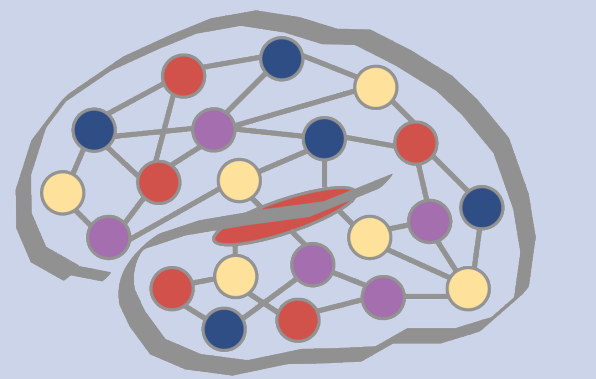


Measuring the rapid acquisition and integration of structured knowledge



Brynn E. Sherman, Elizabeth M. Siefert, Anna C. Schapiro



Penn Computational Cognitive Neuroscience Lab

Contact: brynns@sas.upenn.edu

Questions

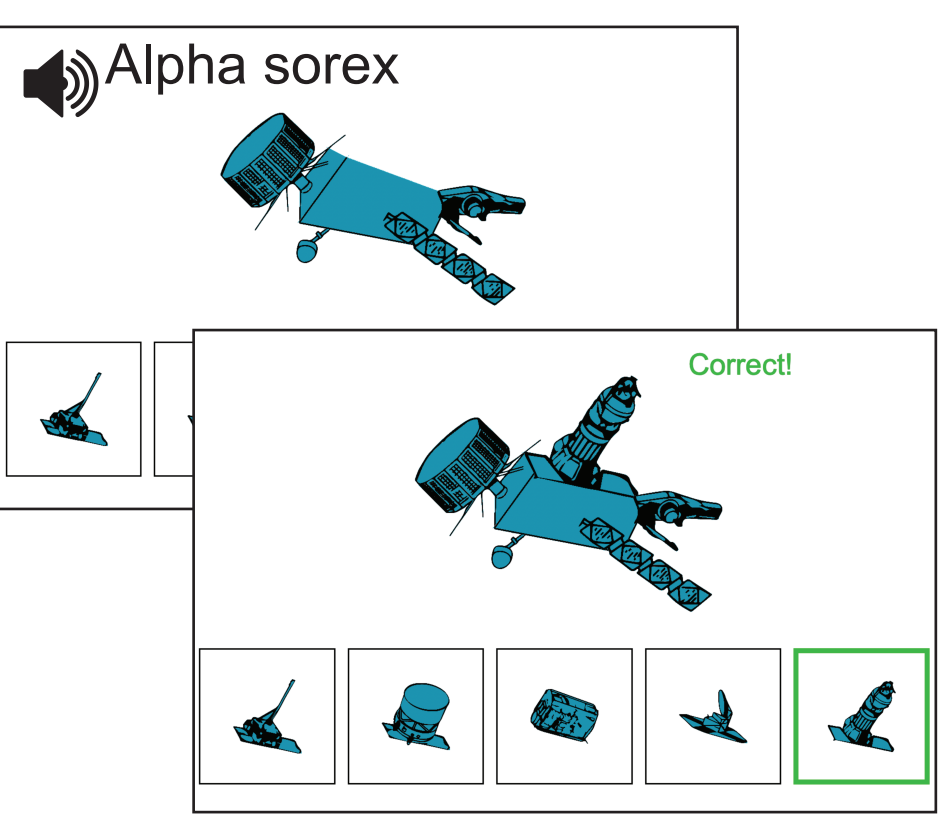
Can we quickly build knowledge structures that scaffold continued learning?

How do we integrate new information while retaining its specifics?

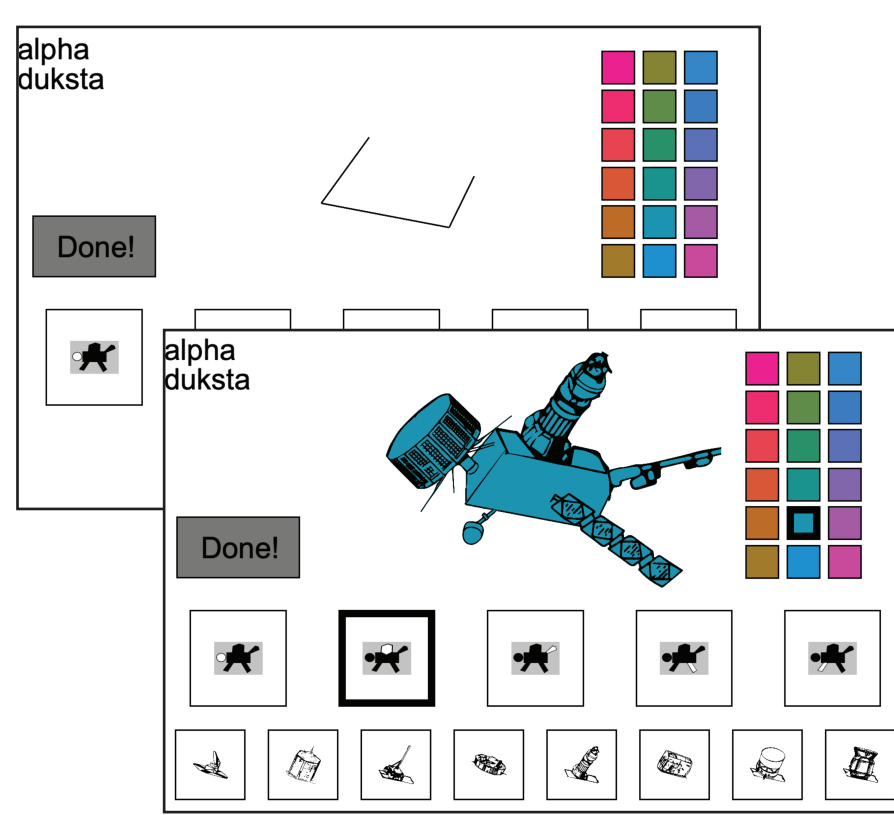
Tasks

Training

(repeated until 66% correct)

