



COLLOQUIA TREVERENSIA

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Multisensory mechanisms of body ownership

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Henrik Ehrsson is a neuroscientist and professor at the department of neuroscience at the Karolinska Institute in Stockholm. Initially studying medicine, he did his PhD on neural correlates of skilled movements at the Karolinska Institute in 2001. After completing his postdoc at the University College London, he returned to the Karolinska Institute where he started his own lab.

Prof. Ehrsson is interested in the general sense to own a body and how this can be manipulated. His main focus is on illusions, in particular the illusory experience of being located outside the own body. By clarifying how the normal brain produces a sense of ownership of one's body, he set out to learn how to project ownership onto mannequins and simulated virtual bodies, onto tiny little Barbie dolls and also to make people have the experience of swapping bodies with each other.

Abstract:

Ask any child if his hands belong to him and the answer will be "Of course!" But how does the brain actually identify its own body? Our hypothesis is that parts of the body are distinguished from the external world by the patterns they produce of correlated information from different sensory modalities (vision, touch and muscle sense). These correlations are hypothesized to be detected by neuronal populations in frontal and parietal areas that integrate multisensory information from the space near the body. We have used a combination of functional magnetic resonance imaging and human behavioral experiments to present experimental evidence in support of these predictions. To change the feeling of body ownership, perceptual illusions were used where healthy individuals experienced that a rubber hand was their own, that a mannequin was their body ("body-swap illusion"), or, that they are outside their physical body and looking at it from the perspective of another individual ("out-of-body illusion"). By clarifying how the normal brain produces a sense of ownership of one's body, we can learn to project ownership onto prosthetic devices in amputees. This can facilitate the development of advanced prosthetic limbs that feels just like real limbs.