Cognitive Development in Middle Childhood

Chapter 13
Guideposts for Study

1. How Do School-Age Children’s Thinking and Moral Reasoning Differ from That of Younger Children?

2. What Advances in Information Processing Skills Occur During Middle Childhood?

3. How Accurately Can Schoolchildren’s Intelligence Be Measured?
Guideposts for Study

4. How do Communicative Abilities Expand During Middle Childhood?
5. What Factors Influence School Achievement?
6. How do Schools Meet Special Needs?
Piagetian Approach:
The Concrete Operational Child

- Cognitive Advances
  - Space and causality
  - Categorization
    - Seriation
      - Arrangement of objects in a series using one or more dimensions
    - Transitive inference
      - Ability to infer a relationship between two objects from the relationship between each of them and a third object
    - Class inclusion
      - Ability to see a relationship between a whole and its parts
Piagetian Approach:  
The Concrete Operational Child

- **Cognitive Advances**
  - **Inductive reasoning**
    - Specific to general
    - E.g.: My dog barks. Sue’s dog barks. All dogs must bark
  - **Deductive reasoning**
    - General to specific
    - E.g.: All dog’s bark. Spot is a dog. Spot barks.
    - Does not develop until adolescence
Piagetian Approach:
The Concrete Operational Child

- Cognitive Advances
  - Conservation
    - Principle of identity
    - Principle of reversibility
    - Horizontal décalage
      - Inconsistency in the development of different types of conservation
Piagetian Approach: The Concrete Operational Child

Cognitive Advances

- Number and Mathematics
  - By age 6 or 7 many can count in their heads
  - Able to count on
  - More adept at solving simple story problems
Piagetian Approach: The Concrete Operational Child

- **Cognitive Advances**
  - Number line estimation
  - Computational estimation
  - Numerosity estimation
  - Measurement estimation
Piagetian Approach:
The Concrete Operational Child

- Influences of Neurological Development and Schooling
  - Logical thinking of older child depends on neurological development and experience
  - Cross-cultural studies support progression from preoperational to operational thought
Piagetian Approach: The Concrete Operational Child

- **Moral Reasoning**
  - 1\textsuperscript{st} stage
    - Ages 2-7; Corresponds with the preoperational stage
    - Rigid obedience to authority
    - Rules cannot be changed or bent
Piagetian Approach: The Concrete Operational Child

Moral Reasoning

2\textsuperscript{nd} stage

- Ages 7-11; Corresponds with the concrete operational stage
- Increasing flexibility
- Considers intent
- Uses a wider range of viewpoints
Piagetian Approach:
The Concrete Operational Child

- **Moral Reasoning**
  - 3rd stage
  - Ages 11 or 12; corresponds with formal operational stage
- **Equity**
  - Takes specific circumstances into account
Information-Processing Approach: Attention, Memory, and Planning

- Executive Function
  - Conscious control of thoughts, emotions, and actions to accomplish goals or solve problems
  - Can plan and use strategies or deliberate techniques to help them remember
Information-Processing Approach: Attention, Memory, and Planning

How do Executive Skills Develop?

- Development of the prefrontal cortex
- Processing speed improves dramatically
- Home environment contributes
  - Available resources
  - Cognitive stimulation
  - Maternal sensitivity
Information-Processing Approach: Attention, Memory, and Planning

- **Selective Attention**
  - Ability to deliberately direct one’s attention and shut out distractions

- **Inhibitory control**
  - Voluntary suppression of unwanted responses

- **Working Memory Span**
  - Efficiency increases greatly
Information-Processing Approach: 
Attention, Memory, and Planning

- Metamemory: Understanding Memory
  - Knowledge about the processes of memory
  - Improvements both in processing speed and in storage capacity
Information-Processing Approach: Attention, Memory, and Planning

- Mnemonics: Strategies for Remembering
  - External Memory aids
  - Rehearsal
    - Conscious repetition
  - Organization
    - Mentally placing information into categories
  - Elaboration
    - Associating items with something else
Information-Processing Approach: Attention, Memory, and Planning

Information Processing and Piagetian Tasks

- Case (1985, 1992) states that as a child’s application of a scheme becomes more automatic, space is freed in working memory to deal with new information.
- Improvements in memory may contribute to the mastery of conservation tasks.
Psychometric Approach: Assessment of Intelligence

- **Wechsler Intelligence Scale for Children (WISC-III)**
  - Ages 6-16
  - Measures verbal and performance abilities

- **Otis-Lennon School Ability Test (OLSAT8)**
  - Kindergarten – 12th grade
  - Verbal comprehension; verbal, pictorial, figural, and quantitative reasoning
Psychometric Approach: Assessment of Intelligence

The IQ Controversy

Positive

- Standardized
- Extensive information about norms, validity, and reliability

Negative

- Equates intelligence with speed and penalizes a child who works slowly and deliberately
- Infers intelligence from what children already know
Psychometric Approach: Assessment of Intelligence

- Influences on Intelligence
  - Genes and brain development
    - Pattern of development of prefrontal cortex
  - Influences of schooling in IQ
    - Scores drop during summer vacation
    - Language, spatial, and conceptual scores improve most between October and April
Psychometric Approach: 
Assessment of Intelligence

