Glide Formation and Compensatory Lengthening within Sympathy Theory*

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Kang, Hyunsook. 1998. Glide Formation and Compensatory Lengthening within Sympathy Theory. *Studies in Phonetics, Phonology and Morphology* 4, 69-87. In this paper, I analyze the vowel hiatus resolutions, namely, vowel deletion and glide formation in Korean within Sympathy Theory (McCarthy 1997). Two kinds of vowel hiatus resolutions are discussed; obligatory and optional. I will show that obligatory vowel hiatus resolution takes place in the input-to-output correspondence and optional one in the output-to-output correspondence. **(Hanyang University)**

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1. Introduction

It has long been recognized that vowel hiatus is resolved in several ways in Korean. I argue that these vowel hiatus resolutions can be generalized into two kinds. One is obligatory which either deletes a vowel or derives a glide out of it, thus resolving a VV or VVV sequence. Speakers with vowel length distinction feel that the surviving vowel does not become long by this process.

The second case of vowel hiatus resolution which also deletes a vowel or changes a vowel into a glide takes place optionally. Speakers with vowel length distinction feel that the surviving vowel becomes long by this process. The author does not feel vowel length distinction clearly. Therefore, the following data are not marked with vowel length. Some data, however, are marked with vowel length when it becomes necessary.

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2. Obligatory Resolution of Vowel Hiatus

In this section, I will discuss obligatory vowel hiatus resolution in Korean within Optimality Theory (McCarthy & Prince 1995).

First, if a base with an [a, ə]-final is adjoined with a suffix with an [A]-initial[1], there is an obligatory vowel deletion as (1a) shows. If [ɨ] is adjoined with another vowel across a morpheme boundary as in (1b, c), there is [ɨ] deletion. If other vowels abut across a morpheme boundary, no deletion takes place as in (1d).

(1)	a. ka + A	[ka]	*[kaA]	'to go'
	b. ka + ɨni	[kani]	*[kaɨni]	'to go'
	c. kkɨ + A	[kkA]	*[kkɨA]	'to turn off'
	d. tu + A[2]	*[tu] *[tA]	[tuA]	'to put'

Second, obligatory glide formation occurs if a base ending with [i,u,o] is added with an /A/-initial suffix (cf. Han 1990, Lee 1994, 1997). Note that for the obligatory glide formation to occur, the stem final vowel [i,u,o] should not be preceded by a consonant as in (2). Compare forms in (2) with that in (1d).

(2) V{u, i} + A

a. seu + A	[sewA]	*[seuA]	'to raise'
b. meu + A	[mewA]	*[meuA]	'to fill up'
c. moi + A	[moyA]	*[moiA]	'to gather together'
d. o + A	[wA]	*[oA]	'come'

Let us first discuss how vowel hiatus in (1) is resolved within the Optimality Theory. Several constraints are relevant here. First, we suggest that the OCP dominates Max(a). In addition, No-Long-Vowel in (3) should dominate Max(μ). In fact, NLV is undominated for speakers

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1 [A] surfaces either as [a] or [ə] depending on the preceding vowel quality.

2 /tu+A/ also surfaces as [twA(:)]. This surface form will be discussed in Section 4.

with no vowel length distinction. The partial constraint ranking in (4) will insure that the surviving vowel does not become long.

(3) No-Long-Vowel (NLV):
No long vowel is allowed.

(4) /ka + A/ ---> [ka]
Constraint Ranking: OCP>>Max(a)
NLV>>Max(μ)

μ μ ka + A	NLV	OCP	Max(a,u,i)	Max(μ)
μμ a) .ka.	*!		*	
μ μ b) .ka.A.		*!		
μ ☞c) .ka.			*	*

(4a) violates NLV and (4b) the OCP. (4c) is chosen as optimal since it violates the least fatal constraint, namely, Max(μ).

For /i/ deletion in (1b, c), I suggest the constraint tableau in (5) in which Max(a), NLV and Onset dominates Max(i).

(5) /ka+ ini/ ---> /ka + ni/

μ μ μ ka + ini	NLV	Max(a,u,i)	Onset	Max(i)
μμ μ a) .ka:. ni	*!			*
μ μ μ b) .ka.i.ni.			*!	
μ μ ☞c) .ka.ni.				*
μ μ d) .ki.ni.		*!		

(5a) violates NLV, (5b) Onset and (5d) Max(a) whereas (5c) violates the least fatal Max(i). Therefore, (5c) is the most optimal form[3].

[3] At this point, one might wonder whether Onset can replace the OCP in (4).

