Anatomy of the Korean Vowels

Dick Grune

`dick@dickgrune.com`

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Abstract

The observed characteristics of the Korean vowels are explained on the basis of a simple descriptive model.

1 Introduction

When one reads the descriptions of the Korean vowels in educational material and on the Internet, one is struck by the apparent "shiftiness" of their sounds. The ㅜ (u in the official transcription) is described as /u/ and /ʊ/[1] in the International Phonetic Alphabet (IPA); the ㅗ (o) as /o/ and /ω/; the ㅡ (eu) as /ɨ/ and /ɯ/; and the ㅓ (eo) boasts four descriptions: /ʌ/, /ɔ/, /ə/, and /ɒ/. These descriptions are not wrong: Western ears can hear each of them at one time or another from native speakers. But the native speakers know that their vowels are just what they are, and not chameleons.[2]

The explanation suggests itself that the Korean vowels define themselves by different features than the IPA vowels. The IPA vowels are defined basically by three features: vertical position (high/middle/low); horizontal position (back/front); and lip shape (unrounded/rounded). This paper proposes three features that would seem to be more appropriate for the Korean vowels: mouth opening (open/almost closed); internal rounding (unrounded/rounded); and lip shape (unrounded/rounded). The lip shape is the same as in the IPA system; the mouth opening is somewhat similar to the IPA vertical position; but the internal rounding is new.

2 Internal rounding

The vowel ㅡ (transcribed eu) has a striking hollow sound, but Koreans insist it should be pronounced with the lips widely spread, as if smiling. The only way to produce a hollow sound with that lip position is to make a more or less round hollow space in the mouth by lowering the back of the tongue. This shows that "internal rounding" (as opposed to external rounding, i.e. of the lips) plays a major role in at least one Korean vowel.

Once we have acknowledged the existence of internal rounding in one vowel, we find it back in the ㅗ (o), often with strong lip rounding, and in the ㅓ (eo).

2.1 The model

The three binary features proposed above allow 8 combinations, which are presented in Figure 1 and more concisely in Figure 2. Six of them correspond to the six primary Korean vowels. The two combinations with open mouth and rounded lips do not occur, since one cannot very well round one's lips with one's mouth wide open.

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[1] It is also heard as /ɤ/ although I have not seen this described.

[2] Except for a few well-defined situations in which the pronunciation does not match the spelling (see Section 5); but even there the replacing vowel is a standard Korean vowel.

Mouth	Lips	Internally	Result
almost closed	unrounded	no rounding	ㅣ (i)
		rounding	ㅡ (eu)
	rounded	no rounding	ㅜ (u)
		rounding	ㅗ (o)
open	unrounded	no rounding	ㅏ (a)
		rounding	ㅓ (eo)
	rounded	no rounding	–
		rounding	–

Figure 1: Model of the primary Korean vowels

mouth	lips	int.round.	
open	rounded	+	–
–	–	ㅡ	ㅣ
–	+	ㅗ	ㅜ
+	–	ㅓ	ㅏ

Figure 2: Concise diagram of the primary Korean vowels
(int.round. = internal rounding)

2.2 Comparison with the IPA Model

The main difference with the IPA feature system is the absence of the back/front axis (which is replaced by an internal rounding distinction). This absence allows a vowel to move forward and backward in the mouth; it allows the ㅜ (u) to sound like /u/, /ʊ/ or /ɤ/; it allows the ㅡ (eu) to sound like /ɨ/ or /ɯ/; and it allows the ㅓ (eo) to sound like /ɒ/, /ʌ/, or /ə/[3]. Since it is difficult to create internal rounding without at least rounding the lips a little bit, internal rounding is often accompanied by some parasitic external (lip) rounding. This explains the extreme lip rounding often observed in the ㅗ (o) (inherent + parasitic lip rounding), which lends it its /ω/ sound. And the slight lip rounding to the ㅓ (eo) sometimes causes it to sound like /ɔ/ to Western ears.

ZZ Hollywood -¿ 할리우드; 대우 -¿ Daewoo

It is tempting to say that this model just replaces the front-back feature of standard IPA by an internal rounded-unrounded feature, but that would not be correct. Fronting an /o/ in IPA does not yield an /u/ but an /ø/ in IPA, for example.

2.3 Direct support from the language

The authors of the Korean alphabet may have used a chart similar to Figure 1, since the symbols that denote vowels distinguished only by the internal rounded-unrounded feature are each other's mirror images along the long stroke.

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[3]S.E. Martin, "A reference Grammar of Korean", (1992) pg. 24-6) uses the term "internal rounding" to describe the sound of the ㅓ: "Many southern speakers give the vowel a slight internal rounding, as if scooping the back of the tongue with a spoon", but does not introduce "internal rounding" as a notion.

