

Rule Reordering in Middle Korean Phonology

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I

There is ample textual evidence showing that a rule that changes an intervocalic *l* to *r*, which is well-known in modern Korean, e.g., *tal* 'moon', but *tar+i* 'moon' (Nom), was also operating in Late Middle Korean. For example, a morphemic sequence *kil+il* 'a letter' (Acc) was written in two syllable blocks as *ki\$liil*,¹ indicating that its pronunciation was most likely [kiril]. Likewise, *palal+ay* 'at sea' was written as *pa\$la\$lay*, with its pronunciation likely to have been [paɾlay], given the fact that the syllable-initial prevocalic *l* is always pronounced as [r] in Korean.

What is puzzling is that we find examples in the same text of the same period that did not follow this orthographic convention. For example, *nalay* 'a wing', was consistently written as *nal\$ay*, not as *na\$lay*; *il+ənil* 'though stirring' as *il\$ə\$nil*, not as *i\$lə\$nil*; *talay+sya* 'to soothe' (Nonorific) as *tal\$ay\$ya*, not as *ta\$lay\$ya*, as might be expected.

This interesting fact was of course noted by many, and has been a topic of somewhat lively debate among scholars. It was generally assumed that the two different orthographic conventions reflected something different, either phonological and/or morphological, and the question was always centered around the phonetic values (actual pronunciations) of these different transcriptions. In the following are five representative views, of which the first one (a) is a null hypothesis that the two were simply variant transcriptions of the same pronunciation:

- (1) a. *l\$V* was pronounced as [rV], i.e., was the same as *SIV* (S. Lee 1960:21; Choi 1959:39)
- b. *l\$V* was pronounced as [llV] (Huh 1965:387-89)
- c. *l\$V* was pronounced as [lV] (Yu 1961:113)
- d. *l\$V* represented an alternation between [lgV] and [l#V], where *g* is a historical etymological segment, and # is a pause juncture. (W. Kim 1971:123)
- e. The empty consonant symbol *o* in V of *l\$V* must have represented an actual consonant, probably [ɣ] or [ɦ] (voiced h), the weakened form of the histo-

¹ We transcribe all occurrences of the liquid with the letter *l* for the sake of uniformity unless given as a phonetic transcription within square brackets. Its normal value is [l] syllable-finally but [r] prevocalically (i.e., syllable-initially). + indicates a morpheme boundary; # a word boundary, and \$ a syllable (block) boundary.

rical *g*. (K. Lee 1972:17)

The following criticism can be given for each of these views:

(a) is unacceptable in view of the fact that the two types of transcriptions existed in the same text. Choi's argument (1959:33) that *l̥SV* and *sl̥V* must have been pronounced the same, i.e., [rV], because the variant transcriptions of the same lexical items existed during the same period, e.g.,

- (2) *kiySpyəSlil* 'a news' (Acc.) (Y 35, S 43)²
kiySpyəlSil (WC 23)
miSlil (S 92); *miSlin* (Y 2)
milSil 'water' (Acc.) (WC 226)

is considerably weakened because, although these texts date from approximately the same period, i.e., Y(1445), S(1447) WC (1449), the variations are never found in the same text, each text having adopted different orthographic conventions.

(b) is also an untenable view because there are many examples of *ll* [ll] in the same texts that have the examples of *l̥SV*, e.g.,

- (3) *milSləSkaSni* 'to retreat' (Y 51)
molSla 'not know' (Y 60)
nolSlaSni 'be surprized' (Y 59)
alSliSoSni 'to inform' (S 41)

If *l̥SV* was pronounced as [llV], then it is difficult to understand why these words in (3) were not transcribed as *l̥SV* or vice versa, i.e., why the words like *nalSay*, *talSaySsya*, etc. were not transcribed as *nalSlay*, *talSlaySsya*, etc.

We agree with the view of (c) that *l̥SV* represented the pronunciation [l̥#V]. The question remains, however, as to why some words were pronounced as [l̥#V] while some others having the same segmental sequence were pronounced as [rV].

(d) attempts to answer the question raised above. The problem is that there are other segments besides *g*, e.g., *p*, *s*, *h*, and even the vowels *ʌ* and *i*, whose deletion in

² The capital letters are abbreviations of Late Middle Korean texts given below in a chronological order with the date of publications in parentheses. The numbers following the symbols refer to chapters and/or verses in the text.

