

Reduplication in Tanjung Raden Malay*

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Abstract

We present novel reduplication data from Tanjung Raden Malay. Tanjung Raden Malay exhibits patterns of reduplication previously documented in other Malay dialects, such as Standard Indonesian and Riau Indonesian: full reduplication, CV reduplication, and C[ə] reduplication. Tanjung Raden Malay also has six additional patterns. We provide a formal analysis of all reduplication patterns in TR Malay within Precedence Based Phonology (Raimy 2000, in press). We claim that the three reduplication patterns attested in all varieties of Malay discussed here are the basic patterns and that Tanjung Raden Malay has innovated the additional six patterns. Our analysis demonstrates a theory that explains the connections between the six innovated and three common reduplication patterns in Tanjung Raden Malay.

1. Introduction

This paper has three purposes. The first is to document reduplication patterns found in Tanjung Raden Malay (henceforth TR Malay) which is a

Malay dialect spoken in the village of Tanjung Raden (literally means ‘Prince Cape’) in the Jambi Province of Southern Sumatra, Indonesia. The TR Malay data presented in this paper were gathered from naturalistic recordings of various speakers and elicitation from 3 informants of different ages (16, 23, 50 years old). Naturalistic recordings consisted of conversations, personal narratives and stories. Elicited data were obtained by asking informants whether or not certain forms exist and to give illustrations of those forms in sentences. Some reduplication types in this paper did not occur very frequently in the naturalistic data and we consequently made use of previously elicited data. The second purpose is to provide a formal analysis for these reduplication patterns based on Precedence Based Phonology (PBP) proposed by Raimy (2000, in press), and the third one is to show how the PBP model provides an insightful account for how the innovations in TR Malay reduplication came to be.

The paper is organized as follows. Section 2 presents background information on reduplication in other Malay dialects. Section 3 displays the reduplication patterns attested in TR Malay. Section 4 provides an analysis of TR reduplication using PBP model. Section 5 presents an account of how ambiguities in the analysis of reduplication by language learners have led to language change. Section 6 concludes this paper.

2. Reduplication in other Malay dialects

Previous studies on different Malay varieties show that Malay exhibits both partial and full reduplication (Sneddon 1996, Gil 2005). Sneddon (1996) points out that Standard Indonesian (SI) exhibits three types of reduplication: full reduplication, partial reduplication and imitative reduplication, as shown in (1-3) (Sneddon 1996:16-22).

(1) Full reduplication

- a. gula ‘sugar’ gula-gula ‘sweets’
- b. duduk ‘sit’ duduk-duduk ‘sit about’

(2) Partial reduplication

- a. tangga ‘ladder’ tetangga ‘neighbor’
- b. laki ‘husband’ lelaki ‘man’

(3) Imitative reduplication

- a. sayur ‘vegetable’ sayur-mayur ‘vegetables’
- b. warna ‘color’ warna-warni ‘all kinds of colors’

Similarly, Gil (2005) shows that Riau Indonesian (RI) uses both full and partial reduplication. In addition, RI also exhibits multiple reduplication. An example of each reduplication type found in RI is presented in (4-6).

(4) Full reduplication (Gil 2005:50)

Suara kau putus-putus kenapa?

voice 2 RED-cut.off why

‘Why does your voice keep getting cut off?’

- (5) Partial reduplication (Gil 2005:58)

Baju-nya ko-koyak itu.

clothes-ASSOC RED-tear DEM-DEM:DIST

‘Your shirt’s all frayed.’

- (6) Multiple reduplication (Gil 2005:58)

Udah si-si-siap?

PFCT RED-ready

‘Is everything ready?’

Because of limits of space, we leave a review of the semantic functions of reduplication in Malay dialects aside and the reader is referred to Sneddon (1996) for more information.

3. Reduplication types in Tanjung Raden Malay

Like other varieties of Malay, TR Malay exhibits both full and partial reduplication. In contrast to SI, partial reduplication in TR Malay is still very productive.

- (7) Full reduplication

a. /saŋko/ ‘think’ /saŋko-saŋko/ ‘think’

b. /bajaŋ/ ‘a lot’ /bajaŋ- bajaŋ/ ‘too much’

(8) Partial reduplication

- a. /kawan/ 'friend' /ka-kawan/ 'friends'
- b. /main/ 'play' /ma-main/ 'play about'

Similarly to SI, TR Malay also has imitative reduplication as shown in (9).

(9) Imitative reduplication

- a. /lauʔ/ 'side dish' /lauʔ-pauʔ/ 'side dishes'
- b. /asal/ 'origin' /asal-usul/ 'origin'

The semantic functions of reduplication are similar to those in SI. The reduplication of nouns, for instance, forms the meaning of a group of the noun being reduplicated (the exact number is unspecified). Reduplicated adjectives may function as adverbs and intensification. Reduplication of verbs shows that the action is not done seriously. Some examples of these functions are shown in (10).

- (10)
- a. /budaʔ/ 'kid' /budaʔ-budaʔ/ 'kids'
 - b. /baʃu/ 'shirt' /baʃu-baʃu/ 'shirts'
 - c. /eloʔ/ '(is) nice' /eloʔ-eloʔ/ '(are) nice'
 - d. /main/ 'play' /main-main/ 'play about'

However, the semantic functions of reduplication in TR Malay need further research and in this paper we only focus on the phonological properties, rather than the semantic functions of reduplication. For an overview of TR Malay phonology see Tadmor and Yanti (2005).

