

# Investigating Flexibility in Young Children's Spatial Recall Strategies through Probabilistic Modeling



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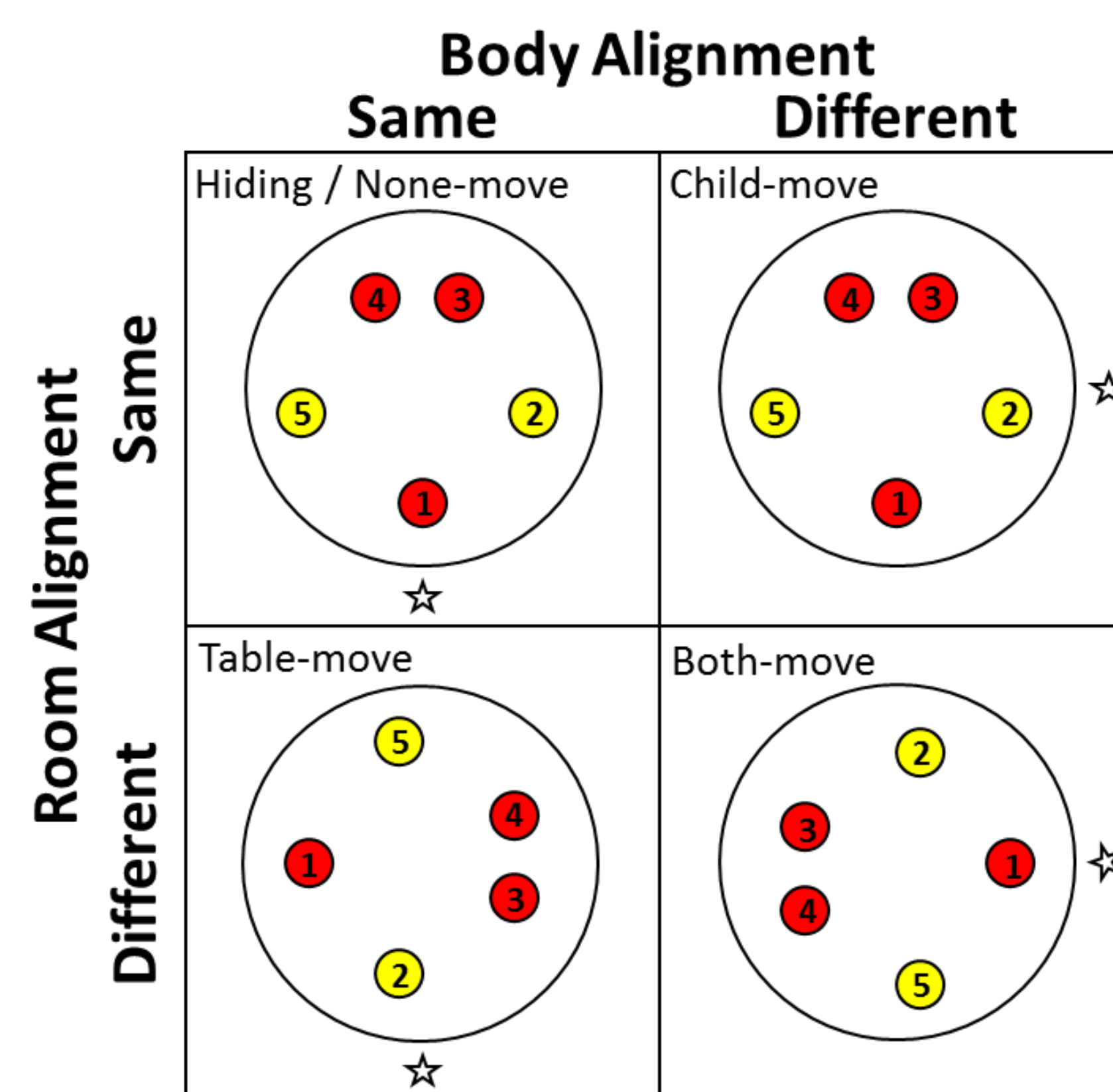


