

Kroeger, Paul R. 1994. "Vowel Harmony, Neutralization and Inalterability in Dusun vs. Murut." Paper presented at the Seventh International Conference on Austronesian Linguistics, 22-27 August, 1994, Leiden. **Note:** a new footnote (9) containing additional data was added to this document in March, 2013.

# Vowel Harmony, Neutralization and Inalterability in Dusun vs. Murut

Paul R. Kroeger  
S.I.L., Malaysia Branch

## 1. Introduction\*

This paper discusses the vowel harmony systems of two related languages, both spoken in the Malaysian state of Sabah (formerly British North Borneo). As will be demonstrated below, the superficial pattern of alternations is almost identical in the two languages. However, a closer investigation of the data reveals that the rule systems which underlie these alternations are in fact almost mirror images of each other.

In Dusun, a regressive rule of Vowel Harmony changes /o/ to /a/ when the immediately following vowel is an /a/. That is, the low vowel /a/ "spreads" from right-to-left across adjacent non-high vowels (/o/), one syllable at a time. The following examples illustrate this pattern:

### (1) **Kimaragang Dusun Vowel harmony**

noko-dagaŋ	→	nakadagaŋ	'sold' different on the different printouts
poN-omot-an	→	paŋamatan	'harvest time'
po-ogom-an	→	paagaman	'place where you set something'
ondom-an	→	andaman	'remember'
o- sodoy -an	→	asadayan	'all day long'
-in-poN-olos-an	→	pinaŋalasan	'the person you borrowed from'

There is a distinct process of Vowel Neutralization which changes non-final /a/ to /o/ when a suffix is added. Although this change is the opposite of the Vowel Harmony effect illustrated in (1), it is neither harmonic nor disharmonic since it does not depend in any way on the quality of the suffix vowel, as the following examples demonstrate:

---

\*I would like to express my gratitude to Richard Brewis and Jim Johansson, for helping me to compile the data for this paper; and to Jack Prentice for extensive comments on an earlier version.

(2) **Kimaragang Dusun Vowel neutralization**

talib + -an	→	toliban	‘to pass by’
lasu + -an	→	losuan	‘to feel hot’
sawo + -on	→	sowoʔon	‘to marry’
tanom + -on	→	tonomon	‘to plant’

Very similar processes are found in Murut. Note the change of /o/ to /a/ in (3), closely paralleling the alternation in (1); and the change of /a/ to /o/ in (4), closely paralleling the alternation in (2).

(3) **Timugon Murut**

orop + -an	→	arapan	‘perch’
ojoy + -an	→	aʔayan	‘go’
sakoy + -an	→	sakayan	‘mount, ride’

(4) **Timugon Murut**

tanom + -on	→	tonomon	‘plant’
patoy + -on	→	potoyon	‘kill’
pa- + sakoy + -on	→	posokoyon	‘cause to mount’
paN- + takod + -on	→	ponokoron	‘live-with’

However, it turns out that (4), rather than (3), is the result of Vowel Harmony, while (3), rather than (4), is the result of Vowel Neutralization. In other words, both languages have both rules; but the effect of each rule in Murut is (almost) the mirror image of the effect of the corresponding rule in Dusun. I will suggest that the crucial parameter of difference between these two systems lies in the choice of “unmarked” or neutral vowel: /o/ for Dusun, /a/ for Murut.

Another interesting difference emerges concerning the role of geminate vowels. Dusun Vowel Harmony is (somewhat unexpectedly) constrained by Geminate Inalterability: geminate vowels systematically resist Vowel Harmony. In Murut, it appears (even more surprisingly) that Vowel Harmony can only be triggered by a geminate (or rather, doubly-linked) vowel; but I will argue that this fact is actually epiphenomenal, following as an incidental consequence from the interaction of other constraints. There is, however, a different kind of Geminate Integrity principle in Murut, which blocks the application of Vowel Neutralization in certain contexts. Without this Geminate Integrity effect, under the

analysis proposed below, Vowel Neutralization would bleed all occurrences of Vowel Harmony.

## 2. Descriptive overview

Dusunic and Murutic are actually two clusters of closely related languages and dialects. The close relationship of these two clusters to each other is seen not only in shared vocabulary items (roughly 50% shared cognates; Smith, 1984),<sup>1</sup> but also in extensive phonological and grammatical similarities. Both groups of languages exhibit characteristic Philippine-type morpho-syntactic features.

Both of these groups of languages exhibit a basic 4-vowel system: /i,a,o,u/. High vowels neither trigger nor undergo Vowel Harmony, and are in fact opaque (blocking the application of the rule to any non-high vowels to their left). The back mid vowel, which is traditionally represented as /o/, is normally unrounded or only slightly rounded in most Dusunic languages. It has a fairly wide range of allophonic variants in some languages, but its most basic realization is generally as a central or back unrounded vowel ([ʌ] or [ɤ]) (Miller, 1993). In Murut, it is most often pronounced as [ɔ] (Prentice, 1971; K. Brewis, 1988; Harris and Chapple, 1993).

As representative languages for these two groups, I have selected Kimaragang, a Dusunic language spoken in northeastern Sabah; and Timugon, a Murutic language spoken in the Tenom district. The Kimaragang data comes from my own field notes, and from a preliminary draft of a Kimaragang dictionary by my colleague, Jim Johansson. Much of the Timugon data, as noted below, is taken from Prentice (1971); the rest was provided by Richard Brewis and Silipa bte. Majius (p.c.), supplemented by examples from K. Brewis (1988) and Brewis & Brewis (1988).

### 2.1. Kimaragang Dusun

As stated above, most Dusunic languages exhibit a 4-vowel system: /i,a,o,u/. In Kimaragang the mid front vowel /e/, which is present as an allophone in Central Dusun,

---

<sup>1</sup>Languages within each cluster share approximately 65-75% cognate vocabulary (Smith, 1984).

Rungus and some other Dusunic dialects, has (fairly recently) developed into a fifth contrastive surface vowel. This vowel is derived historically from the sequences \*/o(?)i/ and \*/a(?)i/ after merger of \*h with \*ʔ.<sup>2</sup> But this development is not of major significance to the present study, and we will ignore it in what follows.

### 2.1.1. Vowel Harmony

The rule of vowel harmony in Kimaragang changes /o/ to /a/ when the immediately following vowel is an /a/, as noted above. The following examples (some repeated from (1)) illustrate the effect of vowel harmony:

- (5) **Kimaragang Dusun Vowel Harmony**
- |                     |   |             |                                 |
|---------------------|---|-------------|---------------------------------|
| noko-dagaŋ          | → | nakadagaŋ   | ‘sold’                          |
| poN-omot-an         | → | paŋamatan   | ‘harvest time’                  |
| po-ogom-an          | → | paagaman    | ‘place where you set something’ |
| poN-tanom-an        | → | pananaman   | ‘time/place of planting’        |
| ondom-an            | → | andaman     | ‘remember’                      |
| -in-poN-olos-an     | → | pinajaŋalan | ‘the person you borrowed from’  |
| (olos = ‘borrow’)   |   |             |                                 |
| -in-poN-asok-an     | → | pinajaŋakan | ‘the place you planted’         |
| (asok ‘plant rice’) |   |             |                                 |

High vowels neither trigger nor undergo vowel harmony. Moreover, the process is blocked when a high vowel intervenes between the /a/ and a preceding /o/. The /o/’s in the examples in (6a) do not undergo vowel harmony, even though a suffix containing an /a/ is added, because they are shielded by an intervening high vowel. Semivowels (/y,w/) do not block vowel harmony, as shown by the examples in (6b):

- (6) a. sogit + -an → sogitan ‘cold’  
 sobu + -an → sobuan ‘urinate’  
 oliŋ + -an → oliŋan ‘forget’
- b. o- sodoy -an → asadayan ‘all day long’  
 o- roloy -an → aralayan ‘to be overgrown (e.g. with vines)’  
 poki-REDUP-bolow-an → pokibabalaʔan ‘wish to cause blindness’

<sup>2</sup>A parallel development changed Dusunic \*/o(?)u/ and \*/a(?)u/ to Kimaragang /o(?)o/.

