2 Phonemic Inventory

2.1 Consonants

Single consonants occur word initially, intervocalically, finally and in sequences of no more than two word medially. The inventory of consonant phonemes in Kara is given in Chart 1. Examples of each phoneme are given in Appendix 1; contrasts are shown in Appendix 2.

CHART 1: INVENTORY OF CONSONANT PHONEMES

p	t	q
b	d	g
ɸ	s	
β		ɣ
m	n	ŋ
	l	r

* Kara is an Austronesian language belonging to the Northern Subgroup of the Patpatar-Tolai Family. Other closely related languages include Nalik, Tigak, Tiang, and Tungak or Lavangai. New Ireland languages tend to run in bands across the island with dialectical differences from village to village within the languages. West Coast versus East Coast dialect differences are quite marked. Transition from Kara to Tigak on the north takes place about Livitua village on the East Coast. Lavolai is the northernmost Kara speaking village on the West coast. The southern boundary is along a line drawn from Lakuramau across the island to Panamecho. The primary data for this paper comes from the dialect spoken in Lemakot and Fangalava on the East Coast, about 61 and 64 kilometers south of Kavieng. We have sincerely enjoyed our close working relationship with the people of Lemakot and have been personally blessed by many friendships over the years.

The voiceless obstruents /p t q ɸ s/ occur word initially, intervocalically, word finally, and as the second consonant in a cluster; /t/, /q/ and /s/ also occur as the first consonant in a cluster. The voiced obstruents /b d g β ɣ/ occur word initially and intervocally, but not word finally or as the first consonant in a cluster. Since the voiced obstruents occur word initially, logically they should also appear as the second consonant of a consonant cluster if the first consonant is voiced. There are two examples of such clusters: [βalβal] 'tree sp.' and [demdem] 'land snail', although [demdem] is an introduced lexical item. This gap may be due to the fact that the voiced stops are infrequent.

The voiceless stops /p t q/ are aspirated word initially, intervocalically and as the second consonant in a cluster. Word finally and before a consonant they are unreleased and therefore are not aspirated. Word final /t/ is pronounced with the blade of the tongue against the teeth while the tongue tip protrudes between the teeth.

The fricatives /ɸ/ and /β/ are distinctively bilabial in all environments. In the West Coast dialects /s/ is replaced with /z/ any time it immediately precedes a vowel. The West Coast reflexes of /ɸ/ are [h] before a vowel, and [ʔ] word finally. The fricative /ɣ/ is realized as voiceless [x] word initially before a round vowel.

1) a.   [xutʰat] 'crayfish'
   b.   [xolŋ] 'crooked'

In all other environments, that is word initially before a nonround vowel or intervocalically, /ɣ/ is realised as voiced [ɣ].

2) a.   [ɣis] 'yellow'
   b.   [ɣɛt] 'bite'
   c.   [ɣaiŋ] 'wave/breaker'
   d.   [ɣaβɛs] 'plenty'
3) a.   [pʰɔɣɔʔ] 'fall'
   b.   [tʰɛɣas] 'know'
   c.   [maɣus] 'breathless'
   d.   [joɣomɸat] 'spotted crab'

The phone [ʔ] appears to be a function of morpheme boundaries rather than a fully utilized phoneme. It is particularly evident as a very abrupt word final closure in words like [nobeʔ] 'here' or [rɔɣɔʔ] 'good'. In addition, it is probably the actual onset phone for all vowel initial words. Under normal circumstances it is not noticeable but with reduplication or prefixation of vowel initial stems [ʔ] becomes apparent. It seems to function as a consonantal separator of adjacent vowels preventing degemination or diphthongisation.

The uvular stop /q/ and fricative /ɣ/ actually present a more complex picture than that outlined above. The two contrast word initially as shown in (4-5).

4) a.   [qʰɔnə] 'his leg'
   b.   [ɣɔnə] 'for him'
5) a.   [qʰam] 'your leg'
   b.   [ɣam] 'longing for'

They also contrast intervocalically, although /q/ occurs in this position only as the result of affixation or reduplication.

Alternations between word final [q] and intervocalic [ɣ] occur as shown in (6-7).

6) a.   [siəq] 'get'
   b.   [siəɣe] 'get it'
   c.   [siəɣən] 'the getting'
7) a.   [ɣarədəq] 'straight'
   b.   [ɸəɣarədəɣe] 'cause it to be straight'

Further alternations between [q] and [ɣ] related to transitivity are discussed in 4.2. There is no direct indication that voiced stops ever alternate with their voiceless counterparts.[1]

The nasals and liquids are regularly distributed in all environments except that the [ɾ] is infrequent word finally. Historically there appears to have been an alternation between /d/ and /r/ but there are only a few fossilized traces of this now. The allomorphs for 'small' and 'tall' show [d] in (8a) and (9a), but [ɾ] in (8b,c) and (9b).

8) a.   [mɔdəq] 'small'
   b.   [ɸomɪɾəq] unexpectedly small (sing.)'
   c.   [mɪɾəɣənə dɪn] '(many) small fish'
9) a.   [mɔdus] 'long/tall"
   b.   [ə mətʰa ɾus] 'a tall man'

Judging from some of the other dialects the phone [j] is also involved in this with the form [jɪn] occurring instead of [dɪn] 'fish'.

Phonetic glides or semivowels may occur word initially or as a realisation of a diphthong word medially. The nonphonemic status of [j] and [w] will be discussed in 3.2.

2.2   Vowels

The vowel system of Kara is more complex than the consonant system. The phones which occur are given in Chart 2.

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[1] The only possible exception noted to date is in the suffix marking first person singular inalienable possession. As shown in 4.3, this suffix has allomorphs [-gə] and [-əq] as a result of metathesis and devoicing. There are no other indications (i.e. voicing of voiceless stops) of an alternation involving voiced and voiceless stops.

CHART 2: INVENTORY OF VOWEL PHONES

i		u
ɪ		ʊ
e		o
ɛ	ɔ	ɔ
	a	

The overall distribution of vowels in monosyllabic forms can be summarised as follows. The central vowels [a] and [ɔ] contrast in both open and closed syllables as shown in (10-11).

