Output-to-Output Correspondence in Korean Reduplication*

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In this paper, we provide an Optimality-Theoretic analysis of Korean partial reduplication by relying on Jun’s (1994) rule-based analysis. We are mainly concerned with the patterns in which coda consonants delete along with laryngeality of the following onset: /tʰak/ → /tʰa-tak/. Such patterns have been analyzed by Jun employing Metrical Weight Consistency (MWC) constraint, which requires the identity of the foot number of the input and output. Within the framework of Correspondence Theory (McCarthy & Prince 1995, 1997), we propose, as the main mechanism, an Output-to-Output correspondence constraint, DEP-OO(foot), which requires metrical feet of an output candidate to have correspondents of the base. It is shown that the proposed Output-to-Output constraint is equally efficient in deriving attested patterns without positing intermediate levels.

Key words: Output-to-Output correspondence, partial reduplication, Korean foot structure, suffixation, BR-Identity, Metrical Weight Consistency

1. Introduction

In this paper we analyze Korean partial reduplication within the framework of Optimality Theory (Prince & Smolensky 1993; McCarthy & Prince 1993, 1995) by relying on a requirement for the identity in metrical weight between the base and reduplicated word.

Korean reduplication is divided into two types, total and partial. In total reduplication, the whole base repeats (e.g. sak → sak-sak) whereas in partial reduplication, only part of the base repeats (e.g. sak → sa-sak). Partial reduplication has been the focus of most previous researches on

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Korean reduplication. The crucial patterns are characterized by coda deletion (e.g. sa-sak, *sak-sak) and loss of laryngeality (e.g. p'a\textsuperscript{0} → p'a-p'a\textsuperscript{0}, *p'a-p'a\textsuperscript{0}).\textsuperscript{1} To account for these segmental and featural alternations, most previous Optimality-Theoretic (OT) approaches (Kang, 1998; Park, 1998; Chung, 1997) adopt markedness constraints like *CODA and *LARYNGEAL. They claim that the patterns show the emergence of the unmarked (McCarthy & Prince, 1994). However, these analyses cannot be generalized to the suffixation case which produces the same morphological meaning as the partial reduplication. In this paper, we will provide an alternative Optimality-Theoretic analysis which covers both suffixation and partial reduplication by adopting Jun's (1994) Metrical Weight Consistency constraint. We will re-analyze this pre-OT constraint as a type of Output-to-Output (OO) correspondence constraint (Kenstowicz, 1996; Benua, 1995, 1997), which requires identity in phonological properties of the outputs in the same paradigm.

This paper is organized as follows: In Section 2, we will discuss reduplication patterns in Korean onomatopoetic and mimetic words. In Section 3, we will examine the previous rule-based analyses, focusing on McCarthy and Prince (1986) and Jun (1994). In Section 4, we will discuss Kang's (1998) Optimality Theoretic analysis. In Section 5, we will provide an alternative analysis relying on Output-to-Output correspondence. Finally, in Section 6, we will summarize conclusions of the present study.

2. Data\textsuperscript{2)}

Patterns in Korean partial reduplication can be divided into the following four types. First, if the base consists of a single syllable with a lenis onset, the onset and nucleus are reduplicated, excluding the coda:

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\textsuperscript{1} [p', t', k'] represent tensed counterparts of Korean lenis stops [p, t, k].

\textsuperscript{2} The data provided in this paper are selected from Jun (1994).
(1) Monosyllable words with a lenis onset

<table>
<thead>
<tr>
<th>base</th>
<th>partial reduplication</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. sak</td>
<td>sa - sa - k</td>
<td>‘crisp’</td>
</tr>
<tr>
<td>b. tu</td>
<td>tu - tu -γ</td>
<td>‘sound of booming drum’</td>
</tr>
<tr>
<td>c. cik</td>
<td>ci - ci - k</td>
<td>‘sound of tearing’</td>
</tr>
<tr>
<td>d. pu</td>
<td>pu - pu -γ</td>
<td>‘sound of car engine’</td>
</tr>
</tbody>
</table>

Second, as can be seen in (2), if the base consists of a single syllable with a fortis or aspirated onset, the onset and nucleus are reduplicated without coda just like monosyllabic words with a lenis onset.

(2) Monosyllable words with fortis and aspirated onset

<table>
<thead>
<tr>
<th>base</th>
<th>partial reduplication</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. p’a</td>
<td>p’a - pa -γ</td>
<td>‘bang, bombing’</td>
</tr>
<tr>
<td>b. t’ak</td>
<td>t’a - ta - k</td>
<td>‘bumps’</td>
</tr>
<tr>
<td>c. t’ak</td>
<td>t’a - ta - k</td>
<td>‘with a slap’</td>
</tr>
<tr>
<td>d. t’a</td>
<td>t’a - ta - γ</td>
<td>‘bang’</td>
</tr>
<tr>
<td>e. c’a</td>
<td>c’a - ca -γ</td>
<td>‘clanging’</td>
</tr>
<tr>
<td>f. p’a</td>
<td>p’a - pa -γ</td>
<td>‘bombing sound’</td>
</tr>
<tr>
<td>g. t’u</td>
<td>t’u - tu -γ</td>
<td>‘with a boom’</td>
</tr>
</tbody>
</table>

However, onsets of the reduplicant do not retain laryngeality, fortition and aspiration. Fortis and aspirated onsets are changed into lenis onsets in the reduplicant.

Third, as can be seen in (3), if the base is made up of two syllables, the onset and nucleus of the final heavy syllable are reduplicated, excluding the coda.

(3) Disyllable words with lenis onset

<table>
<thead>
<tr>
<th>base</th>
<th>partial reduplication</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. cu.luk</td>
<td>cu. lu - lu -k</td>
<td>‘sound of rain dropping’</td>
</tr>
<tr>
<td>b. wasak</td>
<td>wa. sa - sa -k</td>
<td>‘munching’</td>
</tr>
<tr>
<td>c. o.tok</td>
<td>o. to -to -k</td>
<td>‘with a clatter’</td>
</tr>
<tr>
<td>d. u.tuk</td>
<td>u. tu - tu -k</td>
<td>‘with a clatter’</td>
</tr>
<tr>
<td>e. a.sak</td>
<td>a. sa -sa -k</td>
<td>‘crunching’</td>
</tr>
<tr>
<td>f. u.cik</td>
<td>u. ci - ci -k</td>
<td>‘cracking, sputtering’</td>
</tr>
<tr>
<td>g. ho.lok</td>
<td>ho. lo - lo -k</td>
<td>‘flapping’</td>
</tr>
<tr>
<td>h. t’a.lıı</td>
<td>t’a. li - li -ıı</td>
<td>‘sound of bike bell’</td>
</tr>
</tbody>
</table>
When a base form is reduplicated, the target for reduplication is always the last heavy syllable of the base. Therefore the first syllable of the base is not involved in reduplication, regardless of whether its onset is fortis, lenis or aspirated.

