

COGNITIVE DEVELOPMENT CHAPTER 13

Thoughts About Infancy & Childhood

- A child is a curly, dimpled lunatic.
 - Ralph Waldo Emerson
- If only we could know what was going in a baby's mind while observing him in action, we could certainly understand everything there is to psychology.
 - Jean Piaget
- I would prefer to turn child-raising over to a specialist. I just can't believe that an ordinary parent can do a good job.
 - B. F. Skinner

METHODS OF STUDYING INFANT COGNITION

- For a long time, thought cognitive abilities at birth & infancy were minimal:
 - partly due to lack of _____
 - can't ask about perceptual experiences must be _____
- How can we possibly know what a baby sees, hears, smells, and perceives when she can't tell us about it?

Measures of Attention: Preferential Looking

- **Measures of attention**: state of alertness or arousal focused on a specific aspect of environment.
- **Preferential Looking**
- 2 stimuli are presented to the infant and if she stares at one longer than the other, the experimenter concludes she can _____.
- **Special photographic techniques** involving **infrared lights** and appropriate film.

Visual Preferences in Newborns

- Infants spend more time looking at _____.
- Infants spend the most time looking at a drawing of a _____.
- Is this just preference for complexity?

Newborns and Human Faces

- Infants were shown blank shape, a proper face, or scrambled facial features.
 - proper face and scrambled face have same _____.
- Infants looked more intensely at the _____.

Use of Learning Principles to Study Infant Perception Habituation-Dishabituation Paradigm

- **Habituation** refers to a _____ in the strength of a response due to repetitive stimulation.
- **Dishabituation** is a _____ after a new stimulus appears.
- The habituation-dishabituation sequence is used to explore whether infants can perceive differences between stimuli.

Operant Conditioning

- **Operant conditioning** is a form of learning in which a behavior is followed by a stimulus that changes the probability that the behavior will occur again.
- A **reinforcer** is a stimulus that _____ the occurrence of a response.
- Operant conditioning allows researchers to determine what stimuli babies perceive and which ones they _____.
- Used a lot for exploring infant hearing: _____.

DEVELOPMENT OF MEMORY: Ability to Store Information for Later Use

- When you are asking the question what is the difference between adults and infants or young child's memory the best answer would be?
- “_____ . . . “. That is, _____ on a whole host of factors such as the memory task, the memory store involved, the type of memory involved . . .

DEVELOPMENT OF MEMORY

- **Memory Stores:**
 - Sensory Memory
 - Short-term or Working memory
 - Long-term Memory
- **Different Types Of Memory**
 - Procedural
 - Declarative
 - Implicit
 - Explicit
- **Methods For Testing Memory**
 - Recognition
 - Cued Recall
 - Recall

MEMORY DEVELOPMENT IN INFANCY

- During infancy there are changes in both _____ information and _____.

MEMORY IN THE FIRST HALF-YEAR

- **Recognition Memory:** _____, enduring large capacity, biological basis likely.

Recognition Memory

- Joseph Fagen (1974): habituation with paired comparison procedure.
 - 5-6 mos olds were shown black and white photos of human faces for a few minutes until habituation was reached.
 - they were given a recognition memory test via paired comparison procedure after delays of 3 hours to 14 days.
 - results =

INFANCY: RECOGNITION MEMORY
Decasper & Spence (1986): “The Cat in the Hat Study”

- Women read aloud a passage from the “The Cat In The Hat” twice a day during the last six weeks of pregnancy.
- 2-3 days after birth the infants listened to either the same passage or a new story while outfitted with a special pacifier that recorded the rate of sucking.
- Infants modified their rate of sucking to listen to “The Cat In The Hat,” but not the new story.
- Suggesting that _____.

Rovee-Collier (1985, 1989, 1993): Conjugate Reinforcement Procedure

Cued Recall

- Baseline measure: ribbon connected to infant’s ankle to an empty mobile stand – spontaneous kicking.
- 2 training sessions with ribbon connected to ankle and mobile.
- Immediate retention test: 3 minutes after training session.
- Long-term memory: 1 to 42 day delay
 - Compare number of kicks after immediate retention test and the long-term delay.
- 2-4 month old infants have demonstrated memory for this task after delays _____.
- Rovee-Collier and associates have demonstrated that the _____ of LTM increases dramatically in the first year of life.
- 6-12 month olds learn to press a lever to move a train around a circular track.