10) a.   [pʰa] 'east'
    b.   [pʰɔ-] 'instrument/accompany'
11) a.   [pʰat] 'head'
    b.   [pʰɔt] 'dull'

The contrast between [a] and [ɔ] is widespread throughout the language, and the two are definitely separate phonemes. Even though /ɔ/ predominates in frequency and there is a tendency to lax /a/ in open syllables, in a closed syllable the quality of /a/ is constant.

The mid phones [e] and [ɛ], and [o] and [ɔ], on the other hand, are generally in complementary distribution. The tense member of each pair occurs in open syllables, while the lax member occurs in closed syllables.

12) a.   [pʰe] 'locative'
    b.   [pʰɛt] 'betray'
13) a.   [pʰo] 'dumb/mute'
    b.   [ɸɔt] 'type of fishing'

Finally, the high phones [i] and [ɪ], and [u] and [ʊ], contrast in closed syllables, as shown in (14-15), but generally only the tense members occur in open syllables, as illustrated in (16).

14) a.   [pʰit] 'break (a rope)'
    b.   [pʰɪt] 'hit (inanimate obj)'
15) a.   [pʰut] 'husk'
    b.   [pʰʊt] 'erupt/explode'
16) a.   [ɸi] 'weave'
    b.   [pʰu] 'drop in/visit'

A major problem in Kara phonology, then, is whether the four high phones are separate phonemes (parallel with /a/ and /ɔ/) or members of two phonemes /i/ and /u/ (parallel with

/e/ and /o/). Before addressing this problem, we give more detail regarding the phonemes /a ə e o/.

The contrast between /a/ and /ə/ is not total. A general rule of Kara phonology is that all vowels in a sequence are tense in most positions. In most environments, then, /a/ but not /ə/ occurs in vowel sequences as illustrated in (17).

17) a. [pʰai] 'stingray'
    b. [pʰau] 'frog'
    c. [βaul] 'hole'
    d. [sait] 'too/also'
    e. [ɣaot] 'harvest fruit'
    f. [βual] 'jungle'
    g. [marias] 'dry season'
    h. [leaɸ] 'afternoon'

As will be shown in the discussion of inalienable possession in 4.3, when the sequence /ə-ə/ arises over a morpheme boundary it is realised as a single [a] phone in accord with this generalisation.

There are two positions in which /ə/ occurs in vowel sequences instead of /a/. One is before /q/ or /ɣ/ where [Və] occurs instead of [Va] as shown in (18).

18)   [xuəq] 'my stomach'

In addition, [Və] occurs instead of [Va] in word final position as shown in (19).

19) a. [ɣəɣəluə] 'image'
    b. [reə] 'blood'
    c. [tʰorəguə] 'two'
    d. [pʰiə] 'earth'
    e. [xusiə] 'rat'
    f. [pʰuə] 'north'
    g. [soə] 'reef drain'

In deliberate speech the word final vowel sequences [uə oə iə eə] are usually pronounced as [ua oa ia ea] respectively.

Moving to the mid phonemes /e/ and /o/, the generalisation that the tense allophones [e] and [o] occur in open syllables while the lax allophones [ɛ] and [ɔ] occur in closed syllables must be modified. First, as illustrated in (20-21), the tense allophones [e o] occur instead of [ɛ ɔ] before /l/ in closed syllables; [o] also occurs instead of [ɔ] before /m n/.

20) a. [gel] 'deny'
    b. [ɣelmat] 'call unsuccessfully'

21) a. [qʰol] 'west'
    b. [mon] 'only'

The lax allophone [ɛ] does occur before nasals, while [ɔ] occurs before /ŋ/.

22) a. [tʰɔnɛn] 'today'
    b. [pʰɔŋ] 'pretend'

Second, the mid vowels follow the constraint against lax phones in vowel sequences; only tense phones occur there. This includes word final position as shown in (23d, 24c).

23) a. [βeowɔ] 'shark'
    b. [ɣarei] 'root'
    c. [jeis] 'vine/rope'
    d. [galeo] 'canoe'
24) a. [soɣoi] 'throw at'
    b. [ɸɔlou] 'attack'
    c. [βio] 'pig'
    d. [ɣaot] 'harvest fruit'

Third, only the lax allophones [ɛ] and [ɔ] occur before /r/, even in open syllables as shown in (25).

25) a. [sesɛregɔn] 'rough'
    b. [ɸɛrɔwai] 'speak'
    c. [sɔrɔq] 'over achiever'

One possible reason that /r/ and only /r/ should have this affect could be that /r/, due to its trilled or flapped nature, is ambisyllabic and so is acting simultaneously as coda for the preceding syllable and as onset to the following syllable. No laxing of /a/ seems to be acceptable preceding /r/, however. Contrasts between /a/ and /ə/ are maintained before /r/ as shown in (26).

26) a. [rarʊm] 'water'
    b. [ɸatʰɔrəguə] 'twice'

Fourth, the lax allophone [ɛ] occurs in open syllables preceding syllables with lax phones [ɪ ɛ], while [ɔ] occurs preceding [ɔ].

27) a. [ɣalɛlɛɸ] 'lightweight'
    b. [lɛlɛq] 'run away to eat'
28) a. [pʰɔɣɔʔ] 'fall'
    b. [dɔɣɔt] 'accompany'

Tense allophones occur, however, in open syllables before lax phones other than those indicated above.

    29)   [ɸeŋɔs] 'kiss a child'

Fifth, the lax allophone [ε] occurs in the morphemes [ne] 'I' and [ne-] 'a piece of' and in constructs of these two.