In the above data, we can make two observations involving deletion. First, fortition and aspiration disappear in the reduplicant. Second, the coda of the final syllable of the base also disappears in the reduplicant.

A different operation may be adopted for the same morphological meaning change. Some onomatopoeic and mimetic words undergo suffixation, instead of reduplication, as shown below.

(4) Suffixation

<table>
<thead>
<tr>
<th>base</th>
<th>Suffixed words</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. cal.p'ak</td>
<td>cal.p'a - tak</td>
<td>'squelching'</td>
</tr>
<tr>
<td>b. c'al.k'ak</td>
<td>c'al.k'a - tak</td>
<td>'with a snap'</td>
</tr>
<tr>
<td>c. cil.p'ak</td>
<td>cil.p'a - tak</td>
<td>'with a squishing noises'</td>
</tr>
<tr>
<td>d. mi.k'in</td>
<td>mi.k'i - to'</td>
<td>'sleekly'</td>
</tr>
<tr>
<td>e. p'al.la</td>
<td>p'al.la - to'</td>
<td>'falling onto one's back'</td>
</tr>
<tr>
<td>f. t'al.kl</td>
<td>t'al.ki - la</td>
<td>'rattling'</td>
</tr>
<tr>
<td>g. ce0.ki</td>
<td>ce0.ki - la</td>
<td>'clanking'</td>
</tr>
<tr>
<td>h. k'om.ci</td>
<td>k'om.ci - lak</td>
<td>'budging'</td>
</tr>
<tr>
<td>i. k'u.mul</td>
<td>k'u.mu - lo</td>
<td>'moving slowly'</td>
</tr>
<tr>
<td>j. mæ.mus</td>
<td>mæ.mu - cə</td>
<td>'hesitating'</td>
</tr>
<tr>
<td>k. man.cis</td>
<td>man.ci - cak</td>
<td>'fingering'</td>
</tr>
<tr>
<td>l. møp.kis</td>
<td>møp.ki - cak</td>
<td>'dawdling'</td>
</tr>
<tr>
<td>m. k'u.pus</td>
<td>k'u.pu - cə</td>
<td>'rather bend'</td>
</tr>
</tbody>
</table>

In data (4), three types of suffixes are used: i) /-tVK/ ii) /-lVK/ iii) /-cVK/ where V and K represent a vowel and a velar consonant, respectively. The choice depends on the coda of the preceding stem-final syllable: l and c are chosen when the preceding stem-final codas are l and s, respectively. Interestingly, the stem-final coda disappears in the output of
the suffixation: e.g. /cal.pαk/ + /tak/ → [cal.pα.a.tak], * [cal.pα.a.tak]. In conclusion, the stem-final coda disappears in both partial reduplication and suffixation. In so far as the both precesses are adopted for the same morphological meaning, the loss of stem-final coda involved in both processes should be subject to the same account. In the remainder of this paper, we will point out that most previous approaches to Korean partial reduplication fail to extend their analyses to the suffixation cases, and then we will provide a unified account for partial reduplication and suffixation following the main idea of Jun's (1994) analysis.

3. Previous Rule-based Analyses

3.1. McCarthy and Prince (1986)

In their analysis, McCarthy and Prince (1986, p. 54) claim that Korean partial reduplication is in fact a suffixing reduplication while considering the stem-final consonant extrasyllabic. This treatment can be illustrated by the following sample derivation:

(5) partial reduplication [cu.lu-lu-k]

base /cu.luk/

\[
\begin{array}{c}
\sigma \\
\mu \\
\text{c u l u k}
\end{array}
\]

\[
\begin{array}{c}
\sigma \\
\mu \\
\text{c u l u k}
\end{array}
\]

As far as we can see, it is very difficult to extend this type of analysis to the suffixation case. As mentioned earlier, suffixation may be adopted for
the same morphological meaning as partial reduplication denotes. Therefore the generalized analysis for both partial reduplication and suffixation is definitely preferred. The pattern of suffixation is characterized by attaching a single CVC syllable to the base. According to McCarthy and Prince’s coda extrametricality proposal, the final coda of a suffixed word must be the same as the final coda of the base. But, as shown in (4), all suffixed words end with a velar consonant, [k] or [g], even though some of their bases do not end with a velar segment, as in /k'om.cil/ and /m'a.mus/. In these cases the prediction is that stem-final consonants [l] and [s], which would be rendered extrasyllabic, would surface as the coda of the resulting word. To illustrate this, let us consider the following sample derivation of /k'om.cil/.

\[(6) \text{ base } /k'om.cil/\]

\begin{center}
\[
\begin{array}{c}
\sigma \\
\mu \\
k' \\
m \\
oc \\
l \\
\end{array}
\quad \begin{array}{c}
\sigma \\
\mu \\
\mu \\
(\mu) \\
\end{array}
\end{center}

\text{suffixation of } /la/ \\
\begin{center}
\[
\begin{array}{c}
\sigma \\
\mu \\
k' \\
m \\
oc \\
l \\
\end{array}
\quad \begin{array}{c}
\sigma \\
\mu \\
(\mu) \\
\end{array}
\quad \begin{array}{c}
\sigma \\
\mu \\
\mu \\
\mu \\
(\mu) \\
\end{array}
\end{center}

\text{stray erasure } *\{k'om.clal\} \\
\text{desired output } [k'om.ci.lak]

The final coda [l] of the base remains extrasyllabic and suffix [la] is attached to the last syllable of the base. As a result *[k'om.clal]* comes out for the output. But the desired output is [k'om.ci.lak], with a different coda from that of the base. Therefore it seems true that McCarthy and Prince (1986)'s proposal can not be easily extended to loss of the coda in suffixation cases.

