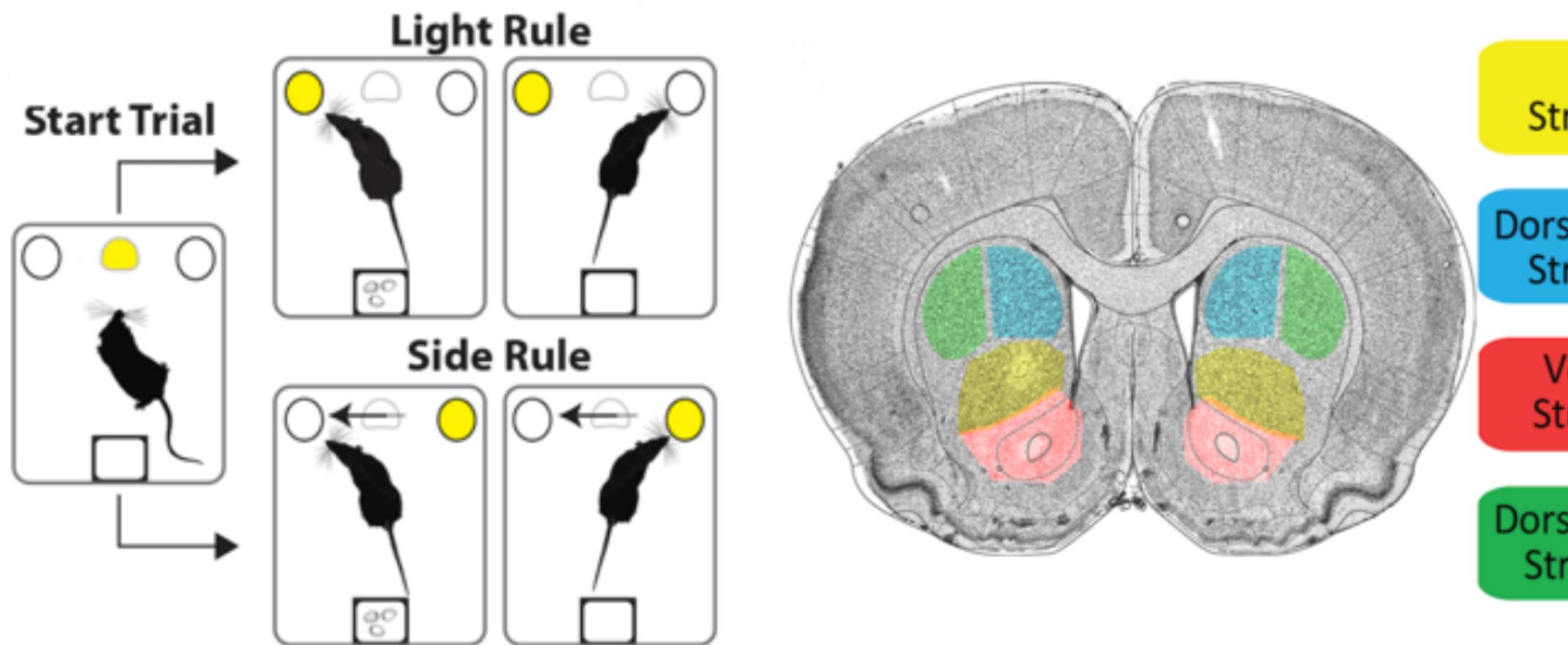


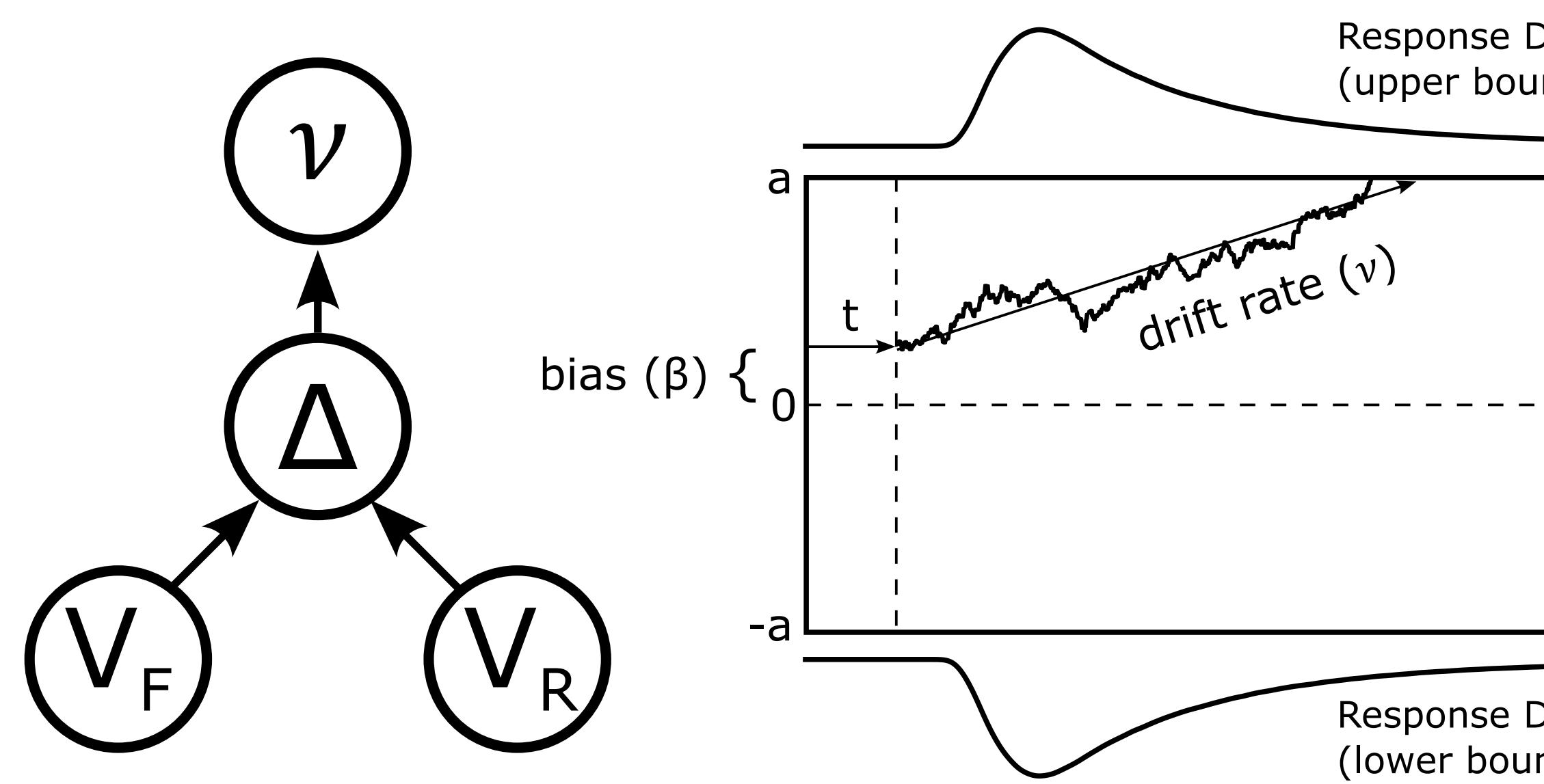
Evan M Dastin-van Rijn, Elizabeth M Sachse, Adriano E Reimer, Alik S Widge

