Non-linearity and dual-edge dependency in Malay dialects: An optimality analysis

Sung-A KIM
Dong-A University, Korea

Abstract

Partial reduplication in Johore and Perak Malay exemplifies nonlocal, dual-edge dependency and subsequent feature-changes: reduplicative prefixes are determined by both left and right edge segments of a base, skipping intermediate segments. The dual-edge dependency and the subsequent feature changes are sufficiently unusual to merit serious investigation in that they provide a challenge to analyses in derivational frameworks. This paper presents a constraint-based account (McCarthy and Prince 1995; McCarthy 1995) which captures both aspects of these Malay reduplications as an interaction between faithfulness and phonotactic constraints. This paper shows that the unusual reduplicative pattern in these dialects can be successfully subsumed in a general pattern of reduplication under a constraint-based framework.

1. Data; partial reduplication in Malay dialects

A recurrent pattern in partial reduplications is the edge-orientation of reduplicated affixes (i.e., reduplicants): a reduplicative prefix is sensitive only to the left edge of a base. If a reduplicant is a prefix, then the leftmost element in a reduplicant corresponds to the leftmost element in a base (McCarthy and Prince 1993, 1994). This paper discusses a somewhat unusual pattern of partial reduplication which does not obey this generalization. The data presented in the paper reveal a 'dual-edge dependency' as reported in at least two distinct dialects of Malay: Johore and Perak Malay. In these dialects, stem-final segments as well as stem-initial segments play an important role in determining the content of reduplicative prefixes.

First considered is the following data from Johore Malay spoken in the southern region including the Johore, Malacca and Salangor states.

(1) Johore Malay (data from Onn 1976:104)[1]

	Stem	Reduplicated form for intensification	Gloss
(a)	timbus	tətimbus	to fill in (hole)
	jual	jəjual	to sell
	puas	pəpuas	to satisfy
	sapu	səsapu	to sweep
(b)	malam	məmalam	night
	təndaŋ	tətəndaŋ	to kick
	sudah	səsudah	to complete, finish
	laju	ləlaju	fast
(c)	tiap	təʔtiap	every
	buat	bəbuat	to do, to make
	tembak	təʔtembak	to shoot
	benkok	bəʔbenkok	to bend
	tutupe	təʔtutup	to close

In the examples in (1), the reduplicative prefix has the shape of a single syllable (i.e., CV or CVC). It should be noted that the final consonant of the reduplicated prefixes is always a glottal stop in (1c), while it is not in (1a) and (1b). The presence or absence of a glottal stop in reduplicated prefixes depends on the features of a stem-final consonant. If a stem ends with a stop, then the reduplicative prefix has a glottal stop. The glottal stop is not simply inserted but rather it represents a reduced segment of the stem-final stop. In other words, the process of reduplication must consider both edges of the base form. The idea that the glottal stop corresponds to the reduced stem-final stop is supported by parallel data from another dialect: Perak Malay given in (2) on the next page. In Perak Malay, spoken in the west coast area of Peninsular Malaysia, the final consonant in a reduplicated prefix varies depending on the stem-final consonants. The reduplicative prefix has the shape C_1VC_2, where C_1 is the initial consonant of the stem and C_2 is defined as follows: C_2 is a glottal stop if the stem-final consonant is a stop as in (2b); it is a nasal unspecified for place of articulation if the stem-final consonant is a nasal, as shown in (2c); otherwise C_2 is null.

[1]The gloss refers to the meaning of stems.

(2) Perak Malay (data from Zaharani 1988:151-155)[2]

	Stem	Reduplicated form for intensification	Gloss
(a)	cəʁit	cəcəʁit	all kinds of stories
	kaji	kəkaju	to study repeatedly
	kɛʁɛ	kəkɛʁɛ	by my estimate
	dulu	dədulu	very long ago
	mɔlɛ	məmɔlɛ	at the very beginning
	mudɛ	məmudɛ	very young
	tuɛ	tətuɛ	very old
(b)	banaʔ	bəʔbanaʔ	very much
	kəceʔ	kəʔkəceʔ	very small
	siket	səʔsiket	very little
	gəlap	gəʔgəlap	very dark
(c)	baʁaŋ	bəmbaʁŋ	all kinds of tings
	pətaŋ	pəmpətaŋ	every evening
	jaʁaŋ	janjaʁaŋ	very seldom
	jaman	jənjaman	for a long time
	kəʁen	kəŋkəʁen	very dry

To sum up, the segment-skipping reduplication given in (1) and (2) can be characterized by two different aspects: i) dual-edge dependency where both edges of a base are important in shaping the reduplicative prefix, and ii) the feature changes in reduplicants.

