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Having a body versus moving your body: neural signatures of body-ownership and agency

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Talk

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Abstract

Body ownership can be easily confused with the sense of controlling one's body because agency is a powerful cue to ownership: my body feels like 'mine' in part because I can control it at will. As a result, interactions between body-ownership and agency are difficult to investigate. A first imaging study using PET reveals that the right posterior insula that has been previously linked to agency, may in fact encode body-ownership. Because agency typically involves both efferent and afferent signals, previous studies have been unable to distinguish between these alternatives. We therefore developed an fMRI paradigm to investigate multisensory and sensorimotor aspects of body representation in the brain in an attempt to disambiguate the neural signatures of agency and body-ownership. Movements of the participant's hand were either self-generated or externally-generated, and video-feedback was relayed either in real-time or with a systematic delay. Analyses showed different activations in the right parietal lobe for intersensory and sensorimotor conflicts. Activity in the SMA was linked to a sense of agency distinct from the sense of body-ownership, while activations in midline cortical structures were associated with a purely sensory-driven sense of body-ownership. The results are discussed in the light of recent neurocognitive models of self.

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