Vowel Harmony in Korean and Morpheme Correspondence[1]

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1 Introduction

The two most controversial aspects of vowel harmony in Korean ideophones are its morphologically restricted nature and the harmonic feature governing these alternations. Not only is the harmony pattern restricted to the ideophone class[2], but also the value of the harmonic feature determines the meaning of the ideophone itself. While alternations from one feature to another involve relative lowering of vowels, and thus appear to be a lowering process, this is complicated by the fact that [ə] and [o] are phonetically the same height (Yang 1992), but belong to different harmonic classes. While previous analyses have acknowledged the morphological nature of vowel harmony in Korean ideophones (Ahn and Kim 1984; Cho 1994; Chung 2000; Kim-Renaud 1976; Sohn 1986), these analyses do not formally distinguish between the type of morphological harmony found in Korean ideophones, and the more common forms of phonological harmony found elsewhere. Both the harmonic feature problem and the morphological nature of Korean vowel harmony can be straightforwardly accounted for when a faithfulness-based correspondence approach is used to account for the appearance of harmony.

The analysis is presented as follows: I begin with a presentation of data on vowel harmony in Korean ideophones, followed by a summary of problems presented in previous work on Korean vowel harmony. I then present a faithfulness-based correspondence analysis of the data using morpheme-specific constraints. I also discuss the relation between the Harmony/Inventory Theorem and morphological vowel harmony, showing that a faithfulness account of vowel harmony predicts that violations of this theorem may occur in morphological harmony of the type found in Korean.

2 Data

Vowel harmony in Korean ideophones is characterized by the presence of DARK and LIGHT lexical items. Whether an ideophone is semantically DARK or LIGHT is determined entirely by the vowels that make up the particular lexical item. The semantic nature of the ideophone is intimately tied to

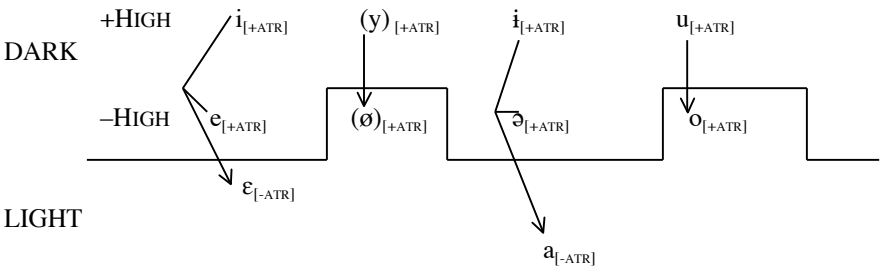
the harmonic class of vowels that make up the lexical item, and all vowels must agree in the harmonic feature value throughout the ideophone. The data below show alternations between DARK and LIGHT morphemes. The terms "dark" and "light" are used (as opposed to a more theoretically universal term) because there is no distinct natural class that can easily describe the variation of "light" and "dark" vowels. The terms LIGHT and DARK are also used because of the semantic variation found in sound symbolic words. LIGHT forms are composed of all "light" vowels and have a fast connotation, while DARK forms are composed entirely of "dark" vowels, and have a slow connotation. The class of "dark" vowels contains [i, y, ɨ, u, e, ə] and the class of "light" vowels contain [ø, o, ɛ, a]. In addition, the alternations between a DARK form of a sound symbolic word and a LIGHT form of a sound symbolic word is systematic and predictable. Korean ideophones are always fully reduplicated (e.g. [minduŋminduŋ] 'bald'). For the sake of simplification, however, this reduplication will not be marked on these forms.

(1) Alternations between Light and Dark Ideophones:

	Dark	**Light**	**Gloss**
(a)	[minduŋ]	[mɛnduŋ]	'bald'
(b)	[tˀeŋkɨəŋ]	[tˀɛŋkɨaŋ]	'clanging'
(c)	[kˀwidʒwidʒwi]	[kˀwedʒwedʒwe]	'extremely shabby'
(d)	[hɨnɨl]	[hanɨl]	'in an airy manner'
(e)	[kˀubudʒəŋ]	[kˀobudʒaŋ]	'bented'

The vowel alternations are summarized in (2) below. The arrows show the alternation from DARK to LIGHT, but the productive nature of the harmony system also allows for DARK forms to be derived from LIGHT forms.

