Piagetian Approach to Cognitive Development

Piaget's Stages

- Sensorimotor
  - (birth – 2 yrs)
- Preoperational
  - (2 – 7 yrs)
- Concrete Operational
  - (7 – 11.5 yrs)
- Formal Operational
  - (11.5 yrs and on)

Key Piagetian Concepts

- Schemas
  - Action Patterns
- Assimilation
  - Interpreting environment w/schemas
- Accommodation
  - Changing schemas

Sensorimotor

| Table 3–1	Piaget's Stages of Cognitive Development	
Typical Age Range	**Description of Stage**	**Developmental Milestones**
Birth to nearly 2 years	*Sensorimotor* Experiencing the world through senses and actions (looking, touching, mouthing)	• Object permanence • Stranger anxiety

Sensorimotor: Substage 1

- Modification of Reflexes
  - Sucking
  - Closing Hands
  - Focus Eyes
  - Turn Heads

Substage 2: Primary Circular Reactions (1-4 mos.)

Infant

Environment
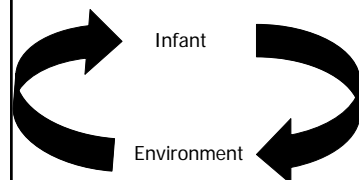
- Combine Reflexive Actions
  - Grab, Suck
- Circular
  - Repetitive
  - Infant->Env.

Substage 3: Secondary Circular Reactions (4-8 mos.)

- Increasing interest in outcomes beyond child's body
  - Ball rolling away
- Increasing Efficiency Organizing Circular Reactions
  - Kicking response to swinging mobile

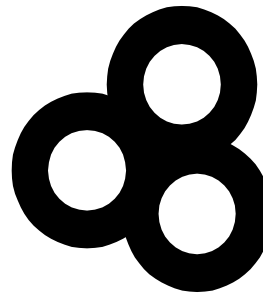## Substage 4: Coordination of secondary reactions (8-12 mos)

- Knock barrier out of way to grasp matchbox
- Object Permanence
- Understand particular actions produce particular effects

Lack of Object Permanence

Substage 5: Tertiary Circular Reactions (12-18 mos.)

- Active exploration of what objects can do
- Deliberate "scientific" variation of actions in order to observe effects

Substage 6: 18-24 mos.

- Beginning of Representational Thought
- Delayed Imitation

The Child's Expanding World

- Primary
  - Perform Action
  - Note Effect on Own Body
- Secondary
  - Perform Action
  - Note Effect on Body *or* External World
  - Note Cause/Effect Relation
- Tertiary
  - Form Goal/Perform Act
 - Vary Actions/Targets
  - Causal Relationships
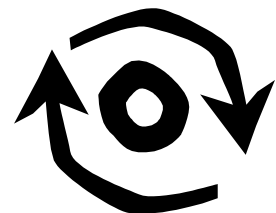
Infancy

- Activities
  - Body-centered → World-centered
- Goals
  - Concrete → Abstract
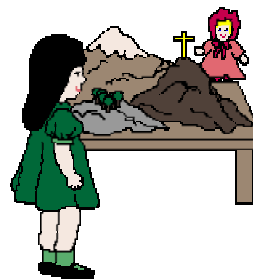- Increasing correspondence between intention and behavior

Preoperational

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Egocentrism

My dad is a fireman. ... He's a hero!

I'm 6 years old! ... My birthday is today.
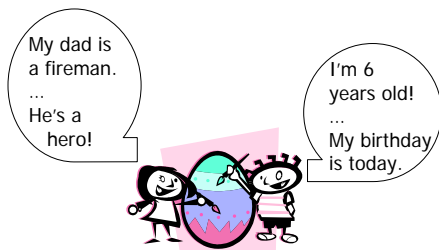
Mountain Task

- What can the doll see?
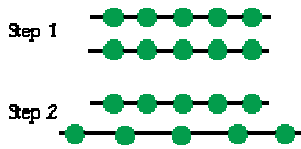- Mountain w/trees, Mountain w/cross, Snowy Mountain

Neo-Piagetians

- Mountain Task too Complicated!
  - Success on Simple Perspective Tasks
- Development Gradually Unfolds

Concrete Operational
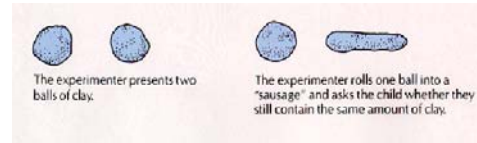
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Conservation of Number

Step 1

Step 2

- Are there the same number of objects in each row?

Conservation of Mass

The experimenter presents two balls of clay.

The experimenter rolls one ball into a "sausage" and asks the child whether they still contain the same amount of clay.
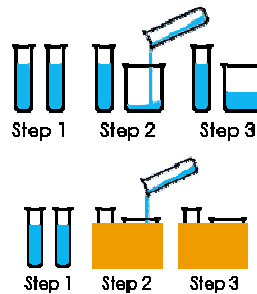
- Is there the same amount of clay in each ball?
- Is there still the same amount of clay?

Conservation of Liquid

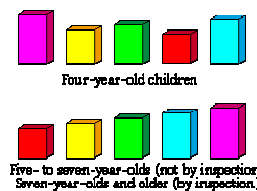- Which glass has more water in it?

Conservation of Liquid

Step 1   Step 2   Step 3

Step 1   Step 2   Step 3

- Bruner
  – Child succeeds when tall beaker is covered
- Physical Appearance Overwhelming
  – Child *does* understand conservation

Transitivity

A > B AND B > C => A > C

- 8-9 years of age
- Important for Seriation

Seriation

Four-year-old children

Five- to seven-year-olds (not by inspection)
Seven-year-olds and older (by inspection)

- Ability to put things in an ordered series
- 4-year-olds baffled!
- 5-year-olds use pairwise comparisons
- 7-year-olds have adult competence

Limitations of Concrete Ops

- Some abstract reasoning still beyond concrete operational child
  - Counterfactual Reasoning
  - Abstract Scientific Concepts

Formal Operational

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About 12 through adulthood	*Formal operational* Abstract reasoning	• Potential for mature moral reasoning

Isolation of Variables

- What causes the pendulum to change speed?
- Young: try 1 weight w/1 string, another weight w/another string
- Older: start w/shortest string & try different weights on it

Combinatorial Reasoning
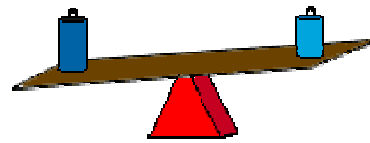
- Fulcrum Problem: balance the seesaw
- Combinatorial – weight and distance from fulcrum must both be taken into account

Chemical Problem
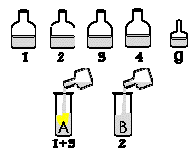
- Pour g into A: turns yellow; g into B clear
- Find a combination of chemicals that does this
- Requires systematic testing to realize you need to combine chemicals (and to figure out which ones!)
- Very culture-specific task

Cognitive Development

- Piaget: 0 → Logic in 4 stages
- Age 6: Big birthday
- Major Factors
  - <2 brain maturation
  - >2 knowledge
  - Processing Resources (attention, WM)

Criticisms of Piaget

- Empirical Details
  - Piaget consistently underestimates age at which children able to do certain things
  - Perhaps his children were somewhat slow in developing?
- Stages versus gradually development
  - Objections to discrete series of stages versus idea of development as more of a gradual process
- Ethnocentric
  - Some have noted that Piaget's theory is how to become a Swiss scientists
  - Much of the changes outlined in childhood reflects the western educational system rather than inevitable changes related to maturation