    30)   [nethara] 'we'

Finally, the phones [ε] and [ɔ] occur in open syllables in reduplicated forms. The typical form for reduplication is to replicate the initial consonant, if one exists, and the initial nucleus of the stem.[2]

    31) a.   [gogon] 'sweeping' (< [gon] 'clean')
          b.   [thithɪŋ] 'tapping' (< [thɪŋ] 'tapp')
          c.   [liliu] 'a sling' (< [liu] 'throw/sling')
          d.   [thɔthɔβai] 'a presentation' (< [thɔβai] 'present')
          e.   [mamat] 'a death' (< [mat] 'die')
          f.   [uʔulə] 'returning' (< [ulə] 'return')
          g.   [iʔɪrɪn] 'healing' (< [ɪrɪn] 'heal')
          h.   [ɸeɸeo] 'whistling' (< [ɸeo] 'whistle')

When the nucleus is one of the diphthongs [ai], [oi] or [ei], it is reduplicated as [ε]; when the nucleus is the diphthong [au], it is reduplicated as [ɔ].[3]

    32) a.   [βεbai] 'not liking (habitual)' (< [βebai] 'dislike')
          b.   [βεβoi] 'bees' (< [βoi] 'honey')
          c.   [thεthei] 'habitually fells trees' (< [thei] 'chop/fell')
          d.   [βɔβau] 'spirit' (< [βau] 'sieze/possess')
          e.   [ŋɔŋaul] 'fishing with hook and line' (< [ŋaul] 'fish (hook)'

This process may also account for the [ε] and [ɔ] in (33).

    33) a.   [memai] 'big man'
          b.   [lɔlau] 'Malay Apple'
          c.   [xɔxau] 'yam type'

Returning now to the high vowels, as indicated above high tense and lax vowels contrast in closed syllables. In a number of environments, however, this contrast is neutralised. The factors determining the distribution of high phones are similar to those for the mid phones.

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[2] Grammatical categories which utilize reduplication include continuative or iterative, characterisation and nominalization.

[3] The diphthong [ou] has not been found in the stem of a reduplicated form.

Generally, only the tense phones [i] and [u] occur in open syllables. Preceeding /r/, however, only the lax phones [ɪ] and [ʊ] occur. For example, in the verb [ɪrɪn] 'heal' the first [ɪ] is lax because it precedes /r/. When it is reduplicated, the reduplicated vowel is [i] in [i?ɪrɪn] 'healing/healer'. Similarly, when the possessive marker [si] and third person dual marker [re] are joined, the result is [sɪre] with a lax [ɪ]. Monomorphemic examples are given in (34).

34) a.   [pʰɪrən] 'big man'
    b.   [pʰɪraus] 'wet'
    c.   [pʰʊrə] 'chicken'
    d.   [uri] 'yam'

The lax phone [ɪ] also occurs in open syllables before velar consonants.

35) a.   [ɪŋoi] 'tree ants'
    b.   [tʰi] or [tʰɪginə] 'stand'
    c.   [βɪŋɪl] 'deserted'

The high vowels also follow the constraint against lax vowels in vowel sequences, even in closed syllables and word finally.

36) a.   [nui] 'stonefish'
    b.   [pʰau] 'frog'
    c.   [meut] 'body watchers'
    d.   [su.ai] 'respect'
37) a.   [βoi] 'honey'
    b.   [pʰi.ə] 'ground'
    c.   [sait] 'too/also'

Since the lack of contrast between high tense and lax vowels in a number of environments parallels the mid vowels, it would be desirable if they could be reduced to two phonemes in all environments.[4] The problem is that they clearly contrast in closed syllables. In addition, in polymorphemic forms a lax vowel phone may occur an open syllable. For example, when the third person object suffix /-e/ is added to [pʰɪt] 'hit' and [pʰit] 'break', the vowel contrast is maintained.

38) a.   [pʰɪtʰe] 'hit it/him'
    b.   [pʰitʰe] 'break it'

The lax vowel [ʊ] also occurs in open syllables in reduplicated forms as shown in (39).

39)   [sʊsui] 'habitually returns borrowed items' (< [sui] 'give back')

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[4] Tone, as identified by Lithgow and Classen (1968), does not seem to be a factor.

In general, when the nucleus of a reduplicated syllable is the diphthong [ui], it is reduplicated as [ʊ].

One possible solution to the problem of the contrasts between tense and lax high vowels is suggested by the analysis of possessive suffixes outlined in 4.3. It is shown there that the underlying form for forms like [ɣum] 'your stomach' and [mim] 'your back' are probably /ɣu+əm/ and /mi+əm/. An explanation for this is suggested by the distribution of vowel sequences word finally and before a consonant. The distribution word finally is given in Chart 3.

Chart 3: Word Final Vowel Clusters

	a	e	i	o	u	ə
a	—	—	ai	ao	au	—
e	—	—	ei	eo	eu	eə
i	—	i+e[5]	ji	io	iu	iə
o	—	—	oi	—	ou	oə
u	—	—	ui	—	—	uə

There is no contrast between /Va/ and /Və/ in this environment; only /Və/ occurs word finally.

One readily apparent observation is that with one exception geminate sequences are disallowed. The lone exception, [ji] 'kunai grass', suggests a rule establishing initial glide formation is applicable prior to a degemination rule.

The distribution of vowel clusters before a consonant is given in Chart 4.

Chart 4: Vowel Clusters before Consonants

	a	e	i	o	u	ə
a	—	—	ai	ao	au	—
e	ea	—	ei	—	eu	eə
i	ia	—	—	io	iu	iə
o	—	—	—	—	—	oə
u	ua	—	ui	—	—	uə

Once again, geminate sequences are disallowed. Although it appears that /Va/ and /Və/ sequences contrast before consonants, this is not true since /Və/ occurs only before /x/ and /q/ and /Va/ never occurs in this environment.[6] In general, /ə/ does not occur in a sequence before a consonant. It is possible that /ə/, as the second V in a cluster, is either coalesed or deleted before any consonant other than /ɣ/ or /q/.

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[5] The sequence /ie/ occurs in open syllables as the result of joining the third person direct object morpheme /-e/ to a stem ending in /i/.

[6] There is only one contrastive example of [Va] preceding [q]; [tʰiaq] 'my brother' contrasts with [miəq] 'my back' and [siəq] 'mine'. As suggested in 4.3, it is likely that the underlying form for 'brother' is /tiə/, not /ti/.

