Development Part I

Cognitive Development
Overview

• Piaget’s stages
• Theory of mind
• Challenges to Piaget
• Executive function
Jean Piaget
August 9, 1896 – September 16, 1980
Swiss philosopher, natural scientist and developmental theorist
Father of modern cognitive developmental psychology
General approach: learning is an active process

- Infant or child is like a scientist or detective
- He or she is constantly testing hypotheses about the physical and social worlds
Several Key Concepts

- **Schemas**: action patterns or a mental representation through which an infant organizes the world

- **Assimilation**: children’s use of existing schemas to interpret and act on the environment

- **Accommodation**: changes in schemas to adapt to something new in the environment
Two-year-old Gabriella has learned the schema for "cow" from her picture books.

Gabriella sees a moose and calls it a "cow." She is trying to assimilate this new animal into an existing schema. Her mother tells her, "No, it's a moose."

Gabriella accommodates her schema for large, shaggy animals and continues to modify that schema to include "mommy moose," "baby moose," and so forth.
Piaget’s Stage Theory

- Sensorimotor stage
  Ages 0 to 2

- Preoperational stage
  Ages 2 to 7

- Concrete operations
  Ages 7 to 12

- Formal operations (12+)

- Different way of reasoning at each stage
- Discontinuous development
- Ages are approximate
- But order of stages cannot vary
Sensorimotor stage

- **Formal operations (12+)**
- **Concrete operations**
  - Ages 7 to 12
- **Preoperational stage**
  - Ages 2 to 7
- **Sensorimotor stage**
  - Ages 0 to 2

**Abilities:** Babies learn about the world through their senses and motor activity

**Limitation:** Can't form mental representations

Stage ends when child achieves **object permanence**
Object Permanence

- The knowledge that objects continue to exist when you are not presently acting on them or sensing them.

See also: http://www.youtube.com/watch?v=pCwiYCQr3xs&feature=gv
Even for adults, the internal representations of the visual world is rather sparse
A not B error

- Infant continues to search at the first hiding location after object is hidden in the new location.

- Infant seems to understand the “permanence” of the object only in relation to their own action
Capacity for representational thought. **Failure to interrelate different dimensions.** Only pays attention to one feature of a situation at a time. Egocentrism

Preoperational Stage

**Formal operations (12+)**

Concrete operations
Ages 7 to 12

Preoperational stage
Ages 2 to 7

Sensorimotor stage
Ages 0 to 2
Failure to conserve quantity
Video: Lack of Conservation (2 min.)

http://www.youtube.com/watch?v=GLj0IZFvKvg&feature=related
Egocentrism

• Young children are *egocentric* in the sense that they have difficulty understanding perspectives that are different from their own

• Piaget developed the mountain task: child has to reason about the objects that are in view from perspective of a doll
Video: Ego-centricism (1 min.)

http://www.open2.net/healtheducation/family_childdevelopment/development/methods_video_perspectives.html
Social Cognition and Theory of Mind

• Preschoolers have the rudiments of a theory of mind: child's ability to reason about their own mental states as well as the mental states of other people.

• Limitations can be seen in children's poor performance with false belief tasks.
Video: theory of mind (7 min.)

Evaluation of Piaget’s theories

• Many of Piaget’s findings have held up

• Some of his explanations for his findings were wrong
  – Piaget underestimated children’s abilities
  – The stages are not discrete

• Recent research insights:
  – even infants have built-in understanding of the physical world and some concept of object permanence
  – importance of executive control processes
Infants do have some understanding of object permanence.
Four-month-olds were shown a rod that moved back and forth behind an occluding block. After they became habituated to this display and stopped looking at it, they were shown the displays in A and B.

In this display the rod that moved back and forth was unbroken.

This display was made of two aligned rod pieces that moved back and forth together.

The infants spent much more time looking at B than at A.
Video: responses to magical events (2 min.)

Challenge to egocentrism

• A different perspective-taking task (Hughes)

• Task: hide the little boy so the policeman can’t find them
Video: successful perspective taking (17 secs.)

http://www.open2.net/healtheducation/family_childdevelopment/development/methods_video Perspectives3.html
Executive Control: Development of Prefrontal Cortex

• Foremost part of the frontal lobes

• Matures slowly: one of the last areas of the brain to fully develop

• Involved in executive control processes

• Overrides automatic responses (impulses)
Video: A not B task reinterpreted (2 min.)

Marshmallow Test (Mischel, 1972)

• Experiment tests ability to delay gratification

• One version of the experiment:
  – Child is offered a choice:
  – Ring the bell, and get one marshmallow now. Or, wait, and get two marshmallows later when the experimenter returns

• Can the child resist temptation to immediately eat the marshmallow?
Video: testing impulse control with Marshmallow test (3 min.)

http://www.cbsnews.com/video/watch/?id=6419327n
see also http://www.youtube.com/watch?v=6EjJsPylEOY
Marshmallow Experiment (Mischel, 1972)

• Results:

• Some grabbed the treat immediately. About a third were able to wait the entire 15 minutes

• A follow-up study was conducted 14 years later

• Children who waited 15 minutes (as opposed to 30 seconds or less) tended to have better relationships and averaged 210 points higher on the SAT

For another video, see: http://www.ted.com/talks/joachim_de_posada_says_don_t_eat_the_marshmallow_yet.html
Alternative Explanation

• Children are more likely to delay eating the first marshmallow when they have reason to believe the researcher’s promise to come back with a second one.

→ Their behavior might have less to do with “self-control” and more about strategic decisions.

→ For a child raised in an unstable environment, it might make sense not to wait (“the only guaranteed treats are the ones you have already swallowed”).