

Learning and memory may play a central role in synesthesia

January 23 2013

People with color-grapheme synesthesia experience color when viewing written letters or numerals, usually with a particular color evoked by each grapheme (i.e., the letter 'A' evokes the color red). In a new study, researchers Nathan Witthoft and Jonathan Winawer of Stanford University present data from 11 color grapheme synesthetes who had startlingly similar color-letter pairings that were traceable to childhood toys containing magnetic colored letters.

Their findings are published in *Psychological Science*, a journal of the Association for [Psychological Science](#).

Matching data from the 11 [participants](#) showed reliably consistent letter-color matches, both within and between testing sessions (data collected online at <http://www.synesthete.org/>). Participants' matches were consistent even after a delay of up to seven years since their first session.

Participants also performed a timed task, in which they were presented with colored letters for 1 second each and required to indicate whether the color was consistent with their synesthetic association. Their data show that they were able to perform the task rapidly and accurately.

Together, these data suggest that the participants' color-letter associations are specific, automatic, and relatively constant over time, thereby meeting the criteria for true [synesthesia](#).

The degree of similarity in the letter-color pairings across participants,

along with the regular repeating pattern in the [colors](#) found in each individual's letter-color pairings, indicates that the pairings were learned from the [magnetic](#) colored letters that the participants had been exposed to in childhood.

According to the researchers, these are the first and only data to show learned synesthesia of this kind in more than a single individual.

They point out that this does not mean that exposure to the colored letter magnets was sufficient to induce synesthesia in the participants, though it may have increased the chances. After all, many people who do not have synesthesia played with the same colored letter magnets as kids.

Based on their findings, Witthoft and Winawer conclude that a complete explanation of synesthesia must incorporate a central role for learning and memory.

Provided by Association for Psychological Science

Citation: Learning and memory may play a central role in synesthesia (2013, January 23)
retrieved 20 April 2024 from

<https://medicalxpress.com/news/2013-01-memory-central-role-synesthesia.html>

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