

The direction of decay of Korean "vowel harmony" rule

This paper studies the direction of decay of Korean "vowel harmony" rule by examining phonetic realization of alternating suffix-initial vowels through production experiment and acoustic analysis. Experimental results show that the unification of suffix-initial vowels to /ə/ is not the only direction of decay of the rule. Every stem-final conditions shows variations in applications of the rule. This means that Korean speakers are re-formalizing the rule in various ways.

The "vowel harmony" rule is a constraint on alternations of the initial vowel of verbal suffixes depending on the stem-final vowel. With stem-final /a/ or /o/, the following suffix has the initial /a/ as in (1). With other stem-final vowels, the suffix-initial vowel is /ə/ as in (2). The rule is a residue of Middle Korean vowel harmony. The grouping of vowels in the rule (/a, o/ vs. others) does not form natural classes in Contemporary Korean. Then how Contemporary Korean speakers learn and apply the rule without knowing Middle Korean? In this paper, I focus only on the application part.

(1) stem	+imperative _{sentence-final}	+declarative _{honorific.sentence-final}	+reason _{non-final}
a. mak- 'block'	mak-a	mak-ajo	mak-asə
b. po- 'see'	po-a	po-ajo	po-asə
(2) stem	+imperative _{sentence-final}	+declarative _{honorific.sentence-final}	+reason _{non-final}
a. mək- 'eat'	mək-ə	mək-əjo	mək-asə
b. pu- 'pour'	pu-ə	pu-əjo	pu-əsə
c. ɪlp ^h - 'recite'	ɪlp ^h -ə	ɪlp ^h -əjo	ɪlp ^h -əsə
d. mit- 'believe'	mit-ə	mit-əjo	mit-əsə
e. pe- 'cut'	pe-ə	pe-əjo	pe-əsə
f. tallɛ- 'soothe'	tallɛ-ə	tallɛ-əjo	tallɛ-əsə
g. k'y- 'release'	k'y-ə	k'y-əjo	k'y-əsə
h. k'ø- 'lure'	k'ø-ə	k'ø-əjo	k'ø-əsə

In Contemporary Korean, it has been reported that the "vowel harmony" rule is weakened, and especially the use of /ə/ as the suffix-initial vowel is often generalized to contexts that originally took /a/. In the production experiment of Kang (2012), when a nonce stem is given, participants produce disharmonic /ə/-initial suffixes after /o/-stems (68.7%) as much as after /a/-stems (67.8%). Dialectal speech corpus study of Kang and Ryu (2015) shows that the percentage of disharmonic suffixes after /o/-stems (14.09%, total n=1121) is smaller than after /a/-final stems (42.15%, total n = 1988). Based on the results, it has been concluded that in Contemporary Korean, the unification of suffix-initial vowels to /ə/ is happening. However, it is hard to accept the conclusion because of possible dialectal effects and asymmetrical numbers of target items across conditions. Also, the previous work focused only on stem-final /a,o/ conditions.

In the current production experiment, only Seoul dialect speakers participated, and six stem-final vowels /a, o, ə, u, ɪ, i/ are compared under the properly controlled conditions for the almost same number of target items. In the experiment, participants are asked to produce a verbal conjugation form in a natural way using a stem and a suffixation frame which are given in written forms on each screen. Participants must insert /a/ or /ə/ as a suffix-initial vowel after the given stem in their responses. Formant values of stem-final vowels, especially /a/ and /ə/, and suffix-initial vowels are measured for analysis. Based on the measured F1 and F2, the Euclidean distances between suffix vowels and the mean (center) of stem /a/ vs. the mean of stem /ə/ are calculated by participants. Using log difference between the two Euclidean distances, the distribution of suffix vowels is analyzed through the Gaussian fitting. For bimodal distributions, the data points are categorized in two ways: clustering based on a cross-point of two Gaussian distributions and k-medoids clustering.

In experimental results, five participants show on-going or complete unification of suffix-initial vowels to /ə/, but other nine participants show variations in alternations of suffix-initial vowels across all of the stem-final conditions. It means that sometimes participants select disharmonic suffix-initial vowel /a/ after stem-final /ə, u, ɪ, i/ conditions.

Reference

- Kang, Hijo. 2012. *Diachrony in Synchrony: Korean vowel harmony in verbal conjugation*. Doctoral dissertation, Stony Brook University;
- Kang, Yoonjung, and Na-Young Ryu. 2015. Variation on in Korean vowel harmony and the emergent locality effect. Handout of the presentation in ICKL/Harvard-ISOKL 2015