VOWEL GAMES IN KARA

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0. INTRODUCTION

Kara is an Austronesian language spoken by over 2000 people in the Northern or Kavieng District of New Ireland in the Bismarck Archipelago. It is a member of the Northern New Ireland sub-group of the Patpatar-Tolai Family (Beaumont, 1972). Four dialects of Kara are spoken on the east coast of the island with three more in the central cordillera and west coast areas. The data supporting the present study comes from speakers living in the villages of Lemakot and Fangalava on the east coast.

1. SURFACE VOCALIC CONTRASTS

Vowels and vowel clusters in Kara have provided and continue to provide some very challenging problems in differentiation and analysis. At the surface level there are many contrasts in identical and nearly identical environments (set 1).

(1) [sɔk] 'to sew sago leaves on bamboo strips for roofing'

[sʊk] 'to be dark' (as in a 'dark' night)

[suk] 'to scrub (clothing)'

[siak] 'mine'

[siʌk] 'to get'

[suʌk] 'to trick/to be funny'

[sɛseʌk] 'to strike the target'

[sasak] 'sago palm'

[sɔɣɔ] 'to put the sago shingles on the roof'

[soɣoi] 'to shoot at'

[$t^h\varepsilon f$] 'to call out (indicating your presence)'

[$t^h\mathfrak{o} f$] 'breakers on the reef'

[$t^h\upsilon f$] 'sugar cane'

[t^huf] 'to put leaves over a mumu'

[t^haf] 'placenta'

[$t^h\wedge f$] 'to dust yourself off'

[$d\iota f$] 'to dig out coconut meat'

[$p^h\iota\tilde{t}$] 'to hit'

[$p^hi\tilde{t}$] 'to break a rope'

These few examples indicate a complex vowel system with ten surface phones as recorded in Table 1.

TABLE 1: KARA VOCALIC PHONES

	front	back
high	i ɪ	u ʊ
mid	e ɛ	ɔ o
low	ʌ	a

Initially we will assume that the clusters are composed of a sequence of individual segments rather than consider them as complex unit phonemes. A distinctive feature matrix for the systematic phonemes is given in Table 2. We intend to demonstrate the discrepancy between the surface phones and the systematic phonemes as we proceed.

TABLE 2: DISTINCTIVE FEATURES

	i	e	ʌ[1]	o	u	a	p	b	t	d	k	g	ɸ	β	s	ɣ	m	n	ŋ	l	r	w	y
cons	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
syll	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
high	+	-	-	-	+	-	-	-	-	-	+	+	-	-	-	+	-	-	+	-	-	+	+
mid	-	+	-	+	-	-																	
low	-	-	+	-	-	+																	
extreme[2]	+	-	-	-	+	+																	
round	-	-	-	+	+	-														-	-	+	-
front/ant	+	+	+	-	-	-	+	+	+	+	-	-	+	+	+	-	+	+	-	+	-	-	+
cor	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	+	-	+	-	-	-
voice	+	+	+	+	+	+	-	+	-	+	-	+	-	+	-	+	+	+	+	+	+	+	+
son	(+	+	+	+	+	+)	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+
cont	(+	+	+	+	+	+)	-	-	-	-	-	-	+	+	+	+	-	-	-	+	+	+	+
lab	-	-	-	+	+	-	+	+	-	-	-	-	+	+	-	-	+	-	-	-	-	+	-

One process that becomes immediately apparent is that a consonant coda affects the vowel quality of the preceding nucleus. This is expressed in a laxing rule:

RULE A: VOWEL LAXING (VL)

$$\begin{bmatrix} + \text{ syll} \\ - \text{ low} \end{bmatrix} \longrightarrow [\text{-tense}] \Big/ [\text{-syll}] \_\_\_\_\_ [\text{+cons}] \$$$

This rule accounts for the appearance of the phones [ɪ, ɛ, ɔ, ʊ] in closed syllables.

