Iconicity in Korean Consonantal Symbolism

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Abstract

Korean is well-known for its rich inventory of sound-symbolic words, ideophones, where three different laryngeal settings of the syllable-initial stop change to connote different degrees of intensity. In order to examine to what degree the observed iconic relations in Korean ideophones are naturally motivated, English speakers were asked to guess the relevant connotations of nonsense Korean ideophonic pairs which contrasted the laryngeal settings in word-initial stops. The result indicates that English-speaking listeners did not show a strong sensitivity towards the expected semantic effect of the stop alternation. This supports a conclusion that Korean consonantal symbolism is largely established by convention.

Index Terms: sound symbolism, Korean ideophone, Korean stops, iconicity

1. Introduction

"Sound symbolism" is the term used for the idea that linguistic signs have intrinsic meanings in and of themselves. Despite the received view of the arbitrariness of the signs in modern linguistics [1], the subject of sound symbolism has been dealt with in numerous anthropological or linguistic studies [2, 3, 4, as examples] due to the potential presence in many languages of a lexical class whose arbitrariness as signs seems to be weaker.

In particular, Korean is well-known for its rich inventory of sound-symbolic words, ideophones, in the lexicon. Korean ideophones exhibit highly structured properties correlating with certain semantic features related to perceptual sensory meanings. For example, they use three different laryngeal settings of the syllable-initial obstruents to connote different degrees of intensity. In more detail, within some semantic scales, lenis obstruents connote a "neutral" character whereas fortis and aspirated series connote "intensive" and "paraintensive" characters, respectively [5, 6]. One can find possible articulatory grounds for such a systematic association by relating plain obstruents to neutrality, fortis obstruents, which involve constricted glottis with greater muscular tension, to intensiveness, and aspirated obstruents, which produce a strong burst of air through the spread glottis, to paraintensiveness [cf. 7]. This iconic mechanism grounded in articulatory gestures suggests the hypothesis that, in Korean ideophones, the observed obstruent change which accompanies connotation shift with respect to intensity is naturally motivated.

To examine whether this hypothesis holds true, native English speakers were asked to match connotative oppositions which contained different degrees of intensity with the relevant nonsense Korean ideophonic pairs. By measuring English-speaking participants' correct guessing rates when associating the three separate laryngeal pairs (i.e., lenis-fortis, lenis-aspirated, and fortis-aspirated) with the relevant connotative oppositions at three different places of articulation (bilabial, alveolar, and velar), this study serves to provide detailed information about where and to what degree Korean ideophones are naturally motivated, and hence contrary to the Saussurean idea of the arbitrariness of the sign.

2. Method

2.1. Participants

A total of 94 students from an introductory linguistics course at the University of Queensland in Australia served as participants. All of them were native English speakers with no prior knowledge of Korean. They were given course credit for their participation in this study.

2.2. Materials

The targeted consonant alternations, which accompany connotation shifts in Korean ideophones, involved the three-way laryngeal contrast in word-initial stops at three different places of articulation – bilabial, alveolar, and velar. Stimuli consisted of six Korean ideophonic pairs for each of the three laryngeal contrasts (i.e., lenis-fortis, lenis-aspirated, and fortis-aspirated) at each place of articulation, except for /k-k^{h}/ where only one existing disyllabic ideophonic pair was available. This yielded 49 existing Korean ideophonic pairs in total (3 places of articulation for each of 3 laryngeal contrasts, times 6 items each, minus 5 items for /k-k^{h}/). These were then used to create a final stimulus set which was composed of nonsense ideophonic pairs.

Nonsense pairs were used in order for the results of this study to be comparable to the results for native Korean listeners' perceptions of Korean consonantal symbolism in a forthcoming paper [8, in prep]. Ideophonic pairs taken directly from the Korean lexicon would not block Korean listeners' attempts to use their prior knowledge of Korean.

