

Infancy: Cognitive Development

Chapter 6
Child Psychology

Make sure you understand these concepts :

Piaget's Stage Theory

- Schemas: assimilation & accommodation
- Developments in Sensorimotor Stage
 - Sub-stages
 - Object Permanence
 - Mental Representation
- Criticisms of Piaget

Issues in Measuring Infant Intelligence

- Developmental Quotient
- Bayley Scales

Make sure you understand these concepts
from the reading:

Infant Language Development

- Characteristics of linguistic composition
- Linguistic comprehension v. production
- Prelinguistic communication
- Infant directed speech

Piaget's Approach to Cognitive Development

■ Who was Piaget?

■ one of the most influential developmental theorists of the 20th century

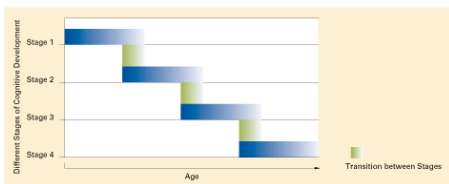


■ Carefully observed children-especially his own young son-and used this information to form the theory that human cognition develops not so much through traditional learning processes as through changes in the way children approach problems (*believed that infants learn by doing!*)

- Believed that knowledge is the product of direct motor behavior in infants
- Both quantity and quality of knowledge increase
- Believed that cognitive development occurs in an orderly and *gradual* fashion
- His theory is thus based on a stage approach to development

Transitions...

Infants do not suddenly shift between stages of cognitive development. Instead Piaget argues that there is a transition period in which some behaviors reflect one stage, some the next stage (GRADUAL change!)



Piaget believed that ...

All children pass through a series of *universal* stages in a *fixed* order.

- A. sensorimotor
- B. preoperational
- C. concrete operations
- D. formal operations

(we will elaborate on these more later...)

During these stages..

- A. Both *quantity and quality* of knowledge increase.
- B. Focus is on the *change in understanding* that occurs as child moves through stages.
- C. Movement through stages occurs with physical maturation and experience with environment.

Piaget believed that infants have mental structures called **SCHEMES**
(*organized patterns of sensorimotor functioning*)

- Newborn schemes differ from adult schemes
 - Reflexes (sucking & rooting)
- Schemes become more sophisticated as motor capabilities advance
 - Piaget considered this a signal of potential for more advanced cognitive development

Two principles underlie children's schemes:

1. **ASSIMILATION** *is when people understand an experience in terms of their current stage of cognitive development and way of thinking.*
 - sucking on every toy the same way
 - calling all animals "dogs"
2. **ACCOMMODATION** *is change in existing ways of thinking that occur in response to encounters with new stimuli or events.*
 - sucking on things based on shape,
 - calling only flying animals "birds"

SENSORIMOTOR STAGE OF COGNITIVE

- **DEVELOPMENT** (table in text)
- The initial, major stage of cognitive development in Piaget's theory!
- Can be broken down into 6 substages:
 - Substage 1: simple reflexes
 - first month of life
 - various reflexes determine the infant's interaction with world.
 - Sucking reflex (provides info about the world = cognitive development)

(Piaget's SENSORIMOTOR STAGE OF COGNITIVE DEVELOPMENT continued)

- Substage 2: first habits and primary circular reactions
 - From 1-4 months of age
 - coordination of actions
 - A CIRCULAR REACTION *is an activity that permits the construction of cognitive schemes through repetition of a chance motor event.*
 - Primary circular events occur
 - *primary circular reactions* are the infants repeating of interesting or enjoyable actions on his or her own body.

(Piaget's SENSORIMOTOR STAGE OF COGNITIVE DEVELOPMENT continued)

- **Substage 3: secondary circular reactions**
 - 4-8 months of age
 - begins to act on world (e.g., rattles rattle)
 - *secondary circular reactions* are repeated actions meant to bring about a desirable consequence on the outside world.
 - vocalization increases and imitation begins

(Piaget's SENSORIMOTOR STAGE OF COGNITIVE DEVELOPMENT continued)

- **Substage 4: coordination of secondary circular reactions**
 - 8-12 months of age
 - Employs GOAL-DIRECTED BEHAVIOR, *where several schemes are combined and coordinated to generate a single act to solve a problem.*
 - development of OBJECT PERMANENCE, *the realization that people and objects exist even when they cannot be seen.*

(Piaget's SENSORIMOTOR STAGE OF COGNITIVE DEVELOPMENT continued)

- **Substage 5: tertiary circular reactions**
 - 12-18 months of age
 - *tertiary circular reactions* involve the deliberate variation of actions to bring desirable consequences
 - Miniature “experiments” to observe consequences
 - Interest in understanding the unexpected

However, specific aspects of Piaget's theory have been *criticized*.

- 1) Some developmentalists *question the stage concept*, thinking development is more continuous.
- 2) Piaget's notion that development is grounded in activity *ignores the importance of infant's sensory and perceptual abilities*.
- 3) Imitation and object permanence may occur *earlier* than Piaget suggested
- 4) *Some development is universal*, and some appears to be subject to cultural variations.

Approaches used to detect differences in intelligence during infancy...

- 1) the **DEVELOPMENTAL QUOTIENT**
- 2) **BAYLEY SCALES OF INFANT DEVELOPMENT**
- 3) **VISUAL-RECOGNITION MEMORY measurement**

(Approaches used to detect differences in intelligence during infancy, continued)

- Arnold Gesell formulated the
- → **DEVELOPMENTAL QUOTIENT**,
 - *an overall developmental score that relates to performance in four domains and is the earliest measure of infant development based on hundreds of babies; it compared their performance at different ages to learn what behaviors were common to a certain age.*
 - *Assesses performance in 4 domains*

(DEVELOPMENTAL QUOTIENT-- Approaches used to detect differences in intelligence during infancy, continued)

- motor skills (balancing, sitting)
- language use (speaking, sounds)
- adaptive behavior (alertness, exploration)
- personal-social (feeding, dressing)

(Approaches used to detect differences in intelligence during infancy, continued)

→ **BAYLEY SCALES OF INFANT DEVELOPMENT** are a measure that evaluates an infant's development from 2 to 30 months.