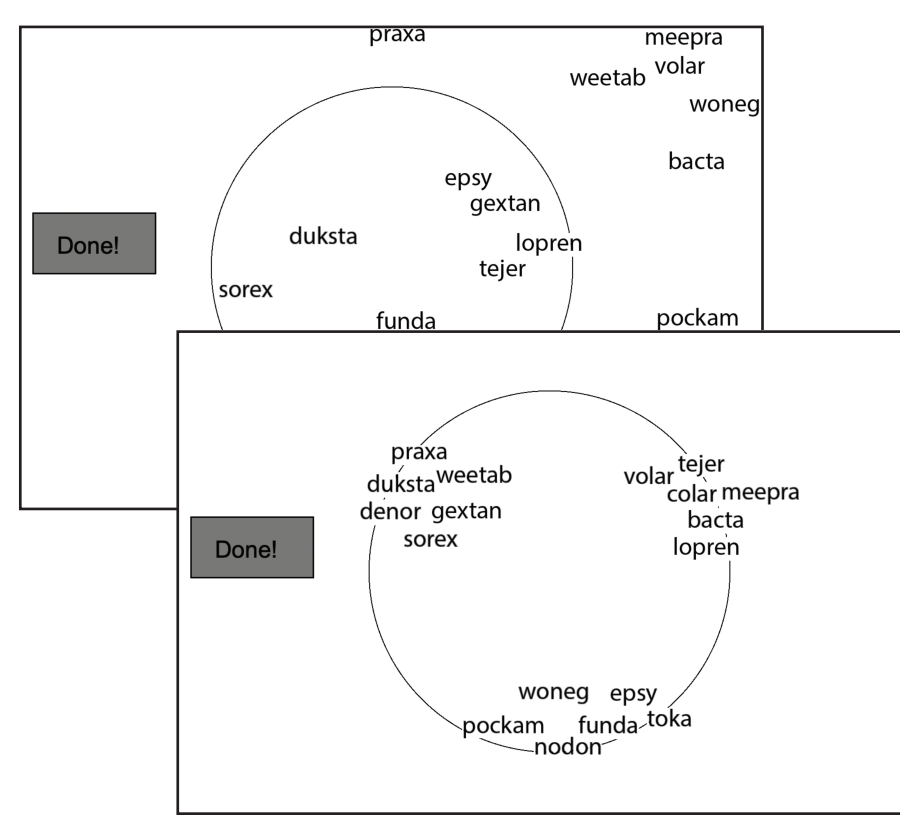


Test



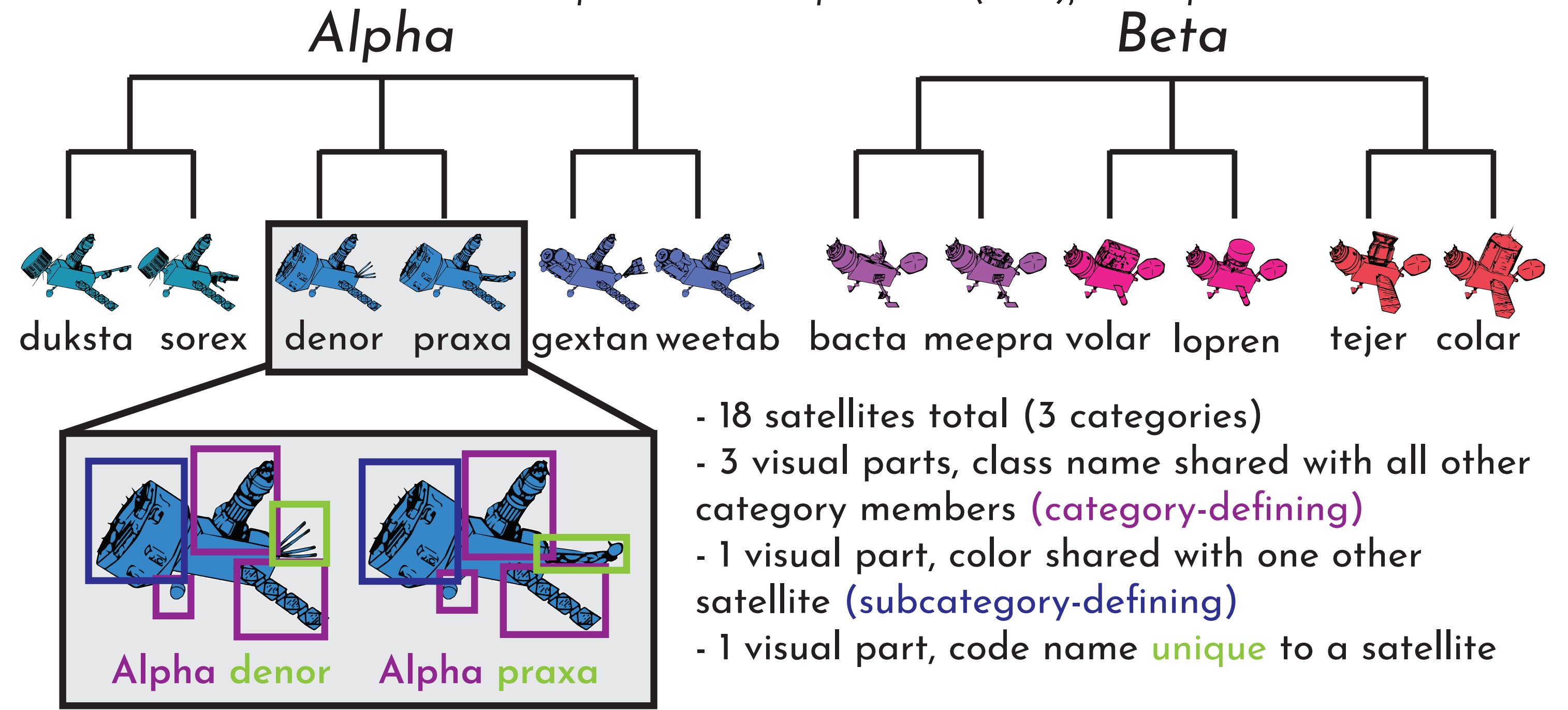
Sorting

(Exps 2 & 3 Only)