Examples like those in (7) demonstrate two additional facts about the harmony process. First, it is unidirectional: /a/ does not spread from left-to-right, but only from right-to-left. Second, although both non-high vowels are involved in the process, only one of them (/a/) can trigger it; /o/ does not spread to the left when preceded by /a/:

- (7)    dagaŋ + -on    →    dagaŋon    ‘buy’  
       rapaʔ + -on    →    rapaʔon    ‘to boil something’  
       lapak + -on    →    lapakon    ‘to split’

Let us provisionally assume that Vowel Harmony is a simple autosegmental spreading process. The first question to be addressed is, what is the harmonic feature? That is, what is the autosegment which spreads? Notice first that the harmonic feature must be the feature which distinguishes between /a/ and /o/, and second, that only one value of the harmonic feature spreads (that borne by /a/).

The minimal set of features needed to specify a 4-vowel system is, of course, two. In this case, we could easily use the features [ $\alpha$  high,  $\beta$  round] to distinguish the four vowels /i,u,a,o/. However, there are several objections to this analysis. First, as noted above, the actual pronunciation of /o/ in Dusunic languages is normally unrounded or only slightly rounded, except in certain specific environments. Thus height, rather than rounding, seems to be the primary feature which distinguishes /o/ from /a/. Second, the two-feature system leaves no room for the emergence of the fifth surface vowel in Kimaragang, /e/.

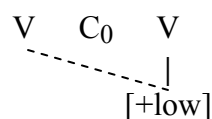
The standard analysis of Dusunic languages assumes that the feature which minimally distinguishes /a/ from /o/ is [ $\alpha$  low] (see, for example, Hurlbut (1993); Pekkanen (1993)).

This assumption leads to the following classification of the four Dusun vowels:

(8)

	i	u	a	o
High	+	+	-	-
Back	-	+	+	+
Low	(-)	(-)	+	-

Based on this analysis, we can formulate the rule of Vowel Harmony as one which spreads the feature [+ low] from right to left, as shown in (9). Only /a/ can trigger the rule, since only /a/ is [+ low]. Assuming that a redundancy rule blocks the feature combination \*[+ high,+ low], this would explain why high vowels do not undergo Vowel Harmony.

(9) **Vowel Harmony in Kimaragang**

One objection to this analysis is that “lowness” harmony is highly unusual.<sup>3</sup> A more plausible analysis might be to assume that the harmonic feature, which minimally distinguishes /a/ from /o/, is [ $\alpha$  lax]. The Dusunic pronunciation of /o/ as a back unrounded vowel [ɤ] typically involves quite a noticeable degree of tension in the back of the throat, particularly in the Central and West Coast dialects. High vowels are redundantly [- lax] (i.e. tense) at UR (and, by structure preservation, in the lexical component), though in some Dusunic languages they have lax allophonic (post-lexical) variants in closed syllables. Moreover, [lax] is not contrastive for consonants. Thus this analysis could provide a very natural explanation for the fact that high vowels are opaque while all consonants, including semivowels, are transparent.

At this point, however, the identity of the harmonic feature is not of crucial importance. The chart in (8) rule and the rule in (9) can be formulated in the same way whether the feature [lax] or [low] is used.

Finally, we might ask whether VH is a lexical rule. The following observations suggest it is:

1. VH is obligatory and categorial.
2. VH is structure preserving (Kiparsky, 1985).
3. VH does not apply across clitic boundaries:<sup>4</sup>

oŋo- (pl.) + gayo ‘big’	→	oŋogayo ‘big (pl.)’	(*angagayo)
oŋo- + DUP + maal ‘expensive’	→	oŋomamaal	(*angamamaal)
po ‘yet’ + ma (particle)	→	poma ‘even if’	(*pama)

4. VH does not apply into “level 2” prefixes. (I use this label here to refer to a set of prefixes which systematically fail to undergo normal phonological processes such as Nasal Assimilation, merger of /o+i/ → /e/, and Vowel Harmony. No careful analysis

<sup>3</sup>Thus far I know of no other Vowel Harmony system in which the feature [+ low] spreads.

<sup>4</sup>The same holds for VN as well: akano? po ‘eat!’, etc.

of “level ordering” in Kimaragang has yet been attempted). The failure of VH in these forms is illustrated below:

soŋ- ‘all’ + akan ‘eat’	→	soŋakan-akan ‘each one eating’
soŋ- + DUP + ago ‘hurry’	→	soŋagaago ‘all hurrying around’
soro- ‘each’ + DUP + walu ‘eight’	→	sorowawalu ‘eight apiece’
soro- + DUP + opod ‘ten’ + -an	→	soroapapadan ‘having 10 each’
ponoko- + DUP + lamin ‘room’	→	ponokolalamin ‘use as a room’
ponoko- + DUP + talib ‘pass by’	→	ponokotatalib ‘keep passing by’

5. A small number of lexical exceptions are found, e.g. mogkonan ‘to negotiate marriage payment’, from the root konan.<sup>5</sup>

Based on these considerations, I will assume that VH is a lexical rule.

### 2.1.2. Vowel Neutralization

The examples in (7) above demonstrated that “reverse vowel harmony” does not occur; that is, /a/ does not change to /o/ when the following vowel is /o/. However, there is another context in which the change from /a/ to /o/ can be triggered. This process is illustrated in the following examples:

#### (10) Kimaragang Dusun Vowel Neutralization

a. talib + -an	→	toliban	‘to pass by’
b. lasu + -an	→	losuan	‘to feel hot’
c. anu + -on	→	onuwon	‘to take’
d. sawo + -on	→	sowoʔon	‘to marry’
e. tanom + -on	→	tonomon	‘to plant’
f. rayow + -on	→	royoʔon	‘to praise’

In these examples, /a/ is the first vowel in a disyllabic root whose second vowel is not /a/. When a suffix is added, the /a/ changes to /o/. If the suffix is /-an/ (as in 10a-b), which would trigger vowel harmony, this change is only observed when the second root vowel is

<sup>5</sup>This spelling is given in Johansson’s field dictionary; check for geminate vowel in penultimate syllable?? The following forms seem to represent lexical exceptions involving VN:

wayaʔ + -on	→	woyoʔon	‘to be followed; leader’
sawat + -on	→	sowoton	‘make higher’

compare:

rapaʔ + -on	→	rapaʔon	‘to boil’
sawak + -on	→	sawakon	‘(gloss??)’

high. If the suffix is /-on/, which cannot trigger vowel harmony, the change is observed even when the second root vowel is not high, as in (10d-f).

I will postpone a precise formulation of the rule of Vowel Neutralization until section 4, where I will argue that this alternation is caused by a shift in stress placement. The fact that neutralization can only be observed when the neutralized vowel is not affected by Vowel Harmony indicates that VN must be ordered to precede VH. If the opposite ordering were possible (i.e. VH before VN), the neutralization would always be observable, whether or not there was a high vowel in the final root syllable, and regardless of the quality of the suffix vowel; and we would get forms like \*poŋomatan, \*ondaman, etc. instead of paŋamatan, andaman, etc. (cf. example (5)).

