

Mimetic Vowel Harmony in Japanese

Vowel harmony (VH), which is a well-known characteristic of Altaic languages, is said to be present in the sound-symbolic (or mimetic) sublexicon of Korean (Cho 1994). However, it has not been discussed that Japanese mimetics have a similar tendency—perhaps because of their remarkable *consonantal* peculiarities, such as a strong OCP effect, which excepts only five mimetics with $C_1 = C_2$ (e.g., *kikkari*) in Hamano (1998). This study presents the first quantitative description of the VH-like distribution of Japanese mimetic vowels, and, based on a production experiment, proposes that it is more like part of a general phonological tendency of mimetics than a “trace” of Altaic VH.

The vowel patterns of bimoraic mimetic roots in KTS (1996) were statistically analyzed in terms of both total identity (e.g., *kuru-kuru*) and featural identity (excluding total identity cases) based on backness (e.g., *uro-uro* [+back]) and height (e.g., *puti-puti* [+high]). Cohen’s κ - and t -scores (+ = harmonic; – = disharmonic) were adopted as a measure of harmony strength of overall and individual vowel patterns, respectively (cf. Goldsmith & Riggle, to appear). As a result, overall harmony was significantly strong in total identity (31.68%, $\kappa = .13$, $p < .001$; Table 1) but in neither backness (45.81%, $\kappa = -.31$; Table 2a) nor height identity (14.25%, $\kappa = -.26$; Table 2b). The apparent VH of mimetics is therefore attributable to their preference for totally identical vowels. This result differentiates the phenomenon from the alleged VH in Old Japanese and major Altaic VHs, which are (arguably) based on backness, roundedness, and/or ATR (Vago 1973; Ono 2000).

Then, where does mimetic “VH” come from? Our hypothesis is that “ $V_1 = V_2$ ” is an **unmarked pattern in mimetics**. This solution allows us not only to avoid the controversial issue of the Altaic Hypothesis, but also to suggest why Korean “retains” VH in mimetics.

To evaluate the hypothesis, we conducted an experiment that asked 93 native Japanese speakers and 31 native English speakers to coin CVCV words intuitively (\rightleftharpoons sound-symbolically) matching human agents’ motion in 70 video clips. As a result, coined CVCVs with totally identical vowels amounted to 37.89% ($\kappa = .19$, $p < .001$) in Japanese (e.g., *dosyo*, *gyara*) and 48.91% ($\kappa = .32$, $p < .001$) in English (e.g., *lugu*, *tiwi*) (Table 3). Both results even surpassed the total identity rate of existent mimetic vowels in Table 1 (J: $\chi^2(1) = 6.37$, $p < .05$; E: $\chi^2(1) = 30.30$, $p < .001$). In par-

Table 1. Vowel patterns of mimetics

$V_1 \setminus V_2$	i	e	a	o	u
i	23	2	29	18	8
e	5	1	26	17	3
a	28	2	48	9	24
o	27	12	35	53**	21
u	14	10	55	13	41*

Table 2. Vowel feature patterns of mimetics

a. $V_1 \setminus V_2$	Front (i, e)	Back (a, o, u)
Front	7	101
Back	93	157

b. $V_1 \setminus V_2$	High (i, u)	Mid (e, o)	Low (a)
High	22	43	84
Mid	56	29	61
Low	52	11	0

Table 3. Vowel patterns of coined mimetics

J: $V_1 \setminus V_2$	i	e	a	o	u
i	18	2	18	33	1
e	8	26**	25	41	25
a	39	6	136***	16	36
o	117	31	72	292***	67
u	57	36	207***	30	57

E: $V_1 \setminus V_2$	i	e	a	o	u
i	49**	2	21	17	4
e	6	9*	14	17	2
a	29	3	76**	15	15
o	29	1	26	74**	2
u	10	0	13	8	16**

ticular, since English has neither VH nor a well-established mimetic lexicon, its striking vowel identity rate can be taken as a pure reflection of the default pattern in sound symbolism.

The unmarked nature of mimetic “VH” gains further support from some related phenomena. First, similar distributional tendencies have been reported for mimetic vowels in other languages, including Kisi and Zulu (Childs 1994). Mimetic roots or stems also show tonal consistency in some languages, such as Hausa (e.g., *búzíúbùzùu* ‘unkempt’; Newman 2001) and Dagaare (e.g., *gbàng-bàlàng* ‘long pole falling down’; Bodomo 2006). This suggests that mimetic “VH” is an instance of the general orientation of mimetic vowels to phonological harmony.

Second, identical vowels seem to be phonosemantically linked with regularity. Hamano (1998) argues that, in Japanese mimetics, V_1 symbolizes the “initial shape of movement/object” and V_2 the “resultant shape and size of movement/object”. If this is true, mimetics with identical vowels will be associated with regular (and perhaps major) eventualities whose internal structure is homogenous. In this sense, mimetic “VH” is a basis of the sound-symbolic system. This view is supported by the fact that irregularity is often expressed by ablaut (e.g., *kara-koro* ‘clattering irregularly’) across languages (Childs 1994; LaPolla 1994; Ono 2000).

Third, the strength of mimetic “VH” is in proportion to iconicity (Akita 2009): psychomimic (internal) (28.9%, $\kappa = .10$, $p = .16$) < phenomimic (visual/tactile) (28.0%, $\kappa = .10$, $p < .001$) < phonomimic (auditory) (39.39%, $\kappa = .22$, $p < .001$). Assuming that phonomimic/onomatopoeic words constitute the prototype of mimetics, we can consider this vowel pattern as basic.

The present discussion leads us to reunderstand the overall sound-symbolic system of Japanese in which vowels and consonants have near-opposite phonosemantic orientations: regularity and variability, respectively. Beyond this generalization in a language with only five vowels lies a broader typology of the division of labor between consonantal, vocalic, and tonal symbolism. Also, an experimental approach to the presumable articulatory/perceptual ease of mimetic “VH” may reveal the primitive nature of the phonological harmony in question.

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