

CHANGES IN ALPHA POWER AND VISUAL CONTENT AFTER CLOSING ONE'S DREAM-EYES IN REM SLEEP

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Background: The visual system is active during REM sleep, producing percepts that appear so real they are commonly misconstrued as waking experiences.

Aims: Here, we assessed whether one of the most robust features of the waking visual system - increased alpha oscillations upon closing one's eyes - also applies when people dream of closing their eyes.

Method: We studied individuals who became aware they were dreaming while remaining asleep, including people with and without narcolepsy. We confirmed REM sleep with standard polysomnography while they simultaneously reported on their visual experiences and eyelid status (open or closed). Dreamers performed signals with their facial muscles or respiration that we observed in real time. For example, some individuals produced a discrete number of rapid sniffs, measured with a nasal cannula, to indicate aspects of their current dream experience.

Preliminary results: Participants usually indicated having no visual experience when they reported that their dream-eyes were closed—however, there were exceptions, defying the common logic of waking experience. Relatedly, dreaming of closing one's eyes did not produce the robust increase in alpha seen in wake. On the other hand, consistent with the relationship between waking visual experience and alpha, we found decreased alpha power when momentarily dreaming with versus without a visual experience.

Conclusions: These neural and experiential correlates of eye closure in REM sleep highlight the functional alterations of dreaming. In a dream, the visual cortex is highly active but somewhat autonomous, as it receives reduced input from the eyes and operates less closely in connection to representations of body position such as whether the eyelids are open or closed.

Keywords: Lucid dreaming, REM sleep, Alpha power

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