Early Memories Are Highly Context Dependent: Rovee-Collier (1985)

- 3 month old infants
- Cribs were lined w/ a _____
- After 7-day delay
 - infants who had same crib liners demonstrated _____.
 - those infants whose crib liners were change demonstrated _____
- Why is young infant memory so context dependent?

Newborn Imitation

- Babies sometimes mimic gestures made by others who are within sight.
 - Sticking tongue out of mouth
 - Moving head side to side

MEMORY IN THE SECOND HALF-YEAR

- **Deferred imitation** has been used to study LTM
- Both the complexity of actions baby can remember and the length of time they can remember increases with age.
 - 11 mos olds for up to _____
 - 16 mos olds up to _____

Can infants add and subtract?

- Show the baby the same array many times.
- Show the array with an element missing (shown).
 - or one added
- _____ indicates that her expectations were violated.

INFORMATION PROCESSING APPROACH TO COGNITIVE DEVELOPMENT

- What is responsible for cognitive development?
- Increase in processing efficiency.
- Acquisition of cognitive skills.

Types of skills/processes that develop/improve:

- ↑ use of strategies with age because:
 - direct teaching in school
 - indirect learning
 - Metamemory
 - general knowledge of the world
- ↑ in memory span or working memory:

DEVELOPMENTAL CHANGES IN RECALL

- **Memory span**: we see an increase in memory span with age -- Why?
 - The hardware (physical capacity of working memory) does not ↑, but instead ability to employ _____
 - children < 7 yrs are _____ information to make it more meaningful.
 - children < 7 yrs have _____ - they overestimate ability.
 - ↑ operational efficiency

Speed of Information Processing

- Response times decrease from 7 - 12 years of age.
 - Consistent across several different types of tasks.
- This may be due to the biological maturation of the brain
 - Increased _____
 - Pruning of neurons & dendrites

DEVELOPMENTAL CHANGES IN RECALL

- Delayed Recall: clear developmental trend between age and amt. of info. accurately recalled.
- Age 8 yrs and older - free recall is more accurate & greater amount.
- Younger Children's poor recall performance may not be memory based:
 - Retrieval based -
 - Egocentrism
 - Same experimenter that was present during encoding is asking the child to recall - problem?

Serial Position Effect

Ornstein, Naus, & Liberty (1975): developmental trend in the serial position effect

- Looked at serial position effect in 3rd, 6th, and 8th graders
- primacy effect - 6th or 8th graders demonstrate better memory for words at the beginning of the list than 3rd graders.
- _____ for 3rd graders – Why?
- The problem is that 3rd graders _____.
- Ornstein wanted to see if they _____ at least 3 words at a time if they could improve recall.
- They carried the _____ through the list, but no others.

Memory Strategies

- Older children are more likely to employ self-generated strategies of encoding & retrieval:
 - rehearsal
 - organization
 - elaboration – 1 of the latest strategies to appear
- Children 7 yrs and older will initiate some activity to improve recall.
- 10-11 y.o.'s do this automatically, < 7 yrs don't

METAMEMORY

- Metamemory -

Flavell, Friedrichs, and Hoyt (1970)

- 1st trial child was shown one picture.
- On each subsequent trial the # of pictures increased, to a maximum of 10.
- First phase of the experiment: metamemory
- Second phase: recall test
- Results:

INFANTILE AMNESIA

Hypotheses for why this occurs

- **Recovery Failure:**
- Early memories are **poorly encoded**
- **Language development and Sense of Self**
- **Brain Development** - immature CNS results in inability to lay down memories that will be retrievable years later.
- **Events can be stored in two different kinds of memory systems:**
 - **implicit memory system**
 - **explicit memory system**

Piaget's Theory of Mind Stages of Development

- Each stage is _____ different from others
- Ages for stage transitions are _____
- Child is _____ in his/her development.
- **Interactionist** position on cognitive development

SENSORY MOTOR STAGE (0-2yrs)

PIAGET'S VIEW OF THE DEVELOPMENT OF OBJECT PERMANENCE

- Piaget argued that **newborns have no concept of objects**, but that this concept must be actively constructed during the first two years of life.
- **Object permanence:** understanding that objects _____ even when they disappear from site.
 - Requires the internal representation of objects.
- When a child has a mature understanding of object permanence she is ready to move on to _____.

