THAT'S (NOT) ABOUT THE SIZE OF IT: SOUND-SYMBOLIC EFFECT OF LABELS ON SIZE PERCEPTION

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Sound symbolism is a set of cross-culturally common iconic associations between perceptual features, such as size, roundness or weight, and phonetic features of speech sounds (Sidhu & Pexman, 2018). A growing number of papers provides support to the notion that sound symbolism plays a role in the dynamics of language change on time scales from developmental (Imai et al., 2008) to cultural (Carr et al., 2018) to evolutionary (Cuskley & Kirby, 2013). Research suggests multiple functions it could serve and have served in language evolution, including a rather fundamental one – bootstrapping the emergence of language in the human lineage. Specifically, Cuskley and Kirby (2013) hypothesize that sound symbolism could have provided a foundational resource for the emergence of protolanguage via iconic cross-modal associations that were used for communication.

Thus, understanding the mechanics of sound symbolism is important for theories of language evolution. However, many questions remain understudied, including the question of the mechanism: what underlies the iconic mappings in sound symbolism? A frequently assumed answer is that sound symbolism works broadly like other cross-modal correspondences, e.g. between (non-vowel) pitch and size (Ramachandran & Hubbard, 2001). As cross-modal correspondences are not unique to humans, a common mechanism for the two types of phenomena would make the sound-symbolic bootstrapping of (proto)language hypothesis evolutionarily plausible (Cuskley & Kirby, 2013). The similarities between the phenomena make this assumption justifiable, but it cannot be blindly taken for granted, as important differences exist as well. For example, sound-symbolic mappings involve more complex features (e.g. vowel height) compared to other cross-modal correspondences (Parise, 2016). If sound-symbolic relationships are not bidirectional, the idea that they work like other

types of cross-modal correspondences needs to be reexamined or further fleshed out. That, in turn, would affect the sound-symbolic bootstrapping hypothesis and other theories of the role of sound symbolism in language evolution that rely on this assumption. In order to shed more light on this question, we focus on bidirectionality of sound-symbolic mappings, as it is typically assumed that cross-modal correspondences are bidirectional (Deroy & Spence, 2013), but whether that is the case for sound symbolism has not been tested.

We investigated this question experimentally by testing whether people would more often misremember shapes as being smaller when they were given a nonword with a front vowel (/i/), as compared to a back vowel (/u/) in a forced choice task. We focused on this sound-symbolic mapping due to extensive research on the effect of vowel frontness and height on size perception (Sapir, 1929; Newman, 1933; Thompson & Estes, 2011; Knoeferle et al, 2017). Each shape was once paired with an /i/-nonword and once with an /u/-nonword. In each experimental trial, a shape accompanied by a nonword with CVC structure appeared on the screen for 5 seconds. Participants were instructed to remember the name of the shape. Following a 5 second presentation of a fixation cross, the participants were asked to type in the name of the shape without any feedback, after which they were presented with two shapes – one smaller than the original and one larger – and were asked to choose which shape they saw earlier.

Analyses of data from 63 participants (45 female, mean age = 20.03, SD = 1.67) using mixed effects logistic regression show a significant effect of vowel on shape size perception ($\chi 2 = 3.8635$, $p < 0.05$): participants chose the smaller picture 44.95% of the time when the nonword contained /u/, and 50.13% of the time when it contained /i/ (Fig. 1). The result thus supports the bidirectionality of sound-symbolic associations. That, in turn, supports the evolutionary plausibility of the role of sound symbolism in early stages of language evolution by contributing evidence for the continuity between sound-symbolic and other cross-modal associations.

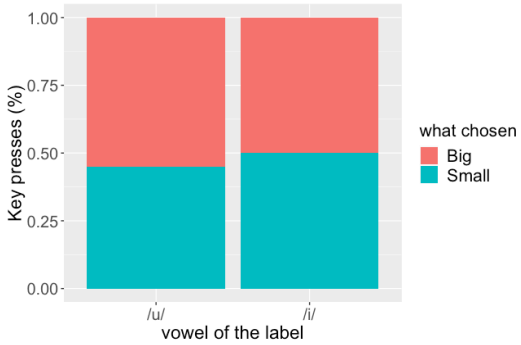

Fig 1. X-axis indicates the nonword vowel; the y-axis shows the percentage of choices for all participants. The color indicates which size choice was chosen by participants.

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