2.2.1. Selection of existing Korean ideophonic pairs

Existing Korean ideophonic pairs were collated from the Great Standard Korean Dictionary, developed by the National Institute of the Korean Language (http://stdweb2.korean.go.kr/main.jsp). The entire group of stimulus items was restricted to disyllabic words in order to control for syllabic length and to keep the experiment as simple as possible. Searches were made manually through the detailed search function which helped select disyllabic words that conformed to any of the traditional semantic subcategories of Korean ideophones [9]: phonomime (depiction of sound), phenomime (depiction of visual/tactile information), or psychomime (depiction of mental states). In addition, the words selected by their semantic definitions underwent a structural check, so that only those words that exhibited the desirable connotation shift

correlating with a certain consonant alternation (/p-p'/, /p-p^h/, /p'-p^h/, /t-t'/, /t-t^h/, /t'-t^h/, /k-k'/, /k-k^h/, /k'-k^h/) were included. The meanings of each pair, which are crucial for the current meaning matching task, were directly extracted from the Great Standard Korean Dictionary and translated into English by the author, a native speaker of Korean.

2.2.2. Creation of nonsense Korean ideophonic pairs

The first vowel of the first syllable in each of the 49 existing Korean ideophone pairs was manually replaced with a Korean vowel that also occurs in English, such as /i/, /u/, /a/, and /o/. As a result, a maximum of four candidate nonsense word pairs were generated for each existing ideophonic pair , for example, /pin.cil/~/p'in.cil/, /pun.cil/~/p'un.cil/, /pan.cil/~/p'an.cil/, /pon.cil/~/p'on.cil/, for /pən.cil/~/p'ən.cil/, 'lesser/greater greasiness'. Among those candidate nonsense pairs, only one pair that neither violates Korean phonotactics nor appears in the Korean vocabulary was included in the final stimulus set (recall that there was only one available existing ideophonic pair for /k-k^h/ so the number of nonsense pairs was restricted in the corresponding contrast). All of the chosen nonsense words were additionally evaluated for their nonsensicality by three other native Korean speakers who did not have any background information about this project.

2.3. Procedure and design

The 49 disyllabic nonsense ideophonic pairs were recorded with a simple falling pitch by the author, a female native speaker of Korean. Then, the stimuli were divided into two different sets – one for alveolar and velar stops, and the other bilabial stops – and distributed to the two subgroups of English-speaking participants, groups A-1 and A-2, respectively. The division of the stimulus set was intended to reduce the risk that the participants become fatigued with listening to a large number of foreign sounds. The pairs in each stimulus set, with their related definitions, were presented in random order for each group of English-speaking participants. The word arrangements of semantic opposition were counterbalanced in the six stimulus pairs of each contrast (e.g., 3 neutral-intensive items with 3 intensive-neutral items for the lenis-fortis contrast). The words' orthography was not provided so that participants' judgments relied entirely on the sounds of the words.

Consequently, 42 participants in group A-1 and 52 participants in group A-2 listened to 31 and 18 stimulus pairs, respectively, in random order. They then ticked against either 'first word' or 'second word' to indicate which word in the pair they felt contained more intensive connotation. A sample list of meaning matching questions for /p-p'/ alternation is presented in Table 1 below.

Table 1: *Sample questions for /p-p'/*

Nonsense ideophonic pairs	Questions
pol.c'ok ~ p'ol.c'ok	Both words describe a motion of opening the mouth slightly and laughing without making a sound. Which word describes a more FORCEFUL motion of opening the mouth?
p'in.cil ~ pin.cil	Both words mean greasily. Which word describes GREATER greasiness?
pa.soŋ ~ p'a.soŋ	Both words describe softness and moisturelessness of the laundry. Which word describes GREATER degree of softness and moisturelessness?
p'i.kɨl ~ pi.kɨl	Both words describe the sound of water boiling. Which word describes MORE rapid boiling?
pi.tɨk ~ p'i.tɨk	Both words mean "persistently". Which word describes STRONGER persistence?
p'o.cak ~ po.cak	Both words describe a crackling sound. Which word describes a STRONGER crackling?

Prior to their actual participation, all of the participants completed a practice question to make sure that they understood the instruction correctly.