2.1 Full reduplication

Full reduplication occurs when the reduplicant copies all segments of the base. This type of reduplication can apply to any base and is widely accepted among speakers. Some examples are presented in (11).

- (11) a. /kiro/ ‘about’ /kiro-kiro/ ‘average’
b. /dulu/ ‘before’ /dulu-dulu/ ‘long time ago’
c. /main/ ‘play’ /main-main/ ‘play about’
d. /siaŋ/ ‘daytime’ /siaŋ-siaŋ/ ‘during the day’
e. /ubat/ ‘medicine’ /ubat-ubat/ ‘medicines’
f. /enaʔ/ ‘delicious’ /enaʔ-enaʔ/ ‘very delicious’
g. /dulur/ ‘relative’ /dulur-dulur/ ‘relatives’
h. /tabok/ ‘slap’ /tabok-tabok/ ‘slap repeatedly’
i. /m^boʔ/ ‘older sister’ /m^boʔ-m^boʔ/ ‘older sisters’
j. /lap/ ‘rag’ /lap-lap/ ‘rags’
k. /ban/ ‘tire’ /ban-ban/ ‘tires’
l. /jaram^ba/ ‘bridge’ /jaram^ba-jaram^ba/ ‘bridges’
m. /pariyuʔ/ ‘pot’ /pariyuʔ-pariyuʔ/ ‘pots’
n. /batruŋ/ ‘k.o.fish’ /batruŋ-batruŋ/ ‘a group of *batruŋ*’

2.2 *Full reduplication with glottal stop*

This reduplication pattern occurs when the reduplicant is a complete copy of the base except for a word final consonant which is replaced by a glottal stop [ʔ]. Speaker's intuitions vary with respect to this type of reduplication. One of our three consultants in elicitation (the eldest one) accepts this type of reduplication as described here while the other two speakers only accept it if the base is /k/-final.

- (12) a. /ɪkʊt/ 'follow' /ɪkʊʔ-ɪkʊt/ 'imitate'
- b. /alat/ 'tool' /alaʔ-alat/ 'tools'
- c. /dikit/ 'a little' /dikiʔ-dikit/ 'little by little'
- d. /rampok/ 'rob' /rampoʔ-rampok/ 'rob'
- e. /ləm^bap/ '(is) damp' /ləm^baʔ-ləm^bap/ '(are) damp'
- f. /raʊp/ 'scoop' /raʊʔ-raʊp/ 'scoop repeatedly'

2.3 *Full reduplication without final consonant*

This pattern occurs when the reduplicant consists of the entire base except for a word final consonant. Examples follow.

- (13) a. /sopan/ ‘polite’ /sopa-sopan/ ‘very polite’
 b. /cabaŋ/ ‘branch’ /caba-cabaŋ/ ‘branches’
 c. /dikit/ ‘a little’ /diki-dikit/ ‘little by little’
 d. /cakap/ ‘say’ /caka-cakap/ ‘chitchat’
 e. /gamal/ ‘gong’ /gama-gamal/ ‘gongs’
 f. /subur/ ‘fertile’ /subu-subur/ ‘very fertile’
 g. /catar/ ‘rent’ /cata-catar/ ‘rent’
 h. /sekoʔ/ ‘one’ /seko-sekoʔ/ ‘one by one’
 i. /ancur/ ‘destroyed’ /ancu-ancur/ ‘destroyed’
 j. /alat/ ‘tool’ /ala-alat/ ‘tools’

2.4 CV reduplication

CV reduplication occurs when a reduplicant is the copy of the first consonant vowel sequence of the base (14a-f) and not the first syllable (14g-h).

- (14) a. /dulu/ ‘before’ /du-dulu/ ‘long time ago’
 b. /kiro/ ‘think’ /ki-kiro/ ‘average’
 c. /cubo/ ‘try’ /cu-cubo/ ‘try about’
 d. /budaʔ/ ‘kid’ /bu-budaʔ/ ‘kids’
 e. /lebar/ ‘wide’ /le-lebar/ ‘very wide’

f.	/koyaʔ/	‘torn’	/ko-koyaʔ/	‘torn’	
g.	/makan/	‘eat’	/ma-makan/	‘eat’	
h.	/ʃantan/	‘male’	/ʃa-ʃantan/	‘male’	*ʃan-ʃantan
i.	/rampok/	‘rob’	/ra-rampok/	‘rob’	*ram-rampok
j.	/teŋkat/	‘level’	/te-teŋkat/	‘levels’	*teŋ-teŋkat

2.5 C[a] reduplication

C[a] reduplication occurs when the first consonant of the base and the prespecified vowel [a] form a reduplicant, as illustrated in (15). Speakers also vary in the extent to which they accept this form. Younger speakers show arbitrary lexical variation as to whether a root can undergo this pattern.

