

Sleight of hand and sense of self

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Participants had a rubber hand placed in their field of vision and their real hand concealed behind a partition.

(PhysOrg.com) -- An illusion that tricks people into believing a rubber hand belongs to them isn't all in the mind, Oxford University researchers have found. They have observed a physical response as well, a finding that offers insight into conditions which affect a patient's sense of self and body ownership, such as stroke, schizophrenia, autism, or eating disorders.

The rubber-hand illusion involves placing a rubber hand in front of the participant in their field of vision and near to their real hand. The real hand is then concealed behind a partition. If the real hand and the rubber hand are touched or stroked in the same way and at the same time, the participant tries to co-ordinate what they are feeling (their own hand

being stroked) and seeing (the rubber hand being stroked). They can experience a shift in where they believe their hand is to the position of the rubber hand.

‘People experience this weird illusion,’ says Dr G Lorimer Moseley of the Department of Physiology, Anatomy and Genetics at the University of Oxford. ‘They will say things like, “I feel like I own the rubber hand”.’

Dr Moseley, along with Professor Charles Spence of the Department of Experimental Psychology and researchers in Italy and The Netherlands, report in the journal PNAS that incorporating the rubber hand into our sense of self comes at a physical cost. It is as though they are ‘disowning’ the real hand, resulting in a measurable temperature drop in that hand.

‘The rubber-hand illusion is a beautiful device to manipulate our sense of self,’ Dr Moseley says. ‘It tells us that our sense of our bodies, our sense of who we are, is labile.’

Body ownership is a fundamental aspect of self-awareness – the feeling that your body belongs to you and is constantly there. This important sense of self is disrupted in a range of different neurological, psychiatric and psychological conditions, such as after a stroke, in autism, epilepsy, anorexia, and bulimia.

People suffering from complex regional pain syndrome can experience significant distortion in their sense of their physical self. They can disown a limb, feeling that it does not belong to them or that a limb is bigger than it really is.

Many conditions characterised by distortions of body image or ownership are also characterised by a disruption of temperature in one side of the body or a single limb.

‘We wanted to see if we could replicate any of this experience. We wanted to see if we could manipulate our sense of ownership of our bodies and reproduce a temperature disruption,’ says Dr Moseley. ‘That is exactly what we saw.’

‘Our sense of our physical self comes from what we’re born with and the constant messages the brain receives from all parts of our bodies. We’ve now shown that this is a two-way street. The mind can also influence the body’s tissues. We have demonstrated that the mind can control a specific body part.’

Provided by Oxford University

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