In summary, I posit two distinct phonological rules which affect the quality of vowels in Kimaragang: one a rule of vowel harmony, which changes /o/ to /a/, and the other a rule of neutralization which reduces /a/ to /o/.

## 2.2. Timugon Murut

Timugon exhibits the typical Murutic 4-vowel system: /i,a,o,u/. At first glance, the following alternations suggest that Timugon has a rule of vowel harmony quite similar to that of Kimaragang: /a/ spreads to replace /o/, right-to-left:

### (11) Timugon Murut

orop + -an	→	arapan ‘perch’ (LocF) <sup>6</sup>
oŋoy + -an	→	aŋayan ‘go’ (LocF)
sakoy + -an	→	sakayan ‘mount, ride’ (LocF)
in- + abot + -an	→	inabatan ‘belt’ (RF, past tense)
paG- + sigo + -an	→	pansigaan ‘spying place’ (LocF)

(cf. mansigo ‘to spy on’)

And, once again, the rule fails to apply in the reverse direction (left-to-right):<sup>7</sup>

<sup>6</sup>I use the following abbreviations for the “focus” (or voice) affixes on the verb: AF = ‘Actor Focus’ (= Prentice’s ‘Subject Focus’); OF = ‘Object Focus’; RF = ‘Referent Focus’; LocF = ‘Locative Focus’ (usually corresponds to Prentice’s ‘Associate Focus’). Referent Focus generally marks the subject as being the goal, recipient or benefactive of the action, though may have a locative sense with intransitive verbs.

<sup>7</sup>The only case in which it appears that /a/ spreads from left-to-right is when a root ending in /a/ or /a?/ is followed by the suffix -on or -o?. No sequence of contiguous distinct non-high vowels is allowed in



- (12) akan + -on → akanon 'eat' (OF) (Prentice, p. 127)  
 baal + -on → baalon 'make' (OF) (Prentice, p. 136)

Timugon also has a process which appears to be similar to the Kimaragang rule of Vowel Neutralization which was illustrated in example (10) above. In Timugon, /a/ changes to /o/ in roots of form CaCo(C) when the suffixes -on or -o? are added (cf. Prentice, p. 112):<sup>8</sup>

- (13) tanom + -on → tonomon 'plant' (OF) (Prentice, p. 113)  
 patoy + -on → potoyon 'kill' (OF) (Prentice, p. 136)  
 abot + -on → oboton 'belt' (OF)  
 rakop + -on → rokopon 'catch (w/ noose)' (OF)  
 pa- + sakoy + -on → posokoyon 'cause to mount' (OF)  
 paN- + takod + -on → ponokoron 'live-with' (OF) (Prentice, p. 113)  
 paG- + latok + -on → porotokon 'cause to mix' (OF) (Prentice, p. 137)

However, when we look at a wider sample of data certain differences emerge.

Crucially, in Timugon this change does not occur if the suffix vowel is not /o/, or if some other vowel intervenes between /o/ and /a/. Contrast the invariant /a/'s in the following examples with the Kimaragang pattern illustrated in examples (10a-c) above:

- (14) tampio + -on → tampioon 'drought-stricken' (Prentice, p. 144)  
 andu? + -on → anduon 'marry' (OF)  
 pali + -on → palion 'abstain from' (OF)  
 sapuk + -on → sapukon 'shoot with blow-gun' (OF)  
 taji? + -in → tajiin 'weep for' (RF) (Prentice, p. 138)  
 paG- alig -in → pagaligin 'exchange' (RF) (Prentice, p. 139)  
 paG- andu? -an → paganduan 'marry each other' (LocF) (Prentice, p. 140)  
 paG- saruy -an → pansaruyan 'swim' (LocF) (Prentice, p. 140)

Timugon, forcing the change from /a(?)o/ → /aa/ (with the deletion of intervocalic glottal stop):

tuna? + -on → tunaan 'place upright, stand up' (OF)

Further examples:

asa? + -on → asaan 'sharpen' (OF) (Prentice, p. 112)

gaba? + -on → gabaan 'push over' (OF)

<sup>8</sup>Following a suggestion from Prentice (p.c.), I have written intervocalic and word-initial /d/ in native Timugon words as [r]. This represents a change from Prentice's phonemic orthography, used in his ch. 2 and 5 (1971), to his practical orthography, used elsewhere in his work and by my other sources. Prentice analyzes the flap [r] as an allophone of /d/ occurring in intervocalic and word-initial positions. Brewis and Brewis (p.c.) report that a contrast is emerging in the language, partly due to Malay loan words; but words in which [d] appears in these positions are still extremely rare.

There is a third pattern of vowel alternation in Timugon of a very surprising kind, an apparent disharmony rule, unlike anything in Kimaragang. The RF suffix *-in*, even though it does not contain an /a/, also triggers the change from /o/ to /a/ (cf. Prentice, p. 113, paragraph E). The same change is also triggered by the imperative form of the RF suffix, *-i?*:

(15)	tanom + -in	→	tanamin	‘plant’ (RF)	(Prentice, p. 113)
	abot + -in	→	abatin	‘belt’ (RF)	
	atod + -in	→	atarin	‘escort’ (RF)	(Prentice, p. 138)
	rakop + -in	→	rakapin	‘catch (w/ noose)’ (RF)	
	oŋoy + -in	→	aŋayin	‘go’ (RF)	
	sigo + -in	→	sigain	‘spy on’ (RF)	
	orop + -in	→	arapin	‘perch’ (RF)	
	pa- korojo -in	→	pakarajain	‘cause to work on’ (RF)	(Prentice, p. 138)
	sakoy + -i?	→	sakayi?	‘mount, ride’ (RF imperative)	

This alternation appears at first glance quite inexplicable. However, the change begins to make sense in light of two generalizations about the distribution of vowels within a word noted by Prentice (1971, p. 22, sec. 2.3.4.1.1): First, /o/ may only occur in non-final syllables of morphemes and words if /o/ also occurs in all following syllables. Second, if /o/ occurs in the last two syllables of a word, /a/ may not occur in preceding syllables of the word unless another vowel intervenes. We can represent these constraints schematically as follows (with  $C_0$  representing a sequence of zero or more consonants):

(16) **Restrictions on distribution of /o/ in Timugon** (based on Prentice, 1971):

- a. \*... o  $C_0$   $V_1$  ... (where  $V_1$  is not /o/)
- b. \* ... a  $C_0$  o  $C_0$  o ...

Given the constraints in (16), all of the Timugon vowel alternations discussed thus far follow as necessary consequences. One could view these alternations as repair mechanisms which are triggered whenever some morphological process creates a form which violates one of the two constraints. For example, the right-to-left spreading of /a/ to replace /o/ is due to the constraint in (16a). The underlying forms in the following examples (repeated from (11)) violate this constraint because an /o/ is followed by another vowel in the same word, in this case /a/; the illicit form is repaired by changing the /o/’s to /a/:

- (17) orop + -an → arapan ‘perch’ (LocF)  
 ojoy + -an → ajoyan ‘go’ (LocF)

The puzzling “disharmony rule” triggered by the suffix -in follows in exactly the same way from the constraint in (16a). Once again an /o/ in the underlying forms is followed by another vowel in the same word, in this case /i/, and once again the form is repaired by changing the /o/’s to /a/:

- (18) (repeated from (15))
- |                |   |            |                               |                    |
|----------------|---|------------|-------------------------------|--------------------|
| tanom + -in    | → | tanamin    | ‘plant’ (RF)                  | (Prentice, p. 113) |
| atod + -in     | → | atarin     | ‘escort’ (RF)                 | (Prentice, p. 138) |
| ojoy + -in     | → | ajayin     | ‘go’ (RF)                     |                    |
| pa- korojo -in | → | pakarajain | ‘cause to work on’ (RF)       | (Prentice, p. 138) |
| sakoy + -i?    | → | sakayi?    | ‘mount, ride’ (RF imperative) |                    |