3. Results

If the English-speaking participants were not able to discriminate the sounds involved when they listened to the stimulus items, it would have been impossible for them to correlate connotation change with the corresponding consonant alternations in the meaning matching task. To examine whether or not English listeners can actually discriminate the laryngeal contrasts of the Korean stops, a preliminary study [10], which measured 122 English-speaking listeners' discrimination level of the relevant Korean stop contrasts, was consulted. In the preliminary discrimination task, English-speaking participants listened to the disyllabic minimal pairs of the three laryngeal contrasts (e.g., *pi.ta* 'be empty' - *p^{h}i.ta* 'to bloom') at three different places of articulation, and answered yes-no questions for discrimination. As a result, poor discrimination was found only in the /t-t^h/ contrast at a significant level, and for /p-p'/ and /k-k'/ at a chance level. This establishes the prediction: English listeners would not be sensitive to the semantic minimal pairs of lenis and fortis which correspond to neutrality and intensiveness, respectively, at bilabial and velar. In addition, they would not be sensitive to the semantic correlates of the lenis-aspirated pairs at alveolar.

Moving on to the main results, all of the participant's judgments of the stimuli were converted to binary numbers (0 = wrong guess, 1 = correct guess). Then, based on [11], a binomial test was applied to examine whether the participants' correct guessing rates were different from chance on a statistically significant level.

The overall mean scores for the three laryngeal pairs at three different places of articulation are shown in Figure 1 below. At bilabial, the lenis-aspirated ($p<0.001$) and fortis-aspirated contrasts ($p<0.05$) were judged more towards the Korean symbolic pattern in comparison to the lenis-fortis (n.s.), which did not seem to display any systematic form-meaning mapping. At alveolar, the Korean symbolic pattern was recognised in both lenis-fortis ($p<0.001$) and lenis-aspirated contrasts ($p<0.001$), in comparison with the fortis-aspirated ($p<0.001$), where the expected symbolic pattern appeared in a reversed manner. At velar, on the other hand, none of the contrasts were judged conforming to any symbolic patterns – note that the reversed Korean symbolic pattern seemed to appear in the lenis-aspirated contrast. However, the mean failed to reach statistical significance due to the limited number of nonsense stimulus items involved.

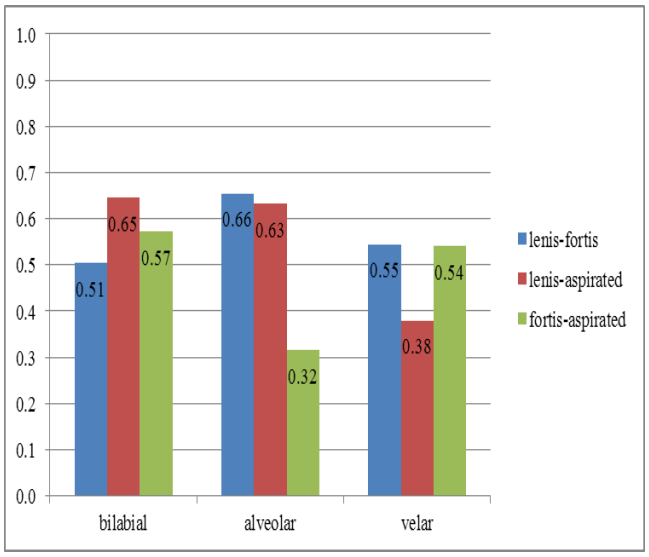

Figure 1: *Means of the three laryngeal pairs.*

The prediction based on English listeners' sound discrimination level was partly borne out: the participants did not show sensitivity to the Korean sound-symbolic patterns in /p-p'/, /k-k'/, /t'-t^h/, and /k'-k^h/ (poor matching rate was also observed in /k-k^h/. However, due to the restricted number of stimulus items involved, it will not be discussed further).

For a more rigorous comparison among the guessing scores of the three different laryngeal pairs at each place of articulation, separate Friedman tests [12] were applied. The results revealed that the mean scores of the three laryngeal pairs were significantly different at bilabial and alveolar (Bilabial, χ^2 (2, n=312) =14.14, p=0.001; Alveolar, χ^2 (2, n=312) =74.19, p<0.005).

