

A new look at partial reduplication in Korean^{*}

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Kim, Hyung-Soo. 2003. A new look at partial reduplication in Korean. *Studies in Phonetics, Phonology and Morphology* 0.0. 00-000. An approach based on the phonological process of dissimilation turns out to do a better job of explaining the so-called asymmetry and delaryngealization in partial reduplication of ideophonic words in Korean than any of previous constraint-based analyses, including those done under Optimality Theory, calling into question the wisdom of many of the theoretical assumptions of such approaches. While the previous analyses had to make the unmotivated postulation of final velar consonant extrametricality and accept the partial reduplication in, e.g. *culu-luk* “dribbling of rain, tear, etc.” as a type of infixation, the processual approach adopted here does away with such assumptions, explaining the reduplication instead as a natural consequence of the dissimilation of consonant clusters, by first suffixing the final CVC syllable of the base followed by elision of the first velar consonant in coda position by the dissimilation of $kCVk\# \rightarrow \emptyset CVk\#$. It is shown that this rule of dissimilation of consonant clusters, with the necessary refinements and extensions made, can also be applied to cases of the so-called asymmetry in, e.g. *tu-tuysil* < **tuŋ-tuysil* “floating gently” and *t’ekt’ekul* < **t’ek-t’ekul* “rolling; rumbling” as well as those of delaryngealization in, e.g. *p’apay* < **p’ay-p’ay* “banging sound (of a gun)” thus providing a unified explanation of Korean partial reduplication, unlike the previous analyses in which as many as three separate solutions had to be assumed. (Jeonju University)

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1. Introduction

Partial reduplication in ideophonic words of Korean has been one of the most recurrent topics for investigation in Korean phonology and morphology. It has been dealt with in various frameworks including traditional grammar (W. Chae 1986), nonlinear CV phonology (Y-S. Kim 1984), prosodic phonology and morphology (McCarthy and Prince 1986,

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J-H. Jun 1994, C-K. Suh 1993, and Davis and Lee 1996) and recently, Optimality Theory (C-W. Chung 1997, 1998, 1999, J-H. Kim 1997, O. Kang 1998, S-K. Kim 1998, Y-M. Yu Cho 1999, and S-C. Ahn 2000). But as C-W. Kim (1998) points out, many problems still remain unresolved, and these form the topic of this paper. In particular, I will focus on the following problems:¹

- a) The so-called asymmetry problem: in Korean partial reduplication the syllabic shape of the reduplicant appears to be inversely correlated with the shape of the base, e.g. *tujɕil* → *tutujɕil*, *culuk* → *cululuk*, but *t'ekul* → *t'ekt'ekul*²
- b) The question of delaryngealization in partial reduplication: bases of suffixal reduplication sometimes lose aspiration and tenseness, e.g. *p'aj* → *p'apaj*, *p^haj* → *p^hapaj*, but this delaryngealization fails in the prefixal reduplication of e.g. *t'ekul* → *t'ekt'ekul*
- c) The question of how we should treat the so-called 'internal' reduplication. It has generally been assumed that in *culuk* → *cululuk* the second 'lu' is the reduplicant, while the final velar 'k' is part of the base. But this assumption has created the problem of having to accept infixation only in partial reduplication in Korean because there is no evidence for infixation elsewhere in Korean morphology.

The above problems, which are all interrelated, are addressed under the following four headings: First, the problem of 'internal reduplication' and the asymmetry problem are taken up under 'types of reduplication' in section two. This is then followed by discussion of the delaryngealization problem in section three. Up to this point, I will remain focused on presenting my own analysis, sometimes comparing it with previous analyses of the same topic. In section four, however, I will present a brief review of the analyses done under the framework of Optimality Theory, pointing out their explanatory weaknesses. The last section will conclude

¹ There are two more problems that are also considered by C-W. Kim but not included here: The so-called irregular reduplication (often referred to as fixed segmentism type) in, e.g. *chalk^hak* → *chalk^hatak* "with a snap (of, e.g. taking a picture)" and what he calls segment-timing correlation. Of these the first problem will be analyzed in a subsequent paper in preparation, which will mainly deal with the question of underlying forms used for the base in reduplication. C-W. Kim also mentions in passing the problem in reduplication of trisyllabic bases, which appears to exhibit a different reduplication pattern, e.g. *utaj^haj* → *utataj^haj* "banging." This problem has not been considered in this paper leaving it as a topic for future research.

² Most of the examples of ideophonic words analyzed in the paper are given with their glosses under (2) in section 2.2. Those that have not been included in (2) are glossed individually.

with a brief summary of the paper and its ramifications on phonological theory in general.

2. Types of reduplication and the problem of asymmetry

2.1 Types of partial reduplication

Generally speaking, three types have been recognized for partial reduplication in Korean:

- 1) Prefixing type, e.g. tuŋsil → tu-tuŋsil, t'ekul → t'ek-t'ekul
- 2) Internal type, e.g. t'aliŋ → t'ali-li-ŋ, culuk → culu-lu-k
- 3) Suffixing type, e.g. cululu → cululu-lu

The question here is whether we should recognize only prefixation and suffixation or we should also include infixation, or the internal reduplication in 2), as a valid type of reduplication in Korean. This question arises because, as is well known, infixes are rare in languages and even those that have been recognized as infixes often turn out to be suffixes, as in, for example, Latin *tango* “I touch”. The root here is obviously **tag* as appearing in its assimilated form in the past participle *tactus* “touched” < **tag-tus*. Although one may think that *n* in *tango* is an infix, an alternative analysis is more persuasive, in which the underlying form is **tag-n-o* where ‘n’ is an incremental suffix to the root ‘tag’ and a metathesis rule converts the sequence *g-n* to *ng*. The alternative analysis gains support because there is no affix that we could properly call infix in Latin and it is rare that languages have such affixes, even though it is not altogether impossible to find such a language.

Since there is also no evidence that infixation is part of Korean morphology, it would indeed be odd to have an infixing type of reduplication. It would be, however, merely begging the question if we call the reduplication occurring in *culu-lu-k* as ‘internal’ because such an appellation does not change the essential character of the reduplication process. The problem here is that most previous analyses assume the final consonant of the base in *culuk* → *culu-lu-k* as extrametrical or extrasyllabic, as in McCarthy and Prince (1986, M&P hereafter) arguing that only the CV of the final CVC syllable is reduplicated. Such previous analyses have given no independent argument of why only the final velar consonant of the reduplicative base should be extrametrical, even though their analysis crucially depends on such evidence.³ Note, for example, Y-S. Kim (1984:

³ This seems to be a typical problem of any theory assuming extrametricality or extraprosodicity. Note, for example, that Inkelas and Orgun (1995) argue that in Turkish stem final *k* drops in certain morphological environments due to final consonant invisibility. But they fail to explain why *t* and *p* do not drop in the same environment: *bebei* < **bebek-i* “baby 3rd Poss.” but *lalibi* < **lalip-i* (cf. *lalip* “mold”) and *konadi* < **konat-i* (cf. *konat* “wing”).

203), who comments that ‘we must ask why the stem-final C should be treated as extrasyllabic in Korean solely on the basis of internal reduplication’. It suffices here to say that any analysis that avoids such concept would be preferred.

One analysis that does not strictly follow the concept of extrametricality is J-H. Jun (1994), whose Metrical Weight Consistency (MWC) analysis argues that what is copied in the so called internal reduplication examples is the final heavy syllable CVC but the final velar consonant of the base is deleted because Korean maintains the Metrical Weight Consistency in partial reduplication, namely that both input and output of Korean partial reduplication consistently maintain the same number of feet. Thus:

(1) Metrical Weight Consistency (J-H. Jun 1994: 81)

[culuk]_φ →(by reduplication) [culuk]_φ [luk]_φ →(by MWC) [cululuk]_φ

As C-W. Kim (1998) has pointed out, however, the problem is that Jun assumes mora as the basic phonological unit in Korean, despite a lack of evidence for Korean (unlike Japanese) being a moraic language. Moreover, his analysis depends on the assumption that tense and aspirate consonants are geminates and carry a moraic weight even in the onset position while arguing that Korean has a foot type approximating iambic despite that, if anything, Korean is considered to be a language with the initial syllable heavy, its stress usually falling on the word initial syllable and the long vowels being shortened in noninitial syllables, e.g. *nu:n* “snow” but *hampak-nun* “large snowflakes”. But the most crucial weakness of Jun’s analysis is, as pointed out by J-H. Kim (1997: 747), that it cannot handle partial reduplication of the type *t’ek-t’ekul* because the base for this reduplication, *t’ekul*, has only one foot but the corresponding reduplicative form has two feet. Under Jun’s MWC analysis, we should expect *çt’et’ekul* rather than *t’ekt’ekul*: [t’ekul]_φ →(by reduplication) [t’ek]_φ[t’ekul]_φ →(by MWC) *ç* [t’et’ekul]_φ⁴

Since *k*, *t*, and *p* form a natural class of voiceless stops, it is expected that if the stem-final *k* is invisible due to its extrametricality in Turkish, so should the stem-final *t* and *p*. But they give no independent argument of why only *k* but not *t* nor *p* should be extrametrical. For an alternative solution, see Foley (1977) where *k* is phonologically weaker than *t* and *p* on the Alpha parameter. The elision of *k* in preference to *t* and *p* is therefore expected. In fact, one of the points that Foley emphasizes throughout his book is that there is a certain inherent order among phonological elements that we normally group as a natural class and rules often occur preferentially under this order.