Now, let us discuss how the vowel hiatus in (2) is resolved in which a stem ending with /i,u,o/ is added with an /A/-initial suffix. Note that a /(V,##)V+V/ sequence is changed into /(V,##)G+V/ where the stem ending vowel is realized as a glide. The surviving vowel(s) never become(s) long. The constraint ranking we motivated above explains how the optimal form is chosen.

(6) /seuA/--->[sewA]

μμ μ seu+A	NLV	Max(a,u,i)	Onset	Max(μ)
μ μμ a) .se.wA:.	*!			
μ μ ☞b) .se.wA.				*
μ μ μ c) .se.u.A.			*!*	
μμ μ d) .se:.wA	*!			

(6a, d) violate NLV and (6c) violates Onset whereas (6b) violates the least fatal Max(μ). Therefore, /sewA/ is the most optimal form.

As was noted earlier, however, there are speakers who distinguish the vowel length. According to Kim-Renaud (1986), these speakers distinguish the vowel length only in the initial syllable of a word. However, even these speakers do not feel a long vowel for forms in (2).

To explain why speakers with vowel length distinction also feel a short vowel for forms in (2), we suggest the following constraints for these speakers; first, we suggest Ident(WT) in (7) which says that the moraic weight of a segment in the input should be identical to that of the output. Secondly, we adopt the constraint Align-$\sigma_{\mu\mu}$ (8) Lee (1997) suggested. This constraint will insure that a heavy syllable only appears at the initial syllable of a prosodic word. For speakers with vowel length distinction, Align-$\sigma_{\mu\mu}$ is undominated.

This is not possible, however. In section 3, I will show that Onset should be dominated by Max(a) when we examine some more data. Therefore, it cannot replace the OCP which dominates Max(a). Refer to note (6).

(7) Ident(WT): The moraic weight of a segment in the input should be identical to that of the output.

(8) Heavy syllable in initial position
Align($\sigma_{\mu\mu}$, L, PrWd, L)(Align-$\sigma_{\mu\mu}$)
Heavy syllables are in the initial position of a prosodic word.

(9)[4]

$\mu\mu$ μ seu+A	Align-$\sigma_{\mu\mu}$	Max(a,u,i)	Onset	WT-ident	Max(μ)
μ $\mu\mu$ a) .se.wA:.	*!	*		**(w,A:)	
μ μ ☞b) .se.wA.				*(w)	*
μ μ μ c) .se.u.A.			*!*		
$\mu\mu$ μ d) .se:.wA				**!(e:,w)	

(9a) violates Align-$\sigma_{\mu\mu}$ and (9d) violates Ident(WT) twice; one by [e:] and another by [w]. (9c) violates Onset which dominates Ident(WT). Therefore, (9b) is optimal since it violates the least fatal Ident(WT) only once. With the proper constraint ranking as in (9), we can explain why a short vowel appears for data in (2) even for speakers with vowel length distinction.

In this section, we have proposed the constraint ranking for Korean verbal forms which undergo obligatory vowel hiatus resolution.

3. Apparent Counter Examples

In this section, we will examine some surface forms with vowel sequences which were avoided by the constraint ranking suggested in section 2. First, let us consider surface /{i,u,o}+V/ sequences which do

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[4] Lee (1997) presented a similar constraint tableau for /seu+A/-->/sewA/. However, the constraint tableau (9) is somewhat different from that in Lee (1997): He did not motivate Ident(WT) and his tableau did not consider a candidate /se:wA/. It is not clear how he will rule out /se:wA/ as an optimal form. We will discuss about his suggestion in Section 4.

not undergo obligatory glide formation. Consider (10).

(10)

a. tu+A	[tuA]	'to put'
b. ki+A	[kiA]	'to crawl'
c. si+A	[siA]	'sour'

As was mentioned earlier, these forms are different from those in (2) which undergo the obligatory glide formation; Forms in (10) show /-CV+V/ sequence whereas those in (2) show /(V,##)V+V/ sequence. For forms in (10), I suggest the constraint ranking in (12) in which Max(a,i,u) and NoComplex(11) dominate Onset; it selects the correct optimal form.

(11) NoComplex: No complex onset or coda is allowed.

(12) /tu + A/ ----> [tuA]

μ μ tu+ A	Dep	Max(a,u,i)	NoComplex	Onset
μ μ ☞a) tu.A				*
μ b) .twA.			*!	
μ μ c) .tu △A	*!			
μ d) .tu		*!		