Y: *Yongpi-echen-ka* (1445)
 S: *Sekpo-sangcel* (1447)
 WC: *Welin-chenkang-cikok* (1449)
 WS: *Welin-sekpo* (1459)
 N: *Nungemkyeng-enhay* (1463)
 P: *Pephwakyeng-enhay* (1463)
 WK: *Wenkakkyeng-enhay* (1465)
 NH: *Nayhwun* (1475)
 C: *Chokan-twusi-enhay* (1481)
 K: *Kumkangkyeng-samkahay* (1482)

the same environment, i.e., between l and V , yielded $l\#V$ [IV], not $\$lV$ [rV]. Furthermore, we find examples of $z\$V$ contrasting with $\$zV$, and of $y\$V$ contrasting with $y\$yV$. What we need then is an integrated description of the derivation and the role of the juncture phoneme $\#$ proposed in (d).

(e) is, like (d), a reasonable view. As long as it is recognized that l of $l\$V$ was not pronounced as [r] but as [l], it can be assumed that a consonant, however weak it might have been, must have followed the liquid, for the syllable-final l can remain as [l] only preconsonantly, and changes to [r] prevocally. Thus, a historical change of $k > g > \gamma$ or $h > \phi$ may be assumed to have taken place. We question however whether it is necessary to assume that there indeed was an intermediate stage in which k (intervocally) was phonetically [γ] or [h] before becoming ϕ . We will argue that it is not. We subscribe to the view that phonetic changes need not be gradual and that they can bring about rather dramatic changes. To cite just two examples from English, there is absolutely no evidence that gh in *laugh*, which was originally [x] as the spelling suggests (note the German cognate *lachen* [laxən], went through such intermediate stages as [c] > [š] > [s] > [θ] before becoming [f]. [x] became [f] more or less suddenly and directly. Likewise, in the Great Vowel Shift, there is no evidence that a high tense vowel \bar{i} , for example, took the intermediate steps before becoming a low diphthong *ay*.

What is needed is a theoretical apparatus that would enable us to describe the observed phonological change (or alternation) in a natural and general way. We will argue that rule reordering is just such a device. It will be shown that an appeal to rule reordering will enable us to describe not only the phenomenon at issue, i.e., the $l \sim \phi$ alternation, but also the $z \sim \phi$, and $y \sim \phi$ alternations, in an adequate and general manner. It will also be shown that rule reordering is not an ad hoc device designed to explain only the phenomenon at issue but is a diachronic process well-attested in other languages, based on well-motivated forces such as paradigm uniformity, feeding and counter-bleeding, and minimum opacity (i.e., maximum transparency).

II

In order to account for the three alternant pronunciations of the phrase *os # nip + ko* 'wearing clothes', i.e., [oñnipko], [ošihko], and [odipko], Kim (1977) proposed that the rule of deletion of a word-boundary $\#$ between *os* and *nip + ko* be ordered in different stages relative to other relevant segmental rules. The following derivation illustrates this:

(4) Underlying :	<i>os # nip + ko</i>	<i>os # nip + ko</i>	<i>os # nip + ko</i>
	$\#$ -Deletion		
	<i>os + nip + ko</i>		
Nasal Drop :		<i>os # ip + ko</i>	<i>os # ip + ko</i>
		$\#$ -Deletion	
		<i>os + ip + ko</i>	

Plosivization :	ot + nip + ko		ot # ip + ko
Palatalization :	ot + ŋip + ko	oš + ip + ko	
			#-Deletion
			ot + ip + ko
Nasalization :	oň + ŋip + ko		
Voicing :			od + ip + ko
Surface :	[oňnipko]	[ošipko]	[odipko]

This is not the place to motivate the particular shape of the underlying form or the particular ordering and the environment of the relevant segmental rules given above. Details are found in Kim (1977). But it is worth mentioning that the phrase is a contracted form of a full verb phrase *os + il # nip + ko*, and that the deletion of the Accusative marker *-il* apparently makes the noun a part of the following verb, making it a kind of a compound verb. In fact, it is this encliticization process that induces the deletion of the word boundary #.

