Arash Aryani, Erin S. Isbilen, Morten H. Christiansen

Meaning as Aroused by Sound: Revisiting the Bouba-Kiki Effect

Abstract:

A striking demonstration of the systematicity of sound-meaning correspondences can be found in how both children and adults from across the world reliably map nonsense words such as bouba to rounded shapes and kiki to spiky shapes (e.g., Bremner et al., 2013; Köhler, 1929; Ozturk et al., 2013). Despite the widespread documentation of this bouba/kiki effect, the cognitive processes that underlie this matching bias have remained controversial. Prior explanations have varied from orthographical influences (Cuskley et al., 2015), the existence of analogies in different sensory modalities (Ramachandran & Hubbard, 2001), to cross-modal statistical learning (Spence, 2011). Given the cross-cultural existence and the implicitness of this phenomenon, we hypothesized that the affective arousal evoked by the sound and the shape of the paired stimuli may be a crucial factor mediating the association between these two different sensory domains.

To test this hypothesis, we first collected subjective ratings of arousal for a number of shapes and words used in previous bouba/kiki studies (Experiment 1). Our analyses showed that the ratings of arousal significantly differ across two matching categories, with kiki-like words and spiky shapes evoking higher levels of arousal than bouba-like words and rounded shapes. We next developed a novel measure of assessing the level of arousal of the words (Experiment 2), by generating a corpus of pseudowords and collecting arousal ratings of their sound. By extracting the acoustic features of pseudowords, we developed acoustic models that strongly predict the variation in the human ratings. Applying these models to the bouba/kiki words from previous studies demonstrated that the predicted values of arousal of kiki-like words were consistently higher than those of bouba-like words. Lastly, we conducted a classic bouba/kiki task (Experiment 3) using the same rounded/spiky shapes from previous studies combined with a new set of words that we categorized in two groups of high-arousal-sounding vs. low-arousal-sounding based on the previous ratings. In line with our hypothesis, participants matched low-arousal-sounding words significantly more with rounded shapes and high-arousal-sounding words with spiky shapes.

Taken together, these results provide support for the idea that the crucial link underlying the matching bias in the bouba/kiki effect is the level of perceived arousal of the stimuli, i.e., the sound of words and the form of shapes. Our findings shed new empirical light on an old phenomenon, drawing attention to the role of emotion as a mechanism linking information from different sensory modalities.
References:


