Actively generated outcomes are more precisely reproduced.

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Résumé

Being an agent structures the way we experience our environment. It has been shown that voluntary actions produce outcomes that are attenuated in terms of their perception and cortical response compared to externally generated outcomes. This study combines visual psychophysics and EEG to investigate the influence of intentionality and prediction on the processing of sensory outcomes. Three types of outcomes are compared: those predicted by a voluntary action, those predicted by a forced action and those predicted by a stimulus. The outcome is a grating whose orientation is (to some extent) predicted by the action/stimulus preceding it. Participants' task is to indicate whether the grating is brighter than another visual grating presented at trial onset. They are also asked to reproduce the orientation of the grating following the action/stimulus.
Interestingly, our behavioral results do not replicate the classical sensory attenuation result, since gratings generated by one's actions were not reported as less bright than those predicted by a stimulus. contrary to what sensory attenuation would have predicted (i.e. reduced sensitivity for self generated outcomes) we observed better identification of the outcome, since actively generated stimuli were more precisely reproduced. Our EEG analyses will therefore focus on two aspects. First, to disentangle differences and similarities in the sensory processing of actively or passively generated gratings. Second, to evaluate what neural mechanisms can underly this improved behavioral performance and how it relates to the neural sharpening hypothesis of sensory attenuation.
Lastly, our study will contribute to the characterization of the serial dependence effect. It is known that our visual system uses and is influenced by past information when perceiving a current stimulus, but how does this mechanism take into account intentionality and agency?

Mots-Clés: Agency, orientation reproduction task, eeg

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