## Spatial Recall Strategies

- Reference frame selection
  - Egocentric: viewpoint dependent, evident from infancy (e.g., Bremner, 1978)
  - Allocentric: viewpoint independent
    - Room-centered, emerges around 18-24 months (e.g., Acredolo, 1984; Bremner, 1994)
    - Intrinsic, emerges around 5 years (Nardini, Burgess, Breckenridge, & Atkinson, 2006)
- Are young children *not able to use an intrinsic strategy, or simply not using it effectively?*

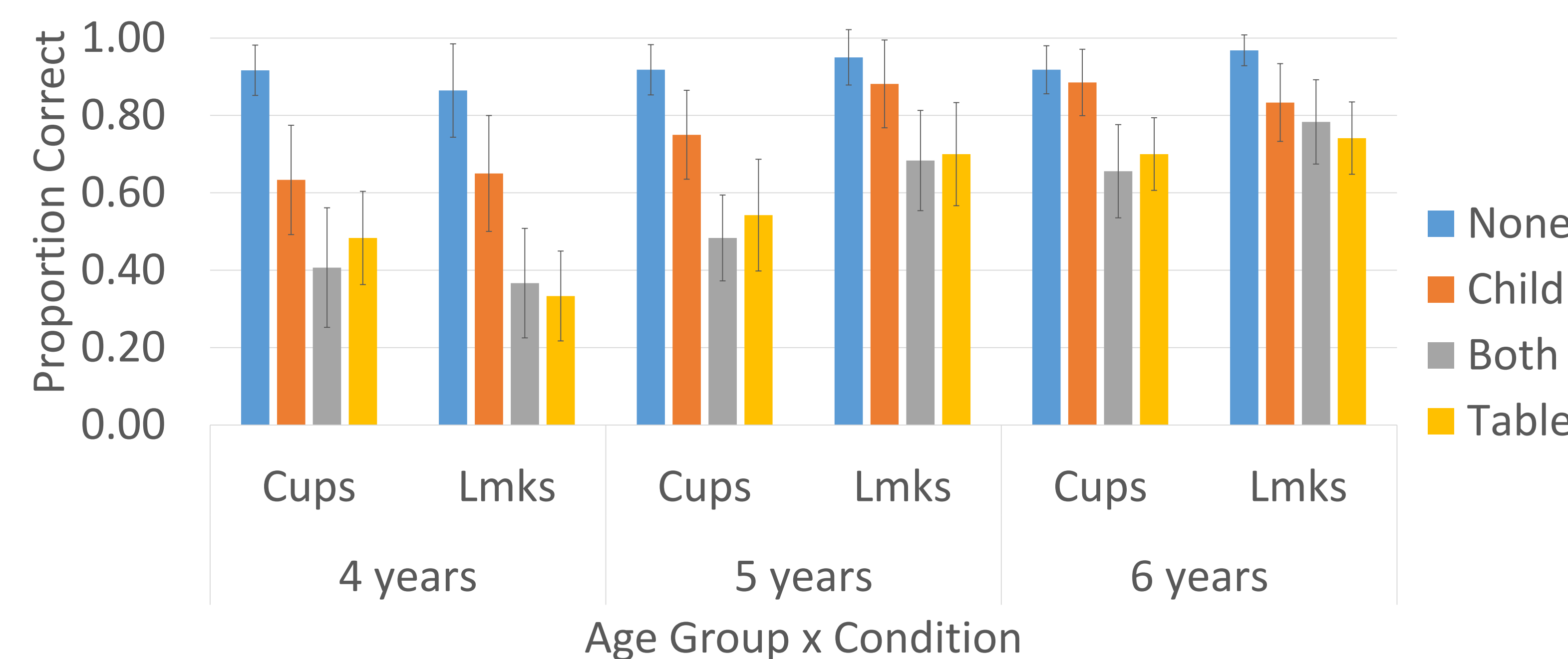
## Spatial Recall Task

- Designed to test intrinsic strategy (Miller, Patterson, & Simmering, 2016; cf. Nardini et al., 2006)
  - Manipulate view at hiding, disrupt alignment of reference frames
  - Only intrinsic is reliable across rotation types
- Compared cups only to landmarks