⁴ The symbol *ç* refers to an incorrect form: *c* for correct and / for not. The asterisk * is reserved for underlying forms or nonsurfacing intermediate forms. The fact that Jun’s analysis cannot explain examples such as *t’ekt’ekul* means that his MWC is unable to handle the so-called asymmetry problem, unlike C-K Suh’s Weight Complementarity principle, the detail of

C-K. Suh (1993), on the other hand, proposes the Weight Complementarity (WC) principle, that Korean tends to keep three moras in what he calls the ‘UNIT’, which consists of the original portion plus the copied portion of the base. Unlike Jun’s MWC, his WC can handle prefixal reduplications such as *t’ekt’ekul* and *tutujysil* because it copies only CV if the original portion of the base is CVC and vice versa. But because his analysis is based on McCarthy and Prince’s prosodic circumscription theory, it depends on the concept of extramortality. The graver problem, I believe, is his assumption of dual aspect of weight, which regards coda consonants as nonmoraic for all phonological and morphological processes in Korean *except* for partial reduplication in which they are considered to be moraic. He, however, gives no convincing argument for this ideosyncratic use of the phonological mora, admitting that ‘there is no convincing evidence for the moraicity of the coda consonants in Korean.’⁵ This shows that the assumption of dual aspect of weight has been made solely for the purpose of explaining the problem of partial reduplication in Korean.

In any case, the position of this paper is that it is awkward to classify the so-called internal reduplication as a separate type of partial reduplication in Korean. It would be better if we could get rid of the type altogether and just recognize the prefixing and the suffixing types, if that can be done somehow, by analyzing it under either one of these two basic types. We will return to this problem after considering the so-called asymmetry problem.

2.2 The so-called asymmetry problem

This problem is summarized by C-W. Kim (1998: 250) as

“... in partial reduplication in Korean, the syllabic shape of the reduplicant appears to be inversely correlated with the shape of the base. For example, if the initial syllable of the base is CVC, then the reduplicant is CV, while if the initial syllable of the base is CV, then the reduplicant is CVC”

Thus:

which is explained immediately below. The asymmetry problem is the topic of the next section.

⁵ He was referring to the nonoccurrence in Korean of compensatory lengthening of the type observed in, e.g. Latin *ni:dus* < **ni-sd-os* ‘nest’ where loss of ‘s’ in coda position results in lengthening of the preceding vowel. (Cf. Suh 1993: 156f) Another type of compensatory lengthening does occur in Korean where glide formation of high and mid vowels often results in lengthening of the preceding vowel, e.g. *ki-ə* > *kyə*: ‘crawl’.

(2) Examples of asymmetric partial reduplication in Korean⁶

a. CV reduplication:

| <u>base</u> | <u>reduplicant</u> | |
|-------------|---------------------|-----------------------------------|
| tuɲsil | tu -tuɲsil | “floating gently” |
| culuk | culu- lu -k | “dribbling (of rain, tear, etc.)” |
| tʰaliŋ | tʰali- li -ŋ | “ringing (of a bell)” |
| pʰaŋ | pʰa- pa -ŋ | “banging (of a gun)” |
| pʰaŋ | pʰa- pa -ŋ | “exploding” |
| asak | asa- sa -k | “crisp” |

b. CVC reduplication:

| <u>base</u> | <u>reduplicant</u> | |
|-------------|---------------------|-----------|
| tʰekul | tʰek -tʰekul | “rolling” |
| kolu | kol -kolu | “evenly” |

Note that as the above data illustrate, the asymmetry problem arises in both prefixing as well as suffixing types of reduplication because, under the assumption of extrametricality, bases with the initial or final CVC syllables seem to copy only the CV portion of the heavy syllable (as in *tu-tuɲsil* and *culu-lu-k*), but bases with the initial CV syllable have the CVC as the reduplicant (as in *tʰek-tʰekul*).

We have already mentioned that neither Jun’s Metrical Weight Consistency (J-H. Jun 1994) nor Suh’s Weight Complementarity can explain this so-called asymmetry problem. Jun’s analysis, in addition to the problems with its treatment of aspirate and tensed consonants as geminates carrying moras, simply cannot handle the reduplication of the type *tʰek-tʰekul* where the base *tʰekul* has only one foot but the reduplication two feet, violating MWC. Suh’s WC analysis, though it initially appears to work well for the asymmetry problem, is critically flawed because of its dependence on the concepts of extrametricality and dual aspect of weight; these concepts apply only in partial reduplication in Korean, no evidence having been offered that they are independently needed elsewhere in Korean phonology and morphology. The problems exhibited by these two previous analyses call for an entirely new approach,⁷ which we provide in the next subsection.

⁶ In the following examples the boldfaced parts refer to what has generally been considered to be the reduplicants under the assumption of extrametricality of final velars. Note that these do not necessarily agree with my analysis of the same forms, which denies extrametricality and which thus argues that the last heavy syllable as a whole is the reduplicant: *culu-luk*, *pʰa-paŋ*, *asa-sak*.

⁷ Another analysis in a similar line of research is done by Davis and Lee (1996), which has not been included here because it does not consider the asymmetry problem in prefixal reduplications of, e.g. *tu-tuɲsil* but *tʰek-tʰekul*. We will be coming back to it, however, when we discuss the delaryngealization problem in section three below.

2.3 Alternative analysis available

The alternative analysis that I propose below does not rely on any of the previous assumptions made by Jun and Suh. Like Jun's, it recognizes only two types of partial reduplication in Korean: prefixal and suffixal reduplications. It does not recognize infixal reduplication, so it would be superior to those analyses that have to assume infixal or, conveniently appellated, internal reduplication, because there is no evidence that such morphological process indeed exists in Korean. The basic template of Korean partial reduplication, we argue, is CV(C). The final consonant of this template is optional, i.e. it is copied if there is a consonant available after CV; otherwise it plays no role in the copying process. Under these assumptions, the bases in the above examples of reduplication will have the following intermediate forms:

(3)

| <u>base</u> | <u>by reduplication</u> | <u>final form</u> |
|-------------|-------------------------|------------------------------|
| tuŋsil | *tuŋtuŋsil | (→ tutuŋsil) |
| culuk | *culukluk | (→ cululuk) |
| asak | *asaksak | (→ asasak) |
| p'aŋ | *p'aŋp'aŋ | (→ p'apaŋ) |
| t'ekul | t'ekt'ekul | (no further change required) |
| kolu | kolkolu | (no further change required) |
| c'ip'iti | c'ip'ititi ⁸ | (no further change required) |
| cululu | culululu | (no further change required) |

In this exposition, except in the case of $p'aŋ \rightarrow *p'aŋp'aŋ (\rightarrow p'apaŋ)$, which can be interpreted either way,⁹ it is easy to see which reduplication is by prefixation and which is by suffixation because we are assuming that

⁸ The glosses for this and the next word are (respectively): “unwell” and “dribbling (of water, blood, etc.)”. I have added these two CV suffixing reduplication examples because they illustrate the application of the CV(C) template when the final C is missing: *c'ip'iti-ti* and *cululu-lu*. Although generally overlooked in the analysis of asymmetry, these examples are problematic when compared with examples such as *culu-lu-k* because their reduplicant and the base retain the same CV syllable, against the tendency of inverse correlation in syllabic shape between the base and the reduplicant.

⁹ For this example, it is difficult to determine whether it is a case of prefixing or suffixing reduplication because the CVC syllables occur at both peripheries in the intermediate **p'aŋp'aŋ*. The usual assumption that it is a case of suffixing reduplication because ‘the reduplicative affix is more likely to change than the stem itself’ (cf. J-H. Jun 1994: 70) does not work here because in examples such as *cululuk* it is the stem, not the suffix ‘luk’ that changes its shape (by dropping the final ‘k’ in Jun’s analysis). In its multiple reduplication, however, the base very much behaves like other suffixing reduplications: *p'aŋ*, *p'apaŋ*, *p'apa...paŋ* (like *t'aliŋ*, *t'aliliŋ*, *t'ali...liŋ* rather than *tuŋsil*, *tutuŋsil*, *tutu...tuŋsil*). The loss of aspiration or tenseness in examples such as *p'apaŋ* but not in examples such as *t'ekt'ekul* will be the topic of section three. Vide infra.

the reduplicative copying in Korean occurs only at peripheral positions.