/twA/ in (12b) violates NoComplex, /tu.△A/ in (12c) Dep, and /tu/ in (12d) Max(a) whereas /tuA/ in (12a) violates Onset which is the least fatal among the relevant constraints in (12)[5].

Though forms in (10) do not undergo the obligatory glide formation, they do undergo optional glide formation, thus resulting in forms in (13).

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[5] Note that Onset is dominated by Max(a). Therefore, in order to explain /ka+A/--->[ka] in (4), the OCP, not Onset, needs to dominate Max(a).

(13)

a. tu+A	[twA(:)]	'to put'
b. ki+A	[kyA(:)]	'to crawl'
c. si+A	[syA(:)]	'sour'

Lee (1997) argues that the optional forms in (10) and (13) can be explained if NoComplex and Onset are unranked to each other. Lee argues that if NoComplex dominates Onset, [tuA] will be optimal as in (12) whereas if Onset dominates NoComplex, [twA(:)] will be chosen as optimal. We will discuss about his proposal in section 4 where we point out some problems with his proposal and suggest another solution for this optionality.

There are also forms where /a+a/ and /V%i/ sequences appear on the surface as in (14) contrary to the prediction made in section 2. Note, however, these vowel sequences appear on the surface only if /A/ or /i/-initial affixes are added to stems ending with a non-surfacing /h/ or /s/. Consider (14).

(14)[6]

a. nah + A	[naA]	'to bear'
b. pu(:)s + ini	[puini]	'to pour'
c. noh+A	[noA]	'to put'
d. pu(:)s+A	[puA]	'to pour'

The surface forms in (14) also undergo optional vowel deletion or glide formation as in (15). We will discuss these optional forms in (15) in section 4 along with the forms in (13).

(15)

a. nah + A	[na(:)]	'to bear'
b. pu(:)s + ini	[pu(:)ni]	'to pour'
c. noh+A	[nwA(:)]	'to put'
d. pu(:)s+A	[pwA(:)]	'to pour'

[6] As we see in (14), the underlying vowel length does not affect the output in any interesting way.

What distinguishes forms in (14) from those in (1) which undergo the obligatory vowel deletion is that the stems in (14) end with /h/ or /s/ which does not appear on the surface if vowel initial suffixes follow. In Korean verbal morphology, /h/ can surface only at the initial position in verbal stems. In addition, /s/ in (14b) never surfaces at the onset position[7]. In order to incorporate this observation, we suggest constraints *h (16) and Align-L (17) and the constraint ranking, Align-L >> *h, which insure that only the stem initial [h] will surface.

Even if we include the constraints (16) and (17), however, the constraint ranking we have suggested earlier still can not explain why the optimal form for /nah+A/ is [naA]. Consider (18). Note that in (18) *h dominates the OCP since *h is never violated on the surface except in the initial position whereas the OCP is violated on the surface.

(16) *h: [h] cannot appear in Korean verbal morphology.

(17) Align-L (stem, prosodic stem): The left edge of a morphological stem should be aligned with that of a prosodic stem.

(18) /nah+A/ ---> [naA] *[na]

μ μ $na_1h + A_2$	Align-L	*h	OCP	Max(a)	Onset
μ μ a) .na.A.			*!		*
μ ☞*b) .na.				*	
μ μ c) .na.hA.		*!			

As is shown in (18), the correct surface form /naA/ in (18a) can never be selected as optimal since it violates the OCP and there is always a more optimal form /na/ in (18b) which violates only Max(a). This is due to the opacity. In Korean, /a+a/ sequence is avoided on the surface only if they are adjacent in the input; if /h/ or /s/ intervenes between two vowel segments in the input, the /a+a/ sequence is

[7] In this paper, we discuss about a non-surfacing [h] only. We do not formulate a constraint for a non-surfacing [s].

tolerated on the surface. However, the original optimality theory could not explain this difference.

Interestingly, in operational serialism the surface forms in (14) can be easily derived since a non-surfacing /h/ or /s/ prevents the obligatory vowel deletion rule from applying to /nah+A/ as is shown in (19).

(19) Operational Serialism

UR		/nah+a/
a --->	φ / a ___	-----
h --->	φ / V ___ V	naa
SR		[naa]

In order to explain this kind of opacity in Optimality Theory as well, McCarthy (1997) suggests that the optimal output form needs to be chosen not from the correspondence relationship with the input but from the correspondence relationship with the ♧-ed candidates which may violate some higher constraints but obey certain faithfulness constraints. Let us consider how this works out. Note that two constraint rankings in (20) are important in selecting the correct output from /nah+A/.