To discover where the significant mean difference lay in the possible combinations at bilabial and alveolar, each laryngeal pair was further compared with another at the corresponding places of articulation, using separate Wilcoxon signed rank tests [12]. The further post-hoc tests (with Bonferrioni adjusted alpha value 0.017) revealed that, at bilabial, a significant difference was found between lenis-fortis and lenis-aspirated (z=-3.692, p<0.005) but not between fortis-aspirated and lenis-fortis (z=-2.121, p=0.034). This indicates that English-speaking listeners' sensitivity to Korean symbolic pattern was significant only for the lenis-aspirated contrast. At alveolar, on the other hand, there were significant differences in lenis-fortis *vs.* fortis-aspirated (z=-7.484, p<0.005) and lenis-aspirated *vs.* fortis-aspirated (z= -6.911, p <0.005) indicating that English-speaking listeners recognised Korean symbolic patterns in both lenis-fortis and lenis-aspirated pairs at a statistically significant level. At velar, no significant difference was found perhaps because /k-k^h/ was not taken into consideration.

At this point, it is interesting to note that the Korean symbolic pattern of the fortis-aspirated pair was not significantly recognised at any of the places of articulation, although its sound contrast was discriminable by English listeners. At alveolar, it was even judged to be the reverse of the Korean symbolic pattern (i.e., fortis is more intense than aspirated). So why do the fortis-aspirated judgments show this aberrant behaviour? One possible explanation could be because of the overlapping acoustic and articulatory gestures between fortis and aspirated stops in Korean [13]: the stop closure duration and linguopalatal contact are not significantly different between fortis and aspirated stops, in the sense that both have longer closure duration and greater linguopalatal contact than lenis stops. Both fortis and aspirated stops are articulatorily "strong" [14], compared to lenis stops, and this shared supralaryngeal articulation between the fortis and aspirated stops possibly makes their connotative differences in Korean ideophones subtle (some authors [7, 15, 16] have indicated that native Korean speakers do not easily recognise the semantic contrast between aspirated and fortis stops in existing words). For this reason, the English-speaking listeners' poor sensitivity to the Korean symbolic pattern in the fortis-aspirated pairs is not surprising.

In sum, according to the data analysis above, which compared the means of three laryngeal pairs at each place of articulation, it could be said that English-speaking listeners are sensitive to the Korean consonant symbolism only in the lenis-fortis pair at alveolar and the lenis-aspirated pair at bilabial and alveolar. However, it is questionable whether this finding can be generalised to the entire ideophonic lexicon. Thus, the mean inter-item correlations [12] were calculated to examine whether all of the six stimulus items in each of the laryngeal pairs, where the listeners seemed to recognise their semantic information relatively well in an expected way (i.e., lenis-fortis at alveolar and velar; lenis-aspirated at bilabial and alveolar), coherently measure the underlying hypothesis. As a result, it was shown that none of the relevant contrasts reached Briggs and Cheek's [17] optimal range for the inter-item correlation of .2 to .4 (t-t', 0.024; p-p^h, 0.137; t-t^h,-0.042), reporting low internal consistency. This demonstrates that English-speaking listeners' sensitivity to Korean consonantal symbolism in the lenis-fortis pair at alveolar, and the lenis-aspirated pair at bilabial and alveolar cannot be accounted for in general terms.

4. Discussion

In the current study, English-speaking listeners showed some degree of sensitivity to the *lenis = neutral force, fortis/aspirated = intensive force* phonosemantic association in the lenis-fortis at alveolar and lenis-aspirated pairs at bilabial and alveolar. However, in contrast with the hypothesis, it was found that their sensitivity cannot be generalised, because the expected sound symbolic effects occurred only in a subset of items. There were no reliable agreements across items.

The current finding raises a question as to why the listeners did not show a strong sensitivity to form-meaning correspondence in Korean ideophones in an expected manner. As for the fortis-aspirated, the semantic contents were either randomly or reversely assigned, perhaps due to their overlapping acoustic and articulatory gestures. The current random association between phonetic form and meaning in the lenis-fortis pairs at bilabial and velar, and the limited sensitivity to Korean symbolic pattern in the /t-t^h/ pair are explicable in terms of English listeners' sound discrimination level.