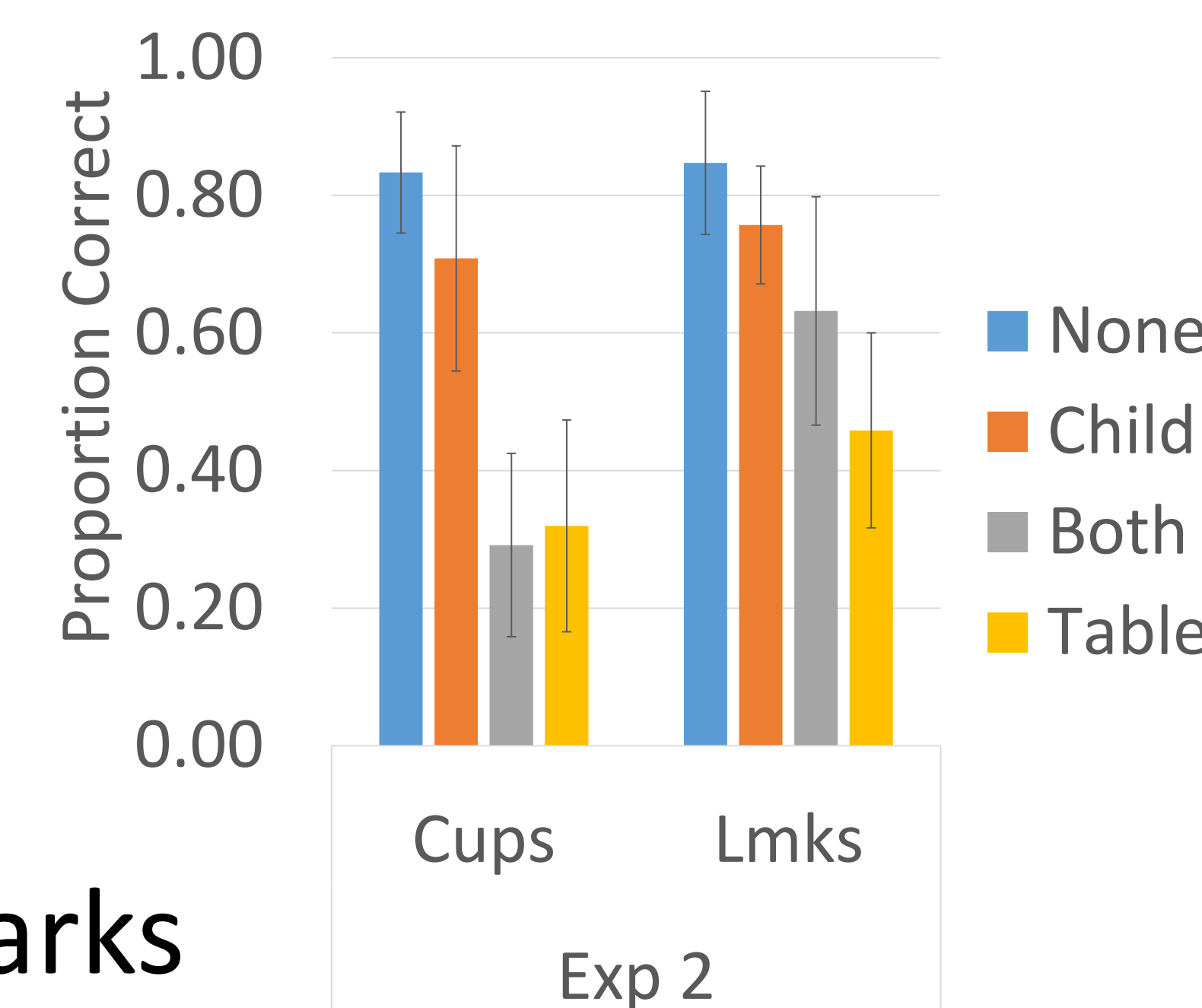


## Behavioral Results

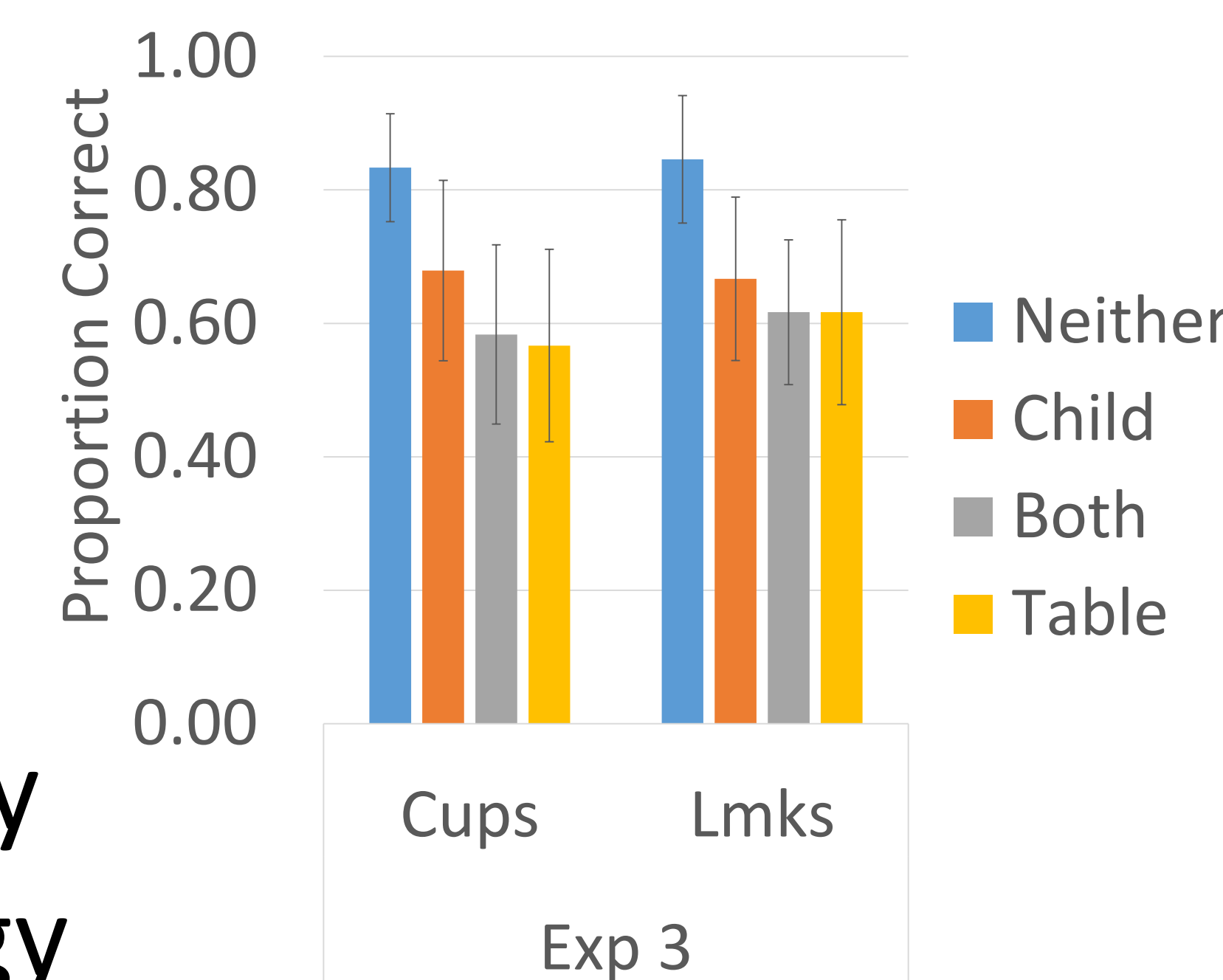
- Experiment 1
  - Three age groups: 4, 5, and 6 years
  - Cups, landmarks (between subjects)
  - Rotation types counter-balanced



- Experiment 2
  - Only 4 years
  - Simplify intrinsic strategy by hiding in same location on every trial
  - Better with landmarks than in Exp1



