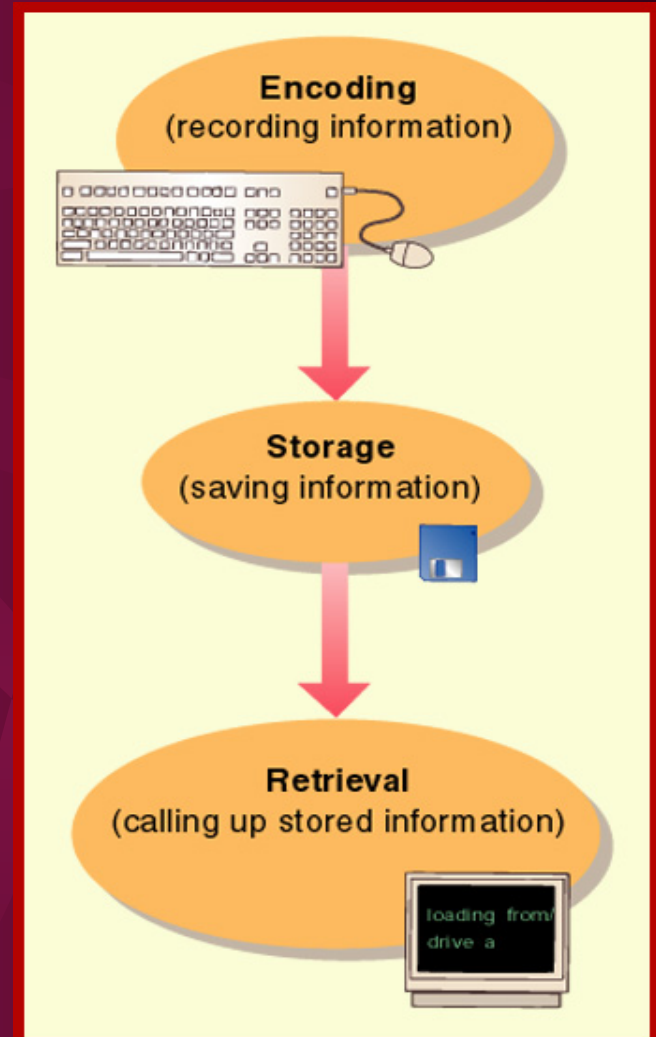
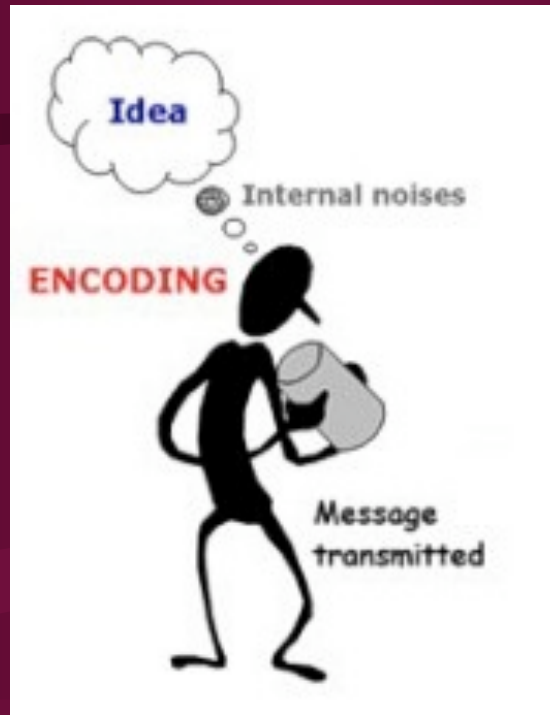


Memory

Chapter 9





Section 1

ENCODING

How do we Encode?

