An experiment on 'cute' vowels in Japanese

Gakuji Kumagai
Kansai University, Japan

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Abstract

This study experimentally examined which vowels can be associated with cuteness, or *kawaii*, in Japanese, from the perspective of sound symbolism. The results showed that /a, i/ were more likely to be perceived as 'cuter' than /u, e, o/ (when the surrounding consonants are all obstruents). To explain this result, I presented the babyishness and familiarity hypotheses.

Keywords: babyishness, cuteness, familiarity, sound symbolism, vowels

Introduction

Sound symbolism is a phenomenon in which a sound conveys a particular meaning (e.g., Hinton et al. 1994). Recent studies have examined which phonetic and phonological factors make names sound cute (e.g., Kumagai 2022; Schmitz et al. 2023). Schmitz et al. (2023) conducted experiments on 'cute' vowels primarily with German speakers. They reported that when a character name containing /a:/ is larger or when a character name containing /i:/ is smaller, each tends to be perceived as cuter. This suggests that size and cuteness are correlated in names containing /a/ or /i/. To the best of my knowledge, no such experiments have been conducted on Japanese 'cute' vowels. Therefore, this study involved an experiment to examine which vowels are perceived by Japanese speakers as cute.

Experiment

Task and stimuli

In this study's task, given a pair of two nonce words, participants were asked which name sounds cuter than the other. Japanese has a five-vowel system: /i, e, a, o, u/. Therefore, the present study compared /a, i/ with /u, e, o/ as well as compared /a/ with /i/ (provided that these two vowels sound cuter than other vowels). Table 1 presents examples of pairs of stimuli (relevant files for the present experiment are available at the Open Science Framework (OSF) repository: https://osf.io/n9vku/). Set 1 compared /a, i/ with /u, e, o/. Set 2 compared /a/ with /i/. Each set had two conditions: whether the surrounding consonants were sonorants or voiceless obstruents. Each condition comprised eight pairs. A total of 32 pairs (= 2 sets * 2 conditions * 8 pairs) were presented. All nonce words were three-mora long. See the OSF repository for all stimuli.

Table 1. Examples of pairs of stimuli.

Set	Vowels	Conditions	Examples
1	ai (vs. ueo)	sonorants	/minari/ (ai) vs. /monere/ (ueo)
		voiceless obstruents	/kasiti/ (ai) vs. /kesuto/ (ueo)
2	a (vs. i)	sonorants	/manara/ (a) vs. /miniri/ (i)
		voiceless obstruents	/kasata/ (a) vs. /kisiti/ (i)

Procedure

The experiment was implemented online using the SurveyMonkey (surveymonkey.com) questionnaire platform. Participants were recruited in May 2024 using the buy-response function provided by the company. Participants were first asked to agree to participate via a consent form. They were allowed to participate if their first language was Japanese and if they had never studied sound symbolism. Subsequently, participants were required to select which name sounded cuter (*kawaii* in Japanese) between the two nonce words. Additionally, they were instructed to provide an answer after pronouncing each name, as written stimuli were used. The stimuli were presented with Japanese katakana characters (the orthography typically used for loanwords), similar to those used in previous experiments on cuteness in Japanese (e.g., Kumagai 2022). Thirty-two pairs of stimuli were randomly presented to each participant.

Participants

In total, 150 participants completed the task. Of these, 71 participants were females, 68 were male, and 11 did not select any gender. Twenty-two were aged 18−29 years, 89 were aged 30−44 years, and 39 were aged 45−60 years.

Statistics

The results were analysed with a Bayesian mixed-effects logistic regression, using 'brms' (Bayesian regression model using Stan; Bürkner 2017) in R version 4.2.2 (R Core Team 2022). Regression analysis was performed for each set of stimuli. The dependent variable was binary (1 vs. 0): it was coded as '1' when a stimulus group (/a, i/ for Set 1; /a/ for Set 2) was selected as a cute name, and '0' when the other stimulus group was selected as a cute name. The independent variables were the consonant type (sonorants vs. voiceless obstruents) and vowel type (/a, i/ vs. /u, e, o/ for Set 1; /a/ vs. /i/ for Set 2). The interaction between the vowel and consonant types was included in the model. Additionally, the analysis included by-stimulus and by-participant random intercepts, as well as by-participant random slope adjustments to the vowel and consonant types. See the OSF repository for details.

