

F-112/11 "Depersonalization and body awareness in epileptic patients"

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Recent research in cognitive neuroscience using virtual reality, robotic technology and brain imaging has linked self-consciousness to the processing and integration of multisensory bodily signals. This work on bodily self-consciousness has implicated the temporo-parietal, premotor and extrastriate cortex and partly originated in work on neurological patients with different disorders of bodily self-consciousness. One class of such disorders is autoscopic phenomena, which are defined as illusory own-body perceptions, during which patients experience the visual illusory reduplication of their own body in extrapersonal space. Three main forms of autoscopic phenomena have been defined. During autoscopic hallucinations, a second own body is seen without any changes in bodily self-consciousness. During out-of-body experiences, the second own body is seen from an elevated perspective and location associated with disembodiment. During heautoscopy, subjects report strong self-identification with the second own body, often associated with the experience of existing at and perceiving the world from two places at the same time. Although it has been proposed that each autoscopic phenomenon is associated with different impairments of bodily self-consciousness, past research on neurological patients and the development of experimental paradigms for the study of bodily self-consciousness has focused on out-of-body experiences and the association with temporo-parietal cortex. Here, we performed quantitative lesion analysis in the— to date—largest group of patients with autoscopic hallucination and heautoscopy and compared the location of brain damage with those of control patients suffering from complex visual hallucinations. We found that heautoscopy was associated with lesions to the left posterior insula, and that autoscopic hallucinations were associated with damage to the right occipital cortex. Autoscopic hallucination and heautoscopy were further associated with distinct symptoms and deficits. The present data suggest that the autoscopic hallucination is a visuo-somatosensory deficit implicating extrastriate cortex and is, despite the visual hallucination of the own body, not associated with major deficits in bodily self-consciousness. Based on the symptoms and deficits in patients with heautoscopy and the implication of the left posterior insula, we suggest that abnormal bodily self-consciousness during heautoscopy is caused by a breakdown of self–other discrimination regarding affective somatosensory experience due to a disintegration of visuo-somatosensory signals with emotional (and/or interoceptive) bodily signals. These brain mechanisms are distinct from those described for out-of-body experiences. The present data extend previous models of autoscopic phenomena and provide clinical evidence for the importance of emotional and interoceptive signal processing in the posterior insula in relation to bodily self-consciousness.

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