

An aspect of dialectal variations in Korean phonology: a constraint-based analysis*

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Chung, Chin-Wan. 2006. An aspect of dialectal variations in Korean phonology: a constraint-based analysis. *Studies in phonetics, phonology and morphology* 12.2. 377-390. This paper focuses on the different realizations of /y/ and /h/ in different dialects in Korean. We delve into /y/ when it occurs word initially, post-consonantly followed by a vowel, and as an off-glide; we observe /h/ when it appears as the onset of a word initial and non-word initial syllable. The paper reveals that a different strategy is applied to modify /ye/, /Cye/ and /iy/ in different positions of a word in different dialects. In Jeolla dialect (JD), the glide /y/ does not occur in the output while in Standard Korean (SK) it consistently appears in /ye/ and /iy/ while /Cye/ shows an optional realization. In Gyeongsang dialect (GD), the off-glide /iy/ is simplified to [y] and it is vocalized. For the word initial /h/, there is no difference in its realization among dialects but in non-initial syllable onset /h/ deletes in JD while /h/ and a preceding voiceless stop are aspirated together in both SK and GD. It shows some interesting phonological patterning among dialects. In some cases, SK patterns with JD while in other cases it patterns with GD. The paper shows that intra-dialectal and inter-dialectal realization differences can best be explained by the constraint-based account because it allows that the dialectal variation can be accounted for by ranking permutation of low ranked constraints. (Chonbuk National University)

Key words: variation, constraint, off-glide, ranking, ranking permutation

1. Introduction

More than one output form of a single input might arise when there is inter-dialectal variation and intra-dialectal variation in one language. From a phonological perspective, we may attribute the inter-dialectal variation to the different rule ordering in a rule-based approach and to the different constraint ranking between the relevant dialects in a constraint-based analysis. In this paper, we will investigate an aspect of phonological variations in Korean focusing on the glide /y/ in various positions in a word and the realization of /h/ in different word positions when it occurs at the onset. The status of the glide /y/ has been a controversial issue in Korean phonology because of its dual patterning in phonological processes. In this paper, however, we will adopt the traditional notion in Korean phonology which dubs the glides /y/ and /w/ semivowels. Combining the previous analyses on the status of glides either as a part of the onset (Ahn 1985; Lee 1994) or a part of the nucleus (Kim 1986; Sohn 1987; Kim 1991), we will

* I am really thankful for anonymous reviewers for their insightful comments and suggestions. Any remaining errors are my own responsibility.

assume that the glide /y/ has a dual aspect depending on where it appears in a word: we regard it as a part of the onset occurring word initially while it is considered to be a part of the nucleus occurring after a consonant. Based on this assumption, we will look at diverse realizations of the glide /y/ and the consonant /h/, and provide a constraint-based analysis for such variations in order to show that dialectal variation can best be accounted for by a constraint-based approach in comparison with the rule-based analysis. We will compare Standard Korean (SK) to Gyeongsang Dialect (GD) and Jeolla Dialect (JD) in explaining the realization of /y/ and /h/. Depending on the position where a segment occurs, there is an interesting pattern emerging from the dialects. It implies an intriguing fact about positional faithfulness (Beckman 1997, 2004) in that in GD and JD the off-glide /y/ does not preserve its status as a glide by either dropping or changing into a vowel in the word initial position. Since this is the case, we try to shed light on the patterns of dialectal variations in this paper.

The organization of this paper is as follows. Section two introduces the data for the study and section three is about an analysis of the data in addition to the relevant constraints and their ranking relation. Section four summarizes the study with some implications of the paper.

2. Data and description

In this section we introduce the data for the paper, which begins with the variation occurring within SK with respect to /y/. When /y/ appears after a consonant and is followed by a vowel, we have two different realizations of such input: /y/ realizes in the output resulting in [CyV] or /y/ does not occur in the output as in [CV], which is a case of intra-dialectal variation. The position of such a configuration does not play any role in the realization of /y/ as can be seen in the following examples.

