

Consonant-changing reduplication in Malay as identity avoidance*

Hiroki Nomoto

nomoto@tufs.ac.jp

Tokyo University of Foreign Studies

1 Introduction

Malay has a semi-productive phonological phenomenon called rhythmic reduplication (*kata ganda berima/berentak*), where the base is reduplicated with changes in vowels and/or consonants as in (1).¹ The base is indicated by underlining. The relative order between the base and the reduplicant is not predictable.

- (1) /gunuŋ/ [gunoŋ-ganaŋ] ‘mountain range’
 /herot/ [herot-berot] ‘very crooked’
 /liuk/ [lijaŋ-lioʔ] ‘swaying’

Rhythmic reduplication occurs with bases of various categories and expresses meanings such as plurality with a sense of diversity, continuity of action, intensity and randomness.

- (2) a. Noun
 /bukit/ [buket-bukau] ‘hills’
 b. Verb
 /mundar/ [mundar-mande:] ‘to move to and fro’
 c. Adjective
 /gopoh/ [gopoh-gapah] ‘hurried, hasty’

The process is not completely productive in the sense that it does not apply to novel words freely.

At first glance, rhythmic reduplication appears to be governed not by rules but by euphony (Asmah 2009). However, studies have shown that rhythmically reduplicated words are not governed completely by euphony, but they actually exhibit certain regularities, particularly in the vowel changes (Abdullah 1974; Tham 1979; Hashim 1993; Boyé 2005; Mohd Yunus and Zaitul Azma 2011; Soh 2011). I thus regard rhythmic reduplication as a semi-productive phonological process.

*The research reported here was supported in part by the JSPS Grant-in-Aid for Young Scientists (B) (#23720199).

¹Rhythmic reduplication is also referred to as ‘rhyming and chiming’ reduplication (Abdullah 1974) and imitative reduplication (Mintz 2002).

A satisfactory level of understanding has been reached regarding the vowel changes involved in rhythmic reduplication. Vowel alternation occurs between the low vowel *a* and non-low vowels, i.e. *i*, *e*, *u*, *o*.² Alternation does not occur between two non-low vowels. Soh (2011) captures this fact by means of the $\text{POLAR}^{[\text{low}]}$ constraint, defined as in (3). (4) illustrates the effect of this constraint, showing relevant candidates for the vowel-changing reduplication form of the stem *kəlip*.³

- (3) $\text{POLAR}^{[\text{low}]}$
 * if the base-reduplicant correspondents are not polar opposites of each other in the value for the feature [low].
- (4) /kəlip/ ‘twinkling’
 a. $\sqrt{\text{POLAR}^{[\text{low}]}}$
 kəlap-kəlep
 b. $*\text{POLAR}^{[\text{low}]}$
 *kəlip-kəlep, *kəlup-kəlep, *kəlop-kəlep, *kəlep-kəlep

Furthermore, Soh (2011) points out that a non-low vowel in the reduplicant has a [back] feature that is opposite from the vowel adjacent to the corresponding vowel in the base. She captures this generalization by means of the $\text{POLAR}^{[\text{back}]}$ constraint, defined as in (5), and ranks it below $\text{POLAR}^{[\text{low}]}$. The tableau in (6) illustrates the interaction between the two constraints, taking the rhythmically reduplicated form of the stem *tʃulaŋ* ‘not in order’.

- (5) $\text{POLAR}^{[\text{back}]}$
 * if the reduplicant and the vowel adjacent to the corresponding base are not polar opposites of each other in the value for the feature [back].

(6)

	/tʃulaŋ + RED/	$\text{POLAR}^{[\text{low}]}$	$\text{POLAR}^{[\text{back}]}$
a.	tʃulaŋ-tʃalaŋ	*!	*
b.	tʃulaŋ-tʃaleŋ		
c.	tʃulaŋ-tʃaloŋ		*!
d.	tʃulaŋ-tʃaləŋ	*!	*

Unlike the vowel changes, little is understood regarding the consonant changes. This study fills this research gap by proposing four descriptive generalizations that hold with the consonant changes in rhythmic reduplication, envisaging a constraint-based analysis in future research (section 2). It also compares the rhythmic reduplication in Malay with a similar phenomenon in Sui (Tai-Kadai) discussed by Stanford (2007) (section 3).

