

Decision-Making Under Uncertainty in Major Depression Patients

XIN SONG

University of Minnesota, Twin Cities, Minneapolis, Minnesota, United States

Mathi Manavalan

University of Minnesota, Twin Cities, Minneapolis, Minnesota, United States

Iris Vilares

University of Minnesota, Minneapolis, Minnesota, United States

Abstract

Substantial evidence has suggested that major depression is associated with a dysregulated dopamine system, which plays a pivotal role in decision-making under uncertainty. Previous research has proposed that dopamine enhances the weight given to current sensory information (sensory weight) versus prior beliefs, yet how much this relationship holds true in depression remains a topic under debate. To examine whether depression patients have decreased sensory weight due to disturbed dopaminergic neurotransmissions, we used a visual coin-catching task in which uncertainty in both prior and sensory information varied. Decision-making strategies during the task were modeled by Bayesian statistics. Our results supported that depression patients preserved the ability to learn both prior and sensory information uncertainty, comparable to healthy controls. In contrast to our prediction, depression patients did not show decreased reliance on sensory information compared to controls, suggesting that depression does not induce a universal alteration in decision-making strategies under uncertainty. Our study provides empirical evidence that depression does not always show deficits in uncertainty processing regardless of its correlation with dopamine dysregulations.