ZZ rewrite

The model seems to do little to explain the only active vowel harmony left in modern Korean – the use of ㅏ (a) instead of ㅓ (eo) as the infinitive ending in verbs that have ㅏ (a) or ㅗ (o) in their final syllable – since rather than being similar, ㅏ (a) and ㅗ (o) have all their features reversed.

However, if we read Sohn[4], page 181-185, carefully, we see that what seems vowel harmony is probably be better described as *vowel pair restriction*, in that the pairs ㅗ-ㅓ (o-eo) and ㅜ-ㅏ (u-a) are to be avoided. The reasons I give for this different description are: 1. next to 앉아요 (anzayo - "sits"), the form 앉어요 (anzeoyo) is allowed; but next to 놀아요 (norayo - "plays"), the form *놀어요 (noreoyo) is not allowed; and 2. it is exactly these two pairs that are not allowed in sound symbolism words, of which Korean has many. For examples see Sohn.

Figure 2 shows the relations between the vowels in the pairs ㅗ-ㅓ (o-eo) and ㅜ-아 (u-a): they occupy similar positions, and differ in the same properties.

2.4 Indirect support

There is some indirect evidence for the above analysis from the way the English vowel er is represented in Korean and the Korean ㅗ (o) is represented in English.

The slight internal rounding that may be heard in the "er" in words like "sweater" and "terminal" in British English may be the reason why Koreans identify this vowel as ㅓ (eo): 스웨터 (seuweteo), 터미널 (teomineol).

Berlitz' Korean Phrase Book & Dictionary, which seems to transliterate the Korean text in such a way that naively pronounced transcription would have the best chance of being understood, transcribes the ㅗ (o) by aw. At first sight this is remarkable, since to Western ears the English aw (/ɔː/) sounds in no way like the Korean ㅗ (o). But the English aw has a considerable amount of internal rounding, for example in words like "hawk" and "raw", which may be enough for it to be identified as ㅗ by Koreans.

It may also be noteworthy that when we pick from Figure 1 those vowels that do not exhibit internal rounding, we are left with i, u, and a, which are the standard vowels of languages with few vowels.

3 The i-supplemented vowels

Five of the six primary vowels in Korean can combine with a postfixed ㅣ (i), historically forming diphthongs; the sixth vowel, the ㅣ (i), does not combine with itself. In Hangul the ㅣ (i) is incorporated in the primary vowel character (Figure 3).

The first effect of the added i is to move the place of articulation of the vowel to the front. This reduces or removes the relevance of the internal rounding. Second, a diphthong can develop in one of two ways: with stress on the first half or with stress on the second half.

In the lower half of the diagram stress on the first half has prevailed, and in the case of a diphthong ending in i this often results in umlauting. Indeed the 아 is umlauted into /ɛ/ and the ㅓ into /e/.

In the upper half of the diagram stress on the second half has won: the i has remained and the ㅗ and ㅜ have withered to a /w/, supported by the lip rounding. The little rounding left to the ㅢ is apparently enough to pull the /i/ back to an /ɛ/.

The ㅢ does not have the benefit of lip rounding to support the stress-less ㅡ in its first half, and a weak form of the ㅡ, /ɰ/, results, which survives only at the beginning of a word; elsewhere ㅢ is just pronounced /i/.[5]

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[4]Ho-min Sohn, The Korean language, 1999

[5]Except where ㅢ is the genitive particle, which is pronounced /ɛ/.

mouth	lips	internally	result
almost closed	unrounded	no rounding	–
		little rounding	⊣ (ui) /ɰi/
	rounded	no rounding	⟨ㅟ⟩ (wi) /wi/
		little rounding	ㅚ (oe) /wɛ/
open	unrounded		ㅐ (ae) /ɛ/
			ㅔ (e) /ɛ/
	rounded		–
			–

Figure 3: The i-supplemented vowels

4   The other diphthongs

Some Korean vowels may be modified further by prefixing them with a y or a w; since both actions take place up front in the mouth, internal rounding plays no role in them, as the model would predict.

The y can be prefixed to the almost-closed, lip-rounded vowels, and to all open vowels, i-supplemented or not; this yields ㅠ (yu), ㅛ (yo), ㅑ (ya), ㅕ (yeo), ㅒ (yae), and ㅖ (ye). The y cannot be prefixed to the almost-closed, lip-unrounded vowels (ㅣ, ㅡ) or to the almost-closed i-supplemented vowels (ㅢ, ㅚ, ㅟ), possibly because these are too close to the underlying /i/.

The w can be prefixed to all open vowels, i-supplemented or not; this yields ㅘ (wa), ㅝ (wo), ㅙ (wae), and ㅞ (we). The w cannot be prefixed to the almost-closed vowels (ㅣ, ㅡ, ㅜ, ㅗ, ㅢ, ㅚ, ㅟ), probably because in these the mouth is already almost closed.