(2) LIGHT/DARK Alternations



The diagram above shows that the alternations from "light" vowels to "dark" vowels involve both the features ATR and HIGH, but alternations never involve rounding or back features. [i] and [e] alternate with [ɛ], [u] alternates with [o], and [ɨ] alternates with [a]. Cho (1994) also notes that [y] alternates with [ø], but in many dialects surface as an alternation between [wi] and [we].

While it was noted above that alternations from DARK to LIGHT are bidirectional, there are many cases in which a particular lexical item has no DARK or LIGHT counterpart. These cases show that while vowel harmony in Korean is fully productive, and can be applied to novel forms, they are still subject to lexically-specific restrictions. Below are examples of instances in which only a DARK form or only a LIGHT form exists.

(3)

	Dark Form Only	**Gloss**
(a)	[məŋməŋ]	'barking'
(b)	[ult^{h}uŋbulduŋ]	'bumpy'

(4)

	Light Form Only	**Gloss**
(a)	[k^{ʔ}amtʃ^{ʔ}ak^{ʔ}]	'astonishing'
(b)	[agitʃagi]	'be full of interest'

The vowel harmony system in Korean is tied to the semantic nature of the ideophone. Semantic alternations crucially involve phonological alternations that affect the entire lexical item. These phonological alternations involve multiple features: ATR and height. The fact that alternations involve multiple features poses challenges for a simple, yet accurate characterization of the harmony system.

3 The Harmonic Feature Problem

As discussed above, the alternations between LIGHT and DARK forms are strict in maintaining their respective front/back feature: front vowels alternate with front vowels, central vowels alternate with central vowels and back vowels alternate with back vowels. This creates what appears to be a lowering process, which has lead many scholars to describe the harmonic feature of Korean as low (McCarthy 1983; Sohn 1986, 1987). However, the alternations described above involve changes in [ATR], height or both. For example, [i] alternates with [ɛ], a change in both height and ATR. [u] alternates with [o]– a change in height only. [ə] (a [+ATR] vowel) on the other hand, alternates with [a]– a change in [ATR] only.

If one treats the harmonic feature as low, one must acknowledge that there is only one [+LOW] vowel in Korean ([a]); all other "light" vowels are

mid. In order to use low as the harmonic feature, one would either have to force the other "light" vowels into having the feature [+LOW], or using repairing/restructuring rules to raise the derived vowels into their surface forms. The problem with the first alternative is that it arbitrarily assigns features to vowels which reflect very little on their phonetic or phonological status; there does not seem to be any evidence that [ɛ], [ø], and [o] behave like low vowels anywhere else outside of the harmonic domain. The problem with the second alternative is that there is no way to account for why non-low "light" vowels do not occur in DARK forms. For example, if [o] is [–LOW] then it should be a perfectly acceptable "dark" vowel, but [o] (and all other non-low "light" vowels) does not occur in DARK forms.

Other scholars (Chung 2000, Kim 2000) have attempted to characterize the harmony in terms of the feature ATR, considering that all [–ATR] vowels in Korean are "light" ([a] and [ɛ]). However, using ATR as the harmonic feature causes similar problems to using low as the harmonic feature. Note that round vowels in Korean are all [+ATR]. In order to explain why [o] and [ø] are "light" one must either force these vowels into having the feature [–ATR], which is as arbitrary as forcing non-low vowels to have the feature [+LOW].