²Malay has six vowel phonemes. I follow Soh (2011) and assume the following feature specifications for them.

(i)

	i	e	ə	a	o	u
high	+	-	-	-	-	+
low	-	-	+	-	-	-
back	-	-		+	+	

The schwa appears to be involved in vowel-changing rhythmic reduplication in some cases due to an independent process whereby an underlying *a* is realized as a schwa in a final open syllable (Farid 1980; Teoh 1994).

³The underlying *i* in the base is realized as *e* due to an independent constraint that militates against a high vowel in a final closed syllable.

2 Generalizations

A close investigation of the rhythmically reduplicated words discussed in previous studies and additional data reveals that at least four descriptive generalizations can be made about the consonant changes involved in them. Generalizations I–III are concerned with consonant alternation while Generalization IV is concerned with epenthesis and deletion.

2.1 Generalization I: Native consonants only

Only consonants that are native to Malay participate in the consonant alternation. These consonants and the positions in which they occur are summarized in (7).

	<u>Element 1</u>	-	<u>Element 2</u>
Onset:	p, t, k, g, tʃ, s, l, r, h		p, t, k, b, d, tʃ, m, ɲ, l, r, j
Coda:	p, ɲ, h		t, ʔ, n

Borrowed consonants, i.e. *f*, *v*, *z*, *ʃ* (*q*, *x*, *ɣ*), do not alternate. Thus, forms like **zaki-baki* (cf. *saki-baki* ‘remainder’) and **laoʔ-faoʔ* (cf. *laoʔ-paoʔ* ‘all sorts of side dishes’) are not only unattested but should not exist with good reason.⁴ The restriction to native consonants partly explains the semi-productive status of rhythmic reduplication.

(8) shows all correspondence types attested in the dataset (75 consonant alternation instances).

(8)	a.	p- $\{r, m, n\}$			
		/pindah/	[<u>pindah</u> -randah]		‘to move constantly’
		/peŋtʃoŋ/	[<u>peŋtʃoŋ</u> -meŋtʃoŋ]		‘askew’
		/təgap/	[<u>təgap</u> -təgon]		‘robust’
	b.	t- $\{l, j\}$			
		/tunɣaŋ/	[<u>tunɣaŋ</u> -lanɣaŋ]		‘helter-skelter, topsy-turvy’
		/goton/	[<u>goton</u> -rojon]		‘mutual help’
	c.	k- $\{b, m\}$			
		/katʃau/	[<u>katʃau</u> -balau]		‘chaotic’
		/karut/	[<u>karot</u> -marot]		‘very messy’
	d.	g-r			
		/goton/	[<u>goton</u> -rojon]		‘mutual help’
	e.	tʃ- $\{b, m, l, r\}$			
		/tʃirit/	[<u>tʃiret</u> -biret]/[<u>tʃiret</u> -miret]		‘diarrhoea’
		/katʃau/	[<u>katʃau</u> -balau]/[<u>katʃau</u> -birau]		‘chaotic’
	f.	s- $\{b, m, l\}$			
		/baki/	[<u>saki</u> -baki]		‘remainder’
		/sajur/	[<u>sajo:</u> -majo:]		‘all kinds of vegetables’
		/sənaŋ/	[<u>sənaŋ</u> -lənaŋ]		‘very comfortable’

⁴The word *safan-safa* ‘cleared, finished’ appears to be a counterexample, as it contains the borrowed consonant *f*. However, it is likely that the form did not result from rhythmic reduplication, but was borrowed from Arabic in this exact form. I thank Haruko Sakaedani for clarifying the relevant Arabic data for me.

- g. l-{p, b, d}
 /lauk/ [laoʔ-paoʔ] ‘all sorts of side dishes’
 /kabut/ [kalaŋ-kabot] ‘confused’
 /lalu/ [lalu-landaŋ] ‘to and fro’
- h. r-{t, tʃ, k, ɲ}
 /remeh/ [remeh-temeh]/[remeh-tʃemeʔ] ‘unimportant’
 /hiruk/ [hiroʔ-pikoʔ] ‘uproarious’
 /herot/ [herot-beɲot] ‘in a mess’
- i. h-{p, ʔ, b, d}
 /hiruk/ [hiroʔ-piroʔ] ‘uproarious’
 /remeh/ [remeh-tʃemeʔ] ‘unimportant’
 /herot/ [herot-berot] ‘in a mess’
 /hina/ [hinə-dinə] ‘the poorest’
- j. ŋ-{t, ʔ}
 /kabut/ [kalaŋ-kabot] ‘confused’
 /liuk/ [lijaŋ-lioʔ]⁵ ‘swaying’

2.2 Generalization II: No identical manner; No voiceless pairs

The corresponding consonants are strictly constrained with regard to their manners of articulation and voicing. First, they differ in manner of articulation.