The important thing to note is not so much that a rule of #-deletion is needed as that such a rule must be ordered in different places with respect to other segmental rules. The effect of such differential ordering of the #-deletion is that the sooner the #-deletion applies, the more "assimilatory" will the adjacent segments become, because, in general, the earlier the site of the boundary deletion rule, the more the number of rules that apply across the deleted boundary, and vice versa, i.e., the later the site of the #-deletion rule, the less the number of applicable word-internal rules. In fact, a fourth alternant pronunciation [ot'ipko] is possible only with a slight pause or a glottal stop between *ot* and *ipko*, indicating that the word boundary still exists here, changing *os* to *ot* and preventing the intervocalic voicing rule from applying. The required pause or a glottal stop is the proof enough of the presence of the word boundary. There is no other way to explain the alternate pronunciations. The pronunciation [odipko] is particularly instructive in telling us both the presence of the word boundary # at some point in the derivation and the absence, i.e., its deletion, at a later point in the derivation. On the surface level, there must be no # between *ot* (<*os*) and *ip + ko* (<*nip + ko*) because *t* is voiced to *d*, and the intervocalic voicing never takes place across a word boundary. Yet we know that the boundary must have been present earlier in the derivation, in particular, until after the application of the rule of palatalization. We know this to be the case because if the boundary would have been deleted before the palatalization rule, *t* of *os* would have been palatalized to *č* (*č* eventually with intervocalic voicing). The fact that it is not is a proof that a word boundary existed sometime earlier blocking the application of the palatalization rule, and the fact that it is voiced is a proof that it no longer existed at the time of the intervocalic voicing rule.

What we have established, with respect to a fragment of modern Korean phonology, is that, the underlying representation undergoing the same set of segmental rules in the same

order can nevertheless yield different outputs when a boundary deletion rule is differentially ordered among these segmental rules. We would like to propose that just such differential ordering of the rule of syllable boundary (§) repositioning produced the alternation under discussion in Late Middle Korean.

III

The importance of syllable as a phonological unit has been an increasing topic of discussion in recent days not only in Korean but also in English phonology (cf. Kim and Shibatani 1976; Kim-Renaud 1978; Kahn 1976; Kiparsky 1979). That the syllable is a psychologically real unit is evidenced by the fact that the Korean script, though alphabetic (phonemic), is grouped into syllable blocks. Details aside, a syllable boundary is positioned in general between any two syllables, each syllable maximally consisting of (C)V(C). Thus, the rule of syllable boundary (§) insertion will take the form:

$$(5) \phi \rightarrow \$/ \text{ ______ } (C)V$$

This rule will insert § before CV whether the preceding segment is vowel or a consonant, but before a V if the preceding segment is also a vowel, i.e., VSCV, CSCV, V\$V.

Suppose now that in LMK this rule was a fairly early rule so that the *g*-deletion rule and the syllable-initial *l*→*r* rule followed the syllable boundary insertion rule. We then have the following derivation of *nal\$ay* :

$$\begin{aligned} (6) \text{ Underlying : } & \text{nalgay} \\ & \text{\$-Insertion : } \text{nal$gay} \\ & \text{g-Deletion : } \text{nal$ay} \\ & \text{l} \rightarrow \text{r : } \quad \text{—} \\ \text{Surface : } & \text{[nal-ay]} \end{aligned}$$

Suppose however that the relative order of the syllable boundary insertion rule and the *g*-deletion rule was reversed sometime later. The derivation is then :

$$\begin{aligned} (7) \text{ Underlying : } & \text{nalgay} \\ & \text{g-Deletion : } \text{nalay} \\ & \text{\$-Insertion : } \text{na$lay} \\ & \text{l} \rightarrow \text{r : } \quad \text{na$ray} \\ \text{Surface : } & \text{[naray]} \end{aligned}$$

We would like to argue that such rule reordering in fact occurred in diachronic phonology of Late Middle Korean. Fairly consistent transcriptions of the middle 15th century texts began to take variant shapes in the texts of late 15th and early 16th centuries, e.g., *nal\$ay* > *na\$lay* and/or *nal\$lay*, settling on one of the latter two in the texts of late 16th and early 17th centuries, indicating that the rule reordering or resyllabification

process has finished its course by the beginning of the 17th century. Divergence of the *nalʂay* form into *naʂlay* or *nalʂlay* is interesting. Apparently, the *l*-gemination in the last form was introduced in cases where preservation of the original pronunciation (i.e., prevention of *l* from becoming *r* due to resyllabification) was felt desirable. In the following is a table showing cognate forms in three different stages:

