

Detailed Chapter Outline with Key Terms

Chapter 5: Cognitive Development During the First Three Years

Focus: William Erasmus (Doddy) Darwin, Naturalist's Son

STUDYING COGNITIVE DEVELOPMENT: CLASSIC APPROACHES

- *Cognitive development:* The study of learning, thinking, problem solving, memory, and intelligence.
- **Behaviorist approach:** Approach to the study of cognitive development that is concerned with basic mechanics of learning.
- **Psychometric approach:** Approach to the study of cognitive development that seeks to measure the quantity of intelligence a person possesses.
- **Piagetian approach:** Approach to the study of cognitive development that describes qualitative stages in cognitive functioning.

Behaviorist Approach: Basic Mechanics of Learning

Classical and Operant Conditioning

- **Classical conditioning:** Learning based on associating a stimulus that does not ordinarily elicit a response with another stimulus that does elicit the response.
- *Extinct:* The fading of classically conditioned learning that occurs when that learning is not reinforced.
- **Operant conditioning:** Learning based on reinforcement or punishment.

Infant Memory

- *Infantile amnesia:* The inability to remember events prior to the age of 3 years.

Psychometric Approach: Developmental and Intelligence Testing

- **Intelligent behavior:** Behavior that is goal-oriented and adaptive to circumstances and conditions of life.
- **IQ (intelligence quotient) tests:** Psychometric tests that seek to measure intelligence by comparing a test-taker's performance with standardized norms.

Developmental Testing for Infants and Toddlers

- **Bayley Scales of Infant and Toddler Development:** Standardized test of infants' mental and motor development.
- *Mental scale:* In the Bayley Scales, the section that measures such abilities as perception, memory, learning, and vocalization.
- *Motor scale:* In the Bayley Scales, the section that measures gross (large-muscle) and fine (manipulative) motor skills, including sensorimotor coordination.
- *Behavior rating scale:* In the Bayley Scales, the section that is completed by the examiner based in part on information from the child's caregiver.

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- *Developmental quotients (DQs)*: In the Bayley Scales, separate scores based on deviation from the mean established by comparison with a normal sample.

Assessing the Impact of the Home Environment

- **Home Observation for Measurement of the Environment (HOME)**: Checklist to measure the influence of the home environment on children's cognitive growth.

Socioeconomic Status, Parenting Practices, and IQ

Early Intervention

- **Early intervention**: Systematic process of providing services to help families meet young children's developmental needs.

Piagetian Approach: The Sensorimotor Stage

- **Sensorimotor stage**: In Piaget's theory, the first stage in cognitive development, during which infants learn through senses and motor activity.

Substages of the Sensorimotor Stage

- **Schemes**: Piaget's term for organized patterns of behavior used in particular situations.
- **Circular reactions**: Piaget's term for processes by which an infant learns to reproduce desired occurrences originally discovered by chance.
 - *First substage (birth to about 1 month)*: Neonates begin to exercise some control over inborn reflexes, modifying and extending their schemes.
 - *Second substage (about 1 to 4 months)*: Babies learn to repeat a pleasant bodily sensation first achieved by chance (called a primary circular reaction).
 - *Third substage (about 4 to 8 months)*: Babies are interested in manipulating objects, and engage in secondary circular reactions: intentional actions repeated not merely for their own sake but to get results beyond the infant's own body.
 - *Fourth substage, coordination of secondary schemes (about 8 to 12 months)*: Infants have learned to generalize from the past to solve new problems and exhibit complex, goal-directed behavior.
 - *Fifth substage (about 12 to 18 months)*: Infants experiment with new behavior to see what will happen. They engage in tertiary circular reactions: the varying of an action to get a similar result instead of mere repetition. Trial and error is used for problem solving.
 - *Sixth substage, mental combinations (about 18 months to two years)*: A transition into the preoperational stage of early childhood.
- **Representational ability**: Piaget's term for capacity to mentally represent objects and experiences, largely through symbols.

