UNIT 7: COGNITION

7A: MEMORY

KEY QUESTION: What is Memory?
CORE CONCEPT: Human memory is an information–processing system that works constructively to encode, stores, and retrieves information

Memory:

Vague Memory:

MEMORY'S THREE BASIC TASKS
AKA: Information Processing Model of Memory

1. Encoding:

Elaboration:

2. Storage:

3. Retrieval:

Eidetic Memory:

KEY QUESTION: How do we form memories?
CORE CONCEPT: Each of the three stages of memory encodes and stores memories in different ways.
But they also work together to transform sensory experience into a lasting record that has a pattern or meaning

THREE STAGES OF MEMORY
Based upon the *Atkinson and Shiffrin Model*

STAGE ONE: Sensory Memory

Capacity:

Duration:

Visual Stimulation = Iconic Memory
Auditory Stimulation = Echoic Memory
Tactile (touch) Stimulation = Tactile Sensory Memory
Olfactory Stimulation = Olfactory Sensory Memory
Gustatory Stimuli = Gustatory Sensory Memory

STAGE TWO: Working Memory

AKA: **Short term memory**

Capacity:

Duration:

Magic Number Seven

Three Parts of Working Memory

Central Executive: directs attention to material retrieved from LTM or to important input from the sensory memory

Phonological Loop: Temporarily stores sounds….like someone's name

Sketchpad: Stores and manipulates mental images…like when you can imagine driving a car to school from home

Working Memory Aides to Overcome Limited Capacity and Short Duration

Chunking:

Rehearsal

a. **Maintenance Rehearsal:**

b. **Elaborate Rehearsal:**

Acoustic Encoding: The Phonological Loop

Visual and Spatial Encoding…the sketchpad

Levels of Processing Theory:

STAGE THREE: Long-Term Memory

Capacity:

Duration:

Procedural Memory:

Declarative Memory:

Episodic Memory:

Semantic Memory:

(SEE CHART p.272)

Engram or Memory Trace:

Consolidation:

Antergrade Amnesia:

Retrograde Amnesia:

Flashbulb Memories:

PARTS OF THE BRAIN ASSOCIATED WITH LONG TERM MEMORY

Amygdala: *strengthens memories that have strong emotional associations….*
Posttraumatic Stress Disorder
Cerebellum: *key role in forming and storing implicit memories created by classical conditioning*
- *Damaged cerebellum: cannot develop certain conditioned reflexes*

Hippocampus*: deterioration of the hippocampus the cause of Alzheimer's Disease*
--Long term memories make a stop here before going into long term storage

KEY QUESTION: How do we retrieve memories?
CORE CONCEPT: Whether memories are implicit or explicit, successful retrieval depends on how they were encoded and how they are cued

Implicit Memory:

Explicit Memory:

RETRIEVAL CUES

Retrieval cues:

Priming:

Recall:

Recognition:

Encoding Specificity Principle:

Mood Congruent Memory:

TOT Phenomenon: "On the Tip of Your Tongue"

KEY QUESTION: Why Does Memory Sometimes Fail Us?
CORE CONCEPT: Most of our memory problems arise from memory's **Seven Sins**...
Which are really byproducts of otherwise adaptive features of human memory

MEMORY'S SEVEN SINS

1. Absent-mindedness
2. Transience
3. Blocking

} forgetting

4. Misattribution
5. Suggestibility

} distortion

6. Bias
7. Unwanted Persistence — intrusion

1. Transience :

2. Absent-mindedness:

3. Blocking:

Proactive Interference:

Retroactive Interference:

Serial Position Effect:

4. Misattribution:

5. Suggestibility:

Misinformation Effect:

Fabricated Memories:

Eyewitness Accounts
Recovered Memory Controversy

6. Bias:

Expectancy Bias:

Self-Consistency Bias:

7. Unwanted Persistence:

Advantages of the Seven Sins

Mnemonics

Method of Loci:

Natural language Mediators:

7B: THINKING, PROBLEM SOLVING, CREATIVITY AND LANGUAGE

KEY QUESTION: How do children acquire language?
CORE CONCEPT: Infants and children face an especially important developmental task with the acquisition of language

LANGUAGE STRUCTURES IN THE BRAIN

Language:

Innateness Theory of Language:

LAD Language Acquisition Device:

Babbling Stage:

Acquiring Vocabulary and Grammar

One Word
Two Word
Telegraphic Speech
Morphemes:

Overgeneralization/Overregularization:

Computer Metaphor:

KEY QUESTION: What are the Components of Thought?
CORE CONCEPT: Thinking is a cognitive process in which the brain uses information from the senses, emotions, and memory to create and manipulate mental representations, such as concepts, images, schemas, and scripts.

CONCEPTS

1. Natural Concepts:

Prototype:

2. Artificial Concepts:

Concept Hierarchies:

Culture, Concepts, and Thought

–Recent work by cross-cultural psychologists cautions us not to assume that thinking works exactly the same in all cultures.
–One Major Cultural Difference: The use of logic….many cultures do not value the use of logical reasoning as Europeans/North Americans
–Another Difference: Concept Formation…Asians' conceptual boundaries tend to be more fluid, place less importance upon precise definitions

SCHEMAS AND SCRIPTS

Schema:

Script:

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KEY QUESTION: What abilities do good thinkers possess?
CORE CONCEPT: good thinkers not only have a repertoire of effective strategies (called **algorithms** and **heuristics**), they also know how to avoid common impediments to problem solving/decision making.

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Problem Solving
a. Identifying the Problem
b. Selecting a strategy

Algorithms:

Heuristics:

Heuristics Strategies
Working Backward
Searching for Analogies
Breaking a big problem into smaller problems

OBSTACLES TO PROBLEM SOLVING

1. Mental Set:

2. Functional Fixedness:

3. Self Imposed Limitations:

JUDGING AND MAKING DECISIONS

Confirmation Bias:

Hindsight Bias:

Anchoring Bias:

Representativeness Bias:

Availability Bias:

Creativity:

Aptitudes: