

# ESSENTIALS OF LIFE-SPAN DEVELOPMENT

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PHYSICAL AND COGNITIVE DEVELOPMENT IN MIDDLE AND LATE  
CHILDHOOD

7

# CHAPTER OUTLINE

- Physical changes and health
- Children with disabilities
- Cognitive changes
- Language development

# PHYSICAL CHANGES AND HEALTH

- Body growth and change
  - Middle and late childhood as a period of slow, consistent growth
    - Grow an average of 2–3 inches per year
    - Gain an average of 5–7 pounds a year
    - Body proportion changes
    - Muscle mass and strength increase as “baby fat” decreases

# PHYSICAL CHANGES AND HEALTH

- The Brain
  - Total brain volume stabilizes
  - Significant changes in structures and regions occur
    - Especially in the prefrontal cortex
  - Activation of some brain areas increase while others decrease

# PHYSICAL CHANGES AND HEALTH

- Motor Development
  - Motor skills become smoother and more coordinated
  - Improvement of fine motor skills due to increased myelination of the central nervous system
  - Boys outperform girls in gross motor skills
    - Girls usually outperform boys in fine motor skills

# PHYSICAL CHANGES AND HEALTH

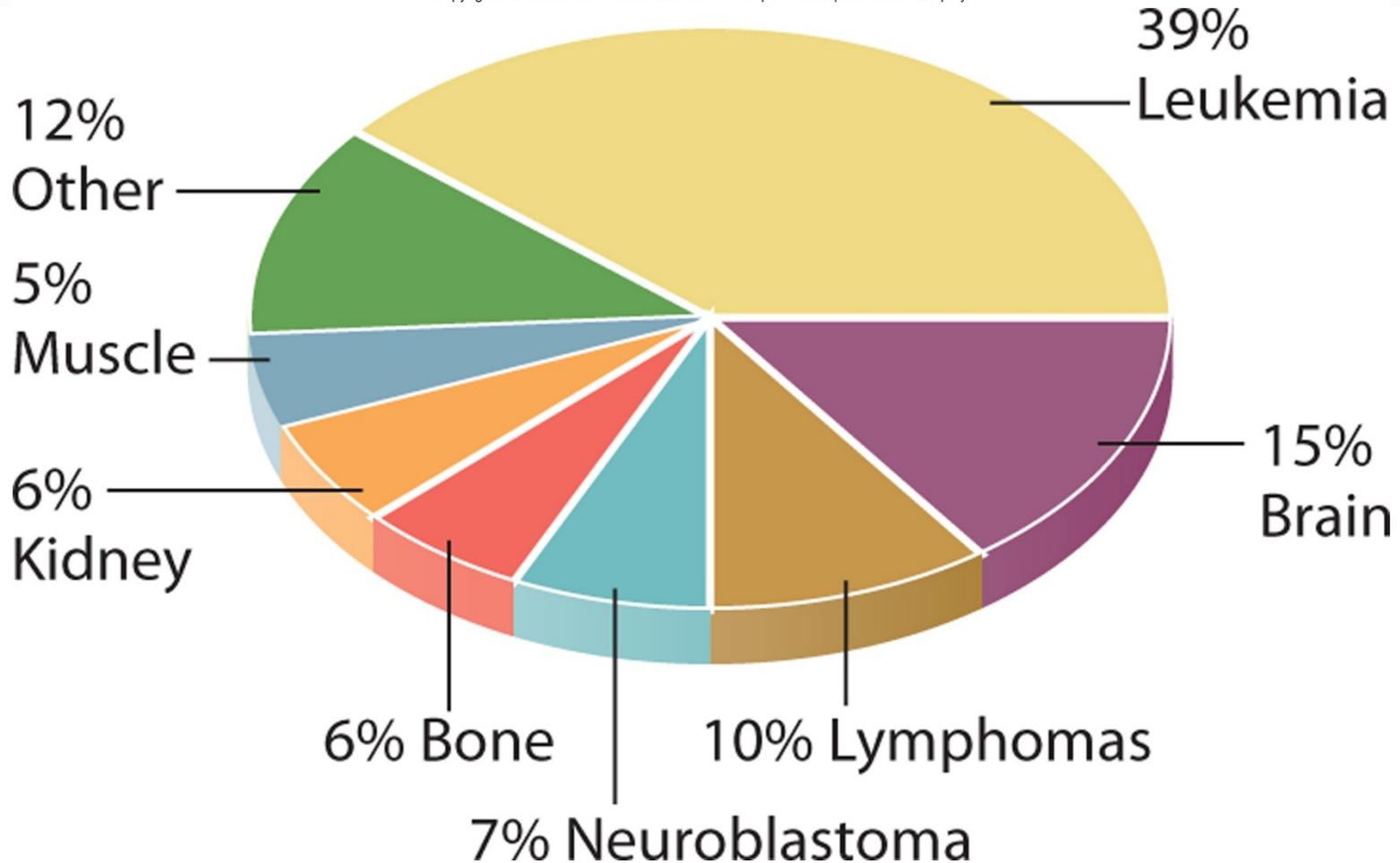
- Exercise
  - American children do not get enough exercise
  - Increasing exercise levels has positive outcomes
  - Aerobic exercise benefits:
    - Attention, memory, effortful and goal-directed thinking and behavior, creativity
  - Parents and schools play important roles in children's exercise levels
  - Screen time linked to low activity levels and obesity

