

Re-learning body models in the human brain

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Human new-borns explore and actively learn what kind of bodily agent they are, thus gaining a sense of "embodied selfhood". Certain neurological or psychiatric disorders show that this sense, despite its fundamental nature, may become distorted. Presently, new challenges for the embodied self are arising through the potential (con)fusion of physical and virtual realities. These challenges cannot yet be tackled; for although neuroscience, psychology, and philosophy largely agree that embodied selfhood is created by the brain, the mechanisms of this creative process remain unknown. To resolve this problem, the proposed research group will develop a new account of embodied selfhood in terms of a mathematical "body model" that links brain mechanisms of perception, decision-making, and action. Combining innovative virtual reality experiments with measurements of, and interventions with brain activity, the research group will illuminate three core mechanisms within this model: How does one actively learn to self-identify with one of several possible new (virtual) bodies? What happens when one alternates between physical and virtual bodies? How persistently does one's body model change in such scenarios? By revealing how people transform their body models, this project will provide the mechanistic understanding needed to tackle the challenges that we, as embodied selves, face today.

Projektbeteiligte

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