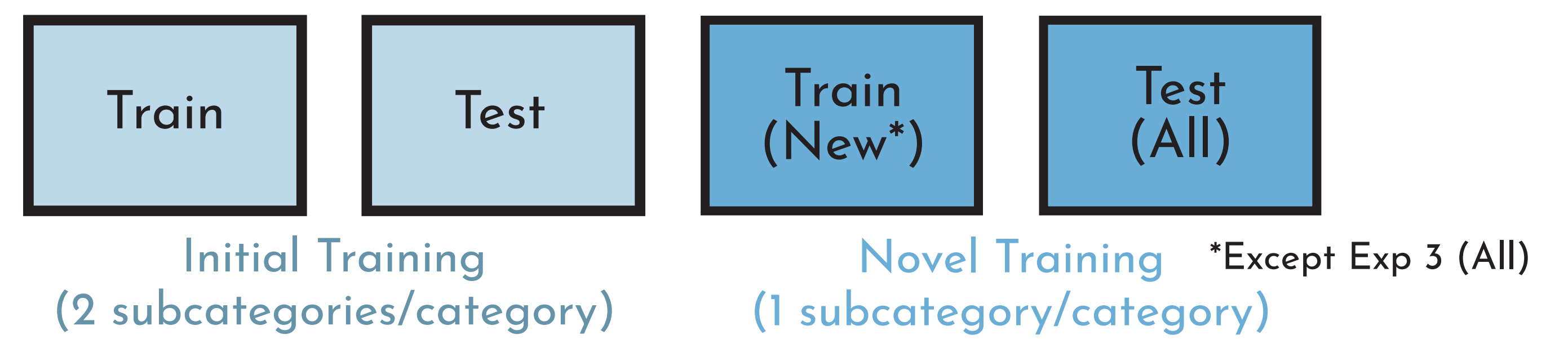


Stimuli

Adapted from Schapiro et al. (2017), Sci. Reports



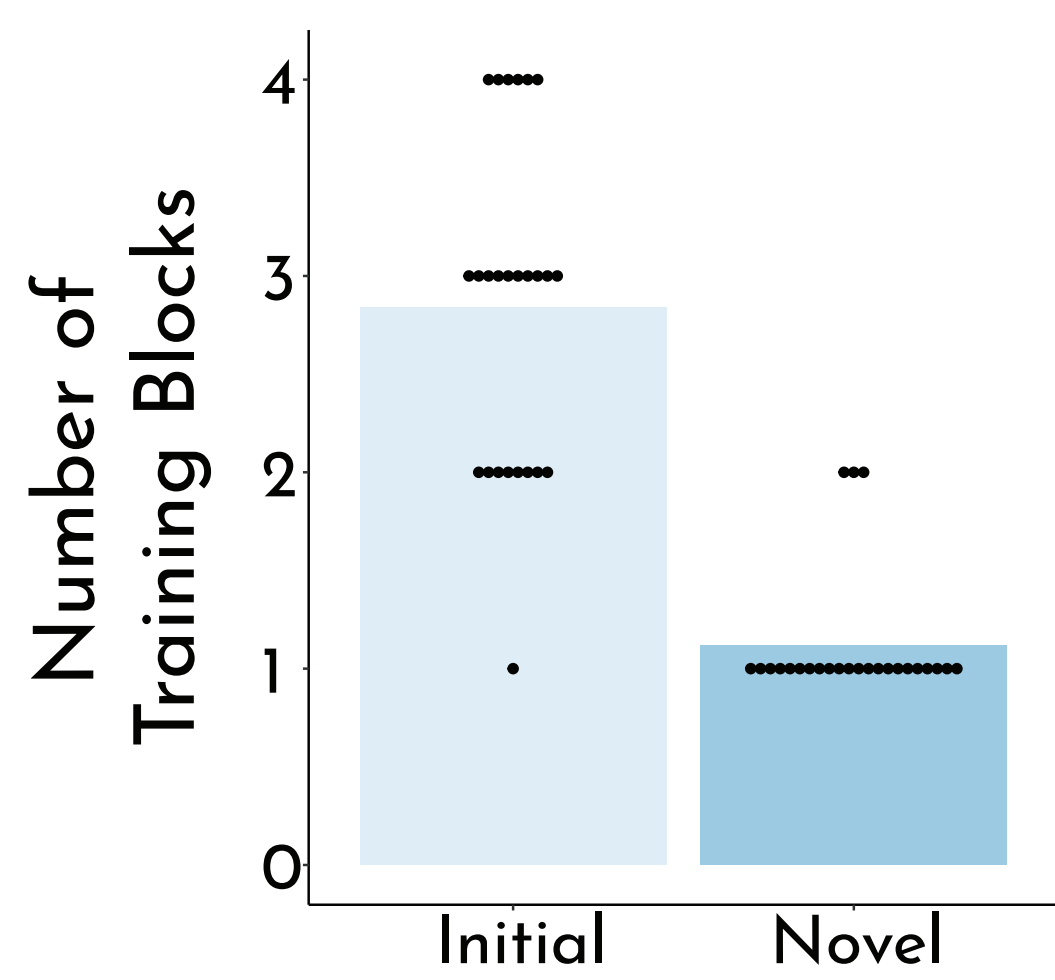
