Conscious Intention-based Processes Impact the Neural Activities Prior to Voluntary Action on Reinforcement Learning Schedules

Authors : Xiaosheng Chen, Jingjing Chen, Phil Reed, Dan Zhang
Abstract : Conscious intention can be a promising point cut to grasp consciousness and orient voluntary action. The current study adopted a random ratio (RR), yoked random interval (RI) reinforcement learning schedule instead of the previous highly repeatable and single decision point paradigms, aimed to induce voluntary action with the conscious intention that evolves from the interaction between short-range-intention and long-range-intention. Readiness potential (RP) -like-EEG amplitude and inter-trial-EEG variability decreased significantly prior to voluntary action compared to cued action for inter-trial-EEG variability, mainly featured during the earlier stage of neural activities. Notably, (RP) -like-EEG amplitudes decreased significantly prior to higher RI-reward rates responses in which participants formed a higher plane of conscious intention. The present study suggests the possible contribution of conscious intention-based processes to the neural activities from the earlier stage prior to voluntary action on reinforcement leanring schedule.
Keywords : Reinforcement leaning schedule, voluntary action, EEG, conscious intention, readiness potential
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