9.85 Cognition in Infancy and Early Childhood

Lecture 15: Pretend play; Theory of mind and word learning

Mini (20-minute) lab meetings

- Find a partner
- Explain your proposal.
- Convince her/him of the importance of your research question.
- Get and give feedback --
- Is it the right question? The right experiment? The right interpretation?
- Switch

Pretend play

- Complex even at 2 …
- Multiple representations
- Multiple transformations
- And becomes increasingly abstract

Pretend play

- Ubiquitous but mysterious

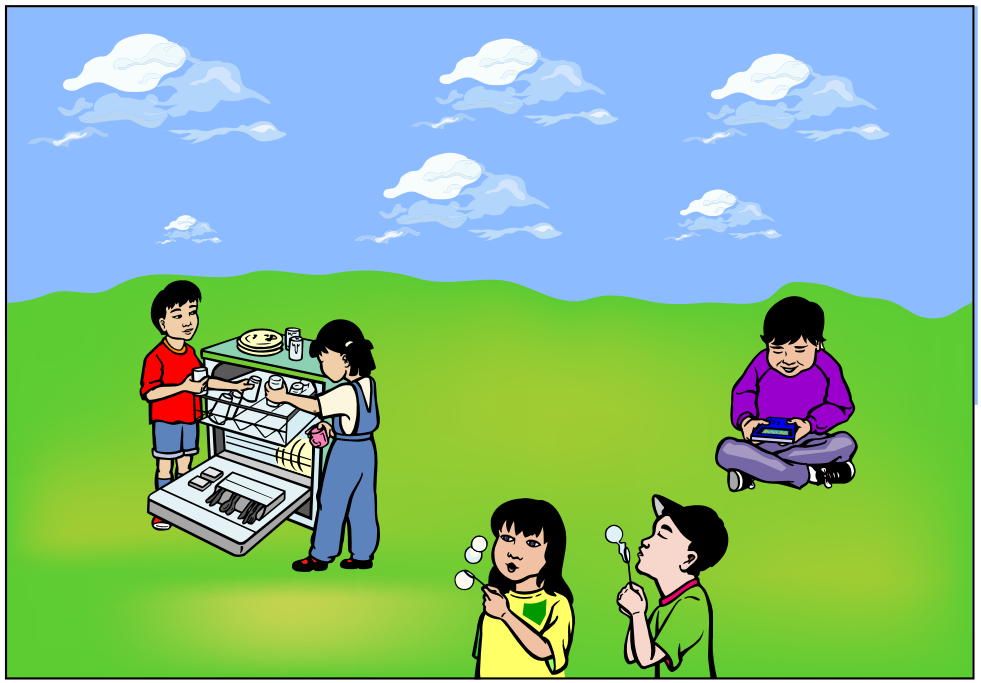


Illustration courtesy of MIT OCW.

Appearance/reality

- "What is this really and truly? Is it really and truly a rock or is it really and truly a sponge?"
- "When you look at this with your eyes right now, does it look like a rock or does it look like a sponge?"