- (9) Stop and non-stop
 /pindah/ [pindah-randaŋ] ‘to move constantly’ (liquid)
 /peŋtʃoŋ/ [peŋtʃoŋ-meŋtʃoŋ] ‘askew’ (nasal)
 /gotonj/ [gotonj-rojoŋ] ‘mutual help’ (semi-vowel)
- (10) Fricative and non-fricative
 /baki/ [saki-baki] ‘remainder’ (stop)
 /sənaŋ/ [sənaŋ-lənaŋ] ‘very comfortable’ (liquid)
 /sajur/ [sajo:-majo:] ‘all kinds of vegetables’ (nasal)
- (11) Affricate and non-affricate
 /tʃirit/ [tʃiret-biret] ‘diarrhoea’ (stop)
 /katʃau/ [katʃau-balau] ‘chaotic’ (liquid)
 /tʃirit/ [tʃiret-miret] ‘diarrhoea’ (nasal)
- (12) Liquid and non-liquid
 /lauk/ [laoʔ-paoʔ] ‘all sorts of side dishes’ (stop)
 /remeh/ [remeh-tʃemeʔ] ‘unimportant’ (affricate)
 /herot/ [herot-beɲot] ‘in a mess’ (nasal)
- (13) Nasal and non-nasal
 /kabut/ [kalaŋ-kabot] ‘confused’ (stop)

Moreover, at least one of the corresponding consonants is voiced.

⁵The glide *j* in the reduplicant results from the general glide insertion process whereby *j* and *w* are inserted within the *ia* and *ua* hiatus respectively.

- (14) [+voice] and [+voice]
 /gotɔŋ/ [gotɔŋ-**ro**joŋ] ‘mutual help’
 /kabut/ [kalaŋ-**ka**bot] ‘confused’
 /herot/ [he**ro**t-be**no**t] ‘in a mess’
- (15) [+voice] and [–voice]
 /lauk/ [laoʔ-**pa**oʔ] ‘all sorts of side dishes’
 /hiruk/ [hi**ro**ʔ-pi**ko**ʔ] ‘uproarious’
 /kabut/ [kalaŋ-**ka**bot] ‘confused’
- (16) [–voice] and [+voice]
 /pindah/ [pi**nda**h-ra**nda**h] ‘to move constantly’
 /karut/ [ka**ro**t-ma**ro**t] ‘very messy’
 /baki/ [sa**ki**-ba**ki**] ‘remainder’

There are three exceptions to these constraints, however: ‘k-b’, ‘h-p’ and ‘h-ʔ’.

- (17) /katʃau/ [katʃau-**ba**lau]/[katʃau-**bi**lau]/ ‘chaotic’
 [katʃau-**bi**rau]/[katʃau-**bi**ʃau]
 /hiruk/ [hi**ro**ʔ-pi**ro**ʔ]/[hi**ro**ʔ-pi**ko**ʔ] ‘uproarious’
 /remeh/ [re**me**h-tʃe**me**ʔ] ‘unimportant’

These forms are the only exceptions found in the dataset. Notice that even in these cases only one constraint, but not both, is violated. ‘k-b’ violates the manner constraint whereas ‘h-p’ and ‘h-ʔ’ violate the voicing constraint. It is likely that the various reduplicant forms of *katʃau* developed by analogy with the second element of the compound *katʃau-bə(n)tʃah*, whose meaning is identical to the rhythmically reduplicated forms. Similar historical explanations may be possible for ‘h-p’ and ‘h-ʔ’.