In this paper, two related claims are made: First, it is shown that the unusual pattern of dual-edge dependency receives a straightforward account in Optimality theory (McCarthy and Prince 1995; McCarthy 1995). In the present analysis, dual-edge dependency is a consequence of an interaction between a constraint on base-reduplicant identity and a faithfulness constraint. Second, it is argued that the feature changes in the reduplication are an instance of 'the emergence of unmarked' (McCarthy and Prince 1994). In conclusion, it is claimed that the unusual reduplicative patterns of these dialects can be successfully subsumed into a general pattern of reduplication in a constraint-based analysis.

The remainder of this paper is organized as follows: Section 2 addresses problems for a derivational analysis of the dual-edge dependent reduplication. Section 3 gives a brief sketch of Correspondence Theory (McCarthy and Prince 1995; McCarthy 1995), which is the theoretical framework assumed throughout this paper. Section 4 presents an Optimality theoretic account of the facts described above. The theoretical implications of the analysis are discussed in the conclusion.

[2] The pattern described by Hendon (1966) for the Ulu Muar dialect is quite similar to that observed in the Perak data. Due to space limitations, the Ulu Muar data are not discussed in this paper.

2. Problems in a derivational analysis

In a derivational framework, the type of dual-edge dependency described above may be accounted for by 'Edge-in Association' which gives priority to edge segments over intermediate ones (Yip 1988). The definition of 'Edge-in Association' is given in (3).

(3) Edge-In Association (EIA): For a melody /*a*....*z*/, (i) link *a* to the initial melody-anchor; (ii) link *z* to the final melody-anchor; (iii) link any remaining melodies in a left to right way (Yip 1988).

Suppose the 'Edge-in-Association' for the dual-edge dependency is adopted for the dual-edge dependency described above. The application of 'Edge-in-Association' is schematically shown in (4).

(4) Edge-in Association for Perak Malay

```
Prefix:  σ                    σ                      σ
         /                   /  \                   / | \
Base: si ket siket  ---->  s  i t   siket ---->   * [s  i  t siket]
```

As shown in (4), EIA may successfully capture the dual-edge dependency in question. However, it fails to account for the feature changes accompanying the reduplication *səʔsiket* is the correct surface form. Some may suggest that the feature changes should be explained by a subsequent debuccalization rule and a vowel-reduction rule that apply in the later stages of the derivation; thus, the appropriate form *səʔsiket* 'very little' is derived.

The problem with this proposal arises from the fact that Perak Malay does not have a debuccalization rule that targets non-velar stops. In the Malay language including the two dialects, the debuccalization process is limited to velar stops (Onn 1976). Only velar stops lose their place of articulation in coda positions. This suggests that debuccalization rules for bilabial and coronal stops are required only in the case of the reduplication process in question, as there is no independent evidence supporting the existence of a debuccalization rule for non-velar stops. Furthermore, Perak Malay has no vowel reduction rule that changes the vowel quality into a schwa (Zaharani 1988). As a consequence, EIA cannot be successful without resorting to stipulations, by which some phonological rules apply only to the partial reduplication process described above.

On the other hand, the output-oriented Optimality theory (OT henceforth) makes it possible to handle both a dual-edge dependency and feature-changing aspects without such stipulations. The present analysis uses previously well-established constraints to explain these phenomena. Before the analysis is presented, the core ideas of the Correspondence theory are briefly summarized.

3. Theoretical framework; correspondence theory

In this section, the theoretical assumptions for the present analysis are briefly presented. Optimality Theoretic grammars (Prince and Smolensky 1993) consist of the following components: a function Gen, which associates an input form with a potentially infinite set of output candidates; and a function Eval, which evaluates output candidates and orders them according to how well they satisfy the constraint system of the language in question; and a set of violable constraints, ranked on a language-particular basis, by which the well-formedness of output candidates is evaluated. The optimal output form is the candidate that best satisfies the constraint system. Because of the variability of constraint ranking, OT is inherently a theory that captures typological diversity.

