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PROBING THE UNCONSCIOUS MIND USING INSTRUMENTAL HYPNOSIS

Mathieu Landry^{1,2}, Jérôme Sackur², & Amir Raz¹

¹McGill University and ²École Normale Supérieure

Grant 280/16

Background: Hypnotic suggestions can dramatically alter how individuals perceive the world. Hypnotic analgesia, for example, modifies pain perception. Despite a growing interest from the scientific community, the mechanisms of hypnotic phenomena continues to elude researchers. Prevailing theories link hypnosis to a form of heightened top-down control operating over mental processes. This framework contends that hypnosis can exert control over the unconscious mind – a widely popular, yet unchecked, belief amongst clinicians.

Aims: The overarching purpose of the current research is to investigate the mechanisms of hypnosis, and test whether the hypnotic response can influence unconscious processes. We divide our efforts across four specific aims. First, we intend to confirm that hypnosis encompasses top-down regulation and heightened executive control using computational modelling. Relying on the hypnotic suppression of automatic processes, we plan to evaluate whether the influence of top-down regulation generalizes across both conscious and unconscious processes. Second, we intend to investigate the neural dynamics that characterizes this phenomenon and test whether fronto-parietal cross-frequency coupling between slow and fast oscillations represent a reliable mechanism of hypnosis. Third, we further intend to assess the relationship between the induction process and the hypnotic response. Lastly, we propose to investigate whether similar effects occur during hypnotically-induced hallucinations – i.e., whenever information is being appended to perception as opposed to being suppressed.

Method: Our approach is grounded in psychophysics, electroencephalography (EEG) and computational modelling. Participants (i.e., low, medium, and high hypnotizable individuals) shall complete different visual tasks (i.e., Stroop Task, Subliminal Priming Task, Occluded Diamond Task) while we give them a hypnotic suggestion to alter perception and record EEG.

Preliminary results: Although our computational modeling approach corroborates that hypnosis is associated with increased executive control, evidence intimates that this effect hardly generalizes to unconscious mental processes. Furthermore, our results show hypnotic phenomena relates to reduced alpha-gamma cross-frequency coupling in the frontal region. Lastly, we demonstrate that participants were capable of experiencing visual hallucinations.

Keywords: Hypnosis, Top-down Regulation, Unconscious processing, Computational Modeling, Electroencephalography,

E-mail contact: mathieu.landry2@mail.mcgill.ca