UR	bit	bite	ɤet	ɤete	pok	poɤe	tun	tune
VL	bɪt	-	ɤɛt	-	pɔk	-	tʊn	-
SR	[bɪt]	[bite]	[ɤɛt]	[ɤete]	[pɔk]	[poɤe]	[tʊn]	[tune]
	'lie'		'bite'		'turn'		'cook'	

As members of a cluster or in open syllables, vowels retain their [+tense] quality. The one exception is the [-tense] /ʌ/[1].

(2.) [feo] 'to whistle' [vuɑl] 'jungle' [buře] 'a ceremony'
[ɤɑiŋ] 'a wave' [vɑul] 'hole' [sivi] 'to go down'

Counter-occurrences due to underlying features

In a limited environment (i.e. CVC syllables) there are several contrastive examples with [+tense] vowels where, according to VL, a [-tense] vowel should occur.

(3.) [fʊn] 'to hide' [pʰɪt] 'to hit'
[fun] 'turtle' [pʰit] 'to break a rope'

These contrasts have been noticed to occur <u>almost</u> exclusively within the extreme high vowels, but one example leads to the expectation that /o/ and /e/ may also behave in this way.

(4.) [xɔf] 'to stare'
[xof] 'dust or visual obstruction'

The question here is: Is there really a segmental phonemic contrast? Or is something else happening to cause a surface contrast?

Further investigation disclosed that no surface geminate vowel clusters occurred and homorganic vowel clusters (e.g. [ie], [ou]) did not occur before a consonant coda. The homorganic clusters did occur word finally as in /fɑnie/ 'to climb it' and /pɑlou/ 'in the midst of' but not elsewhere.

The second clue was found in the word [sim] 'yours'. The word /si/ means 'belonging to' as in /mo si Peri/ 'thing belonging to Perry' while /-im/ is the second person singular possessive suffix. The juxtaposition of the two results in the word [sim] 'yours/belonging to you' with a [+ tense] nucleus instead of [- tense].

/si/ + /-im/ ⟶ /sim/

In this case vowel laxing is prevented from applying. The most probable cause is a Vowel Reduction Rule ordered after the Laxing Rule so the tenseness is retained by a single vowel nucleus with a consonant coda. This word [sim] 'yours' contrasts with [sɪm] 'to gnaw wood (as a termite)'. Similarly /mɑ/ 'hand' plus [-ɑk] first person singular possessive suffix results in [mɑk] 'my hand'. We may now formulate the following rule of Vowel Reduction:

RULE B: VOWEL REDUCTION (VR)

$$[+\text{syll}_1\ ] \ + \ [+\text{syll}_1] \longrightarrow [+\text{syll}_1]$$

Thirdly, the word /fʌmʌre/ 'chest' can occur with the first person singular possessive /iga/ (see footnote 2) which becomes [fʌmʌre iga] which reduces to [fʌmʌrega]'my chest'. In a similar way [te] 'buttocks' goes to [tega] 'my buttocks'. This example also illustrates a rule apparently operating throughout the system that deletion of an [i] signals a joining of two morphemes into a single word.

(5.) si + iak ⟶ siak

te + iga ⟶ tega

tau + iga ⟶ tauga

clan business mine

ma + iak ⟶ maak ⟶ mak

The indications then are 1) a consonant coda is again seen as affecting the tenseness of preceding vowels: 2) clusters of two identical vowels reduce to one [+ tense] vowel; 3) in clusters of homorganic vowels [∝front, -∝round, -low] the second vowel immediately preceding the consonant deletes. Accordingly, a rule of vowel deletion can be posited:

RULE C: VOWEL DELETION (VD)

$$\begin{bmatrix} +\text{syll} \\ \propto\text{front} \\ -\propto\text{round} \\ -\text{low} \end{bmatrix}_1 \begin{bmatrix} +\text{syll} \\ \propto\text{front} \\ -\propto\text{round} \\ -\text{low} \end{bmatrix}_2 \rightarrow \begin{bmatrix} +\text{syll} \\ \propto\text{front} \\ -\propto\text{round} \\ -\text{low} \end{bmatrix}_1 \Big/ \underline{\qquad} [+\text{ cons}]$$

This rule must be ordered after VL in a counter feeding relationship. Thus postulated, the underlying form for [pʰit] 'to break a rope' becomes /piIt/ since it is not known whether the second vowel might have been /i/ or /e/. Likewise for [fun] 'turtle' and [gon] 'to clean' we cannot determine whether the underlying second vowel is an /o/ or a /u/.

