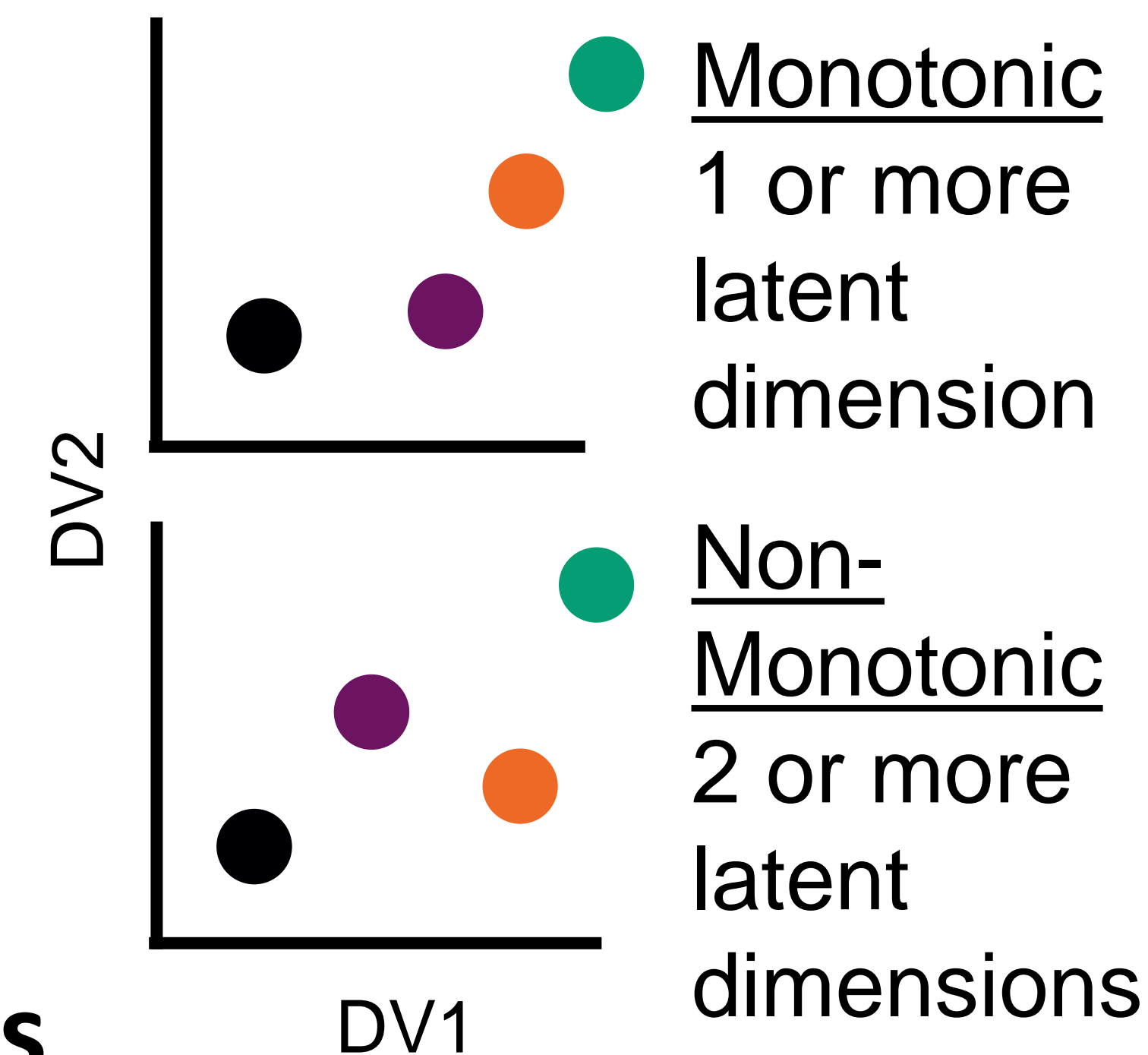


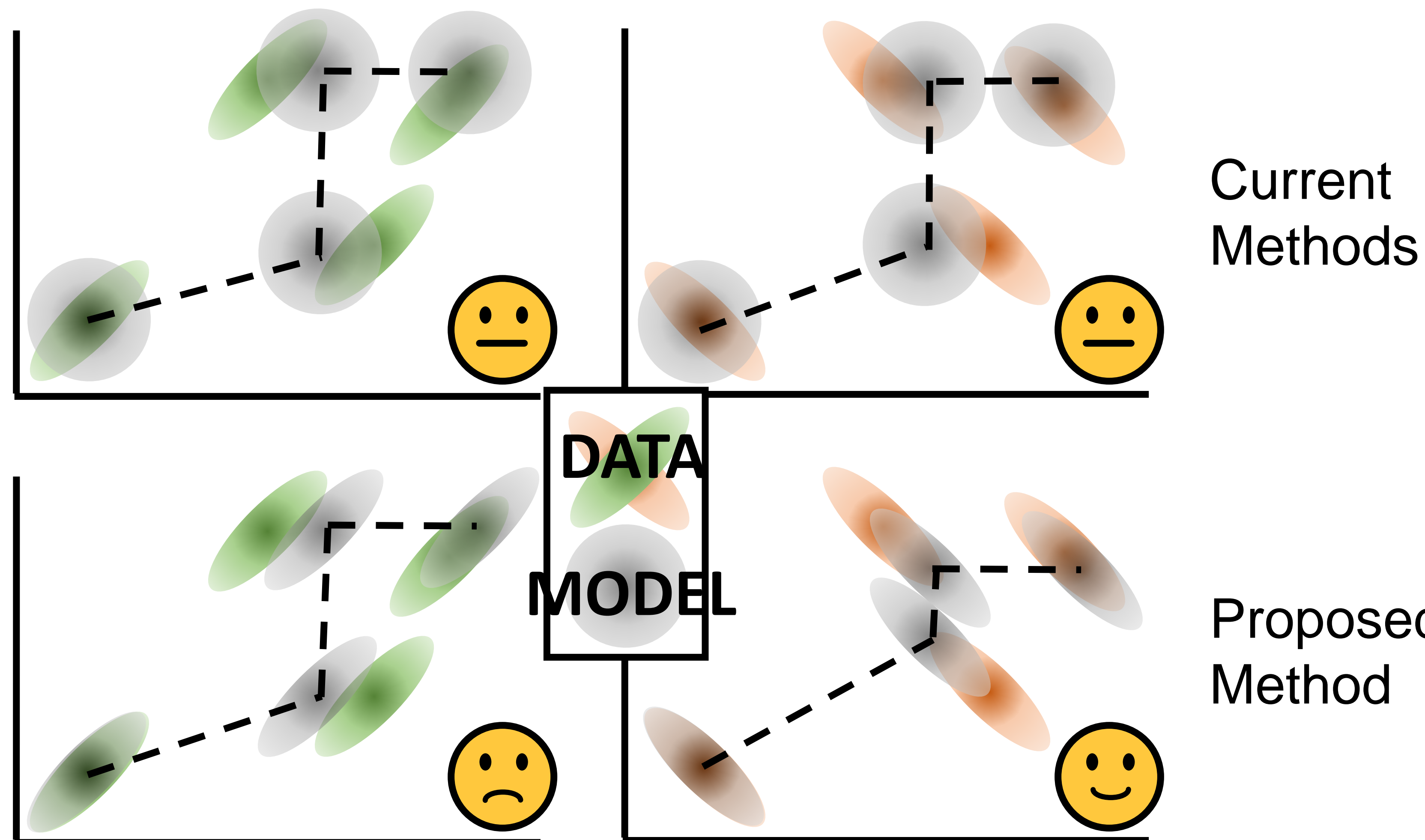
A hierarchical Bayesian state trace analysis for assessing monotonicity factoring out subject, item, and trial level dependencies

