

Are Infants Little Scientists?



The Prevailing View

- Infants have **theories**
- That are **innate**,
- Specific to ontological **domains**
- And **conceptual**, not perceptual

The Prevailing View

Theories

- **Causal/explanatory principles**
- **Postulate hidden causes**

The Prevailing View

The Prevailing View

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Innateness

- **Organism's contribution**
- **Tests:**
 - Poverty of the stimulus (triggering)
 - Fixed stages (maturation)
 - Selective deficits (genetic)

Domains

- Psychological structures comprising knowledge of fundamental categories

What is the Alternative?

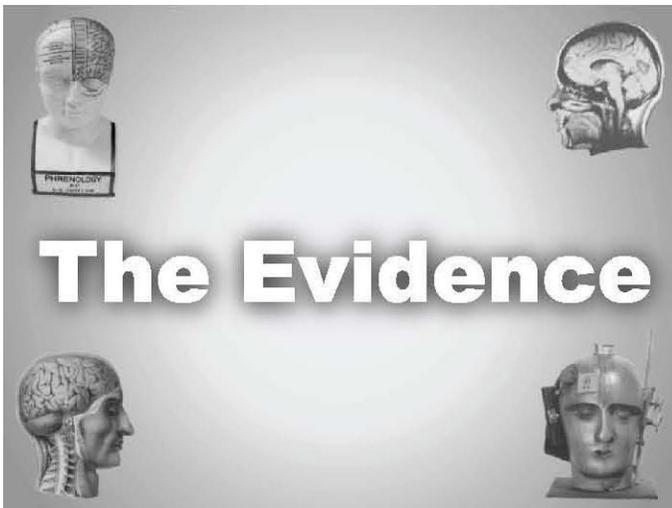
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Concepts

- Construed as amodal
- Organismic control

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- Infants have innate **similarity-spaces**, faculties and biases
- That are domain **general**
- And grounded in **perceptual** systems



Case1 : Folk Physics

- Some physical principles:
 - **Solidity**: Objects cannot pass through each other
 - **Coherence**: Objects move as bounded wholes

Solidity

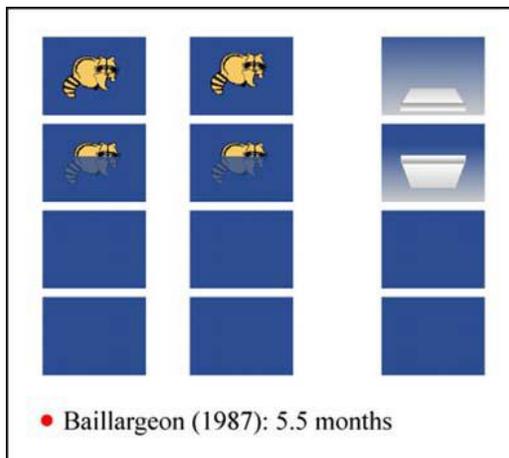


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Solidity

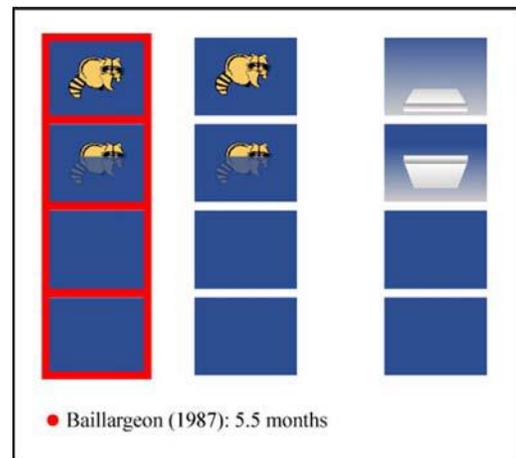


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Do Infants Respect Domain Boundaries?