Another phenomenon requiring explanation is the presence of the [-tense] vowel /ʌ/ in clusters: [iʌ, eʌ, oʌ, uʌ]. One would expect that the /ʌ/ either should not occur in a cluster because of its [-tense] feature, or it should occur in both positions of a cluster in various environments as the result of its phonemic status. In clusters, however, /ʌ/ is restricted to the second position and, reminiscent of the rule of vowel reduction, never co-occurs with /ɑ/. Moreover its distribution is severely limited, preceding only [ɤ] or [k] (set 6).

(6)

[siʌk] 'to get'	[siʌɤe] 'to get it'
[pʰeʌk] 'bald'	[sɛseʌɤe] 'to strike it (the target)'
[luʌk] 'to vomit'	[luʌɤe] 'to vomit it'
[loʌk] 'to bear, give birth to'	[loʌɤe] 'to bear him'

(7)

[piʌk] 'to scavenge'

[viʌk] 'to break food to share'

[ɤiʌk] 'to push down'

[tepiʌk] 'burst'

[ɤapiʌk] 'all'

[tamʌsiʌk] 'to stand up to leave'

[fataɤapiʌk] 'last of all'

[boʌk] 'to grow'

(tɛteʌk] 'strong'

[rʊruveʌk] 'muddy'

[ɤeʌk manu] 'a tree type'

[vuʌk] 'to break'

[suʌk] 'to joke/trick'

[ɤuʌk] 'my stomach'

[ɤufuʌk] 'internal organ'

[pisiguʌk] 'seven'

Apparently relevant to this matter is the lack of a front and round or round and front vowel cluster before /ɤ/ in the language. Furthermore, we have seen that consonant codas affect the preceding vowel, to explain the unequal distribution of the [ʌ] clusters, we may formulate a rule of neutralization:

RULE D: VOWEL NEUTRALIZATION (VN)

$$\begin{bmatrix} +\text{syll} \\ \alpha\text{front} \\ -\alpha\text{round} \\ -\text{low} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{syll} \\ +\text{front} \\ +\text{low} \end{bmatrix} \Big/ \begin{bmatrix} +\text{syll} \\ -\alpha\text{front} \\ \alpha\text{round} \\ -\text{low} \end{bmatrix} \_\_ \begin{bmatrix} +\text{cons} \\ +\text{cont} \\ +\text{voice} \\ +\text{high} \end{bmatrix}$$

COUNTER OCCURRENCES DUE TO COALESCENCE

The reduplicative process in Kara reproduces the first consonant and vocalic nucleus of the word. Thus [sɛŋ] 'to hunt' becomes [sesɛŋ] 'to search for'. This is the normal method for denoting iterative or continuous action, intensifying action, characterizations, or nominalizing. There are, however, some reduplicated forms in which there is a vowel change, e.g. [bɔk] 'to like or want' becomes [βubɔk]. Why should the reduplicated syllable contain a /u/

instead of an /o/? The occurrence of the /u/ in the reduplicated syllable suggests that perhaps a /u/ -initial vowel cluster is the underlying form, i.e. */buVk/. Now let us consider what the second vowel might be.

When the suffix /-ane/ is added to [bɔk] the final [k] is subject to a rule of spirantization, resulting in [boɣane].

