
Does Body Ownership require visual awareness: The Virtual Hand Illusion in a Continuous Flash Suppression paradigm

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Abstract

There is wide agreement that the rubber hand illusion is multisensory. Capitalizing on the fact that multisensory integration can occur even if one sensory signal is unconsciously perceived, we tested whether (or not) visual awareness is necessary to induce the illusion by combining immersive virtual reality and Continuous Flash Suppression.

Thirty-six healthy subjects participated in a Virtual Hand Illusion (VHI) procedure to assess the presence of the illusion. Then, those susceptible to the illusory feeling underwent a VHI task where we manipulated spatial perspective (1PP/3PP), stimulation congruency (Synch/Async), and awareness (Conscious/Unconscious) through Continuous Flash Suppression. We measured proprioceptive drift and stimulus visibility.

Results showed that in the Conscious condition, the drift was significantly higher in the 1PP sync compared to 3PP/Async conditions, thus indicating a successful procedure. Crucially, the drift in any 1PP Unconscious condition (i.e., Sync and Async) did not differ from that in the 1PP Synch Conscious condition. A significant difference in the drift was found between the unconscious 1PP and 3PP conditions, being higher in the former. These data show that the drift was induced without visual awareness only when the virtual hand was unconsciously perceived in 1PP.

Our findings suggest that objective illusory ownership is unconsciously modulated by perspective, similar to when stimuli are consciously perceived. This work suggests that body ownership can be triggered without visual awareness, highlighting a complex interplay between consciousness and bodily self-perception.

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