2.3 Generalization III: Don’t alternate the coda alone

If a coda alternates, then the preceding vowel also alternates as in (18).⁶

- (18) /tə.gap/ [tə.g**ap**-tə.g**o**n] ‘robust’
 /beŋ.kok/ [beŋ.k**aŋ**-beŋ.k**o**ʔ] ‘winding’
 /tuŋ.ʒaŋ/ [tuŋ.ʒ**aŋ**-toŋ.ʒ**e**t] ‘to jump here and there’

Although a change in the coda entails a change in the nucleus, the reverse is not the case. A vowel change can occur independently of the following consonant.

- (19) /go.poh/ [go.p**o**h-ga.p**a**h] ‘hurried, hasty’
 /boŋ.kaj/ [boŋ.k**aŋ**-baŋ.k**e**ŋ] ‘sprawling, afloat’
 /kə.lip/ [kə.l**a**p-kə.l**e**p] ‘twinkling’

There is an asymmetry between the onset and coda. Unlike codas, onsets can alternate freely, whether alternation occurs with the following vowel or not.

⁶The dataset contains a form that appears to be a counterexample to this generalization, i.e. *re.meh-tʃe.meʔ*. In this form, the vowel does not alternate while the coda does. However, this is because the vowel *e* here is underlyingly an *e*, unlike the *e* in *ʒə.leŋ-ʒə.lu.wat* ‘to ogle at’, which is underlyingly an *i* and has undergone lowering. An underlying *e* does not participate in the vowel alternation (cf. Mohd Yunus and Zaitul Azma 2011; Soh 2011).

- (20) /go.tɔŋ/ [gɔ.tɔŋ-ro.jɔŋ] ‘mutual help’
 /ka.tʃau/ [ka.tʃau-ba.lau]/[ka.tʃau-bi.lau] ‘chaotic’
 /pin.dah/ [pin.dah-ran.dah] ‘to move constantly’

In short, the alternation involved in rhythmic reduplication is sensitive to position. A single change can occur with an onset or a nucleus, but never with a coda.

2.4 Generalization IV: Epenthesize/Delete codas

While codas cannot be altered by themselves, it is possible to epenthesize (21) or delete (22) them alone. Contrary to consonant alternation, epenthesis and deletion target codas rather than onsets.

- (21) Epenthesis
 /bə.li/ [bə.li-bə.lah] ‘to shop’
 /ba.tu/ [ba.tu-ba.tan] ‘all sorts of stones’
 /la.lu/ [la.lu-la.laŋ]/[la.lu-lan.daŋ] ‘to and fro’
 /lu.mus/ [tuŋ.kos lu.mos]⁷ ‘industrious’
- (22) Deletion
 /gə.rak/ [gə.raʔ-gə.riØ] ‘movements’
 /sə.laŋ/ [sə.laŋ-sə.liØ] ‘to alternate’
 /li.tʃin/ [li.tʃen-li.tʃauØ] ‘very smooth’
 /so.rak/ [so.raʔ-so.raiØ] ‘cheer’

There is a strong tendency that the nucleus also changes when a coda is epenthesized/deleted. This suggests that coda alternation discussed in the last section and epenthesis/deletion discussed in this section are in fact different ways of achieving the same goal. The relevant goal can be referred to as ‘anti-rhyming’, i.e. to minimize the base-reduplicant correspondence at the level of rhyme. The vowel change is obligatory in the case of coda alternation, but not in the case of epenthesis/deletion, because the former does not change the syllable structure unlike the latter. Altering only the coda does not have as big an anti-rhyming effect as changing the syllable structure; hence, the nucleus must also alternate.

Moreover, the vowel tends to be a diphthong when deletion occurs, as illustrated by the last two examples in (22). This diphthongization preserves the syllable weight of the base after the deletion of the coda.

2.5 Don’t be fooled by imposters

There are rhythmic reduplication imposters, which are in fact compounds or inherently reduplicated words. For example, *tʃuʃu-tʃiʃet* ‘descendants’ is a compound as both component elements can stand alone with their own meanings: *tʃuʃu* ‘grandchild’; *tʃiʃet* ‘great-grandchild’. *haru-biru* ‘uproarious’ is inherently reduplicated in the sense that the word happens to have a form such that one element is the reduplicant of the other, though

⁷The base and reduplicant are spelt separated by a white space. An anonymous reviewer of AFLA 19 doubts that this word is a rhythmically reduplicated form. However, the description found in *Kamus Dewan* (2005) suggests that it is. While *lumos* can be used by itself to mean ‘smudged (with mud, blood, etc.)’, *tʃuŋkos* is only used in the form *tʃuŋkos lumos* ‘industrious’.

neither component element is not used by itself. These words have not been distinguished from real rhythmically reduplicated words in the literature.

