The neural correlates of the "self" in altered states of consciousness

ABSTRACT:

Background
Despite the increasing popularity of mindfulness and hypnosis in healthcare and in the general community the underlying neuropsychological mechanisms are unclear. The hypnotic state is characterised by absorption, suggestibility and reduction of self-consciousness. Mindfulness meditation, aims, amongst other things, at strengthening meta-awareness. The change in the relationship between the self and the conscious experience that they bring about may be crucial. Studying such states, their associated changes in subjective experience and corresponding neural correlates is challenging and requires an accurate description of the experience.

Aims
We report on a study that aims at identifying the phenomenological and neural correlates of self-consciousness in meta-awareness and absorption, and highlight the challenges in linking subjective experiences with neural correlates.

Method
We used three standardised audio instructions of 17 minutes each in randomised order to modify the conscious state of participants: 1) mind wandering 2) raising awareness of conscious processes and re-focusing on the body and the breath (meta-awareness) 3) multi-sensory reexperiencing of a nice place (absorption). First-person experiences were assessed using likert scales and interviews. To study the neural correlates of these states, the experiment was repeated in a subgroup during functional Magnetic Resonance Imaging (fMRI) scanning, which were combined with the likert 13 scales and interviews. In addition, 3 people with epilepsy and implanted electrodes were presented with the same audio instructions.

Results
Hundred healthy participants completed the first part of the study, of which forty participated in the fMRI experiment. Qualitative analysis of interviews shows that the experience is highly variable. In addition, experiences reported in the interviews are often discordant with Likert scale ratings, raising questions on how to accurately access the first-person experience in experimental settings.

Conclusions
This study sheds light on the neurophenomenological correlates of meta-awareness and absorption and the challenges in assessing them.

Keywords
Meditation, Hypnosis, Neurophenomenology, fMRI, iEEG

Published Work:

Bauer, P. R., Sabourdy, C., Chatard, B., Rheims, S., Lachaux, J. P., Vidal, J. R., & Lutz, A. (2021). Neural dynamics of mindfulness meditation and hypnosis explored with intracranial EEG: a feasibility study. *Neuroscience Letters, 766*, 136345. doi: 10.1016/j.neulet.2021.136345

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