- 10-month-olds distinguish animals from artifacts (Mandler and McDonough)

Reply

- Kindergarteners are old!
- They have been told that some transformations are impossible (“toys are not real”)
- They have seen realistic toys
- They also see animals that transform (butterflies, babies etc.), but no cross-domains transformations
- So response is consistent with experience



Xu & Carey (1996)

- Vehicles innate?!
- Perceptual differentiation (curves, wheels, faces)
- 10 months is still old (they know plans and birds)
- Do younger infants distinguish categories?

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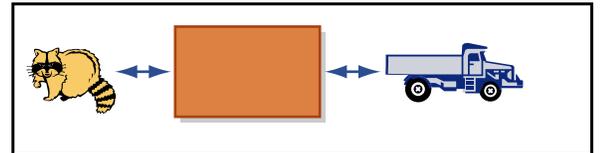


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Xu & Carey (1996)



Image by MIT OpenCourseWare.

Xu & Carey (1996)



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<10 mos, not surprised!

Folk Biology

Upshot

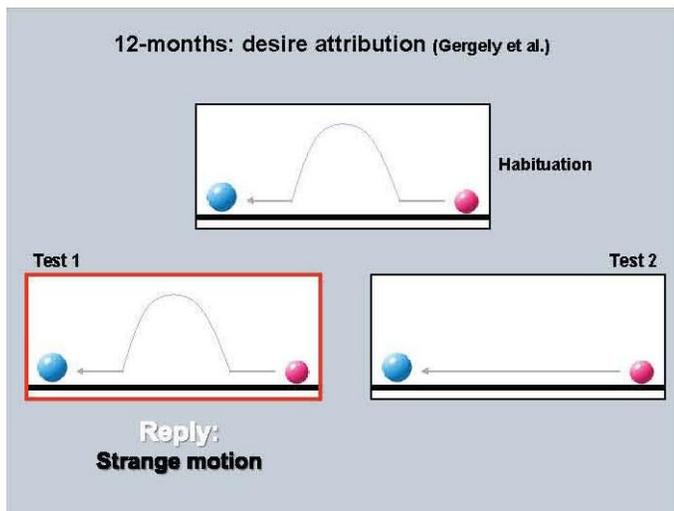
- We learn to distinguish biological from non-biological categories perceptually
- Views about what is essential to each category are learned by observation
 - If outside change, inside must matter
- And school learning

Figures removed due to copyright restrictions.

Case 3: Folk Psychology

Mindreading

- Attribution of mental states to animate objects
- Goals, preferences, beliefs



15 month-olds false beliefs

(Onishi & Baillargeon 2005)

Familiarization

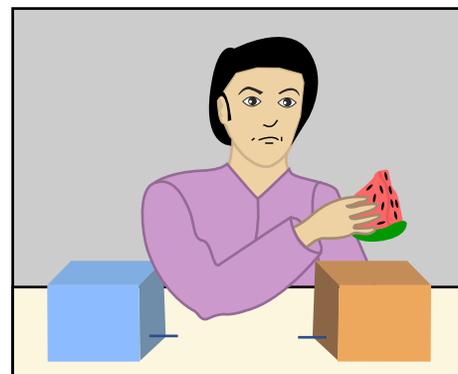


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15 month-olds false beliefs

(Onishi & Baillargeon 2005)

Familiarization

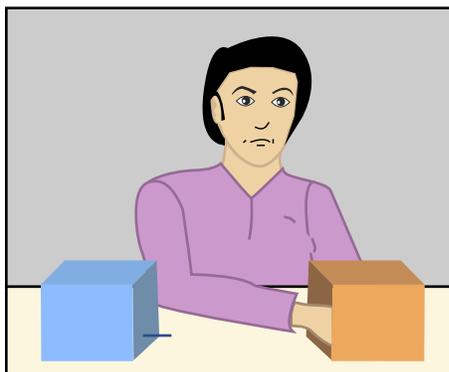


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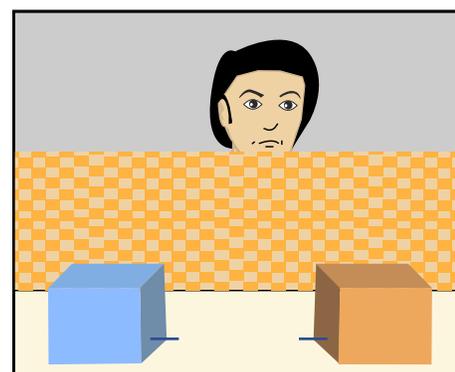