(8) Middle 15th c.	Late 16th/Early 17th c.	Modern K.
<i>oʂa</i>	<i>oʂla</i>	<i>olla</i> 'to rise'
<i>noʂi</i>	<i>noʂli</i>	<i>nori</i> 'a game'
<i>noʂay</i>	<i>noʂlay</i>	<i>nore</i> 'a song'
<i>suʂuy</i>	<i>suʂluy</i>	<i>sure</i> 'a wheel'
<i>pəʂəy</i>	<i>pəʂliy</i>	<i>pəreji~pəlle</i> 'an insect'
<i>cuʂi</i>	<i>cuʂli</i>	<i>curi</i> 'to reduce'
<i>əʂi</i>	<i>əʂli</i>	<i>əlli</i> 'to freeze'
<i>puʂhuy</i> > <i>puʂuy</i>	<i>puʂluy</i>	<i>ppuri</i> 'roots'
<i>saʂi</i>	<i>saʂli</i>	<i>salli</i> 'to revive'
<i>kəyʂilʂi</i>	<i>kəyʂilʂli</i>	<i>keilli</i> 'lazily'

Examples of diachronic rule reordering are found in other languages. King (1969: 52f) for instance gives the following example from German. A rule devoicing the word-final obstruents came into German ca. 1000 A.D., and a rule lengthening a vowel before a voiced consonant ca. 1400 A.D., so that *lob* 'praise', *lob*+əs 'of praise' came out as [ʈop] and [ʈo:bəs] respectively, as the following derivation shows:

(9) Underlying :	<i>lob</i>	<i>lob</i> +əs
Devoicing :	<i>ʈop</i>	—
V Lengthening :	—	<i>ʈo:b</i> +əs
Surface :	[ʈop]	[ʈo:bəs]

However, sometime after the introduction of the vowel lengthening rule, the relative order of the two rules was reversed so as to allow the grammar to utilize the rules to the fullest extent ("feeding") and to achieve a "paradigm uniformity". The derivation with the reversed order of the two rules looks as follows:

(10) Underlying :	<i>lob</i>	<i>lob</i> +əs
V Lengthening :	<i>ʈo:b</i>	<i>ʈo:b</i> +əs
Devoicing :	<i>ʈo:p</i>	—
Surface :	[ʈo:p]	[ʈo:bəs]

King cited the above example in support of the principle of paradigm uniformity and feeding/counter-bleeding as criteria in intrinsic rule ordering, i.e., rules tend to shift into the order which allows their fullest utilization in the grammar, minimizing exceptions and uniformizing all the forms in the same paradigm. We would like to argue that such

was the motivation in the reordering case of Middle Korean under discussion.

Returning to the problem of the “liquid” transcription in Late Middle Korean, the gaining and prevalent view among Korean scholars is that the variant transcriptions of *lSV* and *SlV* reflected different pronunciations in such a way that, while the latter was undoubtedly [rV], the former must have represented [lʔV] or [lhV], the “ghost” consonant being a reflex of a weakened *g*.

The strength of this argument appears to have come from two sources. The first is the fact that the variant forms still exist in Modern Korean; conservative dialects having forms like *nalgay* ‘a wing’, *molgay* ‘sand’, corresponding to *nalay* [narɛ], and *molay* [more] in innovative dialects. Thus, it is tempting, even appealing, to postulate an intermediate stage between the two. The second source of support is by way of an analogy to a well-known weakening process in LMK, namely, *p* > *b* > *β* > *w*. When this bilabial weakening occurred after a liquid, a resyllabification did not occur. That is, *l* was left as the syllable-final consonant, i.e., was not resyllabified into the syllable-initial segment. (prevocalic glides *y* and *w* in Korean are written as a part of a vowel complex, and a consonant preceding the glide becomes a syllable-initial segment in pronunciation as well as in phonemic writing, e.g., *wəl + yo + il* [wəʔryoʔil] ‘Monday’, *tong + mul + wən* [tongʂmuʔrwən] ‘a zoo’, *kyəl + hon* [kyəʔrhon] ‘marriage’, etc.) For example,

