Cognitive Development in Early Childhood

Chapter 10
Guideposts for Study

1. What Are Typical Cognitive Advances and Immature Aspects of Preschool Children’s Thinking?
2. What Memory Abilities Expand in Early Childhood?
3. How Is Preschoolers’ Intelligence Measured, and What Factors Influence It?
Guideposts for Study

4. How Does Language Improve, and What Happens When Its Development Is Delayed?
5. What Purposes Does Early Childhood Education Serve, and How Do Children Make the Transition to Kindergarten?
Piagetian Approach: The Preoperational Child

- Advances of Preoperational Thought
  - Symbolic function: ages 2 to 7 yrs. shows great expansion in use of symbolic thought
  - Deferred imitation is proof of symbolic function
    - becomes more robust after 18 months
  - Pretend play
  - Language
<table>
<thead>
<tr>
<th>Advance</th>
<th>Significance</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of symbols</td>
<td>Children do not need to be in sensorimotor contact with an object, person, or event in order to think about it.</td>
<td>Simon asks his mother about the elephants they saw on their trip to the circus several months earlier.</td>
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<tr>
<td></td>
<td>Children can imagine that objects or people have properties other than those they actually have.</td>
<td>Rolf pretends that a slice of apple is a vacuum cleaner “vrooming” across the kitchen table.</td>
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<tr>
<td>Understanding of identities</td>
<td>Children are aware that superficial alterations do not change the nature of things.</td>
<td>Antonio knows that his teacher is dressed up as a pirate but is still his teacher underneath the costume.</td>
</tr>
<tr>
<td>Understanding of cause and effect</td>
<td>Children realize that events have causes.</td>
<td>Seeing a ball roll from behind a wall, Aneko looks behind the wall for the person who kicked the ball.</td>
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<tr>
<td>Ability to classify</td>
<td>Children organize objects, people, and events into meaningful categories.</td>
<td>Rosa sorts the pinecones she collected on a nature walk into two piles: “big” and “little.”</td>
</tr>
<tr>
<td>Understanding of number</td>
<td>Children can count and deal with quantities.</td>
<td>Lindsay shares some candy with her friends, counting to make sure that each girl gets the same amount.</td>
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<td>Empathy</td>
<td>Children become more able to imagine how others might feel.</td>
<td>Emilio tries to comfort his friend when he sees that his friend is upset.</td>
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<tr>
<td>Theory of mind</td>
<td>Children become more aware of mental activity and the functioning of the mind.</td>
<td>Bianca wants to save some cookies for herself, so she hides them from her brother in a pasta box. She knows her cookies will be safe there because her brother will not look in a place where he doesn’t expect to find cookies.</td>
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<tr>
<td>Limitation</td>
<td>Description</td>
<td>Example</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>----------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Centration: Inability to decenter</td>
<td>Children focus on one aspect of a situation and neglect others.</td>
<td>Jacob teases his younger sister that he has more juice than she does because his juice box has been poured into a tall, skinny glass, but hers has been poured into a short, wide glass.</td>
</tr>
<tr>
<td>Irreversibility</td>
<td>Children fail to understand that some operations or actions can be reversed, restoring the original situation.</td>
<td>Jacob does not realize that the juice in each glass can be poured back into the juice box from which it came, contradicting his claim that he has more than his sister.</td>
</tr>
<tr>
<td>Focus on states rather than on...</td>
<td>Children fail to understand the significance of the transformation between states.</td>
<td>In the conservation task, Jacob does not understand that transforming the shape of a liquid (pouring it from one container into another) does not change the amount.</td>
</tr>
<tr>
<td>Transductive reasoning</td>
<td>Children do not use deductive or inductive reasoning; instead they jump from one particular to another and see cause where none exists.</td>
<td>Luis was mean to his sister. Then she got sick. Luis concludes that he made his sister sick.</td>
</tr>
<tr>
<td>Egocentrism</td>
<td>Children assume everyone else thinks, perceives, and feels as they do.</td>
<td>Kara doesn’t realize that she needs to turn a book around so that her father can see the picture she is asking him to explain to her. Instead, she holds the book directly in front of her, so only she can see it.</td>
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<tr>
<td>Animism</td>
<td>Children attribute life to inanimate objects.</td>
<td>Amanda says that spring is trying to come but winter is saying, “I won’t go! I won’t go!”</td>
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<tr>
<td>Inability to distinguish appearance...</td>
<td>Children confuse what is real with outward appearance.</td>
<td>Courtney is confused by a sponge made to look like a rock. She states that it looks like a rock and it really is a rock.</td>
</tr>
</tbody>
</table>
Piagetian Approach: The Preoperational Child