(15) a.	/kiro/	‘about’	/ka-kiro/	‘average’
b.	/koyaʔ/	‘torn’	/ka-koyaʔ/	‘torn’
c.	/buwat/	‘make’	/ba-buwat/	‘make’
d.	/rugaw/	‘tangle’	/ra-rugaw/	‘tangle’
e.	/potoŋ/	‘cut’	/pa-potoŋ/	‘cut repeatedly’
f.	/makan/	‘eat’	/ma-makan/	‘eat’
g.	/kawan/	‘friend’	/ka-kawan/	‘friends’
h.	/ʃaram ^b a/	‘bridge’	/ʃa-ʃaram ^b a/	‘bridges’

- i. /jalan/ ‘walk/street’ /ja-jalan/ ‘walk around/streets’

2.6 C[ə] reduplication

C[ə] reduplication occurs when the first consonant of the base is followed by a prespecified schwa to form the reduplicant, as shown below.

- (16) a. /pagi/ ‘morning’ /pə-pagi/ ‘early morning’
 b. /sopan/ ‘polite’ /sə-sopan/ ‘more polite’
 c. /kitar/ ‘about’ /kə-kitar/ ‘about’
 d. /subur/ ‘fertile’ /sə-subur/ ‘fertile’
 e. /kanaʔ/ ‘young child’ /kə-kanaʔ/ ‘young child’
 f. /pasat/ ‘pay attention’ /pə-pasat/ ‘pay attention’

2.7 CV[ʔ] reduplication

CV[ʔ] reduplication occurs when the first consonant vowel sequence of the base is followed by a glottal stop to form the reduplicant. Younger speakers do not prefer this reduplication pattern and only accept half or fewer of the reduplicated forms accepted by the older generation.

- (17) a. /lasaʔ/ ‘restless’ /laʔ-lasaʔ/ ‘very restless’

- b. /lam^bat/ ‘slow’ /laʔ-lam^bat/ ‘slowly’
- c. /buwat/ ‘make’ /buʔ-buwat/ ‘make something up’
- d. /boŋkot/ ‘root’ /boʔ-boŋkot/ ‘roots’
- e. /teŋoʔ/ ‘look’ /teʔ-teŋoʔ/ ‘look/observe’
- f. /pon^doʔ/ ‘hut’ /poʔ-pon^doʔ/ ‘huts’

2.8 C[aʔ] reduplication

C[aʔ] reduplication occurs when the reduplicant is a copy of the first consonant of the base followed by a prespecified vowel [a] and a glottal stop [ʔ]. Like CV[ʔ] reduplication, younger speakers do not prefer this pattern. They accept fewer than half of the reduplicated forms as speakers from the other generation.

- (18) a. /piʃat/ ‘massage’ /paʔ-piʃat/ ‘give massage repeatedly’
- b. /lasaʔ/ ‘restless’ /laʔ-lasaʔ/ ‘very restless’
- c. /lam^bat/ ‘slow’ /laʔ-lam^bat/ ‘slowly’
- d. /teŋoʔ/ ‘look’ /taʔ-teŋoʔ/ ‘look/observe’

2.9 C[əʔ] reduplication

The last reduplication type found in TR Malay is when the reduplicant is a copy of the first consonant of the base followed by a prespecified schwa [ə] and glottal stop [ʔ]. Some examples are shown in (19).

- (19) a. /kilat/ ‘shinning’ /kəʔ-kilat/ ‘very shinning’
b. /sɪbʊʔ/ ‘busy’ /səʔ-sɪbʊʔ/ ‘very busy’
c. /kəciʔ/ ‘small’ /kəʔ-kəciʔ/ ‘very small’
d. /dikit/ ‘a little’ /dəʔ-dikit/ ‘a little’
e. /deweʔ/ ‘alone’ /dəʔ-deweʔ/ ‘alone’

It should be pointed out that if a word can undergo CV[ʔ] reduplication, it can also undergo C[aʔ] and C[əʔ] reduplication although two exceptions have been found, as illustrated in (20).

- (20) a. /boŋkot/ ‘root’ /boʔ-boŋkot/ *baʔ-boŋkot *bəʔ-boŋkot
b. /teŋkat/ ‘level’ /teʔ-teŋkat/ *taʔ-teŋkat *təʔ-teŋkat

This concludes our description of the nine reduplication patterns observed in Tanjung Raden Malay.

3.0 Precedence Based Phonology

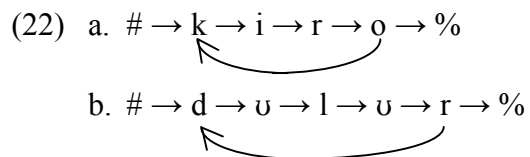
In this section, we provide a formal analysis of the reduplication patterns of TR Malay presented in section 2. Our analysis is couched within Precedence Based Phonology (Raimy 1999, 2000, 2005, in press).

Precedence Based Phonology (PBP) proposes that phonological representations consist of both segments (bundles of distinctive features) and precedence relations (which order the segments) in addition to other aspects of 3-D phonological representations (Halle 2002). Both segments and precedence relations can be manipulated by the morphology and phonology. Raimy (1999, 2000) proposes that precedence relations are represented by an arrow, \rightarrow , where ‘ $X \rightarrow Y$ ’ indicates that ‘ X precedes Y ’. Furthermore, the beginning and end of a phonological representation are indicated by begin, ‘#’, and end ‘%’ symbols.

To fully explicate PBP and how reduplication is accounted for in this model, we begin by showing how the total reduplication pattern in (11) is derived. Non-reduplicated forms are represented in the traditional way except for the addition of the ‘#’ and ‘%’ symbols along with the precedence relation indicators as in (21) below.