Correspondence Theory is inspired by a parallelism between prosodic phonology and other fields of phonology. McCarthy (1995), and McCarthy and Prince (1995) noticed a wide range of parallels exhibited between requirements on base-reduplicant identity in prosodic morphology and requirements of input-output faithfulness in general. Base-reduplicant identity is supported by the overapplication of nasalization in Johore Malay (McCarthy and Prince 1995)[3]. By generalizing the parallelism, McCarthy and Prince propose that candidate sets from Gen be produced with a correspondence function expressing the dependency of the output on the input, as given in (5):

(5) Correspondence:
Given two related strings *S1* and *S2* (input and output), Correspondence is a function (f) from any subset of elements of *S1* to *S2*. Any element *X* of *S1* and any element *Y* of *S2* are correspondents of one another if *Y* is the image of *X* under Correspondence; that is if *Y*=f (*X*).

The following family of faithfulness constraints discussed in McCarthy and Prince (1995) plays an important role in the analysis presented in this paper.

(6) The MAX Constraint Family
Every element of an input/base has a correspondent in an output/reduplicant respectively (No-Deletion).

(7) The DEPENDENCE Constraint Family
Every element of an output/reduplicant has a correspondent in an input/base respectively (No-Insertion).

(8) The CONTIGUITY Constraint Family
If two segments ‘a’ and ‘b’ are adjacent in an output/reduplicant then they are adjacent in an input/base (No-Skipping).

[3]The segmental rule in Johore Malay provides additional evidence supporting an analysis in the framework of Correspondence model over the one in the Containment model (Prince and Smolensky 1993) to account for the reduplication process.

(9) The IDENT (F) Constraint Family
Correspondents have identical feature [F].

4. An optimality analysis

4.1. Generalizations and constraints

In this section, the constraints employed in this analysis are presented. Some key generalizations of the reduplication pattern are summarized as follows:

(10) Generalizations of Partial Reduplication in Johore and Perak Malay.

a. A reduplicated prefix is always a single syllable.
b. In Perak Malay, the rightmost segment of the reduplicant is identical to a stem-final segment if the stem-final segment is either a stop or a nasal.
c. In Johore Malay, the rightmost segment of the reduplicant is identical to a stem-final segment if the stem-final segment is a stop.
d. The vowel in a reduplicant is always a schwa.
e. [*h*] does not occur in reduplicant codas.

First, the generalization described in (10a) is expressed, in OT terms, by the constraint, Af=σ: Affixes are equal to a single syllable. It should be noted that Af=σ is adopted rather than RED=σ. Af=σ is supported by the similarities between reduplicants and general prefixes. Most prefixes in Malay have the shape of a single syllable and contain a schwa at their syllable peak, which is identical to reduplicants.

The segment-skipping phenomena mentioned in (10b) and (10c) are captured by the ANCHOR constraint family and its interaction with CONTIGUITY (BR).

(11) ANCHOR constraint family (McCarthy and Prince 1995)

a. ANCHOR-L: Leftmost segment of the reduplicant corresponds to the leftmost segment of a base.
b. ANCHOR-R: Rightmost segment of the reduplicant corresponds to the rightmost segment of a base.

(12) CONTIGUITY (BR): If two segments, *a* and *b* are adjacent in a reduplicant, f (*a*) and f (*b*) are adjacent in a base.

ANCHOR constraints ensure correspondence between edge segments in a base and those in a reduplicant, while CONTIGUITY (BR) requires a linear order among segments to be preserved in a reduplicant. Therefore, the unusual dual-edge takes place where CONTIGUITY (BR) is not satisfied in favor of both ANCHOR-L and ANCHOR-R.

Secondly, the occurrence of placeless codas in reduplicated prefixes suggests CODA-COND.

(13) CODA-COND: A syllable final consonant is placeless (Ito 1989).

$$\begin{array}{l} *\ C]\sigma \\ \quad | \\ [\text{PLACE}] \end{array}$$

CODA-COND penalizes a coda with its own place feature. It is satisfied in both cases. One is the case where codas are limited to *h*, and *ʔ*, assuming that both of them are placeless[4]. The other is the case where coda consonants share a place of articulation with a following consonant (Ito 1989). As a result, CODA-COND does not provide a way to distinguish the first case from the second one, although such a distinction is necessary to explain the asymmetric behavior between nasals and stops at reduplicant codas. In Perak Malay, nasals always share the place of articulation with a following consonant in reduplicant codas, while stops do not. It is always a glottal stop that occurs in reduplicant codas if the stem-final segment is a stop. This strongly suggests that an additional constraint plays a role in Perak Malay. In order to explain the invariant occurrence of a glottal stop, Crispness [-son] that prohibits a stop from sharing the same place of articulation with the next consonant is proposed here. The definition of Crispness [-son] is given in (14).

