

# Color my numbers

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For as many as 1 in 20 people, everyday experiences can elicit extraordinary associated sensations. The condition is known as synaesthesia and the most common form involves "seeing" colours when reading words and numbers. Many previous studies have shown that the brains of people who experience this phenomenon are different from those who do not and, in a new study reported in the February 2010 issue of *Cortex*, researchers from the University of Padova, Italy, have discovered that learning may also play an important role in synaesthesia and can lead to synaesthetic behaviour even when the person is not consciously aware of the experience.

Dr Ilaria Berteletti and colleagues tested an Italian synaesthete using a classic test, in which the participant was shown a series of numbers presented in different ink colours and asked to name those colours. A synaesthete for whom the number 2 is red will find it more difficult to name the ink colour of a green 2 than if the number is presented in red ink and will take longer to respond. This slowing of response is generally taken as evidence that synaesthetic experiences are real and automatic.

As predicted, the participant in this study was slower to name the colours of the presented Arabic digits when they did not match the colours that he had reported "seeing". Strikingly, the same slowing was observed when the numbers were presented as dots, such as dice patterns, even though the participant denied seeing any colours for these types of stimuli. The results suggest that the mere concept of a number, regardless of how it was presented visually (as an Arabic digit or pattern of dots), was enough to produce the marker of synaesthetic behaviour,

even when the participant was not conscious of experiencing synaesthesia.

According to co-author Dr Edward Hubbard, "a lifetime of synaesthetic experiences may lead to the creation of learned associations between different classes of stimuli" and that "conscious awareness of these associations is not necessary for them to affect behaviour".

**More information:** Cortex is available online at [www.sciencedirect.com/science/journal/00109452](http://www.sciencedirect.com/science/journal/00109452)

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