- Advances of Preoperational Thought
  - Understanding of Objects in Space
    - Relationships between pictures, maps, or scales models after age 3
  - Understanding of causality
    - Reason by transduction
Piagetian Approach: The Preoperational Child

- Advances of Preoperational Thought
  - Understanding of identities and categorization
    - Animism
  - Number
    - Ordinality and Cardinality
    - Number transformations
    - Estimation
    - Patterns
<table>
<thead>
<tr>
<th>Area</th>
<th>Components</th>
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</thead>
<tbody>
<tr>
<td>Counting</td>
<td>Grasping one-to-one correspondence</td>
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<td></td>
<td>Knowing stable order and cardinality principles</td>
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<td></td>
<td>Knowing the count sequence</td>
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<tr>
<td>Number knowledge</td>
<td>Discriminating and coordinating quantities</td>
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<td></td>
<td>Making numerical magnitude comparisons</td>
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<tr>
<td>Number transformation</td>
<td>Simple addition and subtraction</td>
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<td>Calculating in story problems and nonverbal contexts</td>
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<td></td>
<td>Calculating “in the head”</td>
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<tr>
<td>Estimation</td>
<td>Approximating or estimating set sizes</td>
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<td></td>
<td>Using reference points</td>
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<tr>
<td>Number patterns</td>
<td>Copying number patterns</td>
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<td></td>
<td>Extending number patterns</td>
</tr>
<tr>
<td></td>
<td>Discerning numerical relationships</td>
</tr>
</tbody>
</table>

Source: Adapted from Jordan et al., 2006.
Piagetian Approach: The Preoperational Child

- Immature Aspects of Preoperational Thought
  - Centration
    - Tendency to focus on one aspect of a situation and neglect others
  - Egocentrism
    - Inability to take another’s point of view
    - Three-mountain task
Piaget’s three-mountain task: A preoperational child is unable to describe the “mountains” from the doll’s point of view - an indication of egocentrism, according to Piaget
Piagetian Approach: The Preoperational Child

- **Immature Aspects of Preoperational Thought**
  - Failure to understand **conservation**
    - Two things that are equal remain so if their appearance is altered
  - **Irreversibility**
  - Focus on successive states
Piagetian Approach: The Preoperational Child

- Do Young Children Have Theories of Mind?
  - Knowledge about thinking and mental states
    - Social cognition
  - False beliefs and deception
  - Distinguishing between appearance and reality
  - Distinguishing between fantasy and reality
Information-Processing Approach: Memory Development

- **Basic Processes and Capacities**
  - **Encoding**
    - Like putting information in a folder to be filed in memory
  - **Storage**
    - Like putting the folder away in the filing cabinet
  - **Retrieval**
    - Occurs when information is needed
Information-Processing Approach: Memory Development

- Basic Processes and Capacities
  - Sensory memory
    - “Holding tank” for incoming sensory information
  - Working memory
    - For information being encoded or retrieved
    - Executive function
Information-Processing Approach: Memory Development

- Recognition and Recall
  - Types of retrieval
  - Recognition
    - Ability to identify something encountered before
  - Recall
    - Ability to reproduce knowledge from memory
Information-Processing Approach: Memory Development