The “vowel neutralization” pattern which was illustrated in example (13) follows from the constraint in (16b). When the suffix -on is added to a root whose final syllable contains an /o/, a sequence of two /o/’s is created. The constraint in (16b) says that the syllable immediately preceding such a sequence cannot contain /a/. When the morphemic representation of a form violates this constraint, it is repaired by changing the /a/’s to /o/:

- (19) tanom + -on → tonomon ‘plant’ (OF) (Prentice, p. 113)  
 patoy + -on → potoyon ‘kill’ (OF) (Prentice, p. 136)  
 paN- + takod + -on → ponokoron ‘live-with’ (OF) (Prentice, p. 113)

This account correctly predicts that the “neutralization” rule in Timugon will only be triggered by the suffix -on, and that it will be blocked by an intervening high vowel,<sup>9</sup> unlike the superficially similar process in Kimaragang. A further consequence of the same

---

<sup>9</sup> The following examples from Prentice (1971) (added to this document in March, 2013) demonstrate that high vowels are opaque; i.e., they block the leftward spread of a penultimate /o/:

- /tampio + -on/ [tampioon] ‘drought-stricken’ (Prentice, p. 144)
- /mati- + koolong/ [matikoolong] ‘wants to sleep’ (Prentice, p. 134)
- makausoso ‘noisy’ (Prentice, p. 86)
- nalingongon ‘done completely’ (Prentice, p. 235)
- sangkinolor ‘one moment’ (Prentice, p. 248)
- nangkirongog ‘pay attention’ (Prentice, p. 250)
- l<in>opot ‘rice packet’ (Prentice, p. 126)
- inggonom ‘six times’ (Prentice, p. 117)
- minongoy ‘went’ (Prentice, p. 151)
- sundoyon ‘type of jar’ (Prentice, p. 230)

constraint is that, as noted by Prentice (1971, p. 112), the vowel /o/ can spread from right-to-left, usually from root to prefix, whenever the last two syllables of a word contain /o/. Once again this pattern has no parallel in the Kimaragang data. Note the alternation in the prefix vowel in the following examples, /o/ before /o/ and /a/ before all other vowels:

- (20) maG- + bilin → mambilin ‘inform’ (AF, pl. subj.)<sup>10</sup>  
 maG- + bolog → mombolog ‘sleep’ (AF)  
 mapa- + turu’ → mapaturu’ ‘aim’ (Prentice, p. 135)  
 mapa- + ojoy → mopoojoy ‘cause to go’ (Prentice, p. 135)

In this way, the two constraints on the distribution of /o/ can be seen to trigger several different kinds of vowel alternations in Timugon. However, these constraints themselves require a phonological explanation. As they are stated above, they seem completely *ad hoc*. What principles of the language are responsible for the restricted distribution of /o/? A preliminary answer to this question will be outlined in the following section.

### 3. Explaining the distributional restrictions in Timugon Murut: a first approximation

K.P. Mohanan (p.c.) has pointed out to me that both the distributional restrictions in (16), and the pattern of alternations illustrated in (11-15) and (20), can be explained by making the following assumptions (for simplicity, I will assume that vocalic and consonantal melodies are represented on separate tiers):<sup>11</sup>

- (21) a. The melodic features [o] may not appear in non-final position on the V-melody tier.  
 b. Any [o] which violates this constraint is delinked and subsequently deleted (through stray erasure).  
 c. /a/ is the neutral vowel in Timugon; unspecified vowels are realized as /a/ by default spell-out rules.  
 d. An [o] which is linked to more than one V slot spreads to a non-high (or unspecified) vowel on its left (that is, doubly linked /o/ replaces /a/ from right-to-left).

<sup>10</sup>Prentice (p.c.) states that either singular or plural subject is possible with this form.

<sup>11</sup>One might suggest that not just melodies but C and V slots as well should be represented in separate tiers, as in McCarthy’s work on Arabic. But this hypothesis is not well motivated, since Timugon has neither templatic morphology nor predictable CV patterns (ref??).

In other words, the rules in Timugon have roughly the opposite effect from their counterparts in Kimaragang. Alternations in which underlying /o/ changes to /a/, as in (11) and (15) above, are the result of neutralization (delinking followed by default feature assignments); alternations in which underlying /a/ changes to /o/, as in (13) and (20) above, are the result of Vowel Harmony, which is triggered only by doubly linked /o/'s. Let us work through some sample derivations in detail.

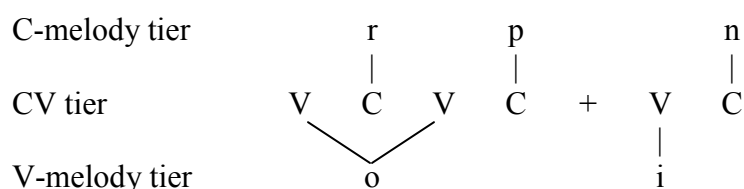
Assumption (21a) implies that Vowel Neutralization will apply whenever an /o/ appears in a non-final syllable, unless all vowels to its right are also /o/. As stated, this constraint assumes that consecutive /o/'s share a common melody node, through some kind of OCP effect. Thus the last n syllables of a word may all contain /o/'s, but there will only be one melody node and it will be in final position on its tier. Some relevant forms are repeated below:

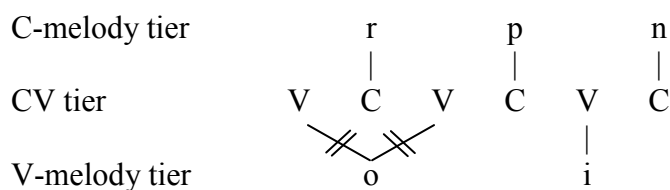
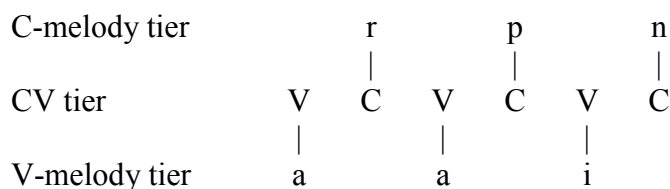
(22) **Timugon Murut Vowel Neutralization**

orop + -an	→	arapan 'perch' (LocF)
oŋoy + -an	→	aŋayan 'go' (LocF)
rakop + -in	→	rakapin 'catch (w/ noose)' (RF)
oŋoy + -in	→	aŋayin 'go' (RF)
orop + -in	→	arapin 'perch' (RF)
pa- korojo -in	→	pakarajain 'cause to work on' (RF) (Prentice, p. 138)
sakoy + -i?	→	sakayi? 'mount, ride' (RF imperative)

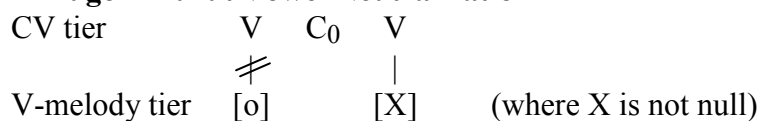
The alternations are the result of delinking non-final /o/'s, which are then spelled out as /a/ by default rules as shown below:

(23) **/orop/ + /-in/ → /arapin/: UR**



**Vowel Neutralization (21b)****Default spell-out rules (21c)**

The Vowel Neutralization rule could be formulated somewhat informally as follows: delink an [o] which is not final on its tier. (The association lines in the following diagram are not meant to be exhaustive, i.e., the indication of a single linkage is not intended to exclude multiply-linked melodies from being delinked.)