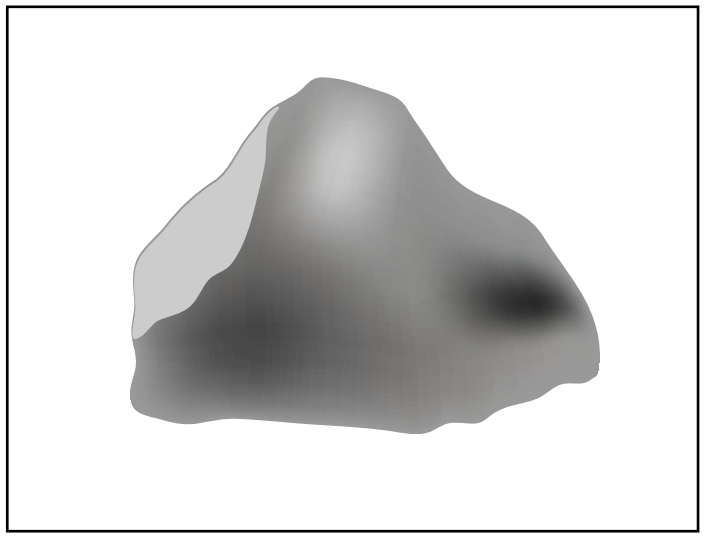


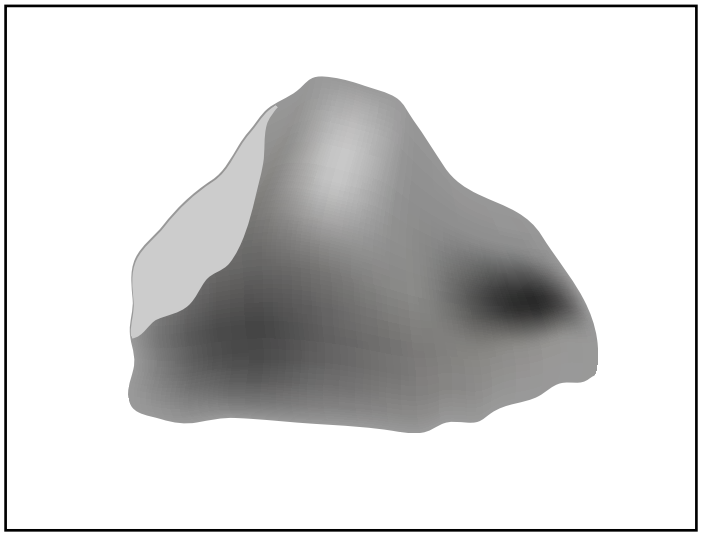
Illustration courtesy of MIT OCW.

Appearance/reality

- Children make two types of errors
- Phenomenalism
  - Go with appearance for both questions
- Realism (reality for both questions)
  - Go with reality for both questions

Pretense/reality

- "What is this really and truly? Is it really and truly a rock or is it really and truly a sponge?"
- "What is Sally pretending? Is Sally pretending it's a rock or is Sally pretending it's a sponge?"



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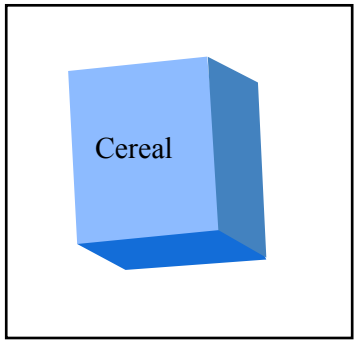
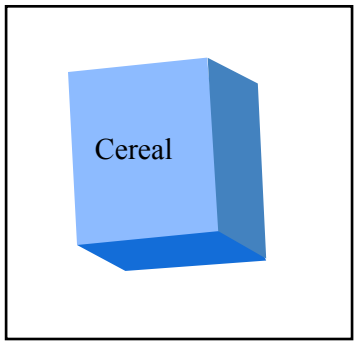
Mental states/reality

- Here's an empty cereal box.

