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Measuring conscious contents using EEG complexity
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Abstract

Measuring consciousness has been a longstanding problem. Although behavioral responses are commonly used, converging evidence indicates that they dissociate from consciousness per se. Measures of complexity applied to brain activity, such as Lempel-Ziv complexity and the perturbational complexity index, have been shown to discriminate between levels of consciousness, but less of this work has been done in the context of conscious contents. To address many of the limitations of previous work, in this study we measure participants' neurophysiological (EEG complexity), subjective, and behavioral responses in states of normal wakefulness to visual and auditory stimuli that vary in granularity of subjective characteristics, such as meaningfulness. In addition, we investigate if any of five dimensions of subjective ratings correlate with any differences in EEG complexity. This study advances our understanding of consciousness by clarifying the relationship between stimulus complexity and measures of brain complexity and phenomenology.

Keywords: Consciousness, complexity, EEG, phenomenology