# PHYSICAL CHANGES AND HEALTH

- Health, illness, and disease
  - Middle and late childhood is a time of excellent health
  - Disease and death are less prevalent
- Overweight children
  - Heredity and environmental contexts
  - Linked to diabetes, hypertension, and elevated blood cholesterol levels
- Cancer
  - Second leading cause of death in children 5–14 years old
  - Most common child cancer is leukemia
  - Children with cancer are surviving longer, advancements in treatment

# FIGURE 7.1 - TYPES OF CANCER IN CHILDREN

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# CHILDREN WITH DISABILITIES

- **Learning disability** – Difficulty in learning that involves:
  - Understanding or using spoken or written language
  - Listening, thinking, reading, writing, and spelling
  - Approximately 80% of children with a learning disability have problems with reading
  - Types of learning disabilities:
    - *Dyslexia* - Severe impairment in the ability to read and spell
    - *Dysgraphia* - Difficulty in handwriting
    - *Dyscalculia* - Developmental arithmetic disorder

# FIGURE 7.2 - U.S. CHILDREN WITH A DISABILITY WHO RECEIVE SPECIAL EDUCATION SERVICES

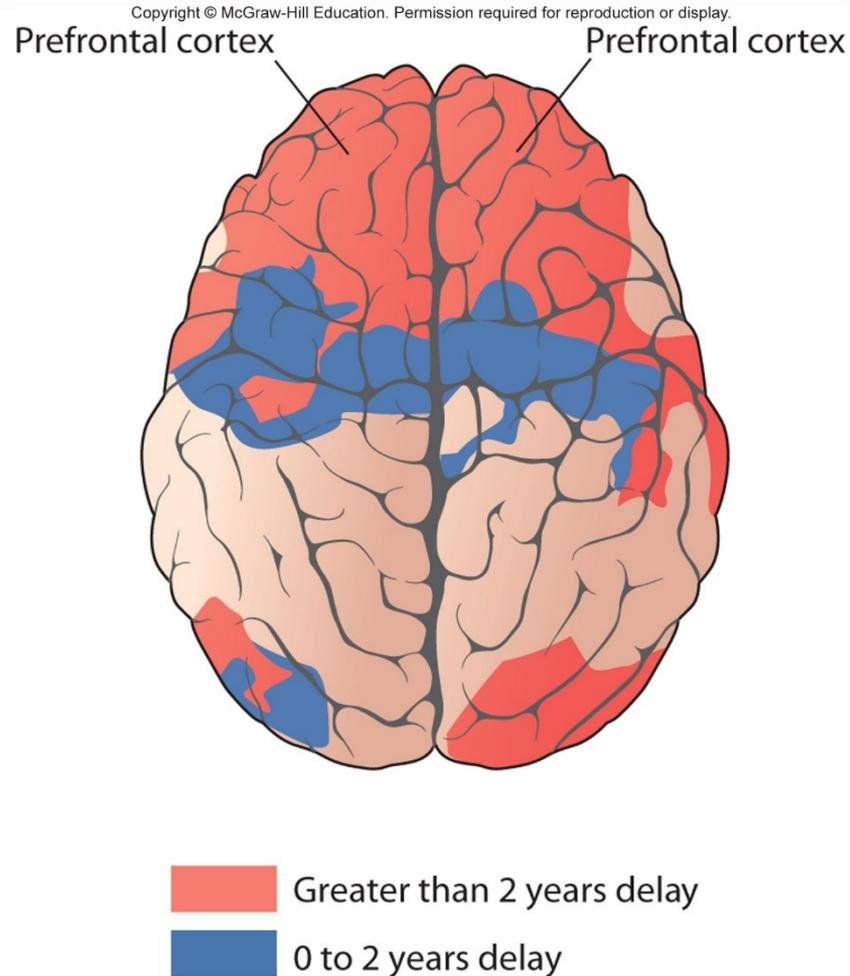
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<b>Disability</b>	<b>Percentage of All Children in Public Schools</b>
<b>Learning disabilities</b>	4.7
<b>Speech or hearing impairments</b>	2.8
<b>Intellectual disability</b>	0.9
<b>Autism</b>	0.9
<b>Emotional disturbance</b>	0.8