Intro

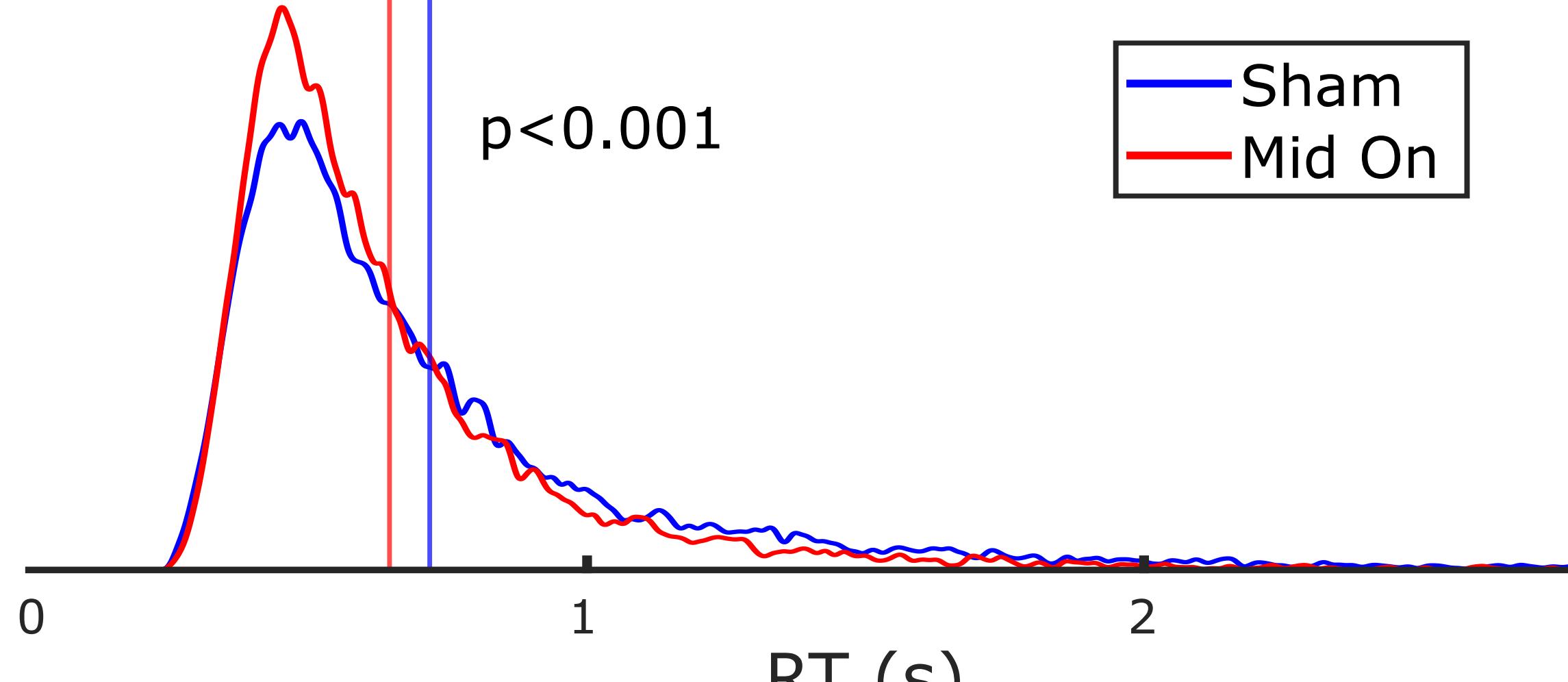
- The balance between flexible and rigid thinking is disrupted in psychiatric disorders
- The extradimensional set-shifting task has been used to probe this balance in rats and humans
- Previous work has demonstrated that electrical stimulation can decrease reaction times on this task for both rats and humans
- However, whether this change in reaction time is a product of improved cognitive control has yet to be shown

Methods

- Long-Evans rats completed an extradimensional set-shifting task with active and sham stimulation

