1 **Cognitive Development: Middle Childhood**

Slides Presented by Nicole Porter,
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2 **A Prime Time for Learning**

- Children in the school years are inquisitive and eager to learn new skills.
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3 **Grand Theorist**

- Jean Piaget developed a thesis of cognitive theory: How children think changes with time and experience, and these thought processes always affect behavior.
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4 **Stages of Development**

5 **Piaget's Third Stage**

- Concrete operational thought is the ability to reason logically about direct experiences and perceptions.
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- Children in this stage become more systematic, objective, and scientific thinkers–but only about tangible, visible things.
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6 **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

7 **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
      -

8 **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
    -

9 **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
  -
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10 **Piagetian Approach: The Concrete Operational Child**

- Cognitive Advances
  - Number line estimation
  - Computational estimation
  - Numerosity estimation
  - Measurement estimation

11 **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
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12 **Moral Development**

Group Activity

13 **Piagetian Approach: The Concrete Operational Child**

- Moral Reasoning
  - 1st stage
    - Ages 2-7; Corresponds with the preoperational stage
    - Rigid obedience to authority
    - Rules cannot be changed or bent
  -

14 **Piagetian Approach: The Concrete Operational Child**

- Moral Reasoning
  - 2nd stage
    - Ages 7-11; Corresponds with the concrete operational stage
    - Increasing flexibility
    - Considers intent
    - Uses a wider range of viewpoints
-

15 **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
    -

16 **Information Processing**

- Analyzes how the mind analyzes, stores, and retrieves information.

- Cognition becomes more efficient in middle childhood.

17 **The Three "Parts" of Memory**

- Sensory register: registers incoming stimuli for a split second

- Working memory (short term): where current, conscious mental activity occurs

- Long-term memory = stores information for minutes, hours, days, months, years
  - Unlimited capacity (!)

18 **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

19 **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

20 **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

21 **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
-

22 **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

  –

23 **Memory Exercise**

24 **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

25 **Speed of Processing**

- Speed of processing increases during middle childhood.
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- This allows a child to process more thoughts quickly, retain more thoughts in memory, and simultaneously process two different thoughts.

26 **<u>Make it Real</u>: Learning a Subject**

- *Do you find it easier to learn new material in your major field of interest than in a brand new subject?*
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- *Why do think that is?*

27 **Measuring the Mind**

- Are grades an important measure of how a child is doing in school?

- However, why might someone want a different assessment in addition to grades?

28 **Objective Tests of Ability**

- Achievement Tests: measure what has been taught (given routinely in school).
-
- Aptitude Tests: measure one's potential

29 **Psychometric Approach: Assessment of Intelligence**

1 - Wechsler Intelligence Scale for Children (WISC-III)
  - Ages 6-16
  - Measures verbal and performance abilities
2 - Otis-Lennon School Ability Test (OLSAT8)
  - Kindergarten – 12th grade
  - Verbal comprehension; verbal, pictorial, figural, and quantitative reasoning

30 **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
  -
  -

31 **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
  -

32 **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

33 **Psychometric Approach: Assessment of Intelligence**

- Influences on Intelligence
  - Influences of Culture on IQ
    - Cultural bias
    - Culture-free tests
    - Culture-fair tests
    - Culture-relevant tests

34 **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
- Naturalistic
-

35 **Intelligence Activity**

Analytical, Creative, Practical

36 **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)

37 **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

38 **Language: New Vocabulary**

- School-age kids learn up to 20 new words a day.

- They understand metaphors and various uses of words.

  - Examples: egg, "walking on eggshells," "last one is a rotten egg," egg salad, etc.

39 **Two "Codes" of Language**

- Formal Code: used in school and other "formal" situations

  - Extensive vocabulary

  - Complex syntax

  - Lengthy sentences

40 **Two "Codes" of Language *(cont.)***

41 **Code Switching: A Life Saver**

- Kids in middle childhood learn that certain words and phrases are okay with friends (informal code), but NOT with teachers or other adults.