(20) Constraint Ranking

a. *aa(OCP) >> F(a->φ)

b. *h >> F(h->φ)

F(a->φ) and F(h->φ) in (20) are faithfulness constraints which say that '/a/ in the input needs to surface on the output' and '/h/ in the input needs to surface on the output' respectively. F(a->φ) and F(h->φ) can be replaced with Max(a) and Max(h) respectively. However, McCarthy (1997) uses this type of constraints when he refers to faithfulness constraints in his paper on Sympathy theory and therfore, in this section we will use this type of constraint following McCarthy (1997). This bears no significance for the argument.

In (21), I have shown the constraint tableau for /nah+a/ with the partial constraint ranking in which the ♧-ed candidate, /naha/ is also specified. Note that the ♧-ed candidate in (21b) is the most harmonic member of the set of candidates which obey the faithfulness constraint F(h->φ).

(21) /nah+A/

/naha/	♧F(a->φ)$_{F(h->φ)}$	*aa(OCP)	F(a->φ)$_{IO}$	*h	F(h->φ)$_{IO}$
☞a. naa		*			*
♧b. naha				*!	✓
c. na	*!				*

The sympathetic, cross-candidate faithfulness constraint ♧F(a->φ)$_{F(h->φ)}$ evaluates resemblance to ♧/naha/. /naha/ in (21b) cannot be an optimal form since it violates the undominated *h. /na/ in (21c) violates ♧F(a->φ)$_{F(h->φ)}$ since the second /a/ in ♧/naha/ has no correspondent in it. /naA/ in (21a) violates *aa; however, *aa is dominated by ♧F(a->φ)$_{F(h->φ)}$. Therefore, /naA/ is the optimal form.

In (23), we consider a constraint tableau for /nah+ini/. The relevant constraints and their ranking motivated in section 2 are given again in (22) for the ease of reference.

(22)

a. Onset >> F(i->φ)

b. *h >> F(h->φ)

(23) /nah+ini/

/nah+ini/	♧F(i->φ)$_{F(h->φ)}$	Onset	F(i->φ)$_{IO}$	*h	F(h->φ)$_{IO}$
☞a. naini		*			*
♧b. nahini				*!	✓
c. nani	*!		*		*

Among the candidates which are faithful to F(h->φ), /nahini/ in (23b) is the most optimal candidate and therefore, it is the ♧-ed candidate. The sympathetic, cross-candidate faithfulness constraint ♧F(i->φ)$_{F(h->φ)}$ evaluates resemblance to ♧/nahini/. /nahini/ in (23b) cannot be an optimal form since it violates the undominated *h. /nani/ in (21c) violates ♧$F(i->\varphi)_{F(h->\varphi)}$ since the second vowel /i/ in ♧/nahini/ has no correspondent in it. /naini/ in (23a) violates the least fatal Onset. Therefore, /naini/ is the optimal form.

Stems like /ka+a/ in (4) can be reinterpreted within the sympathy theory which allows a ♧-ed candidate. Consider (24).

(24) /ka+A/

μ μ ka_1 + A_2	♧$F(a->\varphi)_{F(h->\varphi)}$	*aa	$F(a->\varphi)_{IO}$	*h	$F(h->\varphi)_{IO}$
μ μ a) .ka.A.		*!			✓
μ ♧☞b) .ka_1.			*		✓

Among the candidates which are faithful to $F(h->\varphi)$, /ka/ is the most optimal candidate and therefore, it is the ♧-ed candidate which is the same as the output. Since the ♧-ed candidate and the output are the same, ♧$F(a->\varphi)_{F(h->\varphi)}$ has no effect.

In this section, we have considered V+V sequences on the surface which do not undergo obligatory glide formation and vowel deletion. We have motivated the following constraint ranking in (25).

(25) Constraint Ranking
a. ♧$F(a->\varphi)_{F(h->\varphi)}$ >> *aa(OCP) >> $F(a->\varphi)_{IO}$
b. ♧$F(i->\varphi)_{F(h->\varphi)}$ >> Onset >> $F(i->\varphi)_{IO}$
c. *h >> $F(h->\varphi)_{IO}$
d. *h >> *aa(OCP)

4. Optional Vowel Deletion and Glide Formation

In this section, we will consider optional vowel deletion and glide formation. In section 3, we have presented some data with /-C{i,u}+A/ sequence which show two surface forms, namely [-C{i,u}A] and [-CGA]. We also have presented data with /-CVh+{A,i}/ sequence. They surface either as [-CVV] or [-CV:] or [-CGV(:)] depending on the vowel quality of the abutting vowels. We show these examples again in (26) and (27) for ease of reference.