RULE E: SPIRANTIZATION (SP)

$$\begin{bmatrix} +\text{ cons} \\ -\text{ cont} \\ -\text{ voice} \\ +\text{ high} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{ cont} \\ +\text{ voice} \end{bmatrix} \Big/ \underline{\qquad} \, [+\text{ syll}]$$

If the underlying vowel were either /i/ or /e/, the /ɣ/ would trigger VN, and the vowel would appear as a surface [ʌ]. On the other hand, if the vowel were an underlying /o/ or /u/, it would be subject to VR, so that the output would be *[bok] and the reduplicated form *[βobok]. With the exclusion of these potential candidates the only cardinal vowel left is /a/. Our hypothesis is that /u/ + /a/ ⟶ [ɔ] in some environments.

Schane (1973)[3] points out that, in Hanunoo, a metathesis rule is a likely prelude to a coalescence rule which simplifies the syllable structure. This appears to be the case for Kara also. The first person singular possessive, as pointed out already, is /igɑ/. However, when the word follows nouns indicating a kin relationship or referring to a body part which end in [+ extreme] vowels, an alternate suffix [-ak] occurs. This suffix is easily derived from /igɑ/ by a metathesis rule with a resultant devoicing of the now word final /g/, plus the deletion of the initial /i/. The /igɑ/ was chosen as the base form because of its occurrence as a separate word.

RULE F: METATHESIS (MT)

$$iga \longrightarrow iag \Big/ \begin{bmatrix} + \text{ inalienably possessed nouns} \\ + \text{ extreme} \end{bmatrix} \_\_\_\_$$

As mentioned previously the deletion of a morpheme initial /i/ sparks a mechanism which joins the two morphemes. In this case metathesis may well remove the initial /i/ to create a suffix. In other environments VR has the same effect (see [fʌmʌrega] page 5).

	'belonging to' + 'my'	'hand' + 'my'
UR	/si + igɑ/	/mɑ + igɑ/
MT	si + iɑg	mɑ + iɑg
DV	si + ɑk	mɑ + ɑk
VD	___	mɑ + k
SR	[siɑk]	[mɑk]
	'mine'	'my hand'

When, however, a noun with a stem final /u/ is marked for such possession the resulting vowel is [ɔ].

(8.) /pɑtu/ 'head' + [-ɑk] ⟶ [pɑtɔk] 'my head'

/isu/ 'nose' + [-ɑk] ⟶ [isɔk] 'my nose'

/ɣesu/ 'cousin opp. sex' + [-ɑk] ⟶ [ɣesɔk] 'my cousin'

Having posited that across morpheme boundaries /u + ɑ/ coalesce to [ɔ] we may extend this hypothesis to include forms with a single morpheme such as [bɔk], with /ɑ/ supplying the lowness and /u/ the rounding. Because the underlying /u/ surfaces in the reduplicated form the reduplication rule must precede the coalescence. Another example supporting this hypothesis is found in the reduplicated form [dudɔɣɔt] 'sticky' apparently derived from [dɔɣɔt] 'to go with'. All of the above examples of coalescence involve a velar stop or

fricative immediately following the coalesced cluster. This also provided the environment for VN.

RULE G: COALESCENCE (CO)

$$\begin{bmatrix} +\text{syll} \\ +\text{round} \\ +\text{extreme} \end{bmatrix} \begin{bmatrix} +\text{syll} \\ +\text{extreme} \\ -\text{high} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{syll} \\ +\text{round} \\ -\text{high} \\ -\text{tense} \end{bmatrix} / \text{——} \begin{bmatrix} +\text{cons} \\ +\text{high} \\ -\text{nasal} \end{bmatrix}$$

We may apply this rule to the data of set (9).

