Spatial Reference Frames
- Egocentric (~8-12 mo; e.g., Bremner, 1978)
- Allocentric
  - Global (~18-24 mo; e.g., Newcombe, Huttenlocher, Drummey, Wiley, 1998)
  - Local (~5-6 yr; e.g., Nardini, Burgess, Breckenridge, & Atkinson, 2006)

Why does the use of local frames develop so late?

What contexts support the use of local frames for young children?

Three behavioral tasks:
- Memory task – experimenter hides toy under cup, child retrieves after short delay
- Comprehension task – child locates toy based on verbal description

Method
- Four rotation conditions (within subjects); global cues were eliminated by curtains

Exp 1 Memory Task: How do kids use Ego vs Local reference frames?
- Main effects of Age, Rotation; Age x Rotation interaction
- 4yr: 1-none > 2-table/4-both, 3-child > 2-table
- 6yr: 1-none > 2-table/4-both

Conclusions
- Egocentric updating at both 4 and 6 years in the memory task
- Without verbal cues, 6-year-olds but not 4-year-olds can use the local allocentric reference frame to remember locations
- No differences in 4- and 6-year-olds’ comprehension within local allocentric frame; 4-year-olds don’t produce descriptions well
- Providing verbal cues while hiding toy improved 4-year-olds’ use of local allocentric reference frame
- Future question: how enduring is this benefit? Can 4-year-olds spontaneously verbalize without instructions?