

## **In sound symbolic effects, visual dimensions interact: The case of vowel quality and cuteness**

Sound symbolism describes the phenomenon that certain sounds become meaningful when combined with sensory information. Among the different types of sound symbolism, size sound symbolism is one of the most prominent ones. It describes that some speech sounds, e.g. /i/, are associated with smallness, while other speech sounds, e.g. /a/, are associated with bigness (Knoeferle et al. 2017). While size sound symbolism has been rather extensively researched during the last decades (Blasi et al. 2016), there is barely any research available connecting size to other visual dimensions. The present investigation aims to deliver results to fill this research gap by connecting size to one such dimension: cuteness.

Cuteness, as from its biological perspective comprised in the so-called “infant schema” (Lehmann, Huis in’t Veld & Vingerhoets 2013), is not only considered a fundamental feature of human perception that correlates with size (Kringelbach et al. 2016), but research on Japanese has shown that cuteness is also found as a factor for sound symbolism (Kumagai 2019).

Taking into account both size and cuteness, the present study aims at establishing a relation from “small” to “big” and from “not cute” to “cute” for long vowels of Standard German (i.e. /a:, ε:, e:, i:, o:, ø:, u:, y:/), providing further insight into the multimodal nature of sound symbolism and interactions therein.

Following a pilot study with 21 participants (Schmitz 2022), a full-sized study with 124 participants consisting of two online forced-choice tasks was conducted. As auditory stimuli, disyllabic pseudowords were used. Pseudowords were made use of to control for potentially confounding lexical (Caselli, Caselli & Cohen-Goldberg 2016) and contextual (Klatt 1976) effects. In either syllable of a stimulus, nuclei consisted of one of the vowels under investigation. The simplex onsets of the open syllables consisted of one consonant, i.e. /d, f, j, k/ or /r/. In total, 96 pseudowords were used. Images of phantasy creatures (van de Vijver & Baer-Henney 2014) were used as visual stimuli. In each trial of the first forced-choice task, a size judgement task, participants were shown five differently sized versions of a randomly chosen creature. The participants’ task was to decide which image version, i.e. which size, matched the audio stimulus of a trial best. As cuteness judgements likely differ by participants, in the second forced-choice task, a cuteness judgement task, participants were again shown all creature images to judge them for their cuteness on a five-point scale.

The size responses then entered three ordinal logistic regression analyses in generalised additive mixed models as dependent variable. Cuteness judgements, vowel quality, onset consonant types and phonological neighbourhood density were introduced as independent variables, while participant ID and age were included as random effects. Taking into account vowel quality as the sole predictor of interest for size, it was found that /a:/ is considered bigger than all other vowels, while /i:, y:/ are considered smallest. Testing cuteness as sole predictor of interest for size, it was found that higher cuteness ratings are associated with smaller size. Coming to the interaction of interest, i.e. the interaction of vowel quality and cuteness, it was found that the size response of the open vowel /a:/ increased with cuteness, while the size response of the close vowels /i:, y:/ further decreased. That is, the vowel /a:/, which was already

on its own associated with the biggest size, comes with an even bigger size when combined with very cute creatures. Contrarily, the vowels /i:/, y:/, which were already on their own associated with the smallest size, come with an even smaller size when combined with very cute creatures.

The present findings demonstrate that cuteness amplifies the effect of size sound symbolism – a finding potentially related to the infant schema in human perception. The results indicate that sound symbolic effects manifest in intricate interactions when multiple visual dimensions are given, calling for the incorporation of multiple dimensions into analyses when applicable.

## References

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