

The different faces of one's self: Neural correlates of changes in selfidentity

Results:

The neural processes that underpin the cognitive capacity for self-recognition were investigated in two fMRI studies:

(1) Aging-related changes in self-face identification: Participants viewed images of either their own face as it currently looks morphed with the face of a familiar other or their childhood face morphed with the childhood face of the familiar other. Results suggest that distinct neural structures encode changes in self-identity across time. Activity in areas that have a generalised selectivity for faces, including the inferior occipital gyrus, the superior parietal lobule and the inferior temporal gyrus, varied with the amount of current self in an image. Activity in areas involved in memory encoding and retrieval, including the hippocampus and the posterior cingulate gyrus, and areas involved in creating a sense of body ownership, including the temporo-parietal junction and the inferior parietal lobule, varied with the amount of childhood self in an image.

(2) Sensory-driven changes in self-face identification. Participants experienced tactile stimulation delivered to their face, whilst observing either temporally synchronous or asynchronous tactile stimulation delivered to another person's face on either a congruent or incongruent location. Activity in a network of multisensory areas including the right temporo-parietal Junction (rTPJ) and middle frontal gyrus, the bilateral anterior insula and intraparietal sulcus, showed an effect of synchronous, congruent stimulation. Activity in the rTPJ was scaled with the extent to which the participants' felt identification with the observed face during stimulation. These results provide a functional basis for the neural plasticity of the self-recognition network.

Published work:

Published peer-reviewed papers:

Apps, M. A., Tajadura-Jiménez, A., Sereno, M., Blanke, O., & Tsakiris, M. (2013). Plasticity in unimodal and multimodal brain areas reflects multisensory changes in self-face identification. *Cerebral Cortex*. doi: 10.1093/cercor/bht199

Apps, M. A., Tajadura-Jiménez, A., Turley, G., & Tsakiris, M. (2012). The different faces of one's self: An fMRI study into the recognition of current and past self-facial appearances. *NeuroImage*, 63(3), 1720-1729. doi: 10.1016/j.neuroimage.2012.08.053.

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Areas of interest:

Cognitive neuroscience of selfhood

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