



Ruprecht-Karls-Universität Heidelberg
Medizinische Fakultät Mannheim
Dissertations-Kurzfassung

**Neuropsychological correlates of trait-like differences in the
experience of illusory limb ownership**

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The rubber hand illusion (RHI) paradigm induces a feeling of ownership for a rubber hand by synchronous visuotactile stimulation of the artificial limb together with one's own hand. However, it is not known if the susceptibility to perceive the RHI is a trait or a state variable, and if differences in the susceptibility are applicable to other RHI setups. Therefore, the present thesis focused on intra-individual capabilities and the neuronal mechanisms to experience illusory limb ownership. The first study examined contextual and temporal stability of RHI experiences. The illusion was induced in two different setups, with either a horizontal or vertical displacement of the rubber hand in respect to the real hand. Further, the RHI was induced twice with a long-term interval and changes on the perceptual and behavioral level were evaluated. Finally, we measured the long-term stability of cortical activity during the induction of the RHI using functional magnetic resonance imaging (fMRI). We found that a vertical setup induced higher ratings of illusory embodiment of the rubber hand than a horizontal setup, but the responses to both setups were significantly correlated. There was high long-term stability of the subjective perception of illusory embodiment but a lower stability on the behavioral level. fMRI data suggest temporally robust processing in ventral premotor cortex (PMv). In the second study, we compared subjects who were identified as either low- or high-responders in the RHI paradigm, and assessed their subjective and neuronal responses to setups in which a rubber hand, a wooden block, or their real hand were stimulated. In both illusory conditions, the high-responders reported stronger ownership compared to the low-responders. We found corresponding group activity differences in frontal, parietal and occipital regions. In both illusory conditions, but not in the own hand condition, we found significantly stronger activity in PMv, which was subsequently used as seed region to perform a psycho-physiological interaction (PPI) analysis for the high-responder group. Subjective ownership ratings were used as regressors in the PPI analysis. We found significant co-activation in the left precuneus in both illusory conditions. Additionally, there was activity in anterior cingulate cortex and right temporo-parietal junction associated with a successful incorporation of the wooden block. These results indicate that dynamic changes in perceived ownership are trait-like. Temporally stable PMv activation and subjective responses suggest robust visuotactile integration in the RHI paradigm, which might be modulated by the degree of sensory incongruence induced by different illusion setups. Further, high RHI susceptible subjects can even perceive a non-corporeal object as belonging to the own body. This group shows a trait-like neuronal responsiveness to visuotactile stimulation in the RHI paradigm, indicating that the degree of functional coupling of different integrative brain regions is more crucial for the manipulation of body integrity than the appearance of the external object itself.