3.2. Jun (1994)

For an analysis of Korean partial reduplication, Jun makes the following
assumptions. First, based on Lee (1974) and Lee (1987), he assumes that Korean metrical foot structures are i) right-headed, ii) unbounded and iii) quantity-sensitive. According to this assumption, no matter how many light syllables precede a heavy syllable, they form a single foot with the heavy syllable. Thus light syllables with no heavy syllable cannot form an independent foot. Second, it is assumed that Korean fortis and aspirated consonants are geminate. This hypothesis is originally proposed by Martin (1951) and Kim (1986). Under this assumption, Jun proposes that Korean fortis and aspirated obstruents bear an underlying mora as shown in (7-8) below. According to this proposal, when a laryngeal consonant is in the onset, its extrametrical mora can make a preceding CV syllable heavy as can be seen in (8).

(7) /k'ok/ ‘exactly’ (8) /co pʰ ap/ ‘boiled millet’

Under these two assumptions, Jun observes that the numbers of feet of the input and output are identical in partial reduplication and suffixation both of which belong to the same morphological category, termed as “partial extension”. This observation leads Jun to propose a constraint, defined below:

(9) Metrical Weight Consistency (MWC) (Jun 1994, p. 79)

The number of feet in the output of partial extension must be identical to that in the input.

3) According to Lee (1974) and Lee (1987), Korean stress rules are as follows. First, a stress falls only on heavy syllables (i.e., (C)VV(C) and (C)VC). Second, if the first syllable is light, a stress falls on the following syllable.

4) Jun (1993) argued that Korean fortis and aspirated consonants are geminate consonant in the following. First, fortis and aspirated consonants are not allowed in the coda position. Second, they do not become voiced between sonorant segments. Third, it is ambiguous that they are syllabified as onsets of the following syllable or as codas of the preceding syllable. These observations are general in any language as well as in Korean. See Jun (1993) for more details.
To see how this mechanism analyzes Korean partial reduplication, let us consider a following sample derivation:

(10) base with a lenis onset  (11) base with a fortis onset

\[
\begin{align*}
\text{base} & \quad \sigma \quad (1 \text{ foot}) & \quad \text{base} & \quad \sigma \quad (1 \text{ foot}) \\
& \quad \mu \quad \mu \quad s \quad a \quad k \quad \phi & & \quad \mu \quad \mu \quad p' \quad a \quad \eta \quad \phi \\
\end{align*}
\]

\[
\begin{align*}
\text{RED} & \quad \sigma \quad (2 \text{ feet}) & \quad \sigma \quad (2 \text{ feet}) \\
& \quad \mu \quad \mu \quad \mu \quad s \quad a \quad k \quad \phi & & \quad \mu \quad \mu \quad \mu \quad p' \quad a \quad \eta \quad \phi \\
\end{align*}
\]

\[
\begin{align*}
\text{MWC} & \quad \sigma \quad (2 \text{ feet}) & \quad \sigma \quad (2 \text{ feet}) \\
& \quad \mu \quad \mu \quad \mu \quad (\mu) \quad s \quad a \quad k \quad \phi & & \quad \mu \quad \mu \quad \mu \quad \mu \quad p' \quad a \quad \eta \quad \phi \\
\end{align*}
\]

\[
\begin{align*}
\text{output} & \quad \sigma \quad \sigma \quad (1 \text{ foot}) & \quad \sigma \quad (1 \text{ foot}) \\
& \quad \mu \quad \mu \quad \mu \quad s \quad a \quad s \quad a \quad k \quad \phi & & \quad \mu \quad \mu \quad p' \quad a \quad p \quad \eta \quad \phi \\
\end{align*}
\]
(12) disyllabic base

\[
\text{base} \quad \sigma \quad \sigma \quad (2 \text{ feet})
\]
\[
\begin{array}{cccccccc}
\text{c} & \text{i} & \text{l} & \phi & \text{p} & \emptyset & \text{k} & \phi \\
\end{array}
\]

\[
\text{sufffixation} \quad \sigma \quad \sigma \quad \sigma \quad (3 \text{ feet})
\]
\[
\begin{array}{cccccccc}
\text{c} & \text{i} & \text{l} & \phi & \text{p} & \emptyset & \text{k} & \phi & \text{t} & \emptyset & \text{k} & \phi \\
\end{array}
\]

\[
\text{MWC} \quad \sigma \quad \sigma \quad \sigma \quad (3 \text{ feet})
\]
\[
\begin{array}{cccccccc}
\text{c} & \text{i} & \text{l} & \phi & \text{p} & \emptyset & \text{k} & \phi & \text{t} & \emptyset & \text{k} & \phi \\
\end{array}
\]

\[
\text{output} \quad \sigma \quad \sigma \quad \sigma \quad (2 \text{ feet})
\]
\[
\begin{array}{cccccccc}
\text{c} & \text{i} & \text{l} & \phi & \text{p} & \emptyset & \text{t} & \emptyset & \text{k} & \phi \\
\end{array}
\]

In the above, stem-final heavy syllables are the target of reduplication, and they undergo coda deletion to maintain the number of feet of the base. Notice the loss of laryngeality in the reduplicant. In the third step of (11), an extrametrical mora of the reduplicant is omitted, making its output a single foot. As a result, the second syllable, the reduplicant, is deprived of its laryngeality. It seems that among previous analyses including OT analyses, some of which will be discussed in the next section, Jun's approach is the only one which provides a single motivation for loss of stem-final coda in partial reduplication and suffixation, and loss of laryngeality in partial reduplication. This single motivation is formally captured by proposing MWC. However, Jun's analysis can be subject to the problems
that any other rule-based analysis is. For instance, its analysis is not homogeneous in using both rules and constraint, and its analysis requires presence of intermediate levels, necessarily being serial (Kager, 1999). In Section 5, we attempt to provide an alternative analysis to resolve these problems.

4. Previous OT Analyses

We are now in a position to discuss previous OT analyses of Korean partial reduplication. In this section, we will focus on the discussion of Kang (1998) who provides a most elaborate OT analysis, dealing with the wide range of the data. (A brief separate discussion of Ahn (2000) will be provided at the end of Section 5.)

In McCarthy and Prince (1995, 1997), Faithfulness constraints are formalized in terms of correspondence relation:

\[(13) \text{Correspondence} \]

Given two strings \(S_1\) and \(S_2\), correspondence is a relation \(R\) from the elements of \(S_1\) to those of \(S_2\). Elements \(a \in S_1\) and \(b \in S_2\) are referred to as correspondents one another when \(aRb\).