- Memory – Persistence of learning over time
- Three-Stage processing Model - Atkinson & Shiffrin (1968)
 - 1) Sensory Memory – Records information
 - 2) Short Term Memory – Process & encode information
 - 3) Long Term Memory – Retrieved at a later time for use
- Encoding occurs in two forms
 - 1) Automatic Processing – Unconscious encoding of information
 - 2) Effortful Processing – Requires attention & conscious effort

Automatic Processing

- Encode information about space, time and frequency
- Occurs effortlessly and hard to shut down
- With practice, effortful processing becomes automatic
- -> Learning your multiplication tables
- Does not interfere with our thinking

Effortful Processing

- Information that we work on encoding
- Rehearsal – Conscious repetition of information
- -> Used to maintain information or encode it for storage
- Herman Ebbinghaus - (Pavlov of memory)
- -> The amount remembered depends on the time spent learning
- Spacing Effect – Distribute rehearsal over time
- -> Spaced study beats cramming (rehearse wait, rehearse wait)
- Serial Position Effect – Recall the last & first items in a list
- -> We often do not remember the items in the middle

Encoding Meaning

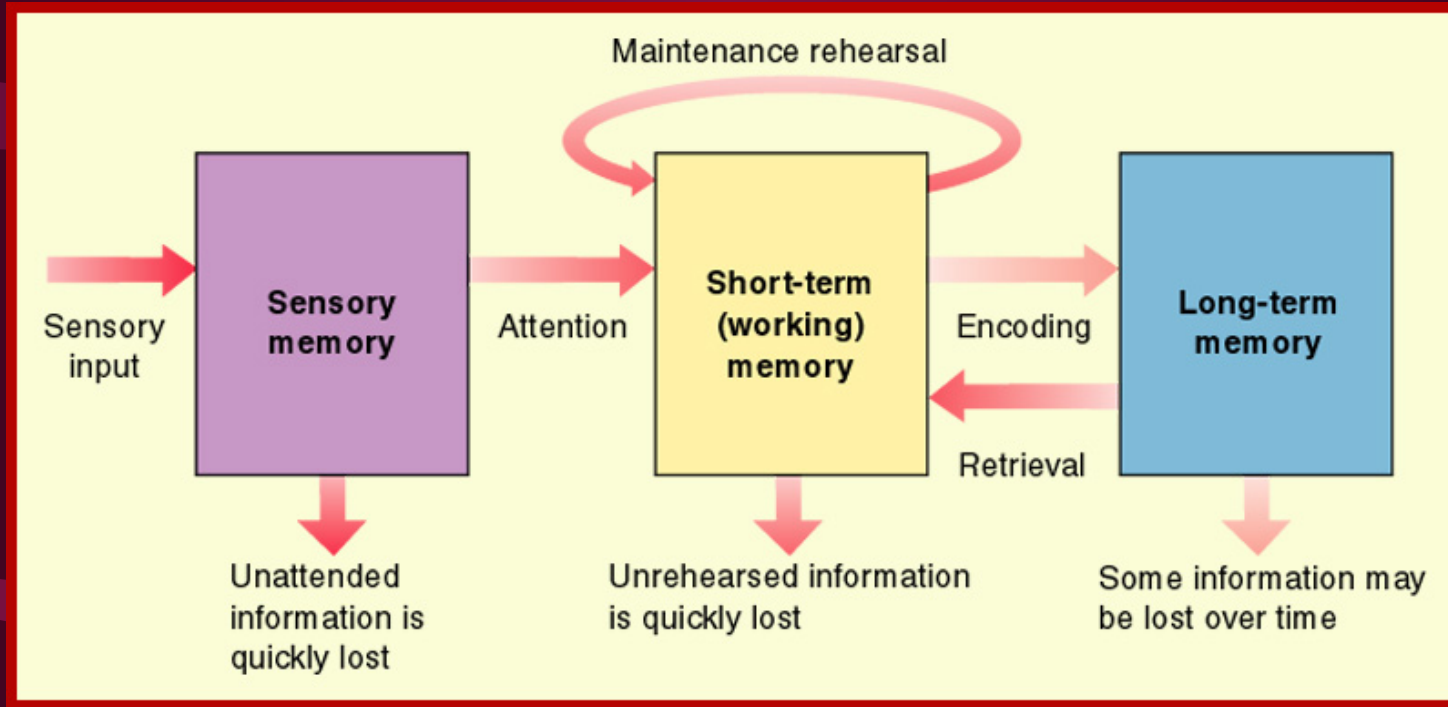
- William Brewer (1977) – We remember what we encode
- -> How we encode depends on our experience & context
- Gordon Bower & Daniel Morrow (1990) – Mental model
- -> We do not recall literal text but a mental model we construct
- Visual Encoding – Encoding of pictures & images
- Acoustic Encoding – Encoding of sounds & sounds of words
- Semantic Encoding – Encoding of the meaning of words
- John Bransford & Marcia Johnson (1972) – Rephrase what we hear into meaningful terms.
- Self- Reference Effect – We remember things that describe us
- -> Take time to find personal meaning in what you are studying.