This accounts for all of the 21 Korean vowels.

The simple classification of the vowels that can or cannot obtain y- or w-prefixes in the model offered here can be seen as support for it.

5   Alternative pronunciations of the -요 (-yo), ㅗ (o), and ㅓ (eo)

In "The Sounds of Korean" Choo and O'Grady state (pg. 68) that in two specific contexts the /o/ gets a different pronunciation in colloquial speech. In a footnote on the same page they state that a different pronunciation is also available for the ㅓ (eo).

5.1   -요 (-yo) pronounced as -여 (-yeo)

The very frequent sentence ender -요 (-yo) is often pronounced as -여 (-yeo): 가여 (gayeo, "Go!") for standard 가요 (gayo); this pronunciation is allowed only for the sentence ender -요, not for any other occurrence of 요.

The effect is obtained by failing to almost close the mouth (Figure 1): the lip rounding is lost by opening the mouth, but the internal rounding remains and an 여 (eo) results. This failure to almost close the mouth may be related to the fact that the sentence ender -요 (-yo) is very often preceded by ㅏ (a) or ㅓ (eo), both of which require the mouth to be open.

5.2 ㅗ (o) pronounced as ㅜ (u)

The ㅗ (o) in several frequently used syntactic particles is often pronounced as ㅜ (u): 차루 (charu, "by car") for standard 차로 (charo); again this pronunciation is only allowed in these specific particles. The effect is obtained when the ㅗ (o) loses its internal rounding; it then turns into an ㅜ (u).

5.3 ㅓ (eo) pronounced as ㅡ (eu)

The ㅓ (eo) is often pronounced as if it were an ㅡ (eu): 언제 (eonje), "when?" is often pronounced as 은제 (eunje) and 덜 (deol), "less" is often pronounced as 들 (deul). The effect is obtained when the speaker fails to open the mouth widely: the internal rounding and the absence of lip rounding remain, turning the ㅓ (eo) into an ㅡ (eu).

It may be significant that all Choo and O'Grady's examples occur in closed syllables. The following consonant will have less mouth opening than a vowel, so it may steer the vowel to a smaller mouth opening.

All three changes find a simple description in the model presented here. In all cases the pronunciation effort is reduced.

6 Conclusion

The model presented here gives reasonable explanations for

1. the variation in pronunciation of the Korean vowels observed by Westerns;

2. the distribution of the y- and w-prefixes over the vowels, both simple and i-supplemented;

3. the extreme lip rounding often observed in the ㅗ (o);

4. the strange way English vowels are represented in Korean writing;

5. the vowel-pair restrictions ㅗ-ㅓ (o-eo) and ㅜ-ㅏ (u-a)

6. the alternative pronunciations of -요 (-yo), ㅗ (o), and ㅓ (eo).

Summary

The 21 Korean vowels can be summarized in the following table. The left columns in the subtables contain vowels that are themselves internally rounded or derive from vowels that are internally rounded.

A   Appendix

The pronunciation of ㅗ as /wo/ and ㅜ as /wu/ easily leads to an unambiguous, rational, and almost phonetic romanization of the Korean vowels. It is summarized in the table below.

1	2	3	4	5
a	a	a	a	ㅏ
o	o	o	o	ㅓ
(wo)	(wo)	(wo)	wo	ㅗ
(wu)	(wu)	(wu)	wu	ㅜ
u	u	u	u	ㅡ
i	i	i	i	ㅣ
ay	ay	ay	ay	ㅐ
oy	oy	e	e	ㅔ
(wo)y	(wo)y	(wo)y	woy	ㅚ
(wu)y	(wu)y	(wu)y	wuy	ㅟ
uy	uy	uy	uy	ㅢ
iy	—	—	—	—
ya	ya	ya	ya	ㅑ
yo	yo	yo	yo	ㅕ
y(wo)	y(wo)	y(wo)	ywo	ㅛ
y(wu)	y(wu)	y(wu)	ywu	ㅠ
yu	—	—	—	—
yi	—	—	—	—
yay	yay	yay	yay	ㅒ
yoy	yoy	ye	ye	ㅖ
y(wo)y	—	—	—	—
y(wu)y	—	—	—	—
yuy	—	—	—	—
yiy	—	—	—	—
wa	wa	wa	wa	ㅘ
wo	wo	wo	wo	ㅝ
w(wo)	—	—	—	—
w(wu)	—	—	—	—
wu	—	—	—	—
wi	—	—	—	—
way	way	way	way	ㅙ
woy	woy	we	we	ㅞ
w(wo)y	—	—	—	—
w(wu)y	—	—	—	—
wuy	—	—	—	—
wiy	—	—	—	—