Returning to the problem of tense and lax high vowels, according to the analysis of possessives outlined above we can posit /si+əm/ as the underlying form for [sim] 'yours'. This in turn means we can posit /sinɪ/ as the underlying form for [sɪm] 'eat wood (as termites do)'. The process laxing /i/ in closed syllables would apply before /ə/ was deleted before /m/. Thus the influence of the /ə/ would be felt in the preceding vowel. The phonetic contrast between [i] and [ɪ] according to this analysis would result from an underlying contrast between /iə/ and /i/ in closed syllables. Positing [i] in closed syllables as underlyingly /iə/ (and [u] as /uə/) underlyingly seems more reasonable and simpler than claiming four individual phonemes /i ɪ u ʊ/, especially since [ɪ] and [ʊ] are fairly limited in their appearence.

The assumption that tense [i] always results from /iə/ and tense [u] always from /uə/ is problematic, however, as can be seen in (40-41).

40) a.   [pʰiq] 'lever crossways'
    b.   [pʰiɔq] 'scavenge'
41) a.   [suq] 'root like a pig'
    b.   [sʊq] 'dark'
    c.   [suəq] 'joke, v.'

If [pʰiq] is underlyingly /piəq/, and [suq] is /suəq/, then in neither case should the /ə/ delete since the sequence precedes [q]. In addition, [pʰiq] contrasts with [pʰiɔq], therefore the source of [i] in the former cannot be /iə/. Similarly, [suq] contrasts with [suəq] (as well as with [sʊq]) so the [u] cannot be derived from /uə/.

The general principle of deriving the tense high vowels from a sequence still remains a valid option, however. Referring back to chart 4, the only combination of the front high and mid vowels which occurs before a consonant is [ei]. Furthermore, there is only one instance of that combination. Since there is no conclusive evidence, the underlying form of [pʰiq] could be any of several possibilities. We will assume that it is /pieq/, and that the underlying form of [suq] is /suoq/.

2.3   Stress

Stress appears to be very irregular as it seems to occur on any syllable in a word. There is, however, an ordered system of rules governing stress placement in all words of two syllables or more. There are two levels of stress in addition to unstressed syllables. Primary stress is mainly a function of intensity but may work in combination with pitch. Secondary stress is usually a function of changing pitch. Under certain conditions primary and

secondary stress appear to be equal. When this occurs both stressed syllables are marked with primary stress.

Stress is determined by three factors: vowel quality, syllable closure, and position in the word. A prefixal syllable, however, including a prefix resulting from reduplication, is almost never stressed, regardless of its other characteristics.

The most important factor in stress assignment is vowel quality. A syllable with a nucleus of /a/ almost always receives primary stress regardless of position.

42) a.   ['qʰa.pʰɪs] 'plant'
    b.   ['qʰaq.sa.ɣə] 'one-leg'
    c.   [nɛ.'tʰa.rə] 'we'
    d.   [ɸə.'tʰa.pʰʊs] 'quickly'
    e.   [ɸə.'ɣa.rə.ˌdəq] 'straighten'
    f.   [ˌɸə.gə.ʔu.'la.tʰe] 'surround it'
    g.   [mə.'tʰa] 'man'
    h.   [xu.'tʰat] 'crayfish'
    i.   [ˌni.naŋ.'pʰap] 'stepmother'
    j.   [ˌqʰə.nəm.'sat] 'saddened'

When more than one syllable with a nucleus of /a/ occurs in a word, the last one is stressed as shown in (42i).

In the absence of a syllable with a nucleus of /a/, a closed syllable will receive primary stress. A final closed syllable takes precedence over a nonfinal one.

43) a.   [ˌɣɔ.lɔ.'pʰʊŋ] 'a swallow'
    b.   [ˌmɛ.lɔ.'sʊɸ] 'meaning'
    c.   [ˌrʊ.ru.'βeəq] 'muddy'
    d.   [ˌŋʊ.ru.βɔ.'pɔŋ] 'protectress spirit'
    e.   ['mɛs.qʰə] 'muscle tissue'

In the absence of either a syllable with a nucleus of /a/ or a closed syllable, primary stress normally falls on the stem initial syllable (since, as noted, stress generally does not fall on a prefixal syllable).

44) a.   ['pʰu.tʰə] 'pull out'
    b.   ['ɣi.lə] 'a parrot
    c.   ['ja.mu] 'axe'
    d.   ['rɔq.mai] 'bird type'
    e.   ['βi.lau] 'intestines'
    f.   ['nə.bɔ.ˌɣɔʔ] 'now'
    g.   ['pʰi.sə.ˌne] 'tie it up'

    h.   ['ɣɔ.lu.ˌmə.nə] 'his neck'
    i.   ['ɸai.so.ˌɣɔ.ne] 'work it'
    j.   ['sə.ŋɔ.ˌɸi.lu] 'ten'
    k.   ['βo.gə.ˌɾɔ.mə] 'needlefish'
    l.   ['mɔ.tʰə.ɸe.ˌtʰɔ.mə] 'a family'

There are exceptional forms in which stress falls on the second syllable.

    45) a.   [ŋo.'ŋo.lɔ.ˌne] 'to not recognize him'
        b.   [pʰe.'bo.gə.ˌne] 'to put off limits'

    Primary and secondary stress may not occur on contiguous syllables. Thus, in two syllable words there is no secondary stress. Similarly, in three syllable words with stress on the second syllable there is no secondary stress. If primary stress falls on the initial syllable, secondary stress falls on the ultimate syllable in three syllable words and on the penultimate in words of greater than three syllables, as shown in (44l).

    If the second syllable is stressed in a four syllable word, the ultimate syllable receives secondary stress. If primary stress falls on the third syllable or later, secondary stress falls on the initial syllable (unless it is a prefix in which case it will fall on the second syllable).

3   Syllable Structure

3.1   *Syllable Types and Distribution*

    Syllable structure plays a very prominent role in Kara phonology as shown in the discussion in 2.2 of tense and lax vowel phones. In addition, an understanding of diphthongs and glides is best gained through a study of syllable structure. The basic syllable type appears to be the CV syllable as illustrated in (46).

    46) a.   [ne] 'I'
        b.   [no] 'you'
        c.   [ni] 'coconut palm'
        d.   [sa] 'permissive marker'

The three other basic syllable types are V as in (47), CVC as in (48), and VC as in (49).