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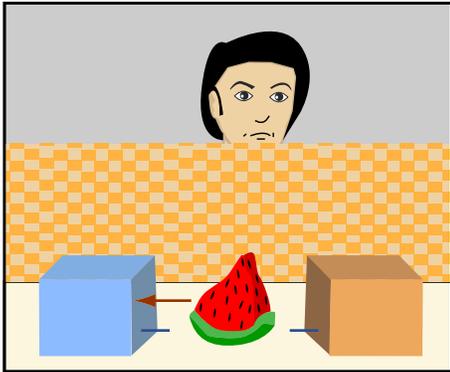
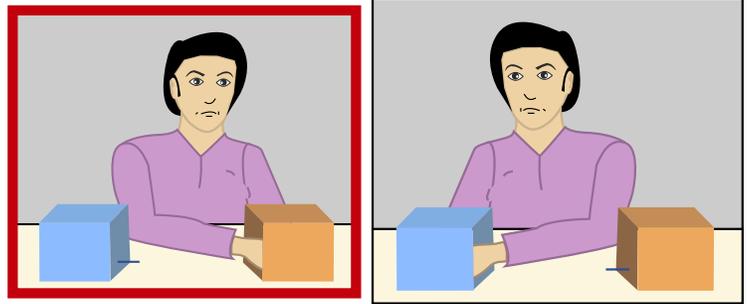


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15 month-olds false beliefs

(Onishi & Baillargeon 2005)

TEST



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15 month-olds false beliefs

(Onishi & Baillargeon 2005)

Familiarization

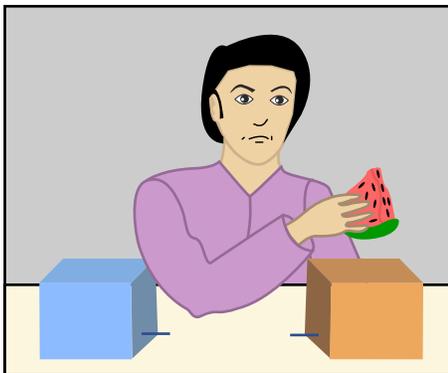


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Familiarization

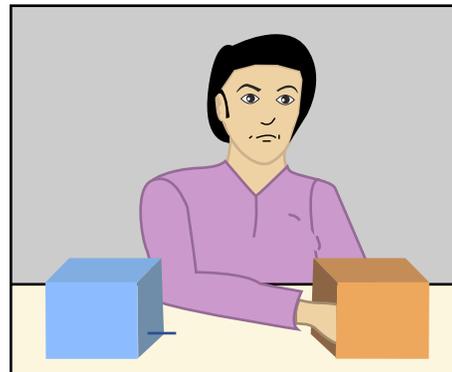


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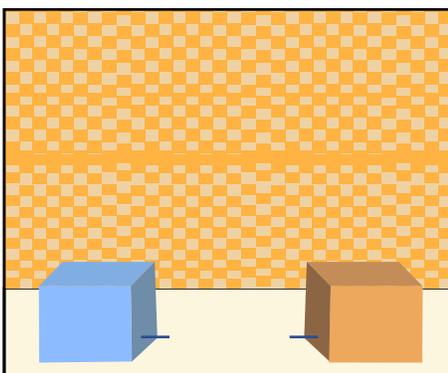


