

Skin temperature changes in response to body ownership modulation through mirror-box illusion: a preliminary EEG study

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Recent studies have revealed intriguing links between experimental manipulation of body ownership and changes in autonomic responses, including skin temperature changes. However, the mechanisms underlying this interaction remain unclear.

The aim of the present study is to investigate the electroencephalographic correlates of body ownership manipulation and skin temperature changes.

The Mirror Box Illusion (MBI) was applied to manipulate the sense of ownership of upper limbs, while 64-channel EEG was continuously recorded and skin temperature was measured before and after the MBI with a thermal imaging camera, along with assessments of explicit ownership judgments and proprioceptive drift. The results showed that hands temperature significantly decreased after the synchronous compared with the asynchronous condition.

Moreover, comparison of proprioceptive drift showed a significant difference indicating a larger left-hand position displacement towards the mirror on the right in the synchronous condition compared with the asynchronous condition.

Cortical responses were analysed using cluster-based tests, and Independent Components Analysis (ICA) was used to investigate EEG-derived brain sources. Preliminary results revealed different modulations at 300 -500 ms time range between synchronous and asynchronous conditions in left and right motor cortex.

These findings not only contribute to our understanding of how changes in body perception can influence physiological responses, but also highlight the importance of multisensory integration in shaping our sense of embodiment and provide valuable insights into the underlying neurobiological mechanisms, thus opening avenues for further research in neuroscience and cognition.

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