→ Focuses on 2 areas: mental and motor abilities...

(BAYLEY SCALES OF INFANT DEVELOPMENT, continued)

- Mental Scale
 - Assesses senses, perception, memory, learning, problem solving, language
 - Social smile, reaching, using words
- Motor Scale
 - Assesses gross motor skills, fine motor skills
 - Lifts head, sits with support, walks alone (see table of sample items)

(Approaches used to detect differences in intelligence during infancy, continued)

- →VISUAL- RECOGNITION MEMORY measurement
- - A contemporary approach to infant intelligence
 - measures how *quickly* infants process information
 - *a measure of memory and recognition of a stimulus that has been previously seen.*

One more approaches used to detect differences in intelligence during infancy:

- **CROSS-MODAL TRANSFERENCE** *is the ability to identify a stimulus that has previously only been experienced through one sense using another sense.*
- Information processing measures correlate moderately well with later measures of intelligence.

Cognitive Development in Infancy:
Language...from sounds to symbols

- LANGUAGE *is the systematic, meaningful arrangement of symbols, and provides the basis for communication.*
- Language has several formal characteristics that must be mastered as linguistic competence is developed...

Formal characteristics of language mastery...

- **Phonology** refers to the basic sounds of language, called *phonemes*, that can be combined to produce words and sentences.
- **Morphemes** are the smallest language unit that has meaning.
- **Semantics** are the rules that govern the meaning of words and sentences.

→ Language is closely tied to the way infants think and how they understand the world

- A. Linguistic *comprehension* is the understanding of speech.
- B. Linguistic *production* is the use of language to communicate.
- C. Comprehension of language precedes production of language

Infants show **PRELINGUISTIC COMMUNICATION** through sounds, facial expressions, gestures, imitations, and other non-linguistic means.

- **BABBLING** is when infants make speech-like but meaningless sounds at about 2-3 months continuing to about 1 year.
 - Babbling is a *universal* phenomenon.
 - Babbling begins with easy sounds (b - p) and proceeds to more complex sounds (d - t).
 - By age 6 months, babbling differs according to the language to which the infant is exposed.

First words are generally spoken between **10-14 months**.

- First words are typically **HOLOPHRASES**, *one-word utterances that depend on the particular context in which they are used to determine meaning.*

Some more things to know about language development in infants...

- By 15 months the average child has a vocabulary of 15 words.
- Between 16 and 24 months a child's vocabulary increases to 100 words.
- by 18 months, infants are linking words in sentences using **TELEGRAPHIC SPEECH** *where words not critical to the message are left out.*
 - **UNDEREXTENSION**, *using words too restrictively*, is common.
 - **OVEREXTENSION**, *using words too broadly*, is also common.

Linguists are divided on the origins of language

- **LEARNING THEORY APPROACH** posits that language acquisition follows the basic laws of reinforcement and conditioning.
 - Through the process of *shaping*, language becomes more and more similar to adult speech.
 - This theory does not explain how children learn grammar.
 - It does not explain how children produce novel phrases, sentences, and constructions, such as nonsense words using correct grammar.

An alternative theory of the origins of language has been proposed by Noam Chomsky

- Chomsky argues that there is a genetically determined, *innate mechanism* that directs the development of language.
- Chomsky argues that all the world's languages share a similar underlying structure called UNIVERSAL GRAMMAR.
- The brain is wired with a LANGUAGE-ACQUISITION DEVICE (LAD), a neural system of the brain hypothesized to permit the understanding of language.

Speaking to children: The language of infant-directed speech

- INFANT-DIRECTED SPEECH, a type of speech directed towards infants, characterized by short, simple sentences.
 - This type was previously called *motherese*.
 - Pitch of voice becomes higher.
 - Intonation may be singsong.
 - Typically only used during first year.
 - Infants seem more receptive to this type of speech.
 - Use of this type of speech is related to the early appearance of words

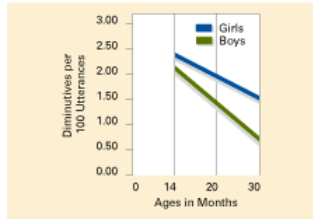
Gender differences...

Research shows that parents use different language for boys than for girls!

- They use diminutives more with girls (kitty/dolly vs. cat/doll), warmer phrases and more emotional referents and tend to hear firmer, clearer language.

Diminishing Diminutives

The use of diminutives declines with age, but women still hear them more consistently. What is the cultural significance of this?



(“kitty, dolly, birdie, dolly”)

Do the differences in language directed at boys and girls during infancy affect their behavior as adults???

- No direct research evidence, but it is CLEAR that men and women use different language as adults
 - Women tend to be more tentative and use less assertive language as adults

Intriguing possibility that altering the language we direct at young women could change this!

Is Infant-Directed Speech Similar Across Cultures?

- Although the words differ across languages, the way the words are spoken are similar!
 - Cross-cultural similarities are so great, patterns can be realized.
 - Pitch rises when a mother is attempting to gain an infant’s attention
 - Vowel sounds exaggerated
- ~ Deaf mothers use a form of infant-directed speech too! Use slower tempo and repeat signs more often.
