

INTERACTING SOUND SYMBOLIC PATTERNS: THE CASE OF VOWEL SOUND SYMBOLISM IN KOREAN GIVEN NAMES

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ABSTRACT

The light-dark vowel pattern in Korean sound symbolic vocabulary runs contrary to the proposed cross-linguistic vowel height symbolism and, therefore, presents an opportunity to explore how cross-linguistic and language specific patterns interact when they operate on the same sounds. Analysis of a corpus of Korean given names suggests that the language-specific pattern overrides the cross-linguistic one and light vowels (which are lower) are more frequently found in female names than dark vowels (which are higher). This study examines the productivity of this pattern by testing if native speakers of Korean extend it to novel names in a nonce-name gendering experiment. The results show that Korean speakers judge the names with /o/ (light but lower) to be more female than those with /u/ (dark but higher), mirroring the findings of the corpus study and the native sound symbolism, but English speakers do not.

Keywords: Korean, sound symbolism, names

1. INTRODUCTION

Sound symbolic patterns occur when a sound or sound property is associated with a particular meaning. Most research in this area uses nonce name experiments (e.g. [1, 2]). However, some recent work has shown that these patterns are attested in areas of the lexicon such as animal names (e.g. [3]), character names (e.g. [4, 5, 6]), given names (e.g. [7, 8, 9, 10, 11, 12, 13]) and brand names (e.g. [14, 15, 16]).

The sound symbolic pattern we focus on in this paper is vowel height [1]. High vowels (e.g. /i u/) are associated with smallness and low vowels (e.g. /æ a/) with largeness. Some suggest an iconic, and potentially universal, connection between the size of the oral cavity and the meaning of larger and smaller size (e.g. [17, 2]). This pattern appears to be present in the phonology of given names, with female names having more high vowels than male names in languages such as English [18, 13],

Armenian [8] and Cantonese [12]. Smallness may be associated more with females than males, leading to more high vowels in female than male names.

1.1. Korean Dark-Light Sound Symbolism in Given Names

Despite being a proposed universal, there are counterexamples to the vowel height pattern. One is the dark-light pattern found in Korean sound symbolic vocabulary [19]. Korean has a sound symbolic vocabulary in which certain vowels and consonants convey specific meanings [20, 21, 22, 19]. We focus on the sound symbolism of vowels, which is the main topic of our study. Dark vowels (/e y ʌ u/) are associated with largeness while light vowels (/ε ø a o/) are associated with smallness, amongst other meanings [23]. For example, /tultul/ and /toltol/ refer to a large and a small object rolling into a round shape, respectively. This pattern runs opposite the height pattern as light vowels are lower than dark vowels (see Table 1), so its presence suggests that the vowel height pattern may not be present in Korean, or that it is suppressed by the language specific dark-light pattern.

	Front	Central	Back	Legend
High	i y	ɨ	u	Neutral
Mid	e ø	ʌ	o	Dark
Low	ε		a	Light

Table 1: Korean Vowels

Previous studies that examined the Korean speakers' association of vowel height and size found mixed results. Taylor and Taylor [24] found that speakers rate nonce words with light vowels as smaller than those with dark vowels. Kwon [23] found that unlike English speakers, Korean speakers chose dark vowel words (with /u/) as more augmentative in meaning more often than light vowel words (with /o/), but this did not hold in /i-ε/, /i-a/, and /i-a/ pairs, where the universal height pattern overruled the native pattern. Shinohara and Kawahara [25] found a weaker effect of height

for Korean speakers than Chinese, English, and Japanese speakers, presumably due to the native sound symbolism.

One question this raises is whether the sound symbolic vocabulary pattern extends to other areas of the lexicon. This appears to be the case for names. A corpus analysis of the most popular two syllable Korean newborn names between 2008 and 2020 (F: 974, M: 970) [26] shows that male names tend to have more dark vowels than female names, which is consistent with the light-dark sound symbolic pattern, rather than the vowel height pattern [27]. However, the height pattern still seems to be at play, as /i/ and /ɪ/, neutral vowels in the sound symbolic vocabulary, are more prevalent in female names than male names, suggesting that both patterns are present, but that the language-specific sound symbolism may override the more universal pattern.

1.2. Lexicalized Pattern or Productive Phonological Process?

Even though the height and dark-light patterns are found in the English and Korean name corpora, respectively, this does not reveal if they are productive in speakers' minds. Previous studies [8, 10, 28, 11, 29] indicate that cross-linguistically recurring sound-meaning associations, such as the vowel height pattern, are part of speaker's productive grammar and that they are able to use them to assign gender to nonce names, at least in their native language.

Korean presents an opportunity to explore how cross-linguistic and language specific patterns interact as the height and dark-light patterns operate on the same vowels. If the Korean dark-light pattern is a fossilized historical accident and is not reflected the speaker's productive grammar we should see English and Korean speakers assigning gender to names in the same way. If, on the other hand, the Korean pattern is active in speaker's minds, we would expect Korean, but not English, speakers to use it to assign gender to names, leading to names with dark vowels being considered male more often than those with light vowels. If this is the case, it suggests that speakers are able to learn sound symbolic patterns specific to their language, and apply them to novel situations.