(1) The realization of /y/ in /CyV/ in SK

a. /kyecip/	[kyecip] [kecip]	'a girl'
b. /ʃikye/	[ʃikye] [ʃike]	'the visual range'
c. /myepyəl/	[myepyəl] [mepyəl]	'a sad separation'
d. /hyet ^h æk/	[hyet ^h æk] [het ^h æk]	'benefit'
e. /yənkye/	[yənkye] [yənke]	'connection'
f. /kæp ^h ye/	[kæp ^h ye] [kæp ^h e]	'opening and shutting'
g. /cihye/	[cihye] [cihe]	'wisdom'

When /y/ occurs word-initially, it is fully realized in the output in SK. Interestingly the data given in (2) does not pattern with the examples in (1) in the realization of /y/. This shows the status difference of /y/ in (1) and (2). In the former, /y/ is optionally deleted after a consonant regardless of its location in the word, while /y/ in the word initial position faithfully preserves its phonetic value in the output as shown in (2). The patterning of /y/ in (1)

and (2) is very similar to an interesting status of on-glide in English (Lee 1993; Davis and Hammond 1995). The faithful appearance of the word initial /y/ in the output of SK does not hold in JD where the word initial /y/ does not appear in the output as represented by the data in (2). Thus, we can assume based on the data that the (C)ye sequence is highly prohibited in JD while /y/ in some other sequences such as (C)yu in [kyuyul] ‘rules’ and [yuri] ‘glass’ or (C)yə in [kyəul] ‘winter’ and [yərim] ‘summer’ faithfully appear in the output forms. So SK and JD pattern together in terms of the realization of the [Cye] sequence but JD diverges from SK in pronouncing the [ye] sequence, which is an example of inter-dialectal variation.

(2) The realization of /y/ in the word initial position in SK

- | | | |
|------------|-----------------|--------------|
| a. /yecəl/ | [yecəl] *[ecəl] | ‘courtesy’ |
| b. /yesul/ | [yesul] *[esul] | ‘art’ |
| c. /ye/ | [ye] *[e] | ‘an example’ |
| d. /yecən/ | [yecən] *[ecən] | ‘old days’ |

The realization of /y/ in the word initial position in JD

- | | | |
|------------|-----------------|--------------|
| a. /yecəl/ | [ecəl] *[yecəl] | ‘courtesy’ |
| b. /yesul/ | [esul] *[yesul] | ‘art’ |
| c. /ye/ | [e] *[ye] | ‘an example’ |
| d. /yecən/ | [ecən] *[yecən] | ‘old days’ |

There is also an instance of intra-dialectal variation in SK in the output forms when [iy] is preceded by a consonant in the input. On the one hand, the off-glide is fully pronounced as shown by the first output forms of the data in (3). On the other hand, the first part of the diphthong deletes and the off-glide /y/ converts into [i] playing the nucleus role in the output. When [iy] occurs word-initially, it is fully realized in the output as illustrated by the examples in (3g) and (3h).

(3) The realizations of an off-glide /iy/ in SK

- | | | |
|-------------|--------------------|----------------|
| a. /muniy/ | [muniy] [muni] | ‘a pattern’ |
| b. /s’iyə/ | [s’iyə] [s’iə] | ‘putting on’ |
| c. /hiyman/ | [hiyman] [himan] | ‘hope’ |
| d. /cuiy/ | [cuiy] [cui] | ‘notice’ |
| e. /hyəpiy/ | [hyəpiy] [hyəpi] | ‘conference’ |
| f. /kaŋiy/ | [kaŋiy] [kaŋi] | ‘a lecture’ |
| g. /iysa/ | [iysa] *[isa] | ‘a doctor’ |
| h. /iyiy/ | [iyiy] [iyi] *[ii] | ‘significance’ |

In addition to intra-dialectal variation concerning the realization of [iy] in SK, there is also an inter-dialectal variation between GD and JD with respect to the pronunciation of [iy]. Unlike SK, in both dialects there are no articulation differences between the word initial [iy] and [iy] in the other positions in a

word whether it is preceded by a consonant or not. In word initial and the other positions, the input /iy/ is realized as [i] and the input /Ciy/ is realized as [Ci] in GD as presented in (4). The common fact between SK and GD is that GD patterns with SK in the vocalization of the off-glide /y/ after the deletion of /i/ in the non-word initial position. The difference between SK and GD is that the word initial /iy/ is realized as [i] only in GD but in SK it is pronounced as [iy] such as /iysa/ → [iysa] ‘a doctor.’ In JD, however, [iy] or [Ciy] in all positions in a word is realized as [i] or [Ci], which is different from both SK and GD as shown in the outputs of (4).