Introduction

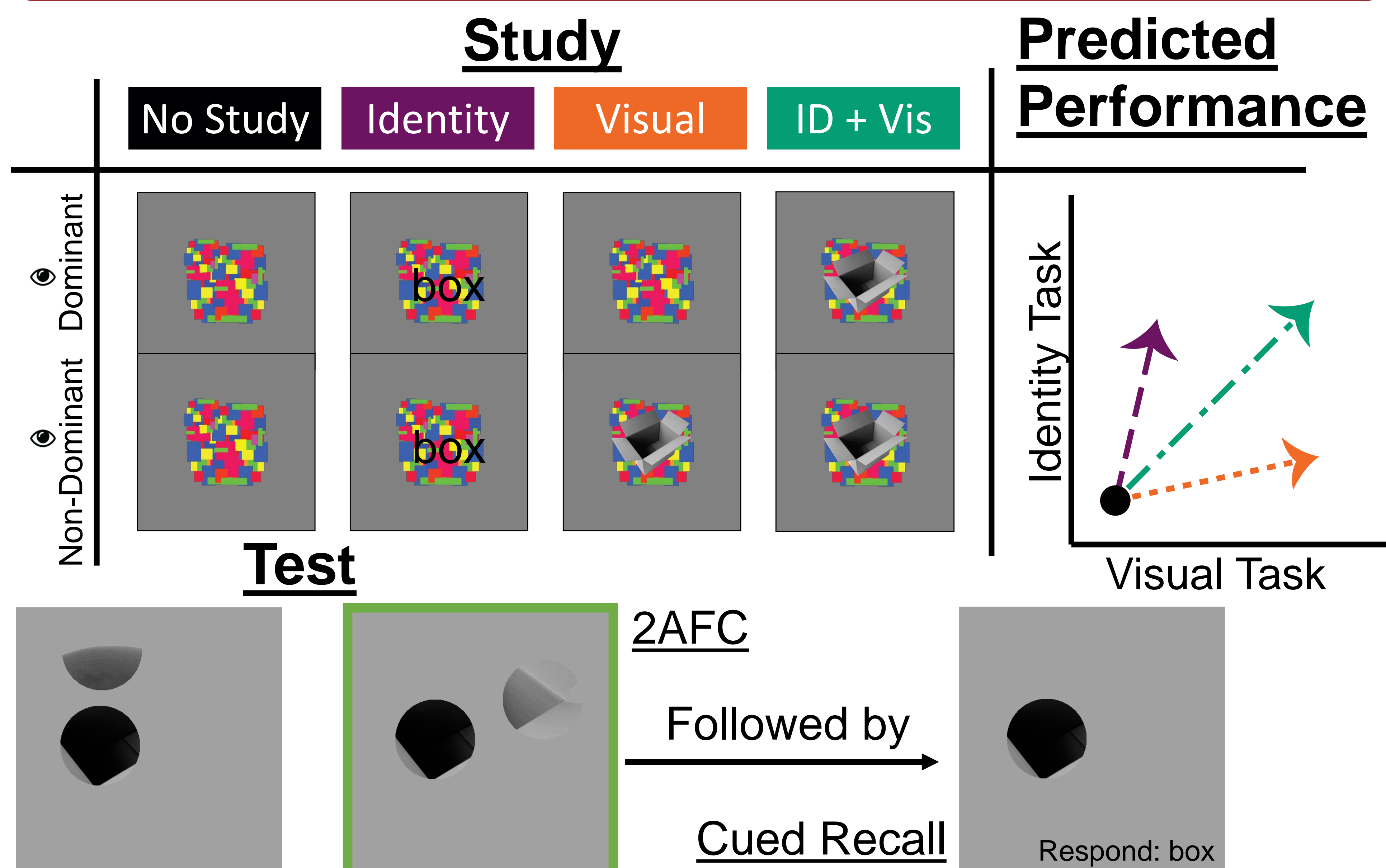
- Debates focus on single vs. dual process
- State-Trace Analysis can probe latent dimensionality
- **Challenge:** Inferences often assume task performance independence
- Participant, Item, and Condition effects can all induce dependencies



