On the Irregular Verbs in Korean

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Abstract

The aim of this paper is to show how an optimality-theoretic conception of phonology (McCarthy & Prince 1993, 1995; Prince & Smolensky 1993) overcomes some of the limitations of the traditional ways of treating the so-called 'irregular verbs' in Korean. Building on the notion of OT, I attempt to shed new light on the properties of some general phonological phenomena of Korean. In the literature on Korean, the behavior of stem-final 'p' and 'h' is usually left unanalyzed as the alternations are considered to be phonologically unmotivated. I show in this paper that the irregular alternations are not really irregular but phonologically predictable.

1. Introduction

Korean verbs[1] are typically divided into two groups: regular and irregular. Regular verbs are invariant throughout the paradigm. Irregular verbs, on the other hand, show alternations before certain suffixes. In the literature on Korean (e.g., Choy 1959; Huh 1965; Martin 1992), the behavior of "irregular" verbs is usually left unanalyzed as the alternations are considered to be phonologically unmotivated.

This paper is organized as follows. After a presentation of surface [p]/[u](or [w]) alternations of /p/-irregular verbs, I argue that the alternation in question should be explained in terms of simplification in coda position, which will be captured through the interaction of structural and faithfulness constraints (section 2). The apparently dual behavior of /h/ will receive a unified account through the interactions among the universal constraints I propose (section 3).

2. /p/-irregular verbs

The /p/-regular verbs are those verbs that end in /p/. They do not show any alternations before suffixes, as shown in (1): an underlying phoneme /p/ is phonetically realized in its unchanged form when either a vowel or a consonant follows:

(1) /p/-regular verbs

Indicative	Connective	Stative	Nominal	Gloss
a. /kop + ta/	/kop + ko/	/kop + a/	/kop + m/	'to be numb'
⇓	⇓	⇓	⇓	
[kop⁼.t'a][2]	[kop⁼.k'o]	[ko.ba]	[ko.buɯm]	

b. Additional /p/-regular verbs
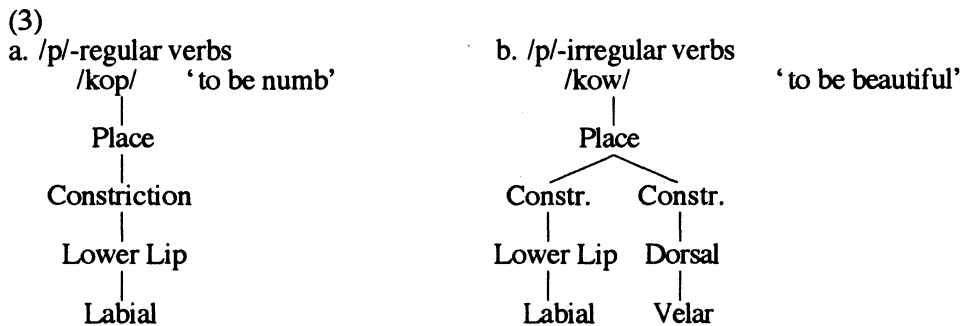kup- 'to bend'
s'ip- 'to chew'

However, the /p/-irregular verbs show alternations, as illustrated in (2): the stems apparently end in /p/, but show an alternation of [p] ~ [w] before a vowel (i.e., Indicative and Connective forms) while they have no such alternation before a consonant (i.e., Stative and Nominal forms):

(2) /p/-irregular verbs

Indicative	Connective	Stative	Nominal	Gloss
a. /kop + ta/	/kop + ko/	/kop + a/	/kop + m/	'to be beautiful'
⇓	⇓	⇓	⇓	
[kop⁼.t'a]	[kop⁼.k'o]	[ko.wa]	[ko.um]	

b. Additional /p/-irregular verbs
kup- 'to roast'
mip- 'to be hateful'

The question then is how to distinguish between those two types of verbs in a natural way. From the point of view of the Site-Articulator model (Gorecka 1989) and its conception of constriction location, the alternation between [p] and [w] can be straightforwardly accounted for. I suggest two different underlying representations for the two types of verbs in question, as contrasted below:

(3)
a. /p/-regular verbs
   /kop/   'to be numb'
        |
      Place
        |
   Constriction
        |
    Lower Lip
        |
      Labial

b. /p/-irregular verbs
   /kow/   'to be beautiful'
        |
      Place
       / \
  Constr. Constr.
     | |
 Lower Lip Dorsal
     | |
   Labial   Velar

The /p/-regular verb stem in (3a) has a Labial constriction under the Place node while the /p/-irregular counterpart in (3b) is assumed to have both Labial and Velar constrictions. A fact of special interest here is that positing two different underlying representations for the same stem-final /p/ does not complicate the underlying segment inventory of Korean. That is because the particular double constriction in (3b) is in fact exactly the configuration of /u/ which already exists in the phonemic inventory of Korean: (3a) is simply a representation of /p/ while (3b) is that of /u/ or /w/ in Gorecka (1989). I assume that the glide /w/ is actually identical with /u/ in constriction locations, but the one differs from the other in syllable positions: /w/ is a nonsyllabic counterpart of /u/, and therefore it occupies an onset position.[3]

Given this, we are in a position to translate the irregularity of the /w/-ending stems into OT framework. I propose that the alternation of the irregular stem-final /w/ in question result from the interaction between the constraint which forbids double constriction in coda position (4a) and a faithfulness constraint (4b):

(4)

a. CODACOND: Complex segments (i.e., segments that have more than one constriction node are not allowed in coda.[4]

b. MAX-IO(C): A constriction node in the input must have a correspondent in the output.

From the OT perspective in the sense of McCarthy & Prince (1995), deletion of the Velar constriction of /w/ in coda means that CODACOND dominates MAX-IO(velar constriction). With this ranking, obedience to the structural constraint takes precedence over preservation of the input form, as illustrated below:
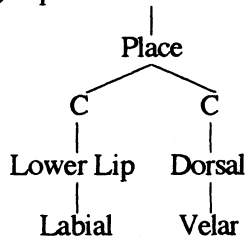
(5)

Candidates	CODACOND	MAX-IO(velar constriction)
a. $w]_\sigma$ — Place — C, C — Lower Lip, Dorsal — Labial, Velar	*!	
☞ b. $p]_\sigma$ — Place — C — Lower Lip — Labial		*

It is necessary to ask why there should be a deletion of Velar constriction instead of Labial constriction to satisfy the coda condition in (5). Assuming that Labial constriction is more prominent than Velar constriction[5], MAX-IO(labial constriction) dominates MAX-IO(velar constriction), which means that the actual output violates the latter rather than the former :

(6) CODACOND >> MAX-IO(labial constriction) >> MAX-IO(velar constriction)

We can see the interaction of these constraints in the following tableau, in which unfettered CODACOND always yields a simplification effect of complex segments in coda:

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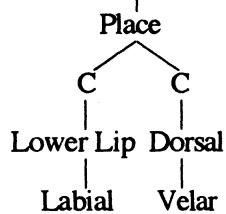(7) Input: /kow + ko/   'to be beautiful'   (Connective)

```
              |
            Place
           /      \
          C        C
          |        |
      Lower Lip  Dorsal
          |        |
        Labial    Velar
```

Candidates	CODACOND	MAX-IO(labial C.)	MAX-IO(velar C.)
a. [kow.ko] ```	Place / \ C C		Lower Lip Dorsal		Labial Velar ```	*!		
b. [kok⁼.k'o] ```	Place	C	Dorsal	Velar ```		*!	
☞ c. [kop⁼.k'o] ```	Place	C	Lower Lip	Labial ```			*

(7a) is faithful to the input and so has two constrictions in coda, which is forbidden by CODACOND. Since the violation of CODACOND by (7a) is fatal, the decision has to be made between (7b) and (7c). (7b) lacks the Labial constriction, crucially violating MAX-IO(labial constriction). The optimal output is therefore (7c), which violates neither of these high-ranked constraints. (7c) is in violation of MAX-IO(velar constriction), which is irrelevant because the constraint is low-ranked. Therefore, this analysis captures the fact that the glide [w] is not found in coda position in Korean.