However, a question still remains because there was no close connection found between English-speaking listeners' discrimination level for /p-p^h/ and /t-t'/, and their meaning-guessing performance for the corresponding laryngeal pairs in the current study (i.e., the English-speaking subjects' discrimination levels for the /p-p^h/ and /t-t'/ were above

chance, but their sensitivity to Korean consonantal symbolism in the corresponding pairs could not be generalised in terms of the closer analysis toward the end of Section 3). One possible explanation for this limited sensitivity to the Korean sound-symbolic patterns in /p-p^h/ and /t-t'/ is that the articulatory motivation is not sufficient cue to establish the consonantal symbolism. This somewhat contradicts Fordyce's [16] finding that listeners from an English-speaking background showed an above-chance level of correct guessing in the lenis-fortis pair in Korean ideophones. However, because [16] generalised the result drawn from only three items, which were different with each other in terms of both manner of articulation and place of articulation, the present possibility is not severely threatened by that finding.

As a final note, if the underlying natural motivation is not playing a sufficient role, then what else establishes such a regular form-meaning mapping in Korean ideophones? Why are native Korean speakers expected to predict the corresponding connotation shift when consonants alter from lenis to their aspirated counterparts, or fortis counterparts, in ideophones [15]? These questions can be answered when implementing Peirce's three levels of signs [2] – "icon", "index", and "symbol" – and Sonesson's [18] further distinction of iconic signs. In Peircean terms, an icon is a sign which displays a close resemblance to a referent (e.g., a portrait), and index refers to a sign which is, by contiguity, associated with a referent in the external world (e.g., smoke as an index of fire). A symbol, on the other hand, is a sign that arbitrarily matches with a certain idea by convention (e.g., $ for dollar).

Korean ideophones contain relative iconicity by associating similar forms with similar meanings. However, having said that they are iconic, this does not necessarily indicate that Korean ideophones totally exclude indexical or symbolic (i.e., conventional) relations. Indeed, they often reveal mixed properties (from the different Peircean levels of signification above) as Dingemanse [19] pointed out that "they [ideophones, in general] are symbolic in that they are subject to conventionalisation so that their interpretation is partly socially mediated; and they are indexical to the extent that they point to perceptions, inviting the listener to see for themselves". This is an instantiation of the fact that strict Peircean distinctions do not exist in the real world [20]. Given this, Sonesson further categorised iconic signs, in particular, into "primary iconicity" and "secondary iconicity". Primary iconicity involves a sign whose referent is recognised primarily due to a possible natural motivation underlying it and secondarily due to convention. In secondary iconic signs, the roles of natural motivation and convention appear in a reversed manner [20].

Building on this conceptual framework, it is expected that the Korean consonantal symbolism should have secondary iconic signs because the involved relative iconicity is considered to have lower proportion of iconic properties than imagic iconicity which is often found in onomatopoeia [19]. The conceptual expectation is in parallel with the empirical finding above: the current finding showed that English listeners were sensitive to the iconic relation between three laryngeal settings with neutral/intensive connotations grounded in the acoustic/articulatory gesture but only weakly as their sensitivity was not generalizable to the larger set of the ideophonic lexicon. This suggests that Korean consonant symbolism is primarily established by convention and therefore cannot stand as a strong counter-example to the arbitrariness of sign.

5. Conclusions

In conclusion, the current study, which examined how English speakers correlate connotation change with the corresponding consonant alternations in nonsense Korean ideophones, showed no generalisable sound symbolic effect in any of the laryngeal pairs. The result indicates that the existing consonant symbolic patterns in Korean ideophones are largely grounded in convention, and that the articulatory motivation plays only a secondary role.

6. Acknowledgements

I thank Erich Round, Kimi Akita, and three anonymous reviewers for their helpful advice on earlier versions of this paper. Needless to say, I bear full responsibility for any remaining errors.

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