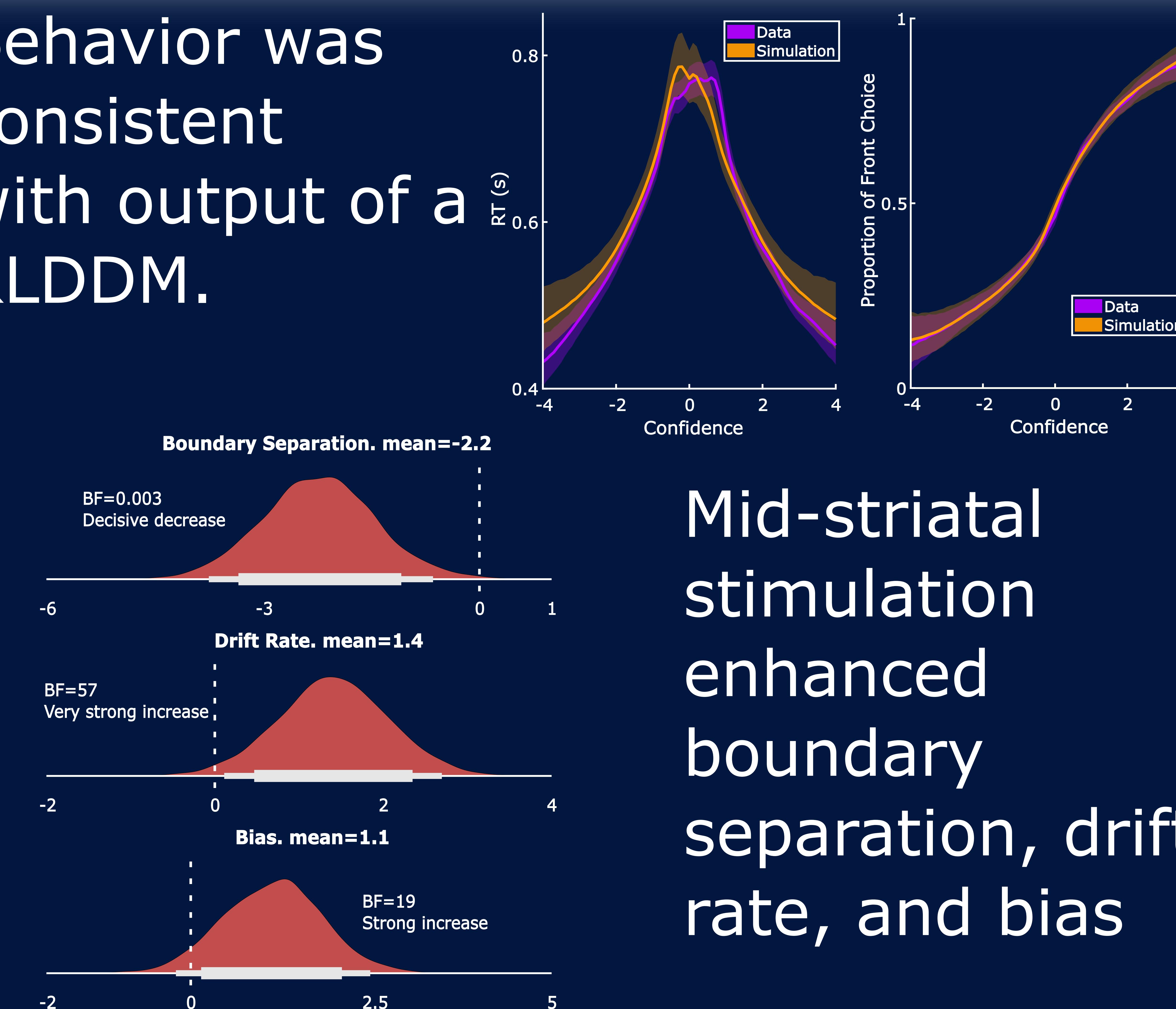


- Combination reinforcement learning-drift diffusion models (RLDDMs) were fit to explore the effect of stimulation on modeled cognitive variables