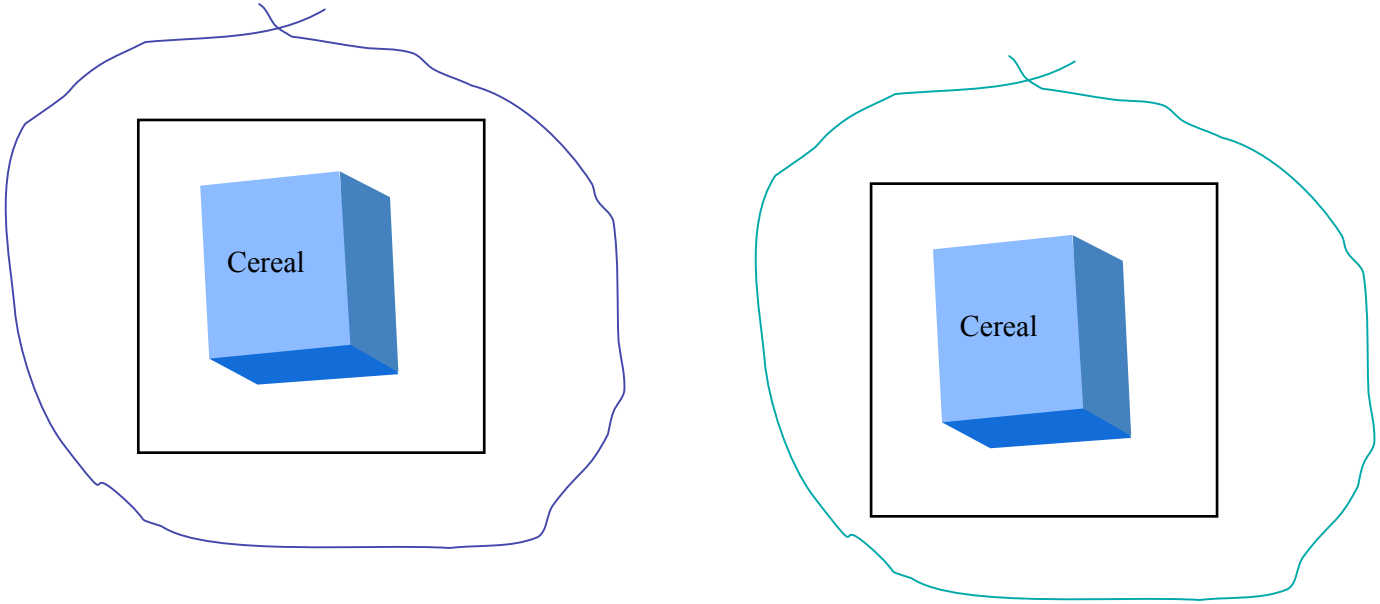


- Sally's pretending it's full.
- Sally thinks it's full.



Mental states/reality

- Show me the picture of what Sally is pretending/thinking.



Mental State/Reality

- We're going to pretend these cups are full of milk.
  - Sally leaves.
- Let's "drink" all the milk.
- Here comes Sally. Will she pretend the cup is empty or full?

Mental State/Reality

- This cup is full of milk.
  - Sally leaves.
- Let's drink all the milk.
- Here comes Sally. Does she think the cup is empty or full?

Counterfactuals

- “If all bears were blue and Jimmy was a bear, what color would Jimmy be?”
- 6 and 7-year-olds fail.

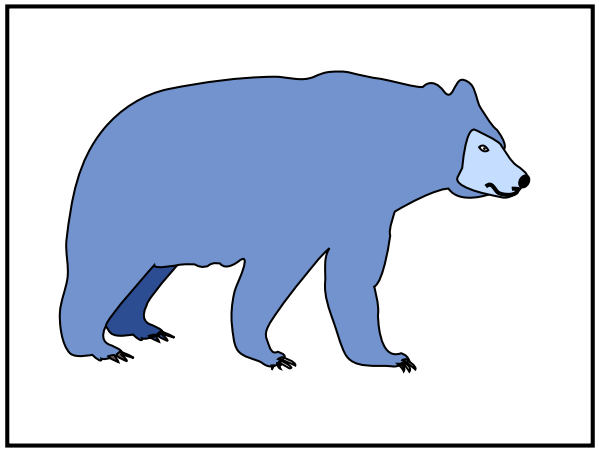


Illustration courtesy of MIT OCW.

- Versus: If this banana were a telephone, what would you do with it?
- 2-year-olds pass.

Illustration courtesy of MIT OCW.

Children's understanding of pretense

- Structure similar to false belief task -- represent reality one way when in fact it's another.
- But arguably easier than false belief because real state (this banana isn't really a telephone) and mental state (this banana isn't really a telephone -- I'm just pretending it is) are congruent.

Children's understanding of pretense

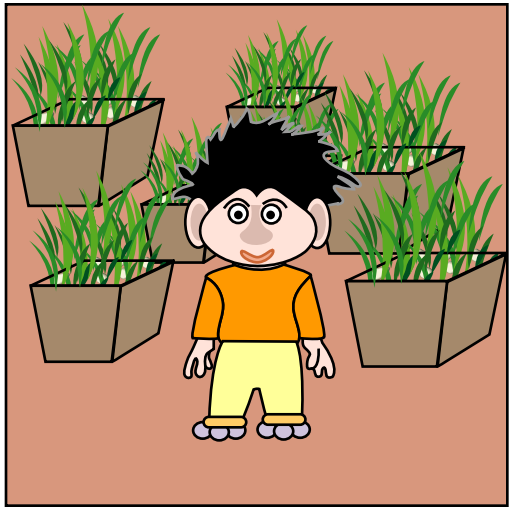
- Pretend play might be a "zone of proximal development"
- Scaffolds mental state understanding?
- Frequency of pretend play at 33 months predicts false belief understanding 7 months later.

Children's understanding of pretense

- But children might engage in pretend play without understanding its representational aspects.
- Might think of pretending as "acting like".
- Indeed, a full understanding of pretense might come after understanding of false belief.