Approach



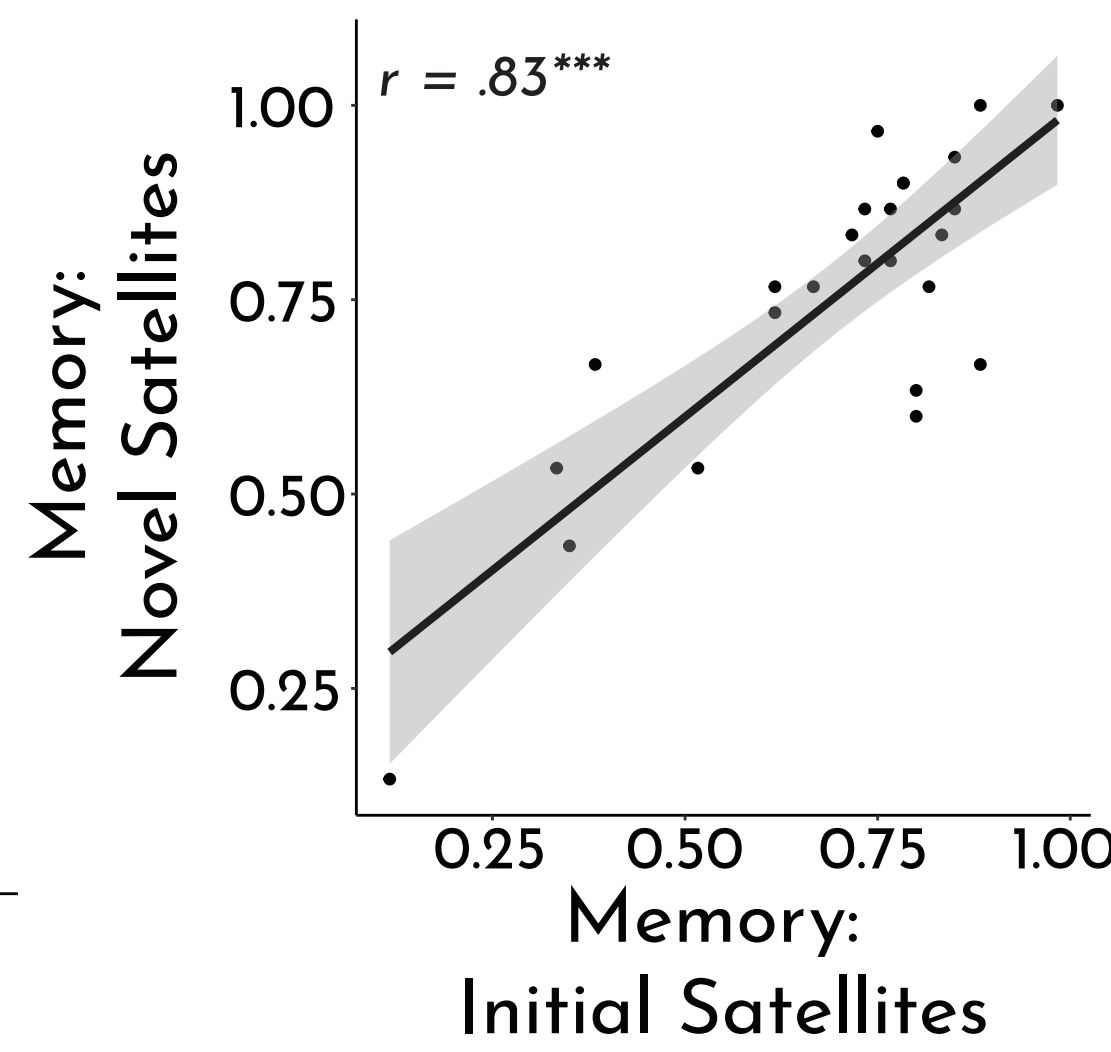
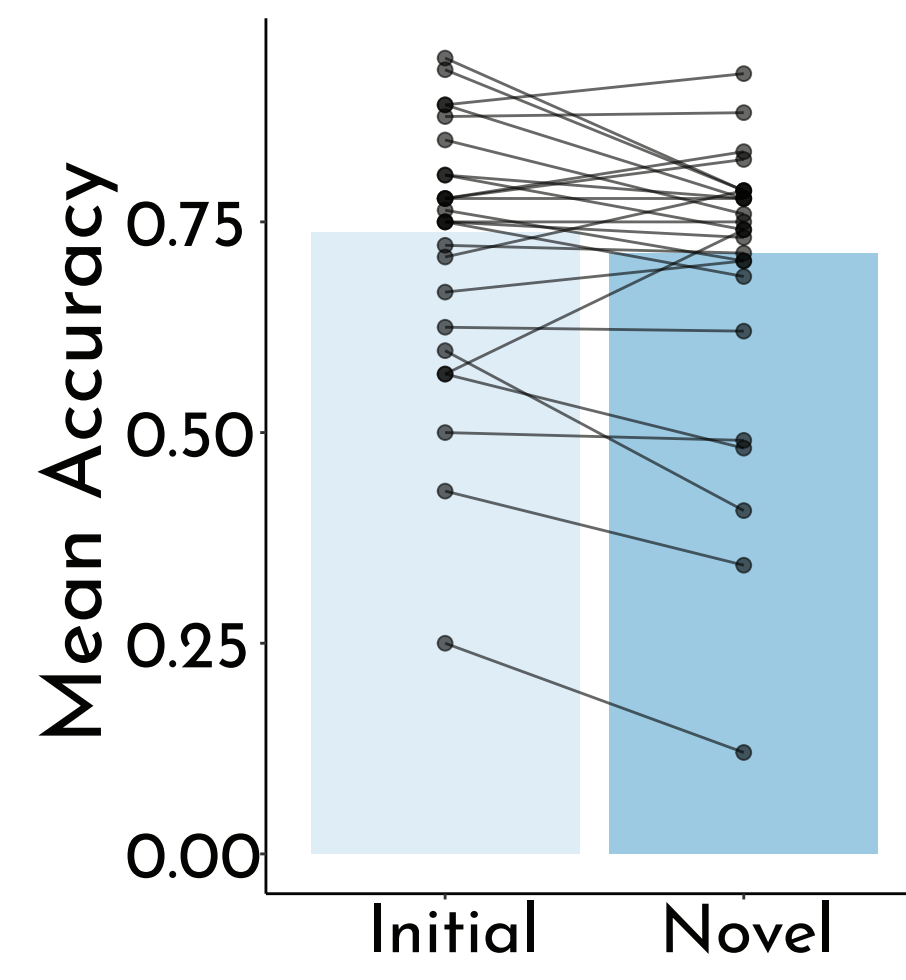
Experiment 1

