Psychology 2200

Developmental Psychology I:
Fundamentals

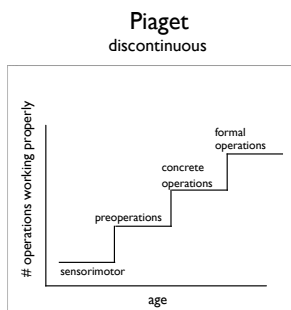### Radical vs. Innate Cognitive Development

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learning objectives

- explain Piaget's constructivist theory of human development, along with concepts of scheme, accommodation, assimilation, and disequilibrium

- describe three strong empirical claims that Piaget made about human development

- describe several implications Piaget's theory has for educating children

- explain Core Knowledge Theory and what empirical claims it makes that counter Piaget's claims

- describe the methodology that Core Knowledge Theorists have use supply evidence of innate cognitive abilities

- describe a study that presents evidence of infants having object permanence

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recall what Piaget found

- **developmental trajectory**
  - discontinuous jumps in cognitive abilities with age
- today:
- Piaget's **developmental mechanism**
  - how does development happen?
- challenge to his **trajectory & mechanism**
  - Core Knowledge

Piaget
discontinuous

(graph: # operations working properly vs. age, showing steps: sensorimotor, preoperations, concrete operations, formal operations)

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disequilibrium

i>clicker: what was your sequence of responses?

☐ = assimilation

◯ = accommodation

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       1  2  3  4  5
A   [A][B][B](A)[B]
B   [A](A)[B](A)[A]
C   [A][B](A)(A)[A]
D   [A][B][B][B](A)
E  OTHER
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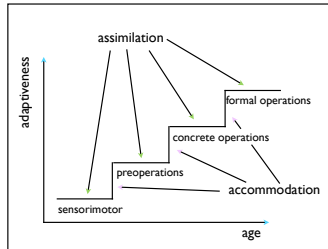
what happened?

1. built ("constructed") an organized way of making sense of the game = a **scheme**

2. used the current scheme to interpret new information and make new predictions = **assimilation**

disequilibrium

3. when old scheme did not explain everything you saw, created a new, better scheme that did = **accommodation**

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assimilation & accommodation in Piaget's stages

- development
  - mentally adapting through hands-on experience with world
  - constructing new schemes
  - child is active, not passive
- four qualitatively different ways of thinking about the world
- within stage: assimilation
  - adding information is quantitative change
- when stage no longer sufficient: accommodation, new stage
  - mechanism: disequilibrium
  - qualitative change

Diagram: a step graph with y-axis "adaptiveness" and x-axis "age", showing stages sensorimotor, preoperations, concrete operations, formal operations, with arrows labeled "assimilation" and "accommodation".

Piaget's strong claims

1. general theory of development
   - all aspects of cognition change together, as a unit
   - e.g., conservation of number, volume, mass

2. invariant stage sequence
   - no skipping stages possible, no regression to earlier stages

3. stages are universal
   - one course of development

Piaget's legacy

- education
  - discovery learning: classroom activities aimed at active exploration
  - learning through doing
  - art, puzzles, dress-up, building blocks, science experiments, musical instruments

- Piaget: greatest contributor to field of child development
  - child as active explorer
  - useful road map of development (4 stages)
  - research method (testing competencies)
 - focus on how children change (mechanism)

Core Knowledge Theory

- Piaget's claim about sensorimotor stage
  - no object permanence until 2 years old (A-not-B error)

- humans come "prewired" for certain tasks (core knowledge)
  - including knowledge of objects
  - object permanence present at birth

- Prewired capabilities? Do those even exist?

Core Knowledge

Piaget

object permanence (no) — (yes)

age (years) 0 1 2 3 4
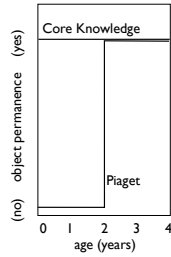
core knowledge

- like a deer is prewired to stand/walk, humans are prewired to understand objects

- these capabilities are "core knowledge"

- therefore, infants (less than 2 years old) have object permanence

- how to test this?

class experiment

1. look at an image for as long as you feel like looking at it

2. when you're bored of looking at the image, note the time on the clock and remember the time

3. report how long you looked using I>CLICKER

- random assignment to one of two conditions, A or B
  - group A: look at first image, close your eyes for second
  - group B: close your eyes for first, look at second image

violation-of-expectation method

1. longer looking time implies violated expectation (surprise)

2. violated expectation implies expectation existed in the first place

3. therefore, longer looking time implies that the violated expectation exists

Core Knowledge Theory
Baillargeon & DeVos (1991)

- **theory**
  - humans come "prewired" for certain tasks (core knowledge)
    - including knowledge of objects
    - even 3-month-old babies have object permanence

- methodology

- **experimental condition**
  - violate the principle of object permanence

- **control condition**
  - keep everything the same except don't violate the principle of object permanence

- **dependent variable**: looking time

- **prediction**: experimental condition will look for a longer time
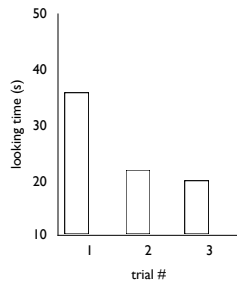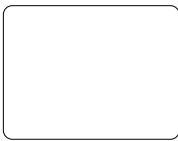
Core Knowledge Theory
Baillargeon & DeVos (1991)
control condition

- i>clicker:
  how long will babies look on trial 2?
  (A) 10s (B) 20s (C) 30s (D) 40s (E) 50s

- infants are...
  - interested at first
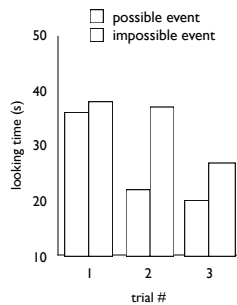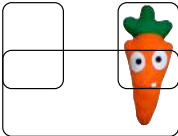 - get bored (look for shorter time) with repetition

Core Knowledge Theory
Baillargeon & DeVos (1991)
experimental condition

- i>clicker:
  how long will babies look on trial 2?
  (A) 25s (B) 30s (C) 35s (D) 40s (E) 45s

  - infants are still interested at first

  - but don't get bored as quickly when seeing impossible event
    - violated expectation

possible event
impossible event

A-not-B task

A

B

moving carrot task

FAIL

PAS

why did 18-month olds fail Piaget's "A-not-B" task but pass Baillargeon's "moving carrot" task?

- i>clicker
  (a) Piaget's 3-month-olds weren't paying attention
  (b) The A-not-B task required 3-month-olds to suppress a habit **and** exercise their object permanence ability
  (c) The two tasks test totally different capabilities
  (d) Baillargeon or Piaget fudged the data

discuss