To answer this question, we conducted a "nonce name gendering" experiment using Korean nonce names with the vowels /u/ and /o/ in the second syllable. In the Korean name corpus, /u/, (dark and high), is more common in male names than /o/ (light and mid) is, while the opposite is true for English (Figure 1) [30]. We expect that, if the pattern present

in the lexicon is active in speakers' minds, Korean speakers should rate names with /u/ as more male than names with /o/. Conversely, English speakers should rate names with /o/ as more male due to the vowel height pattern.

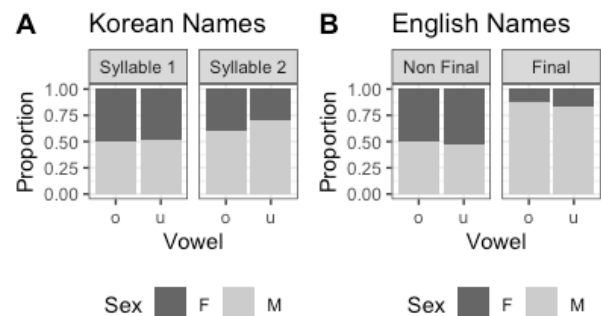


Figure 1: Ratio of male to female names containing /u/ and /o/ in Korean and English

We investigate the alternation in the second syllable as the light-dark pattern is significant on this syllable, but not on the initial one, in the corpus. We focus on /u/ and /o/ because the light-dark status of the front vowel pairs (/e/-/ɛ/ and /y/-/ø/) is less robust than that of the back vowel pairs due to sound changes which have resulted in mergers amongst these vowels [31, 32] and it is not clear how English speakers can distinguish the /a/-/ʌ/ pair.

2. METHOD

2.1. Participants

40 native Korean speakers (28 Female, 12 Male) and 40 native North American English speakers (27 Female, 13 Male) over the age of 18 completed the study. Most participants were under the age of 40. They were recruited through prolific.co (79) and word of mouth (1) and paid \$5.00CAD for their time.

2.2. Stimuli

The stimuli consisted of 78 bisyllabic nonce names including 10 target names, 60 fillers and 8 training items. The target names were 5 bisyllabic CVCV nonce name minimal pairs which varied based on their final vowel. One member of the pair contained /u/ (dark) and the other, /o/ (light). The nonce names were not words or names in Korean or English. The stimuli were recorded by a middle-aged male native speaker of the Seoul dialect of Korean. Korean does not have contrastive lexical stress. The stimuli were produced with no obvious stress prominence on either syllable.

2.3. Procedure

The procedure was implemented online using jsPsych [33]. Participants were instructed to imagine that a Korean family with a boy and a girl had moved in next door and they were trying to figure out what each kid's name was. They would hear the name and then be presented with a 6-point Likert-type scale ranging from 'Definitely Female' to 'Definitely Male' which they used to rate how male or female they thought the name was. The order of presentation was randomized by participant.

2.4. Analysis

A full interaction mixed effects linear regression model was constructed using the *lmer()* function from the *lme4* package [34] and the *lmerTest* package [35] in R [36]. Participant ratings were converted to a numerical scale ranging from 1 (definitely female) to 6 (definitely male). Rating was the response variable and vowel type (dark or light) and participant language (English or Korean) were the predictor variables. Random intercepts for participant, and minimal pair were included. Random slopes were not included due to singular fit issues. Language and vowel type were contrast coded such that /o/ and English were coded as -0.5 while /u/ and Korean were coded as 0.5. For a post-hoc analysis of the interaction between language and vowel type, separate models were constructed for each language group with the same structure as the full model except that language was removed as a predictor variable.

3. RESULTS

Figure 2 shows the Korean and English participants' mean ratings for the nonce names across all five minimal pairs. Korean participants' mean rating of names with the dark vowel /u/ was more male than their mean rating of names with the light vowel /o/. English participants' mean ratings for names with /u/ and /o/ are very similar, though names with /o/ have a slightly higher mean rating. The linear regression showed a significant effect of language (Est. = 0.215, *SE* = 0.0937, *df* = 78, *t* = 2.295, *p* = 0.0244) and a significant interaction between language and vowel type (Est. = 0.350, *SE* = 0.648, *df* = 714, *t* = 2.989, *p* = 0.0029). The main effect suggests that Korean participants, on average, gave names more male ratings than English participants.