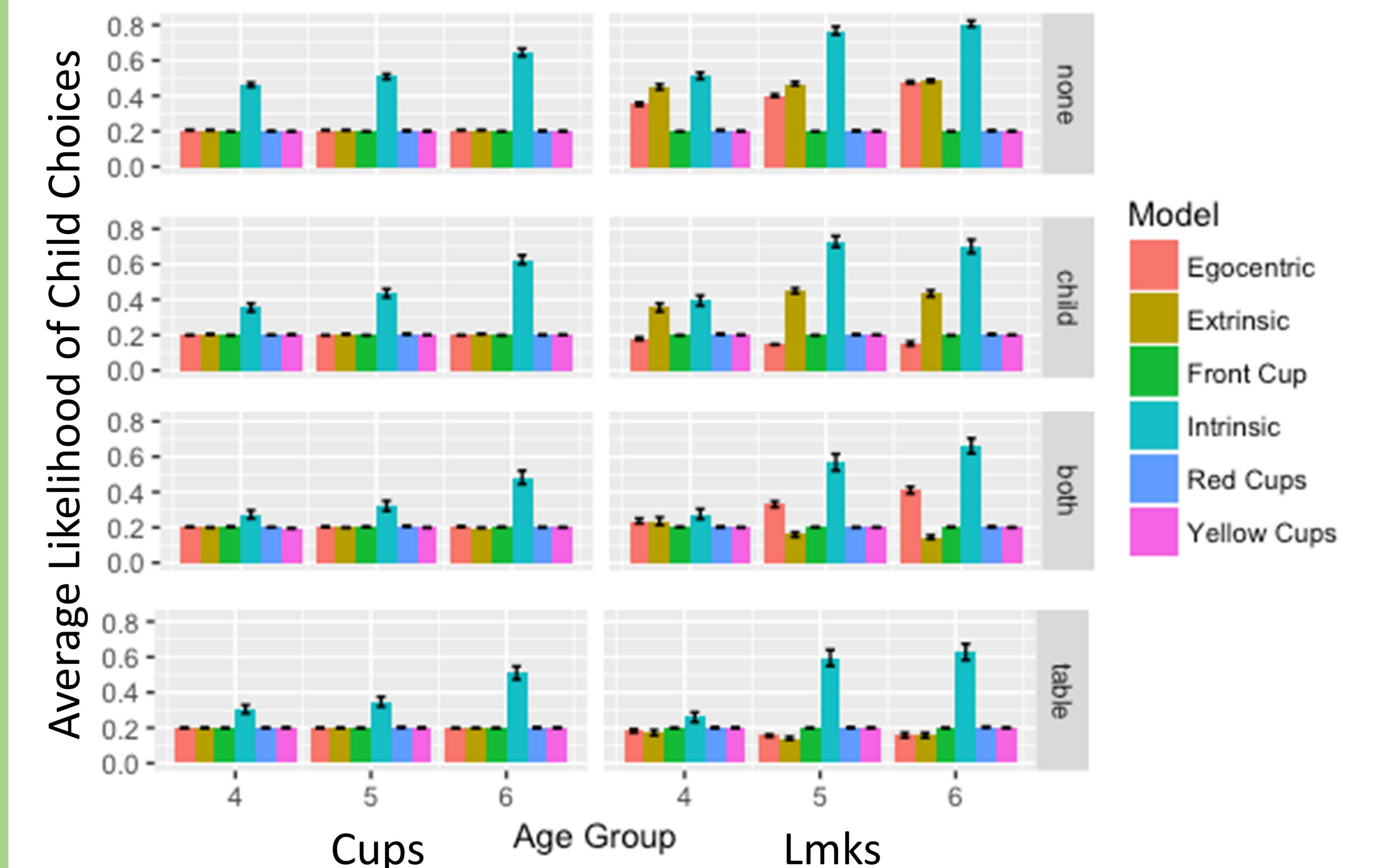
- Experiment 3
  - Only 4 years
  - View table movement to highlight reliability of intrinsic strategy
  - High performance overall



- Model to test which strategies fit best

## Probabilistic Model

- Prior model suggested 4-year-olds mix intrinsic and extrinsic/ egocentric on table-move trials (Negen & Nardini, 2015)
  - Mixing = change strategy over trials
  - Combination = average choices
- We compared 6 search strategies across rotations, conditions, ages in Exp1



- Model results
  - Intrinsic was best single-strategy model, even low performance
  - No better fit from mixing; differs from prior result due to task structure?
  - Next steps: test strategy combination, model Exp2-3
- Young children may use intrinsic strategy but still perform poorly