

Hypnosis Gaining Ground in Medicine

By Alex Lyda

In the world of conventional medicine, hypnosis has struggled to gain legitimacy as a therapeutic medical tool. More often, hypnosis is seen as a form of entertainment imbued with a certain vaudevillian quality that has made it the subject of ridicule.

That misperception is changing, however, as neuroscientists over the last decade have stepped up their study of hypnosis. The research of Columbia Assistant Professor of Clinical Neuroscience



Amir Raz

Amir Raz has contributed considerably to the credibility of this emerging field.

A new study by Raz reported recently in the *Proceedings of the National Academy of Sciences of the United States of America* shows how a specific form of hypnotic suggestion can dramatically alter brain activity in highly hypnotizable individuals, allowing them to regulate their experience of pain and override brain processes commonly considered to be involuntary or automatic, such as recognizing and reacting to certain visual cues, in this case, words.

Highly hypnotizable individuals, approximately 10–15 percent of the adult population, are people who, for reasons not entirely understood, demonstrate heightened compliance with suggestion. Raz, who conducted much of his research at Cornell University's Sackler Institute for Developmental Psychobiology, says his latest findings may shed light on behavioral phenomena and even notions of consciousness, including the power of suggestion in placebo trials and psychotherapy.

Raz's latest findings, part of a series of such studies, show the effect of suggestion on the brain using two convergent neuroimaging methodologies: functional Magnetic Resonance Imaging (fMRI) and event-related potentials (ERP) which measure brain activity by tracking changes in the magnetic properties of oxygenated blood and monitoring the electrical signals from areas closest to the scalp.

His findings show how the brains of highly hypnotizable individuals can undergo marked changes following a specific post-hypnotic suggestion.

Raz based his experiments on a well-known method of inducing conflict in the brain: the Stroop effect. To activate this effect, words such as "blue," "green" and "red" are printed in a color different from the color to which the word refers. When individuals are asked to name the ink color in which the words are printed, rather than read the words, they experience

difficulty (i.e., cognitive conflict). Reading the word "green" printed in red ink, for instance, produces the Stroop effect, because it is harder to say "red" when you read "green" than to read a color-independent word, or a word inked in its own color. This effect activates the specific areas of the brain that are involved in processing cognitive conflict.

With the help of ERP and fMRI, Raz was able to show that these brain regions can be effectively turned off by hypnotic suggestion. "When we look at what is happening inside the brain using a combination of these fancy technologies we can see not only what is happening in the brain but also when and where things occur as people perform attentional tasks," Raz says.

In line with his previous work, Raz's neuroimaging findings show that a specific brain area which regulates automatic processes, the anterior cingulate cortex (ACC), "lights up" when individuals perform the Stroop task without suggestion. However, the ACC tends to turn off when highly hypnotizable individuals perform the task under the suggestion that these English words should be perceived as gibberish.

"At least for highly suggestible people, words framed as part of a carefully-crafted suggestion can change focal brain activity in a way no drug we have can do," Raz says.

In the future, says Raz, it might be possible to use suggestion to help individuals with impairments gain better control over their actions. The potential therapeutic use for these findings may be extended to so-called "impulse control" disorders such as bulimia, an eating disorder associated with self-induced vomiting that becomes automatic with time.

"Whether we can regain control over a process that has been automatized is a question that received little or no discussion, leaving it unanswered, and mostly unasked," says Raz. "Our research shows that we can un-ring the bell. At least in highly suggestible people, we can take an automatic process and make it less automatic using suggestion."

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