This concept of correspondence has been adopted in formalizing not only IO-Faithfulness but also BR-Identity which regulates the relation between the base and its reduplication.

\[(14) \text{Basic Model} \]

Input: \(/Af_{RED} + \text{Stem/} \]

\[\uparrow \downarrow \text{I-O Faithfulness} \]

Output: \(R \leftrightarrow \text{Base} \]

\(B-R \text{ Identity} \)

Kang explains patterns of Korean partial reduplication, relying on the interaction of IO-Faithfulness, BR-Identity and Markedness constraints. Definitions of these Markedness constraints as well as their conflicting Faithfulness constraints are given below:
(15) a. Afx ≤ 1: An affix must not be longer than one syllable.
   b. \text{IDENT}(F)(Featural identity): Correspondent segments are identical in
      feature F.
      (i) \text{IDENT-IO}(Peripheral): Correspondents in the input and output
      are identical in peripheral features.
      (ii) \text{IDENT-BR}(Peripheral): Correspondents in the base and reduplicant
      are identical in peripheral features.
      (iii) \text{IDENT-IO}(Lary): Correspondents in the input and output are
      identical in laryngeal features.
      (iv) \text{IDENT-BR}(Lary): Correspondents in the base and reduplicant
      are identical in laryngeal features.
   c. \text{*PERIPHERAL}: Peripheral features (bilabial and velar) are not allowed.
   d. \text{*LARYNGEAL}: Laryngeal features are not allowed.
   e. \text{*CODA}: Syllables are open.

She basically divides patterns of partial reduplication into three types:
prefixing, internal and suffixing.

(16) Prefixing: /t'e\text{\textk}ul/ \rightarrow [t'e\text{\textk} - t'e\text{\textk}ul]
   Suffixing: /k'u\text{\textc}ak/ \rightarrow [k'u\text{\textc}ak - cak]
   Internal: /culuk/ \rightarrow [culu - lu - k], /p'a\text{\textd}/ \rightarrow [p'a - pa - u]

Kang suggests that the rankings between \text{IO-Faithfulness}, \text{BR-Identity} and
\text{Markedness} constraints depend on the reduplicant's location within a
word. She states that prefixing and suffixing reduplicants are located at
the beginning and the end of the resulting word, respectively. These ends
are morphological boundaries, and need to be clearly perceptible to the
hearer. Therefore \text{IO-Faithfulness} and \text{BR-Identity} can dominate phonological
constraints like \text{*CODA}, \text{*LARYNGEAL} and \text{*PERIPHERAL} in prefixing and suffixing
reduplication. On the contrary, since internal reduplicants emerge in the
middle of the word, they are separated from the morphological boundaries.
In this case Markedness constraints can have some priorities. In sum,
Markedness constraints dominate \text{BR-Identity} constraints in internal redupli-
cation, whereas \text{BR-Identity} ones dominate Markedness constraints in
prefixing and suffixing reduplication. In Kang's proposal, Markedness
constraints adopted are motivated from the following markedness facts:
Consider how this mechanism analyzes the internal reduplication. Markedness constraints occupy higher positions in ranking than BR-Identity constraints while they take lower positions than IO-Faithfulness constraints. Tableau (18) shows the analysis of a word with a laryngeal onset.

(18) /pʰaʊ-/ -> {pʰa- pʰa- o} (Kang, 1998, p. 41)

<table>
<thead>
<tr>
<th>pʰaʊ-RED</th>
<th>a. Afx ≤ σ</th>
<th>b. IDENT-I0(Lary)</th>
<th>∗LARY</th>
<th>a. IDENT-BR(Lary)</th>
<th>b. ∗CODA</th>
</tr>
</thead>
<tbody>
<tr>
<td>pʰa-</td>
<td></td>
<td>b. ∗!</td>
<td></td>
<td>a. ∗</td>
<td>b. ∗</td>
</tr>
<tr>
<td>pʰa-pʰa-</td>
<td></td>
<td>b. ∗!</td>
<td>**!</td>
<td>b. ∗</td>
<td></td>
</tr>
<tr>
<td>pʰa-pʰa-</td>
<td></td>
<td>b. ∗!</td>
<td></td>
<td>a. ∗</td>
<td>b. ∗</td>
</tr>
<tr>
<td>pʰa-pʰa-</td>
<td></td>
<td>b. ∗!</td>
<td></td>
<td>a. ∗</td>
<td>b. ∗</td>
</tr>
</tbody>
</table>

In tableau (18), candidate (b) and (d) are ruled out by a top-ranked IDENT-I0(Lary) because they do not preserve the underlying laryngeal feature in the base. (18c) with two laryngeal features is eliminated by ∗LARY, which is the second high-ranked. (18a) also violates ∗LARY, but only once. Therefore, (18a) is selected as an optimal output. In this internal reduplication, the reduplicant lacks laryngeality, displaying the emergence of the unmarked.

Let us now consider suffixation cases shown in (4). Kang (1998) considers these cases as internal reduplication, unlike Jun who regards these as suffixation cases. Following Chung (1997), Kang adopts the prespecification of [t] as the onset of the internal reduplicant. The following tableau shows her analysis of the suffixation case.
In tableau (19), phonological constraints \( *P_{\text{ERI}} \) and \( *L_{\text{ARY}} \), dominate \( I_{\text{IDENT-BR}} \) constraints. Candidates (c) and (d) violate top-ranked \( I_{\text{IDENT-IO}} \) since they do not preserve underlying velarity. Candidates (a), (b) and (e) all satisfy the top-ranked \( I_{\text{IDENT-IO}}(\text{Peripheral}) \). (19a) contains two aspirated consonants, \([\text{c}^{\text{a}}]\) and \([\text{k}^{\text{h}}]\), and two velar stops, incurring double violations of \( *P_{\text{ERI}} \) and \( *L_{\text{ARY}} \). (19b) includes two occurrences of the velar sounds and three of occurrences aspirated onsets. (19e) has three occurrences of the velar stops and two occurrences of the aspirated consonants. Thus candidate (b) and (e) violate phonological constraints \( *P_{\text{ERI}} \) and \( *L_{\text{ARY}} \) five times in total. Therefore (19a), incurring the fewest violation of the Markedness constraints is selected as an optimal output.