(8) is a case in which the stem-final /w/ is followed by a vowel-initial suffix:

(8) Input: /kow + a/   'to be beautiful' (Stative)

```
              |
            Place
            /    \
          C       C
          |       |
      Lower Lip  Dorsal
          |       |
       Labial    Velar
```

Candidates	CODACOND	MAX-IO(labial C.)	MAX-IO(velar C.)

☞ a. [ko.wa]
 	
 `Place`
 `/  \`
 `C    C`
 `Lower Lip  Dorsal`
 `Labial    Velar`			

b.   [ko.ka]
 	
 `Place`
 `C`
 `Dorsal`
 `Velar`
		*!	

c.   [ko.pa]
 	
 `Place`
 `C`
 `Lower Lip`
 `Labial`
			*!

The tableau compares three plausible candidates. Each candidate fares equally well in terms of CODACOND: none of them has a syllable coda. (8b) is out because it violates MAX-IO(labial constriction), and there are candidates available that do not violate the constraint. Of the two candidates that pass this second test, (8c) is excluded because it violates MAX-IO(velar constriction). We can see that MAX-IO(velar constriction), while low-ranking, is still active here. (8a) is faithful to the input, obeying both MAX-IO(labial constriction) and MAX-IO(velar constriction).

Thus, it is syllabified as [ko.wa], with the stem-final /w/ keeping its double constriction in surface. In such a case, CODACOND is inapplicable, and so it is obeyed. The optimal form (8a) uniquely satisfies all the constraints.

In sum, an important consequence of this approach is that the behavior of /p/-irregular verbs is not irregular any more; the stem-final complex segment /w/ suffers simplification when it happens to be in coda as a result of syllabification. Therefore, it does not come as a particular surprise that the irregular stem-final /p/ is in fact /w/, and realized as [w] or [u] other than in coda position.

3. /h/-irregular verbs

The stems that belong to this class end in 'h'. This group of verbs is called irregular because the stem-final 'h' is optionally[6] deleted between a voiced segment and a vowel or glide, but coalesces with a following consonant. This is illustrated in (9):

(9) /ʧoh-/ 'good'

a. Indicative	b. Connective	c. Causative	d. Conditional
/ʧoh + ta/	/ʧoh + ko/	/ʧoh + asɔ/	/ʧoh + ɯmjən/
⇓	⇓	⇓	⇓
[ʧo.tʰa]	[ʧo.kʰo]	[ʧo.a.sɔ]	[ʧo.ɯ.mjən]

e. Additional /h/-irregular stems
nah- 'to bear', noh- 'to put', pʰarah- 'be blue', norah- 'be yellow', k'amah- 'be black', p'alkah- 'be red', hajah- 'be white'

At issue is the following. At first glance, the behavior of /h/ does not seem to be completely predictable. The 'h' alternates when these verbs are followed by vowel- or consonant-initial suffixes. As shown in (9a), when /h/ is followed by a lenis stop, they together produce a homorganic aspirated counterpart of the latter. (9b) shows that the verb loses the stem-final /h/ obligatorily when followed by a vowel-inital suffix. For example, the Causative form /ʧoh + asɔ/ avoids intervocalic 'h' at the expense of unfaithfulness: the segment /h/ in the input has no correspondent in the output. However, /h/ is never deleted in stem-initial position, as illustrated in (10):

(10)[7]

/hajah + ta/	⇒	[ha.ja.tʰa]	'(It's) white.'	-adjective-
/halmɔni/	⇒	[hal.mɔ.ni]	'grandmother'	-noun-
/ha + ta/	⇒	[ha.ta]	'to do'	-verb-

I suggest that these apparently separate patterns of /h/ be related in terms of constraint domination specific to Korean. The behavior of /h/ will become clearer when it is considered within a theory of constraint interaction in the sense of McCarthy & Prince (1995). Applying the alignment type of analysis to the /h/-

irregular verbs, I adopt a positive constraint for laryngeal neutralization by Lombardi (1994):

(11) Laryngeal neutralization (after Lombardi 1994: 8)
ALIGN-LEFT (laryngeal node, σ)
: Every laryngeal node stands at the left edge of a syllable.

