Universal Phonological Processes in Korean; An overview

Hyung-Soo Kim
Jeonju University, Korea

1. Introduction

This paper introduces certain phonological processes in Korean, under the concept of universal phonological process. There are many phonological processes traditionally recognized in Korean and still many more are perhaps waiting to be discovered. Since it is impossible to include all these processes in this short introductory paper, the discussion will center on the processes that have been popular topics for analysis among phonologists in Korea.

Universal phonological process is a concept that undelies the phonological theory developed by James Foley (Theoretical Phonology: Foley 1977, 1979, 1991). This concept maintains that there exists a limited number of processes occurring as part of the definition of Language, to which all of the phonological rules in languages of the world must belong. It requires that the description of phonological rules and their explanation must be done by referring to these processes. Incorporation of this concept into the explanatory scheme of phonology has been an important contribution to the study of phonology because by working on these universal phonological processes and their manifestation in various languages, we can increase our knowledge of Language, the linguistic system that underlies all languages of the world.

Among the universal phonological processes occurring in Korean I have chosen the following three processes to illustrate the concept of universal phonological process:

1) syncope: the process by which a medial vowel drops
2) lenition, which is weakening of a consonant in intervocalic position
3) dissimilation, becoming dissimilar of sufficiently similar consonants

Other processes occurring in Korean will be presented in a similar form in the future. The purpose of this exercise is to introduce to the reader the major phonological phenomemena occurring in Korean, and encourage future research on the problems that still remain to be resolved. It is my personal belief that working through universal processes is by far the best, the easiest and the most effective way to get initiated into the phonology of a not-so-well-known language such as Korean, because when working on processes which one is already familiar with to a certain degree, it is easier to find the genuine phonological problems in the language being analyzed.

2. Universal phonological processes in Korean

2.1. Syncope

Syncope, as is well known in traditional grammar, is a phonological process by which a medial vowel drops under various preferential conditions. As argued in detail in H-S. Kim (1993), syncope in Korean is subject to the following five principles;

1) it occurs to a low toned vowel in preference to a high toned one, as in the following Late Middle Korean nouns,

LMK hʌrʌ < *hʌrʌr "day" (cf. nom. hʌll-í <*hʌrʌr-í)
LMK mʌrʌ <*mʌrʌr "floor" (cf. nom. mʌllí<*mʌrʌr-í)
LMK pʌrʌ́ <*pʌrʌ́r "sea" (cf. nom. pʌrʌ́r-í)

where a low toned vowel drops but a high toned vowel remains (cf. K-M. Lee 1972b, p152). As S-N. Lee(1960) has first observed in his pioneering paper on dissimilation in Middle Korean, the elision of *r* in the above words such as *hʌrʌ* < *hʌrʌr* "day" is due to a dissimilation rule that drops the second of two similar liquids in word final position:

hʌrʌr-í	hʌrʌr	pʌrʌ́r-í	pʌrʌ́r	
hʌrr-í	"	"	"	preferential syncope: ʌ→∅ /VC__CV
"	hʌrʌ	"	pʌrʌ́	dissimilation of liquids: rVr# → rV#
hʌllí	"	"	"	MR(miscellaneous rules)

2) application of syncope depends on the number of consonants surrounding the medial vowel, as in the following Middle Korean verbs with the suffix *-bɨ*, which derives descriptive verbs from action verbs (cf. Ramsey 1978, p219):

<table>
<tr><td></td><td>miypta "to be hateful" <* mɨi-"hate"-bɨ-ta</td></tr>
<tr><td></td><td>turipta "to be frightening" < *turi-"consider frightening"-bɨ-ta</td></tr>
<tr><td></td><td>nollapta "to be surprising" <*nolla-"to be surprised"-bɨ-ta</td></tr>
<tr><td></td><td>kɨripta "to be missed" <*kiri-"to miss"-bɨ-ta</td></tr>
<tr><td>but</td><td>mitpita "to be reliable"<*mit- "believe"-bɨ-ta</td></tr>
<tr><td></td><td>kʌspʌta "to be hard, trying" <* kʌsk-"to make an effort"-bɨ-ta</td></tr>
<tr><td></td><td>kolphʌta "(one's stomach) is empty" <*kolh-"(one's stomach) remain unfilled"-bɨ-ta</td></tr>
<tr><td></td><td>paspita "to be busy" <* pach-"to busy oneself with"-bɨ-ta</td></tr>
<tr><td></td><td>silphita "to be sad" <* silh-"to grieve over"-bɨ-ta</td></tr>
<tr><td></td><td>alphʌta "to be sick" <*alh-"to suffer from"-bɨ-ta</td></tr>
<tr><td></td><td>wuzbita "to be funny" <*wuz-"to laugh"-bɨ-ta</td></tr>
</table>