**(24) Timugon Murut Vowel Neutralization**

The Vowel Harmony rule proposed in point (21d) above seems odd, in that only doubly-linked [o]'s can spread. However, examples like those in (25b) make it clear that a single /o/ never spreads:

**(25) Timugon Murut Vowel Harmony**

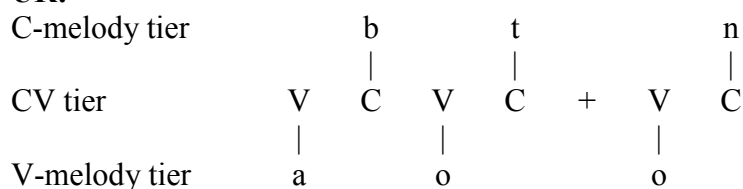
- |                    |   |                                 |                    |
|--------------------|---|---------------------------------|--------------------|
| a. tanom + -on     | → | tonomon 'plant' (OF)            | (Prentice, p. 113) |
| abot + -on         | → | oboton 'belt' (OF)              |                    |
| rakop + -on        | → | rokopon 'catch (w/ noose)' (OF) |                    |
| pa- + sakoy + -on  | → | posokoyon 'cause to mount'      |                    |
| paN- + takod + -on | → | ponokoron 'live-with' (OF)      | (Prentice, p. 113) |
| maG- + bolonj      | → | mombolonj 'sleep' (AF)          |                    |
| mapa- + onjoy      | → | mopoonjoy 'cause to go'         | (Prentice, p. 135) |

- b. lunsay + -on → lunsayon ‘demolish’ (OF)  
 ukab + -on → ukabon ‘open’ (OF)  
 ansak + -on → ansakon ‘cook’ (OF)  
 rasaŋ + -on → rasaŋon ‘sweat’ (OF)<sup>12</sup> (Prentice, p. 144)  
 baal + -on → baalon ‘make’ (OF) (Prentice, p. 136)

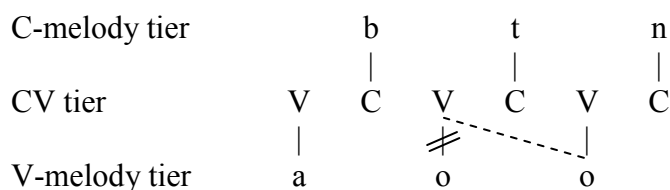
If the rule is to be formulated as in point (21d) above, we must assume that the derivation of forms like those in the first five examples of (25a) involves an OCP enforcement operation which deletes one of the two adjacent [o] melodies:

(26) **abot + -on → oboton**

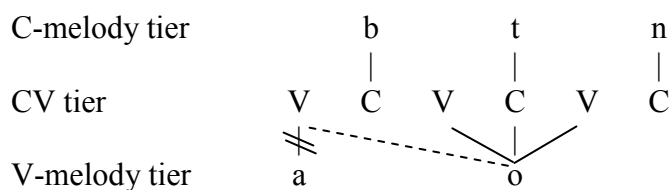
**UR:**



**OCP:**



**Vowel Harmony (21d)**



Before we can formulate the rule more precisely, we need to decide what the harmonic feature is. The two-feature classification which we rejected for Dusun seems more plausible here, partly because in Murut /o/ is actually pronounced as a round vowel and also because there is no evidence of an emerging fifth vowel. Let us therefore tentatively adopt

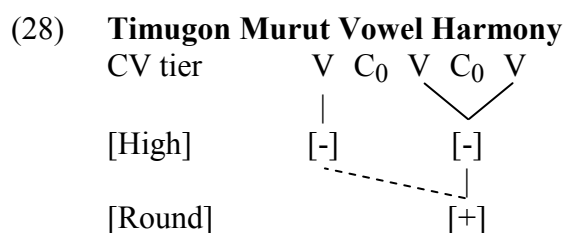
<sup>12</sup>Prentice (p.c.) points out that this form is not a true Object Focus verb. Rather, it seems to follow the pattern common in Dusunic languages in which the OF suffix is used for verbs of affliction and infestation, and (in Dusunic but not apparently in Murut) certain locatives. The characteristic feature of this construction is that the suffix is not deleted in past tense, unlike true OF forms.

the following classification of Murut vowels, and assume that the harmonic feature is [+ round]:

(27)

	i	u	a	o
High	+	+	-	-
Round	-	+	-	+

The rule of Vowel Harmony must therefore spread the feature [+ round] from right to left to a non-high vowel.<sup>13</sup> Moreover, the trigger must be a doubly-linked melodic node [o]:



The two rules formulated here will account for the observed alternations and the restricted distribution of /o/; but these rules in turn raise some questions. Why should only doubly-linked [o]'s spread? And why the odd requirement that [o] may appear only as the last vocalic melody in its word? We will attempt to address these questions, and propose more natural formulations of these rules, in the following section. In section 5, we will look at the behaviour of geminate vowel clusters with respect to Vowel Harmony and Neutralization, and briefly consider the implications of this data for our analysis.

#### 4. Stress and neutralization

Thus far we have ignored stress. Neutralization rules are frequently conditioned by stress placement, and I will argue that this is the crucial conditioning factor for Vowel Neutralization in Kimaragang. However, stress placement does not seem to account for Neutralization in Timugon. I will suggest that the effect is due instead to a Morpheme Structure Constraint somewhat similar to that in (21a). But I will argue that stress placement does play a crucial role in Timugon Vowel Harmony.

<sup>13</sup>Note that this is exactly the reverse of the situation in Turkish, in which roundness spreads from left to right, but only high vowels are affected and non-high vowels are opaque.



#### 4.1. Neutralization in Kimaragang

Non-high vowels are neutralized in pre-stress position in a number of languages in Sabah. Outside the Dusunic and Murutic subgroups, such rules of neutralization are reported in Bonggi (Boutin, 1993) and Tombonuwo (King, 1993), both of which have consistently penultimate stress. In these two languages, a non-high vowel in the penultimate syllable of the root reduces (to /ə/ in Bonggi, /o/ = [ʌ] in Tombonuwo) when a suffix is added, since the suffixation triggers a shift in stress which leaves the non-high vowel to the left of the stressed syllable.

A similar process is found in Labuk Kadazan (Hurlbut, 1981), a Dusunic language closely related to Kimaragang. Labuk Kadazan also has penultimate stress, and any /a/ in penultimate syllable of the root is reduced to /o/ (= [ʌ]) when a suffix is added.

This pattern of neutralization is identical to the pattern demonstrated for Kimaragang in (10).<sup>14</sup> However, stress placement in Kimaragang is more complex than in Labuk Kadazan. As in Penampang Kadazan (Miller, 1993), stress in Kimaragang seems to be neither contrastive nor fully predictable. Stress is always either penultimate or final; in some forms stress appears to be roughly equal on the final two syllables, at least in isolation. Moreover, different researchers may have different judgements as to where stress falls in a particular form, and native speakers seem to have no intuitive feeling for which syllable, if any, bears stress. Intonational peak may occur on different syllables of the same word in different contexts.

Thus while the rule of Vowel Neutralization in Labuk Kadazan simply says “/a/ becomes /o/ in pre-stress syllables”, this formulation cannot be used to describe the identical process in Kimaragang. For example, the form rapaʔon ‘to boil’ (rapaʔ + -on) clearly bears final stress, but the /a/ in the penultimate syllable is not reduced to /o/, even though it precedes the stressed syllable. We need to say something like the following: “/a/ becomes /o/ when it precedes the penultimate syllable”. For the moment, I will assume that the final two syllables (the domain of stress placement) constitute a foot. We can then formulate the rule

---

<sup>14</sup>The pattern of Vowel Harmony in Labuk Kadazan is also identical to the Kimaragang pattern.

as follows: “/a/ becomes /o/ when it precedes the word-final (i.e. stress-bearing) foot”.