The remaining task, then, is to explain by what process the consonants in the intermediate stages drop to become the final output forms on their right. We have already mentioned that neither MWC nor WC can explain the above examples coherently because of the aberrant assumptions these principles make about the phonetic and phonological structure of Korean. This means that any new proposal should conform to the usual phonetic and phonological rules and constraints that obtain in Korean, without making any ad hoc accretions to them. Although generally overlooked in previous analyses, there is just such an analysis available. Consider the following examples in Korean:¹⁰

- (4)
- pyəŋyaŋ > piyaŋ “name of the capital city of North Korea”
 - koŋyaŋmi > koyəŋmi “rice offered to Buddha”
 - *coŋyoŋhi > coyəŋhi “quietly” (cf. MK cyoŋyoŋ)
 - seŋgaŋ > seəŋ > seŋ “ginger”

Piyaŋ is a dialectal pronunciation of *pyəŋyaŋ* while *koyəŋmi* is an alternative pronunciation of *koŋyaŋmi*. *Seŋ* is a reduced pronunciation of *seŋgaŋ* which has first reduced to *seəŋ* and then further contracted to *seŋ*. *Coyəŋhi* is derived from **coŋyoŋhi* whose underlying stem (-*hi* is an adverbial suffix) appears in Middle Korean form *cyoŋyoŋ*.

In H-S Kim (1995), I have argued that a form of dissimilation applies in the above examples, which I have written as¹¹

- (5) Dissimilation of nasal clusters (H-S. Kim 1995: 403)
- $$\eta CV \eta \{C, \#\} \rightarrow \emptyset CV \eta \{C, \#\}$$

That is, when two noncontiguous clusters of velar nasal plus a consonant occur in Korean the velar nasal of the first cluster drops. The word boundary here in effect serves the function of a consonant, as elsewhere in Korean phonology.¹²

¹⁰ These examples are from S-N. Lee (1960).

¹¹ This rule is not regular in Korean phonology, its application being limited to the above and a few more examples, all of which are of Sino-Korean origin. As will be argued below, however, the same rule seems to obtain without exception in the reduplicated ideophonic forms of Korean. That rules often distinguish between ideophonic and nonideophonic words is not new in Korean phonology: The vowel harmony between yin and yang vowels, whose application is erratic in Modern Korean nonideophonic words, is strictly observed in Korean ideophones. Cf. K-M. Lee (1972) and H-S. Kim (2002).

¹² Note the well-known neutralization rule which occurs in preconsonantal and word final position: $s, c, c^h \rightarrow t / ______ \{C, \#\}$ as in *nas-kwa* [natk^wa], *nas* [nat] but *nas-il* “sickle”; *nac-kwa* [natk^wa], *nac* [nat] but *nac-il* “day”; *nac^h-kwa* [natk^wa], *nac^h* [nat] but *nac^h-il* “face” (The

There are two important facts to note concerning the above type of dissimilation rules. The first is that the dissimilation rule of the above type typically occurs between two similar consonant clusters, the first condition on the process thus being that there be two consonant clusters of similar shape, such as *NCVNC* as in the above examples of Korean in (4), *ChVCh* as in the well known examples of Grassmann's Law in the reduplicated forms of Greek, e.g. Gk. *tithemi* < **thi-themi* "I do", or *CLVCL* as in the Spanish liquid dissimilation, e.g. Latin *triplus* Sp. *tiple* "triple". Secondly, like other phonological rules, it is not always the case that dissimilation of consonant clusters literally satisfies the stipulated condition, because the rule can generalize, as we have seen in the above examples of nasal cluster dissimilation, by eliminating a portion of what is required in the canonical shape of the rule; in the above example such as *seŋgay* > *seay* > *seŋ*, for example, the rule has generalized so that the same rule could occur even in the absence of the consonant in the second nasal cluster, i.e. *NCVN#* → *∅CVN#*, because the function of this consonant has been replaced by the word boundary. From these two observations then, it is not unreasonable to assume that the same rule occurs between two sufficiently similar stop clusters, as in *KCVKC* → *CVKC* or in its generalized version, *KCVK#* → *∅CVK#*.¹³

I claim that the same dissimilation rule applies in the above partially reduplicated forms in Korean. We notice that in every case where the intermediate form created by CV(C) reduplication has to change (to arrive at the well-formed form at its right), either preferential or generalized condition on dissimilation of consonant clusters is met, whereas in every case where the intermediate form requires no additional change (because it is already well-formed), neither of these conditions is met. This is illustrated in (6):

(6)

a. Cases where dissimilation applies:

| <u>base</u> | <u>by reduplication</u> | <u>final form</u> |
|-------------|-------------------------|-------------------|
| tun̄sil | *tun̄tun̄sil | (→ tutun̄sil) |
| culuk | *culukluk | (→ cululuk) |
| asak | *asaksak | (→ asasak) |
| p'anj | *p'anj'anj | (→ p'apanj) |

b. Cases where no further change is required:

| <u>base</u> | <u>by reduplication</u> | <u>final form</u> |
|-------------|-------------------------|-------------------------------|
| t'ekul | t'ekt'ekul | (no further change necessary) |

suffix *-il* is objective case marker whereas the suffix *-kwa* is a postposition meaning 'and'.

¹³ The capital 'K' in these rules represents stop consonants.

| | | |
|----------|------------|---|
| kolu | kolkolu | " |
| c'ip'iti | c'ip'ititi | " |
| cululu | culululu | " |

The preferential dissimilation rule that occurs in the former group is the following:

(7) Preferential dissimilation of nasal clusters

NCVN# → ØCVN# e.g. **tuytuysil* → *tuytsil*

The generalized dissimilation rules, on the other hand, have the following shapes:

(8) Generalized dissimilation of nasal and stop clusters:¹⁴

NCVN# → ØCVN# e.g. **p'ayp'ay* → *p'apay*

KCVK# → ØCVK# e.g. **culukluk* → *cululuk*, **asaksak* → *asasak*

The reason why there is no change in forms such as those in (6b) is either because there is simply no similar consonant clusters available, to which a dissimilation rule could occur, as in *c'ip'ititi* → *idem*,¹⁵ or because they do not meet even the minimum condition on the dissimilation rule, as in the cases of *t'ekt'ekul* → *idem* and *kolkolu* → *idem* where there are consonant clusters eligible for consideration of the above dissimilation rule, but does not meet the least required generalized condition: a word boundary could replace the function of the consonant in the second cluster, as in *kCVk#* → *CVk#* and *ICVl#* → *CVl#* but this generalized version of dissimilation rule could not apply because the second consonant *k* or *l* is not in word final position. For types of reduplication, this difference manifests itself as a difference between partial prefixing reduplication and

¹⁴ Since the examples given in (6) are all dissimilation of velar clusters, one could easily collapse the two rules into one, as suggested by one of the reviewers. I have nevertheless kept them as separate because 1) in nonideophonic words only the nasal clusters seem to undergo the rule as illustrated in (4) and 2) in many languages dissimilation typically occurs to resonant (nasal) clusters more readily than to nonresonant (stop) clusters. I have also kept the rules in a more general form so that they could refer not only to velar clusters but to labial and dental clusters as well. This rule statement implies that I expect the dissimilation rule to occur to all nasal and stop clusters as long as the preferential and generalized conditions on the rule are met, at least in ideophonic words. By the same token, we can also expect the same for the liquid clusters of the type LCVLC or LCVL# because like the nasals liquids are also resonant. Note that while the list of words in (4) is not exhaustive for examples of dissimilation of nasal clusters, no sure example is found for dissimilation of stop clusters in nonideophonic words in Korean, although I have found one Sino-Korean candidate word from the dictionary: *mokyok* > *moyok* 'bath'. This example, if it turns out to be an example of dissimilation of stop clusters, can give further support for assuming rules such as *KCVK#* → *ØCVK#* in ideophonic words. For preferential application of dissimilation to resonant clusters, see H-S. Kim (1991).

¹⁵ 'Idem' means 'the same'. Thus A → idem means that A has not changed.

partial suffixing reduplication because although the same CVC template is repeated in both types of reduplication, it is only in the latter that the repeated syllable falls in the word final position.

2.4 Possible objections and synergia

An attentive reader could immediately raise two objections to the above alternative analysis. The first objection could be raised by noticing that the dissimilation rule should essentially be restricted to reduplicated forms because there are numerous words in Korean that have the forms of either $kCVk\{C, \#\}$ or $NCVN\{C, \#\}$ but do not delete the *k* or *N* in the first cluster, as in *kaksek* “dramatization”, *koŋtoŋ* “commonness”, *soktak* “in whispers”, and *kaŋcəŋ* “a kind of rice cookie”.¹⁶

This point would be well taken and we do restrict the rule to reduplicated forms. But then why should a phonological rule be restricted by a morphological category? Although such morphologically sensitive phonological rules have often been used in the past, we abstain from using them because it is our contention that phonological rules should be phonologically conditioned. If the above dissimilation rule appears to apply in a morphologically sensitive environment, then it is our task to reinterpret such environment so that the rule can reveal a phonological conditioning. Keeping this in mind, we recall that a condition on dissimilation is that the two consonant clusters be sufficiently similar. I argue that the above dissimilation rule appears to have morphological restriction only because reduplication naturally makes the best arrangement of phonological elements to meet this primary condition on dissimilation, by repeating not only the consonants themselves but also the whole reduplicated template. In other words, in addition to the condition on dissimilation that the two consonant clusters be sufficiently similar, there is an additional similarity condition at work here, that the syllables these consonant clusters belong to be sufficiently similar as well. This is a reinforcement of the usual condition of sufficient similarity in dissimilation and is one of the reasons why so many languages often reduce complex onsets in reduplicated forms although such reductions are often not observed in the language as a whole.

