-final), which has a duration of 0.6 seconds. It is also spoken at quite a high pitch for a male speaker, around 220 Hz:

(97) Dak=ieŋ kukuom ga [nǝmo kko=t=meg] muareip
be.full=3fS tree(f) and be.4about.to break=3pS branch.nsg
‘The tree was full and the branches were about to break’

The segmental pronunciation too is generally emphatic in this part of the text; /k/ in *kof* ‘break’ is not lenited, and e.g. *muareip* at the end is spoken with very clearly pronounced consonants and much energy on the vowels, but without the high pitch and increased duration. This type of “tense” pronunciation is another way of emphasising particular words and syllables.
3.8 Child-directed speech, children’s speech

There are several phonological aspects to speech directed to small children. As mentioned above there is frequent non-lenition of voiceless stops in environments where they would normally be lenited. This to some extent reflects children’s speech, as children sometimes do not master the relation between the phones [p] and [v] ~ [b], [t] and [r], and [k] and [ɣ] until they are several years old. However, children’s own speech shows both non-lenition (as in (98) from a child of about four years), and lenited phones where there would normally be stops (as in (99) from a child of about six years; ‘pul’ is Tok Pisin for ‘paddle’ and represents an extended phonology as Kuot words do not end in /l/):\(^\text{17}\)

\[(98)\]

<table>
<thead>
<tr>
<th>word</th>
<th>child</th>
<th>normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>tafa=tunj</td>
<td>tafatuŋ</td>
<td>tafaruŋ</td>
</tr>
<tr>
<td>be.sick=1sS</td>
<td>‘I’m sick’</td>
<td></td>
</tr>
</tbody>
</table>

\[(99)\]

<table>
<thead>
<tr>
<th>word</th>
<th>child</th>
<th>normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>eba pul=pay</td>
<td>pulvanŋ</td>
<td>pulpanŋ</td>
</tr>
<tr>
<td>FUT paddle=1pxS</td>
<td>‘We’ll paddle’</td>
<td></td>
</tr>
</tbody>
</table>

Adults’ child-directed speech thus reflects the first of these types but not the second.

It is interesting that both the morphemes in (24) in section 3.2.2.3 above are treated by adults as non-lenited when addressing children, as only the first example is in a position where there is regular variation in many stems (if they are ambitransitives and occur without object prefixes so that the segment occurs at a syllable boundary). In the second case, the /k/ is always pronounced as [ɣ] when not directed to children, as there is an obligatorily filled suffix slot.

Other typical pronunciations by children are not regularly reflected in speech directed to children, such as [j] for [r] (although it may be imitated for amusement).

There is also phonological/morphological simplification, whereby an initial /n/ in a /na/ sequence is omitted when speaking to small children, e.g.:

\[(100)\]

<table>
<thead>
<tr>
<th>word</th>
<th>child-directed</th>
</tr>
</thead>
<tbody>
<tr>
<td>na-abuŋ</td>
<td>[abunŋ] put it! (2sS.fut-put-3sO.fut)</td>
</tr>
<tr>
<td>na-munŋ</td>
<td>[amunŋ] walk! (2sS.fut-walk.fut)</td>
</tr>
<tr>
<td>nabar</td>
<td>[abar] paternal aunt</td>
</tr>
<tr>
<td>naaurup</td>
<td>[aurup] down</td>
</tr>
</tbody>
</table>

The change from na- to a- in the first two words here would normally be morphologically significant, since a- is the 3mS.fut subject prefix, but the second two words suggest that it is a phonological simplification rather than a mor-

\(^{17}\) Both children are the sons of my main informant, Robert Sipa, and spoke only Tok Pisin for the first years of life (although they heard Kuot spoken) so their acquisition of the system may be delayed. The pronunciations given in examples (98) and (99) were observed when they had been speaking Kuot for some two or three years.
However, the use of forms that sound like 3mS.fut appears to have spread from verb class II, where the subject markers are prefixes, to verb class III where they occur medially, in particular in the verb ‘come’:

(101) mu-na-oŋ [munoŋ] → [muoŋ] come! (come-2sS.fut-stm2)

Another interpretation of the same data is of course that third person address has been used to children, and that the initial /n/ of some other words has been dropped either independently or by phonological analogy with the class II verbs. Third person address is otherwise not used in Kuot.

A further area where adults often adapt their speech when speaking to small children is in intonation, particularly in yes/no questions, where the rise on the final syllable can often be as much as a musical fifth or even more.

3.9 Phonological treatment of foreign words

The vast majority of foreign words to enter Kuot come in via Tok Pisin. Those that are English-derived have already undergone a large measure of adaptation to local phonologies.