Further, the phonetic status of vowels matches the phonological classification of height, as shown in (2). For example, Yang (1992) shows that [o] and [ə] have the same height despite the fact that [o] is a 'light' vowel and [ə] is a 'dark' vowel. Thus, the traditional feature system is unable to account for harmony in Korean using a single phonological feature. This may reflect either the inadequacy of the feature system, or the unusual nature of Korean vowel harmony. Rather than restructuring the traditional feature system to account for languages like Korean, this paper attempts to account for the harmonic feature problem using traditional features.

The harmonic feature problem can be solved by capturing the fact that both height and [ATR] are factors involved in the semantic alternations between LIGHT and DARK forms. This can be done if the LIGHT and the DARK morphemes are each associated with distinct floating phonological features. DARK is characterized as [+ATR], while LIGHT is characterized as both [–ATR] and [–HIGH]. While some may argue against using multiple features in order to characterize the harmony of a system, Korean is not the only language that could be analyzed in this way. For example, van der Hulst and van de Weijer (1994) argue that some languages have mixed-harmony systems that behave similarly to the Korean system. For example, they argue that Santrokofi has a mixed system involving both [ATR] and low. The alternations that occur in vowel harmony system in Manchu are quite similar to that of Korean (Ard 1983), and could possibly be analyzed in the same terms as above. Further, the morphological nature of vowel harmony in Korean ideophones affords us the opportunity to use multiple features without formal consequences.

4 A Faithfulness-Based Analysis

The proposed analysis assumes that there is no underlying default form for any lexical item during the alternations between LIGHT and DARK ideophones. The input need only be marked as DARK or LIGHT in order for the correct phonological form to be given in the output. In previous analyses (e.g. Chung 2000; Sohn 1986, 1987) DARK is assumed to be the underlying form. Reasons behind this are that the DARK form is less semantically marked, given that "slow" is often treated as a default. In addition, while it is possible to predict the corresponding "light" vowel for every "dark" vowel, it is not possible to predict "dark" vowels from "light" vowels from the data alone. For example, given an [i] in the DARK form, it is known that [ɛ] will surface in the LIGHT form. However, given an [ɛ] in a LIGHT form, it is impossible to predict simply from the data whether [i] or [e] will surface in the corresponding DARK form. Thus, it seems plausible that DARK forms could be the default form. Recall, however, that there are a large number of sound-symbolic words that have only a DARK form and no LIGHT counterpart and vice versa (Cho 1994). S. C. Moon (personal communication) also notes that speakers have poor intuitions about what forms are the default, and that social and class status often determine what speakers might choose. Given these facts, it is also plausible to assume that neither LIGHT nor DARK is underlying or default. One source of motivation for having both LIGHT and DARK forms marked in the lexicon is that the language as a whole does not have a default; words that are not ideophones do not by default behave like DARK forms. If we assume that DARK forms are the default for ideophones, extra stipulations would be required to allow the non-ideophone grammar from producing forms that do not satisfy constraints on DARK forms. Further, wug test data suggests that Korean speakers are able to make generalizations from both novel LIGHT and DARK forms. The analysis of Korean ideophones must therefore capture the knowledge that speakers have for deriving both LIGHT from DARK and DARK from LIGHT. This is less clear if only DARK is marked in the lexicon.

Another consideration for not explicitly stating DARK as a default is that under any account, one must explain why ideophones all agree in harmonic feature class. If DARK is considered the default for which LIGHT forms are derived from, one must still explain why it is that DARK forms only contain "dark" vowels. Because there are some disharmonic ideophones (Chung 2000), if DARK is considered basic, there must be some way to derive the fact that all basic forms are harmonic, yet still allow for some disharmonic ideophones. Whatever economy of representation in treating DARK as a basic form is lost in this restriction. By lexically marking both LIGHT and DARK forms, the fact that all LIGHT and DARK forms are harmonic is straightforward. The existence of disharmonic ideophones is explained because these forms cannot be lexically

marked with a floating feature. If there is no floating feature, there is no trigger for harmony.

