Introduction

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Cognitive development defined

• Cognition = products and processes of the mind
  – attention, learning, memory, complex thought, concept formation, reading, problem solving... (higher mental processes).

• Development = change over time
  – What changes? (description)
  – How/why does change occur? (explanation)

• Changes in the products or processes of the mind over time.

Why study cognitive development?

• BECAUSE IT’S INTERESTING!
• Necessary for understanding mature cognition
• Identify the role of culture in cognition
• Applied issues:
  – Help children (and adults) learn
  – Influence parenting and policy decisions
  – Developmental disorders
Burning questions about children’s thinking

1. Are some capabilities innate?
2. Does children’s thinking progress qualitatively through stages?
3. How do changes in children’s thinking occur?
4. How does development of the brain contribute to cognitive development?
5. How does the social world contribute to cognitive development?

Are some capabilities innate?

1. Associationist perspective
   • Minimal initial endowment --> associate experiences
2. Constructivist perspective
   • Associative capabilities + some motor and perceptual capabilities
3. Competent-infant perspective
   • Wide range of perceptual skills and conceptual understandings

Does development progress through stages?

1. Qualitative change
2. Concurrence assumption
   • Change in many concepts simultaneously
3. Abruptness assumption
   • Sudden, not gradual
4. Coherent organization
How does change occur?
What are the mechanisms of change?
Is change domain-general, or domain-specific?

How do changes in the brain contribute to cognitive development?

1. Changes in the brain as a whole
   - Brain of an adult weighs 4X that of a newborn

2. Changes in structures within the brain
   - Development proceeds at a different rates for different areas of the cerebral cortex

3. Changes in neurons
   - Synaptogenesis and pruning

How does the social world contribute to cognitive development?

1. Social interaction and cognitive development
   - Social scaffolding

2. The cultural context of cognitive development
   - Cultural tools and activities
Perspectives 1

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Perspectives on Cognitive Development

- Piaget’s stage theory
- Neo-piagetian perspectives:
  - Theory theory
- Socio-cultural approaches
- Information-processing theories

Learning goals

- Identify assumptions and key concepts within each perspective.
- Understand how each perspective contributes to burning questions
- Recognize how theories shape research
- Critically evaluate theories vis-à-vis current evidence.
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Who was Jean Piaget?

- B1896, d1980
- Trained in biology and philosophy
- How children think (Binet)

Knowledge according to Piaget

- Interested in how an organism adapts to its environment ("intelligence")
- Knowledge as process, not state
- Child as active learner
- As knower changes so does known
- Knowledge is biased
Characteristics of stages

- **Stage**: period of time in which a child’s thinking and behavior reflect a particular type of underlying mental structure.
- Thinking differs qualitatively from stage to stage
- Stage change involves the incorporation and transformation of previous stages
- Stages follow an invariant order
- Stages are universal

The developmental process

- Acquisition of abstract symbolic reasoning
- Born with reflexes --> schemes --> hierarchically organized mental structures
- Adaptation:
  - Assimilation
  - Accommodation

Processes of adaptation

- **Assimilation**: using or transforming the environment so that it can be placed in a pre-existing cognitive structure
  - fitting reality into one’s current cognitive organization

"Sucking scheme"
Processes of adaptation

• **Accommodation**: changing cognitive structures to accept something from the environment

  “Sucking scheme”
“Cut it up into A LOT of slices, Mom. I’m really hungry!”
Class inclusion task

“Are there more roses or flowers?”

Characteristics of Formal Operational Thought

Abstract
Adolescents think more abstractly than children. Formal operational thinkers can solve abstract algebraic equations, for example.

Idealistic
Adolescents often think about what is possible. They think about ideal characteristics of themselves, others, and the world.

Logical
Adolescents begin to think more like scientists, devising plans to solve problems and systematically testing solutions. Piaget called this type of logical thinking hypothetical-deductive reasoning.

Piaget: Contribution to burning questions?
Strengths

- Recognizes central role of cognition in development
- Single theory to account for many different developments (parsimonious)
- Child as active, self-motivated agent
- Developmental observations are robust

Weaknesses

- Mechanisms of change under specified
- Children’s cognitive performance is not always consistent and stage-like
- Children’s knowledge is often underestimated
- Insufficient focus on social/cultural context