	A	B	
(26)	A	B	
a. nah + A	[naA]	[na(:)]	'to bear'
b. pu(:)s + ɨni	[puɨni]	[pu(:)ni]	'to pour'
(27)	A	B	
a. tu+A	[tuA]	[twA(:)]	'to put'
b. ki+A	[kiA]	[kyA(:)]	'to crawl'
c. si+A	[siA]	[syA(:)]	'sour'
d. noh+A	[noA]	[nwA(:)]	'to put'
e. pu(:)s+A	[puA]	[pwA(:)]	'to pour'

We have noted earlier that Lee (1997) suggested a constraint tableau (28) for optional forms in (27a-c). Note that Lee (1997) has analyzed the variety of Korean where long vowels are allowed.

(28)[8]

μ μ tu+ A	Align-$\sigma_{\mu\mu}$	Dep	Max(a,u,i)	NoComplex	Onset	Max(μ)
μ μ ☞a) tu.A					*	
μμ ☞b) .twA:.				*		
μ μ c) .tu△A		*!				
μ d) .tu			*!			
μ e) .twA.				*		*!

In order to explain the optionality, Lee (1997) suggested that NoComplex and Onset are unranked to each other; if NoComplex

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[8] The names of the constraints in Lee (1997) are different from those appearing in this tableau. For example, Max(a), Max(μ), Dep are named as Parse(a) and Parse(μ) and Fill, respectively in Lee (1997). However, the roles they are playing are the same.

dominates Onset, [tuA] in (28a) will be optimal whereas if Onset dominates NoComplex, [twA:] in (28b) will be chosen as optimal. With the constraint ranking in (28), however, Lee (1997) cannot explain why /o+A/ does appear as /wA/, not /wA:/. We consider a constraint tableau for /o+A/ in (29) following the constraint ranking suggested by Lee (1997).

(29) /oa/---> [wA] *[wA:]

μ μ o+A	Align-$\sigma_{\mu\mu}$	NoComplex	Onset	Max(μ)
μμ a) oa			*!*	
μμ ☞*b) wA:				
μ c) wA				*!

/oA/ violates Onset, /wA/ violates Max(μ) whereas an incorrect form /wA:/ violates no constraint in the tableau; therefore, it should be an optimal form according to Lee (1997) but is not.

In order to solve this problem, we have suggested Ident(WT) in (7) and made it dominate Max(μ) in (8). The optimal form [wA] for /o+A/ can be chosen with the constraint ranking we suggested in (9). Consider (30).

(30)

μ μ o+A	Align-$\sigma_{\mu\mu}$	NoComplex	Onset	Ident(WT)	Max(μ)
μμ a) oa			*!*		
μμ b) wA:				**!(w,A:)	
μ ☞ c) wA				*(w)	*

(30a) violates the fatal Onset. (30b) violates Ident(WT) twice; one by a non-moraic /w/ and another by a bimoraic /A:/ whereas (30c) violates Ident(WT) only once by a non-moraic /w/.

However, once we modify the constraint ranking and place Ident(WT) higher than Max(μ) as in (30), Lee's constraint tableau cannot choose the optimal form /twA:/ for /tu+A/ even though he analyzed a variety of Korean where length distinction appears. Consider (31).

(31)

μ μ tu+ A	Align-$\sigma_{\mu\mu}$	Max(a,u,i)	NoComplex	Onset	Ident(wt)	Max(μ)
μ μ ☞a) tu.A				*		
$\mu\mu$ b) twA:.			*		*!	
μ ☞*c) twA.			*			*

As is shown in (31), it chooses both [tuA] and [twA]. However, [twA] is an incorrect form in the variety of Korean Lee (1997) investigated. Therefore, we cannot adopt Lee's solution for optional forms in (26) and (27).

Now let us consider another solution for optional forms in (26) and (27). Note that forms in A in (26) show the vowel sequences, /aa/ and /V%i/, on the surface which would have been avoided if these vowel segments were concatenated without an intervening consonant in the input. The forms in A in (27) also show vowel sequences /{i,u,o}V/ on the surface which would have been avoided if the first vocalic element were not preceded by an onset or if these vocalic segments were concatenated without an intervening segment in the input.

I would like to suggest that the processes which change forms in A into forms in B in (26) and (27) are one and the same regardless of how the forms in A are derived. What distinguishes forms in A from froms in B are the formality of speech forms. Note that forms in A appear in formal speech whereas forms in B appear in casual speech.