For the reasons given above, I assume that both DARK and LIGHT are lexically marked. However, it is possible that in the case of some specific lexical items, only a default DARK form is marked, and the LIGHT form is derived (or vice versa). Because I assume that both DARK and LIGHT are lexically marked for at least one lexical item, the formal analysis will not rely on any default marking, and all ideophones are marked with the phonological features that characterize LIGHT and DARK respectively.

The formation of DARK vs. LIGHT forms is treated as a morphological process in which DARK and LIGHT are morphemes bearing floating phonological features ([+ATR] for DARK, [–ATR], [–HIGH] for LIGHT) that induce a correspondence with the vowels in the word. This is similar to the analysis by Akinlabi (1996) of morphological harmony in Kanembu. The difference here is that a faithfulness-based correspondence approach is used, rather than a markedness-based analysis with alignment constraints. The presence of a DARK or LIGHT morpheme triggers morpheme-specific correspondence constraints that restrict the occurrence of vowels in the output. These correspondences are represented both graphically and with subscripts on the harmonic feature. Correspondence with [ATR] is associated with the subscript 1, and correspondence with [HIGH] is associated with the subscript 2. These subscripts will be used throughout this paper to illustrate the established correspondence between floating input features and output representations.

(5) Correspondence Relations in DARK and LIGHT Forms:

(a) DARK:

$$\begin{array}{c} [te_1ŋgə_1ŋ] \\ \quad | \quad | \\ [+ATR]_1 \end{array}$$

(b) LIGHT:

$$\begin{array}{c} [-HIGH]_2 \\ \quad | \quad | \\ [a_{1,2}dʒ\ a_{1,2}ŋ] \\ \quad | \quad | \\ [-ATR]_1 \end{array}$$

The input to every LIGHT morpheme will contain the features [–ATR] and [–HIGH], which are mapped onto the output forms via the correspondence constraints below (which incur gradient violations) (McCarthy & Prince 1995).

(6) L-ANCHOR-IDEO-[ATR]: The [ATR] feature of an IDEO morpheme must be in correspondence with the leftmost vowel

(7) R-ANCHOR-IDEO-[ATR]: The [ATR] feature of an IDEO morpheme must be in correspondence with the rightmost vowel

(8) O-CONTIGUITY-IDEO-[ATR]: The output vowels in correspondence with [ATR] in an IDEO morpheme must form a string of contiguous vowels

(9) L-ANCHOR-IDEO-[HIGH]: The [HIGH] feature of an IDEO morpheme must be in correspondence with the leftmost vowel

(10) R-ANCHOR-IDEO-[HIGH]: The [HIGH] feature of an IDEO morpheme must be in correspondence with the rightmost vowel

(11) O-CONTIGUITY-IDEO-[HIGH]: The output vowels in correspondence with [HIGH] in an IDEO morpheme must form a string of contiguous vowels

I assume here that the correspondence between an input feature [–F] and an output segment x is made available by Gen only when x bears the feature [–F]. That is, ANCHOR is violated when the feature is not realized in any vowel in the lexical item.

It is important to note that these constraints are stratum-specific; they refer only to ideophones (as standard lexical items do not have a 'light'/ 'dark' dichotomy). Because this discussion will not venture outside the ideophonic stratum, I will no longer refer to the specific ideophone stratum in the constraints or tableaux.

The LIGHT morpheme is associated with [–ATR], as presented in the following alternations:

(12)

	DARK	LIGHT	GLOSS
(a)	[**te**ŋg**ə**ŋ]	[t**ɛ**ŋg**a**ŋ]	'chopping'
(b)	[k^{ʔ}**ɨ**d**ə**k]	[k^{ʔ}**a**d**a**k]	'in clusters'
(c)	[**ə**dʒ**ə**ŋ]	[**a**dʒ**a**ŋ]	'toddling steps'

[–ATR] is in correspondence with all vowels in the LIGHT form, creating the appearance of harmony. This constraint is established by ranking the correspondence constraints for ATR (defined in (6)-(8) above) above ID[ATR]

The LIGHT morpheme is also associated with the feature [–HIGH]. This is given in alternations from /u/ to [o] in which only the high feature changes.

