Memory—recognizing images seen briefly ten years previously

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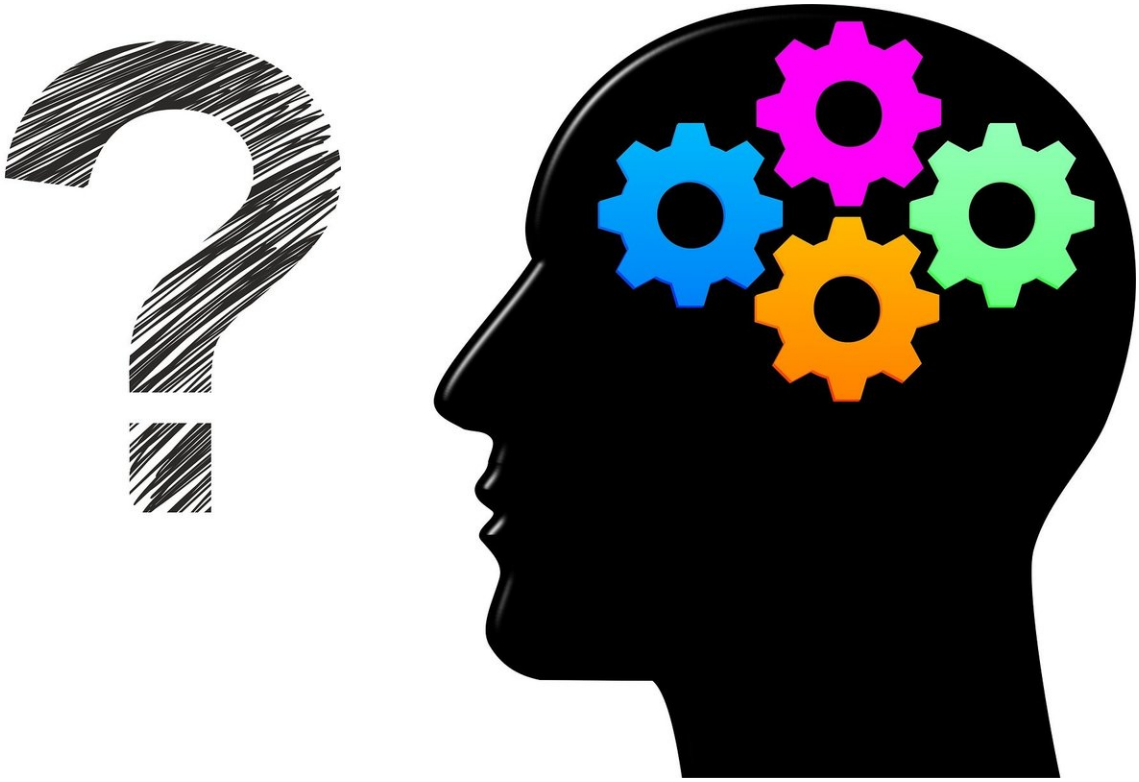

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Recalling the names of old classmates 50 years after graduation or of favorite childhood television series illustrates the amazing abilities of human memory. Emotion and repeated exposure are both known to play a role in long-term memorization, but why do we remember things that

are not emotionally charged and have only been seen or experienced a few times in the past? To answer this question, scientists from the Centre de recherche cerveau & cognition research unit (CNRS/Université Toulouse III—Paul Sabatier)1 decided to challenge the memory of individuals they had tested in the laboratory a decade previously. They discovered that participants recognized images seen for only a few seconds ten years earlier. These findings were published online on November 5, 2017, in *Cognition*.

When conducting laboratory tests, it is difficult to account for key factors involved in memorization. Yet it is known that frequent exposure to sensory data translates into durable memories. And that something seen or experienced only once might never be forgotten when strong emotions are involved.

The researchers in this study were able to control for these variables—i.e., emotional context and number of exposures—and evaluate another type of memorization. They asked 24 people (having no memory disorders) tested in the laboratory ten years previously to return for new tests. A decade earlier, the same individuals had been shown a sequence of simple clipart images, each for only a few seconds, without being given any particular instructions to memorize them. When they returned to the lab in 2016, participants were asked to identify these pictures presented in pairs alongside new images.

On average, those surveyed obtained 55 percent correct answers, compared with 57 percent in the case of images already seen at least three times and up to 70 percent for some participants (one third of whom scored between 60 percent and 70 percent).

Under these experimental conditions, it seems that three exposures are sufficient to memorize an image for 10 years. Although scientists have known for several years that memories can be retained implicitly—that

is, without being able to consciously access them—this new study shows that they can directly influence participants' choices and may sometimes even provoke a strong feeling of familiarity.

The researchers are now seeking to elucidate the biological basis for this memorization. They hypothesize that such memories rely on a small group of ultra-specialized neurons rather than a wide and diffuse neuronal network.

More information: Christelle Larzabal et al. Extremely long-term memory and familiarity after 12 years, *Cognition* (2017). DOI: 10.1016/j.cognition.2017.10.009

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