

## From unconscious to conscious: electrophysiological correlates of consciousness during perception and action

Perception, awareness, and time have a close relationship that has been investigated for a long time. Here, we replicated a study by Zhu and colleagues (2016), to examine the specific frequency at which CFS can effectively suppress 3D stimuli from consciousness. In CFS experiments, rapidly flashing patterns are typically presented to the dominant eye, while the other eye is directed towards a stationary stimulus. This procedure induces a suppression of the visibility of the unchanging stimulus. In the present study, we used a CFS pattern that changed frequencies across 10 different levels (0, 1, 3, 5, 7, 10, 13, 16, 20, and 32 Hz) in separate trials. Participants were instructed to press a button as soon as they began to see a stimulus break through suppression. This approach allowed us to identify the frequency that elicits the greatest suppression and to calculate the average time required for a stimulus to arise into consciousness. Our results with the 3D stimulus align with those reported by Zhu and colleagues: the optimal frequency to suppress both 2D and 3D stimuli appears to be in the high-theta to low-alpha range, which is related to the temporal frequency of attention and perceptual visual cycles. These findings contribute to our understanding of the mechanisms underlying the suppression of visual stimuli from awareness. We are now using these data for a new study, on the EEG correlates of conscious and unconscious stimuli during perception and action, to study the difference in their access to consciousness.

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