(13)

	DARK	LIGHT	GLOSS
(a)	[h**u**$_{[+]}$lləŋ]	[h**o**$_{[-]}$llaŋ]	'take off clothes'
(b)	[tʃ**u**$_{[+]}$ŋəl]	[tʃ**o**$_{[-]}$ŋal]	'muttering'

High vowels are only in correspondence with the [–HIGH] feature in initial position (the left edge). This is given below whereby high vowels do not alternate after the first syllable.

(14)

	DARK	LIGHT	GLOSS
(a)	[h**ɨ**n**i**l]	[han**i**l]	'in an airy manner'
(b)	[um**u**llək]	[om**u**llak]	'chewing'
(c)	[pəŋs**i**l]	[paŋs**i**l]	'smiling'

This can be accounted for by ranking L-ANCH-[HIGH] above ID[HIGH] (R-ANCH-[ATR] and O-CONT-[ATR] are low ranked).

Because of high-ranked faithfulness to the features round and back (not shown), alternations will always result in a change in height and/or [ATR]. There is a one-to-one I-O correspondence between the stem and the output (in addition to correspondence with the ideophone features).

(15) LIGHT Korean Ideophones:

/k^{ʔ}ubudʒəŋ/ 'bented' [–HIGH]$_1$ [–ATR]$_2$	L-ANCH [HIGH]	ID [HIGH]	O-CONT [HIGH]	L-ANCH [ATR]	ID [ATR]
a. [k^{ʔ}ubudʒə$_1$ŋ]	*!*			***	
b. [k^{ʔ}o$_1$bo$_1$dʒa$_{12}$ŋ]		**!		**	*
c. [k^{ʔ}o$_1$budʒə$_1$ŋ]		*	*	**!*	
d.☞[k^{ʔ}o$_1$budʒa$_{12}$ŋ]		*	*	**	*

Candidate (15) (a) contains a high vowel in the initial syllable, which violates L-ANCH-[HIGH]. Candidate (15) (b) has no instances of high vowels, but because ID[HIGH] outranks R-ANCH-[HIGH] and O-CONT-[HIGH], the extra violation of ID[HIGH] is fatal. Candidate (15) (a) and (c) fail because /ə/ is not realized as [–ATR] [a], violating R-ANCH-[ATR] and L-ANCH-[ATR].

The DARK morpheme is associated with the feature [+ATR], given that all DARK forms only contain vowels that are [+ATR]. The status of [o] as a 'light' vowel even though it is [+ATR] can be accounted for by the fact that mid-round vowels are marked in Korean. This is illustrated in (16) below, in which all instances of [o] violate the high-ranked *[+RND, –HIGH] constraint, and are thus ruled out in DARK forms.

(16) Round Vowels in DARK Ideophones

/kʔobudʒaŋ/ 'bented' [+ATR]$_2$	*[+RND, –HIGH]	ID [HIGH]	R-ANCH [ATR]	O-CONT [ATR]	ID [ATR]
a. ☞[kʔu$_2$bu$_2$dʒə$_2$ŋ]		*			*
b. [kʔu$_2$bu$_2$dʒaŋ]		*	*!		
c. [kʔo$_2$bo$_2$dʒaŋ]	*!*	*	*		
d. [kʔo$_2$bu$_2$dʒə$_2$ŋ]	*!				*

One possible concern is the fact that *[+RND, –HIGH] is so high-ranked, and whether this would force [o] not to appear in LIGHT forms either. However, *[+RND, –ATR] is ranked below L-ANCH-[HIGH]. Because a change to any other vowel in the inventory would involve a violation of ID[BACK] and ID[RND], an input /o/ will always surface as [o] in a LIGHT form. This is illustrated in the tableau in (17) below.

