Updating episodic bindings: A role for the ventral striatum

Bernhard Hommel*[1], Lorenza Colzato[1], Nelleke Van Wouwe[1], Sharon Zmigrod[1], Leo De Sonneville[1], Richard Ridderinkhof[2], Hannah Swaab[1], and Scott Wylie[3]

[1]Leiden Institute for Brain and Cognition – Netherlands
[2]University of Amsterdam – Netherlands
[3]University of Virginia, Charlottesville – United States

Abstract

Three studies provide evidence that the control of the retrieval of episodic feature bindings is modulated by the ventrostriatal dopaminergic pathway. First, we found that children with autistic spectrum disorder, an impairment that is associated with atypical dopaminergic activity, show less efficient control over the stimulus-induced retrieval of episodic stimulus-response bindings. Second, less efficient control of stimulus-response bindings was also observed in healthy individuals with a genetic predisposition to lower striatal dopamine levels. Finally, we found Parkinson's disease patients to be more efficient in controlling stimulus-response bindings OFF medication than ON medication (as implied by the overdose hypothesis of PD), suggesting that the ventral striatum, but not (or not so much) the dorsal striatum, is driving the management of stimulus-response episodes.

*Speaker