In these examples, the suffixal vowel *ɨ* which is in the medial position drops after one consonant (*miypta<* mɨi-bɨ-ta* "to be hateful") but retains after two consonants (*mitpita <*mit-bɨ-ta* "to be reliable"). Consider the rules occurring in the following derivation:

mɨi-bɨ-ta	mit-bɨ-ta	
mɨibta	"	preferential syncope (C__)
mɨipta	mitpita	voicing assimilation
miypta	"	MR

3) application of syncope depends on the relative strength of the consonant preceding the medial vowel, as in

	məkta "eat"	məgɨni
	tamta "fill"	tamɨni
	capta "hold"	cabɨni
	ssista "wash"	ssisɨni
but	nolta "play"	noni <*nol-ɨni

where the medial *i* first drops preferentially after the strong liquid *l*, then the liquid itself drops in contact with the *n* (cf. *sonamu* "pine tree" <*sol-*"pine" *-namu* "tree"):

mǝk-ini	tam-ini	nol-ini	
"	"	nolni	preferential syncope (l___)
"	"	noni	$l \rightarrow \emptyset /$__n
mǝg-ini	"	"	$k \rightarrow g /V$__V

The parameter that defines the relative strength of consonants here is the *rho* phonological parameter(Foley 1977, P37)

$$\rho \; \overrightarrow{\begin{array}{cccc} t & s & n & l \\ 1 & 2 & 3 & 4 \end{array}}$$

(*t* for stops, *s* for fricatives, *n* for nasals, and *l* for liquids)

where resonants (i.e. liquids and nasals) are generally stronger than nonresonants (i.e. stops and fricatives), and among resonants, liquids are stronger than nasals. 4) weak vowels drop in preference to strong vowels; The fact that the vowel that drops by syncope in Korean is usually ʌ/i suggests that this is the weakest vowel in Korean. But we would be able to make such a claim only after a full scale analysis of vowels in Korean. This, however, is beyond the scope of this paper and is thus left as a topic for future research.

5) syncope of a vowel may depend on the relative strength of a neighboring vowel, under the mechanism of strength fluxion, e.g.

        ǝrim "ice" (cf. ǝr-ta "to freeze")
        urim "cry" (cf. ur-ta "to cry")
        norim "play" (cf. nor-ta "to play")
        corim "sleepiness" (cf. cor-ta "to drowse")
but   sarm <*sar-im "life" (cf. sar-ta "to live")
        arm <*ar-im "knowledge" (cf. ar-ta "to know")

where the suffixal vowel *i* drops preferentially if the radical vowel is the strongest *a*. This is because the strongest *a* first undergoes preferential strengthening in consonance with the *Inertial Development Principle* that strengthening occurs preferentially to strong elements (see Foley 1977, chapter seven for details). In response to this strengthening, the suffixal vowel weakens in consonance with the strength conservation principle that morphological units such as words and syllables maintain a constant amount of inherent strength, regardless of change by the *IDP* in strength of individual elements. The vowel thus weakened by strength fluxion between the radical vowel and the desinential vowel then drops, because as the *IDP* predicts, weak elements are more likely to drop than strong elements:

sar-im	cor-im	
sa⁺ri⁻m	"	strength fluxion
sarm	"	preferential vowel elision

Although *sarm* and *arm* have often been considered to be exceptions to the rule forming deverbal derivatives, there is no need to posit such exceptions, as their loss

of the suffixal vowel can be explained as a rule governed phenomenon under the concepts of strength fluxion and preferential syncope.