N = 25

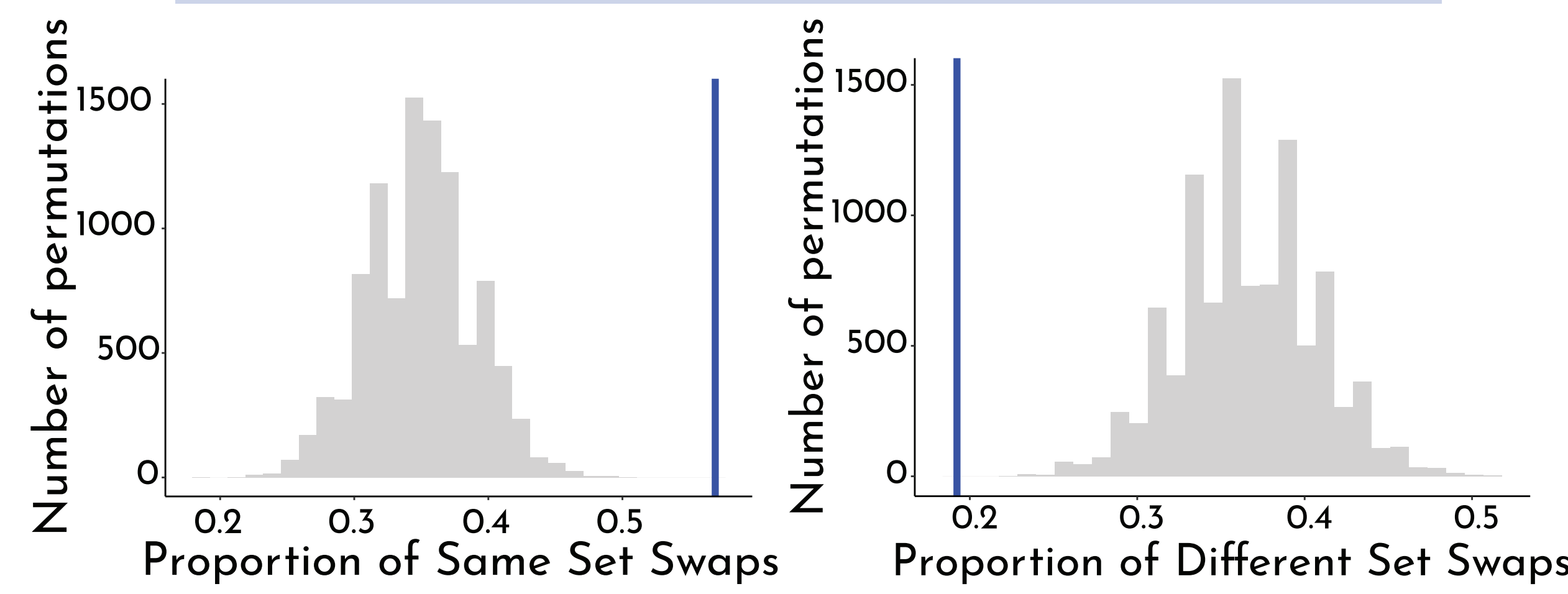
Training Data



Test Data



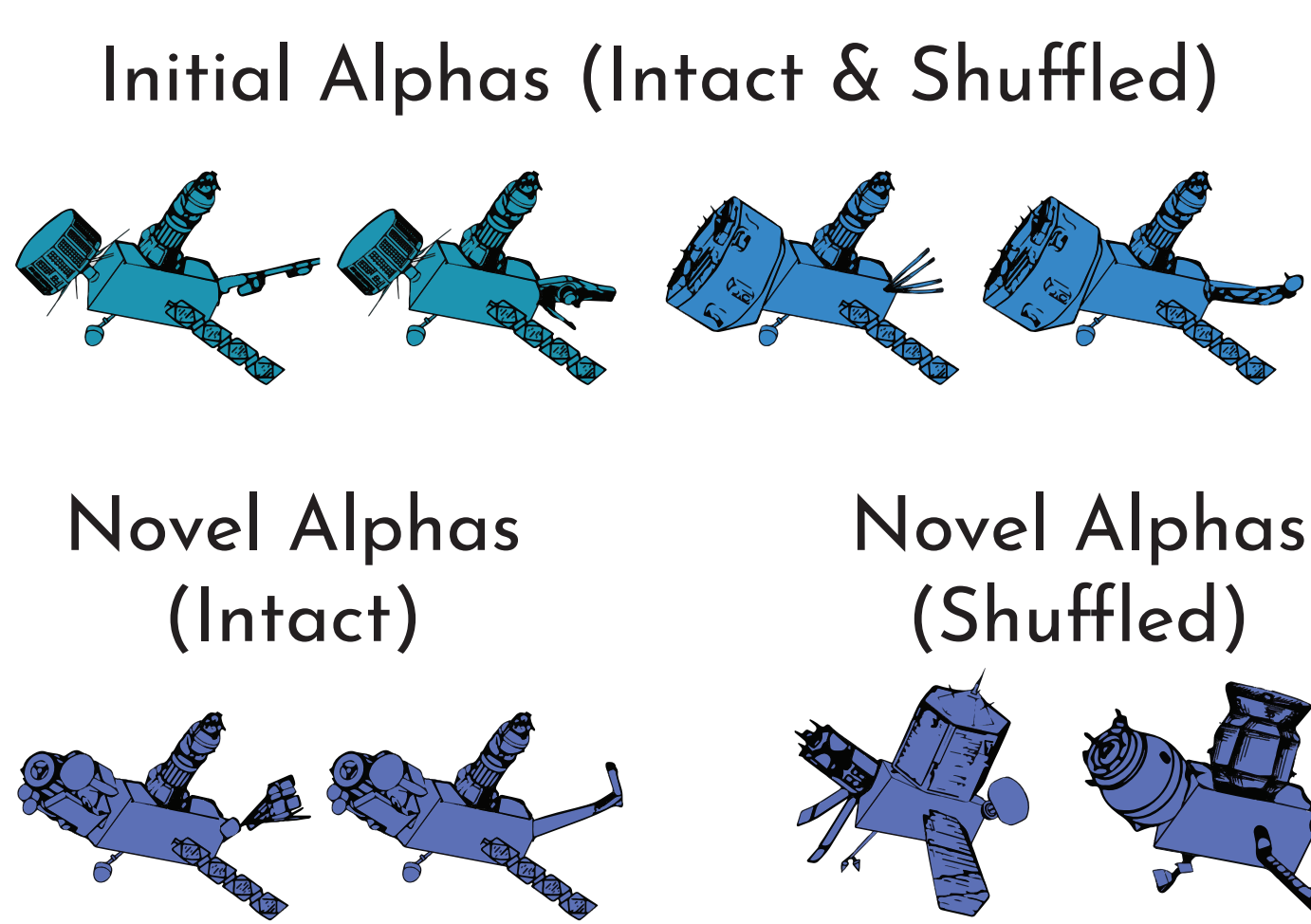
What kinds of errors are people making?