- Influences on Intelligence
  - Influences of Race/Ethnicity on IQ
    - Studies attribute ethnic differences in IQ largely to inequalities in environment -- income, nutrition, living conditions, health, parenting practices, and early childcare
Psychometric Approach: Assessment of Intelligence

- Influences on Intelligence
  - Influences of Culture on IQ
    - Cultural bias
    - Culture-free tests
    - Culture-fair tests
    - Culture-relevant tests
Psychometric Approach: Assessment of Intelligence

- Is There More Than One Intelligence?
  - Gardner’s Theory of Multiple Intelligences
    - Linguistic
    - Logical-mathematical
    - Spatial
    - Musical
    - Bodily-kinesthetic
    - Interpersonal
    - Intrapersonal
Psychometric Approach: Assessment of Intelligence

- Sternberg’s Theory of Intelligence
  - Componential element
    - Analytic aspect
  - Experiential element
    - Insightful or creative aspect
  - Contextual element
    - Practical aspect
Psychometric Approach: Assessment of Intelligence

- Sternberg’s Theory of Intelligence
  - Sternberg Triarchic Abilities Test (STAT)
    - Seeks to measure each of the three aspects of intelligence
    - Three domains
      - Verbal
      - Quantitative
      - Figural (spatial)
Psychometric Approach: Assessment of Intelligence

- New Directions in Intelligence Testing
  - Kaufman Assessment Battery for Children (K-ABC-II)
    - Ages 3-18
    - For children with diverse needs
  - Dynamic Tests
    - Contains items up to two years above a child’s current level of competence
    - Gives teachers more useful information
Language and Literacy

- Vocabulary, Grammar, and Syntax
  - Use of precise verbs increases
  - Figures of speech become more common
    - Similes
    - Metaphors
  - Sentence structure becomes more elaborate
    - More subordinate clauses
Language and Literacy

- Pragmatics: Knowledge About Communication
  - Practical use of language to communicate
  - Includes both conversational and narrative skills
Language and Literacy

- Pragmatics: Knowledge About Communication
  - Reading
    - Decoding
    - Visually-based retrieval
    - Phonetic or code-emphasis approach
    - Whole-language approach
Pragmatics: Knowledge About Communication

- Writing
  - Is difficult for young children
  - Must be judged independently
- Constraints
  - Spelling, punctuation, grammar, and capitalization
The Child in School

- Entering First Grade
  - Interest, attention, and active participation are positively associated with achievement test scores
  - Risk of school failure
    - SES
    - Academic, attentional, or behavioral problems
The Child in School

- Influences on School Achievement: An Ecological Analysis
  - Self-efficacy beliefs
  - Gender
  - Parenting practices
  - Socioeconomic status
    - Social capital
  - Peer acceptance
The Child in School

- Influences on School Achievement: An Ecological Analysis
  - Educational system
    - The school environment
  - Current Educational developments
    - Termination of social promotion
    - Computer and internet use
Educating Children with Special Needs

- Second-Language Education
  - English-immersion (ESL)
    - Language-minority children are immersed in English in special classes
  - Bilingual education
    - Taught in two languages
  - Two-way or dual-language learning
    - English-speaking and foreign-speaking children learn together in their own and each other’s languages
Educating Children with Special Needs

- Children with Learning Problems
  - Mental retardation
    - Significantly subnormal cognitive functioning
    - IQ of about 70 or less
    - Deficiency in age-appropriate adaptive behavior before age 18
      - Communication
      - Social skills
      - Self-care

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Educating Children with Special Needs

- Children with Learning Problems
  - Learning disabilities
    - E.g. dyslexia
    - Processing sensory information
    - Language impairment
    - Reading disability
    - Mathematical disability
Children with Learning Problems

Attention-deficit/hyperactivity disorder (ADHD)

- Persistent inattention
- Distractibility
- Impulsivity
- Low tolerance for frustration
- Much activity at the wrong time such as in a classroom
Educating Children with Special Needs

- Educating Children with Disabilities
  - Individuals with Disabilities Education Act
    - Ensures a free, individualized public education for all children with disabilities
    - Least restrictive environment
    - Inclusion programs
Educating Children with Special Needs

- Gifted Children
  - Identifying gifted children
    - Score on a general intelligence IQ test of 130 or higher
    - Tends to excluded highly creative children, minorities, and children with specific aptitudes
    - Gardner’s multiple intelligences suggests some children may be gifted in different areas
Educating Children with Special Needs

- What Causes Giftedness?
  - Innate characteristics
  - Motivation
  - Hard work
- Lewis M. Terman’s longitudinal study
Defining and Measuring Creativity

- **Convergent thinking**
  - Seeks a single correct answer
  - IQ tests

- **Divergent thinking**
  - Seeks a wide array of possibilities
  - Creativity
Educating Children with Special Needs

Educating Gifted Children

Enrichment versus Acceleration

- **Enrichment**
  - Deepens knowledge and skills through extra classroom activities, research projects, field trips, or expert coaching

- **Acceleration**
  - Speeds up their education through early school entrance, grade skipping, placement in fast-paced classes or advanced courses
Educating Children with Special Needs

- Julian Stanley: Seeking and Nurturing the Profoundly Gifted
  - Study of Mathematically Gifted Youth (SMPY) at Johns Hopkins University
  - Gifted 12 and 13 year-olds can take advanced summer courses and can apply for very early college entrance
  - Accepted the top 0.001 percent of gifted young people