

An Inspection of Two Layer Model of Agency: An fMRI Study

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Abstract : The perception of agency/control is altered with presence of discrepancies in the environment or mismatch of predictions (of possible results) and actual results the sense of agency might become altered. Synofzik et al. proposed a two layer model of agency: In the first layer, the Feeling of Agency (FoA) is not directly available to awareness; a slight mismatch in the environment/outcome might cause alterations in FoA, while the agent still feels in control. If the discrepancy passes a threshold, it becomes available to consciousness and alters Judgment of Agency (JoA), which is directly available in the person's awareness. Most experiments so far only investigate subjects rather conscious JoA, while FoA has been neglected. In this experiment we target FoA by using subliminal discrepancies that can not be consciously detectable by the subjects. Here, we explore whether we can detect this two level model in the subjects behavior and then try to map this in their brain activity. To do this, in a fMRI study, we incorporated both consciously detectable mismatching between action and result and also subliminal discrepancies in the environment. Also, unlike previous experiments where subjective questions from the participants mainly trigger the rather conscious JoA, we also tried to measure the rather implicit FoA by asking participants to rate their performance. We compared behavioral results and also brain activation when there were conscious discrepancies and when there were subliminal discrepancies against trials with no discrepancies and against each other. In line with our expectations, conditions with consciously detectable incongruencies triggered lower JoA ratings than conditions without. Also, conditions with any type of discrepancies had lower FoA ratings compared to conditions without. Additionally, we found out that TPJ and angular gyrus in particular to have a role in coding of JoA and also FoA.

Keywords : agency, fMRI, TPJ, two layer model

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