A second objection could be raised concerning the partially prefixing reduplicated forms such as *t'ekt'ekul* and *kolkolu* where despite having repeated the whole CVC template the dissimilation rule fails to occur because it does not meet the generalized condition on dissimilation: the

¹⁶ The first two of these examples are of Sino-Korean origin whereas the last two are native Korean words. Recall that all of the examples for velar nasal dissimilation in (4) as well as the lone candidate for velar stop dissimilation, *mokyok* > *moŋyok*, are of Sino-Korean origin.

second consonant is not in word final position. One could recall, however, that the word final position was only a surface requirement and the real reason for the word-final environment was that the function served by the consonant in the second cluster is replaced by the word boundary. Since the word boundary comes not only at the end of a word but also at its beginning, one could say, convincingly, that if a generalized dissimilation rule applies to a sequence such as *kCVk#*, it should also occur to a sequence such as *#kVck* because here the word boundary that comes at the beginning of a word can serve the function of a consonant creating a favorable environment for dissimilation of consonant clusters. And if a dissimilation rule could occur to a sequence such as *#kVck*, then there is no reason why the same rule should not occur to sequences such as *#VCt* and *#VCl*, which are what we have in *t'ekt'ekul* and *kolkolu*, respectively.

Notice however that there is an important phonological difference between a sequence such as *kCVk#* and those such as *#VCt* and *#VCl*: The target of the dissimilation rule is in the coda position in the former but it is in the onset position in the latter. Thus the dissimilation rule applies to the former but fails to occur to the latter because phonologically coda is a weak position whereas the onset is a strong position.¹⁷

(9) Preferential application of dissimilation in coda position:

| | |
|----------------------------|---|
| <i>kCVk#</i> → <i>CVk#</i> | e.g. <i>asasak</i> < * <i>asak-sak</i> |
| but <i>#VCt</i> → idem | e.g. <i>t'ekt'ekul</i> < * <i>t'ek-t'ekul</i> |
| <i>#VCl</i> → idem | e.g. <i>kolkolu</i> < * <i>kol-kolu</i> |

Again, we refrain from saying that the rule applies in partial suffixing reduplication but not in partial prefixing reduplication, even though such a statement is true, because saying so would amount to admitting morphologically sensitive rules in a phonological analysis. We have instead uncovered a phonological conditioning hidden beneath such morphological categorization.

But why should a dissimilation rule target a consonant in the weak coda position but not the same consonant in the strong onset position? I think this is a valid question that has to be addressed in view of the fact that a consonant does not drop in modern Korean just because it is in a coda position. To answer this question, we must first consider the theoretical interpretation of dissimilation, which I presented in the aforementioned 1995 article as¹⁸

¹⁷ This is because word or syllable initial is a strong position but word or syllable final a weak position. For arguments for establishing strong and weak positions for phonological environments, see Foley (1977).

¹⁸ The original formulation comes from Foley (1981), which has been developed further in H-S. Kim (1991, 1995).

(10) The mechanism of dissimilation:

$$C \text{ } \S \text{ } K \rightarrow C^- \text{ } \S \text{ } K^+ \quad \text{where } |C - K| \leq \delta \text{ and } |C - \text{ } \S \text{ }| \geq \Delta$$

This interpretation makes two important stipulations on dissimilation, the phonological process in which two noncontiguous consonants (or consonant clusters) become dissimilar. The first stipulation is that there are two conditions on dissimilation: 1) the two consonants or consonant clusters must be sufficiently similar ($|C - K| \leq \delta$) and 2) both consonants (or consonant clusters) must be sufficiently different from what comes in between ($|C - \text{ } \S \text{ }| \geq \Delta$).¹⁹ The former has already been mentioned while explaining the consonant elision in partially reduplicated forms. The latter does not concern us directly here.

The second stipulation is that underlying the mechanism of dissimilation is a strength fluxion under which one of the two similar consonants or consonant clusters (normally the first one) weakens while the other consonant or consonant cluster correspondingly strengthens.²⁰ In the dissimilation of aspirates such as $ChVCh \rightarrow CVCh$, otherwise known as Grassmann's Law, e.g. Gk *tithemi* < **thi-themi*, for example, the above rule will first weaken the glide *h* in the first of the two sufficiently similar consonant plus aspiration clusters, followed by elision of the weakened element, as in (11):

(11)

| | |
|--------------------------------------|--|
| thithemi | |
| th ⁻ ith ⁺ emi | dissimilation: $C \text{ } \S \text{ } K \rightarrow C^- \text{ } \S \text{ } K^+$ |
| tithemi | elision: $h^- \rightarrow \emptyset$ but $h^+ \rightarrow \text{idem}$ |

Similarly for the dissimilation of consonant clusters in Korean partial suffixing reduplication, e.g. *tutɯɣsil* < **tɯɣ-tɯɣsil*:

(12)

| | |
|---------------------------------------|--|
| tɯɣ-tɯɣsil | |
| tɯɣ ⁻ tɯɣ ⁺ sil | dissimilation: $C \text{ } \S \text{ } K \rightarrow C^- \text{ } \S \text{ } K^+$ |
| tutɯɣsil | elision: $\eta^- \rightarrow \emptyset$ but $\eta^+ \rightarrow \text{idem}$ |

So far this interpretation of dissimilation mechanism as a strength fluxion seems to have no bearing on our attempt to explain why dissimilation targets a coda consonant in preference to an onset consonant. It has an important bearing, however, because it is not too difficult to imagine that a consonant in a weak coda position will weaken more readily

¹⁹ The symbol § refers to what is between the two consonants or consonant clusters. See H-S. Kim (1991, 1997) for arguments for these two conditions on dissimilation.

²⁰ The superscript ‘-’ refers to weakening while the superscript ‘+’ refers to strengthening.

than the same consonant in the strong onset position. In Theoretical Phonology (Foley 1977), this intuition is said to be a consequence of the Inertial Development Principle (IDP), which states that weakening will occur in a weak environment in preference to a strong environment and strengthening, in a strong environment in preference to a weak environment. Since coda is a weak position and an onset a strong position, a consonant in a coda position could weaken in preference to the same consonant in an onset position in consonance with the IDP. Normally this weakening will have no surface manifestation in Korean, because no coda consonant ever drops in contemporary Korean. The effect of this latent weakening, however, can be seen when some other phonological process with a similar function weakens the same consonant.

I claim that this synergistic weakening, facilitated by the weak coda position and the mechanism of dissimilation, is the reason why we have elision of the consonant in partially reduplicated examples such as *cululuk* < **culuk-luk* and *tutuṣil* < **tuṣ-tuṣil* in contrast to examples such as *t'ekt'ekul* < **t'ek-t'ekul* and *kolkolu* < **kol-kolu*. First, the dissimilation of consonant clusters weakens the first of two sufficiently similar consonant clusters, and then the consonants in coda position undergo additional weakening, followed by preferential elision of the consonants with double weakening but not with single weakening:

(13) Synergy between dissimilation and coda weakening:

| | | | |
|-------------------------------------|---------------------------------------|--|--|
| culuk-luk | tuṣ-tuṣil | t'ek-t'ekul | |
| culuk ⁻ luk ⁺ | tuṣ ⁻ tuṣ ⁺ sil | t'ekt' ⁺ ekul | dissimilation: C § K → C ⁻ § K ⁺ |
| culuk ⁻ luk ⁺ | tuṣ ⁻ tuṣ ⁺ sil | t'ek ⁻ t' ⁺ ekul | coda weakening ²¹ : C → C/ <u> </u> . |
| cululuk ⁻ | tutuṣ ⁺ sil | t'ek ⁻ t' ⁺ ekul | preferential elision: C ⁻ → Ø |

This then is our final solution of the asymmetry problem in Korean partial reduplication. To add to the cogency of the above analysis, and to show that synergy between phonological processes is not a concept made up just to solve the problem at hand but a phenomenon often observed across languages, between processes sharing similar function, I reproduce here one of the examples from my doctoral dissertation in which I provide a plethora of cases from diverse languages. (H-S. Kim 1991: 91). This particular case comes from Sanskrit desiderative forms and involves corroboration between dissimilation and cluster simplification. Consider the following examples where the initial consonant of the desiderative root drops by the rule $C_1VC_1C_2C_3 \rightarrow C_1VC_2C_3$.