(14) Crispness [-son]: [C-place] of an obstruent is precisely aligned with the syllable edge[5].

$$\begin{array}{l} *[\text{-son}] \\ \quad | \\ C\ ]\sigma\ [C \\ \quad |\ \ / \\ \text{Place}] \end{array}$$

Crispness [-son] penalizes an obstruent that shares place features with a following consonant. It requires an obstruent to be the placeless one (i.e., a glottal stop).

Thirdly, the absence of nasals in the reduplicant codas in Johore Malay is accounted for by *NAS as given in (15).

(15) *NAS: Nasals are not allowed at coda positions (McCarthy and Prince 1994).

*NAS is a part of much bigger package of constraints on markedness. It is independently justifiable by typological markedness: There are languages without nasal segments but there are no languages without oral segments (McCarthy and Prince 1994). Likewise, no occurrence of *h* in reduplicant codas is expressed by *CODA (h).

---

[4]A glottal stop is assumed to be unspecified for place of articulation.

[5]For the formal definition of Crispness, see Ito and Mester (1994).

(16) *CODA (h): *h* is not allowed at coda positions.
h]σ

This constraint, which penalizes *h* at codas, is motivated in languages such as English and Korean. For example, in English, *h* is not allowed in coda positions even though *h* is permitted in onsets as in [hɛlp] and [howp]. In the Malay language, the relative markedness of *h* with respect to *ʔ* is demonstrated in consonant epenthesis. It is not *h* but *ʔ* that is inserted to repair vowel hiatus (Durand 1987).

Finally, the occurrence of the schwa in reduplicants is easily explained if *V-PLACE is assumed as given in (17).

(17) *V-Place: *V
|
[Place] (Lombardi 1995)

This constraint penalizes any vowels other than epenthetic vowels, which are assumed to be placeless. The schwa is a common epenthetic vowel in Malay, Indonesian and Sundanese. It is a schwa that is inserted to break up illegal consonant clusters found in loan words in Malay (Durand 1987). Also, the schwa is the most common vowel that is employed in prefixes. Hassan (1974) reports a list of prefixes of Malay across dialects. Among the 23 affixes listed, only eight of the suffixes have a vowel other than a schwa.

The above-mentioned phonotactic constraints are assumed to crucially interact with the faithfulness constraints given in (18a) and (18b).

(18) Faithfulness Constraints Interacting with Phonotactic Constraints
a. MAX (IO)(Place): Place feature in an input has a correspondent in an output.
b. IDENT (BR)(Place): Correspondents have identical places of articulation.

4.2. Evaluation

In this section, I discuss how the constraints proposed in the previous section interact. The discussion of this should begin with two basic observations. First, the reduplication in question is a partial reduplication rather than a total reduplication. This suggests that Af=σ dominates MAX (BR). Second, reduplicants are prefixed to a stem. This indicates that ANCHOR-L dominates ANCHOR-R in these dialects. If ANCHOR-R dominates ANCHOR-L, a reduplicant is supposed to be suffixed. The most important aspect of the reduplication process, dual-edge dependency, is due to ANCHOR-R which conflicts with and is ranked above CONTIGUITY (BR). In other words, a dual-edge dependency results from the fact that it is more important to map edge segments than to preserve segmental linearity in base-reduplicant correspondence.

(19) Partial Reduplication: Af=σ >>MAX (BR)
(20) Prefixed Reduplicant: ANCHOR-L>>ANCHOR-R
(21) Dual-edge Dependency:
ANCHOR-L>>ANCHOR-R>>CONTIGUITY (BR)

Given the constraint rankings just mentioned, first considered are vowel-final stems. Vowel-final stems are characterized by the occurrence of *ə* in reduplicants. An important point is that such an invariant schwa is restricted to reduplicants and never occurs in bases. This asymmetric distribution of the schwa is accounted for by the MAX (IO) (Place) outranking *V-PLACE which, in turn, dominates IDENT (BR)(Place), as shown in tableau 1. Since MAX (IO)(Place) prohibits deletion of a place feature from an input, the constraint ranking summarized in (22) later in this paper, states that to a place feature should be preserved from an input as long as it does not cause additional violations of *V-PLACE.

