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## Virtual reality experiments fool brain

By Denise Gellene  
LOS ANGELES TIMES  
08/24/2007

Exploring the connection between our mental and physical perceptions of ourselves, scientists said Thursday that they used virtual reality goggles to induce out-of-body sensations in healthy volunteers.

In simple experiments carried out by teams in Switzerland and England, test subjects looking at video images of themselves projected through the goggles reacted as if their own bodies had been touched when their virtual selves were stroked or poked.

Tricked by the illusion, participants reported feeling that their consciousness had drifted from their real bodies into their virtual ones.

The research helps explain the odd sense of floating outside their bodies that people sometimes experience after traumatic events, such as car accidents. Out-of-body experiences have also been reported in cases in which a critical area of the brain is damaged, either from stroke, epilepsy or cancer.

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The studies, published in the journal Science, "call into question the axiom that everything you are is anchored in your body," said Vilayanur S. Ramachandran, director of the center for the brain and cognition at the University of California at San Diego, who was not involved in the current research.

Instead, Ramachandran said, "what you regard as you is really a transient construct created by the brain from multiple sensory sources." When visual, tactile or other inputs don't line up, he said, the boundaries of self-perception shift.

### REAR VIEWS

In England, Dr. H. Henrik Ehrsson of University College London, asked 12 volunteers to wear virtual reality goggles while they sat in an empty room. A camera behind each participant projected an image of their backs. Thus, the participants viewed their own backs from the perspective of someone sitting behind them.

Ehrsson stroked each participant's chest with a stick, carefully keeping his arm and the stick out of the camera's view. At the same time, he moved his other arm in front of the camera, then dropped it down as if it were moving to rub the subject's virtual chest.

The subjects saw nothing happening to the image of themselves projected in the goggles. Yet, they could feel the stick on their own bodies. The result was a disorienting mismatch between the subject's tactile and visual senses.

When touched, participants reported they had the experience of drifting outside their own bodies toward the direction of the camera and viewing themselves from behind.

In the Swiss experiment, Dr. Olaf Blanke of Ecole Polytechnique Federale de Lausanne asked seven subjects to wear virtual reality goggles while standing in an empty room. A camera located behind each person projected three-dimensional images in front of them. Thus, participants felt as if they were standing behind themselves.

When their backs were stroked in sync with the virtual image, participants reported feeling that their consciousness had been transported to the body in front of them.

The studies "allow us to understand how consciousness works," said Susana Martinez-Conde, a scientist at the Barrow Neurological Institute in Phoenix, who had no connection to the latest research. "It is what makes us who we are, what makes us human."

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