(21)	base	reduplicated	PBP representation
a.	kiro	kiro-kiro	# \rightarrow k \rightarrow i \rightarrow r \rightarrow o \rightarrow %
b.	dulur	dulur-dulur	# \rightarrow d \rightarrow u \rightarrow l \rightarrow u \rightarrow r \rightarrow %

Reduplication is a form of affixation (Marantz 1982) in that phonological material is added to a stem due to the spell-out of some morpho-syntactic feature. Reduplication without prespecified material demonstrates that the phonological exponent of a morpho-syntactic feature can consist solely of a precedence relation. The surface effect of reduplication results from the concatenation of a precedence relation (or path of precedence relations and segments) which creates a ‘loop’ in a phonological representation. A ‘loop’ is nothing more and nothing less than a precedence relation (or path of precedence relations and segments) that causes a symmetrical and transitive reflexive precedence relationship between segments. (22) presents the reduplicated forms of the examples in (21).



If we follow the precedence links in both representations in (22), we will see that we can return to any segment we start from which indicates that the overall precedence structures in these forms are symmetric and reflexive. Visually, there is a ‘loop’ in the representation but there is no special formal status to this aspect of the representation.

Phonology contains a linearization process that resolves any reflexive and symmetrical attributes through the copying and repetition of segments. For the purposes of this paper, we only need to recognize that linearization

causes the single repetition of all segments ‘within a loop’. Consequently, the representations in (22) will be linearized as in (23). For detailed discussion of linearization see Raimy (1999, 2000, 2003).

(23) a. # → k → i → r → o → k → i → r → o → %

b. # → d → u → l → u → r → d → u → l → u → r → %

Both forms in (23) show total reduplication because all of the segments in each stem are contained in the ‘loop’. Distinctions in patterns of reduplication are accounted for by altering the description of how the precedence link is concatenated to the base. Anchor Point Theory (Raimy 2005, in press) provides a constrained formalism of possible precedence links that accounts for all reduplication patterns. Each precedence link (or path of precedence links and segments) that represents a reduplication pattern is defined by two points: its ‘begin’ (what the link follows, foot of arrow) and ‘end’ (what the link precedes, head of arrow) and they must be legitimate Anchor Points.

3.1 *Full reduplication*

The total reduplication pattern in TR Malay described in (11) has the formal description based on anchor points in (24).

(24) a. ‘begin anchor point’ → ‘end anchor point’

Begin anchor point = ‘last segment’

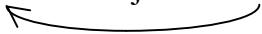
End anchor point = 'first segment'


b. Stems

(i) # → s → a → ŋ → k → o → %

(ii) # → b → a → ɲ → a → ʔ → %

c. Reduplicated forms

(i) # → s → a → ŋ → k → o → %


(ii) # → b → a → ɲ → a → ʔ → %


d. Linearization

(i) # → s → a → ŋ → k → o → s → a → ŋ → k → o → %

(ii) # → b → a → ɲ → a → ʔ → b → a → ɲ → a → ʔ → %

(24a) presents the description of the precedence relation which is the phonological exponent of the total reduplication pattern. Total reduplication is defined as a precedence relation that connects the 'last segment' to the 'first segment'. Because of the generalness of this description, whether the stem begins or ends with a vowel or a consonant is irrelevant. Whatever the first and last segments are, they are now in a precedence relationship which creates a 'loop' which contains the whole stem as shown in (24c). Finally, when linearization occurs as in (24d) we achieve the surface effect of repeating the entire stem that we recognize as total reduplication.

3.2 *Full reduplication without final consonant*

The difference between the full reduplication pattern described above in (24) and the full reduplication without consonant pattern presented in (13) can be produced by simply altering the begin anchor point in (24a). Below in (25), we present the analysis of the full reduplication with no consonant pattern (e.g. a ‘no coda’ effect).

(25) a. ‘begin anchor point’ → ‘end anchor point’

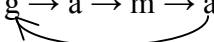
Begin anchor point = ‘last vowel’

End anchor point = ‘first segment’

b. Stem

→ g → a → m → a → l → %

c. Reduplicated form

→ g → a → m → a → l → %


d. Linearization

→ g → a → m → a → g → a → m → a → l → %

By simply making the description of the Begin anchor point in (25a) ‘last vowel’ we achieve the effect of the full reduplication with no consonant pattern. There will be total repetition of the form but a word final consonant will not be repeated. This is the result of the particular anchor points in (25a) when we consider the form in (25c). The ‘loop’ created in

the form in (25c) does not contain the final consonant in the stem in (25b) and consequently when linearization occurs, this consonant is not repeated. Also note that the prefixing nature of this pattern (e.g. the word final consonant is omitted in the first repetition and retained in the second repetition) is directly encoded by the anchor points. The way that linearization treats representations like that in (25c) creates the prefixing aspect of this pattern.

3.3 *CV reduplication*

The CV reduplication pattern showed in (14) can be formalized as in (26).

(26) a. ‘begin anchor point’ → ‘end anchor point’

Begin anchor point = ‘first vowel’

End anchor point = ‘first segment’

b. Stems

→ k → i → r → o → %

c. Reduplicated forms

→ k → i → r → o → %

d. Linearization

→ k → i → k → i → r → o → %

As in (26), the minimal alteration of the Begin anchor point produces a distinct reduplication pattern. In (26a) we have altered the Begin anchor

point to ‘first vowel’ which causes the ‘loop’ in the reduplicated form in (26c) to only contain the first consonant and vowel sequence. When linearized, this produces the surface pattern of CV reduplication as in (26d).