# CHILDREN WITH DISABILITIES

- **Attention deficit hyperactivity disorder (ADHD):** characterized by inattention, hyperactivity, and impulsivity
  - Number of children diagnosed has increased
  - Possible causes:
    - Genetics
    - Brain damage during prenatal or postnatal development
    - Cigarette and alcohol exposure during prenatal development
    - Low birth weight

# FIGURE 7.4 - REGIONS OF THE BRAIN IN WHICH CHILDREN WITH ADHD HAD A DELAYED PEAK IN THE THICKNESS OF THE CEREBRAL CORTEX



# CHILDREN WITH DISABILITIES

- **Autism spectrum disorders (ASD):** range from autistic disorder to Asperger syndrome
  - *Autistic disorder* – More severe disorder
    - Deficiencies in social relationships, abnormalities in communication, restricted, repetitive, and stereotyped patterns of behavior
  - *Asperger syndrome* – Milder disorder
    - Good verbal language skills
    - Restricted range of interests and relationships
  - Autism spectrum disorders can often be detected as young as 1-3 years

# CHILDREN WITH DISABILITIES

- Individuals with Disabilities Education Improvement Act (2004)
  - Mandates for providing educational services to children with disabilities, including:
  - **Individualized Education Plan (IEP):** Written statement that is specifically tailored for the disabled student
  - **Least Restrictive Environment (LRE):** Setting that is as similar as possible to the one in which non-disabled children are educated
  - **Inclusion:** Educating a child with special education needs full-time in the regular classroom

# COGNITIVE CHANGES

- Piaget's Concrete Operational stage (Ages 7 to 11)
  - Can perform concrete operations and reason logically as applied to specific or concrete examples
    - Classification
    - **Seriation:** Ability to order stimuli along a quantitative dimension
    - **Transitivity:** Ability to logically combine relations to understand conclusions

# COGNITIVE CHANGES

- Evaluating Piaget's theory
  - Concrete operational abilities do not appear in synchrony
  - Education and culture exert strong influences on children's development
- **Neo-Piagetians:** Argue that Piaget got some things right but that his theory needs considerable revision
  - Elaborated on Piaget's theory
  - Gave more emphasis to how children use attention, memory, and strategies to process information

# COGNITIVE CHANGES

- **Long-term memory:** A relatively permanent and unlimited type of memory
  - Increases with age during middle and late childhood
  - Knowledge and expertise
    - Experts have acquired extensive knowledge about a particular content area

# COGNITIVE CHANGES

- **Strategies:** Deliberate mental activities that improve the processing of information
  - **Elaboration:** Extensive processing of the information
  - Engage in mental imagery
  - Understanding the material
  - Repeat with variation
  - Embed memory-relevant language

# COGNITIVE CHANGES

- **Fuzzy trace theory:** Two types of memory representations:
  - *Verbatim memory trace* – precise details of information
  - *Gist* – central ideal of information
  - During early elementary years, children begin to use gist more
- **Thinking:**
  - Involves manipulating and transforming information in memory
  - Thinking critically and creatively