While most imposters are unharmed, some imposters disrupt the generalizations above. Some examples of the bad imposters are given in (23).

- (23) a. lintaŋ-pukaŋ ‘helter-skelter’
 [lintaŋ ‘to move towards all directions’; pukaŋ ‘thigh’]
 b. sampah-sarap ‘all kinds of rubbish’
 [sampah ‘rubbish’; sarap ‘rubbish’]
 c. Øa.naʔ-pi.naʔ ‘descendants’
 [anaʔ ‘child’; pinaʔ is thought to have developed by analogy with *pina* ‘a kind of plant that spreads out the roots’.]

The alternating pair ‘t-k’ in (23a) appears to be a counterexample to Generalization II (No identical manner; No voiceless pairs) because *t* and *k* are both voiceless stops. (23b) could pose a problem for Generalization III (Don’t alternate the coda alone) because alternation occurs only with the coda, but not with vowel preceding it. (23c) could invalidate Generalization IV (Epenthesize/Delete codas) because epenthesis appears to occur with the onset. However, these words are all compounds, but not rhythmically reduplicated words. Hence, one cannot rely on these words to test the validity of the generalizations above. Since the forms of imposters are governed more by lexical factors than by phonological factors, they need to be discerned carefully, sometimes taking the word’s etymology into consideration.

3 Comparison with Sui

Sui (Tai-Kadai, Guizhou Province, China) has a similar semi-productive rhythmic reduplication as shown in (24). All Sui data provided in this paper are from Stanford (2007). As the translations show, the reduplicant functions as an adjective intensifier. Rhythmically reduplicated words in Sui can be classified into the three categories that are reminiscent of Generalizations II–IV discussed above.

- (24) a. Onset-alternation
 /ɸa:t⁷/ [ɸa:t⁷ tɕa:t⁸] ‘very agile’
 /ʔmɛj⁵/ [ʔmɛj⁵ tɛj¹] ‘very selfish’
 /fa:ŋ³/ [fa:ŋ³ ʔa:ŋ²] ‘very wide’
 /tom¹/ [tom¹ ʔnom¹] ‘very dull’
 /ʔnəm¹/ [ʔnəm¹ fəm²] ‘very dark/black’
 /lap⁷/ [lap⁷ tap⁸] ‘very garrulous’
 b. Coda-alternation
 /ɸa:t⁷/ [ɸa:t⁷ ɸow¹] ‘very agile’
 /ʔmɛj⁵/ [ʔmɛj⁵ ʔmɔ:t⁷] ‘very selfish’
 c. Epenthesis and deletion
 /çu¹/ [çu¹ çɪŋ⁵] ‘very green’
 /çɑ¹/ [çɑ¹ çɛn¹] ‘very sharp’
 /qəm¹/ [qəm¹ qeØ⁵] ‘very bitter’

This section compares the rhythmic reduplication in Malay with that in Sui and presents an outline of a constraint-based analysis of the former, which I intend to flesh out and

refine in future research.

3.1 The emergence of the unmarked (TETU)

Stanford (2007) points out that coronals account for the great majority (88/100) of the onsets of the reduplicants. He analyses this as a TETU (the emergence of the unmarked) effect (McCarthy and Prince 1994), where markedness constraints favouring coronal consonants are sandwiched between Input-Output Faithfulness and Base-Reduplicant Faithfulness: FAITH-IO \gg *PL/LAB[cons], *PL/DORS[cons] \gg IDENT-BR[place]. FAITH-IO combines the faithfulness constraints MAX (anti-deletion), DEP (anti-epenthesis) and IDENT (featural identity between the corresponding segments). The tableau in (25) illustrates how this ranking selects the correct form as the optimal candidate for the base *k^hij* ‘brown’.