- Forming and Retaining Childhood Memories
  - Early memories: Three types
    - Generic memory
    - Episodic memory
    - Autobiographical memory
Information-Processing Approach: Memory Development

- Forming and Retaining Childhood Memories
  - Influences on memory retention
    - Uniqueness of the event
    - Active participation
    - Talking about past events
      - Low elaborative style
      - High elaborative style
Information-Processing Approach: Memory Development

- Forming and Retaining Childhood Memories
  - Constructing shared memories: The role of culture
    - Social interaction model
    - Effects of culture – China vs. U.S.
Intelligence: Psychometric and Vygotskian Approaches

- **Traditional Psychometric Measures**
  - **Stanford-Binet Intelligence Scales**
    - Measures fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory
  - **Wechsler Preschool and Primary Scales of Intelligence, Revised (WPPSI-III)**
    - Measures both verbal and nonverbal reasoning, receptive vs. expressive vocabulary, and processing speed
Intelligence: Psychometric and Vygotskian Approaches

- Influences on Measured Intelligence
  - Temperament
  - Social and emotional maturity
  - Ease in the testing situation
  - Preliteracy or literacy skills
  - Socioeconomic status
  - Match between the child’s cognitive style and the tasks posed
Intelligence: Psychometric and Vygotskian Approaches

- Testing and Teaching Based on Vygotsky’s Theory
  - Zone of proximal development (ZPD)
    - Time when children are almost ready to accomplish tasks on their own
    - Assessed by dynamic tests
  - Scaffolding
Language Development

- **Vocabulary**
  - **Fast mapping**
    - Child forms an idea of a new word’s meaning after hearing it once or twice in conversation
  - **Nouns and adjectives**
    - Children can reference the same noun with two adjectives at 3 – 4 years
Language Development

**Grammar and Syntax**

- At 3, children typically begin to use plurals, possessives, and past tense
- They still make errors of overregularization
- By ages 5 to 7, children’s speech is quite adultlike, but they still have not mastered the fine points of language
Language Development

- Pragmatics and Social Speech
  - Pragmatics
    - Practical knowledge needed to use language for communicative purposes
  - Social speech
    - Speech intended to be understood by a listener
  - Private speech
    - Talking aloud to oneself
Language Development

- Delayed Language Development
  - Heredity seems to play a major role
  - Some may have problems in fast mapping
  - Delayed language development can have far-reaching cognitive and psychosocial effects if not
Language Development

- Preparation for Literacy
  - Emergent literacy
  - Prereading skills
    - Oral language skills
      - Vocabulary, syntax, narrative structure
    - Reading to children
      - One of the most effective paths to early literacy
Early Childhood Education

- Goals and Types of Preschools
  - In some countries (e.g., China), preschools provide academic preparation for schooling
  - Most preschools in the U.S. and many other western countries have followed a "child-centered" philosophy
Early Childhood Education

- Goals and Types of Preschools
  - The Montessori Method
  - The Reggio Emilia Approach
Early Childhood Education

- **Compensatory Preschool Programs**
  - **Project Head Start**
    - 1965 federally funded program
    - A “whole-child” approach – dental, medical, mental health, social services, and at least one hot meal a day
    - Suffers from inadequate funding
    - Does improve school-readiness, but skills still remain below U.S. average
Early Childhood Education

- The School of the Twenty-First Century
  - Universal preschool
  - Goals
    - Childcare and preschool services of high quality
    - Building parent involvement
    - Support services to enhance family functioning
Early Childhood Education

- The Child in Kindergarten
  - Kindergarten – not required in all states
  - Many now spend a full day in kindergarten rather than the traditional half day
  - Preparation a child receives before kindergarten is most important
Early Childhood Education

The Child in Kindergarten

- Emotional and social adjustment: important factors in readiness for kindergarten and strongly predict school success
- Kindergarten adjustment may depend on a child’s age, gender, temperament, coping skills, cognitive and social competencies, and environment of school and home