Abstract: A number of brain regions are associated with the subjective experience of pain. This study adds to our understanding of the neural mechanisms involved in pain by considering the relation between cortical oscillations in response to pain, with and without hypnosis and hypnotic analgesia, and the subjective experience of pain. Thirty-three subjects' neural responses (EEG) were measured during the 40-540 ms period following phasic electrical stimulations to the right hand, under control and hypnosis conditions. Resultant FFT amplitudes for frequencies ranging from 8 to 100 Hz were computed. These were grouped into 7 scalp topographies, and for each frequency, relations between these topographies and pain ratings, performance and stimulus intensity measures were assessed. Gamma activity (32-100 Hz) over prefrontal scalp sites predicted subject pain ratings in the control condition (r=0.50, P=0.004), and no other frequency/topography combination did. This relation was present in both high and low hypnotisable subjects and was independent of performance and stimulus intensity measures. This relation was unchanged by hypnosis in the low hypnotisable subjects but was not present in the highs during hypnosis, suggesting that hypnosis interferes with this pain/gamma relation. This study provides evidence for the role of gamma oscillations in the subjective experience of pain. Further, it is in keeping with the view that hypnosis involves the dissociation of prefrontal cortex from other neural functions.


Abstract: With a sample of nearly 700 undergraduate students, the authors found support for diurnal variations in hypnotic responsiveness. Administering the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGS:SHS:A) in the morning or evening resulted in higher average scores than from afternoon sessions. The authors replicated this finding using a second independent sample. In the primary study, participants indicated the time of day that they are most alert. Matching self-reported preferred time of the day with HGS:SHS:A administration time did not improve hypnotic responsiveness. Considering this as well as past research, the authors argue that mid-morning may be the optimal time to be hypnotized and afternoon the least favorable.

Abstract: A recent study published in the International Journal of Clinical and Experimental Hypnosis reported an interesting diurnal pattern of hypnotic responsivity; specifically, the authors found higher hypnotic responsiveness in a large sample of undergraduates in the morning and early evening. However, they did not have an explanation for this pattern of findings. This pattern is consistent, however, with the theta hypothesis of hypnotic responsivity. Further examination of the associations between brain oscillations and response to hypnosis is needed to determine if specific oscillations such as theta (a) actually facilitate response to some hypnotic suggestions, (b) merely reflect hypnotic responding, or (c) reflect another factor that itself plays a causal role in response to hypnosis.


Abstract: This article summarizes the state-of-science knowledge regarding the associations between hypnosis and brain oscillations. Brain oscillations represent the combined electrical activity of neuronal assemblies, usually measured as specific frequencies representing slower (delta, theta, alpha) and faster (beta, gamma) oscillations. Hypnosis has been most closely linked to power in the theta band and changes in gamma activity. These oscillations are thought to play a critical role in both the recording and recall of declarative memory and emotional limbic circuits. The authors propose that this role may be the mechanistic link between theta (and perhaps gamma) oscillations and hypnosis, specifically, that the increases in theta oscillations and changes in gamma activity observed with hypnosis may underlie some hypnotic responses. If these hypotheses are supported, they have important implications for both understanding the effects of hypnosis and for enhancing response to hypnotic treatments.


Abstract: OBJECTIVE: To (1) evaluate the effects of a single session of four non-pharmacological pain interventions, relative to a sham tDCS procedure, on pain and electroencephalogram- (EEG-) assessed brain oscillations, and (2) determine the extent to which procedure-related changes in pain intensity are associated with changes in brain oscillations.

METHODS: 0 individuals with spinal cord injury and chronic pain were given an EEG and administered measures of pain before and after five procedures (hypnosis, meditation, transcranial direct current stimulation [tDCS], neurofeedback, and a control sham tDCS procedure).

RESULTS: Each procedure was associated with a different pattern of changes in brain activity, and all active procedures were significantly different from the control procedure in at least three
bandwidths. Very weak and mostly non-significant associations were found between changes in EEG-assessed brain activity and pain.

CONCLUSIONS: Different non-pharmacological pain treatments have distinctive effects on brain oscillation patterns. However, changes in EEG-assessed brain oscillations are not significantly associated with changes in pain, and therefore such changes do not appear useful for explaining the benefits of these treatments.

SIGNIFICANCE: The results provide new findings regarding the unique effects of four non-pharmacological treatments on pain and brain activity.