Assuming that /o/ is the neutral vowel in Dusunic (see section 4.4), we can again treat this neutralization as a simple delinking process:

(29) **Kimaragang Dusun Vowel Neutralization**

CV tier	V	... F[ ... ]	]w	(F = ‘foot’, W = ‘word’)
	≠			
V-melody tier	[a]			

Any delinked vowel will be spelled out as /o/ by default rules.

## 4.2. Neutralization in Timugon

Stress in Timugon is consistently penultimate (Prentice, 1971, p. 14). We have identified a process of neutralization in Timugon which changes non-final /o/ to /a/.

However, as formulated in (24), the conditioning environment seems highly unusual: an /o/ which is not final on the V-melody tier is delinked.

Can we reformulate the rule in terms of stress placement, e.g. /o/ in pre-stressed or unstressed syllables is delinked? Neither of these formulations will work, because the rule must also apply to /o/’s in stressed (penultimate) syllables in forms like the following:

(30) rakop + -in	→	rakapin ‘catch (w/ noose)’ (RF)
onjoy + -in	→	anjayin ‘go’ (RF)
sakoy + -i?	→	sakayi? ‘mount, ride’ (RF imperative)

In fact, stress does not seem to be a conditioning factor here. Rather, Neutralization in Timugon seems to depend purely on position. But it is possible to find a somewhat simpler statement of the rule than that proposed in (21a-b) and (24).

Recall that in discussing Timugon Vowel Harmony in section 3, we invoked the OCP to force /o/’s in adjacent syllables to share a single set of melodic features. Under this assumption, we can account for the Timugon vowel neutralization in terms of the following two conditions: (a) a morpheme structure constraint (MSC) which licenses /o/ only in the final syllable; and (b) a geminate integrity condition which prevents a doubly- (or multiply-) linked vowel melody from being delinked if it is licensed in any of the V slots with which it

is associated. (The Neutralization process would now be viewed as a repair mechanism triggered by violations of the MSC in (a), rather than as an independent rule.) The combination of these two conditions will ensure that all non-final /o/'s must share their melodic features with an /o/ in the final syllable, and the No Crossing Constraint will ensure that no other vowel can intervene. In other words, an /o/ will never appear with any other vowel to its right in the same word (cf. (16a)).

A morpheme structure constraint which restricts a particular phoneme to occur only in a certain syllable in the word is certainly more familiar, and I feel more plausible, than one stated as in (21a). Let us assume, then, that all non-final /o/'s are neutralized, i.e. delinked from the CV-tier; however, geminate integrity prevents the rule from applying to any /o/ which shares its melodic features with an /o/ in the final syllable (thus allowing for sequences of syllables containing /o/ at the right edge of a word). The effect of the Neutralization process, now viewed as a repair mechanism for MSC violations, is shown below. Compare this formulation with the earlier formulation in (24):

(31) **Timugon Murut Vowel Neutralization (revised)**

CV tier	V	C <sub>0</sub>	V
	≠		
V-melody tier	[o]		

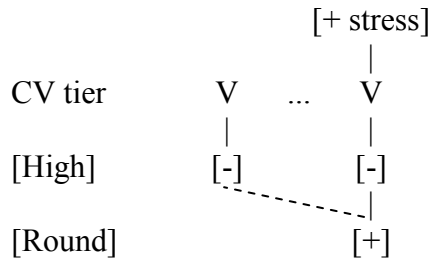
### 4.3. Vowel Harmony in Timugon revisited

We saw in section 3 that Vowel Harmony occurs only where two or more consecutive syllables contain the vowel /o/ (21d), and that /o/ cannot occur in any syllable unless it also occurs in all subsequent syllables, including the final one (16a). These two facts imply that Vowel Harmony is possible only when the penultimate syllable contains the vowel /o/. Since stress is always penultimate in Timugon, this means that the stressed syllable must contain /o/ in order for Vowel Harmony to apply. Let us therefore consider the hypothesis that stress, rather than double linkage *per se*, is what licenses the application of Vowel Harmony.

Suppose, for example, that we make the following assumption: a (single) stressed vowel, and only a stressed vowel, can trigger Vowel Harmony in Timugon. We could then

reformulate the rule as follows: a stressed /o/ spreads to the left until it encounters a high vowel.

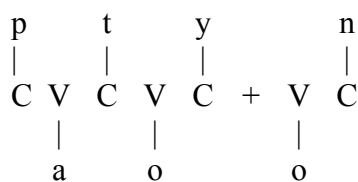
(32) **Timugon Murut Vowel Harmony (revised)**



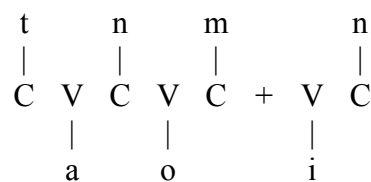
The rule must now be unbounded, but an attempt to cross a high vowel would violate the No Crossing Constraint; thus high vowels will be opaque. This formulation seems to be a clear improvement over our previous attempt in (28), in which only doubly-linked vocalic melodies could function as triggers. Under the revised analysis, the fact that VH takes place only where there are two or more consecutive syllables containing /o/ is an accidental result of the interaction of three independent constraints: first, only stressed vowels trigger VH; second, stress is penultimate; third, /o/ is licensed only in the final syllable of the word, or in V-slots which share their melodic features with an /o/ in the final syllable.

In order to derive the correct results, the OCP must apply (or be enforced) before Neutralization (i.e., before repairs are made to violations of the MSC which limits the distribution of /o/), which in turn must precede Vowel Harmony. Some sample derivations are given below (stress placement, which must be ordered sometime before VH, is not shown):

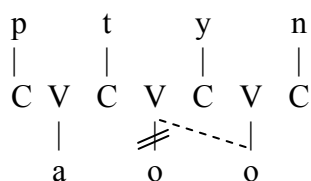
(33) **UR:** /patoy + -on/

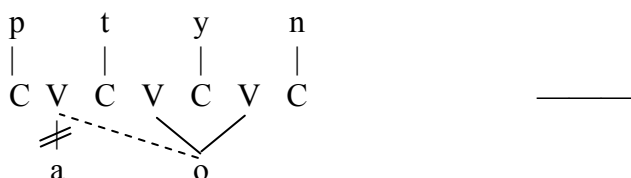


/tanom + -in/



**OCP:**



**MSC (Neutralization):****Vowel Harmony:****Default rules:**

→ [potoyon] 'kill'

→ [tanamin] 'plant'

**4.4. Identity of the neutral vowel**

We have formulated the process of Neutralization in these two languages as a simple delinking of a V-slot from its melodic features. This analysis is based on the assumption that the neutral vowel in Kimaragang is /o/, while the neutral vowel in Timugon is /a/. One piece of evidence which supports this assumption is the quality of non-high prefix vowels in forms where neither Vowel Harmony nor Neutralization apply. Neither language has an underlying contrast between /a/ and /o/ in prefixes (such a contrast would of course be frequently neutralized by the two processes under discussion here). In Kimaragang, non-high prefix vowels are /o/ unless subject to Vowel Harmony; in Timugon, non-high prefix vowels are /a/ unless subject to Vowel Harmony. Note the contrast in the following cognate forms:

(34) <b>Kimaragang</b>	<b>Timugon</b>	<b>Gloss</b>
moŋ-inum	maŋ-inum	‘to drink’
soŋ-ulun	saŋ-ulun	‘one person’
noko-pom(p)upu <sup>15</sup>	naka-pam-pupu?	‘has washed’
moki-maʔap	maki-maap	‘to ask forgiveness’ (from Malay <u>ma’af</u> ‘forgive’)

A second, though clearly related, piece of evidence is the identity of the epenthetic vowel. The nasal element in the Kimaragang verbal prefix poN- has different realizations depending on the initial consonant of the stem it is attached to. It is realized as /ŋ/ before a vowel, and coalesces with (or replaces) a voiceless obstruent or any bilabial consonant. Before /t/, /l/, /j/, /d/, /dʰ/ and /g/, an epenthetic vowel emerges and the nasal once again appears as /ŋ/. As the following examples show, the epenthetic vowel is /o/:

(35) <b>Kimaragang Dusun</b>		
m-poN- duat	→	/moŋoduat/ ‘to ask’
m-poN- guriŋ	→	/moŋoguriŋ/ ‘to harrow’
m-poN- jiil	→	/moŋojiil/ ‘to throw in jail’
m-poN- ribas	→	/moŋoribas/ ‘to ??’
m-poN- lumbid	→	/moŋolumbid/ ‘to roll a cigarette’

To the extent that epenthetic vowels tend to be phonologically unmarked, this data supports the notion that the neutral vowel in Dusun is /o/.

In Murut, the corresponding verb forms involve the insertion of a dummy syllable /-pa-/, rather than just an epenthetic vowel. Certainly the vowel inserted is /a/, but this may follow simply from the fact that prefixes always contain /a/ (rather than /o/) as their underlying vowel. Thus the following forms may or may not be relevant to the question at hand:

---

<sup>15</sup>After Nasal Merger, the actual form is nokopomupu.

(36) **Timugon Murut**

m-paN- rimbas	→	/mamarimbas/	‘to cut grass’
m-paN- junḡkul	→	/mamajunḡkul/	‘to poke up at something’
m-paG- gunṡinḡ	→	/mampagunṡinḡ/ <sup>16</sup>	‘to cut with scissors’
m-paG- luaʔ	→	/mampaluaʔ/	‘to vomit’
m-paG- liunḡ	→	/mampaliunḡ/	‘to rinse’
m-paG- ḡuaʔ	→	/mampaḡuaʔ/	‘to moo (like a cow)’
m-paG- ḡiaw	→	/mampaḡiaw/	‘to meow (like a cat)’

A third piece of evidence is simply the fact that Vowel Harmony changes /o/ to /a/ in Dusun, but /a/ to /o/ in Murut. This could be taken as evidence that /a/ is in some sense “stronger” than /o/ in Dusun, while the reverse holds true in Murut. However, there is a danger of circularity in this line of reasoning.

Another kind of evidence that could be considered relates to the actual pronunciation of the non-high vowels. As noted above, the /o/ in Dusunic languages is generally pronounced as a central or back unrounded vowel ([ʌ] or [ɤ]); in at least some languages (including Kimaragang), /o/ is pronounced as schwa in pre-stress syllables. Thus if “neutral” (mid central unrounded) articulation can be taken as evidence of phonological unmarkedness, the phonetic facts support the claim that /o/ is the unmarked vowel in Dusun. In Murut, on the other hand, /o/ is always rounded, most often being pronounced as [ɔ]. In some Murutic dialects, e.g. Tagal (Harris and Chapple, 1993), /a/ can be pronounced as schwa in pre-stress syllables, but this pattern is not reported in Timugon.<sup>17</sup> Thus the phonetic facts seem less conclusive than in the case of Dusunic.

## 5. Geminate Inalterability

### 5.1. Vowel Harmony in Kimaragang

An interesting fact about vowel harmony in Kimaragang is that the process does not apply to geminate vowels. In the following examples, an /o/ is immediately followed by /a/;

<sup>16</sup>Prentice (p.c.) suggests that the normal form would be mamagunṡinḡ.

<sup>17</sup>Prentice (p.c.) points out that, in Timugon loanwords from English, an original schwa is often realized as /o/, noting that this may argue against the claim that /a/ is the “neutral” vowel in Timugon.

but because the /o/ is part of a geminate cluster, it is not affected by vowel harmony, nor is any preceding /o/ affected:

(37) **Kimaragang Dusun**

woog-an	→	woogan	‘wash’
poN-woog-an	→	pomoogan	‘washing place’
no-loot-an	→	nolootan	‘covered with sand/dirt’
o-toor-an	→	otooran	‘clutch’
toboog-an	→	toboogan	‘tie mouth (of dog)’
poN-in-loow-an	→	poŋinloowan	‘term of address’
		(loow ‘call’)	

Note that this Geminate Inalterability effect holds only for “true geminates”, i.e. morpheme-internal geminates. It does not hold true for clusters in which a morpheme boundary separates the two /o/’s, as shown by examples like the following:

(38) po-ogom-an	→	paagaman	‘place where you set something’
ko-omot-an	→	kaamatan	‘harvest’
n-o-ondom-an	→	naandaman	‘was remembered’

It appears to be quite uncommon for rules of Vowel Harmony to exhibit Geminate Inalterability effects; I have heard of no other cases.<sup>18</sup> This leads us to ask the question, what is different about Vowel Harmony in Kimaragang?

Hayes (1986) notes the following generalization: “the rules subject to Inalterability are those which mention both the CV tier and the melodic tier ...; but those rules which escape Inalterability are formulated on just one tier ...” (p. 330). In other words, rules which are subject to Inalterability are generally those which both (a) change the melodic features of some segment and (b) must refer to syllabicity (i.e. distinguish between consonant and vowel positions). A further observation is that rules which are subject to Inalterability typically distinguish between “true” (morpheme-internal) geminates, to which they do not apply, and “apparent” (or “fake”) geminates, constructed by morphological processes, in which the rule

---

<sup>18</sup>See Selkirk (1991), as quoted in Kenstowicz (1994).



may apply to one or both of the segments. In this respect, Kimaragang Vowel Harmony is typical of this class of rules.<sup>19</sup>

We have thus far assumed that Vowel Harmony in Kimaragang was a simple autosegmental spreading process. As Goldsmith (1990, p. 80) points out, rules which simply add or delete association lines (i.e. spreading or de-linking rules) do not normally exhibit Inalterability effects. These considerations might suggest a need to reformulate the rule of Vowel Harmony in Kimaragang as a feature-changing rule, something like the following, rather than simply a spreading rule:

(39) **Vowel Harmony in Kimaragang (revised)**

$$[-\text{high}] \rightarrow [+ \text{low}] / \begin{array}{ccc} & \text{V} & \text{C}_0 & \text{V} \\ & | & & | \\ & \text{—} & & [+ \text{low}] \end{array}$$

However, it is not yet clear whether there is any phonological motivation for this revision. At this point it would appear to be merely a notational adjustment required by a particular theory of inalterability.<sup>20</sup>

Inkelas and Cho (1993) have recently proposed another account of geminate inalterability. They suggest that geminate inalterability, as well as the existence of singleton opaque elements in harmony systems, can be analyzed simply in terms of lexical prespecification. While this unified treatment of the two phenomena is attractive, it leaves the following question unanswered: Why are singleton opaque elements so common in vowel harmony systems, whereas geminate inalterability in vowel harmony is so exceedingly rare? An answer to this question should help to elucidate the question posed above: What makes Vowel Harmony in Kimaragang unique (or at least highly unusual) in this regard?