At this point, we have demonstrated the full variation of anchor points utilized by all of the reduplication patterns documented in TR Malay. All reduplication patterns attested in TR Malay use as an End anchor point ‘first segment’ and then we can produce three distinct reduplication patterns by altering the Begin Anchor Point among ‘last segment’, ‘last vowel’ and ‘first vowel’. The next question is how the remaining six reduplication patterns can be accounted for. The answer to this question is based on taking Marantz’s (1982) position that reduplication is affixation to its logical conclusion. To do this, we only need to allow segmental material to occur as part of the phonological exponence associated with a ‘reduplication pattern’.

3.4 *Full reduplication with glottal stop*

The most straightforward demonstration of reduplication as affixation is shown in full reduplication with a glottal stop pattern in (12). This pattern can be obtained by simply adding a [ʔ] to the analysis of the full reduplication without final consonant in (25), as shown in (27).

(27) a. ‘begin anchor point’ → ? → ‘end anchor point’

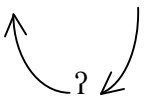
Begin anchor point = ‘last vowel’

End anchor point = ‘first segment’

b. Stems

→ ɪ → k → ʊ → t → %

c. Reduplicated forms

→ ɪ → k → ʊ → t → %


d. Linearization

→ ɪ → k → ʊ → ? → ɪ → k → ʊ → t → %

The only difference between the full reduplication without final consonant pattern in (25) and the full reduplication with glottal stop pattern is the addition of a [ʔ] to the phonological exponence of this pattern in (27a).

The anchor point settings for both patterns are identical. With the pre-specified [ʔ] as a part in this reduplication pattern, we produce the correct surface forms with no other modifications as illustrated in (27d).

3.5 CV[ʔ] reduplication

To account for the CV[?] reduplication pattern presented in (17) we can modify our analysis of CV reduplication in (26) along the same lines as we did above for the full reduplication with no consonant pattern. (28) demonstrates the analogous modification and how it produces the CV[?] reduplication pattern.

(28) a. ‘begin anchor point’ → ? → ‘end anchor point’


Begin anchor point = ‘first vowel’

End anchor point = ‘first segment’

b. Stems

→ l → a → s → a → ? → %

c. Reduplicated forms

→ l → a → s → a → ? → %


d. Linearization

→ l → a → ? → l → a → s → a → ? → %

As with our approach to the full reduplication with a glottal stop pattern, the simple addition of a pre-specified glottal stop to the CV reduplication pattern in (26a) produces the correct analysis of the CV[?] reduplication pattern, as shown in (28a).

The ability to add segmental material to the ‘reduplicative morphemes’ continues to be useful when we turn our attention to the C[a], C[ə], C[aʔ] and C[əʔ] reduplication patterns. In addition to the appropriate segmental material for each of these reduplication patterns, we must modify the settings of the Anchor Points to properly describe the reduplication patterns. The commonality across these four reduplication patterns is that only the stem initial consonant is being repeated. One way to limit reduplication to a single segment is to specify both Anchor Points in an identical manner. This produces the effect that the ‘loop’ will begin and end on the same segment.

3.6 C[a] reduplication

(29) demonstrates the utility of specifying the Anchor Points for an affix in an identical manner. We further add the pre-specified vowel [a] in order to account for the C[a] reduplication pattern from (15).

(29) C[a] reduplication

a. ‘begin anchor point’ → a → ‘end anchor point’

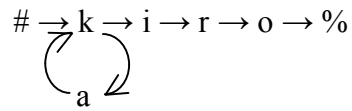
Begin anchor point = ‘first segment’

End anchor point = ‘first segment’

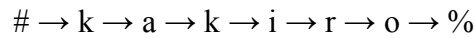
b. Stems

→ k → i → r → o → %

c. Reduplicated forms



d. Linearization



By setting both the Begin and End anchor points in (29a) to ‘first segment’, we create a loop with the pre-specified segment /a/ on it around the first segment of these forms (shown in (29c)). (29d) demonstrates that the forms linearize to the correct surface forms.

It should be noted that it is very likely that patterns which only reduplicate the word initial consonant and some prespecified material will actually require the Begin anchor point to be set to ‘first consonant’ and limited to word initial position. We leave this complexity aside in this paper but developing it would explain the restriction of these patterns to consonant initial forms. The CV pattern would also benefit from this refinement and an alternative analysis of the prespecification of schwa in the C[ə] and C[əʔ] patterns as being epenthetic could also be developed. We leave these issues for future research.

3.7 Remaining reduplication patterns

The remaining three reduplication patterns, C[ə], C[aʔ], and C[əʔ], are now simply accounted for by appropriately specifying the segmental material for each pattern. By simply replacing the pre-specified /a/ in (29a) with [ə], [aʔ] and [əʔ] in an appropriate manner, we derive these three reduplication patterns. (30) summarizes these substitutions.