(4) The realizations of off-glide in GD and JD

Input	GD	JD	Gloss
a. /cuiy/	[cui]	[cui]	‘notice’
b. /hyəpiy/	[hyəpi]	[hyəpi]	‘conference’
c. /kaŋiy/	[kaŋi]	[kaŋi]	‘a lecture’
d. /iysa/	[isa]	[isa]	‘a doctor’
e. /iyiy/	[ii]	[ii]	‘significance’

In Korean phonology, /h/ can occur only in a syllable onset position but it cannot appear in syllable coda because of the coda condition, which stipulates that only 7 consonants are allowed in the syllable coda (Kim- Renaud 1974). The position where /h/ can appear is further limited to the word initial onset position as shown in (5f) and (5g) in which /h/ maintains its phonetic value in the output. When /h/ appears in the non-word initial onset position and is preceded by an obstruent stop, the obstruent and /h/ form an aspirated obstruent stop as shown in (5a)-(5e) in SK. In the same environment of JD, /h/ deletes and a preceding obstruent is resyllabified filling the onset position previously occupied by /h/ before its deletion in the output. If /h/ the in non-initial syllable position follows a sonorant in casual speech, /h/ is usually not pronounced in the output as shown in (5h), (5i), and (5j) in both SK and JD. Thus, the two dialects show variation concerning the realization of the non-initial syllable /h/ only when it is preceded by an obstruent.

(5) The realization of /h/ in SK and JD

Input	SK	JD	Gloss
a. /yukhaknyən/	[yuk ^h aknyən]	[yukaknyən]	‘a six grader’
b. /pəphak/	[pəp ^h ak]	[pəpak]	‘law’
c. /saphwa/	[sap ^h wa]	[sapwa]	‘an illustration’
d. /səpsəphan/	[səps ^h əp ^h an]	[səpsəpan]	‘missed’
e. /c ^h imc ^h akhan/	[c ^h imc ^h ak ^h an]	[c ^h imc ^h akan]	‘calm’
f. /hayan/	[hayan]	[hayan]	‘white’
	*[ayan]	*[ayan]	
g. /hyəŋ/	[hyəŋ] *[yəŋ]	[hyəŋ] *[yəŋ]	‘a brother’

h. /pulhyo/	[pulyo]	[pulyo]	‘unfilial’
i. /samhaknyən/	[samaŋnyən]	[samaŋnyən]	‘athird grader’
j. /hyohəm/	[hyoəm]	[hyoəm]	‘efficacy’

As we explained in this section, the Korean language shows various types of variations in inter-dialect and intra-dialect. Such variations normally do not occur in the word initial position but they occur in non-initial positions in a word. With respect to /y/ and off-glide /y/ in the word initial position, however, GD and JD deviate from SK by not preserving them in the output, which is different from the realization of the consonant /h/.

In the next section, we will provide an analysis for the data presented in this section based on the Optimality Theory (Prince and Smolensky 1993, 2004) and Correspondence Theory (McCarthy and Prince 1995) and try to show how variation in one language between inter-dialectal and intra-dialectal variations can be explained in the constraint-based approach.

3. Analysis

We will first present the constraints which we will apply for the analysis of /y/ and explain their interaction for the analysis. The constraints are given in (6).

- (6) Constraints for the realization of /y/ followed by /e/
- Max-V(owel): Marked vowels have correspondents between the input and the output.
 - Max-G(lide): Glides in the input have their correspondents in the output.
 - *Com(plex)-Nuc(leus): A complex nucleus is not allowed.
 - *Onset-G(lide): The palatal glide is not a preferred onset.

