**Introduction**

-Children distribute attention while adults attend selectively.

-This may be adaptive. In particular, it may subserve exploration.

-Research on exploration makes an important distinction between systematic and undirected exploration.

-Systematic exploration relies on PFC, which is relatively undeveloped in young children.

-In a recent study, we found that children’s choices were highly exploratory, and that exploration was systematic—contrary to predictions of current theories.

*What is driving systematic exploration in young children?*

-We hypothesize that this systematic exploration is tied to attentional mechanisms.

-Brief overview of the current task

-Congruent/Competition attentional manipulation

-Lay out several competing hypotheses (and their predictions) about how the attentional manipulation will affect children’s choices

1. Children’s choices are driven largely by novelty seeking, rather than reward seeking

-predicts choosing the salient option often in both conditions

2. Children’s exploration is not tied to attentional mechanisms

-predicts a small (or no) effect of saliency in both conditions

3. Saliency and reward interact. The effect of saliency will depend on condition.

Give a few examples of interaction:

-e.g. Saliency serves to facilitate memory, leading to avoidance in competition condition and optimization in the congruent condition.

We suggest that attentional mechanisms may be specifically tuned to facilitate learning in young children, generally resulting in high levels of exploration. But, exogenously capturing attention may interfere with systematic exploration by drawing attention to the salient option rather than to less recently sampled options.

**Method**

**Results**

Behavioral results:

-Proportion of selecting the best option was higher in the Congruent condition than in the other two conditions

-Proportion of switching was different between the three conditions.

-High switching in Baseline

-Lower, more random, switching in Competition condition

-Even lower switching in Congruent due to large number of optimizers/exploiters

Computational modeling:

-describe models

-fit results:

-most (~90%) children in Baseline best fit by the model with systematic exploration included, compared to standard model without it.

-both Congruent and Competition condition were best fit by the systematic exploration model much less often (~50%)

-Parameter results

-best-fitting phi parameter further supports that there were high levels of systematic exploration in the Baseline condition and low levels in the other two conditions.

Graphs:

-Mean Choice proportions over the experiment for each condition

-Switch proportions boxplot/scatterplot for each condition

-Model Phi parameter graph

**Discussion**

-Our results suggest that drawing attention to a single salient option disrupts systematic exploration, which is usually high when saliency is more evenly distributed.

-Children’s choices are not driven by pure novelty seeking, since we found an interaction between reward and saliency.

-This suggests a complicated role of attention in determining young children’s choices, which warrants further study

-Our results suggest that attentional mechanisms are a major determinant of exploratory behavior in young children, in contrast to top-down PFC mediated processes used by adults.

-Despite immature PFC, distributed attention supports systematic exploration in young children, which may be critical to enable broad information gathering early in life.