However, other suffixation cases cannot be analyzed within the same mechanism. First, as you can see in (4), all suffixed words end with \([k]\) or \([\text{a}]\). But we cannot regard these segments as the coda of the base, unlike in the analysis of the internal reduplication in (19). This is because, as shown in (4), there exist words whose stems do not end with \([k]\) or \([\text{a}]\). Second, prespecification of \([t]\) is also problematic. According to Kang's proposal, the phonetic realization of the prespecified \([t]\) should be predictable for all the relevant cases. However, several different variants, \([\text{c}]\) and \([\text{l}]\), are attested as can be seen in (4). If we adopt Kang's mechanism for the internal reduplication words like \([\text{k}'\text{om}.\text{ci-lak}]\) would be analyzed as follows:

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} \\
\hline
\text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} \\
\hline
\text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} \\
\hline
\text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} & \text{\text{\v{c}al.k\text{a}}-\text{ta-k}} \\
\hline
\end{tabular}
\end{table}
(20) /k'om.čil/ + RED

<table>
<thead>
<tr>
<th>k'om.čil +RED</th>
<th>I_{IDENT-IO} (Peripheral)</th>
<th>a. *P_{ERI} \ b. *L_{ARY}</th>
<th>I_{IDENT-BR} (Peripheral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. k'om.či-la-k</td>
<td>a. ** b. *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. k'om.či-ta-k</td>
<td>a. ** b. *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. k'om.či-ca-k</td>
<td>a. ** b. *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. k'om.či-ka-l</td>
<td>a. ** b. *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. k'om.či-la-l</td>
<td>a. * b. *</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In tableau (20), candidates (a–e) satisfy $I_{IDENT-IO}(Peripheral)$ which is top ranked. But all candidates, except (e), ruled out by $*P_{ERI}$ because of two occurrences of velar stops. Thus, an optimal candidate is (e). However the desired optimal output is (a) [k'omci-lak]. Therefore, to explain this type of suffixation patterns, at least some drastic revisions are needed for Kang's mechanism.

In previous approaches to Korean partial reduplication, including those couched within Optimality Theory (e.g. Kang (1998), just discussed), loss of coda and loss of laryngeality in reduplication are attributed to different accounts. For instance, in Kang (1998), different markedness constraints, $*_{CODA}$ and $*_{LARYNGEAL}$, are adopted for loss of coda and laryngeality, respectively. In this type of accounts, the cooccurrence of coda loss and laryngeality loss is accidental. Other logical possible patterns in reduplication are predicted: loss of coda alone, loss of laryngeality alone and loss of neither. These patterns can result if we permute the constraint ranking among $*_{CODA}$, $*_{LARYNGEAL}$ and $I_{IDENT-BR}$.

(21) \textbf{Ranking}

\begin{align*}
(a) & \quad *_{CODA}, \quad *_{LARY} > I_{IDENT-BR} & \text{loss of both coda and laryngeality} \\
(b) & \quad I_{IDENT-BR} > *_{CODA}, \quad *_{LARY} & \text{loss of neither} \\
(c) & \quad *_{CODA} > I_{IDENT-BR} > *_{LARY} & \text{(attested: total RED)} \\
(d) & \quad *_{LARY} > I_{IDENT-BR} > *_{CODA} & \text{loss of laryngeality(unattested)}
\end{align*}

Resulting patterns

\begin{align*}
& \text{loss of both coda and laryngeality} \\
& \text{(attested: partial RED)} \\
& \text{loss of neither} \\
& \text{(attested: total RED)} \\
& \text{loss of coda alone(unattested)} \\
& \text{loss of laryngeality(unattested)}
\end{align*}

Notice that these patterns, in which the ranking of $*_{CODA}$ and $*_{LARYNGEAL}$ relative to the faithfulness constraint is identical, are attested. In other words, in those attested patterns, the two markedness constraints behave
as if they are a single constraint. This may indicate that loss of coda and loss of laryngeality in Korean partial reduplication are tightly related.

In sum, we have pointed out two problems to previous analyses. First, the mechanism for reduplication patterns cannot be easily extended to at least some of suffixation cases like [k'omcilak]. Second, it seems coda loss and laryngeality loss always cooccur in patterns of Korean reduplication; however, the two losses are attributed to different accounts in which their co-occurrence has to be accidental. In the next section, we will provide a uniform analysis for partial reduplication and suffixation by formalizing the MWC within the correspondence-theoretic framework (McCarthy & Prince, 1995).

5. Output-to-Output Correspondence Analysis

5.1. Partial Reduplication

We will provide a uniform analysis for partial reduplication and suffixation by relying on OO-correspondence. In Korean reduplication, partially reduplicated forms denote meanings that are a little different from totally reduplicated counterparts. Total reduplication represents successive repetition of the same motion or sound with the same duration. Partial reduplication is temporal extension or lengthening of the base form (Jun, 1994, p. 69). Usually both processes are adopted for the same base:

(22) base Total RED Partial RED
a. p'a₀ p'a₀ p'a₀ p'a₀
b. sak sak sak sak
\[\text{sa} - \text{sak}\]
c. cu.luk cu.luk cu.luk cu.luk cu.luk - luk

Partial reduplication does not involve complete preservation of properties of the base. Depending upon the circumstance, these segments may lose their featural properties in reduplicants unlike total reduplication.

Let us consider the suffixation cases. As shown in (4), base forms like /c'ak/ are combined with the suffix [-tak] and they become suffixed words like [c'ak-tak]. In this case, the base form has two feet, and the suffix, which has a coda, has one foot. So when they are put together, three feet forms would result. But the desired output has two feet [(c'ak)[k
\textsuperscript{a-tak]), in which the coda of the base is deleted.

(23) Fully faithful output \[(\text{\textit{eal}})(\text{\textit{akh}}) + \text{(tak)}\] (3 feet)  

\[\text{stem} \quad \text{Af}\]  

Actual output \[(\text{\textit{eal}})(\text{\textit{ak-a-tak}})\] (2 feet)  

base: \[(\text{\textit{eal}})(\text{\textit{akh}})\] (2 feet)

Following Jun (1994), we assume that partially reduplicated forms maintain the number of feet of the base in the output. Recall that for its analysis Jun proposes MWC which requires that the number of feet in the output of partial reduplication is equal to that of the input base. Within the Correspondence framework, we can formulate it as \text{DEP-OO(foot)} which prohibits an insertion of a foot. The following provides definitions of constraints needed for the proposed OO-Correspondence analysis of the reduplication, including \text{DEP-OO(foot)}.