Max-Vowel is ranked the highest in the analysis because in the output the integral part of the syllable is usually preserved in the output except for /i/. This constraint ranks high because the vowels, except for /i/ usually appear in the output. Max-Glide and *Com-Nuc are ranked differently for each realization of /Cye/ in that Max-G outranks *Com-Nuc in one articulation and the other realization the latter should be ranked higher than the former. The *Onset-G constraint does not show any particular ranking with either *Com-Nuc or Max-G for the /Cye/ sequence. But if /y/ appears as the onset of the word initial syllable, Max-G should be ranked higher than *Onset-G in SK because the word initial /y/ should be realized in this dialect. On the other hand, *Onset-Glide should outrank Max-G because the glide is not the preferred onset segment in the word initial position of JD. We first present the tableau about the realization of /Cye/ in SK.

(7) /cihye/ → [cihye] ‘wisdom’

/cihye/	Max-V	Max-G	*Onset-G	*Com-Nuc
☞ a. cihye				*
b. cihe		*		
c. cihy	*!			

The crucial ranking in (7) is the Max-V constraints over Max-G and *Com-Nuc because Max-V requires the vowels except for /i/ appear in the output. Candidate (a) is the optimal form because it violates the lowest ranking constraint in the tableau. Candidate (b) is not the best form since the glide does not have its correspondent in the output, which is penalized by Max-G once. Candidate (c) resolves the complex nucleus by deleting the vowel only to fail to become the optimal candidate due to the undesirable violation of the highest ranking Max-V constraint.

The other output [cihe] of SK can be explained if we change the ranking between Max-G and *Com-Nuc. The new ranking evaluates a candidate with a simple nucleus better than a candidate with a complex nucleus, which is represented by the following tableau.

(8) /cihye/ → [cihe] ‘wisdom’

/cihye/	Max-V	*Com-Nuc	*Onset-G	Max-G
a. cihye		*!		
☞ b. cihe				*
c. cihy	*!			

As to word initial /y/, following the previous assumption by Ahn (1985) and Lee (1994) we regard it as the onset of the syllable in this paper. Because the word initial /y/ is faithfully realized in the output of SK, Max-G must outrank *Onset-G. *Com-Nuc does not show any ranking with either Max-G or *Onset-G but in this tableau we position it along with the higher ranked constraint as displayed in (9). The different realization of the word initial /y/ in JD is analyzed by re-ranking the constraints between Max-G and *Onset-G as shown in (10).

(9) SK: /yecəl/ → [yecəl] ‘courtesy’

/yecəl/	Max-V	Max-G	*Com-Nuc	*Onset-G
☞ a. yecəl				*
b. ecəl		*!		

(10) JD: /yecəl/ → [ecəl] ‘courtesy’

/yecəl/	Max-V	*Com-Nuc	*Onset-G	Max-G
a. yecəl			*!	
☞ b. ecəl				*

In JD the privileged status of realizing the word initial segment does not hold because the glide /y/ acting as the onset of the word initial syllable is not pronounced in the output, which is accounted for by permuting the

ranking between Max-G and *Onset-G. Concerning the articulation of /Cy/ in intra-dialectal and inter-dialectal variation, we argue that such variations are explained by re-ranking the pertinent constraints. The constraint rankings of variation in intra-dialect and inter-dialect are summarized in (11) and (12).

- (11) The constraint ranking for the articulation of /Cy/ in SK: A case of intra-dialectal variation
- a. Max-V >> Max-G, *Onset-G >> *Com-Nuc → [CyV]
 - b. Max-V >> *Onset-G, *Com-Nuc >> Max-G → [Ce]
- (12) The constraint ranking for the realization of word initial /y/: A case of inter-dialectal variation
- a. SK: Max-V >> Max-G, *Com-Nuc >> *Onset-G → [yV]
 - b. JD: Max-V >> *Com-Nuc, *Onset-G >> Max-G → [V]

To analyze the articulation of /iy/, we adopt the same constraints given in (6) and we introduce four new constraints. The Vocalization constraint, a type of I→O markedness constraint, requires the glide /y/ to become [i] in the output when it should play a nucleus role in the syllable in the case when the vowel preceding it is deleted. This constraint is not ranked high because the conversion of /y/ to [i] is only valid if /y/ is not preceded by a vowel /i/. The Max-[i] constraint demands that the unmarked vowel [i] have the correspondent in the output. This constraint should be ranked lower than Max-V in that the unmarked vowel is normally the target of deletion in Korean phonology. The Faith-σ1 constraint is a type of faithfulness constraint that demands that all the segments in the initial syllable of a word should appear in the output. It normally ranks high in the Korean language but concerning the glide and similar structures in this analysis the constraint is not highly ranked. Constraints from (a) to (d) repeated from (6) and the new constraints are given in (13).