(17) LIGHT /o/

/o/ [–HIGH]$_1$ [–ATR]$_2$	L-ANCH [HIGH]	ID [RND]	ID[BACK]	*[RND, –HIGH]	ID [HIGH]
a. ☞[o$_1$]				*	
b. [u]	*!				*
c. [a$_{1,2}$]		*!	*!		

There is a complication to this, given the fact that in some LIGHT forms, [o] surfaces after the first syllable, illustrated in (18) below.

(18)

	DARK	LIGHT	GLOSS
(a)	[pulluk]	[pollok]	'burging'
(b)	[uduk]	[odok]	'crunching'

The current ranking containing *[+RND, –HIGH] predicts that [u] will surface if the input contains a non-initial /o/. This will, in general make the correct prediction, as a LIGHT input containing non-initial /u/ will surface as [u], and not [o]. Thus we can assume that the underlying forms in (18) must contain non-initial /o/. However, this assumption is not enough to predict non-initial [o] in LIGHT forms because R-ANCH-[HIGH] is ranked below ID[ATR], illustrated in (19) below.

(19) Non-Initial /o/ in LIGHT Forms:

/pollok/ [–HIGH]$_1$ [–ATR]$_2$	L-ANCH [HIGH] $_1$	ID [RND] [BACK]	*[+RND, –HIGH]	ID [HIGH]	R-ANCH [HIGH]
a. [po$_1$llo$_1$k]			**!		
b. ☹ [po$_1$lluk]			*	*	*

The following local conjunction, however, is capable of accounting for the facts in (18).

(20) L-ANCH-[ATR] &$_{word}$ ID[HIGH]

This local conjunction is violated whenever both the [–ATR] feature is not realized on the left edge of the LIGHT form and there is some violation of ID[HIGH] within the lexical item.

(21) LIGHT Forms, Continued:

/pollok/ [–HIGH]$_1$ [–ATR]$_2$	L-ANCH [HIGH]	ID [RND] [BACK]	L-ANCH [ATR] & ID [HIGH]	*[RND, –HIGH]	ID [HIGH]
a. ☞[po$_1$llo$_1$k]				**	
b. [po$_1$lluk]			*!	*	*

Violations of L-ANCH-[ATR] occur only when [o] appears in the output. This is because the only other instances of [+ATR] vowels in LIGHT forms occur in non-participating high vowels, which occur non-initially, and thus do not incur a violation of L-ANCH-[ATR]. Violations of ID[HIGH] are only permitted to occur when a high vowel lowers syllable-initially. Other violations would involve a non-high vowel raising, which would violate ANCH-[HIGH], or a high vowel lowering in non-initial position, which does not occur. It is therefore safe to assume that this local conjunction should not prevent any grammatical cases from surfacing. This is illustrated in (22) below in which non-initial /u/ in the input still surfaces as /u/.

(22) LIGHT Forms, Continued:

/pulluk/ [–HIGH]$_1$ [–ATR]$_2$	L-ANCH [HIGH]	ID [RND] [BACK]	L-ANCH [ATR] & ID [HIGH]	*[RND, –HIGH]	ID [HIGH]
a. [po$_1$llo$_1$k]			**!	**	**
b. [pulluk]	*!				
c. ☞ [po$_1$llu$_1$k]			*	*	*

Note that the local conjunction in (20) will be violated by hypothetical inputs like /pollik/ → [pollɛk]. However, [pollik] is the predicted result both with and without the local conjunction.

(23) LIGHT Forms, Continued:

/pollik/ [–HIGH]$_1$ [–ATR]$_2$	L-ANCH [HIGH]	ID [RND] [BACK]	L-ANCH [ATR] & ID[HIGH]	*[RND, –HIGH]	ID [HIGH]
a. ☞[po$_1$llik]				*	
b. [pullik]	*!				
c. [po$_1$llɛ$_{12}$k]			(*!)	*	*(!)

