Linguistic factors of grapheme-color synesthesia in Chinese characters

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Grapheme-color synesthetes experience unusual color percepts when seeing colorless letters and/or digits. In studies of English-speaking synesthetes, although the same grapheme does not elicit the same color in different individuals, the synesthetic color may be triggered via similar rule-based linguistic mechanisms. However, the rules and mechanisms that may predict synesthetic color trigger are still uninvestigated in logographic languages such as Chinese. We thus examined how linguistics factors in Chinese, including characteristics of a whole character (word frequency, semantic meaning, number of radicals, etc.) and its radicals (including position, semantic meaning, semantic transparency, etc.), may influence color mapping of Chinese character-color synesthetes. In our pilot study, we measured the number of elicited synesthetic color (zero, one, two or more) and the nature of synesthetic color (hue, saturation and luminance). We found that the hue of synesthetic colors was likely influenced by radical meaning and semantic transparency. Our results suggest that in Chinese, synesthetic colors are influenced by some linguistic rules rather than mere random associations. By continuing this research, we might eventually reach a better understanding of Chinese character processing and lexical access, which would grant us a novel way to look at the linguistic-rule differences between English and Chinese.

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