2.2 Lenition

Lenition is a phonological process in which consonants, usually p, t, and k, weaken in intervocalic position. Even though usual environment for lenition is traditionally known to be an intervocalic position, as for example in French, e.g. Lt *ripa* Fr *rive* "river" where p converts to v in the intervocalic position, the essential environment could be reduced to postvocalic position, as for example in Italian and Spanish, e.g. Lt *patre* It *padre*[padre] Sp *padre*[paδre] where t lenites to d in Italian and to $δ$ in Spanish.

Languages often differ in the precise condition on lenition and its reflex. Consider, for example, the following examples in French and Spanish:

Latin	Spanish	French	
cupa	cuba [kuβa]	cuve	"barrel"
vita	vida[biδa]	vie	"life"
amica	amiga[amiɣa]	amie	"female friend"

Looking at the data in French first, the lenition rules initially appear to be

p ---> v (V__V)
t ---> Ø (V__V)
k ---> Ø (V__V)

In Spanish, on the other hand, Latin p, t, and k first become voiced, and then spirantized in the same intervocalic position (Note: the orthographic b, d, and g in the above Spanish data reflect the intervocalic voicing of voiceless stops in Old Spanish). The rules of lenition occurring in Spanish are thus
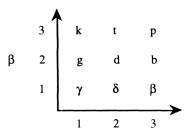
p --> b --> β (V__V)
t --> d --> δ (V__V)
k --> g --> γ (V__V)

The Spanish data compared with the French data thus suggest the following intermediate stages of lenition,

1) p --> b (V__V)	1) t --> d (V__V)	1) k --> g (V__V)
2) b ---> β (V__V)	2) d --> δ (V__V)	2) g --> γ (V__V)
3) β --> w	3) δ -->Ø (V__V)	3) γ -->Ø (V__V)

where the voiceless stops first become voiced as in 1) , and then spirantized as in 2), and finally drops out as in the rule 3) of lenition in the case of t and k, though not in the case of p where the spirant $β$ rather converts to w (Note: v in Lt *cupa* Fr *cuve* is the consonantalized reflex of w). This conversion of $β$ to w is a type of vocalization, a strengthening rule that occurs on the above $ρ$ parameter, which we shall return to shortly when we discuss the lenition rules in Korean.

The successive weakening stages of lenition are seen on the β section of the following α–β phonological parameter (Foley 1977, p 34),

$$
\begin{array}{c|ccc}
3 & k & t & p \\
\beta \quad 2 & g & d & b \\
1 & \gamma & \delta & \beta \\
\hline
& 1 & 2 & 3
\end{array}
$$

where voiceless stops are stronger than voiced stops, which are in turn stronger than voiced spirants. The α parameter, on the other hand, explains why in French lenition, *k* and *t* drop in preference to *p*, as in Lt *amica* Fr *amie* and Lt *vita* Fr *vie* but Lt *cupa* Fr *cuve*: since *k* and *t* are weaker than *p* on the above α parameter, *k* and *t* drop in preference to *p* in consonance with the *IDP* that weakening occurs preferentially to weak elements. So far our interpretation of lenition based on its rules occurring in French and Spanish are:

$$p \rightarrow b \rightarrow \beta \rightarrow w$$
$$t \rightarrow d \rightarrow \delta \rightarrow \emptyset$$
$$k \rightarrow g \rightarrow \gamma \rightarrow \emptyset$$

Lenition in Korean In Korean, occurrence of lenition can be observed in the so called *p*- and *t*-irregular predicates such as

indicative	infinitive	
kop-ta	kow-a	"be pretty"
tit-ta	tir-ə	"hear"

where *p* alternates with *w*, and *t* with *r*. These compare with the following regular predicates

indicative	infinitive	
kup-ta	kub-ə	"bend"
tɨ-ta	ttɨd-ə	"tear"
mək-ta	məg-ə	"eat"

where voiceless stops become voiced in the intervocalic position.

Many attempts have been made to explain the stem alternation in the above irregular predicates. The earliest attempt in the tradition of classical generative phonology was made by C-W. Kim(1973), who posited the underlying stems of **kow-* and **tir-*, and then proposed that the indicative forms *kop-ta* and *tit-ta* are derived by the rules of

w --> p (__C)
r --> t (__C)

These rules, however, are suspicious because we do not often find rules of the above type in languages. For example, it is not clear what universal process is underlying the rule converting r to t in a preconsonantal position. Another problem is that the above rule converting w to p does not relate to the change occurring to the same irregular predicate in Middle Korean,

indicative	infinitive	
kop-ta	koβ-ʌ	"be pretty"
(tit-ta	tir-ə	"hear")

for which we would need another rule converting β to p in the preconsonantal position.