# COGNITIVE CHANGES

- **Critical thinking:** Involves thinking reflectively and productively, evaluating evidence
- **Creative thinking:** Ability to think in novel and unusual ways and come up with unique solutions to problems
  - **Convergent thinking:** Produces one correct answer
    - Tested by standardized intelligence tests
  - **Divergent thinking:** Produces many answers to the same question
    - Creativity

# COGNITIVE CHANGES

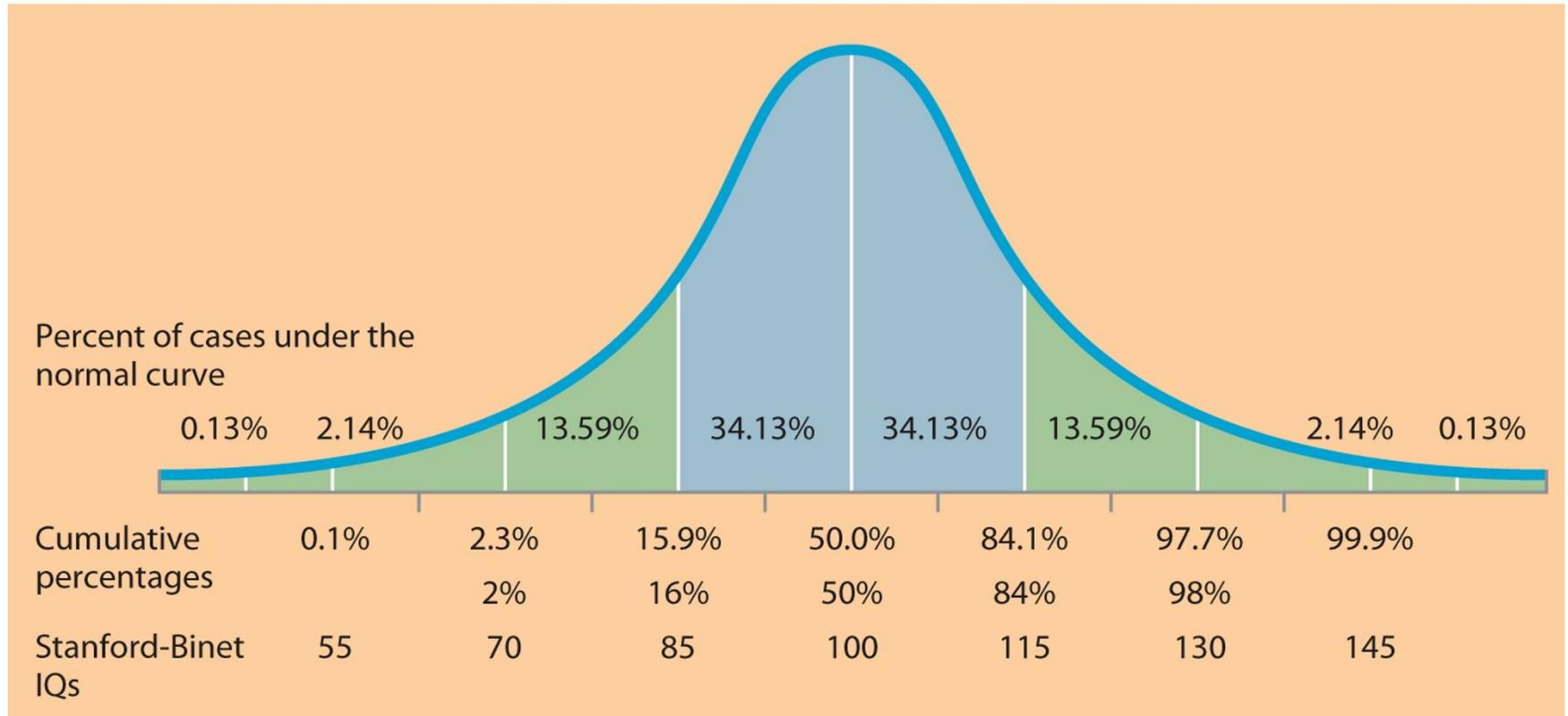
- **Metacognition:** Cognition about cognition
  - Consists of several dimensions of executive function
    - Including planning and self-regulation, memory strategies
  - *Metamemory* - Knowledge about memory
- **Executive function**
  - Most important areas for children's cognitive development and school success:
    - Self-control/inhibition
    - Working memory
    - Flexibility