Encoding Imagery

- Imagery – Mental picture
- -> We tend to remember words that we can attach an image to
- -> Memory is aided when we encode both semantically and visually
- -> Mental snapshots are easily recalled
- Mnemonics – Vivid imagery & organizational memory aides
- -> HOMES (Great Lakes) & ROY G. BIV (Rainbow)
- -> You can also use images as the Greeks did
- -> Associate material with a series of locations/places

Organizing Information

- Chunking – Organize info into familiar & manageable units
- -> Tend to chunk in series of 3 and 4
- -> Phone number & SS#
- George Miller (1956) – Did extensive studies on chunking
- -> We remember 7 + or - 2
- Hierarchies – Broad concepts that are divided & subdivided into narrower concepts & facts
- -> When we group it aides in recall
- -> Note taking in outline format is an example



Section 3

STORAGE

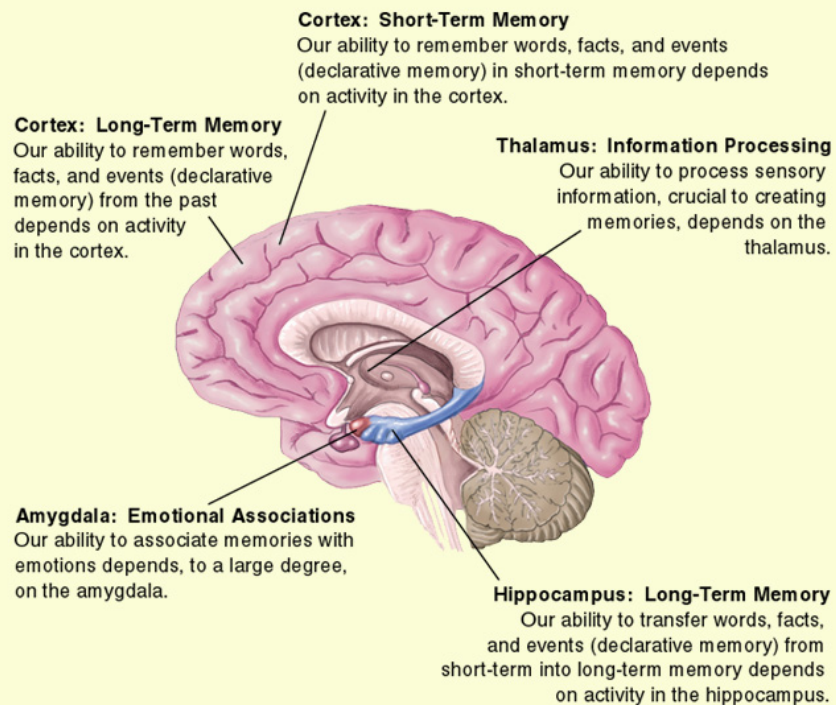
Sensory Memory

- Sensory Memory - Brief memory storage that lasts a fraction of a sec
- George Sperling (1960) – Two types of memory
 - 1) Iconic Memory – Momentary visual memory (Less than a second)
 - 2) Echoic Memory – Momentary auditory memory (3-4 seconds)
- Found that we can quickly recall visual images and auditory stimuli
- 3 Functions of sensory memory
 - 1) Prevents from being overwhelmed
 - 2) Gives time to make decisions
 - 3) Allows for continuity & stability