Prior results

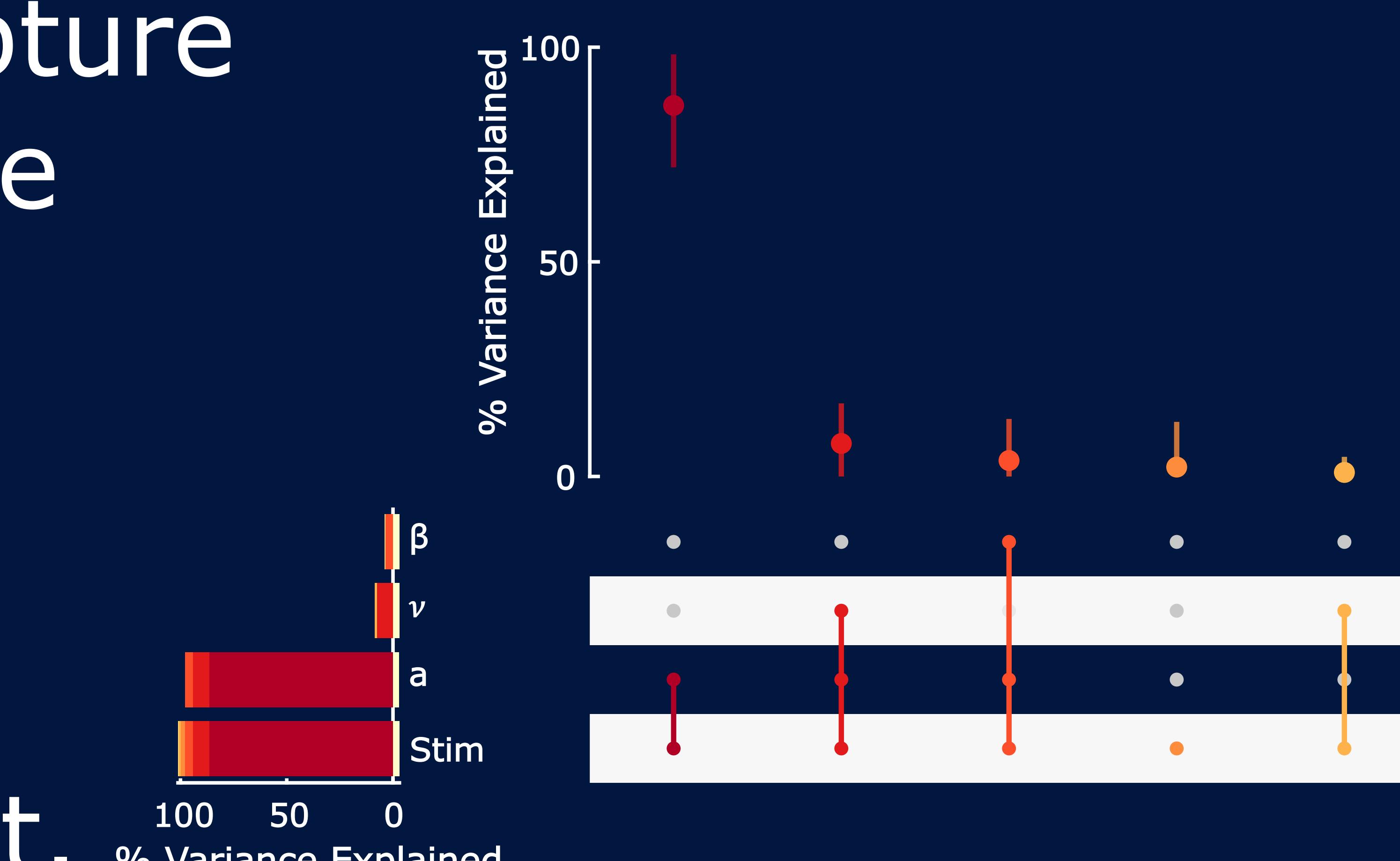
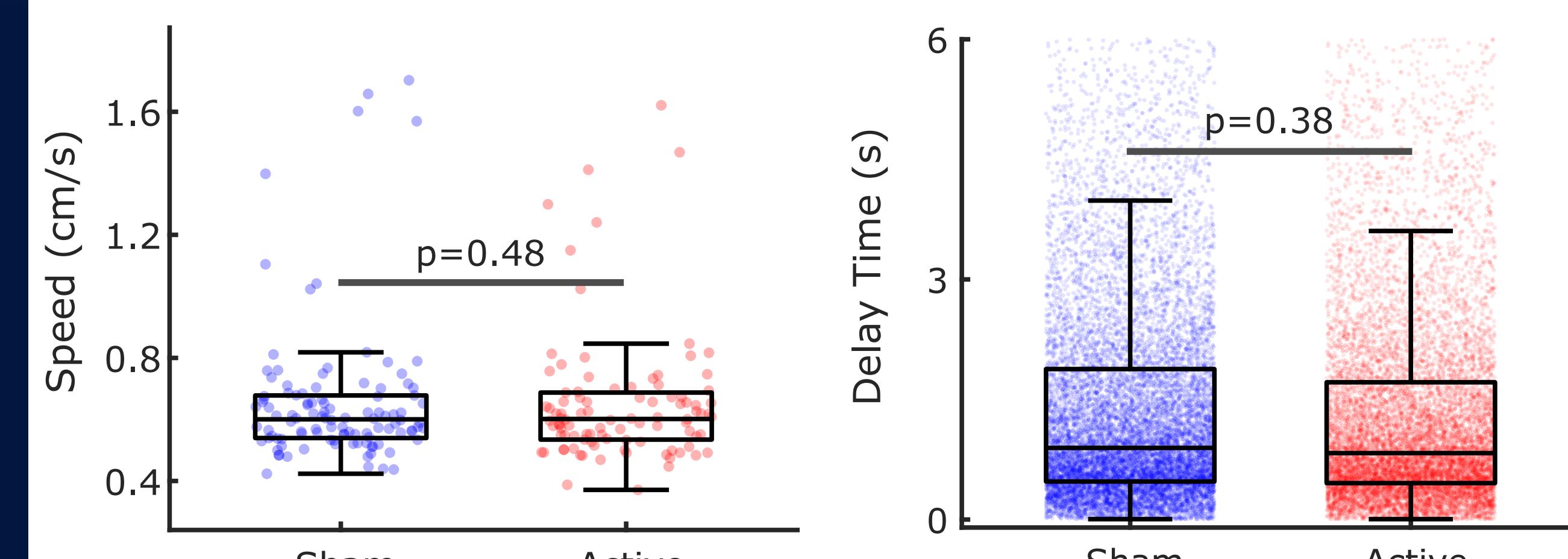
Mid striatal stimulation significantly reduced reaction times but is this decrease a product of changes in cognitive control?

Behavior was consistent with output of a RLDDM.

