What is the time course of verbal updating?
Infants' use of language to update mental representations

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Introduction

• Recent findings indicate that by 30 months children can use verbal input to update an absent object's representation as they hear new information about it (Ganea et al., 2007; Ganea & Harris, 2010).

•The extent to which children younger than 2 years can update their representation of a non-visible scene when they hear information about it is not clear.

•Previous assessments of updating ability relied on effortful behaviors (pointing, searching). The current research used a more sensitive measure (looking) as evidence for updating.

Goal

In the current study we used a Tobii T120 eye-tracker to investigate:

→ the earliest age at which children can map new verbal information about a visual scene onto their mental representation of the scene.

→ whether the children bind the new information into their mental representation of the scene as they hear the information.

Study 1

Participants: 16-month-olds (N=15) and 19-month-olds (N=16)

Children received 2 blocks of 4 trials (expected and unexpected) in counterbalanced order:

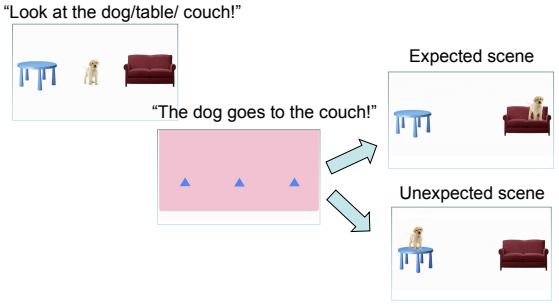
Procedure

Slide 1 (familiarization): two objects and an agent appeared all at once and were named "Look at the dog/bed/table!"

Slide 2 (update event): the scene was covered and the child heard a sentence informing them about a location change, "The dog goes to the chair."

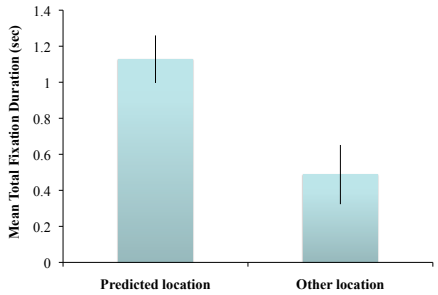
Slide 3 (test event): the child was presented with an expected or unexpected test event.

Experimental events



Results

• The 19-month-olds look significantly longer at the location where the agent should be after the verbal updating but before the scene is revealed (anticipation), $t = 3.27$, $p = 0.004$.



• Once the visual scene is revealed, the 19-month-olds do not prefer any of the two locations. The presence of the agent drives the gaze toward the agent in both conditions.

• The 16-month-olds do not anticipate the location of the agent at the time they hear the information about it.

Study 2 (control)

The procedure was the same with one exception. One slide 2, children heard: "The dog *blicks* to the couch!". The goal was to test whether children simply preferred to look at the last location mentioned.

Participants: 19-month-olds (N=13)

"The dog *blicks* to the couch!"

Results

The children looked toward the named location longer in Study 1 than in Study 2, that is, when they heard 'goes' as opposed to 'blicks', $t = 3.55$, $p = 0.001$.

Conclusions

The current findings provide evidence that children as young as 19 months of age can update their representation of a non-present visual scene at the moment they hear about a change in the scene.

The 19-month-olds in this research looked at the expected location of an agent as they heard new information about it.

References:

Ganea, P. A. & Harris, P. L. (2010). Not doing what you are told: Early perseverative errors in updating mental representations via language. *Child Development*, *81*, 457-463.

Ganea, P. A., Shutts, K., Spelke, E., & DeLoache, J, S. (2007). Thinking of things unseen: Infants' use of language to update object representations. *Psychological Science*, *18*, 734-739.

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