(14) Consonant cluster reduction in Sanskrit desiderative forms:

siksati < *si-sgh-sa-ti (cf. sah- “prevail”)

²¹ We describe the coda position using the syllable boundary, which is represented here by the period.

| | |
|-----------------------------|----------------------|
| siksati <*si-sk-sa-ti | (cf. sak- “be able”) |
| lipsati <*li-lbh-sa-ti | (cf. labh- “take”) |
| dhiksati <*dhi-dhgh-sa-ti | (cf. dah- “burn”) |
| d(h)ipsati <*dhi-dhbh-sa-ti | (cf. dabh- “burn”) |
| ripsati <*ri-rbh-sa-ti | (cf. rabh- “grasp”) |
| pitsati <*pi-pt-sa-ti | (cf. pad- “go”) |

The consonant elision in these examples cannot be explained by a simple rule of medial cluster reduction, because three consonant groups generally remain in Sanskrit as in, e.g. *kalpsyati*. Nor can it be explained by the rule of dissimilation, because elision by dissimilation is normally observed only when the rule occurs between two similar consonant clusters, as in Skt. *dadhami* <*dha-dhami “I do.” This shows that the above consonant elision cannot be explained by positing one phonological process, nor by dissimilation or cluster simplification, but only by combining these processes under the concept of ‘synergia’. The environment for dissimilation is provided by the rule of reduplication whereas the environment for cluster simplification is provided by the historical loss of the root vowel. The following derivation illustrates the rules involved.

(15)

| | | |
|-------------|--------------|------------------------|
| kalp-sya-ti | li-lbh-sa-ti | |
| " | l’il’bhsati | dissimilation |
| " | libhsati | cluster simplification |
| " | libsati | deaspiration |
| " | lipsati | assimilation |

Cluster simplification is a weakening process that applies, in consonance with the IDP, preferentially to a weak consonant. Although three consonants generally remain in Sanskrit, the rule still drops the initial consonant of the three consonant group in the desiderative forms because having been weakened by the dissimilation between two sufficiently similar consonants (applying here in reversed direction), it is susceptible to further weakening. This example provides an argument for the concept of synergy between phonological processes, thus offers indirect support for the synergy between dissimilation of consonant clusters and coda weakening in Korean partial reduplication.

3. Delaryngealization in Korean partial reduplication

The so-called delaryngealization problem in Korean partial reduplication is not a problem at all once we realize that repetition of these aspirated and tensed consonants creates a very favorable ambience for dissimilation of consonant clusters. The most well-known dissimilation rule, i.e. Grassmann’s Law, is just such an example: two aspirated consonants (or

two consonant plus aspiration clusters) undergo dissimilation, as illustrated in the preceding section with the reduplicated example in Greek *tithemi* < **thi-themi* “I do.” There are, however, pair of questions that have to be answered in relation to dissimilation of aspirated and tensed clusters in Korean partial reduplication:

1) If the so-called delaryngealization observed in partial reduplications such as *p'apaŋ* < **p'appaŋ* and *p^hapaŋ* < **p^happa^haŋ* is by dissimilation between two laryngealized consonants, why is the direction of dissimilation reversed just in the case of laryngeal dissimilation? That is, while a consonant in the first of two similar clusters drops by the dissimilation of nasal clusters, i.e. *NCVN#* → *∅CVN#*, a consonant in the second cluster seems to drop by the dissimilation of laryngeal clusters in Korean, i.e. *ChVCh* → *ChVC* and *C'VC'* → *C'VC*, as illustrated in the following derivation:

p'appaŋ
p'apaŋ dissimilation of nasal clusters: *NCVN#* → *∅CVN#*
p'apaŋ dissimilation of laryngeal clusters: *C'VC'* → *C'VC*

2) Why does the same delaryngealization not occur in the partially reduplicated examples such as *t'ekt'ekul*?²² Neither *∅tekt'ekul*, nor *∅t'ektekul*.

We first consider the second problem, an answer to which has been adumbrated by Davis and Lee (1996: 92) as:

“In ideophonic words that are extended by reduplication or other affix-like elements, marked laryngeal features (aspiration and glottalization or tenseness) cannot appear in such elements in non-initial syllables”

To this, they add that the reason delaryngealization is observed only in noninitial syllables is that ‘the initial syllable is traditionally viewed as the accented or prominent syllable in Standard Korean while non-initial syllables are not’.

²² This example, however, does not show clearly that delaryngealization fails in partially prefixing reduplication because voiceless stops often undergo tensification after another voiceless stop in Korean, e.g. *holtak* [holt'ak] “completely”. Another example like *t'ekt'ekul* is *t'alt'arim* “creepy”, which is better because it clearly shows its tense consonant after a resonant. I have however kept the former form here because it was the one used in the preceding section for explanation of dissimilation of consonant clusters.

Their explanation, however, suffers on two fronts. First, their rule of delaryngealization must be restricted to ‘ideophonic words extended by reduplication’. This amounts to using morphologically sensitive information to solve a problem of essentially phonological nature. I have argued in the preceding section that such rules are best avoided and that our task as phonologists is to find the real phonological rules hidden beneath them.

The second problem with the above explanation is their allusion to the accentual position in Korean, which at the first glance may appear to be pertinent. The implication is that the laryngeal features do not appear in the noninitial syllables because noninitial syllables are generally unaccented in Korean. As a supporting argument, they mention the well known vowel shortening in unaccented noninitial syllables, e.g. *nu:n* ‘snow’ but *hampak-nun* ‘large snowflakes’. But there is no evidence that consonants ever weaken in Korean due to lack of accent²³, although there is evidence of intervocalic weakening of consonants, as for example in the voicing of voiceless consonants in, e.g. *kapang* [kabaŋ] ‘bag.’ Moreover, note that their analysis says that there is no delaryngealization in examples such as *t’ekt’ekul* because the reduplicated syllable is in the accented initial syllable. But, in all fairness, if the first laryngeal consonant is not delaryngealized because it is in the accented initial syllable, then we could expect the second laryngeal consonant to be delaryngealized because it is in the unaccented noninitial syllable, but it does not. Davis and Lee get around this obvious problem by restricting their rule of delaryngealization, or loss of marked laryngeal feature, to occur only in ‘reduplicated syllables’, which, as we have mentioned above, is another example of using morphologically sensitive environment as part of solutions to essentially a phonological problem.

The fact that neither the first nor the second laryngeal consonant gets delaryngealized in *t’ekt’ekul* suggests that accent has nothing to do with delaryngealization in partial reduplication in Korean. Rather, what is relevant here is the intervocalic position, which, as a weak environment, often induces weakening in consonance with the IDP. Neither of the laryngeal consonants in *t’ekt’ekul* delaryngealizes because none is in intervocalic position, while the second laryngeal consonant is delaryngealized in *p’apaj* < **p’aj-p’aj* because it falls in the weak intervocalic position due to the prior application of the dissimilation of nasal clusters.²⁴

²³ Regarding the prominence of the accented initial syllable in Korean, S-C. Ahn (2000:115f) mentions the retention of tenseness in examples such as, e.g. *Sammy Sosa* pronounced as either [s’emi s’osa] or [s’emi sosa] but not as [s’emi s’os’a]. But this could be due to the positional strength of word initial position rather than the accent in the initial syllable.

²⁴ Another reason for the failure of delaryngealization in *t’ekt’ekul* may be found in the second condition on dissimilation, namely that what comes in between the two consonant clusters be sufficiently different. Since a consonant is naturally more similar to another

Being in intervocalic position, however, is not enough to delaryngealize a laryngeal consonant in Korean, as witnessed by examples such as *ap^hi*- ‘be sick’, *ap’a* ‘daddy’ where the laryngeal consonants remain despite being in weak intervocalic position. Rather, as in the case of coda consonant elision in the preceding section, the delaryngealization is a consequence of the synergy between two phonological processes that share the similar function of weakening, in this case between intervocalic weakening and dissimilation of laryngeal clusters. Consider the following derivation:

| | | | |
|------|--------------------|-------------------------------------|--|
| (16) | ap’a | p’aŋ-p’aŋ | |
| | " | p’ap’aŋ | NCVN# → ØCVN# |
| | " | p’ ⁺ ap’ ⁺ aŋ | dissimilation: C § K → C ⁺ § K ⁺ |
| | ap’ ⁺ a | p’ ⁺ ap’ ⁺ aŋ | intervocalic weakening |
| | " | p’ap’aŋ | delaryngealization: p’ ⁺ → p but p’ ⁺ → idem |

The dissimilation in this example occurs in reversed direction, weakening the second (instead of the first) of the two laryngealized consonants, precisely because the second laryngeal consonant is in weak intervocalic position, which facilitates its further weakening and eventual elision in consonance with the IDP. Recall the same reversal in direction of dissimilation in the above Sanskrit desiderative forms where $C_1VC_1C_2C_3 \rightarrow C_1VC_2C_3$ (e.g. *lipsati* < **libhsati*) by synergy between dissimilation and cluster simplification.²⁵

consonant than a vowel, it is often the case that dissimilation occurs preferentially when only a vowel intervenes between the two consonant clusters. In *p’ap’aŋ* < **p’aŋ-p’aŋ*, the prior application of dissimilation of nasal clusters has created a situation in which the two laryngeal consonants are separated only by a vowel, whereas a consonant has remained (in addition to the vowel) between the two laryngeal consonants in *t’ekt’ekul* due to the failure of the generalized application of the dissimilation rule, i.e. $kCVk\# \rightarrow \emptyset CVk\#$ could not occur because the second *k* is not in word final position. For arguments on the condition of sufficient difference in dissimilation, see H-S. Kim (1991, 1997).