(9.)	'head' + 'my'	'nose' + 'my'	'cousin' + 'my'
UR	/patu + iga/	/isu + iga/	/ɣesu + iga/
MT	patu + iag	isu + iag	ɣesu + iag
DV	patu + ak	isu + ak	ɣesu + ak
CO	patɔk	isɔk	ɣesɔk
SR	[patɔk]	[isɔk]	[ɣesɔk]
	'my head'	'my nose'	'my cousin'

FURTHER EXAMPLES OF COALESCENCE EVIDENCED IN REDUPLICATION

A study of words apparently formulated by the reduplicative process reveals a consistent pattern of coalescence. The term [ŋaŋat] 'black ants' follows the expected pattern with the first consonant and vowel being reduplicated. [ŋɔŋau] 'to talk in one's sleep', on the other hand, gives no evidence for being a reduplicated word. However, the Tok Pisin word for 'malay apple' was borrowed directly from a language related to Kara as 'laulau' while the Kara word for this fruit is [lɔlau]. This suggests that the underlying form is actually a reduplication disguised by a coalescence of the complex nucleus.

(10.) [ŋɔŋɑu] 'to talk in one's sleep'

[yɔyɑu] 'to prophesy'

[vɔvɑu] ' spirit of a living man'

[ɣɔɣɑu] 'a yam'

[rɔrɑu] ' a loaf of sago'

[lɔlɑu] 'malay apple'

[ɣɑrɔrɑu] 'a type of fish'

[ŋɔŋɑul] 'to fish with a hand held line'

This occurrence appears to be parallelled by the/ɑi/in the words:

(11.) [mɛmɑi] 'a clan leader'

[ɣɛkɑi] 'a rake'

and in the genesis of the word [vɛvoi] 'honey bee' from [voi] 'honey'. These forms can be captured in a second coalescence rule as follows:

RULE H: COALESCENCE IN REDUPLICATED NUCLEI (CR)

$$\begin{bmatrix} +\text{ syll} \\ +\text{ low} \\ +\text{ extreme} \\ +\text{ tense} \end{bmatrix} \begin{bmatrix} +\text{ syll} \\ +\text{ high} \\ \alpha\text{ round} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{ syll} \\ +\text{ mid} \\ \alpha\text{ round} \\ -\text{ tense} \end{bmatrix} \; / \quad \text{Reduplication}$$

The evidence of [ŋɔŋɑul] indicates that instead of vowel clusters being sequential nuclei some may function as units.

VOCALIC CLUSTERS : SEQUENCES OR UNITS

We have said previously that we will treat vowel clusters as sequences; however the time has come to speak of cabbages and kings and complex unit phonemes. When first discovering there was a difference between [siʌk] and [siɑk] various village people were asked how the two differed? The answer

most frequently was, "Well, [siʌk] has one syllable and [siɑk] has two." Psycholinguistically Kara speakers recognize a syllable break between the [i] and [ɑ] of [siɑk] so that each phone is a syllable nucleus while the [iʌ] of [siʌk] receives only a single nuclear beat. This speaker perception was borne out by timing the two sequences and noticing a substantial decrease in length approximately one-third) across the [iʌ] cluster. Similar clusters [oʌ, eʌ, uʌ]fit the same approximate time frame. Further confirmation comes from the reduplicative process which reproduces the first consonant and vocalic nucleus of the word i.e., [lelɛk] 'to separate yourself so as to eat your food in private as a pig or chicken would'. Notice that what is reduplicated forward is the underlying [+ tense] form of the nucleus, not the [- tense] surface form. This fits the scheme of [+ tense] vowels in open syllables, [- tense] in closed syllables. However when dealing with /Vʌ/ nuclei an alternate form is brought forward.

[tʰɛtʰeʌk] 'strength/strong'

[sɛseʌk] ' to hit the mark'

[lɔloʌk] 'birth'

These [- tense] reduplicated nuclei which contravene our general rule are apparently due to the coalescence of the complex nuclei into the [- tense] form of the initial vowel.

$$[C\dot{V}\wedge k] \qquad \text{Redup} \longrightarrow [C\bar{V}C\dot{V}\wedge k]$$

$$C\begin{bmatrix} +\text{syll} \\ +\text{tense} \\ \propto \text{front} \\ -\propto \text{round} \\ -\text{low} \end{bmatrix}\begin{bmatrix} +\text{syll} \\ +\text{front} \\ +\text{low} \end{bmatrix} k + \text{Redup} \longrightarrow C\begin{bmatrix} +\text{syll} \\ -\text{tense} \end{bmatrix}$$