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Do Imitative Abilities Develop Earlier Than Piaget Thought?

- **invisible imitation:** Imitation with parts of one's body that one cannot see.
- **visible imitation:** Imitation with parts of one's body that one can see.
- **deferred imitation:** Piaget's term for reproduction of an observed behavior after the passage of time by calling up a stored symbol of it.
- **elicited imitation:** Research method in which infants or toddlers are induced to imitate a specific series of actions they have seen but not necessarily done before.

Development of Knowledge about Objects and Space

- *Object concept:* The idea that objects have their own independent existence, characteristics, and location in space.

When Does Object Permanence Develop?

- **Object permanence:** Piaget's term for the understanding that a person or object still exists when out of sight.

Symbolic Development, Pictorial Competence, and Spatial Thinking

- *Pictorial competence:* The ability to understand the nature of pictures.
- **Dual representation hypothesis:** Proposal that children under the age of 3 have difficulty grasping spatial relationships because of the need to keep more than one mental representation in mind at the same time.

Evaluating Piaget's Sensorimotor Stage

STUDYING COGNITIVE DEVELOPMENT: NEWER APPROACHES

- **Information-processing approach:** Approach to the study of cognitive development by analyzing processes involved in perceiving and handling information.
- **Cognitive neuroscience approach:** Approach to the study of cognitive development that links brain processes with cognitive ones.
- **Social-contextual approach:** Approach to the study of cognitive development by focusing on environmental influences, particularly parents and other caregivers.

Information-Processing Approach: Perceptions and Representations

Habituation

- **Habituation:** Simple type of learning in which familiarity with a stimulus reduces, slows, or stops a response.

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- **Dishabituation:** Increase in responsiveness after presentation of a new stimulus.

Visual and Auditory Perceptual and Processing Abilities

- **Visual preference:** Tendency of infants to spend more time looking at one sight than another.
- *Novelty preference:* Tendency of infants to pay more attention to new stimuli than to familiar ones.
- **Visual-recognition memory:** Ability to distinguish a familiar visual stimulus from an unfamiliar one when shown both at the same time.
- **Cross-modal transfer:** Ability to use information gained by one sense to guide another.
- *Joint attention:* Infant's response to an adult's gaze by looking or pointing in the same direction. Also known as joint perceptual exploration.

Information Processing as a Predictor of Intelligence

- *Visual reaction time:* The measure of how quickly an infant's gaze will shift to a picture that has just appeared.
- *Visual anticipation:* The measure of how quickly an infant's gaze will shift to the place where the infant expects the next picture to appear.
- *Visual expectation paradigm:* Method of showing a series of computer-generated pictures briefly to an infant, some on the left and some on the right side of the infant's peripheral visual field.

Information Processing and the Development of Piagetian Abilities

Causality

- *Causality:* The principle that one event causes another.

Categorization

Object Permanence

- **Violation-of-expectations:** Research method in which dishabituation to a stimulus that conflicts with experience is taken as evidence that an infant recognizes the new stimulus as surprising.
- *Innate learning mechanisms:* Reasoning abilities that may be present at an infant's birth.

Number

Evaluating Violation-of-Expectations Research

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Cognitive Neuroscience Approach: The Brain's Cognitive Structures

- **Explicit memory:** Intentional and conscious memory, generally of facts, names, and events.
- **Implicit memory:** Unconscious recall, generally of habits and skills; sometimes called procedural memory.
- *Prefrontal cortex:* The large portion of the frontal lobe directly behind the forehead, believed to control many aspects of cognition.
- **Working memory:** Short-term storage of information being actively processing.

Social-Contextual Approach: Learning from Interactions with Caregivers

- **Guided participation:** Participation of an adult in a child's activity in a manner that helps to structure the activity and to bring the child's understanding of it closer to that of the adult.

LANGUAGE DEVELOPMENT

- **Language:** Communication system based on words and grammar.