Consonant clusters are dealt with in terms of epenthesis (e.g. school → sikul; spear → supia), or reduction (e.g. trousers → rausis; needle → nil). Diphthongs are frequently simplified too (e.g. boat → bot; day → de). Tok Pisin has fewer phonemes than English, and there is regular mapping as follows:

(102) z → s kerosene → kerosin
    θ → s dish → dis
    tʃ → s(i) matches → masis
    θ → s(i) German → Siaman
    θ → t think → tingting (reduplicated)
    δ → t brother → brata

Kuot phonological restrictions and processes then apply (somewhat variously as we shall see) to the words used in Kuot. Although all speech sounds needed for Tok Pisin are present in Kuot, their phonemic status is different. As we have seen, Kuot does not allow initial [r], final [l], initial or final [v], or final voiced stops. The local Tok Pisin does not have final voiced stops, but particularly /r/ and /l/ are common in positions not allowed in Kuot. The treatment of these varies with several factors: the level of integration of the word into Kuot, the age of the speaker, and the speaker’s perception of the listener. The more integrated the word and the older the speaker, the more likely it is that the adaptation to Kuot phonology will take place. On the other hand, speakers are more likely to retain features of the original pronunciation when speaking to people who do not know the language well. Examples of adaptation are:

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18 Morphological simplification does occur for some verbs of classes I and (to some extent) III, mainly through omission of the subject marker; there is also some special vocabulary in both verbs and nouns used when addressing children.
Retaining the Tok Pisin phonology (or speaking Tok Pisin with a less localised accent) thus involves expanding the phonotactics rather than the phoneme inventory.\textsuperscript{19}

A few words from Tok Pisin appear to have entered Kuot via other languages in the area with phonologies different from that of Kuot. One is \textit{naf}, Tok Pisin ‘inap’, English ‘enough’, from Nalik which often has /f/ for /p/, and uses \textit{naaf} in this sense (Volker 1998: 32); this form is used in northern Kuot which borders on the Nalik-speaking area (while an indigenous stem \textit{puo} is used in southern Kuot). Another is [ṭeŋon] for ‘table’ (Tok Pisin ‘tebol’); I am unaware of its path, but it could have entered New Ireland Tok Pisin through a language that has a [b] \textasciitilde [v] alternation, such as Lavongai (Stamm 1988) (presumably final [l] \textasciitilde [n] is the Kuot alternation seen above in 3.2.2.4).

Due to English being the language of instruction from grade three in schools, some English words make their way straight into Kuot, and younger speakers have no trouble with clusters such as the initial ones in ‘clay’ and ‘string’. Some English phones also have deviant pronunciation in some words; in particular [z] \textasciitilde [dʒ] (so that ‘New Zealand’ is pronounced [nju dʒilan]). It is not clear to me whether this is a matter of “hyperadaption” on the level of individual speakers, or whether it is more widespread and perhaps even taught in schools.

### 3.10 Areal phonology

Several of the features typical of Kuot phonology are shared with the languages to the north (Nalik, Kara), south (Lamasong, Madak, Barok) and, to a lesser extent, east (Nochi) of Kuot. The features concerned are: the lenition of voiceless stops in intervocalic position; the non-occurrence of voiced stops in final position; final [l] to [n]; and a weak (partial) phonological opposition between

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\textsuperscript{19} Eklund & Lindström (1998) introduced the term “xenophone” to cover what has been variously known as “loan phonemes”, “foreign sounds” or “anomalous segments” (cf. Eklund & Lindström 2001: 82-87). The term covers items such as [tʃ]/ [ts]/[ʃ] for English /tʃ/ when used in Kuot; [tʃ] and [ts] are not part of the phonology of Kuot, but occur in a restricted set of loan words, foreign proper names etc., and would constitute an extension of the phone set of Kuot itself. As the majority of recently borrowed words in Kuot do not result in an expanded phone set but rather in expanded positional possibilities for existing speech sounds, we may perhaps speak of “xenophonotactics” here.
/a/ and /a/ (or /a/ and /aa/). These features are not equally distributed, so that Nochi shares very few, while Kuot’s nearest neighbours (Nalik and Lamasong/Madak) share more features, those further away share fewer properties (and languages still further north or south are not part of the phonological area at all). Malcolm Ross (1994) discusses the distribution of some of these features in terms of a spread from Kuot, and perhaps extinct relatives of Kuot, into its Austronesian neighbour languages, and proposes that ancestors of today’s speakers of Madak languages (Lamasong, Madak and Barok) shifted from a non-Austronesian language to an Austronesian communalect. As more data has come to light in the last few years, it has become possible to put together a more complex picture, and one which indicates that different features have moved in different directions, creating the pattern we see today. This pattern is more suggestive of feature spreading through ordinary processes of extended contact and multi-lingualism, than dramatic language shifts, but nonetheless provides a window on the past.20

20 The data and conclusions are discussed in more detail in Lindström (in prep.).