(30) Remaining reduplication patterns

a. C[ə] reduplication

‘begin anchor point’ → ə → ‘end anchor point’

Begin anchor point = ‘first segment’

End anchor point = ‘first segment’

b. C[aʔ] reduplication

‘begin anchor point’ → a → ʔ → ‘end anchor point’

Begin anchor point = ‘first segment’

End anchor point = ‘first segment’

c. C[əʔ] reduplication

‘begin anchor point’ → ə → ʔ → ‘end anchor point’

Begin anchor point = ‘first segment’

End anchor point = ‘first segment’

We now have a descriptively adequate formal analysis of the nine reduplication patterns in TR Malay. The following section will elucidate how these nine reduplication patterns arose.

5. Language acquisition and change

Three reduplication patterns are common to Standard Indonesian (SI), Riau Indonesian (RI) and Tanjung Raden (TR) Malay.

- (31) Reduplication patterns common to SI, RI, and TR Malay.
- a. Full reduplication
 - b. CV reduplication
 - c. C[ə] reduplication

In addition to these three reduplication patterns, TR Malay has six additional reduplication patterns that are not found in either SI or RI. We assume that these six reduplication patterns are innovations in TR Malay and believe that these innovations are connected to the three common patterns of reduplication in some manner. At the present time, we do not know when these innovations occurred and it appears that some of them are being lost again as evidenced by the younger speakers in our data rejecting some patterns that the older speaker accepts.

One interesting aspect of the PBP approach to reduplication is that for many reduplicated forms, there are multiple settings of anchor points that will produce the correct surface forms. Usually, these analytic ambiguities are generally ignored or even considered an embarrassment. However, we would like to suggest that these analytic ambiguities actually provide an insight into language change. Specifically, we argue that the six innovative reduplication patterns in TR Malay result from analytical ambiguity of surface reduplicated forms.

Learners make decisions about how to analyze the ambient language which results in their particular grammar. Although simplicity of analysis has been a guide to linguistic analysis and provides insights into language acquisition, it is not entirely clear that all learners choose the same analysis for ambiguous surface forms. Yang (2002) argues that a selectionist learner maintains multiple grammars through the acquisition process. The presence of multiple grammars can also be used to account for language variation. Ambiguities in the analysis of surface forms will support multiple distinct analyses and when these distinct analyses are applied to new forms, language change can occur. Lightner (1972) recognizes this possibility and Fitzpatrick and Nevins (2004) argue that this situation is the origin of and explains dialectal variation in Tigrinya (Rose 2003). Furthermore, Nevins and Vaux (2003) and Idsardi and Raimy (2005) both demonstrate the robustness of ambiguity leading to

distinct analyses in ludlings. We follow this line of inquiry and will demonstrate how each of the innovative reduplication patterns can be derived from ambiguities in surface forms of the reduplication patterns in (31).

5.1 *Full reduplication without final consonant*

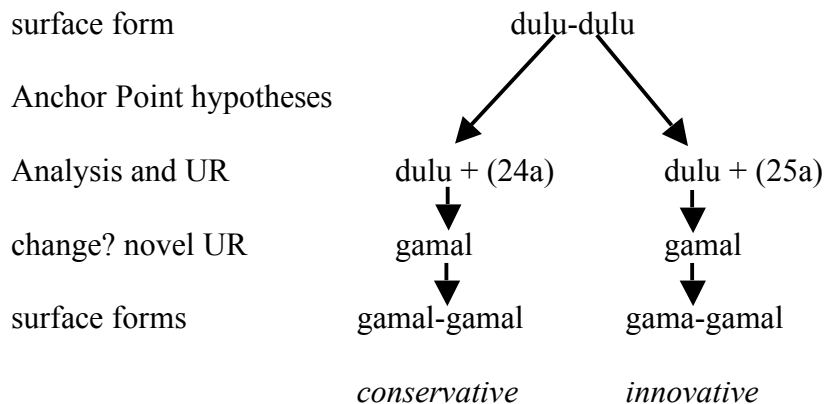
The innovative reduplication pattern that we will derive first is the full reduplication without final consonant pattern presented in (13) and analyzed in (25). The key insight to understanding the genesis of this pattern is that any surface reduplication pattern that is full reduplication of a vowel final base is ambiguous between the description of full reduplication in (24) and full reduplication without final consonant in (25). To see this consider the data in (32) which is drawn from (7), (10) and (11) used to demonstrate full reduplication in TR Malay.

(32) Ambiguous full reduplication

base	reduplicated form
a. saŋko	saŋko-saŋko
b. baʒu	baʒu-baʒu
c. kiro	kiro-kiro
d. dulu	dulu-dulu

All bases of reduplication that end in a vowel and show total reduplication are ambiguous about whether the ‘loop’ is defined from the ‘last segment’ (as in (24) for total reduplication) or from the ‘last vowel’ (as in (25) for full reduplication without final consonant). In previous sections we made the traditional assumption that forms like those in (32) were clearly cases of full reduplication but we must recognize that these types of forms also satisfy the description of full reduplication with no final consonant. If learners are faced with a similar ambiguity, we can then understand that the innovation of the full reduplication with no consonant pattern results from the two part acquisition story of first, the learner analyzes reduplicated forms such as those in (32) with the full reduplication with no final consonant analysis of (25) and then second, uses this generalization on a form that ends in a consonant to create a reduplicated form. This chain of events is presented in (33).

