Theories of Cognitive Development

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Preoperational Stage

- 2-7 years
- Use of symbols
- Thinking is rigid and focused on appearance
- Centration
- Egocentrism
- Animism
- Cannot grasp conservation
Challenges to Piaget’s View of Preoperational Capacity

- Egocentrism and perspective taking
- Motivations of others
Concrete Operational Stage

- 7 to 11 years
- Mental operations – strategies and rules that make thinking more systematic and powerful
- Reversibility
- Class inclusion
- Inductive logic - reasoning from their own experience to a general principle
- Tied to concrete objects and operations
- Horizontal decalage – being able to solve some concrete problems earlier than others
Different Approaches to Concrete Operations

- Siegler’s Wave Theory
  - Use of different strategies
  - Strategies become more sophisticated over time
NeoPiagetian Theories

- Robbie Case’s Theory
- Expands on Piaget’s theory
- Explains cognitive development in terms of short term storage space or working memory capacity
- Operational efficiency – maximum number of schemes that can be put into short term memory storage space
Contributions of Piaget’s Theory

- Opened up the study of cognitive development
- Offered a new view of children
- Provided interesting discoveries about child development
- Promoted facilitating rather than directing children’s learning
- Emphasize exploration and interaction
- The importance of individual differences
- The importance of sensitivity to children’s readiness to learn
Weaknesses of Piaget’s Theory

- Underestimates achievements in sensorimotor and preoperational stages and overestimates them in formal operations.
- The processes and mechanisms of change from one stage to the other are not clearly identified.
- The model does not account for variability in performance.
- There is insufficient attention to the impact of the sociocultural environment.
Vygotsky’s Socio-Cultural Theory

- Culture effects
  - Which cognitive activities are valued
  - Skills that shape how children think
  - How knowledge is organized and how it is communicated to others
Interactions

- Intersubjectivity – mutual shared understanding among participants in an activity
- Guided participation – structured activities with others
- Zone of proximal development
- Scaffolding
Language

- **Egocentric speech Stage**
  - Private speech
- **Ingrowth Stage**
  - Inner speech
Information Processing Theory

- The mechanisms that drive cognitive development include:
  - Better strategies
  - Increased capacity of working memory
  - More effective inhibitory process and executive functioning
  - Increased automatic processing
  - Increased speed of processing
Core Knowledge Theories

- Distinctive domains of knowledge
Understanding Living Things

- Motion
- Growth
- Structure and appearance
- Illness and healing
- Purpose
- Essentialism
Understanding People

- Motives
- Theory of mind
  - Phase 1 – awareness of desires
  - Phase 2 – distinguish mental and physical
  - Phase 3 – actions based on beliefs
- Psychological states
Development of Theory of Mind

- Brain development
- Development of language and executive functioning
- Interactions with others
Memory Strategies

- Rehearsal
- Organization
- Clustering/chunking
- Elaboration
- External memory aids
- Network of knowledge
- Selection of best strategies
- Metamemory
- Metacognition
- Cognitive self regulation
Knowledge and Memory

- Networks of knowledge of concepts
  - Categories
  - Relationships between categories
  - Properties of concepts
  - Scripts
- Storing information verbatim or by the gist
Autobiographical Memories

- Memories of personal experiences
- Form in preschool
- Language skills and sense of self solidifies these memories
- Guidance from adults to enhance memory
- Personal timeline
Problem Solving

- Setting a goal
- Developing strategies to achieve the goal
- Problem solving improves with age however, at 7 months children solve simple problems and even adolescents are vulnerable to errors
Features of Problem Solving

- Encoding Issues
  - Mental representations
- Planning Ahead
- Using General and Specific Processes
  - Means-end analysis
  - Subgoals
- Multiple Strategies
  - Heuristics
- Collaboration
Problems in Problem Solving

- Confounding variables
- Reaching conclusions too quickly
- Confirmation bias
Theories of Intelligence

- Information Processing Theory
  - Speed of information processing
  - Flexibility of strategies
Spearman

- General intelligence
- Specific intelligence
Cattell

- Fluid intelligence
- Crystalized intelligence
Gardner’s Theory of Multiple Intelligence

- Linguistic
- Logical-mathematical
- Spatial
- Musical
- Bodily-kinesthetic
- Interpersonal
- Intrapersonal
Sternberg’s theory of Successful Intelligence

- Analytic ability
- Creative ability
- Practical ability