    47) a.   [e] 'and'
        b.   [o] 'or'
        c.   [i] '3rd pers Subj incomplete'
        d.   [a] '3rd pers Subj completive'

48) a. [sat] 'bad'
    b. [bʊn] 'smoke'
    c. [ɸaɸ] 'mumu food'
49) a. [aŋ] 'yes'
    b. [uŋ] 'come ashore'
    c. [-ɛt] 'away from'

The V, CVC, and VC patterns can be derived from the CV pattern as outlined by Clements and Keyser (1983:28-29). The V syllable is derived by deleting the initial consonant, the CVC syllable by adding a final consonant, and the VC by deleting the initial consonant and adding a final consonant.

Instead of describing phonetic syllable types in terms of C and V, however, we will describe these four fundamental syllable types in terms of C and N (nucleus). This is preferred on the basis of syllables like those in (50-51).

50) a. [nai] 'sit'
    b. [qʰui] 'firewood'
51) a. [sait] 'too/also'
    b. [jɛis] 'vine/rope'

The nucleus in each of these syllables consists of a diphthong of two vowels, only one of which is stressed. The second vowel is essentially an offglide. The offglide does not fill the coda C position, as shown by the forms in (51) with a diphthong and coda C. As a result these and similar words are considered monosyllabic with the shape CN or CNC.

Syllable types N, CN, and CNC occur in isolation, word initially, medially and finally. The type NC may occur in isolation and word finally but does not occur initially in multisyllabic words. The preferred unit for word building is the CN syllable, resulting in a large number of words composed of only CN syllables, and a low incidence of consonant clusters. The CNC syllable occurs frequently but it tends to be more limited than the CN type. The closed syllables, CNC and NC, most frequently occur word finally following one or more CN syllables. The NC type is somewhat rare, appearing in less than 6% of the words collected. Words of up to six syllables have been noted with no more than two syllable types in any given word.

52)   N.CN
    a. [u.lə] 'return'
    b. [u.mə] 'garden'
    c. [e.nə] 'mother-in-law'

53)   N.CNC
    a.   [ɪ.rɪn] 'heal'
    b.   [u.lɪm] 'puddle'
    c.   [i.sam] 'your name'

54)   CN.N
    a.   [ɸc.o] 'whistle' .
    b.   [pʰu.ɔ] 'north'
    c.   [tʰi.ui] 'snake'

55)   CN.NC
    a.   [ni.ong] 'trunkfish'
    b.   [βu.al] 'jungle'
    c.   [ɣa.ot] 'pick fruit'

56)   CN.CNC
    a.   [ɸai.sɔq] 'work'
    b.   [pʰu.nʊq] 'kill'
    c.   [xɔ.qʰɔɸ] 'head covering'

57)   CNC.CN(C)
    a.   [tʰɔng.pʰat] 'begin'
    b.   [mal.mal] 'tired/soft'
    c.   [mes.qʰɔ] 'muscle tissue'

58)   CN.CN.CN.NC
    a.   [mɔ.tʰa.ni.as] 'sea snake'

59)   CN.CN.CN.CN.N
    a.   [ɸc.mɔ.rɔ.li.ai] 'angry with each other'

60)   CN.CNC.CN(C)
    a.   [qʰa.nɔm.sat] 'sad'
    b.   [gɔ.laq.mai] 'red parrot'

3.2 Syllabification

Syllabification, including that of dipththongs, vowel sequences, glides, affixes, and consonant clusters, is predictable. First we consider diphthongs and vowel sequences. As noted in 3.1, there are a number of vowel sequences which syllabify as single syllables. Examples of such dipthongs without codas are given in (61); examples with codas are in (62).

61) a.   [pʰai] 'stingray'
    b.   [pʰau] 'frog'
    c.   [nui] 'stonefish'

    d.   [βoi] 'honey'

    e.   [ɸə.lou] 'attack'

    f.   [tʰei] 'chop/cut down'

62) a.   [βaul] 'hole'

    b.   [uit] 'blood vessel'

    c.   [sait] 'too/also'

    d.   [jeis] 'vine/rope'

The vowels making up a diphthong are co-equal in closed syllables. In open syllables the first vowel is the peak. Thus, the high vowels are more offglides in (61) than in (62).

While some sequences are realised as diphthongs, others are syllabified as separate syllables. Examples of such syllabic sequences without codas are given in (63); examples with codas are in (64).

63) a.   [pʰi.ə] 'ground'

    b.   [pʰu.ə] 'north'

    c.   [ni.u] 'nest'

    d.   [βi.o] 'pig'

    e.   [so.ə] 'reef drain'

    f.   [ga.le.o] 'canoe'

    g.   [ɸə.tʰi.(j)e] 'cause it to stand'

64) a.   [βu.al] 'jungle'

    b.   [ɣa.ot] 'harvest fruit'

    c.   [ɣi.ut] 'strangle'

    d.   [ni.oŋ] 'trunkfish'

    e.   [ma.ɾi.as] 'dry season'

    f.   [le.aɸ] 'afternoon'

All of the above examples in (61-64) except (63g) are monomorphemic.

The generalisation regarding syllabification of vowel sequences is that V_1V_2 will syllabify as a diphthong if V_1 is any vowel except /i/ and V_2 is a high vowel. Otherwise, the sequence syllabifies as separate syllables.

Next we consider syllabification of affixes and glide formation. Prefix morphemes, including reduplication, are realised in the majority of cases as CN and so always constitute a separate syllable. Suffix morphemes are typically N(C) in shape. In accord with the Onset First Principle (Clements and Keyser 1983:37) if a stem ends in a consonant, it becomes the onset of a following nucleus-initial suffix.

65) a.   [pʰɔ.ɣe] 'copy him' (< /poq-e/ 'copy-3.pers.obj')

    b.   [ɣɛ.tʰau] 'bite me' (< /ɣet-au/ 'bite-1.pers.obj')

     c.   [ɸɔ.qʰɔ.sɔ.nə.me] 'cause him to be punished' (< /ɸə-qəsənəm-e/ 'cause-
         punish-3.pers.obj')

When a verb stem ending in a single vowel other than /i/ is followed by a vowel initial
suffix, an epenthetic glide [j] is inserted between the vowels.