²⁵ A reviewer has raised the question of how we know when the dissimilation will reverse its direction and as a possible answer suggested that the rule order between dissimilation and intervocalic weakening in (16) be reversed so that dissimilation is allowed to weaken only the consonants that have been previously weakened by another weakening process (such as intervocalic weakening). While this may appear to partly answer the above question, the same cannot be said of the consonant elision in (15) where the strong liquid consonant will not necessarily weaken by earlier application of cluster simplification in consonance with the IDP (cf. Foley 1977 for general principles regarding elision of weak elements and IDP). Moreover, not all of the examples of reversed dissimilation can be explained this way. The interim position of this paper is that dissimilation ‘looks for’ its direction of application to produce the desired synergy effect. While this stipulation has none of the problems of the sort related to IDP, it however raises a question regarding the teleology of phonological rules, whether the rules are intelligent enough to find the desired result. We will not be able to answer this question until more cases of rule reversion in dissimilation are examined in a variety of languages, which I leave open for future research.

We now turn to the analysis of partial reduplication in Optimality Theory, in which I review how the above problems have been handled in a constraint-based approach.

4. Optimality Theoretic analysis of partial reduplication in Korean: The emergence of the unmarked cases

What are the Optimality Theoretic (OT) solutions to the problems mentioned in the above analysis? I do a brief review of them in this section; the problem of accepting infixation as a legitimate type of partial reduplication in Korean is considered in 4.1 and the problems of asymmetry and delaryngealization in 4.2, followed by discussion of the so-called emergence of the unmarked cases in 4.3.

4.1 OT analysis of infixing reduplication

All the analyses of partial reduplication done under Optimality Theory condone infixing reduplication as a legitimate type of reduplication, even though this is usually not mentioned explicitly. For example, Y-M. Yu Cho (1999), in her attempt to account for the reduplication occurring in examples such as *pipij* and *cululuk*, proposes the constraint ranking of *Final-C* >> *No-Coda* >> *MAX-BR*, *Align-R* whose application is illustrated in the following tableau:

(17)

| /culuk/-RED | Final-C | No-Coda | Max-BR | Align-R |
|---------------|---------|---------|--------|---------|
| a. culuk-luk | | **! | Cu | |
| →b. culu-lu-k | | * | Cu k | * |
| c. culuk-lu | *! | * | Cu k | |
| d. culu-lu | *! | | Cu k | |

The same tableau with minor modifications in constraint names is also used by S. Kim (1996), C-W. Chung (1999) and others who adopt OT. Note that the form marked as optimal in the above tableau is *culu-lu-k*, not *culu-luk*. The implication that the reduplicant *-lu-* is an infix is thus patent in this analysis, which includes more or less all of OT analyses.²⁶ However, the alternative form *culu-luk* would not only get around the problem of infixation in Korean but also satisfy the constraint *Align-R* and violate the

²⁶ A notable exception is S-C. Ahn (2000), who, following J-H Jun (1994)'s analysis of Metrical Weight Consistency, proposes the constraint *IDENT(Ft)*, which requires the foot count of the output to be identical to that of the input. As in J-H. Jun's MWC analysis, which copies the final CVC syllable of the base as the reduplicant, Ahn's analysis does not recognize infixal reduplication in Korean.

Max-BR less heavily than *culu-lu-k* because the reduplicant *luk* faithfully copies the final syllable in the base.²⁷

Why then is *culu-lu-k*, and not *culu-luk*, assumed to be the optimal form? I think there are two reasons, and both have to do with McCarthy and Prince (M&P)'s analysis of reduplication. First is the general acceptance of M&P's analysis of *culu-lu-k* as an example of internal type of reduplication, which is based on the assumption of final velar extrametricality. As mentioned above, M&P (1986) has come up with such analysis as a way of classing *cululuk* with a suffixing type of reduplication, i.e. since the final *k* in the base *culuk* is extrasyllabic, it is not included in the reduplicant when the final syllable is suffixed to the base. The problem, as mentioned above, is that besides the usual problems entailed in assuming extrametricality, the extrametrical velar appears *after* the reduplicant, which makes the reduplicant *-lu-* look more like an infix rather than a suffix, even though M&P may argue otherwise and call it an internal type. The OT analyses that choose *culu-lu-k* as the optimal form in this sense continues with M&P's assumptions of extrametricality and infixation and thus cannot avoid the same criticisms leveled against it, despite the differences in the framework.

The second reason has to do with M&P's more recent proposal expressed in their 1994 work, namely the emergence of the unmarked (TETU): M&P propose that an unmarked structure tends to appear in reduplication even though the language in question may condone marked structures elsewhere. It has been assumed that *culu-lu-k* rather than *culu-luk* is the optimal form because this has the added advantage of revealing the unmarked CV syllable as the reduplicant even though Korean allows both unmarked CV and marked CVC syllables in the language as a whole. We will be discussing the crucial problems with the proposed TETU cases in Korean in the following subsection. It suffices here to show that even under the OT analysis with general constraints such as *Final-C*, *No-Coda*, *Max-IO*, *Max-BR*, and *Align-R* and an appropriate ranking of them, *culu-luk* rather than *culu-lu-k* can be selected as the optimal form, which demonstrates the conceptual superfluity of the final velar extrametricality and the so-called internal reduplication in Korean.²⁸

²⁷ One may, however, point out one problem with this supposition, namely that *culu-luk* violates the faithfulness constraint Max-IO whereas *culu-lu-k* satisfies it. I will come back to this problem below to provide an alternative OT analysis of *cululuk*.

²⁸ As a reviewer has pointed out, *cul-uluk* would have the same number of violations as *culu-luk*. But this only means that there is a high ranked constraint that restricts the size of the reduplicant in Korean, such as *Afx* σ , which states that 'the phonological exponent of an affix is no larger than a syllable' as in, for example, C-W. Chung (1999, 125).

(18)

| /culuk/-RED | Final-C | No-Coda | Max-IO | Max-BR | Align-R |
|--------------|---------|---------|--------|--------|---------|
| a. culuk-luk | | **! | | ** | |
| b. culu-lu-k | | * | | *** | *! |
| →c. culu-luk | | * | * | ** | |
| d. culuk-lu | *! | * | | *** | |
| e. culu-lu | *! | | * | *** | |

4.2 OT solutions to the problems of asymmetry and delaryngealization

If there is one feature that all of previous OT analyses have in common, it is the discreteness of their approach to the problems of asymmetry and delaryngealization. J-H. Kim (1996), for example, proposes a new constraint **Clash* as a way of solving the asymmetry problem,²⁹ which she describes as an output constraint that prohibits identical prosodic templates from being licensed successively in the derived environment. The proposed ranking of constraints to explain the rhythmic asymmetry between *tu-tuɣsil* and *t'ek-t'ekul* is:

(19) Max-IO, Dep-IO >> **Clash* >> Max-BR, Dep-BR

For the delaryngealization problem in examples such as *p'apay*, on the other hand, a new constraint **Effort* is proposed, along with the constraint ranking in (21):³⁰

(20) Faith-IO >> **Effort* >> Ident-BR,

In addition to these two separate solutions, she has yet another solution (21) for the suffixal reduplication in e.g. *culu-lu-k*, which patterns just like *tu-tuɣsil* in rhythmic repetition because two successive heavy syllables are not allowed: \emptyset culukluk.

(21) Max-IO >> No-Coda >> Max-BR

In short, her analysis has given two separate solutions (19) and (21) for the same problem of asymmetry, in addition to a distinct solution (20) for the

²⁹ Although J-H. Kim does not refer to it, this constraint reminds of **Clash* constraint that bans adjacent stressed syllables. Cf. Kager (1999: 165).