The alignment constraint in (11) requires that 'h' stand at the onset of a syllable. The very effect of this constraint is that /h/ is licensed only in onset position. Since this constraint forces an unfaithful analysis of the input, it must dominate MAX-IO(segment), which bans deletion:

(12) ALIGN-L(laryngeal node, σ) >> MAX-IO(segment)

In addition, there must be an independently motivated constraint requiring that each syllable onset have a place node:

(13) ONSET(PL)
: Every onset must have a place node.

The idea of this constraint is based on a requirement found in many languages, restricting codas to the first segment of a geminate or a consonant homorganic to the onset of the following syllable (Steriade 1982; Itô 1986).[8]

    The top priority is given to ALIGN-L(laryngeal node, σ) in (11). The force of ONSET(PL) is felt only when the alignment issue is out of the way, at the expense of violating MAX-IO(segment). The constraint ONSET(PL) in (13) looks at a candidate to check whether a syllable onset dominates a place node. When ONSET(PL) dominates MAX-IO(segment), it has the effect of blocking a placeless 'h' in the syllable onset at the expense of deleting it. The high-ranking two constraints in the hierarchy conspire to compel the violation of MAX-IO(segment). The following tableau illustrates the situation:

(14) /ʧoh-/ 'good' + /a/ ⇒ [ʧo.a]

Candidates	ALIGN-L(laryngeal node, σ)	ONSET(PL)	MAX-IO(segment)
a. ʧoh.a	*!		
b. ʧo.ha		*!	
☞ c. ʧo.a			*

    The notion of disjointness of morphemic content is relevant to the discussion of merger in /h/-irregular verbs. The constraint MORPHDIS introduced by McCarthy & Prince (1995) discriminates against the case in which the contents of two morphemes overlap. When straightforward concatenation of morphemes leads to a merger, the process also violates UNIFORMITY (McCarthy & Prince 1995: 66),

which is a string-based constraint against mapping multiple elements to a single correspondent in the output:

(15) shows that the very alignment constraint in (11) is also responsible for the merger of /h/ with the following lenis stop as well. (15d) clearly violates MORPHDIS and UNIFORMITY, since both the stem and the suffix share the merged 'h' in the output. Therefore, both MORPHDIS and UNIFORMITY must be subordinated to the alignment constraint. By virtue of the ranking given in (14), coalescence is the favored outcome, (15d):

(15) /ʧoh- (stem)/ 'good' + /ta (suffix)/ 'Indicative' $\Rightarrow$ [ʧo.tʰa]

Candidates	ALIGN-L(lar.)	ONSET(PL)	MAX-IO	MORPHDIS	UNIFORM
a. ʧoh.ta	*!				
b. ʧo.ha		*!	*		
c. ʧo.ta			*!		
☞ d. ʧo.tʰa				*	*

When 'h' appears in syllable-final position as in (15a), ALIGN-L(laryngeal node, σ) always decides the matter, because 'h' is simply not licensed in coda. (15b) crucially violates ONSET(PL). The lowly-ranked MAX-IO(segment) turns ot to be decisive in eliminating (15c) from the competition. (15d) satisfies the alignment constraint through coalescence: it trades obedience to ALIGN-L(laryngeal node, σ), ONSET(PL), and MAX-IO(segment) for MORPHDIS and UNIFORMITY-IO, a desirable exchange given their subordinate position in the hierarchy.[9] Therefore, in OT framework, the apparently dual behavior of 'h' shown in (9) receives a theoretically consistent explanation.