An obvious alternative to the above explanation is to consider lenition as the process underlying the stem alternation in irregular verbs. An advantage of this hypothesis is that we can now relate the reflexes of intervocalic p in Middle and modern Korean as

1) p --> b (V__V)
2) b --> β (V__V)
3) β --> w

where rules 1) and 2) occur in Middle Korean but 3) in modern Korean. The conversion of t to r in intervocalic position could be similarly interpreted, as first undergoing the usual t-lenition routine as in Spanish, e.g. Lt *vita* Sp *vida*[biδa], followed by vocalization of δ to r,

1) t --> d (V__V)
2) d --> δ (V__V)
3) δ --> r

although unlike the lenition of p, all these rules have already occurred in Middle Korean (more on this below).

The lenition hypothesis, however, has its share of problems. Under such an hypothesis, it is not clear why all three stages of the lenition rules do not occur in the regular predicates such as infinitive *kub-ə* <*kup-ə* "bend" (cf. indicative kup-ta) where only the first voicing stage of lenition occurs. A solution suggested by Ramsey(1991) posits voiced stops for the irregular predicates but voiceless stops in regular predicates. Even though this suggestion solves the immediate problem of why there is no further progression of the lenition routine in regular verbs, its drawback is that it complicates the proto-Korean consonant system. There have been other proposals made in literature, but none has been satisfactory. Despite these problems that still remain, however, we maintain that the lenition hypothesis in some form is the most natural way of explaining the above irregular predicates, and will continue to explore the questions that concern the condition and reflexes of lenition in Korean.

Another question that arises under the lenition hypothesis is why there is no k-irregular predicates in Korean. That is, if the successive stages of the lenition routine have occurred to intervocalic consonants of p and t in Korean, wouldn't it

be natural to expect a parallel development for the intervocalic k? But the only intervocalic k that we find in verbs is the type

<u>indicative</u> <u>infinitive</u>
mək-ta məg-ə "eat"

which rather belongs to the regular predicate class.

A clue to this question can be found in some Middle Korean nouns often referred to as k-irregular declension,

nàmò <*nàmʌk "tree" nàmkʌ́n <*nàmʌk-ʌ́n(topic marker)
pùlmù <*pùlmïk "bellows" pùlmkïy <*pùlmïk-ïy (locative marker)
nyə̀nï̀ <*nyə̀nïk "other person" nyə̀nkḯ <*nyə̀nïk-í (subject marker)
mïsḯ <*mïsík "what" mïsíkí <*mïsík-í (subject marker)

where k alternates with Ø, suggesting that lenition of k has occurred in the postvocalic, (weak) syllable-final position:

nàmʌk nàmʌk-ʌ́n
" nàmkʌ́n syncope
nàmʌ " postvocalic elision of k

As mentioned earlier, syncope in Korean drops a low toned medial vowel in preference to a high toned one as in nàmkʌ́n <*nàmʌk-ʌ́n but mïsíkí <*mïsík-í.

Note also the traces of lenition of k found in examples such as (Cf. Ramsey 1977)

<u>Pukcheng dialect</u>	<u>MK</u>	<u>Seoul</u>	<u>gloss</u>
məlki	məlɦuy	məru	wild grapes
pəlkəci	pəlɦey	pəlle	insects
molkay	molɦay	more	sand
silkəŋ	silɦey	sirəŋ	shelf

From the analysis of lenition in Spanish and French, we know that lenited k does not just drop but undergoes the stages of k --> g --> γ before it drops out. From analysis of Korean lenition we have seen that after completing the successive stages of lenition, Korean stops p and t undergo vocalization to w and r respectively. The laryngeal glide, which appears in the above Middle Korean nouns, must therefore be the reflex of velar lenition in Korean: k --> g --> γ --> ɦ. But this ɦ is such a weak consonant that it has itself dropped in the intervocalic position, as an h drops in the same position in Korean, e.g. cotha <* coh-ta "be good" but co-a <*coh-a. Had this elision of intervocalic ɦ not occurred, we would still have k-irregular verbs. But due to this ɦ elision and the above syllable-final velar elision, k-irregular verbs have dropped the stem-final k in the postvocalic as well as the intervocalic position, effectively reducing themselves to vowel-final stems.

