

S6.1 INTRINSIC ASSOCIATIONS IN NON-SYNESTHETIC POPULATION BETWEEN SOUND AND COLOR

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Previous studies on synesthesia have suggested non-random association between sounds of linguistic units and colors (Asano & Yokosawa, 2011; 2012; Shin & Kim, 2014). A work in our group also showed that graphemes sharing phonetic rules—i.e., the place and the manner of articulation—tend to induce similar synesthetic colors across multiple languages (Kang et al., ASSC 2014). In the present study, we investigated whether phonetic properties are associated with colors in a specific manner even when other visual and linguistic features of graphemes are removed. In Experiment 1, we employed Haskins Laboratories articulatory synthesizer to generate vowel sounds as stimuli by systematically manipulating voice gender and tongue body position ('frontness' and 'height'). In Experiment 2, we synthesized consonant-vowel (CV) sounds by manipulating the organ of constriction (lips, tongue tip, tongue body), constriction degree, glottal gestures, and velum gestures. Participants including both synesthetes and non-synesthetes were tested with a modified version of the standardized color-matching procedure (Eagleman et al., 2007) to choose a color after hearing each sound. Results from Experiment 1 showed difference in both saturation and value of matched colors between male and female voices. In addition, HSV values and CIE Lab color coordinates of matched colors showed systematic variation along the two axes of the tongue body position. Results from Experiment 2 showed that CV sounds with the same glottal (e.g., /peh/, /teh/, /keh/) or the same velum (e.g., /me/, /ne/, /nge/) gestures tended to be associated with more similar colors than others. Taken together, these results imply that the association between phonetic features and colors is not random, and this synesthetic association is extended to individuals without synesthesia.