Finally, let us consider what protects a word-initial 'h' against deletion. In fact, word-initial position enjoys a special status across languages. McCarthy & Prince (1993: 48) claim that no epenthesis of any kind ever occurs at the beginning of words because of a constraint ALIGN-L:

(16) ALIGN-L (McCarthy & Prince 1993: 48)
: $[_{Stem}$ = $[_{PrWd}$

The constraint demands that stem and prosodic word begin together. If epenthesis occurs in word-initial position, prosodic word and stem are mis-ALIGNed (e.g., $[_{Stem}$ ❑ $[_{PrWd}$, where ❑ is an epenthetic element). Therefore, it correctly rules out all initial epenthesis.

I propose that the lack of deletion in word-initial onset position results from a similar alignment constraint, as shown below:

(17) ALIGN-LEFT (stem, σ)
: Every stem begins with a syllable (i.e., $[_{stem}$ = $[_{σ}$).

In the case of the 'h' in word-inital position in (10), it is clear that ALIGN-LEFT (stem, σ) dominates ONSET(PL) to ensure the appearance of 'h' stem-initially:

(18) ALIGN-LEFT (stem, σ), ALIGN-L(laryngeal node, σ) >> ONSET(PL)

Let us now consider how the constraints are supposed to work. The important candidates generated from /hajah + ta/ are contrasted below:

(19) Input: /hajah + ta/   '(It's) white.'

Candidates	ALIGN-L (stem, σ)	ALIGN-L(lar.)	ONSET(PL)
☞ a. [$_{stem}$ [$_σ$ ha.ja.t^{h}a			*
b. [$_{stem}$ <h> [$_σ$ a.ja.t^{h}a	*!		

In the above tableau, (19a) succeeds on ALIGN-LEFT (stem, σ) while (19b) violates it: <h> in (19) is a syllabically unparsed segment. (19a) wins out because ALIGN-L (stem, σ) takes priority over ONSET(PL) in determining the actual output.

4. Conclusion

It is argued in this paper that the so-called 'h-irregular verbs' in Korean which have been regarded as mysterious by many of the traditional grammarians of Korean (Choy 1959; Huh 1965; Martin 1992) are in fact not anomalous. From the perspective of OT, there is no mystery here. On the contrary, the behavior of the stem-final 'h' turned out to be phonologically predictable, employing the language-specific ranking of universal constraints that is central to OT. It is shown that the description of grammar along the lines of the Correspondence Theory in the sense of McCarthy & Prince (1995) makes the grammar of Korean simpler by elimininating from it a great deal of phonological and morphological exceptions.

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[1] The term "verbs", in this chapter, includes what has traditionally been called "verbs" and "adjectives".

[2] In Korean, obstruents are unreleased in coda (p⁼), and the subsequent onset consonants undergo tensification (t').

[3] cf. Levin (1985)

[4] I argue that CODACOND is different from *COMPLEX: the former penalizes complex segments in coda position only while the latter is concerned with consonant clusters either in onset or coda. In Korean, such complex segments as [u] or [w] are allowed other than in coda position.

[5] A similar phenomenon is reported in Shimizu (1971) and also cited in Gorecka (1989: 92) that in Kpan (a Yukunoid language), a back glide surfaces as a labial after a velar, which supports the argument that the velar constriction is the more likely target of deletion than the labial constriction. (Unfortunately, the relevant data are not available.)

[6] According to Kim-Renaud (1986: 77), the optionality seems to be governed by degree of formality and/or rate of speech. In very careful pronunciation, one hears a voiceless [h] in the voiced surroundings, but in faster, more casual speech the 'h' is absent.

[7] Unfortunately, Korean does not have any prefixes to complete the paradigm to show what happens in cases like 'Prefix + hV...'.

[8] The ONSET(PL) also captures the generalization that the onset is typically a trigger of place assimilation while the coda is a target of the assimilation.

[9] The dotted line in the tableau indicates that MORPHDIS and UNIFORMITY-IO are not crucially ranked with respect to each other.

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