Conscious Awareness of Inducing Stimulus is Necessary for Synesthetic Color Perception

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Background
People with color-graphemic synesthesia experience vivid colors when viewing achromatic alphanumeric characters. The question of whether an inducing character should be consciously perceived for synesthetes to experience synesthetic color has been examined extensively, but experimental results to date have been providing a mixed picture [1-5]. We performed a couple of experiments to investigate the role of conscious visual awareness in synesthetic color experiences.

1. Stimulus visibility manipulated by CFS
We manipulated the visibility of a character by exploiting a psychophysical technique, CFS. A full contrast dynamic CFS display was used to suppress a target character presented to the other eye for a few seconds. Using two kinds of comparison conditions - 1) chromatic non-inducing character vs. achromatic inducing character, 2) congruently colored vs. incongruently colored inducing characters - we tested 1) whether synesthetic color can be induced by invisible inducing character, and 2) whether synesthetic color congruence effect is observed when inducing character is outside of awareness.

Methods
Comparison conditions - 1) real vs. syn, 2) congruent vs. incongruent
- 2-AFC "color" task (red/blue)

Results
The character was not able to induce synesthetic color when it was presented outside of conscious awareness.

Conclusions
- We found no evidence of synesthetic color experience when inducing stimulus is outside of conscious awareness.
- Additional time is required for synesthetic color experience after an inducing character is recognized.
- Taken together, our results indicate the necessity of conscious awareness of inducing stimulus for synesthetic color experience.

References:

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