- (11) *kiʔSpal* > *kiʔSwal*, **kiʔSlwal* ‘a sentence’ (S 9:38)
malʔSpam > *malʔSwam*, **maʔSlwam* ‘a pond chestnut’ (N 9:56)
yəlʔSpin *yəlʔSwin*, **yəʔSlwin* ‘thin’ (P 3:72)

A parallelism between the *p*-weakening and the *g*-weakening is clear, and again it is easy to jump to an assertion that just as *l* did not become a prevocalic syllable-initial segment because the following *p* did not become completely lost but merely weakened to a glide *w*, so *g* < *k* must not have been lost completely but only weakened to [ɾ] or [h], thus preventing the preceding *l* from becoming a prevocalic syllable-initial segment.

The major problem with this line of argument is that, the *lSV* phenomenon is created in LMK not only through the alleged weakening loss of *g* from *lSgV*, but also through a few other phonological processes, which cannot be explained at all in terms of the intermediate stage theory.

One environment in which *lSV* was created was the deletion of the stem-final vowel in certain verbs. E.g.,

- (12) *noʔʌʂi* > *noʔʂi* ‘a game’ (Y 43)
nʌʔʌʂʌy > *nʌʔʂʌy* ‘to fly’ (WS 8:25)
kʌʔʌʂʌlo > *kʌʔʂʌlo* ‘with powder’ (S 6:38)
oʔʌʂa > *oʔʂa* ‘to rise’ (WC 175)
taʔʌ-a > *taʔʂa* ‘to differ’ (WS 2:46, WC 56)
niʔʌʂa > *niʔʂa* ‘to say’ (WS 21:190, 23:65)

$kil\dot{i}\$ə \quad > kil\$ə$ 'to err' (S 9:40; C 20:47)

In these examples, the stem-final vowel is deleted in front of an affix-initial vowel, apparently in order to avoid a hiatus. Since these verb stems are written in two syllable blocks, the second being Λ in other environments, e.g., $ni\$l\Lambda-ia$ 'to say', it is clear that the pronunciation was actually $[r\Lambda]$. The deletion of the final vowel in front of another vowel should maintain the $[r]$ value of the liquid as it is still prevocalic. But note that the pronunciation of the liquid appears to have reverted back to $[l]$. This would be explainable only if we assume that the deletion of the stem-final vowel made the liquid syllable-final, i.e., from $ni\$l\Lambda$ to $ni\$l$, thereby changing the pronunciation from $[nir\Lambda]$ to $[nil]$, $[nir]$ being impossible. Only later, with a rule reordering which ordered the rule of syllable boundary $\$$ positioning after the stem-final vowel deletion rule, would the pronunciation become $ni\$la$ $[nira]$. Compare (13a) with (13b):

- (13) a. Underly: $ni\Lambda+a$
 $\$$ -Insert: $ni\$l\Lambda\a
 V-Delete: $ni\$l\a
 Surface: $[nil'a]$
- b. Underly: $ni\Lambda+a$
 V-Delete: $ni\Lambda+a$
 $\$$ -Insert: $ni\$l+a$
 Surface: $[nira]$

In the above example, we assumed that, when $ni\$l\Lambda\a became $ni\$la$ with the deletion of the stem-final vowel Λ , the liquid changed its phonetic value from the syllable-initial $[r]$ to the syllable-final $[l]$. One may argue that the liquid retained the value $[r]$ even before resyllabification into $ni\$la$ from $ni\$la$ because underlyingly it came from $ni\$l\Lambda\a $[nir\Lambda\Lambda]$. The following will show, however, that the syllable-final segments become phonetically syllable-final when they come from syllable-initial segments via the deletion of the following vowel, even though they are still prevocalic due to the following vowel-initial affixes.

