

Life-Span Development Thirteenth Edition

Chapter 5: Cognitive Development in Infancy

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

Piaget's Theory of Infant Development

- Cognitive Processes
 - Schemes: actions or mental representations that organize knowledge
 - Behavioral schemes (physical activities) characterize infancy
 - Consist of simple actions that can be performed on objects such as sucking and grasping
 - Mental schemes (cognitive activities) develop in childhood
 - Include strategies and plans for solving problems

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

2

Piaget's Theory of Infant Development

- Cognitive Processes
 - Assimilation: occurs when children use their existing schemes to deal with new information or experiences
 - Accommodation: occurs when children adjust their schemes to take new information and experiences into account

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

3

Piaget's Theory of Infant Development

- Cognitive Processes
 - Organization: the grouping of isolated behaviors and thoughts into a higher-order system
 - Equilibration and Stages of Development:
 - Equilibration: the mechanism by which children shift from one stage of thought to the next
 - According to Piaget, individuals go through four stages of development
 - Cognition is *qualitatively* different from one stage to another

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

4

Piaget's Theory of Infant Development

- The Sensorimotor Stage: infant cognitive development lasting from birth to 2 years
 - Infants construct an understanding of the world by coordinating sensory experiences with physical, motoric actions
 - Divided into six substages

Piaget's Theory of Infant Development

Sensorimotor Substages

Substage	Age	Description	Example
1 Simple reflexes	Birth to 1 month	Coordination of sensation and action through reflexive behaviors.	Rooting, sucking, and grasping reflexes; newborns suck reflexively when their lips are touched.
2 First habits and primary circular reactions	1 to 4 months	Coordination of sensation and two types of schemes: habits (reflex) and primary circular reactions (reproduction of an event that initially occurred by chance). Main focus is still on the infant's body.	Repeating a body sensation first experienced by chance (rucking thumb, for example); then infants might accommodate actions by sucking their thumb differently from how they suck on a nipple.
3 Secondary circular reactions	4 to 8 months	Infants become more object-oriented, moving beyond self-preoccupation; repeat actions that bring interesting or pleasurable results.	An infant coos to make a person stay near; as the person starts to leave, the infant coos again.
4 Coordination of secondary circular reactions	8 to 12 months	Coordination of vision and touch—hand-eye coordination; coordination of schemes and intentionality.	Infant manipulates a stick in order to bring an attractive toy within reach.
5 Tertiary circular reactions, novelty, and curiosity	12 to 18 months	Infants become intrigued by the many properties of objects and by the many things they can make happen to objects; they experiment with new behavior.	A block can be made to fall, spin, hit another object, and slide across the ground.
6 Internalization of schemes	18 to 24 months	Infants develop the ability to use primitive symbols and form enduring mental representations.	An infant who has never thrown a temper tantrum before sees a playmate throw a tantrum; the infant retains a memory of the event, then throws one himself the next day.

Piaget's Theory of Infant Development

- The Sensorimotor Stage
 - Object Permanence: the understanding that objects continue to exist even when they cannot be seen, heard, or touched
 - Developed by the end of the sensorimotor period
 - Studied by watching infant's reaction when an interesting object disappears

Piaget's Theory of Infant Development


Object Permanence




Piaget's Theory of Infant Development

Object Permanence

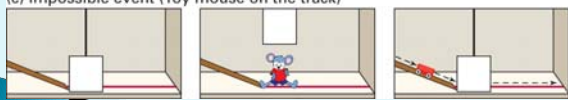
(a) Practice (No toy mouse)



(b) Possible event (Toy mouse behind the track)



(c) Impossible event (Toy mouse on the track)



©2011 The McGraw-Hill Companies, Inc. All rights reserved. 9

Learning, Remembering, and Conceptualizing

- Conditioning:
 - Classical and operant conditioning vs. information retention
- Attention: the focusing of mental resources on select information
 - Orienting/investigative process
 - Sustained attention