Tableau 1. /RED dulu/ 'very long time ago'

candidates	ANCHOR-R	MAX (IO) (P)	*V-PLACE	IDENT (BR) (Place)
a. $\underline{d_1\text{ə}_2l_3}d_1u_2l_3u_4$	*!		**	*
b. $\underline{d_1\text{ə}_4}d_1\text{ə}_2l_3u_4$		*!	*	*
c. $\underline{d_1\text{ə}_4}d_1u_2l_3u_4$			**	*
d. $\underline{d_1u_4}d_1u_2l_3u_4$			***!	

Candidate (a) is excluded from being an optimal output because the rightmost segment in the reduplicant (i.e., *ə*) does not correspond to the rightmost segment in the base. Candidate (b) violates MAX (IO)(Place) as the first vowel in the base is changed into *ə* by deleting a place feature. Candidate (d) is less optimal than candidate (c) as it has more violations of *V-PLACE in order to satisfy IDENT (BR)(Place). As a result, candidate (c) is predicted to be the optimal output. The constraint ranking for the occurrence of *ə* in reduplicants is repeated in (22).

(22) Invariant Schwa in Reduplicants:
MAX (IO)(Place)>>*V-PLACE>>*IDENT (BR)(Place)

Secondly, the case where a base ends with an obstruent is considered. Tableau 2 contains one such case.

Tableau 2. /RED siket/ ‘very little’

Candidates	MAX(IO) (Place)	*V-PLACE	Crispness [-son]	CODA-COND	IDENT (BR) (Place)
a. s$_1$ə$_2$ʔ$_5$ s$_1$i$_2$k$_3$e$_4$t$_5$	***!				
b. s$_1$i$_2$ʔ$_5$ s$_1$i$_2$k$_3$e$_4$t$_5$		***!		*	*
c. s$_1$ə$_2$t$_5$ s$_1$i$_2$k$_3$e$_4$t$_5$		**	*!	*	*
d. s$_1$ə$_2$ʔ$_5$ s$_1$i$_2$k$_3$e$_4$t$_5$		**		*	**

As in Tableau 1, candidate (a) is ruled out by more serious violations of MAX (IO)(Place) in this tableau. Vowels in the base and the base-final stop are changed into *ə* and *ʔ* respectively, in candidate (a). In candidate (b), the vowel in the reduplicant causes more violations of *V-PLACE, as it has its own place feature. The most important point in the tableau is the conflict between phonotactic constraints such as CODA-COND and Crispness [-son] and base-reduplicant faithfulness constraints. The comparison between candidate (c) and candidate (d) exhibits the roles of Crispness [-son] and CODA-COND respectively. The reduplicant coda *t* satisfies CODA-COND in candidate (c) since it has the same place of articulation as a following consonant. However, it violates Crispness[-son] because it shares a [C-Place] with a following consonant. In comparison, the reduplicant coda *ʔ* in candidate (d) satisfies Crispness [-son] as well as CODA-COND because the reduplicant coda is itself placeless. Therefore, candidate (d) is the optimal output.

To sum up, the occurrence of placeless stops in reduplicants results from the interaction between an input-output faithfulness constraint, phonotactic constraints (i.e., Crispness [-son], CODA-COND) and a base-reduplicant faithfulness constraint, as summarized in (23).

(23) Placeless Stop in Reduplicants:
MAX (IO)(Place)>>Crispness [-son], CODA-COND >>IDENT (BR)(Place)
>> MAX(BR)

As shown in Tableau 2, the Crispness [-son] constraint allows for the accounting of the case. What is considered next is how fricatives will be accounted for. In Section 1, it was observed that *h* does not occur in reduplicant codas, even though a base-final segment is a fricative. Tableau 3 displays an input whose final segment happens to be a fricative.

