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

New experience
Equilibration and disequilibrium

- Assimilation: adding and extending an existing scheme
- Accommodation: changing existing schemes to add new information.

Characteristics of Piaget’s Stages

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

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

Preoperational Stage

18 mos-6 yrs

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

- Decenter
- Reversibility
- Compensation

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?

Conservation of Mass
Which Has More?

Flattened

Preoperational to Concrete Operations around 6
- Static images ➡️ Transformational images
- non-conservation ➡️ conservation
- centration ➡️ decentration
- no transitive inference ➡️ seriation
- Lacks C.I. ➡️ Class inclusion or multiple classification

Concrete to Formal Operations
- trial and error ➡️ Systematic problem solving
- Deductive logic ➡️ hypothetico-deductive
- Separate & control variables ➡️ Proportional Reasoning
- concrete evidence ➡️ propositional thought
Concrete to Formal Operations

- Systematic reasoning about hypothetical possibilities.
  - Operations on Concrete
  - Operations on Abstract
- self as distinctive attributes
- moral is respecting law and authority

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
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
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.

Vygotsky Sociocultural Theory

Zone of Proximal Development

- level of independent performance
  - Actual developmental level
- level of assisted performance
  - potential development
  - assisted/active intervention (scaffolding) maximizes learning

Vygotsky Sociocultural Theory

- language
  - thought

Piaget Genetic Epistemology

- thought
  - language

- emphasis on cultural variation
- mediators tools that aid problems solving

- Egocentric speech
  - lack of perspective taking

- Universal
  - Stagelike
  - Qualitative changes
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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