©2011 The McGraw-Hill Companies, Inc. All rights reserved. 10

Learning, Remembering, and Conceptualizing

- Attention
 - Habituation and Dishabituation
 - Infants' attention is strongly governed by novelty and habituation
 - Habituation: decreased responsiveness to a stimulus after repeated presentations
 - Dishabituation: increased responsiveness after a change in stimulation
 - Can help parents interact effectively with infants

©2011 The McGraw-Hill Companies, Inc. All rights reserved. 11

Learning, Remembering, and Conceptualizing

- Attention
 - Joint Attention: individuals focus on the same object or event
 - Requires an ability to track another's behavior
 - One person directs another's attention
 - Reciprocal interaction
 - Increases infants' ability to learn from other people

©2011 The McGraw-Hill Companies, Inc. All rights reserved. 12

Learning, Remembering, and Conceptualizing

- Memory: retention of information over time
 - Encoding: the process by which information gets into memory
 - Implicit memory: memory without conscious recollection
 - Explicit memory: conscious memory of facts and experiences
 - Infantile or childhood amnesia: inability to recall memories of events that occurred before 3 years of age

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

13

Learning, Remembering, and Conceptualizing

- Imitation:
 - Meltzoff: infants' imitative abilities are biologically based and are characterized by flexibility and adaptability
- Deferred Imitation: imitation that occurs after a time delay of hours or days
 - Piaget: deferred imitation does not occur until about 18 months
 - Meltzoff: research suggests it can occur as early as 9 months

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

14

Learning, Remembering, and Conceptualizing

- Concept Formation and Categorization
 - Categories: groups of objects, events, and characteristics on the basis of common properties
 - Concepts: ideas about what categories represent
 - Perceptual categorization: based on similar perceptual features of objects
 - Conceptual categorization: by 7–9 months, infants can categorize objects even though they are perceptually similar

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

15

Individual Differences and Assessment

- Measures of Infant Development
 - Gesell Test measures four categories of behavior: motor, language, adaptive, and personal–social
 - Bayley Scales of Infant Development measures five scales: cognitive, language, motor, socioemotional, and adaptive
 - Fagan Test of Infant Intelligence evaluates an infant's ability to process information

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

16

Individual Differences and Assessment

- Predicting Intelligence
- Infant tests contain items related to perceptual-motor development and include measures of social interaction rather than verbal ability

Language Development

- Language: a form of communication – whether spoken, written, or signed – that is based on a system of symbols. Consists of words used by a community and the rules for varying and combining them
- Infinite Generativity: the ability to produce an endless number of meaningful sentences using a finite set of words and rules

Language Development

Rule System	Description	Examples
Phonology	The sound system of a language. A phoneme is the smallest sound unit in a language.	The word <i>chat</i> has three phonemes or sounds: /ch/ /i/ /t/. An example of phonological rule in the English language is while the phoneme /r/ can follow the phonemes /l/ or /d/ in an English consonant cluster (such as <i>track</i> or <i>drab</i>), the phoneme /j/ cannot follow these letters.
Morphology	The system of meaningful units involved in word formation.	The smallest sound units that have a meaning are called morphemes, or meaning units. The word <i>girl</i> is one morpheme, or meaning unit; it cannot be broken down any further and still have meaning. When the suffix <i>-s</i> is added, the word becomes <i>girls</i> and has two morphemes because the <i>s</i> changed the meaning of the word, indicating that there is more than one girl.
Syntax	The system that involves the way words are combined to form acceptable phrases and sentences.	Word order is very important in determining meaning in the English language. For example, the sentence "Sebastian pushed the bike" has a different meaning than "The bike pushed Sebastian."
Semantics	The system that involves the meaning of words and sentences.	Knowing the meaning of individual words—that is, vocabulary. For example, semantics includes knowing the meaning of such words as <i>orange</i> , <i>improvisation</i> , and <i>intelligent</i> .
Pragmatics	The system of using appropriate conversation and knowledge of how to effectively use language in context.	An example is using polite language in appropriate situations, such as being mannerly when talking with one's teacher. Taking turns in a conversation involves pragmatics.