- (13) The constraints for the realization of /iy/
- a. Max-V(owel): Marked vowels have correspondents between the input and the output.
 - b. Max-G(lide): Glides in the input have their correspondents in the output.
 - c. *Com(plex)-Nuc(leus): A complex nucleus is not allowed.
 - d. *Onset-G(lide): The palatal glide is not a preferred onset.
 - e. Vocalization of /y/: Glide /y/ changes to [i] in the output.
 - f. Syllable-Integrity: Input syllables should be preserved in the output.
 - g. Max-[i]: /i/ has its correspondent in the output.
 - h. Faith-σ1: Segments in the initial syllable should be faithfully realized in the output.

The constraint interaction and their optimal candidate selection processes are displayed in the following tableau when /iy/ appears in the non-word initial syllable position. We first present the one articulation of /iy/ in SK. In the tableau, the highest ranked Syll-Intg constraint is not included.

(14) /muniy/ → [muniy] ‘a pattern’

/muniy/	Max-V	Max-[i]	Max-G	Faith-σ1	*Com-N	Vocal
☞ a. muniy					*	*
b. muni		*!				
c. muni			*!			

In SK, the /iy/ sequence is fully realized in the output as candidate (a) shows. The optimal form (a) violates the *Complex-Nuc and Vocalization, which are ranked low in the tableau. Candidate (b) is not the best form because it violates Max-[i], which the optimal form (a) satisfies. Candidate (c) is also not the optimal form because it incurs the violation of Max-G, which the optimal form (a) satisfies. The other realization of /iy/ in SK can be accounted for if we re-arrange the ranking between Max-[i] and *Com-N as shown by the following tableau.

(15) /muniy/ → [muni] ‘a pattern’

/muniy/	Max-V	Max-G	Faith-σ1	*Com-Nuc	Max-[i]	Vocal
a. muniy				*!		*
☞ b. muni					*	
c. muni		*!				

Next we show the variation in articulation of /iy/ between GD and JD. Both GD and JD deviate from SK in the realization of /iy/ word initially but only JD digresses from SK and GD in the pronunciation of /iy/ in the non-word initial position. We consider SK first by representing an example that has two /iy/ sequences in which *Com-Nuc and Faith-σ1 play an important role when /iy/ occurs word initially.

(16) GD: /iyiy/ → [ii] ‘significance’

/iyiy/	Max-V	*Com-N	Max-G	Faith-σ1	Max-[i]	Vocal
a. iyiy		*!*				**
b. iyi		*!			*	*
☞ c. ii				*	**	
d. ii			*!*	*		

Candidates (a) and (b) are not optimal outputs since they violate *Com-Nuc twice and once respectively. The violation of the constraint is crucial because the complex nucleus is not preferred in GD. Candidate (d) is also sub-optimal because of its violation of Max-G. It violates the constraint

because the input glides do not have their correspondents in the output. On the other hand, candidate (c) satisfies both *Com-Nuc and Max-G. It satisfies *Com-Nuc by deleting the vowel which is also accompanied by the conversion of /y/ to [i] in the output in order to maintain the syllables of the input. Even though the glide converts to the vowel, the output has correspondents of the input glides satisfying Max-G.

The different realization of /iy/ in JD can be explained by re-raking Max-G and Max-[i] of the constraint ranking in GD. In JD, because of the rather high ranking Max-[i] in comparison with the ranking in GD, the input /iy/ is realized as [ii], which is illustrated by the following tableau (17).