- Failure to learn this could result in punishment for calling the teacher "dude"!

42 **Socioeconomics and Language**

- Lower-income children tend to have smaller vocabularies, simpler grammar, and more difficulty in reading.

- Two key explanations for this:

  - Exposure to language
  - Parental expectations towards education

43 **Tones and Tricks**

- By 10 years of age, children learn to understand the nuances of language (tone, sarcasm, puns).

- Example: 10 year olds recognized that saying "I lost my money" in a happy voice is strange.

44

45 **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

46 **Language and Literacy**

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

47 **Language and Literacy**

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

48 **The Reading Wars**

- Phonics approach: teaching reading by first teaching the sounds of each letter

- Whole-language: teaching reading by early use of all language skills–talking, listening, reading, and writing

- BOTH approaches are valuable

49 **Quiz: Which approach is this?**

50 **Pragmatics: Knowledge About Communication**

- Pragmatics: Knowledge About Communication
  - Writing
    - Is difficult for young children
    - Must be judged independently
    - Constraints
      - Spelling, punctuation, grammar, and capitalization
      -

51 **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
  -

52 **The Child in School**

- Influences on School Achievement: An Ecological Analysis

- Self-efficacy beliefs
- Gender
- Parenting practices
- Socioeconomic status
  - Social capital
- Peer acceptance

53 **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

54 **The Hidden Curriculum**

- The hidden curriculum is the unofficial, unstated rules that influence learning.
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- Examples: discipline strategies, teacher salaries, class size, testing, schedules, emphasis on sports, segregation by ethnicity, physical condition of the school

55 **Bilingual Education**

- About 4 million U.S. children are English-language learners (ELL).
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56 **Bilingual Education *(cont.)***

- Middle childhood is an ideal time to teach a second language.
- However, there is considerable debate about when and how to teach a second language.
-

57 **Types of 2nd Language Programs**

- Total (English) immersion: all instruction in second language
- Reverse immersion: instruction of basic subjects in first language, then second language is taught
- Bilingual education: instruction in both languages

58 **Types of 2nd Language Programs *(cont.)***

- Heritage language classes: after school classes to connect with native culture
- English as a second language (ESL): exclusive English for a few months, in preparation for "regular" classes

59 **Which type is best?**

- Research in Canada found the total immersion approach to be very successful.
- However, there is no one right answer. The goal is to help immigrant children preserve their culture, while learning the new language.

60 **Educating Children with Special Needs**

- Children with Learning Problems
  - Cognitively "Mentally" Challenged
    - Significantly subnormal cognitive functioning
    - IQ of about 70 or less
    - Deficiency in age-appropriate adaptive behavior before age 18
      - Communication

- Social skills
- Self-care
-

61 **Educating Children with Special Needs**

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

62 **Educating Children with Special Needs**

- 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
-

63 **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

64 **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

65 **Educating Children with Special Needs**

- What Causes Giftedness?
  - Innate characteristics
  - Motivation
  - Hard work
- Lewis M. Terman's longitudinal study

66 **Educating Children with Special Needs**

- Defining and Measuring Creativity
  - Convergent thinking
    - Seeks a single correct answer
    - IQ tests
  - Divergent thinking
    - Seeks a wide array of possibilities
    - Creativity

67 **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

68 **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

69 **Make it Real: The No Child Left Behind Act**

- *This Act requires yearly testing and a certain level of achievement in order for schools to receive federal funding.*

- *Were you affected by this Act? Do you think it is a good idea? Why or why not?*

70 **The No Child Left Behind Act**

- The Act is controversial. Some questions include:
  - What about the arts and physical education?
  - Does it punish schools that need funding the most?
  - Should graduation (or not) depend on a test?
  - What about special needs students?

71 **The Math Wars**

- Math is an often feared subject, but one of utmost importance.

- New curriculum discourages rote learning, emphasizing problem solving, and *understanding* of concepts.

- The focus is on the thought process, not just the final answer.

72 **Bilingual Education**

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