Children's understanding of pretense

- Moe from the Land of Trolls



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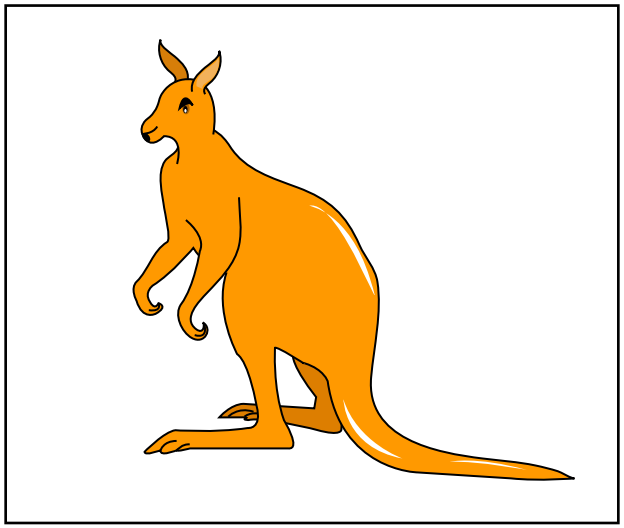
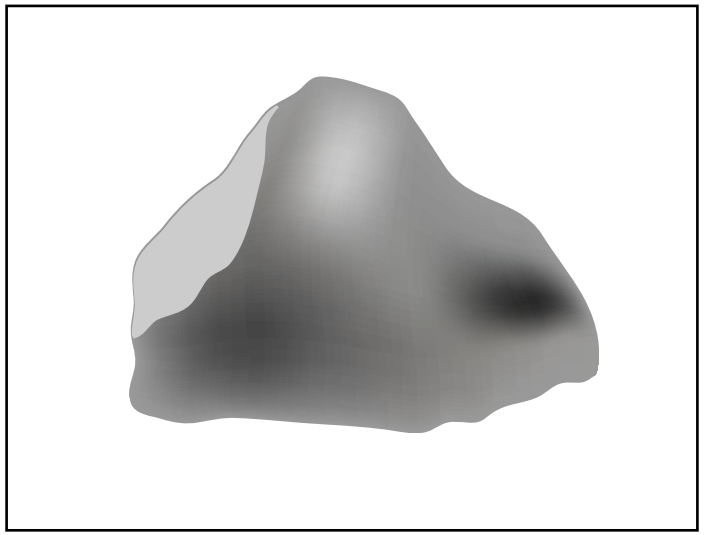
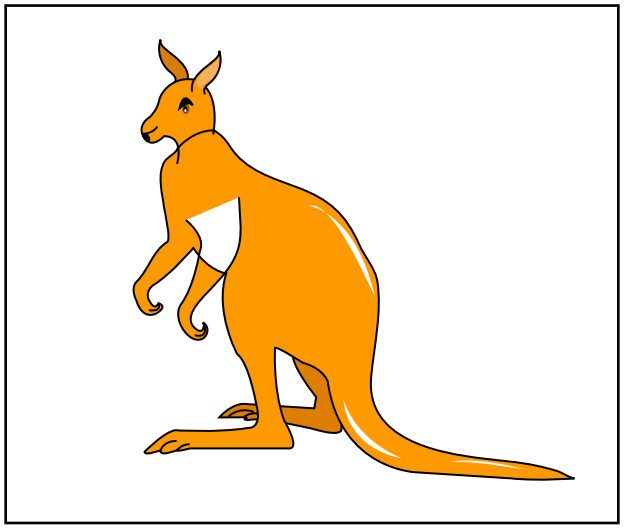


Children's understanding of pretense

- Hopping rock …





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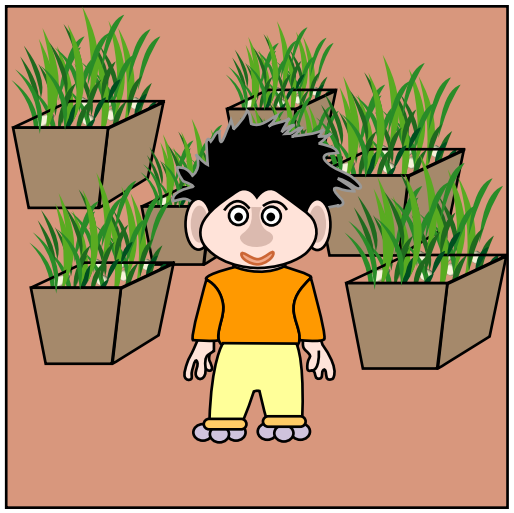
Children's understanding of pretense