Vowel harmony in Korean ideophones is accounted for by incorporating floating phonological features into correspondence constraints. This method for accounting for vowel harmony is able to capture several important features of vowel harmony in Korean. First, the morphological alternations are clearly captured by the presence of floating phonological features. These correspondence constraints allow for multiple features to be used to induce harmony, capturing the all the idiosyncrasies of the "light"/"dark" dichotomy. This method for accounting for vowel harmony is still able to account for all of the data and accurately predict outputs for hypothetical inputs.

While floating phonological features generally do not have long-distance effects, the use of correspondence constraints allows for these features to affect the entire lexical item. The correspondence constraints also allow for a feature to attach at a single edge of the lexical item. The combination of both long-distance and local effects of floating features predicted by the above correspondence constraints is a desired result; it predicts the unusual behavior of high vowels.

5 The Harmony/Inventory Theorem

The interesting thing about high vowels is that while the account presented here is relatively straightforward, their behavior is not predicted to occur under general phonological approaches to vowel harmony. The Harmony/Inventory Theorem is an explanation of non-participating vowels in vowel harmony (Smolensky 2005). The theorem states that if a vowel does not participate in vowel harmony, it is because doing so creates a vowel that is disallowed on the surface. High vowels appear to violate this constraint, because they are both participators and non-participators of vowel harmony– participating in syllable-initial position, but nowhere else as in [hɨnɨl]/[hanɨl] 'in an airy manner'. According to the Harmony/Inventory Theorem, high vowels cannot have a harmonic counterpart in the surface inventory, but the fact that high vowels participate syllable-initially proves this to be false.

Korean's apparent violation of the Harmony/Inventory Theorem can be explained by making use of fact that harmony is governed by a faithfulness-based correspondence relationship, rather than by markedness. In a markedness-based harmony system, it is straightforwardly possible (and most likely impossible) to have a vowel participate in harmony, but only syllable-initially.

In the case of Korean, the feature [–ATR] must be in correspondence with all vowels in the lexical domain. Because there are no [+HIGH, –ATR] vowels in the Korean inventory, high vowels do not, in general, participate in the ATR aspect of this harmony system, (*[+HIGH, –ATR] >> L-ANCH-[ATR], R-ANCH-[ATR], O-CONT-[ATR]). The [–HIGH] aspect of the LIGHT morpheme is specifically ranked to apply only in the first syllable. That is, L-ANCH-[ATR] is ranked above ID[ATR] but R-ANCH-[ATR] and O-CONT are both ranked below ID[ATR], giving the effect that high vowels will only participate syllable-initially. This is illustrated in (15) above.

The correspondence-based approach to morphological vowel harmony, coupled with the use of multiple features to explain Korean vowel harmony offers an explanation for why high vowels should behave in a way that is not typical of vowel harmony languages. The above tableau shows that the correspondence-based approach also handles the potentially problematic fact that high vowels are transparent.

6 Conclusion

The use of faithfulness-based correspondence constraints and multiple features allows for a complicated and seemingly idiosyncratic harmony system to be explained in a relatively straightforward manner. The violation of the Harmony/Inventory Theorem caused by the unusual behavior of high vowels

makes sense in the context of the morphological and multi-featural nature of harmony in Korean ideophones.

One may note that the approach presented for Korean ideophones will not account for the harmony found in the verbal system. In the verbal system the morphemes [ə] alternates with [a], depending on the vowel immediately preceding it. While it is a drawback that Korean's verbal harmony cannot be treated in the same fashion as the harmony in the ideophones, the correspondence-based faithfulness account presented here accurately characterizes the differences between the verbal system and the ideophonic system. The verbal system is local, but the ideophonic system is long-distance. The verbal system uses the feature [ATR] only, while the ideophonic system must use both [ATR] and [HIGH]. Further, the ideophonic system has a semantic component not present in the verbal system.

Notes:

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2. There is also vowel harmony in the Korean verbal system. This vowel harmony is of a slightly different nature (the value of the harmonic feature is not tied to morphology/semantics, and the locus of harmony is local); thus vowel harmony in verbs will not be discussed in this paper.

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