Tableau 3. /RED sudah/ ‘to finish up’

Candidates	*CODA(h)	MAX (BR)	ANCHOR-R
a. $\underline{s_1ə_2h_5}\ s_1u_2d_3a_4h_5$	**!	**	
b. $\underline{s_1ə_2}\ s_1u_2d_3a_4h_5$	*	***	*

In Tableau 3, *CODA (h) conflicts both with MAX (BR) and ANCHOR-R in the sense that it incurs more violations of MAX(BR) as well as non-correspondence between a right-edge segment in a reduplicant and that in a base. If a reduplicant has a coda as in candidate (a), it crucially violates *CODA (h). The opposite situation occurs in candidate (b). In Tableau 3, a situation where a phonotactic constraint dominates MAX (BR) is observed. Analogous to this case, *NAS also conflicts with MAX (BR). It is important to remember that the key difference between Perak and Johore Malay is the presence or absence of nasals in the reduplicant coda positions. In Johore Malay, nasals do not occur in reduplicant codas, while they do occur in Perak Malay. Parallel to the case of *CODA (h), additional violations of MAX (BR) incur in order to satisfy *NAS in Johore Malay. Consider Tableau 4 has a nasal-final input in Johore Malay.

Tableau 4. /RED təndaŋ / ‘to kick repeatedly’ (Johore Malay)

Candidates	*NAS	MAX (BR)	ANCHOR-R
a. $\underline{t_1ə_2ŋ_6}t_1ə_2n_3d_4a_5ŋ_6$	***!	***	
b. $\underline{t_1ə_2}t_1ə_2n_3d_4a_5ŋ_6$	**	****	*

If the non occurrence of nasals results from the ranking of *NAS >> MAX (BR), ANCHOR-R, as shown in Tableau 4, the opposite case in Perak Malay is easily captured by the reversed constraint ranking as given in (24).

(24) Asymmetric Behavior of Nasals in Johore and Perak Malay
  a. Johore Malay: *NAS>>MAX (BR), ANCHOR-R
  b. Perak Malay: MAX (BR), ANCHOR-R>>*NAS

Given the constraint ranking in (24b), Tableau 5 illustrates how placeless nasals occur in reduplicative codas in Perak Malay.

Tableau 5. /RED jaman/ ‘for a long time’ (Perak Malay)

Candidates	MAX (IO) (Place)	*V-PLACE	Crispness[-son]	CODA-COND	IDENT (BR) (Place)
a. $\underline{j_1ə_2}j_1a_2m_3a_4n_5$	*!				
b. $\underline{j_1i_2}j_1a_2m_3a_4n_5$		***!			*
c. $\underline{j_1ə_2m_5}j_1a_2m_3a_4n_5$		**		*!	**
d. $\underline{j_1ə_2n_5}j_1a_2m_3a_4n_5$		**			*

The tableau clearly shows that the same constraint ranking as in Tableau 1 properly selects an optimal output in the case where a stem ends with a nasal in Perak Malay. In candidate (a), the first vowel loses its place feature, and this results in a violation of MAX (IO)(Place). In comparison, candidate (b) has more violations of *V-PLACE due to the vowel whose place feature is kept in the reduplicant. Candidate (c) is less optimal than candidate (d), as it has a violation of CODA-COND. The reduplicant-final nasal *m* in candidate (c) does not share the same place of articulation with the following consonant. Hence, candidate (d), with no violation of CODA-COND, is the optimal output. The constraint ranking in (25) is responsible for the occurrence of the placeless nasals.

(25) The Occurrence of Placeless Nasals in Reduplicants
MAX (IO)(Place)>>CODA-COND>>IDENT (BR)(Place)

In this section, an Optimality analysis of the partial reduplication in Johore and Perak Malay has been presented. The constraint ranking for the reduplication pattern is recapitulated in (26).

(26) Constraint Ranking for the Partial Reduplication in Johore and Perk Malay

Af=σ, *CODA(h)	>>MAX(BR)		
*CODA(h)	>>ANCHOR-L	>>ANCHOR-R >>	CONT(BR)
MAX(IO)(PL)	>>*V-PL	>>IDENT(BR) (PL)	
	CODA-COND	>>IDENT(BR)(PL), MAX(BR)	
	Crispness[-son]	>>IDENT(BR)(PL)	
Johore Malay:	*NAS >>	MAX(BR), ANCHOR-R	
Perak Malay:	MAX(BR), ANCHOR-R	>>*NAS	

5. Conclusion: the emergence of the unmarked in Malay reduplication

This paper explores unusual dual-edge dependent reduplication patterns, which do not obey the generalization that the reduplicative prefix is sensitive only to the left edge of a base. In the proposed analysis, first it was argued that the dual-edge dependency in Malay dialects is a result of interaction between two types of constraints: i) constraints about base-reduplicant identity (i.e., ANCHOR-L and ANCHOR-R) and ii) a faithfulness constraint (i.e., CONTIGUITY (BR)). Secondly, it was shown that the occurrence of placeless segments in reduplicants results from the constraint ranking in (27a). The Constraint ranking in (27b) represents the schematic constraints ranking for the instances of 'the emergence of the unmarked' (McCarthy and Prince 1994).

