USING REAL-TIME REPORTING TO INVESTIGATE VISUAL EXPERIENCES IN DREAMS

Karen R. Konkoly[1], Saba Al-Youssef[2,3], Christopher Y. Mazurek[1], Remington Mallett[1], Daniel Morris[1], Ana Gales[3], Isabelle Arnulf[2,3], Delphine Oudiette[2,3] & Ken A. Paller[1]

[1]Department of Psychology, Northwestern University, Evanston, IL, USA; [2]Sorbonne Université, Institut du Cerveau - Paris Brain Institute (ICM), Inserm, CNRS, Paris, France; [3]AP-HP, Hôpital Pitié-Salpêtrière, Service des Pathologies du Sommeil, National Reference Centre for Narcolepsy, Paris, France

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Background: Neuroscientific investigations of human dreaming have been hampered by reliance on dream recall after awakening. For example, a challenge of associating electroencephalographic features with post-waking dream reports is that they are subject to distortion, forgetting, and poor temporal precision.

Aims: In this study, we used real-time reporting to investigate 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.

Methods: We studied 13 people, four with narcolepsy and nine without, who experienced many lucid dreams — they were aware they were dreaming while remaining asleep. They reported on both their dream experiences (visual percepts present/absent) and dream-eyelid status (open/closed) using a novel communication technique; they produced distinctive sniffing patterns according to pre sleep instructions. We observed these signals in respiration recordings from a nasal cannula. These physiological signals enabled analyses of time-locked neural activity during REM sleep.

Results: We recorded 150 signals over 19 sessions from 11 individuals. Robust increases in alpha power were not found after signaled dream-eye closure. Remarkably, the experience of eye closure while dreaming was associated with fading visual content only about half the time. Comparing presence versus absence of visual content was possible only in three participants, who showed increased alpha power in association with a momentary lack of visual content.

Conclusions: Enlisting dreamers to actively control and report on ongoing dream experiences in this way thus opens new avenues for dynamic investigations of dreams—the illusory perceptions that haunt our sleep.

Keywords: Consciousness, Dream, Lucid, REM, Perception

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E-mail contact: karenkonkoly@gmail.com