Sequence of Early Language Development

- **Prelinguistic speech:** Forerunner of linguistic speech; utterance of sounds that are not words. Includes crying, cooing, babbling, and accidental and deliberate imitations of sounds without understanding their meaning.

Early Vocalization

- *Crying:* Newborn's means of communication; can signal hunger, sleepiness, or anger.
- *Cooing:* Squealing, gurgling, and making vowel sounds like "ahhh."
- *Babbling:* Repeating consonant-vowel strings, such as "ma-ma-ma-ma."

Recognizing Language Sounds

- *Phenomes:* The basic sounds of one's native language.

Gestures

- *Conventional social gestures:* Gestures such as waving goodbye or nodding the head to signify "yes," taught to a child by an adult or older child.
- *Representational gestures:* Gestures that represent the desired action directly, such as holding an empty cup to one's mouth to signify wanting a drink.

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- *Symbolic gestures*: Gestures that function much like words and are symbolic of the desired concept, such as blowing to mean hot or sniffing to mean flower.

First Words

- **Linguistic speech**: Verbal expression designed to convey meaning.
- **Holophrase**: Single word that conveys a complete thought.
- *Passive*: Referring to understood vocabulary.
- *Expressive*: Referring to spoken vocabulary.

First Sentences

- **Telegraphic speech**: Early form of sentence consisting of only a few essential words.
- **Syntax**: Rules for forming sentences in a particular language.

Characteristics of Early Speech

Children:

- *Simplify*: Children use telegraphic speech to say just enough to get their meaning across.
- *Understand grammatical relationships they cannot yet express*: Although unable to string together enough words to express a complete action, children can understand the action.
- *Underextend word meanings*: Certain words may be used by the child to mean only a single object, but not other, similar objects.
- *Overextend word meanings*: A child will overgeneralize a word to objects that are only similar to the original referent.
- *Overregularize rules*: Children will apply rules rigidly, without recognizing exceptions, such as “mouses” instead of “mice.”

Classic Theories of Language Acquisition: The Nature-Nurture Debate

- **Nativism**: Theory that human beings have an inborn capacity for language acquisition.
- **Language acquisitions device (LAD)**: In Chomsky’s terminology, an inborn mechanism that enables children to infer linguistic rules from the language they hear.
- *Hand-babbling*: The gestures of deaf babies that are repeated over and over.

Influences on Early Language Development

Neurological Factors

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- *Brain Stem*: The most primitive part of the brain and the earliest to develop, part of the brain that controls newborn's cries, along with the pons.
- *Pons*: The most primitive part of the brain and the earliest to develop, part of the brain that controls newborn's cries, along with the brain stem.
- *Motor cortex*: Part of the brain that controls movements of the face and larynx.

Social Interaction: The Role of Parents and Caregivers

Prelinguistic Period

Vocabulary Development

- **Code mixing**: Use of elements of two languages, sometimes in the same utterance, by young children in households where both languages are spoken.
- **Code switching**: Changing one's speech to match the situation, as in people who are bilingual.

Child-Directed Speech

- **Child-directed speech (CDS)**: Form of speech often used in talking to babies or toddlers; includes slow, simplified speech, a high-pitched tone, exaggerated vowel sounds, short words and sentences, and much repetition. Also called parentese.

Preparing for Literacy: The Benefits of Reading Aloud

- *Describer style*: Adult style of reading to a child in which the adult focuses on describing what is going on in the pictures, and invites the child to do so.
- *Comprehender style*: Adult style of reading to a child in which the adult encourages the child to look more deeply at the meaning of a story and to make inferences and predictions.
- *Performance-oriented style*: Adult style of reading to a child in which the reader reads the story straight through, introducing the main themes beforehand and asking questions afterward.
- *Dialogic reading*: Shared reading in which the parent asks challenging questions and the child is encouraged to become the storyteller.
- *Prereading skills*: Competencies helpful in learning to read, such as learning how letters look and sound.