(17) JD: /iy/ → [ii] ‘significance’

/iy/	Max-V	*Com-N	Max-[i]	Faith-σ1	Max-G	Vocal
a. iyiy		*!*				**
b. iyi		*!	*!			*
c. ii			*!*	*		
d. ii				*	**	

In explaining the variation of the word initial /iy/ in GD and JD, faith-σ1 is ranked lower than *Com-Nuc and Max-G but in GD and SK for the realization of non-word initial /iy/, faith-σ1 does not show particular ranking with *Com-Nuc and Max-G. This follows from intra-dialectal and inter-dialectal variation in Korean. This also shows an interesting pattern in dialects of Korea in which SK and GD pattern together concerning the realization of non-word initial /iy/ compared to JD while both GD and JD depart from SK in their articulation of /iy/ word initially as well as the variation between GD and JD in the same environment. The constraint rankings with respect to the articulation of /iy/ are summarized in (18).

(18) Constraint rankings as to the realization of /iy/ in the non-word initial syllable

- a. SK: intra-dialectal variation of /iy/
 - Sylla-Intg, Max-V >> Max-[i], Max-G, Faith-σ1 >> *Com-Nuc, Vocal → [iy]
 - Sylla-Intg, Max-V >> *Com-Nuc, Max-G, Faith-σ1 >> Max-[i], Vocal → [i]
- b. GD: the same pattern with SK concerning /iy/ in the non-word initial syllable
 - Sylla-Intg, Max-V >> *Com-Nuc, Max-G, Faith-σ1 >> Max-[i], Vocal → [i]
- c. JD: deviation from both SK and GD
 - Sylla-Intg, Max-V >> Max-[i], Max-G, Faith-σ1 >> *Com-Nuc, Vocal → [i]

- (19) Constraint rankings for the realization of /iy/ in the word initial syllable.
- SK: Sylla-Intg, Max-V >> Max-[i], Max-G, Faith-σ1 >> *Com-Nuc, Vocal →[iy]
 - GD: Sylla-Intg, Max-V >> *Com-Nuc, Max-G >> Faith-σ1, Max-[i], Vocal →[i]
 - JD: Sylla-Intg, Max-V >> Max-[i], *Com-Nuc >> Faith-σ1, Max-G, Vocal →[i]

Now we discuss the variation in the realization of /h/ in the the non-word initial position between SK and JD. In the word initial position, /h/ is faithfully realized in the output in both dialects but they show different articulation in which /h/ occurs in the non-initial position of a word as can be seen in the examples of (5). Some of the data in (5) is repeated in (20).

- (20) The pronunciation of /h/

Input	SK	JD	Gloss
a. /pəphak/	[pəp ^h ak]	[pəpak]	'law'
b. /saphwa/	[sap ^h wa]	[sapwa]	'an illustration'
c. /hayan/	[hayan]	[hayan]	'white'
	*[ayan]	*[ayan]	
d. /pulhyo/	[pulyo]	[pulyo]	'unfilial'
e. /hyohəm/	[hyoəm]	[hyoəm]	'efficacy'

In order to explain this, we introduce five constraints. Some other constraints should be included to explain the output forms such as Syllable contact (Davis 1998) and Tensification (Sohn 2001) but to focus on the articulation of /h/ and its variation, we employ only four constraints. Max-h is a faithfulness constraint that requires that /h/ in the input be realized in the output while more specific Faith-h/σ1 demands that /h/ in the word initial syllable appear in the output. In OT, the more specific constraint should be ranked higher than the more general constraint by Pāṇini's Theorem (Prince and Smolensky 1993, 2004) such that Faith-h/σ1 should be ranked higher than Max-h. Aspiration requests that an obstruent stop and following /h/ form an aspirated consonant. This constraint is ranked high in Korean phonology and it does not show any specific ranking with the high ranking Faith-h/σ1. Uniformity (Kager 1999) calls for a ban on one to multiple correspondence relations holding between the output and the input such that aspiration process violates this constraint since the aspirated consonant has two correspondents in the input: an obstruent stop and /h/. *ShV bans [h] between a sonorant and a vowel, which is ranked high and does not show any particular ranking with Aspiration and Faith-h/σ1. The constraints are given in (21).

- (21) Constraints for the articulation of /h/
- a. Max-h: The input /h/ should have its correspondent in the output.
 - b. Faith-/h/σ1: The initial /h/ should be faithfully realized in the output.
 - c. Aspiration: An obstruent stop and following /h/ form an aspirated consonant.
 - d. Uniformity: No element of the output has multiple correspondents in the input.
 - e. *ShV: [h] between a sonorant and vowel is not allowed.

