

Graphemes sharing phonetic properties tend to induce similar synesthetic colors.

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People with grapheme-color synesthesia experience idiosyncratic colors when viewing achromatic letters and digits. Despite large individual differences, researchers have suggested determinants of grapheme-color associations (Asano & Yokosawa, 2011; Brang et al., 2011). A work in our group, for example, showed that graphemes with similar sounds tend to induce analogous synesthetic colors (Shin & Kim, 2011). In the present study, we extended the previous finding and examined whether graphemes categorized the same based on the phonetic rules – i.e., the place and the manner of articulation – are associated with similar synesthetic colors. Four Korean multilingual synesthetes matched “colors” they experience while viewing achromatic graphemes in Korean, English and Japanese. The matched RGB values were converted into x y coordinates on the CIE xyY color space. The distance between each pair of graphemes was taken as an index for synesthetic color similarity. In terms of the place of articulation, graphemes in the alveolar category induce more similar synesthetic colors than others. In terms of the manner of articulation, graphemes which are categorized as stop sounds tend to be associated with similar synesthetic colors. These results are noticeable since graphemes that are not transliterated into each other (e.g., ‘s’ and ‘ㄴ’(Korean grapheme sounded as /n/)’ in Alveola) belong to each phonetic category as well as graphemes that are. These results imply that the phonetic properties of graphemes across multiple languages, not just conceptual similarity based on their sounds, are what really matter in determination of their synesthetic colors.

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