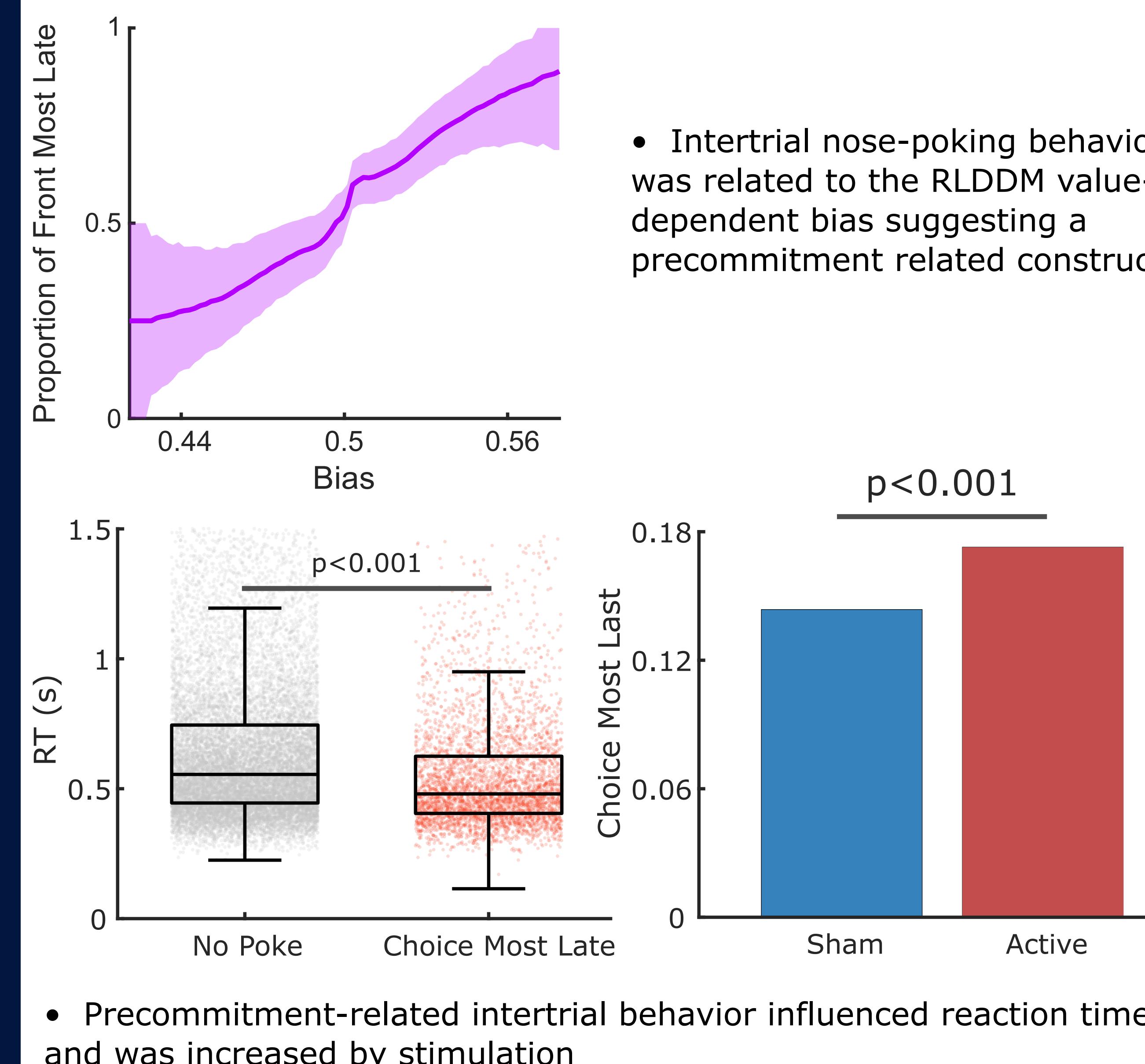


Mid-striatal stimulation enhanced boundary separation, drift rate, and bias

These variables capture features of cognitive control and were sufficient to explain the stimulation-dependent RT effect.

**Additional factors**

- Stimulation had no effect on speed in an open field or motivation-related initiation delay

**Discussion**

- RLDDM analyses indicated that observed stimulation-dependent changes in reaction times could be explained by cognitive measures
- These results support the hypothesis that the therapeutic benefits of ventral capsule/ventral striatum deep brain stimulation for psychiatric disorders may result from improved cognitive control
- Reaction times or other model-derived metrics could serve as control signals for treatment optimization and personalization

Acknowledgements

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