³⁰ The **Effort* constraint is supposed to be motivated by the speaker's ease of articulation while the faithfulness and identity constraints are associated with the distinctness of the hearer's recognition.

problem of delaryngealization.³¹

The same discreteness is also obvious in the OT analyses done by others. For example, in her approach to the prefixal asymmetry problem, Y-M. Yu Cho (1999) proposes the constraint *Eurhythmy*(**HH*, **LL*), which is comparable to Kim's **Clash*, but this constraint does not play any role for the suffixal reduplication in *culu-lu-k*, which is explained by manipulating the ranking of general constraints, as we have seen in (17). For the delaryngealization problem, she proposes yet another constraint *No-Lar*, which is equivalent to Kim's **Effort* in its role if not in its essence. For C-W. Chung (1999), on the other hand, the infixing reduplication in *culu-lu-k* is handled by the ranking *Afx* σ , *Max-IO* >> *No-Coda* >> *Max-BR* but the prefixal reduplication in *t'ek-t'ekul* by reversing the ranking between *No-Coda* and *Max-BR*, while the examples of prefixal reduplication in *tu-tuysil* and *tətəysil* are said to have 'lexically marked reduplication that defies the regular types of reduplication in Korean'.³² For the delaryngealization problem, he proposes **Laryngeal*, same as *No-Lar* proposed by Cho. The key solutions of O. Kang (1998) also lie in ranking reversal. She uses the ranking *Max-IO* >> *No-Coda* >> *Max-BR* for the reduplication in *culu-lu-k* and *tu-tuysil* but the partially reversed ranking *Max-IO* >> *Max-BR* >> *No-Coda* for *t'ek-t'ekul*, while the constraint **Laryngeal* is proposed for the delaryngealization in *p'a-paj*. It is not clear, however, why the specific ranking should be reversed in these cases only. In addition, there is the more general theoretical question of whether such reversal in ranking should be allowed at all within the same language, because it would make the already powerful OT machinery even more powerful. Finally, S-C. Ahn (2000), who does not consider the asymmetry problem in prefixal reduplications, proposes the constraint *IDENT(Ft)* for the suffixal reduplication in *culu-luk*, while for the delaryngealization examples, he proposes **Share(tense)*, which bans 'sharing the feature tense between the base and its heavy syllable reduplicant word-finally'.³³ Unlike the above mentioned OT analyses, his analysis does have some merits in that 1) as in J-H. Jun (1994)'s Metrical Weight Consistency analysis, his

³¹ A reviewer has indicated that (19), (20) and (21) can be collapsed into one ranking: *Faith-IO* >> **Clash*, **Effort*, *NoCoda* >> *Ident-BR*. Note however that despite of the merits such unification of ranking offers, the fact remains that there are still three discrete solutions because the constraints **Clash*, **Effort*, and *NoCoda* are not related to each other in any meaningful way, while the solutions offered in this paper unifies the three problems under the general process of dissimilation and the concept of synergia.

³² This essentially means that you have to write them as exceptions. His argument is that these two are the only examples of CV prefixing reduplications in Korean, but the matter is complicated by the presence of another example similar to it, i.e. *sa-salc'ak* 'by stealth' This raises an interesting question: what is the maximum number of examples that can be listed as exceptions in the grammar? Note that the same question has been raised in H-S Kim (2002) concerning the exceptional behavior of *wa* < **o-a* 'come' in which, unlike *pwa*: < **po-a* 'see', there is no compensatory lengthening of the stem vowel. My answer to this question is that no exceptions should be listed. We should try to explain the exceptions rather than list them!

³³ Note that 'tense' in Ahn's analysis refers to both 'aspiration' and 'glottalization'.

analysis in terms of the constraint *IDENT(Ft)* does not recognize infixal reduplication, so the problem of accepting infixation as a reduplication type in Korean naturally does not arise and 2) his second constraint **Share(tense)* appears to be functionally similar to the dissimilation of laryngealized consonants, except that it does not explain why the ban on sharing the tense feature should be restricted to reduplicants in word final position. But it still uses the same discrete approach, suggesting two (instead of three because it does not consider the prefixal asymmetry in *tu-tuysil* and *t'ek-t'ekul*) unrelated solutions.

In contrast to the above, the analysis presented in this paper takes a unified approach to the three problems. First, it has denied the previous analysis of *culu-lu-k* as an infixal (or internal) type of reduplication in Korean, arguing that it rather belongs to the suffixal type, i.e. *culu-luk*, where the final velar consonant of the base has dropped out. Second, it has argued that the asymmetry in the prefixal reduplication in, e.g. *tu-tuysil* and *t'ek-t'ekul* as well as the suffixal reduplication in, e.g. *culu-luk* is a natural consequence of the dissimilation of consonant clusters, occurring, under the universal condition on dissimilation, between two sufficiently similar consonant clusters, and in synergistic collaboration with coda weakening. Third, it has shown that the delaryngealization in e.g. *p'apay* is also a natural consequence of the same dissimilation process, this time occurring between two similar laryngealized consonants, and again in synergy with the intervocalic consonant weakening. The proposed solutions all refer to the universal process of dissimilation and its synergy with another weakening process. The difference in efficacy between the OT analyses and this analysis is easy to see: the former has three different approaches to three different types of reduplication while the latter has offered a unified solution to the problems in Korean partial reduplication, in effect reducing the number of reduplication types to only two, the prefixing and the suffixing types.

We should keep in mind, however, that this difference is really an end result not of the difference in frameworks but of how you view the phonological problems: whether you see them as individually distinct or as related to each other. The previous analyses, having viewed the problems of asymmetry and delaryngealization as unrelated to each other, have proposed separate solutions to them. This separation of the problems has also extended to the types of reduplication: some have proposed one solution for the prefixing type such as *tu-tuysil* and *t'ek-t'ekul* but another solution for the suffixing type such as *culu-lu-k*. This has resulted in proliferation of new constraints and ranking. In contrast, the analysis proposed here, having viewed these problems as interrelated, was able to come up with a unified solution to them, under the concepts of universal phonological process of dissimilation and synergia, which applies to cases of both asymmetry and delaryngealization as well as to both prefixing and

suffixing types of reduplication. The analysis is thus superior to any of the analyses proposed so far in its scope of application and explanatory power.

4.3 The emergence of the unmarked cases in Korean partial reduplication

All of previous OT analyses have argued that Korean partial reduplication exhibits the effect of what M&P have named ‘the emergence of the unmarked’ or shortened TETU, which refers to the tendency of unmarked structures appearing in reduplication despite corresponding marked structures are not disallowed in the language as a whole. M&P have shown that the TETU effect usually appears under a ranking scheme of the following type:

(22) I-O Faithfulness >> Phono-Constraint >> B-R Identity

For Korean, the following candidates for TETU have been proposed in the literature:

(23) TETU cases in Korean partial reduplication³⁴

- 1) The partial reduplication in, e.g. *culu-lu-k* under the ranking of *Max-IO* >> *No-Coda* >> *Max-BR*
- 2) The delaryngealization in, e.g. *p'a-pa-ŋ* under the ranking of *IDENT-IO (lar)* >> **Laryngeal* >> *IDENT-BR(lar)*

The first is the case in which the unmarked CV syllable appears as the reduplicant even though both CV and CVC syllables are freely observed in the language as a whole, while the second is the case in which the unmarked plain (delaryngealized) consonant appears in the reduplicant, even though there is no general constraint that prohibits laryngeal consonants in Korean.

The previous analyses, however, have not looked at the whole picture, picking and choosing only that part of the data that fits the scheme. For example, as mentioned earlier, in order to say that *culu-lu-k* exhibits a case for TETU, one has to assume that the reduplication copies only the CV portion of the final CVC syllable, and this has necessitated assuming final consonant extrametricality and existence of infixal reduplication in Korean for which there is no evidence elsewhere in the language. A graver problem, however, lies with the prefixing reduplication. In examples such as *tu-tuysil*, where the reduplicant is CV, it initially appears to be a good example that can support TETU, but examples such as *t'ekt'ekul*, which has CVC as the reduplicant, clearly argue against it. This obvious problem has been overlooked by all of previous OT analyses, none of which, curiously enough, has made any mention of TETU in the analysis of

³⁴ See for example C-W. Chung (1997).

prefixing reduplication. If the unmarked CV syllable tends to appear as the reduplicant in suffixing reduplication in a language, then we could naturally expect the same in prefixing reduplication. But this is not the case in Korean, where both unmarked CV and marked CVC syllables emerge in the reduplicant: *tu-tuɲsil* but *t'ek-t'ekul*. Similarly, if the delaryngealization observed in the suffixing reduplications such as *p'a-pa-ŋ* is an instance of TETU, we could expect the same TETU effect in the prefixing reduplications such as *t'ek-t'ekul*. But neither the first nor the second laryngeal consonant loses its laryngeal feature, which argues against assuming TETU in Korean partial reduplication.

What does the above discussion about the problems of TETU cases in Korean mean? We can think of two possibilities: Either that TETU is an invalid principle that cannot be maintained across languages or that Korean partial reduplication has nothing to do with TETU and the previous analyses were wrong in claiming its existence in Korean partial reduplication. Even though I am not saying the former here because to do that would require a reexamination of all cases for TETU presented in M&P (1994), which is beyond the scope of this paper, I am certainly saying the latter.

There is still one more aspect of TETU that we have to consider. According to Hume (2003), who has conducted a broad literature survey of markedness claims, the distinction between marked and unmarked that we often take for granted is not so clear-cut, showing many ambiguities across languages. She concludes that we cannot take the distinction as something absolute but only as a general tendency. Since TETU crucially depends on the unambiguous distinction between marked and unmarked, such finding calls the theoretical construct itself into question. This is especially so because TETU, as is analyzed by M&P, is claimed to be part of Universal Grammar, which should imply its application across languages without exception.³⁵

5. Conclusion

In this paper I have reanalyzed partial reduplication in Korean in regards to the problems associated with its types, rhythmic asymmetry and delaryngealization. The previous analyses done under the various frameworks of metrical phonology, prosodic phonology and morphology, and Optimality Theory have all been shown to be inadequate in dealing with these problems. The alternative analysis presented here has shown that the essence of partial reduplication in Korean is not metrical, nor prosodic (in the sense of prosodic morphology) but rather processual,

³⁵ But then Chomsky refers to Greenberg's implicational universals, which are also claimed to be a general tendency, as something that can be written into UG, even though the nativist view of learning theory should dictate otherwise. This is certainly one area of grammar that needs more elucidation from the perspective of language learning. Cf. Chomsky (1981: 95).

requiring a deeper understanding of the phonological process of dissimilation, which applies preferentially between sufficiently similar consonant clusters. The framework of Foley's Theoretical Phonology (Foley 1977, 1981) and its Inertial Development Principle, which governs preferential application of phonological processes in languages, has been instrumental in uncovering a coherent and unified explanation that obviously has escaped the scrutiny of previous analyses based on metrical and prosodic structures as well as output oriented constraints.

