

**MEMORY** = Active system that receives, encodes, stores, organizes, alters, and retrieves info

**Encoding** = Physical input to representation

**Storing** = Holding/maintaining

**Retrieving** = Back into consciousness

Parallel processing - more than one thing at once

Serial processing search for one thing at a time (exhaustive/self-terminating)

### **Three Stores View (Atkinson/Shiffrin)**

**Sensory Memory** = All of the sensory information you are perceiving at a given moment

Iconic (1/2 - 1 second) - visual images

Echoic (3-4 secs) - auditory continuation (echo)

**Short Term Memory** = 7 items +/- 2 (George Miller) Up to 30 sec (1 min tops)

Stored phonetically (sound)

**Working Memory Area**

Rehearsal

Maintenance - silently repeating

Elaborative - tie info to existing memory

Chunking = Grouping items to recode (reorganize) them

**Long Term Memory** = Limitless capacity and duration ; Relatively permanent

Stored semantically (meaning)

Redintegrative memories

**Procedural memories:** Memories for performance of actions or skills. "Knowing how"

**Declarative memories:** Memories of facts, rules, concepts, and events; includes semantic and episodic memory. "Knowing that"

**Semantic memories:** General knowledge, including facts, rules, concepts, and propositions.

**Episodic memories:** Personally experienced events and the contexts in which they occurred.

**Recall** (from your mind alone)

Serial Recall - in order

Free Recall - in any order

Paired-associate Recall - recall one word when pair is given

Cued Recall - prompt/hint given

**Recognition** (pick from choices)

**Explicit Memory** = Consciously act to remember

**Implicit Memory** = Recall info without trying, occurs on its own (**most** procedural info)

### **Forgetting**

**Forgetting Curve** = Herman Ebbinghaus/Forgetting was rapid at first and then tapered off.

**Decay** (forgotten due to time)

**Serial position curve**

Recency effect - you'll remember more from the end of the list

Primacy effect - you'll remember more from the beginning of the list

**Interference** (info that competes)

Proactive - interfering info is presented before

Retroactive - interfering info is presented after

**Cue-Dependent Forgetting:** The inability to retrieve information stored in memory because of insufficient cues for recall.

**State-Dependent Memory:** The tendency to remember something when the rememberer is in the same physical or mental state as during the original learning or experience.

**Psychogenic Amnesia:** The partial or complete loss of memory (due to nonorganic causes) for threatening information or traumatic experiences.

**Childhood Amnesia (aka Infantile Amnesia):** The inability to remember events and experiences that occurred during the first two or three years of life.

**Retrograde Amnesia:** inability to remember events prior to a trauma

**Anterograde Amnesia:** inability to remember events after a trauma

**Source Amnesia**

**Constructive memory**

Loftus and Palmer Study (1974)

**Priming:** facilitating the remembering of an implicit memory by using cues to activate hidden memories.

**Flashbulb Memories**

**Eidetic Memory (photographic)**

**Mnemonists**

Aleksandr Luria studied "Mr. S" (1968)

Ericsson, Chase, Faloon "S.F." (1982)

Rajan Mahadevan - 31,811 digits of pi

**Memory and the Brain**

**Basal Ganglia:** procedural memory

**Hippocampus:** complex learning, consolidation of encoded memories (cross-referencing)

**Amygdala:** emotional memories

**Cerebral cortex:** long term declarative memories

**Cerebellum:** classically conditioned memories

**Acetylcholine:** NT imp in memory formation, esp hippocampus

**LANGUAGE =** Words or symbols, and rules for combining them, which are used for thinking and communication

**Phone:** Basic speech sounds for all humans

**Phonemes:** Basic speech sounds of a language

**Morpheme:** Speech sounds collected into meaningful units, like syllables or words

**Syntax:** Rules for word order in sentences

**Transformation Rules:** Rules that allow us to change a declarative sentence into other voices (passive, active) or forms

**Productivity:** Ability of language to generate new thoughts or ideas

**American Sign Language (ASL):** Language used by deaf and hearing-impaired people

**Stages for Language**

In Utero

Cooing

Babbling

Holophrases

Telegraphic Speech

Basic Adult-Like Syntax

**Biological Predisposition/Critical Period – Chomsky**

Signals = vocal intonations that signal it's your turn to talk

Turn-taking = repeating phrases to allow for proper speech modeling

Overregularization, Overextension

**Linguistic Determinism**

## THINKING

**Metacognition** – thinking/discussions about thinking

**Cognition:** Mentally processing information (images, concepts, etc.); thinking

**Cognitive Psychology:** Study of human information processing

**Conceptual Rule:** Guideline for deciding if objects or events belong to concept class

**Positive Instance:** Object or event that belongs to the concept class

**Negative Instance:** Object or event that does not belong to the concept class

**Synesthesia:** When images cross normal sensory barriers, e.g., listening to music leads to experiencing tastes

## CREATIVE THINKING

**Divergent thinking:** generating diverse assortment of solutions (\*Creative ppl do this more than others)

**Convergent thinking:** proceeding from various alternatives to converge on one answer

**Fluency:** Total number of suggestions you can make

**Flexibility:** Number of times you shift from one class of possible uses to another

**Originality:** How novel or unusual your suggestions are

### Stages of Creative Thought

**Orientation:** Defining the problem

**Preparation:** Gaining as much information as possible

**Incubation:** The problem, while not appearing to be actively worked on, is still “cooking” in the background

**Illumination:** The “a-ha” experience; rapid insight into the solution

**Verification:** Testing and critically evaluating the solution

### Critical Thinking

**Analysis:** breaking down large

**Synthesis:** combining concepts

**Divergent thinking:** generating diverse assortment of solutions

**Convergent thinking:** proceeding from various alternatives to converge on one answer

**Inductive Thought:** Going from specific facts or observations to general principles

**Deductive Thought:** Going from general principles to specific situations

### Problem Solving

**Well-structured Problems** = clear cut path to solution

Heuristics = intuitive/speculative strategies to solve problems

Algorithms = formula to solve prob that guarantees the correct solution if done right

**Ill-Structured Problems** = do not have a clear cut path to solution

Insight problems = involve insight, or the sudden understanding

Productive thinking = using new thoughts/ideas

Reproductive thinking = using existing ideas/thoughts

### Hindrances Problem Solving

**Mental set** – your preset way of things that hinders

**Negative transfer** – past experience blocks new solution

**Emotional barriers** – fears, self-doubt...

**Cultural barriers**

**Learned barriers** (Functional Fixedness) – you have learned to use an object for a specific purpose and cannot see it for having any other value/purpose

**Confirmation Bias**

**Representativeness Heuristic**

**Overconfidence**

**Availability Heuristic**

**Belief Perseverance**

**Framing**

**Hindsight Bias**

**Incubation** – low cortical arousal lets mind think of new solutions