<sup>19</sup>Hayes (p. 331) proposes an explanation for these facts in terms of his Linking Constraint: “Association lines in structural descriptions are interpreted as exhaustive.” A very similar principle, the Conjunctivity Condition, is proposed by Goldsmith (1990).

<sup>20</sup>Hayes (1986, p. 344) points out that his Linking Constraint does not predict that every rule which obeys Inalterability must be formulated to contain association lines on independent grounds. Inkelas and Cho (1993, p. 534) have criticized this approach as leading to “diacritic rule formulation”, eg. adding association lines to the structural description of a rule simply to block its application to geminates.

## 5.2. Vowel Neutralization

We might also ask whether Neutralization can apply to geminate vowels in Kimaragang. In order to answer this question, we need to check what happens to roots of the form CaaCVC- when suffixes are added. It is difficult to find such examples, since most roots are bisyllabic and thus contain only two vowels. (It is not hard to find stems of this shape which are morphologically complex, but these stems do not contain “true geminates”, since there is a morpheme boundary between the two /a/’s in the cluster.) The only root of this form which has been found thus far is a loan word, /baagi/ ‘to share; divide up’ (from Malay bahagi). As the following forms show, the long /aa/ does in fact neutralize to /oo/ when a suffix is added:

(40)	<b>Morphemic shape</b>	<b>Surface form</b>	<b>Gloss</b>
	m-poN-baagi	mamaagi	Active
	baagi-an	boogiyān	Indirect passive (‘to be given a share’)
	m-pi-baagi	mibaagi	Active reciprocal
	pi-DUP-baagi-on	piboboogion	Passive iterative reciprocal

Thus, assuming that /aa/ cluster in /baagi/ is a true geminate, it seems that Neutralization does apply to geminate vowels in Kimaragang. The same appears to be true for Neutralization in Timugon. Roots of the form Coo(C) are rare, and it is difficult to find one which will accept the -an or -in suffix. My thanks to Prentice (p.c.) for supplying most of the following examples, which indicate that Neutralization does in fact apply to a geminate /oo/ in Timugon:

(41)	soor -an	→	saan	‘approach, head for’ (LocF)
	looy -in	→	laayin	‘shriek with laughter’ (RF)
	tool -in	→	taalin	‘cook (a snack)’ (RF)
	pa- toojo <sup>21</sup> -in	→	pataajain	‘cause to be repaired’ (RF)
	indoroon + -in	→	indaraanin	‘clear off young saplings’ (RF)
			(from <u>roroon</u> ‘sapling’)	

---

<sup>21</sup>check: is this monomorphemic??

### 5.3. Vowel Harmony in Timugon

Does Vowel Harmony apply to geminate vowels in Timugon? In order to check this, we would need to examine the behaviour of roots of the form CaaCoC- under suffixation.<sup>22</sup> Once again, we run into the difficulty that most roots, being bisyllabic, contain only two vowels. The only two un-affixed forms discovered thus far with the desired shape are paado ‘priest’ (from English father); and kaapo (in the phrase kaapo am ‘or’), a contraction of kalo ‘not’ + poyo ‘incomplete particle’. Neither of these words may normally be suffixed; but according to the native speakers consulted, it is conceivable that one could use paado in a verbal sense meaning ‘to be priested’ (i.e. ordained). If one were to attempt this usage, the native speaker intuition is that Vowel Harmony would apply to the suffixed form of this root:

(42) paado + -on → (??) poodoon ‘to be priested’

Of course, this one hypothetical form cannot be used as the basis for any definite conclusions concerning the applicability of Vowel Harmony to geminate vowels. However, it does suggest that the situation in Timugon may be different from that in Kimaragang.

## 6. Conclusion

As we have seen, the pattern of alternations in the Timugon and Kimaragang data appears, at first glance, almost identical. However, a closer investigation of the data forces us to posit underlying rule systems for the two languages which are quite different in some ways. There are certainly close parallels: in both languages, the rule of Vowel Harmony changes the neutral vowel to a more highly marked vowel, while a process of Neutralization has the opposite effect. Since the choice of neutral vowel is different in the two languages, the two rule systems can almost be seen as mirror images of each other. Another similarity is that, in both languages, high vowels are opaque to Vowel Harmony, while all consonants (including semivowels) are transparent.

---

<sup>22</sup>Of course, Vowel Harmony applies freely to apparent (or “fake”) geminates, as illustrated in the examples below, but this does not answer the question at hand.

pa- + abot + -on → pooboton ‘to put on as a belt’  
 pa- + abol + -on → poobolon ‘cause to wallow’

However, there are other differences between the languages which cannot be directly related to the choice of neutral vowel. Stress is the crucial factor which conditions Neutralization in Dusun, whereas under the analysis proposed for Murut, the crucial factor is simply non-final position. Conversely, we have suggested that stress is a crucial conditioning factor for Vowel Harmony in Murut, but irrelevant to Vowel Harmony in Dusun.

Finally, we have seen that Vowel Harmony in Dusun is subject to the Geminate Inalterability condition. There is no positive evidence for this constraint holding in Murut, and one (relatively weak) piece of evidence that it in fact does not. The extreme rarity of this phenomenon in vowel harmony systems cross-linguistically suggests that further research in this area is needed to gain a deeper understanding of the nature of Vowel Harmony in Dusun.

### References

- Boutin, Michael E. 1993. Bonggi phonemics. In Boutin and Pekkanen (eds.).
- Boutin, Michael E., and Inka Pekkanen (eds.). 1993. Phonological descriptions of Sabah languages. Sabah Museum Monograph no. 4. Sabah State Museum, Kota Kinabalu.
- Brewis, Kielo A. 1988. Learn to Speak Timugon Murut: a series of 25 language lessons. Sabah Museum and State Archives, Series C no. 1.
- Brewis, Kielo and Richard Brewis. 1988. A Trilingual Phrase Book: Timugon Murut, Bahasa Malaysia, English. Sabah Museum and State Archives, Series A no. 2.
- Goldsmith, John A. 1990. Autosegmental and Metrical Phonology. Basil Blackwell, Oxford and Cambridge, MA.
- Harris, A. Sue, and Kristy Chapple. 1993. Tagal phonemics. In Boutin and Pekkanen (eds.).
- Hayes, Bruce. 1986. Inalterability in CV phonology. Language 62.2:321-352.
- Hurlbut, Hope M. 1981. Morphophonemics of Labuk Kadazan. Linguistics across continents: Studies in honor of Richard S. Pittman, ed. by Andrew Gonzalez, FSC, and David Thomas, pp. 46-53. Manila: Summer Institute of Linguistics and Linguistic Society of the Philippines.
- Hurlbut, Hope M. 1993. Labuk-Kinabatangan Kadazan phonemics. In Boutin and Pekkanen (eds.).
- Inkelas, Sharon, and Young-mee Yu Cho. 1993. Inalterability as prespecification. Language 69.3:529-574.

- King, John Wayne. 1993. Tombonuwo phonemics. In Boutin and Pekkanen (eds.).
- Kiparsky, Paul. 1985. Some consequences of Lexical Phonology. Phonology Yearbook, vol. 2.
- Miller, Carolyn P. 1993. Kadazan/Dusun phonology revisited. In Boutin and Pekkanen (eds.).
- Pekkanen, Inka. 1993. Tatana' phonemics. In Boutin and Pekkanen (eds.).
- Prentice, D.J. 1971. The Murut languages of Sabah. Pacific Linguistics C-18.
- Smith, Kenneth D. 1984. The languages of Sabah: A tentative lexicostatistical classification. Languages of Sabah: A survey report, eds. Julie K. King and John Wayne King, pp. 1-57. Pacific Linguistics, C-78.