It is not, however, so much the question of whether an analysis is process-based or constraint-based that is important, but rather whether there is any new insight revealed. The insight of the above analysis has been that the phonological process of dissimilation, which was found to occur elsewhere in Korean phonology, also applies in the partial reduplication process. I am sure it would not be too difficult to incorporate this insight into an OT analysis,³⁶ by proposing a unified constraint (or constraints) similar in function to the rule of dissimilation of consonant clusters and by 'locally conjoining' this constraint with an appropriate 'coda or intervocalic condition'. But such manipulation would be of secondary importance to the insights themselves because the new constraint-based analysis has only been made possible by the new insights discovered. This says a lot about the current practice of linguistic analysis, which has often tended to put more emphasis on what type of analysis is given rather than whether any insight is provided by such analysis for solving extant problems. For example, the proposed OT analyses of asymmetry and delaryngealization are more or less the same as the previous metrical and prosodic analyses of partial reduplication in that they both operate under the same assumption of extrametricality and recognize infixation as a legitimate type of reduplication. The constraints they use are also evidently similar to each other, as, for example, the constraints *Eurhythmy* and **Clash* used by Y-M. Yu Cho (1999) and J-H. Kim (1997) respectively remind of the Weight Complementarity proposed by C-K. Suh, while *IDENT(ft)* used by S-C. Ahn (2000) is a conversion into a constraint of Metrical Weight Consistency proposed by J-H. Jun (1994), although their theoretical implications may differ because of the difference between the rule-based and the constraint-based approaches. To solve difficult phonological problems, however, we need to shift our focus from questions such as whether we should do phonological analysis with constraints only,

³⁶ As, for example, in S-K. Kim (1998), who proposes Grassmann's Law as a new constraint to explain delaryngealization in, e.g. *p'a-pa-ŋ*. His analysis, however, is replete with problems: 1) his explanation does not extend to other partial reduplication examples that exhibit the problem of asymmetry, e.g. *culu-luk*, *tu-tuŋsil*, and *t'ek-t'ekul* for which he gives no explanation, 2) he also fails to explain why there is a lack of delaryngealization in *t'ek-t'ekul*, and 3) it is rather unwieldy to translate a derivational rule such as Grassmann's Law into a constraint; such an exercise of converting a phonological rule directly into a constraint defeats the point of doing a phonological analysis, because its only aim appears to be in having a constraint-based analysis in lieu of a rule-based analysis.

or with rules and constraints, or simply with rules, or whether we should allow intermediate stages in derivation, to how we could find some hidden insights into unresolved phonological problems, whether they be done in terms of rules, or rules and constraints, or constraints only.

REFERENCES

- AHN, SANG-CHEOL. 1998. *An Introduction to Korean Phonology*. Seoul: Hanshin Publishing Co.
- AHN, SANG-CHEOL. 2000. Reduplication in Optimality Theory: Input-reduplicant faithfulness. *Korean Journal of Linguistics*. 25.1. 103-127.
- CHAE, WAN. 1986. *Kwuke Eswun Yenkwu (A Study on Word Order in Korean)*. The Society of Korean Linguistics.
- CHO, YOUNG-MEE YU. 1999. Optimality in Korean reduplication. *Harvard Studies in Korean Linguistics* 8.
- CHOMSKY, NOAM. 1981. *Lectures on Government and Binding*. Dordrecht: Foris Publications.
- CHUNG, CHIN WAN. 1997. A Correspondence-Theoretic approach to partial reduplication in Korean. *Studies in the Linguistic Sciences*. 27. 1. 33-47.
- CHUNG, CHIN WAN. 1998. Fixed segmentism in Korean partial reduplication: Three instances of the emergence of the unmarked. *Proceedings of the 11th International Conference on Korean Linguistics*. Honolulu: University of Hawaii, 272-281.
- CHUNG, CHIN WAN. 1999. *Reduplication in Korean*. Doctoral dissertation. Bloomington: Indiana University.
- DAVIS, STUART and JIN-SEONG LEE. 1996. Korean partial reduplication reconsidered. *Lingua* 99. 85-105.
- FOLEY, JAMES. 1977. *Foundations of Theoretical Phonology*. Cambridge: Cambridge University Press.
- FOLEY, JAMES. 1979. *Theoretical Morphology of the French Verb*. Amsterdam: John Benjamins B. V.
- FOLEY, JAMES. 1981. *Philosophy of Linguistics*. Unpublished manuscript.
- HUME, ELIZABETH. 2003. Reconsidering the concept of markedness. Paper presented at the 2nd *Korean International Conference on Phonology*. June 13-14. Seoul: Seoul National University.
- INKELAS, SHARON and C. O. ORGUN. 1995. Level ordering and economy in the lexical phonology of Turkish. *Language* 71: 763-793.
- JUN, JONGHO. 1994. Metrical weight consistency in Korean partial reduplication. *Phonology* 11. 69-88.
- KAGER, RENE. 1999. *Optimality Theory*. Cambridge: Cambridge University Press.
- KANG, ONGMI. 1998. Hankukeuy Pupun Cwungchepetayhan Tayungiron Punsek (A Correspondence Theoretic analysis of Korean partial

- reduplication). *Studies in Phonetics, Phonology, and Morphology* 4. 31-54. The Phonology-Morphology Circle of Korea.
- KIM, CHIN WU. 1998. Problems in reduplication in Korean. *Proceedings of the 11th International Conference on Korean Linguistics*. Honolulu: University of Hawaii, 249-262.
- KIM, HYUNG-SOO. 1991. *Universal Phonological Processes: A theoretical analysis of dissimilation, cluster simplification, and their synergy for consonant cluster reduction in Romance and Indo-European languages*. Doctoral dissertation. Vancouver: Simon Fraser University.
- KIM, HYUNG-SOO. 1995. Dissimilation of liquids in the so-called ri- and rə-irregular predicates in Korean. In *Linguistics in the Morning Calm 3: Selected papers from SICOL-1992*. Seoul: Hanshin Publishing Co.
- KIM, HYUNG-SOO. 1997. Grassmann's law and rule ordering paradox in Greek. *Proceedings of 16th International Congress of Linguists*, Oxford: Pergamon. Paper No. 0403. (CD Rom)
- KIM, HYUNG-SOO. 1999a. Glide formation and compensatory lengthening in Korean revisited. *Studies in Modern Grammar*. 17. 15-31. Taegu: The Society of Modern Grammar.
- KIM, HYUNG-SOO. 1999b. Universal phonological processes in eastern Bantu: a theoretical analysis. *Linguistics* 7.1. 199-225. The Linguistic Association of Korea.
- KIM, HYUNG-SOO. 2002. Underlying representations in glide formation in Korean: A reply to Cho (2000). *Studies in Phonetics, Phonology, and Morphology* 8.1. 65-83. The Phonology-Morphology Circle of Korea.
- KIM, JIN-HYUNG. 1997. An Optimality-Theoretic approach to reduplication in Korean ideophones. *Language Research*. Vol. 38. No. 4. 737-752.
- KIM, SE-KYUNG. Grassmann's Law in Korean reduplication. *Proceedings of the 11th International Conference on Korean Linguistics*. Honolulu: University of Hawaii, 290-298.
- KIM, SOOHEE. 1996. Emergence of the unmarked: Korean partial reduplication. *CLS 32: The Main Session*. 179-189.
- KIM, YOUNG-SEOK. 1984. *Aspects of Korean Morphology*. Doctoral dissertation. Austin: The Univ. of Texas.
- LEE, KI-MOON. 1972. *Kwukesa Kaysel (The outlined history of Korean)*. Seoul: Tower Press.
- LEE, SWUNG-NYENG. 1960. Cwungkieuy ihwacakyonguy kochal (A study on dissimilation in Middle Korean). Reprinted in *Lee Swung-Nyeng Kukehak Suncip 3 (Selected Papers of Lee Swung-Nyeng, Vol. 3)*. Seoul: Minumsa, 1988.
- MCCARTHY J. J. and A. PRINCE. 1986. *Prosodic Morphology*. Unpublished manuscript. Univ. of Massachusetts, Amherst and Brandeis University.
- MCCARTHY J. J. and A. PRINCE. 1994. The emergence of the unmarked: Optimality in Prosodic Morphology. *NELS* 24.6. 333-379.
- SUH, CHANG-KOOK. 1993. Dual aspects of weight: Evidence from Korean partial reduplication. *WCCFL* 12. 153-166.

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