Language Development

- How Language Develops
- Recognizing language sounds
 - Infants can make fine distinctions among the sounds of the language
- Babbling and other vocalizations
 - Sequence of sounds
 - Crying
 - Cooing
 - Babbling

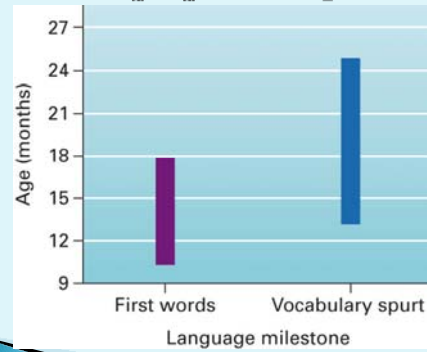
Language Development

- How Language Develops
 - Gestures are used by about 8 to 12 months
 - Pointing is considered an important index of the social aspect of language
 - First words:
 - Children understand first words earlier than they speak them
 - A child understands about 50 words by age 13 months and 200 words by 2 years of age

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

21

Language Development



©2011 The McGraw-Hill Companies, Inc. All rights reserved.

22

Language Development

- How Language Develops
 - First Words
 - Overextension: tendency to apply a word to objects that are inappropriate for the word's meaning
 - Underextension: tendency to apply a word too narrowly
 - Two-Word Utterances
 - Occur at about 18–24 months
 - Child relies on gesture, tone, and context
 - Telegraphic speech: use of short and precise words without grammatical markers

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

23

Language Milestones in Infancy

Typical Age	Language Milestones
Birth	Crying
2 to 4 months	Cooing begins
5 months	Understands first word
6 months	Babbling begins
7 to 11 months	Change from universal linguist to language-specific listener
8 to 12 months	Use gestures, such as showing and pointing Comprehension of words appears
13 months	First word spoken
18 months	Vocabulary spurt starts
18 to 24 months	Uses two-word utterances Rapid expansion of understanding of words

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

24

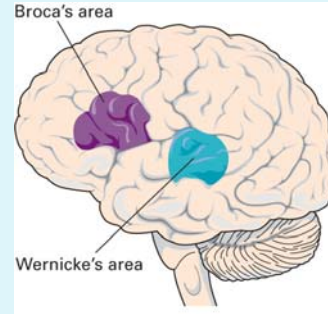
Language Development

- Biological and Environmental Influences
 - Biological Influences:
 - Evolution of nervous system and vocal apparatus
 - Particular brain regions used for language:
 - Broca's area: language production
 - Wernicke's area: language comprehension
 - Language Acquisition Device (LAD; Noam Chomsky): theory that a biological endowment enables children to detect certain features and rules of language

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

25

Language Development



©2011 The McGraw-Hill Companies, Inc. All rights reserved.

26

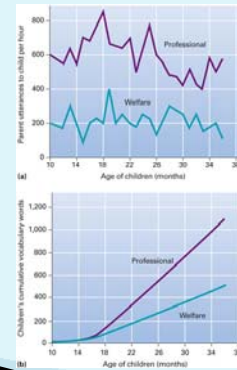
Language Development

- Biological and Environmental Influences
 - Environmental Influences:
 - Behaviorists claim language is a complex learned skill acquired through responses and reinforcements
 - No longer considered a viable explanation of how children acquire language
 - Interaction view (Tomasello): children learn language in specific contexts
 - Children's vocabulary is linked to family socioeconomic status and the type of talk parents direct toward their children

©2011 The McGraw-Hill Companies, Inc. All rights reserved.

27

Language Development



©2011 The McGraw-Hill Companies, Inc. All rights reserved.

28

Language Development

- Biological and Environmental Influences
 - Environmental Influences:
 - Child-Directed Speech: language spoken in a higher pitch than normal with simple words and sentences
 - Captures infant's attention and maintains communication

Language Development

- Biological and Environmental Influences
 - Three strategies to enhance child's acquisition of language:
 - Recasting: rephrasing something the child has said
 - Expanding state: repeating what the child has said but in correct structure
 - Labeling: identifying the names of objects
- An Interactionist View
 - Biology and experience contribute to language development