The above examples of lenition in Korean are important because they show the final stages that lenition of p, t, k can lead to. Combining the final stages of lenition observed in Spanish and French with those in Korean, we can finally deduce the *lenition routine* as

$p \to b \to \beta \to w$

$t \to d \to \delta \to r$

$k \to g \to \gamma \to \hbar$

The first two stages in the above group of changes are properly the steps that we can expect for lenition rules in languages of the world. The third (last) step, even though it belongs to the process of vocalization, has been included as part of the routine because it is often the case in languages that the weakened spirants, if they do not drop by further weakening by lenition, vocalize, giving the above reflexes.

Another point that has to be mentioned concerning the above diagram is the relation between the preferential application of lenition and the extent in progression of the above routine. As mentioned earlier, the *IDP* predicts that the weaker a consonant is, the more likely it is to undergo lenition. We can expect, as a corollary to this prediction, that the earlier the process of lenition applies to a consonant, the farther it is likely to progress on the lenition routine. Thus it is the case, for example, that in Middle Korean *t* has already completed the lenition routine, whereas *p*, being stronger than *t*, has gone as far as the second stage of the routine:

indicative	infinitive	
kop-ta	koβ-ʌ	"be pretty"
tit-ta	tir-ə	"hear"

It is then predicted by the *IDP* that the weakest consonant *k* will also have completed the lenition routine by becoming ħ, whose trace is found in Middle Korean nouns such as *məlħuy* (Cf. Pukcheng dialect *məlki* mod. K *məru* "wild grapes").

2.3 Dissimilation

Dissimilation is becoming dissimilar of two sufficiently similar phonological elements. There are two types of dissimilation occurring in languages of the world: dissimilation of consonants and dissimilation of consonant clusters. A well known example of the former is the liquid dissimilation in Latin where the *l* of the adjectival suffix **alis* as occurring in Lt *regalis* "regal" converts to *r* if the stem contains another *l* as in Lt *regularis* <**regul-alis*, Lt *singularis* <**singul-alis* and Lt *lunaris* <**lun-alis*, etc. A well known example of the latter is the Grassmann's Law in Greek and Sanskrit, in which the first of two similar aspirates deaspirates by the rule, *Ch § Ch → C § Ch*:

Gk *tithemi*<**thi-themi* Skt *dadhami* <**dha-dhami* (IE **dha-* Eng *do*)
Gk *peuthomai*<**pheuthomai* Skt *bodhami*<**bhodhami* (IE **bheudh-* "awaken")

Alhough traditionally Grassmann's Law is often described as deaspiration of an aspirate, implying that the underlying process is a mutation of an aspirate into a nonaspirate, there is an alternative interpretation in which a glide drops by dissimilation between two similar consonant plus glide clusters. An advantage of this interpretation, as has been shown in H-S. Kim(1994), is that when analyzed under the universal condition on dissimilation that dissimilation occurs preferentially between sufficiently similar consonants (or consonant clusters), it provides an explanation of a rule ordering paradox between Grassmann's Law and

deaspiration in Greek, which otherwise is inexplicable.

One of the reasons for distinguishing between the two types of dissimilation rules is that each type typically gives different reflexes: modification of one of the two similar consonants results usually by dissimilation of consonants as in Latin liquid dissimilation but elision will result by dissimilation of consonant clusters as in the examples of Grassmann's Law. Indeed this observation also seems to hold in Korean where both types of dissimilation rules occur. The well known dissimilation of $p \ \S \ p \rightarrow p \ \S \ k$ as occurring in

pup ⟩ puk "drum"
kəpup ⟩ kəpuk "turtle"
puəp ⟩ puək, puəkh "kitchen"

obviously belongs to the first type while the nasal dissimilation rule as occurring in

pyəŋyaŋ ⟩ piyaŋ "name of the capital city in North Korea"
koŋyaŋ ⟩ koyaŋ "offering food to Buddha"
coŋyoŋhi ⟩ coyoŋhi "quietly"
sʌyŋgaŋ ⟩ sʌyaŋ ⟩ sɛŋ "ginger"

belongs to the second type. Though previously the nasal dissimilation rule as occurring in these examples has been described $\eta V \eta \rightarrow V \eta$, it is really

$$\eta CV\eta \ \left\{ {C \atop \#} \right\} \rightarrow CV\eta \ \left\{ {C \atop \#} \right\}$$

where C includes the glide y as well. The word boundary in the above rule counts as a consonant because it often serves the function of a consonant in phonological environments. The nasal dissimilation rule is thus interpretable as an example where a nasal drops by dissimilation of consonant clusters.