(25)

/k ^h ij + RED/	FAITH-IO	*PL/LAB[cons], *PL/DORS[cons]	IDENT-BR[place]
a. tiŋ tiŋ	*!	**	
b. k ^h ij miŋ		****!	*
☞ c. k ^h ij tiŋ		***	*

Candidate (25a) is ruled out because it violates the highest ranked constraint FAITH-IO although it contains the fewest number of non-coronal segments. Candidates (25b) and (25c) do not violate FAITH-IO. (25c) has a coronal at the onset of the reduplicant and incurs fewer violations of the markedness constraints *PL/LAB[cons] and *PL/DORS[cons] than (25b), which makes an additional violation due to the labial at the onset of the reduplicant. (25c) is thus chosen as the optimal candidate.⁸

In Malay, there does not seem to be such a strong preference to coronals. Labials are also common; dorsals are attested as well, though not many. Some examples are given in (26).

(26)

a. Labials			
/lauk/	[<u>l</u> aoʔ- <u>p</u> aoʔ]	‘all sorts of side dishes’	
/katʃau/	[<u>k</u> atʃau- <u>b</u> alau]	‘chaotic’	
/sajur/	[<u>s</u> ajo:- <u>m</u> ajo:]	‘all kinds of vegetables’	
b. Dorsals			
/hiruk/	[<u>h</u> iroʔ- <u>p</u> ikoʔ]	‘uproarious’	
/kabut/	[<u>k</u> alaŋ- <u>k</u> abot]	‘confused’	

Therefore, a similar line of analysis that posits markedness constraints concerning place between the Input-Output and Base-Reduplicant faithfulness constraints does not explain Malay rhythmic reduplication.

3.2 Identity avoidance

Stanford also argues that the TETU ranking interacts with *REPEAT, a generalized version of the OCP that militates against containing two identical elements (Yip 1997; Kenard 2004). Stanford adopts the definition given by Yip (1995).

⁸Stanford (2007) rules out *k^hij tin*, which has fewer non-coronal segments than (25c), by positing a constraint ensuring the correspondence between the rhymes of the base and reduplicant (FAITH-BR[rhyme]) and ranking it as high as FAITH-IO.

- (27) *REPEAT (Yip 1995)
Identical syllables cannot be adjacent.

Specifically, he employs the version that handles the base-reduplicant pair, i.e. *REPEAT-BR, and ranks it over the coronal-favouring markedness constraints. This ranking ensures that the onset alternates even when the base onset is coronal, as in *ləŋ* ‘careless’. The tableau in (28) illustrates this point.

(28)

/ləŋ + RED/	*REPEAT -BR	FAITH-IO	*PL/LAB[cons], *PL/DORS[cons]	IDENT -BR[place]
a. <i>ləŋ ləŋ</i>	*!		**	
b. <i>təŋ ləŋ</i>		*!	**	
c. <i>ləŋ kəŋ</i>			***!	*
☞ d. <i>ləŋ təŋ</i>			**	

(28b) is excluded because of a FAITH-IO violation. (28c) contains an extra non-coronal segment, i.e. *k* at the onset of the reduplicant, compared to (28a) and (28d), and hence it is ruled out. The latter two candidates do not differ in the number of violations of the markedness constraints, and neither violates FAITH-IO and IDENT-BR[place]. What distinguishes between the two is *REPEAT-BR ranked the highest. The fully reduplicated form *ləŋ ləŋ* (28a) violates *REPEAT-BR because identical syllables stand next to each other.

The *REPEAT constraint defined as in (27) does not seem useful in accounting for rhythmic reduplication in Malay, given that most bases are bisyllabic in Malay and the corresponding syllables are normally not adjacent to each other. Nonetheless, the insight behind the constraint is still relevant: UG has identity avoidance constraints as well as identity-enforcing ones. A more general version of the constraint is proposed by Yip (1997), whose scope is not limited to adjacent syllables.

- (29) *REPEAT (Yip 1997)
Output must not contain two identical elements.

Malay rhythmic reduplication is an identity avoidance phenomenon (Soh 2011). Generalizations II (No identical manner; No voiceless pairs) and III (Don’t alternate the coda alone) suggest that an account of the consonant alternation in Malay needs to invoke the *REPEAT constraints that are specific to manner, [–voice] and rhyme. These constraints are concerned with the base-reduplicant correspondence. They can be defined as follows:

- (30)
- a. *REPEAT-BR[manner]
Corresponding segments in the base and reduplicant must have different manner features.
 - b. *REPEAT-BR[–voice]
Corresponding segments in the base and reduplicant must not be both [–voice].
 - c. *REPEAT-BR[rhyme]
Corresponding syllables in the base and reduplicant must have different rhymes.

