Unit 6
Cognitive Development

The child is the father of the man (Piaget, 1954)

Piagetian Views
- Genetic epistemology
- Interactionist
  - not a maturationist
- Constructivist
  - Active process

Scheme
- schemes
  - specific strategies
  - Conceptions
  - classifications
- Differentiation
  - Adaption
- Hierarchical Organization

Equilibration
- equilibrium and disequilibrium
- Assimilation:
  - adding and extending an existing scheme

[Diagram of equilibration process]
**Equilibration, equilibrium and disequilibrium**

- **Assimilation:**
  - adding and extending an existing scheme

- **Accommodation:**
  - changing existing schemes to add new information

**Motivation:** Learning is its own reward

**Sensorimotor Stage to 18 mos.**

- 6 substages
  - from reflexive to
    - coordinating senses and motor action
    - object permanence
    - symbolic representation
  - From reacting to goal-directed behavior

**Characteristics of Piaget’s Stages**

- Qualitatively different
- Hierarchical integrations
- Invariant sequence
- Variations in speed
- Universal

**Preoperational Stage**

- 18 mos-6 yrs

- Symbols
- Naming explosion
- Deferred imitation
- Static imagery
- Centration
- Egocentrism
  - Perspective taking
**Conservation of Volume**

- Decenter
- Reversibility
- Compensation

Same Top has more

**Conservation of length**
Are one of the strings longer or are they the same?

**Logico-Mathematical Operations**

- Reversibility
  - If $A=B$ then $B=A$
- Transitivity
  - If $A>B$ & $B>C$ then $A>C$
- Hierarchical classification
  - $A$ and $B > A$ or $B$
- Reciprocity
  - $A>B$ then $B<A$

**Conservation of area.**
Do the cows in A or B have more grass to eat?
### Preoperational to Concrete Operations around 6

- Static images  ➔ Transformational images
- non-conservation  ➔ conservation
- centration  ➔ decentralisation
- no transitive inference  ➔ seriation
- Lacks C.I.  ➔ Class inclusion or multiple classification

### Concrete to Formal Operations
- Systematic reasoning about hypothetical possibilities.
- Operations on Concrete ➔ Operations on Abstract
- self as distinctive attributes  ➔ self as abstract model
- moral is respecting law and authority  ➔ moral is commitment to reflective principles

### Concrete to Formal Operations
- trial and error  ➔ Systematic problem solving
- Deductive logic  ➔ hypothetico-deductive
- concrete evidence  ➔ propositional thought

### Problems of Piagetian Theory

1) Many skills may appear at a younger age than Piaget thought.
2) Is integration the best criteria to identify movement to the next stage?
   1) Experience precedes skill exhibition
Problems of Piagetian Theory

1) Many skills may appear at a younger age than Piaget thought.
2) Is integration the best criteria to identify movement to the next stage?
3) Development appears to be less stage like, more gradual and domain specific than Piaget thought.
4) Are the stages Universal?
   1) Formal Operations requires education
   2) Some skills, e.g., appear earlier depending on culture

4) Are the stages Universal?
5) What does it mean when younger children are trained to complete Piagetian tasks?

6. Piaget & Education

- Progressive v. Romantic or Mechanistic
- open education
- stimulate natural interaction
- learning (disequilibrium) as motivation
- developmentally appropriate
- self-regulation
- active hands on learning experiences social exchange
- evaluation using optimum performance

Vygotsky Sociocultural Theory

- Emphasis on transmission of culture
- Social activity & dialogue→internalization
- Construct knowledge in social dialogue with adults/more knowledgeable others.
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<th><strong>Vygotsky</strong></th>
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<tbody>
<tr>
<td><strong>Sociocultural Theory</strong></td>
<td><strong>Genetic Epistemology</strong></td>
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<td>Zone of Proximal Development</td>
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<tr>
<td>- level of independent performance</td>
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<td>- Actual developmental level</td>
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<td>- level of assisted performance</td>
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<td>- potential development</td>
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<td>- assisted/active intervention (scaffolding) maximizes learning</td>
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<td>Rote learning valued</td>
<td>Rote learning discouraged</td>
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<td>Disequilibrium &amp; Stage</td>
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<tr>
<td>Social interaction emphasis</td>
<td>Social interaction for social/moral etc. Hands on for Physical</td>
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<td>Social interaction with expert</td>
<td>Social interaction with peers who are slightly more advanced</td>
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<td>linguagetherought</td>
<td>thoughtlanguage</td>
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<td>- step toward private speech</td>
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<td>- language aids problem-solving</td>
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<td>- more self talk on hard problems</td>
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<td>emphasis on cultural variation</td>
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<td>mediators tools that aid problems solving</td>
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<td>Egocentric speech lack of perspective taking</td>
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<td>Universal</td>
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<td>Stagelike Qualitative changes</td>
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<th><strong>An examples of Vygotsky supported Teaching Methods</strong></th>
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<td>• Reciprocal Learning</td>
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### Questions about Sociocultural Theory

- Relatively untested or untestable.
- Most predictions about effective learning aren’t unique. *e.g.*, cognitive apprenticeship (one on one)
- Weak on detailing developmental change.

### Sociocultural Theory Most Significant Contributions

- role of self-talk
- importance of learning through social dialogue
- significance of culture

### Common to Constructivists

- Embed learning in complex, realistic, and relevant learning environment
- Social negotiation
  - Social dialogue to construct meaning, and defend positions and constructions
- Multiple representations of content
  - Constructing own examples/applications
- Student ownership of learning
  - Understand active role in construction