(33) Ambiguity of some full reduplication forms



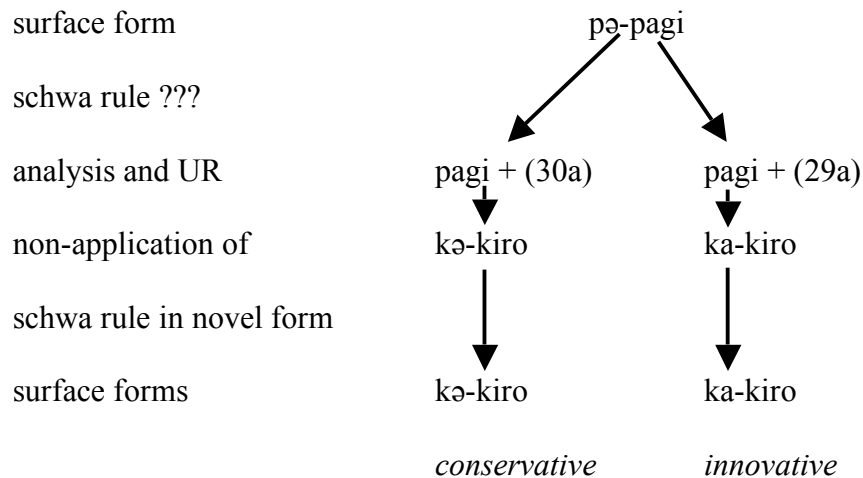
The general approach to innovation we are developing here takes advantage of ambiguity of analysis in surface forms to explain how a learner can make generalizations that lead to language change. In (33) we see that either the generalization in (24) or (25) will correctly account for the surface form *dulu-dulu*. Depending on whether a learner analyzes this form according to (24) or (25) either a ‘conservative’ or an ‘innovative’ grammar will emerge. The ‘conservative’ grammar will produce a surface total reduplication pattern for the consonant final form *gamal* because it adopts the full reduplication analysis of (24). The ‘innovative’ grammar on the other hand would produce the novel surface form *gama-gamal* if the generalization in (25) is adopted instead. This grammar is ‘innovative’ because novel reduplication patterns can be produced via the surface ambiguity of vowel final bases even if the learner never hears an example of the novel pattern.

This example is one where there is an ambiguity in how to analyze a reduplication pattern in terms of Anchor Points. We will see in the next section that there are other possible ambiguities based on whether a phonological rule applied or whether something is pre-specified that will provide explanations for the other innovations in TR Malay.

5.2 *C[a] reduplication*

The C[a] reduplication pattern presented previously in (15) demonstrates a different type of ambiguity that can give rise to language change. TR Malay has a rule that shows variable application which reduces an [a] to [ə] when [a] precedes the penultimate vowel. This process happens particularly in quick speech. The presence of this rule creates an ambiguity for C[ə] reduplicated forms based around what the underlying identity of the prespecified vowel is. The pre-specified vowel in this reduplication pattern could be either [ə] with no application of the ‘schwa rule’ or it could be [a] with the application of the schwa rule.

(34) Ambiguity of C[ə] forms

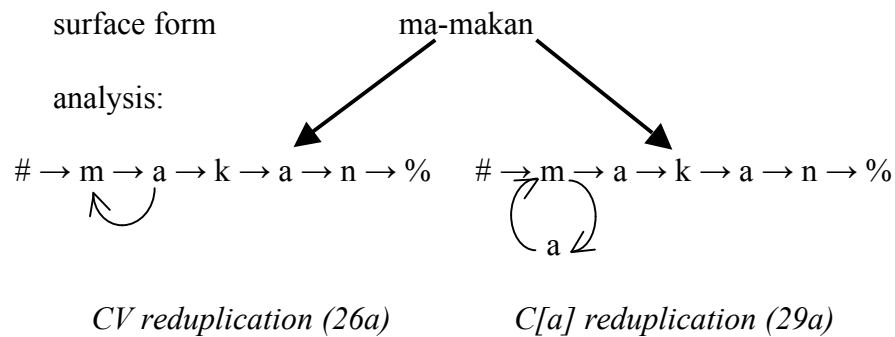


The presence of the ‘schwa rule’ creates an ambiguity in the analysis of the C[ə] reduplication pattern. The learner will recognize that the vowel in this pattern must be pre-specified but is then faced with the question as to whether to take a concrete or abstract approach to this particular affix. A

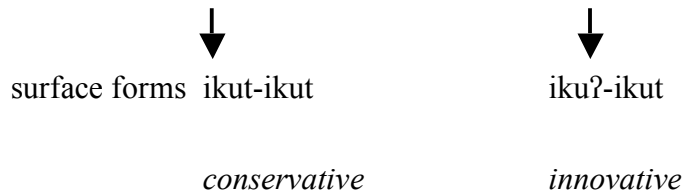
concrete analysis where the learner assumes that the surface schwa is not the result of the ‘schwa rule’ will produce the ‘conservative’ grammar where the analysis of (30a) is adopted. An abstract analysis of this reduplication pattern where the learner posits an /a/ as the memorized pre-specified vowel and derives the surface schwa from the application of the ‘schwa rule’ can produce the novel C[a] pattern in cases where the ‘schwa rule’ does not apply. Given this analysis of the C[ə] pattern, the C[a] pattern can emerge as an innovative reduplication pattern.

Another factor that should be considered in the innovation of the pre-specified [a] are the presence of bases which show CV reduplication and have [a] as the first vowel of the base. When these forms are considered there is the ambiguity of whether the [a] in the reduplicant is being copied or is being pre-specified.