We present the ranking relation between Faith-/h/σ1 and Max-h in the following tableau with an example that has /h/ at the onset in the word initial and word final syllable.

(22) /hyohəm/ → [hyoəm] ‘efficacy’

/hyohəm/	Faith-/h/σ1	*ShV	Max-h
a. hyohəm		*!	
☞ b. hyoəm			*
c. yoəm	*!		**
d. yohəm		*!	*

Candidates (a), (c), and (d) are all sub-optimal since they violate high ranking *ShV, Faith-/h/σ1, and *ShV constraint respectively while candidate (b) only violates the low ranking Max-h by not parsing the medial [h]. Thus, candidate (b) emerges as the optimal form. Now we discuss the articulation of the data which have an obstruent stop and an /h/ over a syllable boundary, which is displayed by the following tableau.

(23) SK: /pəphak/ → [pəp^hak] ‘law’

/pəphak/	Faith- /h/σ1	Asp	*ShV	Max-h	Uniform
a. pəphak		*!			
☞ b. pəp ^h ak					*
c. pəpak				*!	

Candidates (a) and (c) are not the optimal forms because they incur the violation of Aspiration and Max-h each. Candidate (b) violates the low ranking Uniform, which is not a crucial violation. Thus, candidate (b) is selected as the best form in the tableau above. The variation of /h/ in JD in which [h] is deleted rather than forms an aspirated consonant with the preceding obstruent stop, can be accounted for by re-ranking Max-h and Uniform. This is illustrated by the following tableau.

(24) JD: /pəphak/ → [pəpak] ‘law’

/pəphak/	Faith-/h/σ1	Asp	*ShV	Uniform	Max-h
a. pəphak		*!			
b. pəp ^h ak				*!	
c. pəpak					*

The ranking Uniform over Max-h can now select candidate (c) as the optimal form. The constraint rankings that explain the variation of /h/ are given in (25).

(25) Constraint rankings for the realization of /h/

- a. SK: Faith-/h/σ1, Aspiration, *ShV >> Max-h >> Uniform → [C^h]
- b. JD: Faith-/h/σ1, Aspiration, *ShV >> Uniform >> Max-h → [h] deletion

In the next section, we conclude the paper with some implications along with the brief comparison between the rule-based account and the constraint-based analysis.

4. Conclusion

In this paper, we investigated various types of variations that occur in Korean phonology. We closely looked at the realization of [Cye], word initial [ye], word initial [iy], non-word initial [iy], and word initial [h] and word medial [h]. We showed that intra-dialectal and inter-dialectal variations follow from the permutation of relevant low ranking constraints as the summarized constraints given in (11) and (12) for [Cye], (18) and (19) for [iy], and (25) for [h].

The paper reveals that the privileged status of the word initial position (Beckman 1997, 2004) represented by Faith-σ1 should be decomposed depending on the segment that occurs in that position. This is because the structures involving the palatal glide such as [ye] and [iy] behave differently from the structure where the word initial segment is a consonant such as [h] and other consonants in Korean phonology. This is another piece of evidence that the glide /y/ has the quality of both consonant and vowel even though we regard it as the onset of the syllable word initially. Concerning the explanatory power of OT against rule based approach, we argue that OT better fits in with analyzing the variation. In order to explain /iy/ → [i] in GD and /iy/ → [i] in JD by employing rule-based account, we need at least three rules such as /i/-deletion, /y/ → [i] conversion, and /y/-deletion. Furthermore we need to decide the proper order of them, which should be different between GD and JD. However, the problem is that the rules themselves do not have functional unity among them. For example, the rule-based analysis fails in explaining why /y/ should convert to [i] after /i/-deletion in GD. On the other hand, in the Optimality Theory constraints are considered universal and one language is composed of

different ranking of such constraints. It can be deduced from this that the variation occurring in one language can be explained by ranking permutation of low ranked constraints, which is permitted in the Optimality Theory. Thus, the constraint-based account provides us with a better tool to account for phonological variation in one language.

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received: August 2, 2006
accepted: September 8, 2006