

Brain scans show how hypnosis can paralyze a limb

AP Associated Press

By MALCOLM RITTER, AP Science Writer

NEW YORK – How can a hypnotist paralyze your hand just with words? By making a part of your brain butt in on the process that normally makes your hand move, a study says. So the brain region that's ready to move your hand ignores its usual inputs and listens to this interloper, which says, "Don't even bother," the research concluded.

It's "a kind of reconnection between different brain regions," said Yann Cojan, a researcher at the University of Geneva in Switzerland.

He's an author of the study in Thursday's issue of the journal *Neuron*. It used brain scans to show what happened when 12 volunteers tried to move a hand that had been paralyzed by hypnosis.

Results showed the right motor cortex prepared itself as usual to tell the left hand to move. But the cortex appeared to be ignoring the parts of the brain it normally communicates with in controlling movement. Instead, it acted more in sync than usual with a different brain region called the precuneus. That was a surprise, Cojan said.

The precuneus is involved in mental imagery and memory about oneself. Cojan suggests it was brimming with the metaphors the participants had heard from the hypnotist: Your hand is very heavy, it is stuck on the table, etc. So, he said, it might have been telling the motor cortex, "Oh, but your hand is too heavy, you can't move your hand."

It's as if the motor cortex "is connected to the idea that it cannot move (the hand) and so ... it doesn't send the message to move," Cojan said.

For the research, 12 participants had their brains scanned while doing a task that required them to push a button with one hand or the other. For some sessions, they were hypnotized and told their left hands were paralyzed. For other sessions, their mental status was normal. For comparison, six other participants simply pretended their left hands were paralyzed.

Dr. Richard Frackowiak, a brain expert at the University of Lausanne in Switzerland who didn't participate in the study, called the new work a "very valuable addition" to research into hypnotic paralysis.

Amir Raz, who studies hypnosis and the brain at McGill University in Montreal, said he found the work interesting. But he wondered if the results might partially reflect general effects of being under hypnosis, rather than the paralysis suggestion itself.

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"The Brain under Self-Control: Modulation of Inhibitory and Monitoring Cortical Networks during Hypnotic Paralysis" by Y. Cojan, L. Waber, S. Schwartz, L. Rossier, A. Forster, and P. Vuilleumier. *Neuron* (25 June, 2009), Volume 62, Issue 6.

Abstract: Popular theories consider hypnosis as a state of consciousness where volition is abolished. With functional neuroimaging, Cojan et al. investigate paralysis induced by hypnosis during a simple motor task. Activity related to motor intentions is preserved, indicating intact volition. Selective activations were found in regions mediating mental imagery and self-control, and these regions showed increased coupling with motor areas. These findings suggest that internal representations take control over behavior and perception during hypnosis