   66) a.   [rɔɣɔjɔn] 'goodness' (< /roɣo-ən/ 'good-NOM')
        b.   [ɸɔduje] 'cause him to come down' (< /ɸə-du-e/ 'cause come down-
            3.pers.obj')

When a stem ending in a diphthong is followed by a vowel initial suffix, the high offglide
in the diphthong functions primarily as a consonantal onset for the suffixal vowel.

   67) a.   [ɸe.na.wɔn] 'a theft' (< /ɸenau-ən/ 'steal-NOM)
        b.   [su.a.jɔn] 'respect (noun)' (< /suai-ən/ 'respect-NOM')
        c.   [so.ɣo.je.tʰe] ' throw it away from here' (< /soɣoi-et-e/ 'throw-
           away.from.speaker-3.pers.obj')
        d.   [ɸe.rɔ.wai] 'speak' (< /ɸe-rau-ai/ 'RECIP-make.noise')
        e.   [tʰo.wau] 'touch me' (< /tou-au/ 'touch-1.pers.obj')

Since intervocalic offglides are realised as onsets in polymorphemic forms, it is
reasonable to use the same process to account for all intervocalic glides. That is, a dipthong
followed by a vowel becomes a simple nucleus plus a glide. This glide is primarily
consonantal, acting as onset for the following nucleus.

   68) a.   /uiaŋ/ [u.jɔŋ] 'lobster'
        b.   /leauen/ [le.a.wen] 'yesterday'
        c.   /uieʔ/ [u.jeʔ] 'crocodile'
        d.   /βeoua/ [βe.o.wɔʔ] 'shark'
        e.   /iauoŋ/ [ja.wɔŋ] 'belt'
        f.   /sauai/ [sɔ.wai] 'sea urchin'

It has been noted that all vowels in a sequence are tense. The occurrence of lax /ɔ/ after [j]
in (67b, 68a), after [w] in (67a, 68d), and before [w] in (67d, 68f) demonstrates the
consonantal character of the glides. Further support for this is the occurrence of lax [e] in
(67c, 68b,c) and of lax [ɔ] in (68d).

It is also possible to derive word initial glides from high vowels by a process that
desyllabifies a word initial high vowel immediately preceding a syllabic segment.

   69) a.   /uai/ [wai] 'tree'
        b.   /ias/ [jas] 'carry'
        c.   /iuɸ/ [juɸ] 'pull'

    d.   /ieis/ [jes] 'rope'
    e.   /ii/ [ji] 'kunai'
    f.   /uan/ [wan] 'to be'
    g.   /uou/ [wou] 'beware'
    h.   /uas/ [was] 'aibeka greens'

The underlying form /uit/ is realised as [uit] with a diphthong, not [wit]. Diphthongisation applies before initial glide formation, resulting in nonsyllabic [i]. Without a syllabic segment following the initial high vowel, it does not meet the structural description of initial glide formation. In general, the glides [j] and [w] are not phonemes but are derived from /i/ and /u/ or are inserted across syllable boundaries.

    Finally, we examine consonant clusters. Consonant clusters occur only in word medial position in Kara. Even borrowed words are adjusted to meet this restriction. Borrowed words with initial consonant clusters either undergo cluster reduction or have an epenthetic vowel, usually /ə/ as in (70a,b) or /i/ as in (70c), inserted between the consonants. Word final clusters are always reduced as in (70d,e).

    70) a.   [gɔlas] 'glass'
          b.   [qʰɔləp] 'club'
          c.   [simɔk] 'smoke'
          d.   [sap] 'sharp'
          e.   [rɔs] 'rust'
          f.   [naɸ] 'enough

    In certain reduplicated forms, CNC is reduplicated instead of simply the initial CN. This process is not currently productive and apparently applied (when active) only to entire words as in (71).

    71)   [ɣusqʰus] 'legend/story' (cf. [qʰus] 'say')

As a result, there are several words in the lexicon, usually nouns, with the shape CVCCVC in which approximately the same three letters repeated. Some are obviously introduced terms coming from other local languages or Tok Pisin.

    72) a.   [βilβil] 'bicycle'
          b.   [malmal] 'soft/tired'
          c.   [demdem] 'land snail'
          d.   [ɣatqʰat] 'brown cicada'
          e.   [βɔrβɔr] 'bush sp.
          f.   [ɸɔlɸal] 'sacrifice'[7]

---

[7] Of these reduplicated examples only [ɸɔlɸal] has a viable short form. The verb [ɸal] indicates sacrifice by way of self-denial; i.e. not eating certain foods, leaving the hair uncut and other similar actions.

In cases like these, the syllable break occurs between the two consonants of the cluster: CNC.CNC. Other words with medial clusters follow the same syllable pattern.

73) a. [mɛs.qʰɔ] 'muscle tissue'
    b. [pʰi.sɪq.ɸat] 'nine'
    c. [mɛ.lɛs.qʰaq] 'swing'
    d. [pʰi.sɪq.tʰʊl] 'eight'
    e. [nəm.qʰai] 'believe'
    f. [nɔs.mat] 'stutter'
    g. [tʰɔŋ.pʰat] 'begin'

In summary, syllabification in Kara is very predictable and regular. The major problems, centering around dipthongs and glides, can be handled in a way consistant with the remainder of the system by a number of regular processes.

4   Morphophonemics

4.1   *Vowel Quality and Transitivity*

Among the low vowels there is a marked correlation between the tense/lax distinction and the degree of transitivity.[8] Forms with the lax vowel /ə/ always demonstrate a relatively greater action transfer than a corresponding forms with /a/. Frequently, to increase the markedness, this /a/ ~ /ə/ variation occurs in conjunction with a /q/ ~ /ɣ/ variation. Examples are given in Chart 5.