(24) a. \text{MAX-IO}: Every segment of the input has a correspondent in the output. (No phonological deletion)  
b. \text{MAX-BR}: Every element of the base has a correspondent in reduplication.  
c. \text{DEP-OO(foot)}: Every foot of (affixed) phonological words must have a correspondent in the isolation form of its component stem.  
d. \text{Af}_x \leq 0$: Affix must not be over one syllable.  
e. \text{PARSE-\omega}: Syllables are parsed by feet.  
f. *\text{DEGENERATE-foot}: Degenerate feet are not allowed.  
g. \text{EDGEMOST}: Suffix must align with right edge of the phonological word.

Let us now consider how to evaluate the constraints, presented in (25), and how they are ranked. In the evaluation of the metrical constraints, recall the characteristics of Korean metrical foot structure, as mentioned in Section 3.2. According to Jun's assumption, light syllables cannot make

\footnote{Notice that here we cannot rely on the corresponding IO-Faithfulness constraint since it is generally assumed that the input lacks prosodic structures including a foot.}
an independent foot in Korean. Such degenerate feet are banned in many languages; this general requirement is formalized as \( +D_{\text{GENERATE}} - \text{foot} \) (\( *D_{\text{EG}} - \text{ft} \)). Thus all syllables must be parsed by feet but the feet with only light syllables are prohibited. Therefore \( P_{\text{ARSE} - \sigma} \) and \( +D_{\text{GENERATE}} - \text{foot} \) are dominant in ranking. \( Afx \leq \sigma \), which restricts the size of an affix, is also top-ranked in partial reduplication. As shown in the data of (1-4), all reduplicants consist of a single syllable. Notice most reduplicants can be considered as a suffix since they are located at the right edge of the words. \( E_{\text{DEGEMOST}} \) captures this fact. The constraints, just discussed, are summarized as below:

\[ (25) \text{Undominated constraints} \]
\[ Afx \leq \sigma, P_{\text{ARSE} - \sigma}, +D_{\text{GENERATE}} - \text{foot}, E_{\text{DEGEMOST}} \]

We are in a position to consider Faithfulness constraints. Since the foot number is maintained in partial reduplication and suffixation, \( D_{\text{EF-OO}}(\text{foot}) \) must be dominant. What about \( \text{MAX} \) constraints prohibiting segment loss? The target for partial reduplication and suffixation is the final heavy syllable of the base. This heavy syllable loses its final coda violating \( \text{MAX-I} \). The base without coda is never identical with its reduplicant which is always a closed syllable. Therefore we should rank both \( \text{MAX-I} \) and \( \text{MAX-BR} \) constraints at the bottom of the hierarchy.

\[ (26) D_{\text{EF-OO}}(\text{foot}) \gg \text{MAX-I}, \text{MAX-BR} \]

With these ranked constraints, we will analyze partial reduplication patterns. First, consider the analysis of monosyllabic words with a lenis onset.

\[ (27) \text{monosyllabic words with a lenis onset} /\text{sak}/ \]

<table>
<thead>
<tr>
<th>input=/sak+RED/ base=(sak)</th>
<th>( Afx \leq \sigma )</th>
<th>( D_{\text{EF-OO}} ) (foot)</th>
<th>( P_{\text{ARSE} - \sigma} )</th>
<th>( E_{\text{DEGEMOST}} )</th>
<th>( *D_{\text{EG}} - \text{ft} )</th>
<th>( \text{MAX-I} )</th>
<th>( \text{MAX-BR} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (sa-sak)_</td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (sak)<em>-(sak)</em></td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (sak)_-sa</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (sa-sa-k)_</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (sa-sa)_</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. (sak)<em>-(sa)</em></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(an underline represents a reduplicant; ( ) indicates a foot structure.)
In tableau (27), candidate (b) having an additional foot j, is eliminated by top-ranked D\textsubscript{EP-OO}(foot). (27c) violates another top-ranked PARSE-\sigma since it contains unparsed syllable [sa]. (27d) whose reduplicant is not located at the right edge of the word is ruled out by E\textsubscript{DNEGEMOST}. (27e) is ruled out by *Degenerate-foot since it does not have any heavy syllable and violates M\textsubscript{AX-IO}, too. Candidate (f) observes PARSE-\sigma, but a new foot is added. So it violates D\textsubscript{EP-OO}(foot) and the second foot consists of a light syllable alone, which violates Degenerate(foot). Therefore, an optimal candidate is (27a), which violates only lower-ranked constraints M\textsubscript{AX-IO} and M\textsubscript{AX-BR}.

Second, let us consider disyllabic words with a lenis onset. In disyllabic words with a lenis onset, the final coda is deleted. This can be analyzed in line with the analysis just present.

(28) Disyllabic words with a lenis onset /cu.luk/

<table>
<thead>
<tr>
<th>input=\textit{culuk}+RED/ base=(\textit{culuk})</th>
<th>A\textsubscript{FX} \leq \sigma</th>
<th>D\textsubscript{EP-OO} (foot)</th>
<th>PARSE-\sigma</th>
<th>E\textsubscript{DNEGEMOST}</th>
<th>*D\textsubscript{EC-ft}</th>
<th>M\textsubscript{AX-IO}</th>
<th>M\textsubscript{AX-BR}</th>
</tr>
</thead>
<tbody>
<tr>
<td>(28a) (cu-lu-luk) \textsubscript{i}</td>
<td>\textsubscript{a}</td>
<td>\textsubscript{a}</td>
<td>\textsubscript{a}</td>
<td>\textsubscript{a}</td>
<td>\textsubscript{a}</td>
<td>\textsubscript{a}</td>
<td>\textsubscript{a}</td>
</tr>
<tr>
<td>b. (cu-luk)(luk) \textsubscript{i}</td>
<td>\textsubscript{b}</td>
<td>\textsubscript{b}</td>
<td>\textsubscript{b}</td>
<td>\textsubscript{b}</td>
<td>\textsubscript{b}</td>
<td>\textsubscript{b}</td>
<td>\textsubscript{b}</td>
</tr>
<tr>
<td>c. (cu-luk)-lu \textsubscript{j}</td>
<td>\textsubscript{c}</td>
<td>\textsubscript{c}</td>
<td>\textsubscript{c}</td>
<td>\textsubscript{c}</td>
<td>\textsubscript{c}</td>
<td>\textsubscript{c}</td>
<td>\textsubscript{c}</td>
</tr>
<tr>
<td>d. (cu-lu-lu-k) \textsubscript{k}</td>
<td>\textsubscript{d}</td>
<td>\textsubscript{d}</td>
<td>\textsubscript{d}</td>
<td>\textsubscript{d}</td>
<td>\textsubscript{d}</td>
<td>\textsubscript{d}</td>
<td>\textsubscript{d}</td>
</tr>
<tr>
<td>e. (cu-lu-lu) \textsubscript{l}</td>
<td>\textsubscript{e}</td>
<td>\textsubscript{e}</td>
<td>\textsubscript{e}</td>
<td>\textsubscript{e}</td>
<td>\textsubscript{e}</td>
<td>\textsubscript{e}</td>
<td>\textsubscript{e}</td>
</tr>
</tbody>
</table>