- Non-volitional Moe from the Land of Trolls



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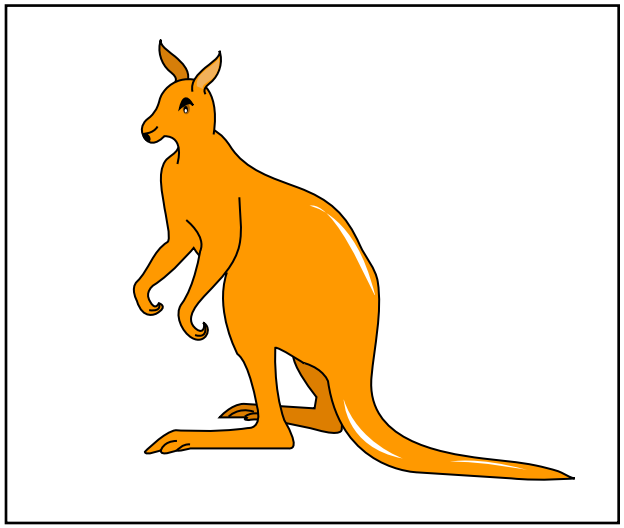
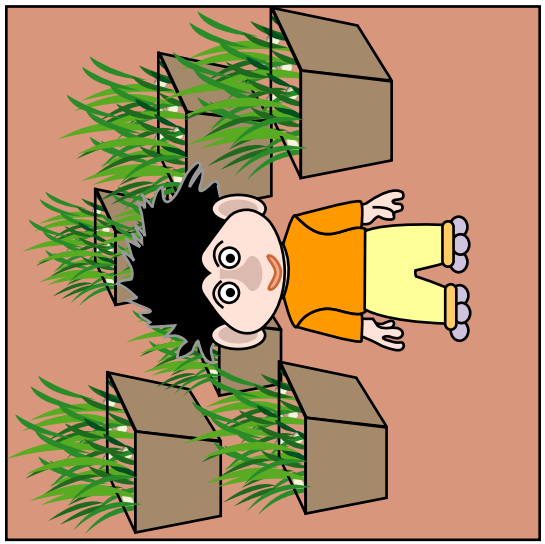


Children's understanding of pretense

- True also for sleeping Moe, unaware Moe …



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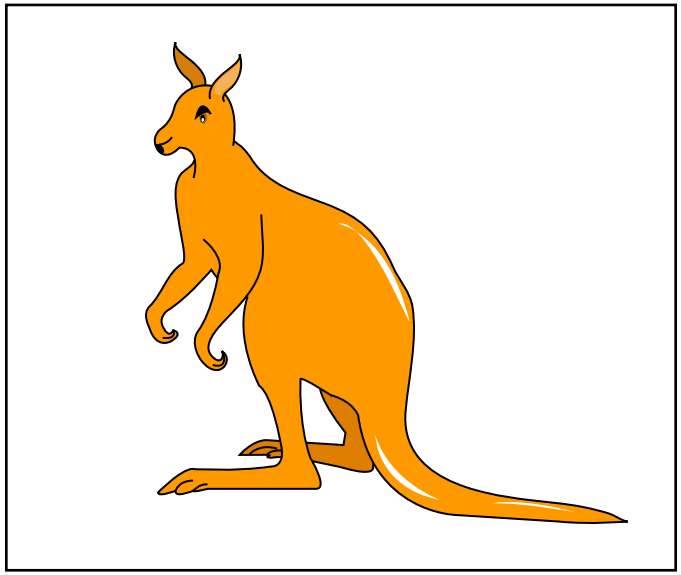


Children's understanding of pretense

- Young children don't think the mind is involved in bodily actions (e.g., sliding down a hill).
- Asked to categorize events into a mind box (thinking about a cat); a body box (sliding downhill) or both (telling a story).
- 65% of 4-year-olds put pretense actions (pretending to be a king) into the body box (even though they are passing false belief).

Children's understanding of pretense

- **Summary**
- Children make largely appropriate distinctions between fantasy and reality by 2.
- They can do tasks in pretense that they cannot do otherwise.
- But still have a fragile understanding of mental states in general. Things they don't understand well in general (mind/body distinctions; awareness) they also don't understand in pretense.

Baby talk

- 3-months: Cooing
- 6-8-months: Language-specific babbling
- 12-months: first word production

Baby talk

- Banana, doggy, mommy, daddy, book, bubbles, mouth, tree, cookie, nose, duck, milk, blanket, door, cow, horse
- Down eat, go, sit, wanna, gimme, up, bye-bye,hi, night-night, no, yes, please, thank you, uh oh, allgone, shh, messy, cold, ouch

Baby talk

- And quite accurate. By 2-word age, children respect grammatical rules …
  - Mommy gone and More cookie (never gone mommy or cookie more)
  - Teddy kiss v. Kiss Teddy

Baby talk

- And apply them …
  - This is a wug. What are these?
  - Overregularization
    - Not imitative
    - Not reinforced

Baby talk

- Fast mapping; long retention; quick recognition

- Adults too …
- What is the capital of Ohio?
- When is your mother's birthday?
- What does "effervesce" mean?

