

Multisensory Integration Induces Body Ownership of an External Tool

Veronica Weser

University of Virginia, Charlottesville, Virginia, USA

Gianluca Finotti

University G. D'Annunzio, Chieti - Pescara

Dennis Proffitt

University of Virginia, Charlottesville, Virginia, USA

Abstract: Bodily self-consciousness (BS) refers to self-knowledge like body shape, position and ownership. BS relies on the integration of multisensory bodily signals and can be experimentally manipulated with the Rubber Hand Illusion (RHI). In this illusion, the incorporation of a rubber hand into the BS is facilitated by visual similarity to the participant's hand. Neurophysiological research indicates that tool use alters neural networks mapping body shape and posture for coordinating motor actions. The present experiment sought to unify perceptual and motoric BS accounts using a modified RHI. We found that synchronous multisensory stimulation induced perceptual embodiment of an external tool. The RHI was stronger if multisensory stimulation was preceded by tool use, highlighting the motor system's role in embodiment. The illusion, as measured by proprioceptive drift and questionnaires, was stronger for skilled individuals but also occurred for untrained participants. This experiment helps to clarify the role of perceptual and motoric embodiment.