Results

Table 2 presents the rates at which the /a, i/-containing words (Set 1) or /a/-containing words (Set 2) were selected as cute names (see the OSF repository for graphs). For Set 1, the coefficient for /a, i/-containing words was positive (coefficient (β)=0.53, error (E)=0.34), but the 95% Credible Interval (CI) included 0 ([−0.16, 1.21]). Thus, it was unclear whether the difference between the two groups was credible. Meanwhile, the coefficient for the interaction between /a, i/ and voiceless obstruents was positive (β=1.42, E=0.46), and the 95% CI did not include 0 ([0.50, 2.32]). Thus, /a, i/-containing words were perceived as cuter when they contained voiceless obstruents as opposed to when they contained sonorants.

Table 2. Rates.

Set	Vowels	Conditions	Rates
1	ai (vs. ueo)	sonorants	/minari/=0.552 (vs./monere/)
		voiceless obstruents	/kasiti/=0.688 (vs./kesuto/)
2	a (vs. i)	sonorants	/manara/=0.462 (vs./miniri/)
		voiceless obstruents	/kasata/=0.524 (vs./kisiti/)

For Set 2, the coefficient for /a/-containing words was negative (β=−0.46, E=0.32), but since the 95% CI included 0 ([−1.09, 0.15]), I cannot say that the difference between /a/ and /i/ was credible. For the interaction between /a/ and voiceless obstruents, the coefficient was positive (β=0.72, E=0.37), but the 95% CI included 0 ([−0.00, 1.46]).

Discussion and conclusion

The present experiment showed that the /a, i/-containing words were perceived as cuter in the voiceless obstruent condition than in the sonorant condition. Thus, the combination of /a, i/ and voiceless obstruents enhanced the image of cuteness. This may be attributable to the cuteness effect of consonants: sonorants have a stronger effect of cuteness than obstruents (Kumagai 2022). Therefore, the cuteness effect of sonorants may have cancelled out that of vowels in the sonorant condition.

The present experiment suggests that /a, i/ can be associated more with cuteness than /u, e, o/. I propose at least two hypotheses to explain this result. The first is the babyishness hypothesis, which states that the early-acquired sounds are associated with images of babies or cuteness (see Kumagai 2022 for an explanation of 'cute' consonants). Acquisition progresses through contrasts of two phonemes. For vowel acquisition, first, the wide vowel is opposed to a narrower vowel (e.g., *papa* vs. *pipi*, Jakobson 1941). Considering this, /a, i/ are considered as early-acquired sounds, which can be associated with the image of babies or cuteness. However, to the best of my knowledge, there is no corpus-

based evidence to suggest that /a, i/ are acquired earlier than /u, e, o/ in Japanese. If such evidence is found, then the babyishness hypothesis will be supported.

Second, I propose an alternative, the familiarity hypothesis, which states that 'familiar' sounds are associated with cuteness. This is based on a psychological study showing that cuteness (kawaii) is closer to 'familiar' than 'unfamiliar' (Nittono 2016). Japanese orthography uses hiragana and katakana, each letter of which consists of either a combination of one consonant and one vowel (e.g., /ka/ 'か'), a moraic nasal alone (/ɴ/ 'ん'), or a vowel alone (e.g., /a/ 'あ'). In the hiragana and katakana syllabaries, the five vowels are ordered as follows: /a/ 'あ', /i/ 'い', /u/ 'う', /e/ 'え', /o/ 'お'. An important point here is that the vowels /a, i/ precede the other three vowels in the syllabaries, which may allow Japanese people to become more familiar with /a, i/ than with /u, e, o/.

Therefore, /a, i/ may be considered as 'familiar' vowels, which are associated with cuteness. However, a drawback of this hypothesis is that there is no reason for the borderline to appear between /a, i/ and /u, e, o/.

In conclusion, this study showed that Japanese speakers tended to perceive words containing /a, i/ as cuter than those containing /u, e, o/ in a particular condition. Whether the two proposed hypotheses are plausible requires further investigation.

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