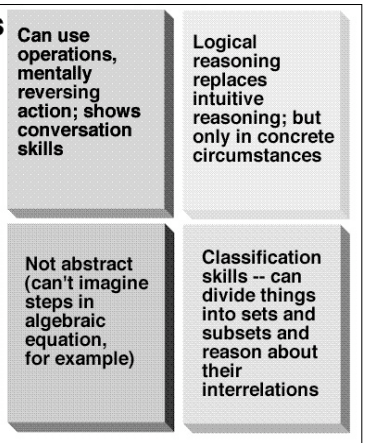
Middle Childhood Cognitive Development

Psychology 313 Lecture 14

Piaget's Theory

- **Preoperational Thought**
  - formation of stable concepts
  - emergence of mental reasoning
  - egocentrism
  - construction of magical belief systems
- **Concrete Operational Thought (6-12)**
  - allow child to do mentally what was done physically before
  - Conservation
  - Decentration
  - Reversibility

Characteristics of Concrete Operational Thought



Conservation

Type of conservation	Initial presentation	Manipulation	Preoperational child's answer
Number	Two identical rows of objects are shown to the child, who agrees they have the same number.	One row is lengthened and the child is asked whether one row now has more objects.	Yes, the longer row.
Matter	Two identical balls of clay are shown to the child. The child agrees that they are equal.	The experimenter changes the shape of one of the balls and asks the child whether they still contain equal amounts of clay.	No, the longer one has more.
Length	Two sticks are aligned in front of the child. The child agrees that they are the same length.	The experimenter moves one stick to the right, then asks the child if they are equal in length.	No, the one on the top is longer.
Volume	Two balls are placed in two identical glasses with an equal amount of water. The child sees the balls displace equal amounts of water.	The experimenter changes the shape of one of the balls and asks the child if it still will displace the same amount of water.	No, the longer one on the right displaces more.
Area	Two identical sheets of cardboard have wooden blocks placed on them in identical positions. The child agrees that the same amount of space is left on each piece of cardboard.	The experimental scatters the blocks on one piece of cardboard and then asks the child if one of the cardboard pieces has more space covered.	Yes, the one on the right has more space covered up

A Change in the Logic of Thinking

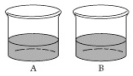
- Piaget: **Concrete Operations**
  - "Concrete" because these mental actions are directed toward concrete objects in everyday activities
  - Distinguished from preoperations by their double-sidedness
  - Results in more flexible and organized thinking
  - Can think thru actions, & mentally combine, separate, order, & transform objects & actions

Conservation

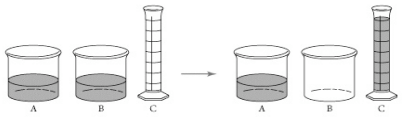
- Understanding that some properties of an object remain the same even when its appearance is altered
- Mental operations
  - **Identity**
  - **Compensation**
  - **Reversibility**

Piaget: Conservation of Quantity

Step 1: Present two beakers with equal amounts of liquid.

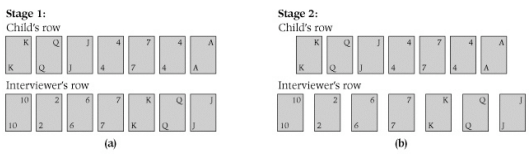


Step 2: Present taller, thinner beaker, and pour contents of B into it.



Step 3: Ask: "Which beaker has more liquid, A or C—or do they contain the same amount?"

Piaget: Conservation of Number



Children below the age of 6 or 7 rarely display conservation of number, and will say that the elongated row has more.

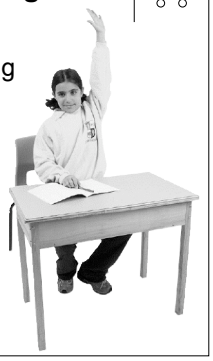
An understanding of logical necessity—that "it *has* to be that way"—is Piaget's key criterion of a stagelike change in thinking.

Causes of Dev Change in Cog

- Piaget believed that all cognitive growth is driven by **assimilation** and **accommodation**
- Other, more recent, explanations
  - **Memory capacity**
  - **Accumulating knowledge**
  - **Development of cognitive strategies**

Influence of Memory on Cognition

- **Factor 1**: Increased speed & capacity of memory processing
  - **Memory span**
  - **Retrieval speed**
  - Speed and capacity are interrelated…
- **Factor 2**: Expanded knowledge base
  - Retention improves because child has more prior info



Influence of Memory on Cognition

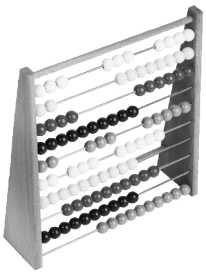
- **Factor 3**: Acquisition of improved memory strategies
  - **Rehearsal**
  - **Memory Organization**
  - **Elaboration**
- **Factor 4**: Emergence of **metamemory**
  - ability to think about one's own memory processes

Additional Cognitive Bridging Strategies

- **Attention**
- **Planning**
- **Metacognition**

Increased Classification Skills

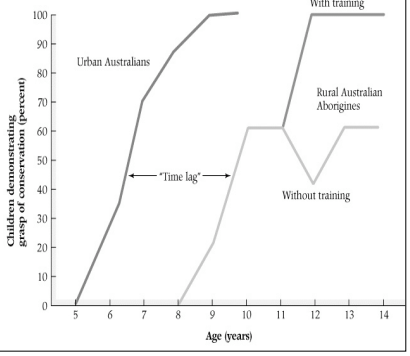
- **Piaget**: Set of brown beads and white beads "Are there more brown beads or more beads?"



- Children 4-6 cannot attend to the subclass and the superordinate class at the same time;
- In middle childhood gain ability to understand the hierarchical structure of categories and can categorize objects according to multiple criteria
- Begin to collect stamps, baseball cards, etc.

Is conservation acquisition universal?

Children in non-industrial societies **lag a year or more** behind Piaget's norms, and in some cases never acquire it, even as adults



Is conservation acquisition universal?

- Performance improves, however, with **training,** and when interviewed in their **native language** and with **content** with which they are more familiar
- Thus, **conservation is a universal cognitive achievement of middle childhood**, as Piaget assumed it was, **when these conditions are taken into account**