To understand the interaction between language and vowel type, separate post-hoc models were constructed for each language. The Korean model

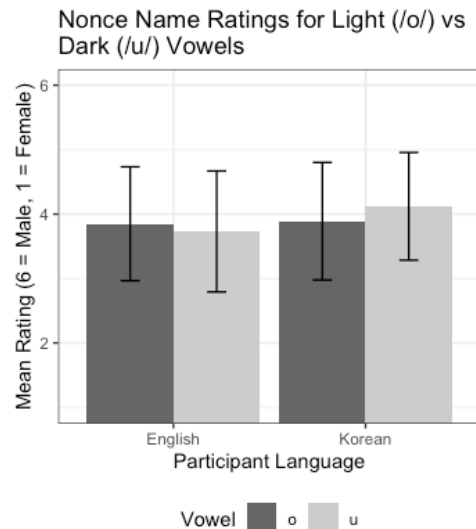


Figure 2: Nonce-name ratings by vowel and participant language. Error bars represent 1 standard deviation above or below the mean.

showed a significant effect of vowel type whereby names with the dark vowel /u/ were rated as more male than those with the light vowel /o/ (Est. = 0.230, *SE* = 0.077, *df* = 355, *t* = 2.983, *p* = 0.003). The English showed a non-significant difference in rating between /o/ and /u/ in the direction of universal height pattern (Est. = -0.120, *SE* = 0.084, *df* = 355, *t* = -1.422, *p* = 0.156). The lack of vowel height effect may be due to the fact that Korean /o/ is phonetically high and may be difficult to distinguish from /u/ for English listeners.

These results indicate that Korean participants were using the dark-light vowel pattern to assign gender to names, but English speakers do not. The main effect of language is due to the fact that English and Korean speakers gave similar ratings to names containing /o/, but Korean speakers gave higher (more male) ratings to those containing /u/, as can be seen in Figure 2.

4. DISCUSSION

The purpose of the experiment was to investigate how native (Korean) vs. non-native (English) language speakers use language-specific and cross-linguistic patterns to assign gender to nonce names using Korean dark-light vowel sound symbolism and cross-linguistic size symbolism as a case study. The results of the name gendering experiment suggest that only native speakers make use of language-specific patterns.

Korean participants rated nonce names with /u/ (dark) as more male than nonce names with /

o/ (light), indicating that Korean speakers use the language specific dark-light pattern when it conflicts with the universal height one. This is consistent with what is found in the corpus of real Korean names [27], suggesting that, like in other languages [11], the sound symbolic patterns found in real names are also actively used by speakers to determine name gender. Furthermore, note that while the universal height pattern is iconically grounded – the smaller oral cavity size of high vowels signals smallness – and can operate without the mediation of the phonological grammar, the Korean light-dark pattern has no natural phonetic motivation and the fact that Koreans are following the light-dark pattern in name gender preference suggests that sound symbolism isn't fully phonetic and hinges on the speaker's language-specific phonological knowledge.

Unlike Korean participants, English participants did not display a difference in their ratings between nonce words with /u/ and those with /o/. This might be unexpected if English speakers are using the height pattern to assign gender to names, since /u/ is higher than /o/, and would be expected to be rated more female. However, as both vowels are phonetically high in Korean, it is possible that there is not sufficient difference in their heights for English speakers to consider them different in terms of size symbolism. This is also the finding of Kwon [23] for English speaker's judgement of size symbolism in Korean sound symbolic words. Regardless, the results indicate that English speakers do not make use of this Korean language-specific pattern.

While the results of this study show that Korean, but not English, speakers use the light-dark pattern, they do not show if Korean participants use the universal height pattern in cases where light-dark symbolism is not at play. In the current study, we were primarily interested in whether or not participants used the light-dark pattern at all, and how this compared between our two language groups. Future work should investigate the potential interaction between the two sound symbolic patterns further by examining alternations throughout the Korean vowel space. In this study we focused on /u/ and /o/ as they are free from neutralizing sound changes and are expected to be reliably distinguished by English listeners. Future studies can examine the rest of the vowel space, where the traditional dark-light pattern is obscured by mergers (/e/ vs. /ɛ/) or neutral vowels (/i/ vs. /ɛ/, /i/ vs. /a/). The findings from the Korean name corpus [27] show that universal height pattern emerges with neutral

vowels and we predict the same to hold true in a name gendering experiment.

5. CONCLUSION

This study used a name gendering experiment to investigate sound symbolism in Korean given names and explore how language-specific and cross-linguistic sound symbolic patterns interact. Korean light-dark sound symbolism presented an opportunity to investigate this as it runs somewhat contrary to the cross-linguistic height pattern. Korean participants rated names with /u/ (dark) as more male than names with /o/ (light) whereas English speakers did not display a difference in their ratings between these two vowels, suggesting that native speakers of a language with a language-specific sound symbolic pattern can make use of that pattern to assign meaning to nonce names. Our study shows that sound-meaning associations that are grounded in a particular group of native vocabulary are productively extended to the domain of personal names, which mostly consists of Sino-Korean morphemes. This finding has implications beyond the sound symbolism of names in demonstrating the fluidity of phonological knowledge that “leaks” across different lexical strata.

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