Certain noun stems ending in $-zV$ lose the final vowel in front of an affix beginning with a vowel. One would expect in such a case that the phonetic value of z remains. But instead of the expected, say azi from $az\Lambda-i$ 'a brother (Nom)', one gets $a\$ti$ $[adi]$ (Y 103), showing that, when z became syllable-final through the deletion of the following vowel, it became a homorganic stop, as all fricatives and affricates do in the syllable-final and preconsonantal positions. More examples:

- (14) $az\Lambda+\Lambda n \rightarrow az+\Lambda n$ transcribed as $a\$d\Lambda n$, $*a\$z\Lambda n$ (Y 24)
 $y\text{ə}z\Lambda+\Lambda y \rightarrow y\text{ə}z+\Lambda y$ " $y\text{ə}\$d\Lambda y$, $*y\text{ə}\$z\Lambda y$ 'a fox' (N 8:120)
 $p\Lambda z\Lambda+on \rightarrow p\Lambda z+on$ " $pa\$don$, $*pa\$zon$ 'to crush' (PH 6:138)
 $skizi-\text{ə} \rightarrow skiz+\text{ə}$ " $ski\$d\text{ə}$, $*ski\$z\text{ə}$, 'to pull' (NH 2:15; C 22:33)

kizi+om →kiz+om transcribed as ki\$dom, *ki\$zom 'to draw' (P 2:202)

This shows unequivocally that the phonetic changes induced by the deletion of the stem-final vowel or a consonant like *g* in our earlier examples is due to the resulting repositioning of the syllable boundary, rather than to anything directly related to the phonetic nature of the deleted segments.

Another indication that it is the syllabic fence, not a consonantal guard, that is preventing the adjacent segment from crossing over to the other side can be seen in what is called *y*-Gemination in LMK. When a stem ends in *y* (the second element of a falling diphthong) and the following affix begins with a vowel, *y* is transferred and copied onto the vowel, e.g.,

- (15) ponay+ətin > ponay+yətin 'to send' (WS 7:15)
 tloy+ə > tloy+yə 'to become' (S 19:3)
 yəhiy+om > yəhiy+yom 'separation' (C 22:30)
 suy+um > suy+yum 'a rest' (WK 1.2:15)

But the same or similar words will not induce *y*-Gemination if the following affix begins with a vowel through the loss of either an affix-initial or a stem-final consonant, e.g.,

- (16) tloy+gəy > tloy+əy, *tloy+yəy (S 6:1)
 ponay+gəsinəl > ponay+əsinəl, *ponay+yəsinəl (Y 26)
 yəhiy+gəy > yəhiy+əy, *yəhiy+yəy (S 6:5)
 suyb+otəy > suy+otəy, *suy+yotəy, 'be easy' (P 1:223)
 miyb+in > miy+un, *miy+yun 'to hate' (P 3:41)
 məyb+ən > məy+on, *məy+yon, 'to be hot' (K 5:29)

These examples show that when *y* and a vowel come to abut each other through the loss of an intervening consonant, the *y*-Gemination does not take place.

One can resort to a rule ordering here to describe the phenomenon. That is, if *y*-Gemination is ordered to apply prior to the consonant deletion, the glide gemination will not occur to a sequence of *y*+*V* created by a subsequent rule of consonant deletion.

- (17) Underlying: yəhiy+om yəhiy+gəy
 y-Gem: yəhiy+yom —
 g-Del: — yəhiy+əy

However, the order of *y*-Gemination and *g*-Deletion is counter-feeding. Note that the surface form of yəhiy+əy (from yəhiy+gəy via *g*-Deletion) is exactly the same as the underlying form of yəhiy+om, which means that if *y*-Gemination followed *g*-Deletion, both forms would have undergone *y*-Gemination. That is, the two rules would now stand in a feeding relationship rather than in a counter-feeding relationship, and the principle of maximum applicability of rules (Anderson 1975) should prefer this reverse ordering of the two

rules. In fact, this has happened historically, *y* is now inserted before a vowel-initial affix very regularly (in colloquial modern Korean) in order to break up a vowel hiatus created by the deletion of an affix-initial or a stem-final consonant and by the monophthongization of the stem vowel.

What we have seen so far with several examples of rule derivations is that one need not postulate an intermediate sound, or a ghost of it, as the factor in determining differential behaviors of the same segmental sequences in LMK, especially the alternation between *lSV* and *SlV*. We have argued instead that a rule reordering, well-motivated for paradigm uniformity and maximum applicability, is a sufficient, simpler, and more general solution.

IV

Writers of the fifteenth century who helped King Sejong in inventing the remarkable Korean script *Hangul* were sophisticated linguists. Not only did they devise separate letters for different phonemes, they also devised letters (mostly diacritic variations of main characters) to denote some important allophones, e.g., β [β] = "light" labial; Δ [z] = "fuzzy" dental sibilant; \bar{o} [$?$]; $\bar{o}\bar{o}$ [x], etc. If [γ] or [h] were indeed extant sounds in LMK, it is difficult to explain why no letter was ever devised for such sounds. It would have been so easy to call it a "light velar", in analogy to a "light" labial.