Fast mapping

- 6 novel objects
  - "Let's use the koba to measure this disk. Let's put the koba away"
- Tested immediately, at 1 week or at 1-month.
- 3's chose correct object 60% of the time, no difference at longer delays.
- Adults were better immediately but looked just like the 3's at 1-month delay.

Baby talk

- Leaving aside grammar …
- How do children do it?

Baby talk

- Statistical problem just to learn word boundaries:
- Theredonateakettleoftenchips
- Then the problem of determining word meaning …
- 8,000-10,000 words by the age of 6.
- 65,000 words for average high school graduate (10 words/day from 12-months on)

Baby talk

- Wittgenstein, Russell and Quine
  - How do you know a referential act when you see one?
  - How do you refer to the intangible?
  - How do you know the scope of reference?

Baby talk

- Constraints on word learning …
- Whole object bias, basic level bias, mutual exclusivity, syntactic bootstrapping …
- But social context might act as another type of constraint …

St. Augustine

- “When my elders named any thing, and as they spoke turned towards it, I saw and remembered that they called what they would point out by the name they uttered. And that they meant this thing and no other was plain from the motion of their body …expressed by the countenance, glances of the eye, gestures of the limbs, and tones of the voice, indicating the affections of the mind …”

Word learning and theory of mind

- Chomsky: Poverty of the stimulus
- Slobin: Poverty of the imagination

- Context and referential intent as a constraint
  - Gezundheit v. Cholera, schmata

Word learning and theory of mind

- Might seem like a vicious circle.
- Use referential intent to understand word meaning …
- But what does it mean to know referential intent without knowing the meaning of words?
- Clever experiments to disentangle these …

Theory of mind and word learning

- Basic point is that you need TOM to overcome the types of errors you would make if you were learning associatively.

- Volunteers …

Theory of mind and word learning

- **Discrepant labeling task**
- Babies learn labels for object of adults' attention, not their own.
- Babies monitor more in ambiguous contexts (e.g., don't look at face if there's only one object; do if there are 2 or more).

Theory of mind and word learning

- **Discrepant retrieval task**
- Babies learn labels for what adult intends to label.
- Not just the first object they see.

Theory of mind and word learning

- **Non-ostensive task**
- Babies learn labels even when
  - Nothing is labeled
  - The intended object is not the first object they see.

Theory of mind and word learning

- **Distractor task**
- Babies learn labels for objects adults intend to name.
- Not perceptually salient distractors.

Theory of mind and word learning

- **Discourse novelty task**
- Babies can use social cues to disambiguate referents.

Theory of mind and word learning

- **Intention task**
- Babies assume labels map onto intended rather than accidental actions.
- (Even if accidental action happens immediately after the label).

Theory of mind and word learning

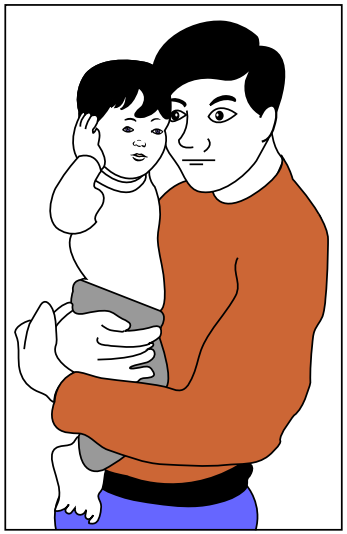
- So how good are these extra-linguistic cues?
- Adult simulation
  - 40 seconds of videotape of mom playing with her toddler.
  - Six most commonly used nouns and verbs were identified.
  - For each word, observers watched 6 tapes with the sound turned off and a beep inserted when the word was uttered.
  - Adults correctly guessed 45% of the nouns and 15% of the verbs.

Theory of mind and word learning

- So … if TOM is critical to word learning.
- What if you have a deficit in TOM?
- Children with autism often fail these tasks.
  - Learn label for what object of their attention, not speaker's attention.
  - Fail to monitor gaze in ambiguous contexts.
- However, vast range of language abilities in autism -- from mutism to Asperger's syndrome. Story still unclear ..

Bottom line

- Language acquisition happens in a rich context with multiple overlapping cues and lots of background knowledge.
- Stimulus may not be so impoverished after all.



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