CHART 5: [a]/[ə] ALTERNATIONS

Noun/Intrans Verb	Trans Verb (required object)
[βəbat] 'wall'	[βəbət] 'to cover a wall'
[gɔl] 'scrape'	[gal] 'scrapings'
[ɸaɸ] 'cook/bake/mumu'	[ɸəɸ] 'bake'
[sam] 'chew noisily'	[səm] 'chew'
[qʰapʰɔs] 'purchase'	[qʰəpʰɔs] 'buy the pig'
[tʰaŋis] 'cry'	[tʰəŋis] 'mourn'
[laŋai] 'listen'	[ləŋai] 'hear'
[qʰalum] 'look'	[ɣəlum] 'see'
[qʰaɸ] 'dig aimlessly'	[ɣəɸ] 'dig a hole'

---

[8] There is also a somewhat inconsistent correlation among the high vowels between the tense/lax distinction and the degree of transitivity.

These variations are also used in modifiers.

74) a. [qʰaβai] 'long ago (noun)'
    b. [ɣəβai] 'old (non-human)'
75) a. [ɸagut] 'strong (adj)'
    b. [ɸəgut] 'strengthen/encourage'

4.2 Reduplication

The /ɣ/ ~ /q/ alternation also occurs in reduplication. When the stem-initial consonant is a bilabial stop or a voiceless velar stop, the reduplicated consonant is a voiced fricative of the same point of articulation.

76) a. [βupʰuq] 'rotate' (cf. [pʰuq] 'turn over')
    b. [βipʰɪs] 'secured/confined' (cf. [pʰɪs] 'tie')
    c. [βipʰɪt] 'striking' (cf. [pʰɪt] 'hit')
77) a. [βubuq] 'liking/wanting' (cf. [buq] 'like/want')
    b. [βibɪt] 'lying' (cf. [bɪt] 'lie')
    c. [βəbərəq] 'thunder' (cf. [bərəq] 'shouting')
78) a. [ɣuqʰus] 'talking' (cf. [qʰus] 'say')
    b. [ɣɛqʰɛt] '(he) bites (habitual)' (cf. [qʰɛt] 'bite')

The alveolar stops and the voiced velar stop are not subject to this spirantisation.

79) a. [tʰitʰɪŋ] 'tapping' (cf. [tʰɪŋ] 'tap')
    b. [dodəɣɔt] 'sticky' (cf. [dɔɣɔt] 'accompany')
    c. [gogon] 'sweeping' (cf. [gon] 'clean')
    d. [gəgən] 'pull in and wind up a fishing line' (cf. [gən] 'pull on a line')

4.3 Possession

Body parts and kinship terms must be identified as belonging to someone or something, that is, they are inalienably possessed.[9] There are several sets of markers of inalienable possession. Chart 6 lists the set of free morphemes used to mark inalienable possession.

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[9] Inalienable possession is used fairly widely in situations other than strictly literal possession. A hospital may be referred to as [ə liɸunə ɣis] 'house of sickness'. Likewise, while the 'midst' of a group of people is a fairly abstract concept, it can be inalienably possessed [lə pəlounə rəbunə].

CHART 6: INALIENABLE POSSESSION FREE MORPHEMES

stem	1s Poss	2s Poss	3s Poss	gloss
[ɣaqʰɔp]	[ɣaqʰap igə]	[ɣaqʰəp imə]	[ɣaqʰəp inə]	'shoulder'
[pʰibʊr]	[pʰibʊr igə]	[pʰibʊr imə]	[pʰibʊr inə]	'lips'
[sus]	[sus igə]	[sus imə]	[sus inə]	'breast'
[jat]	[jat igə]	[jat imə]	[jat inə]	'liver'
[ɸuan]	[ɸuan igə]	[ɸuan imə]	[ɸuan inə]	'fat'
[βulɔq]	[βulɔq igə]	[βulɔq imə]	[βulɔq inə]	'scar'
[βipʰiu]	[βipʰiu igə]	[βipʰiu imə]	[βipʰiu inə]	'fingernail'
[ɣaɣaluə]	[ɣaɣaluə igə]	[ɣaɣaluə imə]	[ɣaɣaluə inə]	'image'
[rɛə]	[rɛə igə]	[rɛə imə]	[rɛə inə]	'blood'

Noun stems ending with consonants take these free morphemes. In addition, as the last three sets of forms show, a few noun stems ending with vowel sequences also take these free morphemes. Most stems ending in vowel sequences take one of three sets of suffixes. It is possible that these noun stems actually end in [ʔ], and are therefore consonant final. There is no allomorphy in this paradigm.

One set of suffixes used to mark inalienable possession is shown in Chart 7.

CHART 7: INALIENABLE POSSESSION SUFFIXES, SET ONE

stem	1s Poss	2s Poss	3s Poss	gloss
[ɸɔmɔrɛ]	[ɸɔmɔrɛgə]	[ɸɔmɔrɛmə]	[ɸɔmɔrɛnə]	'chest'
[tʰe]	[tʰeg ə]	[tʰemə]	[tʰenə]	'buttocks'
[ŋɔŋe]	[ŋɔŋegə]	[ŋɔŋemə]	[ŋɔŋenə]	'place'
[no]	[nogə]	[nomə]	[nonə]	'face'
[ɸui]	[ɸuigə]	[ɸuimə]	[ɸuinə]	'hair'
[βilau]	[βilaugə]	[βilaumə]	[βilaunə]	'intestine'
[tʰau]	[tʰaugə]	[tʰaumə]	[tʰaunə]	'clan'

Since body part and kinship terms must be obligatorily possessed, free noun stems of these categories are rare. However, if the possessor is a proper noun the stem appears unaffixed. For example, 'Beno's chest' is [ɸɔmɔrɛ beno]. The form listed as the stem is the form used with proper nouns.

Set one of the possessive suffixes occurs with noun stems ending in vowel sequences or mid vowels. The suffixes are identical with the free morphemes without the morpheme initial [i]. It is possible that [i-] in the free morphemes is actually a separate morpheme indicating inalienable possession. This would be parallel to the morpheme [si-] which marks alienable possesion with attached person suffixes. (These are listed in Appendix 3.) A stem

plus proper noun or affixed with a person suffix is obviously possessed and would need no extra possession marker.

A second set of suffixes used to mark inalienable possession is shown in chart .