I suggest the relationship between formal speech forms in A and the casual speech forms in B can be defined as the output-to-output (OO) correspondence since both forms appear as independent words. I also argue that the OO-correspondence between formal speech forms and casual speech forms in (26) and (27) is achieved by a morpheme, namely the 'casual speech morpheme' which manifests itself by shortening the output form when two vowels abut. This morpheme dominates OO-faithfulness constraints.

What would be the 'casual speech morpheme', then? Two suggestoins: first, $*Struc(\sigma)_{cas}$ can be the casual speech morpheme. Or Onset placed over some output-to-output faithfulness constraints can do the job as is shown in (33-34). In (33), we have considered an example of OO-correspondence between a formal speech form and a casual speech form for those who do not feel the vowel length distinction. In (34), we presented the constraint tableau for those who feel vowel length distinction.

(32) A morpheme for casual speech
  i) $*Struc(\sigma)$: The less number of syllables the output has, the better it is. OR
  ii) Onset: Onset is required.

(33) [tu.A](Formal Speech Output) ---> [twA](Casual Speech Output)

μ μ tu A	NLV	Onset	$Faith_{OO}$ $Ident(WT)_{OO}$	$Faith_{OO}$ $Max(\mu)_{OO}$
μ μ a) .tu.A.		*!		
μ ☞b) .twA.			*	*
μμ c) .twA:.	*!		*	

(33a) violates Onset and (33c) NLV. (33b), however, violates the least fatal $Faith_{O-O}$ twice: $Ident(WT)_{OO}$ since a moraic /u/ in the formal speech form does not correspond with a moraic segment in the casual speech form. In addition, another faithfulness constraint $Max(\mu)_{OO}$ is also violated: in the casual speech form /twA/, only one mora surfaces on the output even though there were two moras in the formal speech form.

(34) [tuA](Formal Speech Output) ---> [twA:](Casual Speech Output)

μ μ tu A	Align-$\sigma_{\mu\mu}$	Onset	Faith$_{OO}$ Ident(WT)$_{OO}$	Faith$_{OO}$ Max(μ)$_{OO}$	NLV
μ μ a) .tu.A.		*!			
μ b) .twA.			*	*!	
$\mu\mu$ ☞c) .twA:.			*		*

In (34), /tuA/ in (35a) violates Onset and /twA/ in (34b) faithfulness constraint twice. /twA:/ in (34c) violates faithfulness constraint only once, namely Ident(WT)$_{OO}$: a moraic /u/ in the formal speech form does not correspond with a moraic segment in the casual speech form. Therefore, it is the most optimal form.

Some other examples are given in (35-36). For these, we only considered the constraint tableau for those who do not feel the vowel length distinction.

(35) [naa] ---> [na]

$\mu\mu$ naa	NLV	Onset	Faitho-o Ident(WT)$_{OO}$	Faitho-o Max(a)$_{OO}$
$\mu\mu$ a) .naa.	*!		*	*
μ μ b) .na.a.		*!		
μ ☞c) .na.				*

/na/ in (35c) is selected as optimal since it violates the least fatal constraint. The other candidates violate more fatal constraint.

(36) [naɨni] ---> [nani]

μ μ μ na ɨ ni	NLV	Onset	Faitho-o $Max(a)_{O-O}$	Faitho-o $Max(ɨ)_{O-O}$
μμ μ a) .na:.ni.	*!			*
μμ μ b) .na.ɨ.ni.		*!		
μ μ ☞c) .na.ni.				*
μ μ d) nɨ.ni			*!	

(36a) violates NLV and (36b) violates onset. (36d) violates $Max(a)_{O-O}$ which is worse than $Max(ɨ_{O-O})$ violation in (36c). Therefore, (36c) is the optimal form.

In this section, we argued that forms A and B in (26) and (27) are in Output-to-Output correspondence relationship.

5. Conclusion

In this paper, we examined what happens when vowel sequences occur in Korean. We have shown that opacity can be dealt with once we admit the ♧-ed candidate. We have also shown that IO-correspondence and OO-correspondence are necessary to explain two kinds of vowel hiatus resolutions in Korean. McCarthy (1997) suggests that OO-correspondence may be reducible to Sympathy to a special co-candidate. It is not clear at this point whether OO-correspondence in Korean can be reducible to Sympathy to a special co-candidate. More research needs to be done on vowel hiatus resolutions in Korean.

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