I will leave the issue of how these constraints interact with other constraints and among themselves for future research. The rhyme-specific version of *REPEAT (30c) should be able to handle Generalization IV (Epenthesize/Delete codas) through its interaction with

faithfulness constraints.

3.3 The classification issue

Generalizations III and IV largely hold in Sui as well. Thus, data like (24b) and (24c) (repeated below) should be better analysed as combinations of vowel and consonant changes, and consonant changes respectively, rather than alliteration as characterized by Stanford (2007).

- (31) a. Coda-alternation
 /ɸɑ:t⁷/ [ɸɑ:t⁷ ɸow¹] ‘very agile’
 /?mɛj⁵/ [ʔmɛj⁵ ʔmɔ:t⁷] ‘very selfish’
 b. Epenthesis and deletion
 /çu¹/ [çu¹ çɪŋ⁵] ‘very green’
 /çɑ¹/ [çɑ¹ çɛn¹] ‘very sharp’
 /qəm¹/ [qəm¹ qeØ⁵] ‘very bitter’

Stanford characterizes data like (24a), where the onset alternates, as rhyming. Some relevant examples are reproduced in (32).

- (32) /fa:ŋ³/ [fa:ŋ³ ʔa:ŋ²] ‘very wide’
 /tom¹/ [tom¹ ʔnom¹] ‘very dull’
 /?nəm¹/ [ʔnəm¹ fəm²] ‘very dark/black’

These data can also be characterized as consonant changes taking place with the onset, rhyming being only their consequence.

The characterization in terms of alliteration and rhyming is valid for the Sui data because stems are monosyllabic in Sui. However, it does not work for a similar phenomenon in Malay. A rhyming-alliteration dichotomy cannot classify some words with bisyllabic bases to either category.⁹ For example, the base and reduplicant of *remeh-ʔeme?* ‘unimportant’ neither alliterate nor rhyme, beginning with *r* and *ʔ*, and ending with *h* and *?*.

The multisyllabicity of bases creates another problem that is present in Malay, but (probably) not in Sui, i.e. rhythmic reduplication imposters. Some multisyllabic stems are inherently reduplicated words, that is, they look as if they were formed through reduplication (e.g. *haru-biru* ‘uproarious’). If (most) stems are monosyllabic, inherently reduplicated words should be very rare or nonexistent.

3.4 Patterned variety

Both Sui and Malay rhythmic reduplication exhibit ‘patterned variety’. There are bases for which more than one reduplicant form exists, as can be seen in (33) and (34).

⁹Tham’s (1979) classification in terms of initial and final rhyming is considered as a variant of the rhyming-alliteration dichotomy. Final rhyming refers to ordinary rhyming, where the base and reduplicant share a common rhyme in the final syllable as in *ʔərai-bərai* ‘separated, scattered’. Initial rhyming, on the other hand, refers to the base and reduplicant sharing a common onset and nucleus in the first syllable as in *batu-batan* ‘all varieties and shades of stones’.

(33)	Malay		
	/katʃau/	[katʃau-balau]/[katʃau-bilau] [katʃau-birau]/[katʃau-bitʃau]	‘chaotic’
	/tʃirit/	[tʃiret-biret]/[tʃiret-miret]	‘diarrhoea’
	/remeh/	[remeh-temeh]/[remeh-tʃemeʔ]	‘unimportant’
	/herot/	[herot-berot]/[herot-beʔot]	‘in a mess’
	/hiruk/	[hiroʔ-piroʔ]/[hiroʔ-pikoʔ]	‘uproarious’
	/lalu/	[lalu-lalaŋ]/[lalu-landaŋ]	‘to and fro’
(34)	Sui		
	/ʋɑ:t ⁷ /	[ʋɑ:t ⁷ tʃɑ:t ⁸]/[ʋɑ:t ⁷ ʋow ¹]	‘very agile’
	/ʔmɛj ⁵ /	[ʔmɛj ⁵ tɛj ¹]/[ʔmɛj ⁵ ʔmʊ:t ⁷]	‘very selfish’
	/p ^h ɑ ¹ /	[p ^h ɑ ¹ p ^h oj ¹] [p ^h ɑ ¹ p ^h əŋ ¹]	‘very grey (e.g. ash spots on clothing)’ ‘very grey/pale (e.g. especially referring to skin)’
		[p ^h ɑ ¹ p ^h ɛw ³]	‘very grey’
		[p ^h ɑ ¹ p ^h ok ⁷]	‘very grey (e.g. often referring to a distant, misty scene)’