Other vocalic clusters also appear to act very much as units, notably those that fit the SD $\begin{bmatrix} + \text{ syll} \\ - \text{ front} \end{bmatrix} \begin{bmatrix} + \text{ syll} \\ + \text{ high} \end{bmatrix}$. As a result [ni.u] 'stonefish' or [pi.u] 'dog' and [nui] 'nest' and [fui] 'hair' are very different. [p^hu.a] 'to go downward' is very different from [pau] 'frog' and [vi.o] 'pig' and [voi] 'honey' also differ greatly both in manner of enunciation and meaning. This distinction also carries over in to other environments so that [vu.al] 'jungle' receives two beats while [vaul] 'hole' receives one. The mechanics of the grammar offer some guidance in how to view these complex units. The morpheme for adding an object to a verb stem is the suffix [-ye]: [lʌpʌ + ye] 'to overlap it (a building joint)'; [fadu + ye] 'cause it to drop down'. But when the stem ends in [i] or a consonant the [y] is redundant so deletes: [fani + e] 'to climb it'; [l$_{\varepsilon}$p + e ⟶ le.pe] 'to wave it'. What we notice in the consonant final stem is a realignment of syllable structure from CVC + V to CV.CV with resultant tensing of nuclei in the now open syllables. Switching attention to stems ending in vowel clusters we get these results

[fai + e] ⟶ [fa.ye] 'to work it (sago)' (not a good test case due to y deletion following)

[su.ai + e] ⟶ [su.a.ye] 'to respect him'

[rau + e] ⟶ [ra.we] 'to sound it (make it cry or sound)'

[liu + ye] ⟶ [li.u.ye] 'to sling it'

[fa.ti.a.ye] 'to cause him to dance'

and possibly [fe.o + ye] ⟶ [fe.o.ye] 'to whistle it'. We see the clusters we believe are acting as units receiving the same treatment as final consonants while suspect vowel sequences receive the treatment of stem final single vowels. At this point it is easy to hypothesize the high second vowel of a unit as losing its syllabicity.

Some additional corroboration comes from the manner of possessing inalienable nouns where all final clusters are treated in the same manner as the final consonants.

[vilɑu igɑ] 'my intestines'

[riɑ igɑ] 'my blood'

[ɣɑɣɑluɑ igɑ]'my picture or likeness'

[fui igɑ ⟶ fuigɑ] 'my hair' (i deletion signals a coalescence)

The testimony of the inalienable noun possession is non-committal as all words ending in a vowel cluster receive the treatment of those ending in consonants and [- extreme] vowels.

THE STATUS OF /ʌ/

Surface [ʌ] is a frequently occurring form and contrasts strongly with the five cardinal vowels. We have seen, however, that it is limited in distribution, not occurring in clusters except preceding /ɣ/ and then only as the second member. We have suggested that this is probably the result of a neutralization rule (Rule VN). Like the other [+ extreme, - tense] phones, [ʌ] contrasts with its geminate, but contrary to [i] and [ʊ] the /ʌ/ appears in open syllables word medially and finally contrasting with /ɑ/.

(12.)

/sɑŋ/ 'big clam'	/fulɑ/ 'again'
/sʌŋ/ 'to start/alone'	/fulʌ/ 'to plan'
/ŋɑs/ 'sun/to swim'	/ɣɑwɑ/ 'cemetery'
/ŋʌs/ 'to tear down'	/ɣɑwʌ/ 'rubbish'
/tɑf/ 'placenta'	/funɑ/ 'usually'
/tʌf/ 'to dust yourself off'	/funʌ/ 'source'
/pɑn/ 'to go'	/lɑmʌk/ 'a manner of fishing'

/pʌn/ 'shallow' /lʌmʌk/ 'coconut frond'

/vʌbɑt/ 'very thick' /vɑbʌt/ 'the wall of a house'

The vowel laxing rule with an underlying cluster then in contrast with the [- tense] /ʌ/ similar to Rule C VD could provide a partial explanation. The most likely cluster candidate is [ɑe] since this combination has not been detected as occurring in any environment.