# COGNITIVE CHANGES

- Intelligence - ability to solve problems and to adapt and learn from experiences
  - *Individual differences* - stable, consistent ways in which people differ from each other
  - Binet Tests
    - **Mental age (MA)**: Individual's level of mental development relative to others
    - Intelligence quotient (IQ): Mental age divided by chronological age, multiplied by 100
    - **Normal distribution**: Symmetrical distribution
      - Most scores falling in the middle of the possible range of scores
      - Few scores appearing toward the extremes of the range

# FIGURE 7.6 - THE NORMAL CURVE AND STANFORD-BINET IQ SCORES

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# FIGURE 7.7 - SAMPLE SUBSCALES OF THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN-FOURTH EDITION (WISC-IV)

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## Verbal Subscales

### Similarities

A child must think logically and abstractly to answer a number of questions about how things might be similar.

Example: "In what way are a lion and a tiger alike?"

### Comprehension

This subscale is designed to measure an individual's judgment and common sense.

Example: "What is the advantage of keeping money in a bank?"

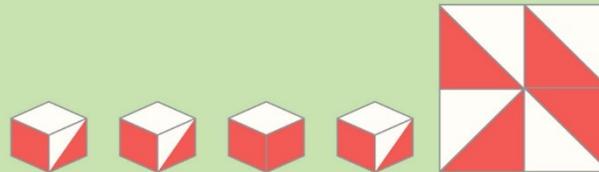
## Nonverbal Subscales

### Block Design

A child must assemble a set of multicolored blocks to match designs that the examiner shows.

Visual-motor coordination, perceptual organization, and the ability to visualize spatially are assessed.

Example: "Use the four blocks on the left to make the pattern on the right."



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# COGNITIVE CHANGES

- Types of intelligence
  - Sternberg's **triarchic theory of intelligence**
    - *Analytical intelligence* – ability to analyze, judge, evaluate, compare, contrast
    - *Creative intelligence* – ability to create, design, invent, originate, imagine
    - *Practical intelligence* – ability to use, apply, implement, put ideas into practice
  - Children with difference triarchic patterns “look different” in school