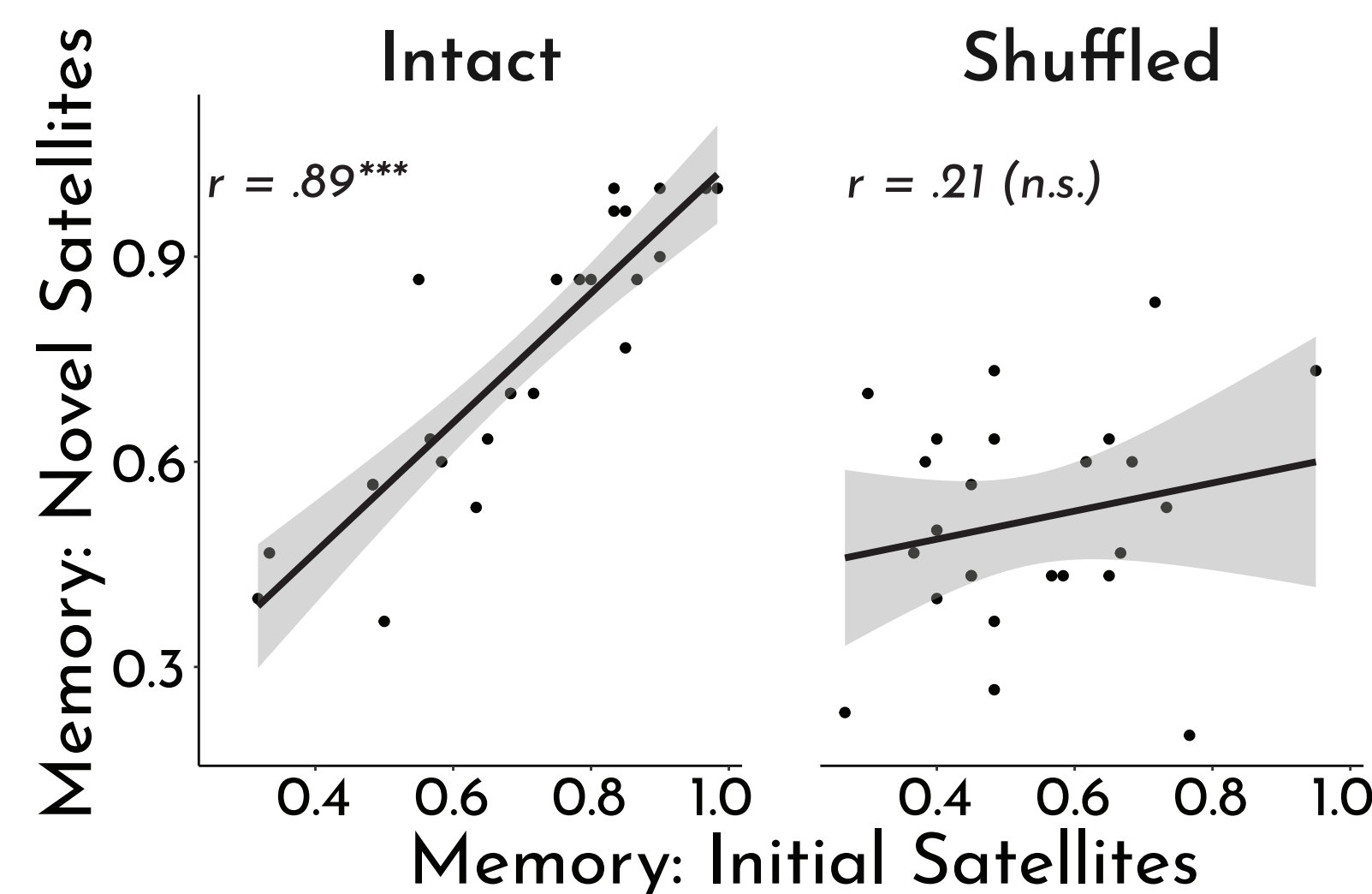
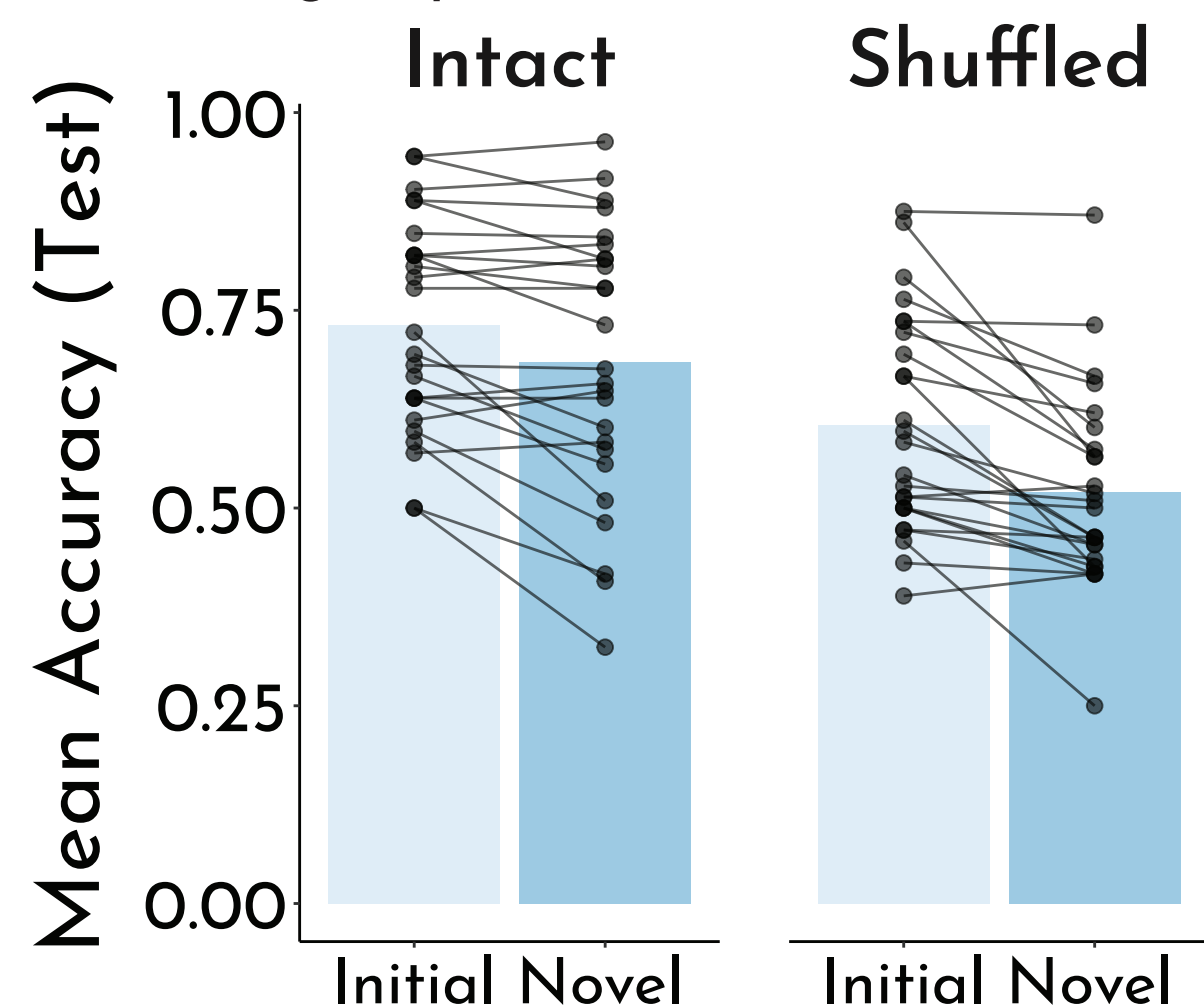
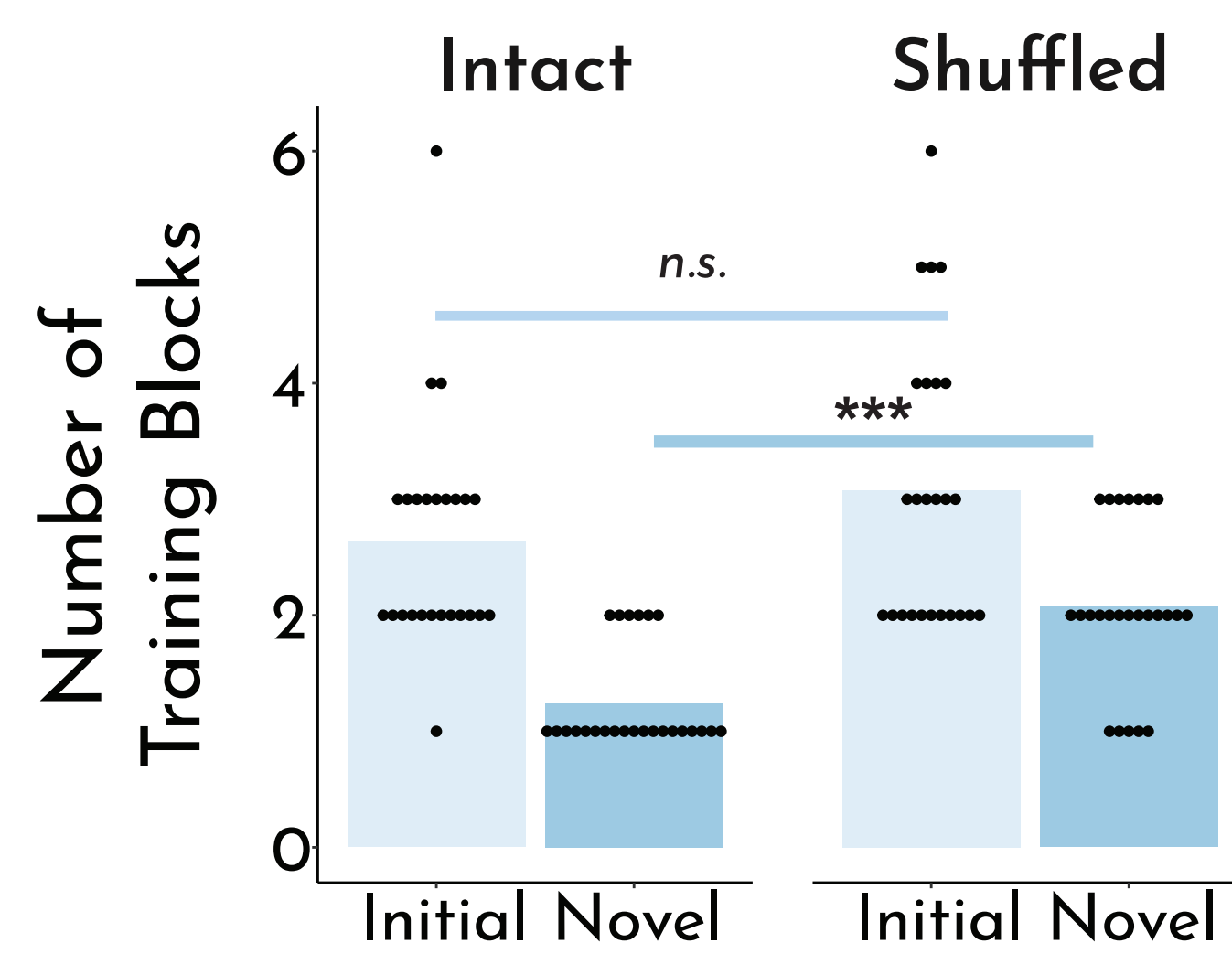
Participants may rapidly use novel category structure to facilitate new learning... ...But memory is still shaped by learning context