(35) CV or C[a] reduplication



In (35), both CV and C[a] reduplication analyses are congruent with a form like *ma-makan*. This ambiguity will further support the ambiguity of URs for the C[ə] pattern providing further evidence to posit an underlying



(36) illustrates the ambiguity of glottal stop final bases when they show surface full reduplication. If bases of this type are high enough in frequency, a learner may transfer the base final [ʔ] to be part of the reduplication pattern as a pre-specified segment. If this generalization is made, as in the ‘innovative’ path in (36), then when it is applied to a base which does not end in a [ʔ], a novel surface reduplicated form will be generated.

This type of ambiguity is analogous to the one suggested for bases with /a/ as the first vowel and CV reduplication which further supported the ambiguity of underlying vowels affected by the application of the ‘schwa rule’. The possible presence of a rule that creates an alternation between [k] and [ʔ] (McDonald 1976:8) in different forms of Indonesian would produce a similar type of pressure to support the pre-specified approach to the glottal stop. A sensitivity to the presence of this rule may also explain the restriction of the full reduplication with glottal stop pattern of reduplication to only bases that end in /k/ as found in two of the informants.

5.4 *Combinations of innovations*

Sections 5.1-5.3 demonstrated three types of ambiguities in reduplicated forms that form the core of the innovations in TR Malay reduplication patterns. The most important aspect of the analysis presented here is that at this point we have demonstrated how all of the primitives required for our analysis of TR Malay in section 4 can arise from ambiguities of analysis. (37) presents the primitive pieces necessary to account for the reduplication patterns in Standard Indonesian (SI) and Riau Indonesian (RI).

(37) Primitives of reduplication in SI and RI

Pattern	Begin AP	Vowel	Consonant	End AP
a. Full	last segment	∅	∅	first segment
b. CV	first vowel	∅	∅	first segment
c. C[ə]	first segment	ə	∅	first segment

In (37), the three reduplication patterns can be accounted for using three distinct Anchor Points, ‘first segment’, ‘last segment’ and ‘first vowel’ and a pre-specified schwa. The immediately preceding sections then demonstrated how the surface forms that give rise to the reduplication patterns and specific pieces of phonological material in (37) are actually ambiguous and support the surface patterns and phonological material below in (38).

(38) Ambiguous primitives and novel surface patterns in TR Malay

Pattern	Begin AP	Vowel	Consonant	End AP
a. Full	last segment	∅	∅	first segment
b. Full w/o cons	last vowel	∅	∅	first segment
c. Full w/?	last vowel	∅	?	first segment
d. CV	first vowel	∅	∅	first segment
e. C[ə]	first segment	ə	∅	first segment
f. C[a]	first segment	a	∅	first segment

The general theme that developed the novel patterns in (38) was noting how ambiguities in the surface forms of full reduplicated forms can support the novel generalizations in (38b-c) and how ambiguities in CV and C[ə] reduplication patterns can support (38f).

To complete the explanation for the origin of the reduplication patterns in TR Malay we must understand where the remaining reduplication patterns, CV[?], C[a?] and C[ə?], come from. We suggest that if there is any sort of economization or pressure for symmetry in grammatical systems then these three remaining patterns are to be expected.

(39) Symmetry of reduplication in TR Malay

Pattern	Begin AP	Vowel	Consonant	End AP
a. Full	last segment	∅	∅	first segment
b. Full w/o cons	last vowel	∅	∅	first segment
c. Full w/?	last vowel	∅	?	first segment

d. CV	first vowel	∅	∅	first segment
e. CV[ʔ]	first vowel	∅	ʔ	first segment
f. C[ə]	first segment	ə	∅	first segment
g. C[a]	first segment	a	∅	first segment
h. C[əʔ]	first vowel	ə	ʔ	first segment
i. C[aʔ]	first vowel	a	ʔ	first segment

(39) demonstrates that no new phonological material either as a pre-specified segment or an Anchor Point is needed in order to derive the analyses for all the reduplication patterns in TR Malay. The only thing that needs to occur is for the grammar to allow the pre-specified glottal stop to occur with the CV, C[a] and C[ə] reduplication patterns which then creates the final three TR Malay reduplication patterns (39e, h and i).

These final three patterns must be accounted for in this grammatical way instead of invoking ambiguity primarily because they are not ambiguous with other attested reduplication patterns in Malay dialects. Invoking symmetry or economy in grammar has provided many striking results in previous analyses of language (Chomsky 1975, Chomsky and Halle 1968, Lightner 1972, to name a few) so we should not be surprised to see its utility here. For a more recent discussion of symmetry and economy in phonology see Clements (in press).

6. Conclusion

We have presented novel data documenting the reduplication patterns in TR Malay and provided a formal analysis of these patterns based on PBP. One advantage of adopting the PBP analysis of reduplication in TR Malay is that the similarities among different reduplication patterns are captured quite directly in this model. The formal analysis provides a connection between the reduplication patterns in different dialects of Malay and a method of determining how reduplication patterns are related. We do recognize that formal analysis is just one part in understanding the reduplication patterns attested in TR Malay. Further development of our knowledge of social factors in language acquisition, statistical aspects of language acquisition, frequency aspects of language acquisition, exceptions to generalizations and restrictions on patterns and modifying the present analysis according to these advancements will improve our understanding of TR Malay specifically and human language in general.

Notes

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