

Mapping the neurophenomenology of the wake-sleep transition

ABSTRACT:

Background

Little is known about human capacity and the contents of our mind during hypnagogic transitions, first due to high variability in subjective reports and other limitations associated with first person accounts of mental states, and second from the difficulty in capturing cognition during sleep transitions. Refined methods controlling biases of self-report and sleep onset probing open the door to the evaluation of thought during transitions of consciousness.

Aims

1) To investigate the sources of thought and memory in hypnagogic transitions, 2) its neurophenomenological trajectories, 3) neural dynamics of microdreams; and 4) modulations of the hypnagogic experience by sleep deprivation.

Method

Participants completed the reality monitoring task (RM) in awake/drowsy conditions and memory recollection after in three experiments. Brain activity determined drowsiness levels. A Follow up study with at home measures of dreams and mindwandering, was performed to further probe Aims 2 and 4.

Results

Reaction times for RM were slower than those for recognition memory and for drowsy states, suggesting that reality monitoring is a higher-level memory process requiring a greater degree of cognitive processing. However, no robust effects of alertness and sleep quantity could be identified as the second and third studies didn't converge.

Conclusions

While probing thoughts and memory with a structured task proved difficult in the transitions and due to data acquisition during the pandemic, the evaluation of phenomenological dimensions during drowsy mindwandering led to both the characterization of aspects of emotion and thought, its bizarreness, and the mathematical structure of dreams and mindwandering.

Keywords

Hypnagogic imagery, Reality monitoring, Sleep onset, Mindwandering, Neural dynamics

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