

Scientists produce illusion of body-swapping

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Courtesy Karolinska Institute
and [World Science](#) staff

Cognitive neuroscientists at the Swedish medical university Karolinska Institute say they have made people perceive the bodies of mannequins and other people as their own. The findings are to appear Dec. 3 in the online research journal PLoS One.

“This shows how easy it is to change the brain’s perception of the physical self,” said the institute’s Henrik Ehrsson, who led the project. “By manipulating sensory impressions, it’s possible to fool the self not only out of its body but into other bodies too.”

The research was aimed at learning more about how the brain constructs an internal image of the body. The knowledge that the sense of bodily identification and self-perception can be manipulated to make people think that they have a new body may be useful in virtual reality applications and robot technology, according to the researchers.

In a first experiment, scientists fitted the head of a shop dummy with two cameras connected to two small screens placed in front of the subjects’ eyes, so that they saw what the dummy “saw.” When the dummy’s camera eyes and a subject’s head were directed downwards, the subject saw the dummy’s body where he/she would normally have seen his/her own.

The illusion of body-swapping was created when the scientist touched the stomach of both with two sticks. The subject could then see that the mannequin’s stomach was being touched while feeling, but not seeing, a similar sensation on his/her own stomach. As a result, the subject developed a powerful sensation that the mannequin’s body was his or her own, researchers said.

In another experiment, the camera was mounted onto another person’s head. When this person and the subject turned towards each other to shake hands, the subject perceived the camera-wearer’s body as his or her own.

“The subjects see themselves shaking hands from the outside, but experience it as another person,” said Valeria Petkova, who conducted the study with Ehrsson. “The sensory impression from the hand-shake is perceived as though coming from the new body, rather than the subject’s own.”

The strength of the illusion was confirmed by the subjects’ exhibiting stress reactions when a knife was held to the camera wearer’s arm but not when it was held to their own, investigators said. The illusion also worked even when the two people differed in appearance or were of different sexes. However, it wasn’t possible to fool the self into identifying with a non-humanoid object, such as a chair or a large block, the researchers noted.