(28b) is ruled out by D\textsubscript{EP-OO}(foot). Base [cu.luk] is a one foot word but (b) has two feet, indexed with i and j. Candidate (c) violates high-ranked constraint PARSE-\sigma, because the final syllable [-lu] is not parsed into a foot. (28d) and (28e) are also eliminated by high-ranked constraints, E\textsubscript{DNEGEMOST} and *D\textsubscript{EC-ft}, respectively. In (28d), reduplicant [-lu] is not located at the right edge of the word. Thus it also violates EDGEMOST. Candidate (28e) [cu.lu.lu] does not have any heavy syllables violating *D\textsubscript{EC-ft}. Therefore satisfying all top-ranked constraints, (a) is an optimal output.

Third, let us now consider the words with fortis and aspirated onsets. As shown in section 3.2, according to the geminate hypothesis, aspirated and fortis onsets can have an underlying mora which can make preceding light syllables heavy syllables, creating a foot. This may cause disagreement in the number of the foot of the base. Recall that this is why there is no fortition or aspiration in the reduplicant. This indicates that IDENT-\textsubscript{BR}(Lary) is dominated by D\textsubscript{EP-OO}(foot) as well as M\textsubscript{AX-IO} and M\textsubscript{AX-BR}. The following shows the analysis of words with fortis and aspirated onsets.
(29) Monosyllabic words with fortis and aspirated onsets

<table>
<thead>
<tr>
<th>input= /p’a0</th>
<th>Afx</th>
<th>DEP-OO (foot)</th>
<th>PARSE-σ</th>
<th>EDGEMOST</th>
<th>DEG-ft</th>
<th>IDENT-IO (lary)</th>
<th>MAX-IO</th>
<th>a. MMAX-</th>
<th>b. IIDENT-BR (lary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (p’a-pa0)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>a. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (p’a)-p(a0)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>a. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (p’a)p’a</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>a. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (pa-pa0)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>a. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (pa0)-p(a0)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>a. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. (pa-pa0)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>a. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(29b) violates \(D_{ER}-OO(foot)\) because reduplicant \(p’a0\) has its own underlying mora and it makes its preceding syllable an independent foot. (29c) is ruled out by \(P_{ARSE-σ}\). In (29d), reduplicant \(-pa\) does not align with the right edge of the word, and (d) is not featurally faithful to its input \(/p’a0/\). Thus (d) violates high ranked constraints \(EDGEMOST\) and \(IDENT-IO(lary)\). In (29e), the second foot \(p’a\) forms an independent foot, violating \(+DEG-ft\) and \(D_{ER}-OO(foot)\). (29f) is eliminated by \(IDENT-IO(lary)\), because \([pa]\) does not retain laryngeal feature in input. Thus (a) satisfies all top-ranked constraints and thus is optimal.

Fourth, in suffixation cases, the stem-final heavy syllable is not reduplicated; instead, it loses a coda and a single syllable suffix is added. Such patterns can be analyzed as below:

(30) suffixation

<table>
<thead>
<tr>
<th>input= /calp ak +tak/</th>
<th>Afx</th>
<th>DEP-OO (foot)</th>
<th>PARSE-σ</th>
<th>EDGEMOST</th>
<th>DEG-ft</th>
<th>IDENT-IO (lary)</th>
<th>MAX-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (cal)(p’a-tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (cal)(pa-tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (cal)(p’a)(tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (ca-pa)(tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (cal)(p’a)(tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. (ca)(p’a)(tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. (ca)(p’a-tak)</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(30c) violates top-ranked constraint \( \text{DEP-OO(foot)} \). (c) fails to delete the stem-final coda, so it has three feet, indexed with \( i, j \) and \( k \) above. In (30d), a new foot indexed with \( k \) is inserted. Thus it violates \( \text{DEP-OO(foot)} \) and the first foot is made up of two light syllables violating \( \ast \text{DEc-ft} \). In (30e), \([\text{pa}]\) is not parsed into a foot, so (e) is eliminated by top-ranked constraint \( \text{PARSE-G} \). In (30f), \([\text{ca}]\) can form an independent foot, since \([\text{pa}]\) has an underlying mora which makes a preceding syllable heavy. However, \([\text{pa}]\) cannot form a foot alone. Besides another foot \( k \) is inserted. Therefore (f) violates both \( \text{DEP-OO(foot)} \) and \( \ast \text{DEc-ft} \) which are top-ranked. (30g) omits foot \( j \), thus it violates \( \text{DEP-OO(foot)} \). In (30b), \([\text{pa}]\) lacks an underlying laryngeal feature and so it is ruled out by \( \text{IDEN'}-\text{IO(lary)} \). Thus satisfying all top-ranked constraints, (a), which obeys all top-ranked constraints, can be optimal.\(^6\)

Before finishing this section, let us consider Ahn's (2000) analysis. His analysis is similar to the present analysis in that it employs a correspondence constraint for prosodic units. Specifically, he proposes \( \text{IDENT(Ft)} \) constraint, which requires identity of the foot number between input and output:

\[(31) \text{IDENT(Ft)} \quad (\text{Ahn, 2000, p. 111}) \]

The foot count of the output is identical to that of the input.