IMPOSSIBLE EVENT & OBJECT PERMANENCE

Impossible Event: The Infant as Intuitive Physicist

- Infants look longer at objects that seem to violate physical laws than those that do not.
 - Surprise indicates that their expectations were violated.
 - They must know what is physically plausible for this to occur.

PREOPERATIONAL STAGE (2-7 YRS)

- **Semiotic function**: ability to use a _____ to stand for something else.
- **Conservation**: knowing that _____ of an object or group of objects aren't change by changes in their appearance.
- **Centration**: tendency to center attention on _____ of situation and to ignore other task relevant features.

How does this change with age?

- **Decentration** - more balanced, complete attention to whole situation, attend to and account for all perceptual data
- Must not only notice characteristics but consider
 - compensation
 - reversibility
- A child's ability perform these tasks signals the beginning of _____
- Conservation of Substance
 - Two identical balls of clay
 - One is deformed
 - "Do the two pieces have the same amount of clay?"
- Conservation of Number
 - Two identical rows of pennies
 - One row is rearranged
 - "Do the two rows have the same number of pennies?"

Modification of Conservation Task Rose & Blank (1974)

- One question/judgment condition:
- Two question/judgment condition:
- Results: children age 6.3 years made fewer errors in the one-judgment condition than in the _____
- Conclusion: Reasoned that 2 judgment condition is taken as a _____ by the child that she/he should _____ .

Modification of Conservation Task

- Siegal (1988) found conservation in 4, 5, & 6 year olds using the one question task.
- Siegal: Puppet failed to conserve all children, including 4 year olds, chose _____
- Siegal: Found conservation in children as young as age _____ when in a _____ a puppet accidentally spread out the coins.
- Cardinal principle of counting:
 - 4-year olds sometimes seem to _____ so that the result of their counting is consistent with their judgment.

ADULTHOOD & OLD AGE

CONFOUNDING VARIABLES IN RESEARCH ON MEMORY & AGING

- When confounding variables are controlled for some age differences still exists.

MEMORY IN ELDERLY PEOPLE

- **How does memory change with age?**
- **It depends . . .**

Working Memory

- **It depends on the nature of the task:**
 - **Simple straight forward task** (e.g., digit span)
 - **Complex tasks** (e.g., mental arithmetic)

MEMORY IN ELDERLY PEOPLE

Long Term Memory

- **Recognition Memory**
- **Implicit Memory Tasks:**
- **Recall/Explicit Memory:**
 - For many tasks we do see a decline in recall
 - Wide variation in performance of elderly on Recall Tasks
 - Verbal Ability
 - Cultural Stereotypes of Aging

What is responsible for memory impairment associated with the Normal aging process?

- **Decrease in the ability to inhibit irrelevant meaning =**
- John went to the *bank* to withdraw \$50
- **Hasher & Zack (1988): Garden Path Stories.**
- **Use Memory Strategies and Metamemory Less Effectively:**
- Book suggests that numerous studies conclude that elderly and young adults report using same strategies, but McEvoy and others have shown differently.
- Reduced Processing Resources & Cognitive Slowing
- Less confidence in memory abilities
- Cultural Stereotypes regarding aging & memory.

How Good is Your Memory?

- Older people are consistently less confident of their memory than younger people.

Intelligence and Age

- Measures of fluid intelligence decline steadily through middle and late adulthood.
 - Inductive reasoning
 - Spatial ability
- Measures of crystallized intelligence remain stable into the 70's
 - Verbal ability
 - Numeric ability