Phonological rules often operate in abstract and arbitrary ways, so that the same segments in the same environment may behave in different ways. Take the rule of palatalization in Korean as an example. Dentals become palatalized in front of [*i*], e.g., *hay+tot+i* [*hetoʃi*] 'a sunrise', *kath+i* [*kačhi*] 'together', *si* [*ši*] 'a poem', *o+ni* [*oŋi*] 'to come', etc. But this palatalization does not occur in front of certain [*i*]'s which are phonetically identical with palatalization-inducing [*i*]'s, e.g., *əti* [*ədi*], **[ə]i* 'where', *thikkil* **[čhikkil]* 'a dust particle', *muni* **[muŋi]* 'a pattern', etc. Although this exceptional [*i*]'s came historically from a diphthong *iy*, an argument that palatalization is not taking place because the value of the vowel is something between [*i*] and [*i*] is simply false.

Kim (1980) argued that preservation of semantic distinction appears to be the motivation for the exception in palatalization in Korean which can be accounted for by having Palatalization rule apply before Monophthongization rule (that also fronts the vowel from *iy* to *i*):

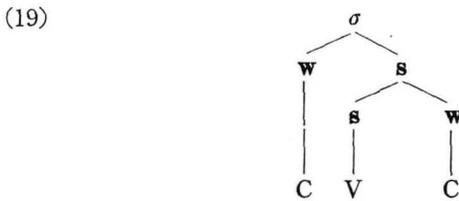
(18) Underlying :	<i>po+ni</i> 'see'	<i>pon+iy</i> 'real intention'
Palatalization :	<i>po+ŋi</i>	—
Monophthongization :	—	<i>pon+i</i>
Surface :	[<i>poŋi</i>]	[<i>poni</i>]

Note that in this derivation the two rules are in an "opaque" relationship because one finds non-palatal *n* on surface in the palatalizing environment in [*poni*] from /*pon+iy*/,

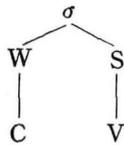
Reordering of the rules into a "transparent" relationship would have eliminated the phonetic distinction between the pairs of these semantically distinct words. However, given a Kiparskian principle that two possible orderings for any pair of rules tend to be ordered so that it results in a broader application of one of these rules, we may safely predict that a reordering (the reverse ordering) of Palatalization and Monophthongization will occur in Korean in the near future.

Metrical structure of the syllable also renders a support for our line of argument that rule reordering resulting in resyllabification is responsible for the phonological variations we have discussed in this paper.

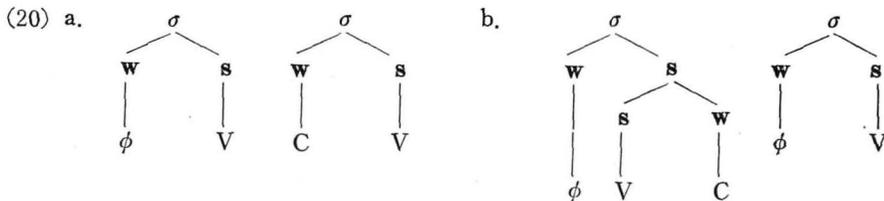
Kiparsky (1979) showed that, given a (simplified) Universal Syllable Template (UST)



in which the minimum branching is



where *w* and *s* stand for weak and strong nodes respectively in terms of the relative weight in the sonority hierarchy, it is natural for *VCV* to syllabify as *V σ CV*, rather than as *VCSV*. It is so because the former entails a simpler structure and fits the UST better as it generates a fewer number of empty (unassigned) nodes in the template. Compare (20a) with (20b):



Thus, with the loss of *g* from *(CV)lSgV(C)*, a resyllabification should occur, changing the string from *CVlSVC* to *CV σ lVC*. But this would have been possible only when the rule that inserted the syllable boundary *S* between *l* and *g* before *g*-Deletion was

moved to the position after *g*-Deletion so that it may now insert the syllable boundary *S* before *l*, i.e., only when a rule reordering has taken place.

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