CHART 8: INALIENABLE POSSESSION SUFFIXES, SET TWO

stem	1s Poss	2s Poss	3s Poss	gloss
[nasə]	[nasaq]	[nasam]	[nasɔnə]	'wife'
[mətʰə]	[mətʰaq]	[mətʰam]	[mətʰɔnə]	'eye'
[βəsa]	[βəsaq]	[βəsam]	[βɔsanə]	'sibling s.s.'
[mi]	[miɔq]	[mim]	[minə]	'back'
[tʰi]	[tʰiaq]	[tʰiam]	[tʰinə]	'sibling o.s.'
[yu]	[yuɔq]	[yum]	[yunə]	'stomach'
[pʰutʰu]	[p ʰutʰɔq]	[pʰutʰum]	[pʰutʰunə]	'head'

The third possessive suffix is [-nə] as before. In the first and second possessive suffixes, however, there is no final [ə]. First person forms like [miɔq] and [yuɔq] suggest a metathesis has taken place (probably historically) with subsequent devoicing of /g/ since voiced obstruents are not allowed word finally. Thus, we posit /-əq/ and /-əm/ as the underlying forms of the first and second person suffixes. This would also account for the first and second person forms [nasaq] and [nasam] with tense vowels. For example, /nasə+əm/ would become *nasa+am* since all vowels in sequences must be tense. Degemination would result in [nasam].

In most of the second person forms [ə] does not appear on the surface. This is probably due to the fact that the sequences /iə uə ɔə eə/ occur only before /y/ or /q/. As the second vowel in a sequence, /ə/ is either coalesed or deleted before any consonant other than /y/ or /q/. However, its influence is still felt as the nucleus retains its tenseness.

The alternation between [uə] in [yuəq] and [ɔ] in [pʰutʰɔq] is attributable to the initial syllable receiving stress in both forms. The sequence [uɔq] becomes [ɔq] when [u] is not stressed, and remains [uɔq] when [u] is stressed. There are no stems of the form /..CVCi/ to determine if this process would also cause [iɔq] to become [ɛq].

The first and second person forms [tʰiaq] 'my sibling' and [tʰiam] 'your sibling' are problematic. The expected forms for stems ending in /i/ are like [miɔq] 'my back' and [mim] 'your back'. Either the first and second person forms are exceptional, or the stem is not /ti/. The first and second person forms would be nonexceptional if the stem is actually /tʰiə/. Thus, the exceptional form is the free form found with the proper noun in [tʰi bɛnɔ] 'Beno's sibling'. For some reason, the stem final /ə/ was deleted in this form.

The final set of inalienable possession suffixes is listed in Chart 9.

CHART 9: INALIENABLE POSSESSION SUFFIXES, SET THREE

stem	1s Poss	2s Poss	3s Poss	gloss
[ninə]	[ninaŋ]	[ninam]	[ninɔnə]	'mother'
[tʰɔmə]	[tʰɔmaŋ]	[tʰɔmam]	[tʰɔmənə]	'father'
[imu]	[i muŋ]	[imum]	[imʊnə]	'in-law'

The use of this set of affixes is not phonologically conditioned. Instead, it is used with a group of important kin relations.[10] Once again the third person suffix is [-nɔ]. The consonant in the second person suffix is [m] again, but the consonant in the first person suffix is the nasal [ŋ] instead of the obstruent. While a velar nasal frequently appears in the first person possessive markers in other Austronesian languages, it does not in Kara except in these few instances. On the basis of the vowel change from stem final [ɔ] to [a] in the first and second person forms, we can posit the first person suffix as [-ɔŋ][11] and the second person suffix as [-ɔm], with phonological processes applying parallel to those seen with set two suffixes.

5   A Sample Text

The text is first written in the orthographic representation, followed by a phonetic representation. Finally, a semi-literal translation is given.
<Kuuskuus paralaak, kuuskuus paratung. A saxa mataa vesan—a mo— malaan sena baaluus, a vesane pana wai. E nane tei saxa wai. E lumui a valofa lana. A falet, falet e lana fevalof. E lulumui nane tafang tapine xe laui. E a mo laak xe laui e poxo fa'ula xe la lapia. E nane fula vesan fulane pana teiaana lana. Teye, teye, teye falet e fexaalelef famodak, e tapine saa, xe laui. E a mo falet famodak; a lif famodak, e falet e fe poxo. Nane fula siaxe e tei fulane. Teye, teye, teye, teye lana fevalof faagut, e fexaalelef famodak, e soxoin fulane xe laui. E a mo xo lifet xo e fe laasun famodak, e lumui fala ula falamaan e maa poxo. Nane fula gone fula pana teiaana, falet, falet, e fe lana fexaalelef faroxo. E nane xo soxoine sait e felif paan xe laasun paaliu falete xo; a mo aave nane xali pana "tulwaiya". E yaan tanen, sina mu mono, taara xalie pana mu baaluus. Pevoxo!>
[qʰusqʰus pʰɔralaq qʰusqʰus pʰɔratʰuŋ|| ə sɔyə matʰa βesɔn ə mo məlan senə balus| ə βesəne pʰɔnə wai|| e nɔne tʰei sɔyɔ wai|| e lumui ə βɔlɔɸ ə lɔnə|| ə ɸɔlet ɸɔlet e lɔnə ɸeβɔlOɸ|| e lulumui nɔne tʰɔɸɔŋ tʰɔpʰine ɣe laui|| e ə mo laq ɣe laui e pʰɔyɔ? ɸaʔulə ɣe lə ləpʰiə|| e nɔne ɸulɔ βesɔn ɸulɔne pʰɔnə tʰeianə lɔnə|| tʰeie tʰeie tʰeie ɸɔlet e ɸeɣaleleɸ ɸəmodəq| e tʰɔpʰine

---

[10] A Kara speaker may, in fact, address a person other than his natural father with the term [təmak], using an affix from set two. This would still be polite usage but signals a subtle difference in the perceived nearness of the relationship.
    [11] The historical metathesis proposed for the set two suffixes would also be needed here to derive the current /-əŋ/ from the protoform *ŋka or possibly *ŋga. A neighboring language, Tiang, also uses /-əŋ/ for the first person possessive morpheme.

Phonologies of Austronesian Languages No.2

Edited by John M. Clifton