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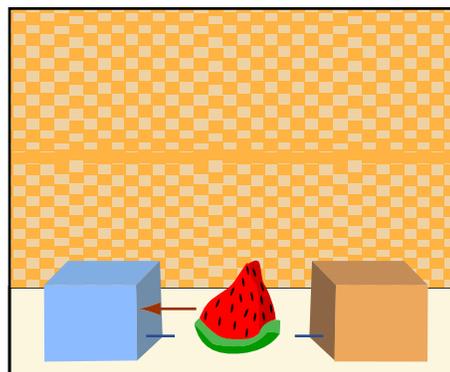
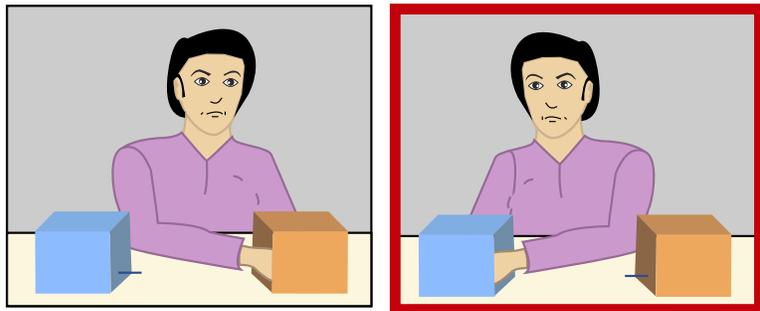


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TEST



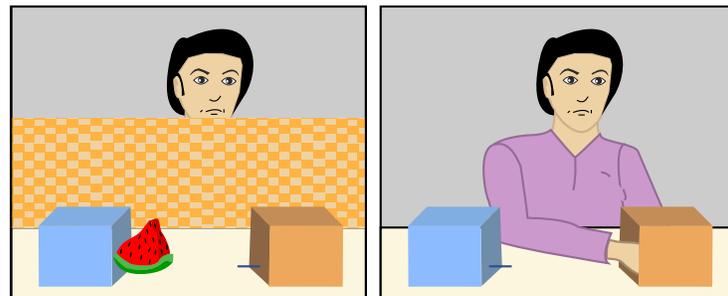
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15 month-olds false beliefs

(Onishi & Baillargeon 2005)

Objection (josef perner)

Responses predicted by final object/box/woman combo



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Is This Cheating?

- Baillargeon: *post hoc* perceptual explanations vs. principled predictions

Reply

- Good for science
- Presumption of anti-nativism is parsimonious
- Not necessarily *post hoc* (prediction could have been made, and new ones are testable)
- For every “good” study, there are many that fail. Is it *post hoc* to cherry pick?

Moreover...

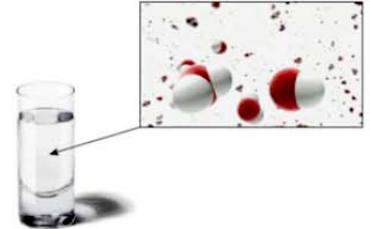
- No poverty of the stimulus arguments
- No need to go beyond perception
- No selective deficits (autism is not!)
- No fixed developmental onset (vinden)

Are Adult Concepts Theories?

- **Format:** we don't think using propositional theories (effortful, school learned)
 - Instead we use perceptual models
 - Principles are post-hoc analyses of these
- **Function:** Tracking not , explanation
 - Explanations superficial
 - Resistance to science

Domain-Specificity In Adulthood?

- "Domain" is a bad construct
 - Superordinate concepts
- Domain divergence exaggerated(Malt)
 - Is water really H₂O?
 - Are artifacts really functional?



Water	% of H ₂ O	Non-water	% of H ₂ O
Pure water	98%	Tea	91%
Pool water	82%	Saliva	89%
Sewer water	67%	Apple juice	77%

Function, appearance, source, microstructure

Upshot

- While adults do come to have beliefs about hidden properties, they also:
 - Make extensive use of appearances in forming categories
 - Do not treat different domains in radically different ways
- Adults may not think like scientists

Are Infants Little Scientists?

- Domain-specific theories may not be innate
- “Little scientists” is a misleading analogy
- Infants may acquire concepts through senses
- Perception may also underlie adult concepts



Thanks

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