UR	*[sɑŋ]	*[sɑeŋ]
VL	[sʌŋ]	*[sɑeŋ]
VD	-	[sɑŋ]
SR	[sʌŋ]	[sɑŋ]
	'to start/alone'	'big clam'

Vowel Reduction could also contribute to the distinction.

[mʌtʌk] 'not ripe yet'

[mʌtɑ + ɑk] ⟶ *[mʌtɑɑk] ⟶ [mʌtɑk] 'my eye'

Another notable hole in the distribution is the absence of /e/ word final except the two inalienably possessed nouns (page 5). The morpheme /-ye/-e/ (third person singular object) is very evident and it is quite possible that non-inalienable noun words especially verb stems would have a final /e/ that neutralized to ə /ʌ/

[ɣɑwɑ] 'cemetery'

*[ɣɑwe] ⟶ [ɣɑwʌ] 'rubbish'

[ɣɑu+e] ⟶ [ɣɑwe] 'to close it'

thus avoiding a great deal of confusion. As previously discussed the Vowel Neutralization Rule is another source of /ʌ/ but only in clusters. Quite possibly so is Coalescence. Even so not every occurrence of /ʌ/ has been explained or attributed to the conditioned reflex of another single vowel.

In the present form of the language /ʌ/ appears to function as a full phoneme in spite of our etic reservations. In closing it is interesting to note that in the consonants a neutralization of contrast occurs in the high back area phonemes (word final k, g, and ɣ) and in the vowels there is a suspected neutralization of contrast in the low front area (ʌ e and ɑ).

CONCLUSION

Throughout the language juxtaposition of vowels even across word boundaries creates a tension which is reflected in the [+ tense] quality. It is as if each vowel marches forth from the speaker's mouth looking over its own shoulder to see what is pursuing it. Even when an identical or homorganic vowel deletes the tension remains. Several processes have been discussed to, if not resolve, then at least somewhat alleviate that tension.

1. Deletion as VR, VD or morpheme joining.
2. Unification as in the clusters $\begin{bmatrix}+\text{syll} \\ -\text{front}\end{bmatrix}\begin{bmatrix}+\text{syll} \\ +\text{high}\end{bmatrix}$ so that in open syllables the final [+ high] vowel ⟶ [- syll] enabling a shift in syllable boundaries when followed by a third vowel [bɑɣ ⟶ bɑ.ye] 'to not like/want it'.
3. Neutralization as in the clusters [iʌ, eʌ, oʌ, uʌ]
4. Coalescence as in [bɔk] *[buɑk] or in reduplication of a single [- tense] form of a complex nuclei.
5. Reduction of unwieldy forms by the judicious use
   *[u.ɑ.i] ⟶ *[wɑ.i] ⟶ [wɑiy] 'tree'
   *[i.i] ⟶ [yi] 'kunai grass'
   both end products falling into the familiar CV or CVC pattern.

Morphophonemic conditioning of Kara vowels is readily apparent. So too is the necessity for further study. We have decided totreat the whole vocalic system as one big game which we play every chance we get.

NOTES

Note 1: from page 3, Table 2: refer to section entitled The Status of /ʌ/.

Note 2: from page 3, Table 2: The distinctive feature "extreme" is used to differentiate /i, u, ɑ/ the most frequently occurring vowels, from /e, ʌ, o/. An indication that this is a natural class is demonstrated by two different systems for marking possession of kinship terms and body parts based on the coda of the noun. A term ending in a consonant, a vowel cluster or /e, o, ʌ/ requires a separate word possessive marker while terms ending in /i, ɑ, or u/ receive a possessive suffix.