Evaluating Individual Differences in Multimodal Measurement of Inhibitory Control Using Drift Diffusion Modeling

Sebastian Franck Love
University of California, Berkeley, Berkeley, California, United States

Danielle Jones
University of California, Berkeley, Berkeley, California, United States

Keanan Joyner
University of California, Berkeley, Berkeley, California, United States

Abstract

Computational modeling of behavioral data allows for a precise characterization of distinct aspects of decision making related to the neurocognitive process of IC. In the Diffusion Model for Conflict (DMC; Ulrich et al., 2015)—drift rate (the amount of information absorbed per time unit) and boundary separation (the amount of information accumulation required for action)—have been found to be differentiable processes implicated in IC. In the current study, we evaluated these DMC parameters in independent community/student samples (Ns=150, 199) completing a flanker task and electroencephalogram recording during a novelty-oddball task to elicit a P300 brain response shown to index IC (Brennan & Baskin-Sommers, 2018). Our results showed that only boundary separation significantly correlated (r=-.20,-.28) with amplitude of the P300 brain response, and this effect replicated across both samples. These findings suggest that computational modeling of behavior is better able to bind together measurement of IC across different measurement modalities.

In D. Barner, N.R. Bramley, A. Ruggeri and C.M. Walker (Eds.), *Proceedings of the 47th Annual Conference of the Cognitive Science Society*