(27)	a.	MAX(IO)(Place)	*V-PLACE CODA-COND etc	IDENT(BR)(Place)
	b.	I-O Faithfulness >> Constraints	Phonotactic Constraints	>> B-R Faithfulness Constraints

It is important to note that the constraint ranking in (27a) is parallel to the one in (27b). In conclusion, it is claimed that the occurrence of placeless segments in the reduplication process is another instance of 'the emergence of the unmarked' in the sense that unmarked segments suddenly appear in a certain phonological process.

This proposed analysis is superior to the previous 'Edge-in Association' account in two respects: First, it explains both aspects of the reduplication, feature-changes and the reduplication process, without resorting to any special mechanism. Rather than relying on a special device specific only to the reduplication, it employs previously well-motivated constraints (i.e., ANCHOR-L and ANCHOR-R).

More importantly, the proposed analysis does not require the partial reduplication in Malay to be an exception to crosslinguistic generalizations. On the contrary, it demonstrates that the feature changes of the Malay reduplication can be subsumed in the general pattern of 'the emergence of the unmarked'. In conclusion, this paper demonstrates that the unusual reduplicative pattern in these dialects can be successfully subsumed within a general pattern of reduplication under a constraint-based framework.

REFERENCES

Durand, Jacque. 1987. "On the phonological status of glides: the evidence from Malay." In Anderson, J & J. Durand, eds., *Explorations in Dependency Phonology*. pp. 79-108, Dordrecht, Foris.

Hassan, Abdula. 1974. *The Morphology of Malay*. Kuala Lumpur: Dewan Bahasa Dan Pustaka,.

Hendon, Rufus S. 1966. *The Phonology and Morphology of Ulu Muar Malay*. New Haven: Yale University Press.

Ito, Junko. 1989. "A prosodic theory of epenthesis." *Natural Language and Linguistic Theory* 7:217-260.

Ito, Junko and Armin, Mester. 1994. "Reflections on coda cond and alignment." *Phonology at Santa Cruz* III:27-46.

Kroeger, Paul R. 1989. "Discontinuous reduplication in vernacular Malay." *Proceedings of the 5th Annual Meeting of the Berkeley Linguistics Society*. pp. 193-202, Berkeley.

Lombardi, Linda. 1995. "Laryngeal neutralization and alignment." *University of Massachusetts Occasional Paper* 18:225-248.

McCarthy, John and Alan, Prince. 1986. *Prosodic Morphology.* ms, University of Massachusetts, Amherst.

McCarthy, John and Alan, Prince. 1993. *Prosodic Morphology I: Constraint Interaction and Satisfaction.* MS, University of Massachusetts, Amherst.

McCarthy, John and Alan, Prince. 1994. "The emergence of the unmarked: optimality in prosodic morphology." *Proceedings of the North Eastern Linguistic Society* 24:333-79.

McCarthy, John and Alan, Prince. 1995. *Faithfulness and Reduplicative Identity*. ms, University of Massachusetts, Amherst.

McCarthy, John. 1995. *Extensions of Faithfulness: Rotuman Revisited*. ms, University of Massachusetts, Amherst.

Onn, Farid. 1976. "Aspects of Malay phonology and morphology." Unpublished doctoral dissertation, University of Illinois at Urbana Champaign, Urbana.

Prince, Alan and Paul, Smolensky. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. ms, Rutgers University, Piscataway.

Yip, Moira. 1988. "Template morphology and the direction of association." *Natural Language and Linguistic Theory* 6:551-577.

Zaharani, Ahmad. 1988. "The phonology and morphology of Perak Malay." M.A. thesis, University of Hawaii, Manoa.

Received: 4 January 2005

Department of English Language and Literature
Dong-A University, Busan
KOREA