As is evident now, the forms of these multiple reduplicants are not totally random, but they exhibit certain patterns, as I have shown in section 2 of this paper for Malay and reported by Stanford (2007) for Sui. Therefore, a constrained-based rather than rule-based analysis is deemed suitable for them.

4 Conclusion

This paper investigated consonant-changing rhythmic reduplication in Malay and proposed four generalizations regarding the possible consonant changes. It also compared consonant-changing rhythmic reduplication in Malay with a similar phenomenon in Sui. The comparison revealed that both phenomena involved identity avoidance between the base and reduplicant, which can be implemented by the OT constraint *REPEAT. It also enabled to outline a possible constraint-based analysis of rhythmic reduplication in Malay. The details of the analysis remain to be worked out in future research.

References

2005. *Kamus Dewan (edisi keempat)*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Abdullah Hassan. 1974. *The Morphology of Malay*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Asmah Hj. Omar. 2009. *Nahu Melayu Mutakhir*. Kuala Lumpur: Dewan Bahasa dan Pustaka, 5th edition.
- Boyé, Gilles. 2005. Apophony and chiming words in Malay. Paper presented at the 9th International Symposium on Malay/Indonesian Linguistics (ISMIL).
- Farid M. Onn. 1980. *Aspects of Malay Phonology and Morphology: A Generative Approach*. Bangi: Universiti Kebangsaan Malaysia.
- Hashim Musa. 1993. *Binaan dan Fungsi Perkataan dalam Bahasa Melayu*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

- Kennard, Catherine Hicks. 2004. Copy but don't repeat: The conflict of dissimilation and reduplication in the Tawala durative. *Phonology* 21:303–323.
- McCarthy, John, and Alan Prince. 1994. The emergence of the unmarked: Optimality in prosodic morphology. In *Papers from the Annual Meeting of the North East Linguistics Society*, volume 24, 333–379.
- Mintz, Malcolm W. 2002. *An Indonesian & Malay Grammar for Students*. Perth: Indonesian / Malay Texts and Resources.
- Mohd Yunus Sharum, and Zaitul Azma Zainon Hamzah. 2011. Golongan dan rumus kata gandaan berima. *Jurnal Bahasa* 11:27–47.
- Soh, Hooi Ling. 2011. Phonological opacity in Malay: Its relevance for constraint evaluations in Optimality Theory. In *Isamu Shoho: Tinta Kenangan “Kumpulan Esei Bahasa dan Linguistik”*, ed. Hiroki Nomoto, Zaharani Ahmad, and Anwar Ridhwan, 118–144. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Stanford, James N. 2007. Sui adjective reduplicaiton as poetic morpho-phonology. *Journal of East Asian Linguistics* 14:87–111.
- Teoh, Boon Seong. 1994. *The Sound System of Malay Revisited*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Tham, Seong Chee. 1979. Vowel patterning and meaning in Malay pair-words. In *South-East Asian Linguistic Studies*, ed. Nguyen Dang Liem, volume 4, 365–377. Canberra: Pacific Linguistics. URL <http://sealang.net/sala/archives/pdf8/chee1979vowel.pdf>.
- Yip, Moira. 1995. Identity avoidance in phonology and morphology. Ms. University of California, Irvine. URL <http://roa.rutgers.edu/files/82-0000/roa-82-yip-3.pdf>.
- Yip, Moira. 1997. Repetition and its avoidance: The case of Javanese. In *Proceedings of the 1995 Southwestern Workshop on Optimality Theory (SWOT)*, ed. Keiichiro Suzuki and Dirk Elzinga, volume 5 of *Coyote Papers: Working Papers in Linguistics*, 238–262. Tucson, AZ: University of Arizona Linguistics Circle. URL <http://roa.rutgers.edu/files/83-0000/83-0000-YIP-0-0.PDF>.