Not getting sleepy? Study explains why hypnosis doesn't work for all

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Not everyone is able to be hypnotized, and new research from the Stanford University School of Medicine shows how the brains of such people differ from those who can easily be.

The study, published in the October issue of Archives of General Psychiatry, uses data from functional and structural magnetic resonance imaging to identify how the areas of the brain associated with executive control and attention tend to have less activity in people who cannot be put into a hypnotic trance.

"There's never been a brain signature of being hypnotized, and we're on the verge of identifying one," said David Spiegel, MD, the paper's senior author and a professor of psychiatry and behavioral sciences. Such an advance would enable scientists to understand better the mechanisms underlying hypnosis and how it can be used more widely and effectively in clinical settings, added Spiegel, who also directs the Stanford Center for Integrative Medicine.

Spiegel estimates that one-quarter of the patients he sees cannot be hypnotized, though a person's hypnotizability is not linked with any specific personality trait. "There's got to be something going on in the brain," he said.

Hypnosis is described as a trance-like state during which a person has a heightened focus and concentration. It has been shown to help with brain control over sensation and behavior, and has been used clinically to help patients manage pain, control stress and anxiety and combat phobias.

Hypnosis works by modulating activity in brain regions associated with focused attention, and this study offers compelling new details regarding neural capacity for hypnosis.

"Our results provide novel evidence that altered functional connectivity in [the dorsolateral prefrontal cortex] and [the dorsal anterior cingulate cortex] may underlie hypnotizability," the researchers wrote in their paper.

For the study, Spiegel and his Stanford colleagues performed functional and structural MRI scans of the brains of 12 adults with high hypnotizability and 12 adults with low hypnotizability.

The researchers looked at the activity of three different networks in the brain: the default-mode network, used when one's brain is idle; the executive-control network, which is involved in making decisions; and the salience network, which is involved in deciding something is more important than something else.

The findings, Spiegel said, were clear: Both groups had an active default-mode network, but highly hypnotizable participants showed greater co-activation between components of the executive-control network and the salience network. More specifically, in the brains of the highly hypnotizable group the left dorsolateral prefrontal cortex, an executive-control region of the brain, appeared to be activated in tandem with the dorsal anterior cingulate cortex, which is part of the salience network and plays a role in focusing of attention. By contrast, there was little functional connectivity between these two areas of the brain in those with low hypnotizability.

Spiegel said he was pleased that he and his team found something so clear. "The brain is complicated, people are complicated, and it was surprising we were able to get such a clear signature," he explained.

Spiegel also said the work confirms that hypnotizability is less about personality variables and more about cognitive style. "Here we're seeing a neural trait," he said.

The authors' next step is to further explore how

these functional networks change during hypnosis. Spiegel and his team have recruited high- and low-hypnotizable patients for another study during which fMRI assessment will be done during hypnotic states. Funding for that work is being provided by the National Center for Complementary and Alternative Medicine.

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