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Mind Control: Hypnosis offers amnesia clues

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Hypnosis can make some people forget and, when given a special cue, quickly remember recently viewed scenes. A new study using the technique may shed light on the process of memory retrieval and the potential for one part of the brain to block it. Hypnosis-induced memory suppression may also expand understanding of amnesia.



TOTAL RECALL. Subjects were asked to remember these documentary scenes—after they had received a hypnotic command to forget. The Dudai lab, Weizmann Institute

Whenever the mind retrieves information, any number of memories might be conjured up by association. Yadin Dudai of the Weizmann Institute of Science in Rehovot, Israel, wondered how the brain selects only one memory and excludes many others.

Memory suppression is usually a healthy mental process that allows people to operate without the burdensome recollections of irrelevant or traumatic events. The process goes wrong in those with psychogenic amnesia, in which a person temporarily cannot recall certain life events.

Because amnesiac victims are difficult to study, Avi Mendelson, a graduate student in Dudai's laboratory, used hypnosis to induce memory suppression. He showed participants in the study, including a control group who were not susceptible to hypnosis, a documentary film. Recalling the content of the documentary taxes the same type of memory that records autobiographical episodes.

One week later, Mendelson attempted to hypnotize all the participants and gave them an instruction to forget the movie. Out of the hypnotic state, they answered yes-or-no questions about the movie while their brains were scanned. He then repeated the process, this time telling participants to remember the movie.

Clear differences turned up between the brain scans of participants susceptible to hypnosis and those who weren't, the researchers report this week in the Jan. 10 *Neuron*. In general, scans of nonsusceptible participants showed more activity in

many brain regions during recall than scans of the susceptible group. But the brains of those under the hypnotic command did show more activity in a part of the prefrontal cortex.

"In normal memory retrieval there is a set of areas that are important," Dudai explains, "so we suggest that this area in the left rostrolateral prefrontal cortex is abating this process early on, halting activity that would occur downstream." In other words, the area denies access to memory-related regions until the hypnotic cue to remember flips its switch.

Some experts express skepticism for the poorly understood technique. Larry Squire, a neuroscientist at the University of California, San Diego, wonders about the supposedly suppressed memories of the hypnotized. "What if participants were told to try harder?" he says. "What if they were offered money to remember?"

References:

Mendelson, A.Y. . . . and Y. Dudai. 2008. Mesmerizing memories: Brain substrates of episodic memory suppression in posthypnotic amnesia. *Neuron* 57(Jan. 10):159-170. Available at <http://www.neuron.org/content/article/fulltext?uid=PIIS0896627307009828>.

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