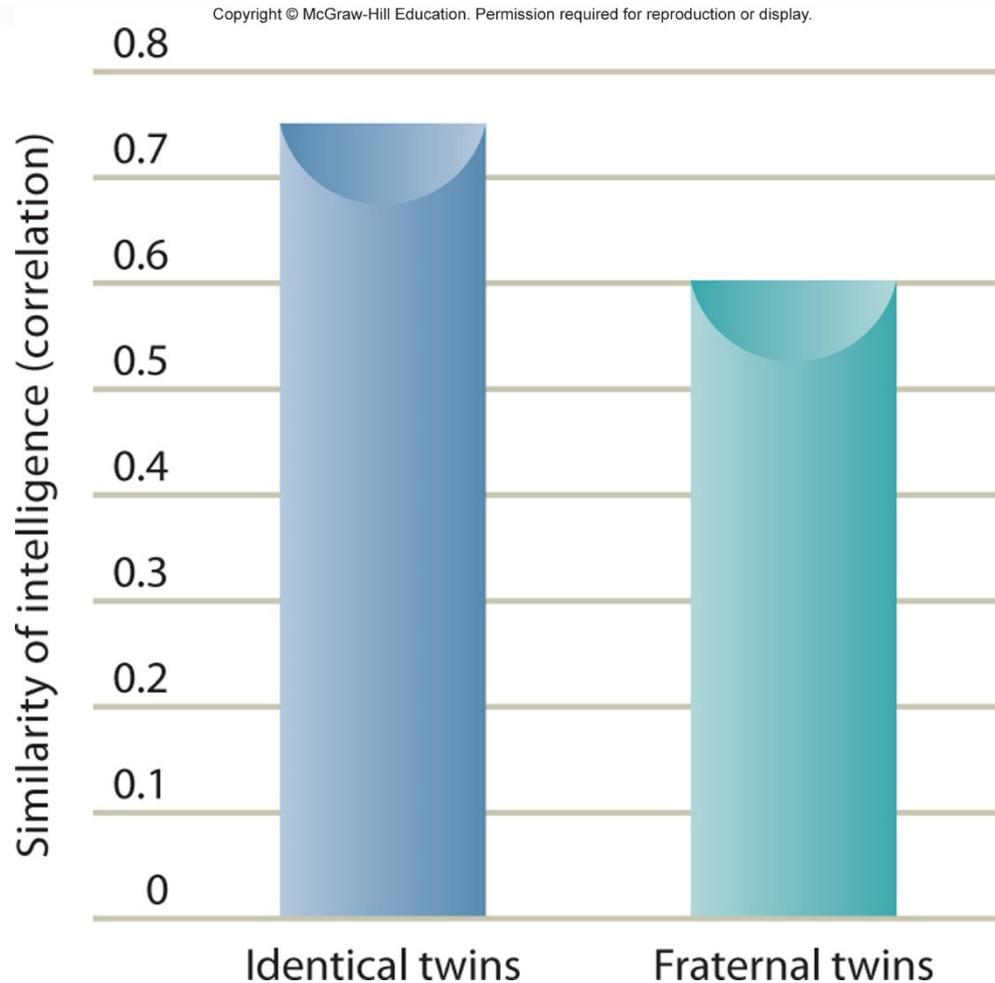
# COGNITIVE CHANGES

- Gardner's eight frames of mind:
  - *Verbal*
  - *Mathematical*
  - *Spatial*
  - *Bodily-kinesthetic*
  - *Musical*
  - *Interpersonal*
  - *Intrapersonal*
  - *Naturalist*
- Evaluating multiple-intelligence approaches
  - Stimulated educators to think about children's competencies
  - Persisting doubts that multiple intelligences exist

# COGNITIVE CHANGES

- Culture and intelligence
  - What is viewed as intelligent varies by culture
- Interpreting differences in IQ scores
  - Influences of genetics
  - Environmental influences
  - Group differences
  - **Culture-fair tests:** Designed to be free of cultural bias

# FIGURE 7.8 - CORRELATION BETWEEN INTELLIGENCE TEST SCORES AND TWIN STATUS



# COGNITIVE CHANGES

- **Intellectual disability:** Limited mental ability reflective of low IQ and difficulty adapting to everyday life
  - Range of mild to severe levels of intellectual disability
  - **Organic retardation:** Caused by a genetic disorder or brain damage
  - **Cultural-familial retardation:** No evidence of organic brain damage
    - IQ is generally between 50 and 70

# COGNITIVE CHANGES

- **Gifted:** Above-average intelligence and/or superior talent for something
  - Three criteria:
    - *Precocity*
    - *March to their own drum*
    - *Passion to master*
  - Nature-nurture link of giftedness
  - Domain-specific giftedness
  - Education of children who are gifted

# LANGUAGE DEVELOPMENT

- Vocabulary, grammar, and metalinguistic awareness
  - Changes occur in the way children's mental vocabulary is organized
  - Categorization becomes easier as children increase vocabulary
  - Similar advances made in grammar skills
- **Metalinguistic awareness:** Knowledge about language
  - Improves considerably during middle and late childhood
  - Understandings of how to use language in culturally appropriate ways

# LANGUAGE DEVELOPMENT

- Reading
  - **Whole-language approach:** Reading instruction should parallel children's natural language learning
  - **Phonics approach:** Reading instruction should teach basic rules for translating written symbols into sounds
  - Children benefit from both approaches, but instruction in phonics needs to be emphasized
  - *Fluency* is a key element in learning how to read

# LANGUAGE DEVELOPMENT

- Second-language learning
  - Bilingualism has a positive effect on children's cognitive development
    - *Subtractive bilingualism* – going from monolingual in home language to bilingual among monolingual speakers
      - Common among immigrant children, negative effects in becoming ashamed of home language
- Dual-language education
  - Teaching English language learners:
    - English-only
    - *Dual-language* – instruction in home language and English