Assuming the Korean foot formation, discussed earlier, Ahn relies on this constraint to explain the coda loss involved in partial reduplication. Notice that his \( \text{IDENT(Ft)} \) constraint is almost a direct \( \text{OT} \) translation of Jun's MWC constraint. Ahn's analysis has several problems that the present analysis is not subject to. First, its evaluation requires counting the number of phonological elements, which should be avoided in the phonological analysis (although Jun's MWC analysis is subject to the same problem). Second, the role of \( \text{IDENT(Ft)} \) is limited to the account for the loss of coda unlike in the present analysis which can explain loss coda and loss of laryngeality of the onset in a unified way. Finally, it seems that Ahn does not intend to propose \( \text{IDENT(Ft)} \) as an Output-to-Output correspondence constraint (as implied in footnote 11 of his paper). Its definition is not fully clear, mainly because terms used in (31) such as

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\(^6\) To exclude another possible candidate like \([\text{ca.pak.tak}]\), we may employ a high-ranked positional faithfulness constraint which requires that an input segment have a correspondent in the output if it belongs to the root-initial syllable (cf. Beckman, 1998).
“output” and “input” are not specific enough. As we understand, for $I_{\text{IDENT}}(\text{Ft})$ to work for the reduplication data, they should be replaced with more specific terms such as “affixed surface form,” i.e. affix plus stem, and “isolation form of the stem”, respectively. Consequently, the present analysis is not only different from Ahn’s (2000) analysis, but also has several advantages over it.

5.2. Total Reduplication

An analysis of total reduplication needs a different constraint ranking. Since total reduplication involves repetition of the base, the foot number of the base is always double the citation form of the base. Therefore reranking of the constraints is inevitable. First of all $O E (O ^{t} O (o))$, which is top-ranked in the analysis of partial reduplication, must be lower-ranked, because the base and its reduplicant are completely identical in total reduplication. In addition, $I_{\text{IDENT}}\text{-BR}$ as well as $I_{\text{IDENT}}\text{-IO}$ are undominated.

\begin{equation}
(32) \quad M_{\text{MAX}}\text{-IO}, M_{\text{MAX}}\text{-BR}, I_{\text{IDENT}}\text{-IO}(\text{Lary}), I_{\text{IDENT}}\text{-BR}(\text{Lary}) \gg D_{\text{EP}}\text{-OO}(\text{foot})
\end{equation}

The size of an affix depends on how many syllables a base has. Therefore $Afx \leq \sigma$ takes a lower-ranked position in ranking. We may rerank the full constraints in total reduplication as in (37).

\begin{equation}
(33) \quad P_{\text{ARSE}}\sigma, *D_{\text{DEGENERATE}}\text{-foot}, E_{\text{DEGMOST}}
\quad M_{\text{MAX}}\text{-IO}, M_{\text{MAX}}\text{-BR}
\quad I_{\text{IDENT}}\text{-IO}(\text{Lary}), I_{\text{IDENT}}\text{-BR}(\text{Lary}) \gg D_{\text{EP}}\text{-OO}(\text{foot}), Afx \leq \sigma
\end{equation}

We will provide an analysis of total reduplication as follows.

\begin{equation}
(34) \quad /culuk/
\end{equation}

<table>
<thead>
<tr>
<th>input=/culuk+RED/ base=(culuk)</th>
<th>$M_{\text{MAX}}\text{-BR}$</th>
<th>$P_{\text{ARSE}}\sigma$</th>
<th>$E_{\text{DEGMOST}}$</th>
<th>$*D_{\text{EG}}\text{-ft}$</th>
<th>$M_{\text{MAX}}\text{-IO}$</th>
<th>$D_{\text{EP}}\text{-OO}(\text{foot})$</th>
<th>$Afx \leq \sigma$</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (culuk)(culuk)</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td></td>
</tr>
<tr>
<td>b. (cu-lu-luk)</td>
<td>**!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (cu-lu)(culuk)</td>
<td>*</td>
<td>*</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td></td>
</tr>
<tr>
<td>d. (cu-luk)-(luk)</td>
<td>**!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (culu-culu)</td>
<td></td>
<td></td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td>$*$</td>
<td></td>
</tr>
</tbody>
</table>
(34b-d) violate top-ranked constraint M_{AX-BR}, since they are not identical with the base. In addition, candidate (b) leaves out the final coda [k] in the input, thus it also violates M_{AX-IO}. Candidate (c) does not satisfy E_{DGEMOST} and *D_{EG-ft}, because reduplicant (culu) is not located at the right edge and [culu] consists of light syllables only. (e) is also eliminated by *D_{EG-ft}. Thus an optimal candidate is (a). Let us consider words with fortis and aspirated onsets.

(35) /p'aʊ/  

<table>
<thead>
<tr>
<th>input=/p'aʊ+RED/</th>
<th>a. M_{AX-BR}</th>
<th>P_{ARSE}</th>
<th>*D_{EG-ft}</th>
<th>M_{AX-IO}</th>
<th>I_{DENT-IO}</th>
<th>D_{EP-OO}</th>
</tr>
</thead>
<tbody>
<tr>
<td>base=(p'əʊ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. (p'əʊ)(p'əʊ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (p'ə-p'əʊ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (p'əʊ)(p'əʊ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (p'əʊ)-p'ə</td>
<td></td>
<td>a. *!</td>
<td>b. *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (p'ə)-p'ə</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. (p'ə)-p'ə</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(35b, d) are ruled out by I_{DENT-RR}(lary) and M_{AX-BR}. In candidate (b), the reduplicant does not have a laryngeal consonant. Candidate (d) has the reduplicant without coda and it is not featurally identical with the base. In (35c), reduplicant [p'əʊ] does not have a fortis onset, and thus it is eliminated by I_{DENT-RR}(lary). Candidate (e) violates *D_{EGENERATE}-foot and M_{AX-IO}, since the foot j consists of a light syllable and the coda of the input disappears. Candidate (f) abides by all top-ranked constraints, but it does not maintain laryngeality of the base. (f) is eliminated by I_{DENT-IO}(lary). Thus an optimal candidate is (a).

6. Conclusion

We have first discussed previous approaches to Korean partial reduplication and suffixation including the ones relying on OT. We have pointed out two problems in previous studies. First, their mechanism cannot be extended to the suffixation cases without any drastic revision. Second, they propose the distinct accounts for the loss of coda and loss of laryngeality.
in partial reduplication. To solve these problems, we have provided a uniform account for the loss of coda and laryngeality by translating Jun's (1994) MWC into a type of OO-Correspondence constraint which requires no insertion of new feet in the reduplicated word.

References


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