Dissimilation of liquids in Korean Another example that belongs to the dissimilation of consonant clusters is the liquid dissimilation in Korean, occurring in, e.g.

LMK hʌrʌ < *hʌrʌr "day" (cf. nom. hʌll-i <*hʌrʌr-i)
LMK mʌrʌ <*mʌrʌr "floor" (cf. nom. mʌll-i<*mʌrʌr-i)
LMK pʌrʌ<*pʌrʌr "sea" (cf. nom. pʌrʌr-i)

As illustrated above while discussing preferential conditions on syncope, the loss of medial vowel in hʌll-i <*hʌrʌr-í as opposed to its retention in pʌrʌr-i < *pʌrʌr-í is due to preferential syncope by which a low toned vowel drops in preference to a high toned one.

The same rule is also observed in the so called *rí- and rə-irregular* predicates in Middle Korean. Consider

*nirír- "arrive"	nirí-tá	nirí-kó	nirí-miə	nirír-ə
*phirír- "be blue"	phirí-tá	phirí-kó	phirí-miə	phirír-ə
*nùrír- "be yellow"	nùrí-tá	nùrí-kó	nùrí-miə	nùrír-ə
*hirír- "flow"	hirí-tá	hirí-kó	hirí-miə	hìllə
*pirír- "call"	pirí-tá	pirí-kó	pirí-miə	pìllə

In the conjugation of verbs such as *nìrír-, *phìrír- and *nùrír-, the stem-final liquid drops by dissimilation before consonant-initial endings but is retained before vowel-initial endings.

As obvious from the above examples, Lee's original formulation of the rule as $rVr > rV$ is incorrect(cf. S-N Lee 1960). The dissimilation rule should be revised so that it could occur only when the second r is in word-final or preconsonantal position:

$$\text{dissimilation of liquids: } rVr \begin{Bmatrix} C \\ \# \end{Bmatrix} \rightarrow rV \begin{Bmatrix} C \\ \# \end{Bmatrix}$$

Note also that the same dissimilation occurs in the conjugation of verbs such as *hìrír- and *pìrír- before consonant-initial endings: hìrí-kó <* hìrìr-kó, pìrí-kó <*pìrìr-kó. But unlike the verbs of the first group, the medial vowel is lost before vowel-initial endings: hìllɔ́<* hìrìr-ɔ́ pìllɔ́ <*pìrìr-ɔ́. This vowel elision depends on two preferential conditions in Middle Korean already mentioned above: syncope of a low toned vowel in preference to a high toned one and preferential syncope after (or before) one consonant. The vowel elision cannot occur unless these two preferential conditions are met. Where no vowel elision occurs, the dissimilation of liquids occurs, dropping the second of two similar liquids in preconsonantal position:

phìrír-kó	phìrír-ɔ́	hìrìr-kó	hìrìr-ɔ́	
"	"	"	hìrr-ɔ́	preferential syncope
phìrí-kó	"	hìrí-kó	"	dissimilation of liquids
"	"	"	hìllɔ́	MR

This analysis shows that once the preferential conditions on syncope and dissimilation in Korean are known, these traditionally irregular predicates can be explained as perfectly regular.

3. Summary

Basic to Theoretical Phonology is the concept of universal phonological process. This concept maintains that there exists a limited number of phonological processes common to all languages of the world, and explanation in phonology must be done by referring to them. In this paper, we have discussed three of those processes and their application in Korean: syncope, lenition, and dissimilation. The purpose of this discussion has been two-fold: 1) to introduce to the reader some major phonological phenomena observed in Korean and 2) to show that these phonological processes in Korean occur essentially under the same conditions as in other languages, thus confirming their universality.

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