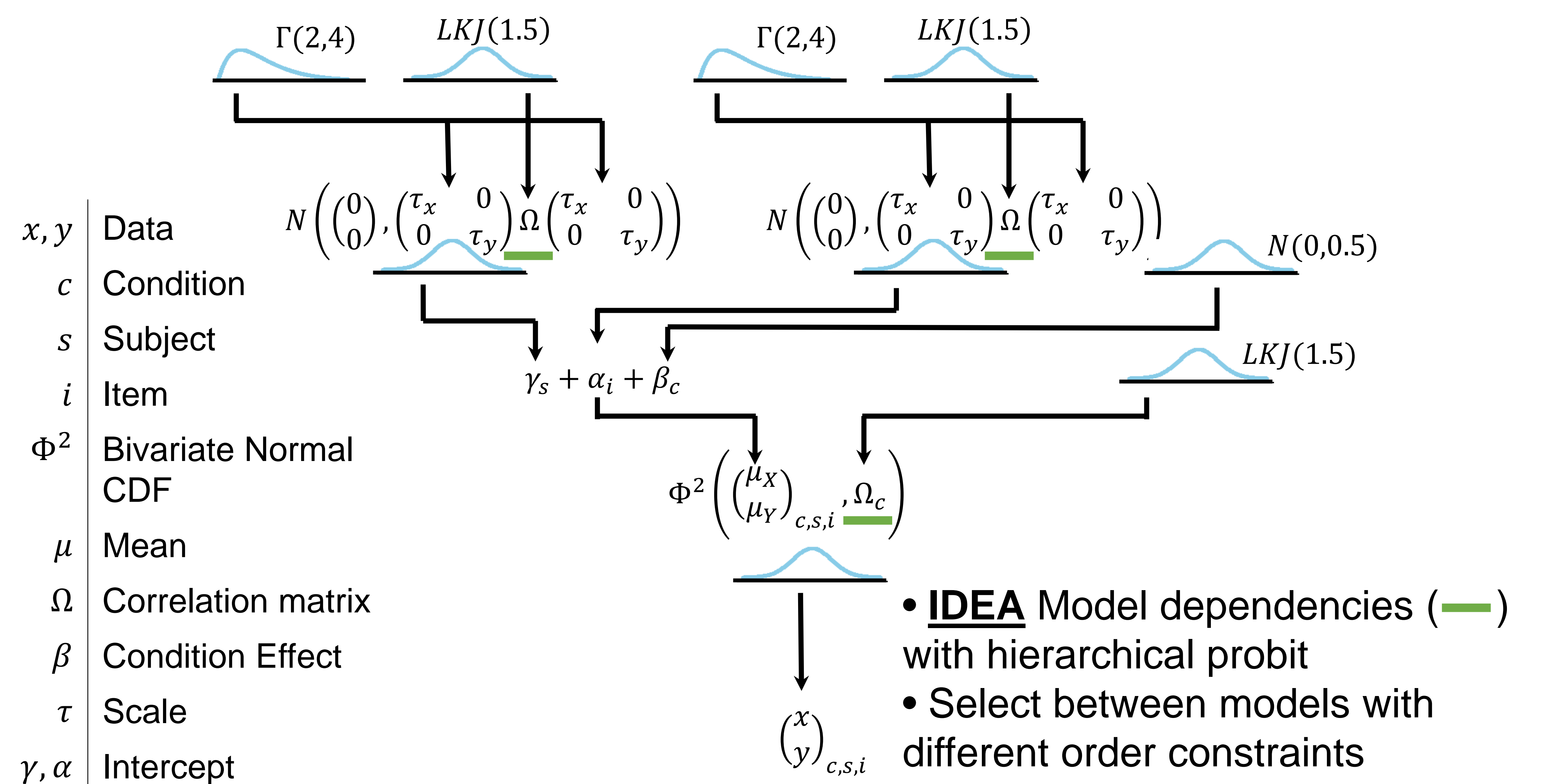
Monotonic Model Fits



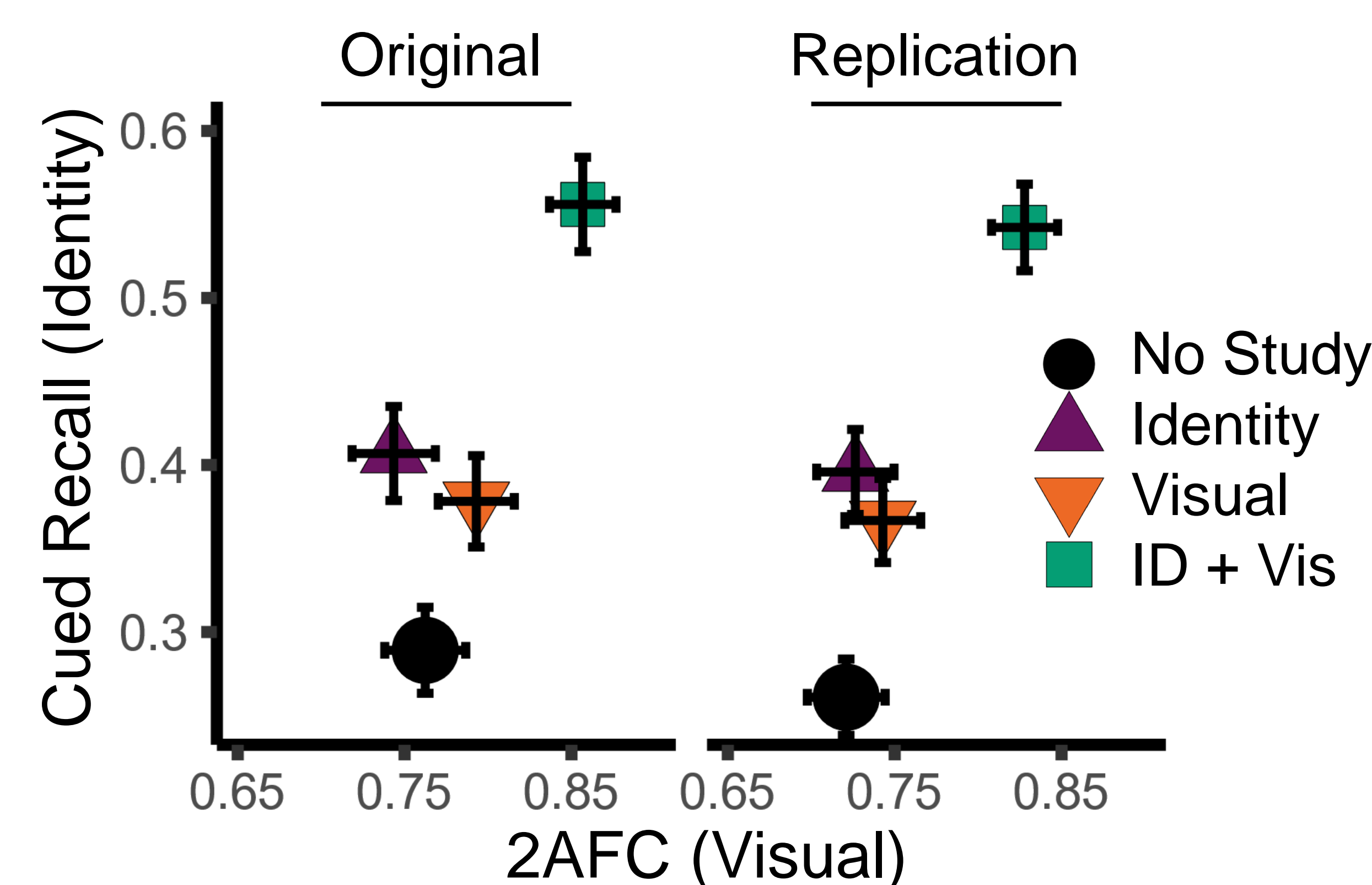
Sample Data



Analysis



Results



- Model recovers correlations from simulated datasets
- Experiment with replication supported non-monotonicity (PseudoBMA+ BF ~470)
- Method applicable despite low trial count per participant

Discussion

- State-Trace Analysis ought to be sensitive to correlations in task performance
- Sensitivity to correlation achieved with parametric assumptions

References

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- Sadil, Potter, Cowell, Huber (2019) *Connecting the Dots Without Top-Down Knowledge: Evidence for Rapidly-Learned Low-Level Associations That Are Independent of Object Identity*. J. of Exp. Psych: General, 148(6), 1058-1070.
- Yao, Vehtari, Simpson, & Gelman (2018) *Using Stacking to Average Bayesian Predictive Distributions*. Bayesian Analysis 13(3). 917-1003