Experiment 2

Is it structure per se that facilitates new learning?



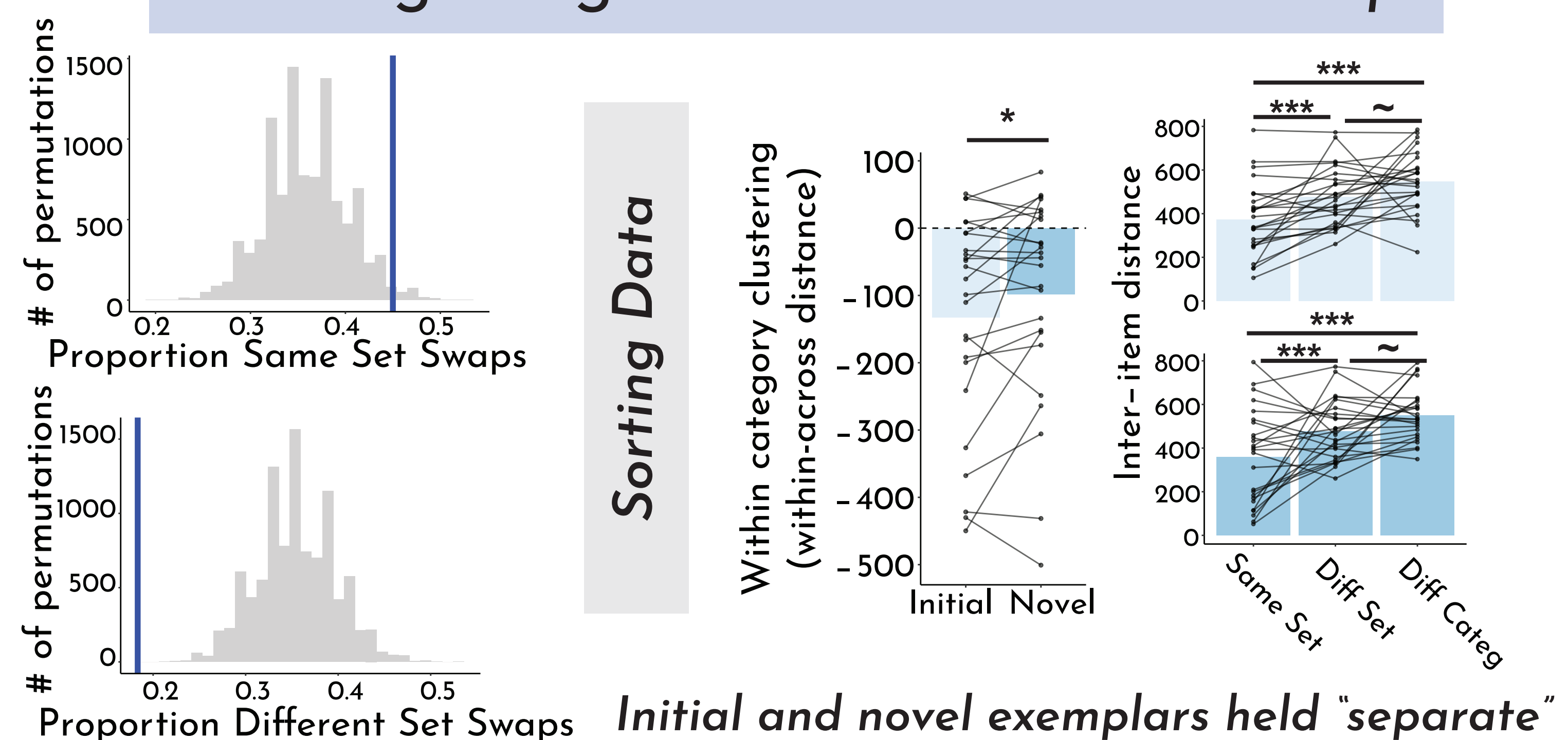
N = 50 (25/group)



No structure in novel satellites → no benefit of prior learning

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

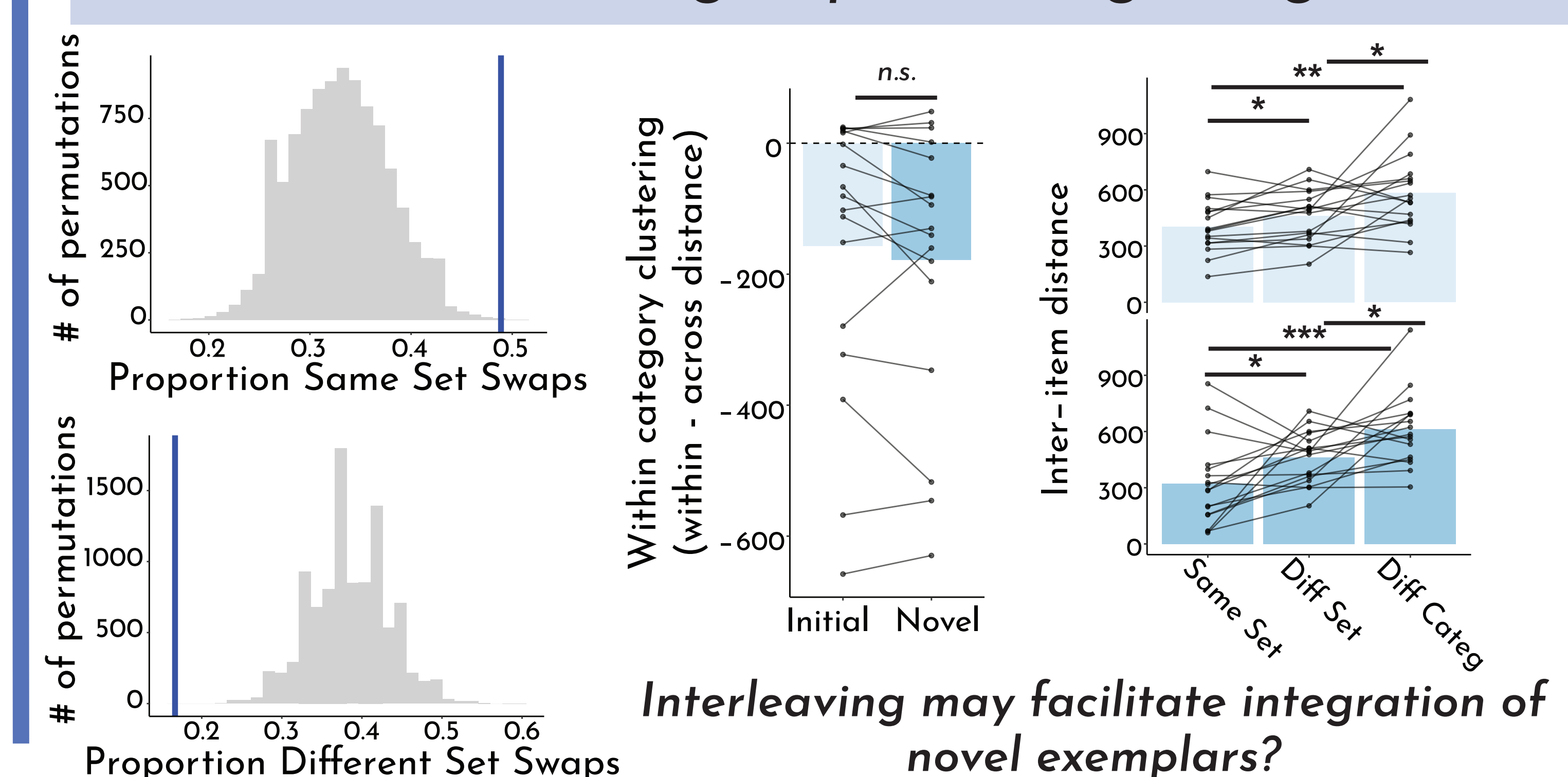
Probing Integration in the Intact Group



Experiment 3

N = 17 (planned N = 25)

Role for interleaving in promoting integration?



Discussion

People are able to rapidly learn novel category structures and use that knowledge to scaffold new, related learning

Newly learned information may not be fully integrated with prior information ("repulsion" in memory, reduced clustering with other exemplars)

Ongoing work examining possible role for sleep in integration process