Short –Term & Long – Term Memory

- STM - Things being held in your conscious mind
- -> Working Memory – Process and use current information
- -> Use rehearsal and chunking to improve STM
- LTM - Info is stored by categories & features
- Semantic Memory - Language & its rules
- Episodic Memory - Of our life & its events
- Declarative Memory - Used to recall info
- - Combines Semantic & Episodic memory
- Procedural Memory - Learned skills
- - Does not require conscious effort (Riding a bike)

Storing Memories



Source: Adapted from *Introduction to Psychology*, Rod Plotnick, 1996.

- Synaptic Changes – Increase in serotonin
- -> Long-Term Potential – Strengthen of potential neuron firing after rapid stimulation
- -> Drugs to possibly strengthen memory
- Rise in hormone levels boost memory
- -> Brain has more glucose available to use
- Implicit/Procedural Memories – Stored in the Cerebellum
- Explicit/Declarative Memories – Stored in the hippocampus and amygdala

Section 4

RETRIEVAL

Getting Information Out of Our Memory

- Recall – Retrieve information not in conscious awareness
- Recognition – Identify items previously learned
 - -> Simple multiple choice test.
- Relearning – Time saved when learning information a second time
- Retrieval Cue
 - -> Priming – Identify a piece of a memory to recall it
 - -> William James – “Wakening of Awareness”
 - -> Memoryless memory – Invisible memory
 - -> Mnemonic devices

Getting Information Out of Our Memory

- Retrieval cues get us ready for memories to be used
- Context Effects
 - -> We remember more in the setting where the memory occurred
 - -> Visit an old surrounding and memories start coming back
 - déjà vu – I've seen or experienced this before
 - -> Being in a context similar to one we have been in before
- Mood & Memories
 - -> State-Dependent Memory – What we learn in one state is more easily recalled in the state (Happy=Happy or Sad=Sad)
 - -> Mood-Congruent – Recall experiences consistent with our current mood



Section 5

ISSUES WITH MEMORY

Forgetting

- Daniel Schacter (1999) – Seven sins of memory
- -> Three sins of forgetting
 - 1) Absent-mindedness – Inattention to detail
 - 2) Transience – Unused information fades after time
 - 3) Blocking – Tip of our tongue, but can't get it out
- -> Three sins of distortion
 - 1) Misattribution – Confusing sources of information
 - 2) Suggestibility – lingering effects of misinformation (Leading)
 - 3) Bias – Others views/feelings affect our recall
- -> One sin of intrusion
 - 1) Persistence – Unwanted memories

Forgetting

- Encoding Failure – Information does not enter long-term memory
- -> As we get older areas that encode new information work slower
- Storage Decay – We lose information over time
- -> Harry Bahrick (1984) – Peaks & then levels off
- Retrieval Failure
- -> Interference – Learning may interfere with retrieval
- -> Proactive – Prior learning disrupts recall of something you experience later (new phone #, the old one interferes)
- -> Retroactive – New information makes it harder to recall something you learned earlier (New students names, old one interfere)
- Motivated Forgetting – We revise our own history
- -> Repression – Self-censoring of painful information

Memory Construction

- Misinformation Effect – Taking in misleading info into our memory
- -> Hard to tell between real & suggested events
- -> Fill in gaps of information with guesses & assumptions
- Imagination Effect – Repeatedly imagining nonexistent actions
- -> Think we actually have done event we repeatedly imagined
- -> Events seem more familiar & then seem more real
- Source Amnesia – Retain an image but the context we acquired it in
- -> With misinformation it is a leading source of false memories
- PET scans can tell the difference between true & false memories
- -> True memories light up the left temporal lobe

Improving Memory

- Study repeatedly to boost long-term memory (Over learn)
- Spend more time rehearsing/actively thinking about material
- Make the material personally meaningful
- Use mnemonic devices for unfamiliar lists of information
- Refresh memory by activating retrieval cues
- Recall vents while they are fresh
- Minimize interference
- Test your knowledge ahead of time