MEMORY

Encoding → Storage → Retrieval

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Bri: Format and organization of outline, vocabulary.

Ryan: Key people and words (bolded and unbolded within the entire chapter).

Nick: Sections 1-3
- Studying memory: Information processing models 1: How do psychologists describe the human memory system?
- Encoding: Getting information in 2: What information do we encode automatically? What information do we encode effortfully, and how does the distribution of practice influence our retention?
- What we encode3: What effortful processing methods aid in forming memories?

Jackson: Sections 4-6
- Sensory Memory 4: What is sensory memory?
- Working/Short Term memory 5: What are the duration and short term capacity of short term and of long term memory?
- Storing memories in the brain 6: How does the brain store our memories?

Emily: Sections 7-9
- Retrieval: Getting information out 7: How do we get information out of memory?
- Context Effects 8: How do external contexts and internal emotions influence memory retrieval?
- Forgetting 9: Why do we forget?

Micah: Sections 10-12
- Memory Construction 10: How do misinformation and source amnesia influence our memory construction?
- Repressed or constructed memories of abuse 11: What is the controversy related to claims of repressed ad recovered memories?
- Improved Memory 12: How can an understanding of memory contribute to more effective study techniques?
memory: the persistence of learning over time through the storage and retrieval of information. (p. 327)

encoding: the processing of information into the memory system—for example, by extracting meaning. (p. 328)

storage: the retention of encoded information over time. (p. 328)

retrieval: the process of getting information out of memory storage. (p. 328)

sensory memory: the immediate, very brief recording of sensory information in the memory system. (p. 329)

short-term memory: activated memory that holds a few items briefly, such as the seven digits of a phone number while dialing, before the information is stored or forgotten. (p. 329)

long-term memory: the relatively permanent and limitless store-house of the memory system. Includes knowledge, skills, and experiences. (p. 329)

working memory: a newer understanding of short-term memory that focuses on conscious, active processing of incoming auditory and visual-spatial information, and of information retrieved from long-term memory. (p. 329)

automatic processing: unconscious encoding of incidental information, such as space, time, and frequency, and of well-learned information, such as word meanings. (p. 330)

effortful processing: encoding that requires attention and conscious effort. (p. 331)

rehearsal: the conscious repetition of information, either to maintain it in consciousness or to encode it for storage. (p. 331)

spacing effect: the tendency for distributed study or practice to yield better long-term retention than is achieved through massed study or practice. (p. 332)

serial position effect: our tendency to recall best the last and first items in a list. (p. 332)

visual encoding: the encoding of picture images. (p. 333)

acoustic encoding: the encoding of sound, especially the sound of words. (p. 333)

semantic encoding: the encoding of meaning, including the meaning of words. (p. 333)

imagery: mental pictures; a powerful aid to effortful processing, especially when combined with semantic encoding. (p. 335)

mnemonics: memory aids, especially those techniques that use vivid imagery and organizational devices. (p. 335)

chunking: organizing items into familiar, manageable units; often occurs automatically. (p. 336)

iconic memory: a momentary sensory memory of visual stimuli; a photographic or picture-image memory lasting no more than a few tenths of a second. (p. 337)
**echoic memory:** a momentary sensory memory of auditory stimuli; if attention is elsewhere, sounds and words can still be recalled within 3 or 4 seconds. (p. 338)

**long-term potentiation (LTP):** an increase in a synapse’s firing potential after brief, rapid stimulation. Believed to be a neural basis for learning and memory. (p. 340)

**flashbulb memory:** a clear memory of an emotionally significant moment or event. (p. 342)

**amnesia:** the loss of memory. (p. 342)

**implicit memory:** retention independent of conscious recollection. (Also called nondeclarative memory.) (p. 343)

**explicit memory:** memory of facts and experiences that one can consciously know and “declare.” (Also called declarative memory.) (p. 343)

**hippocampus:** a neural center that is located in the limbic system and helps process explicit memories for storage. (p. 344)

**recall:** a measure of memory in which the person must retrieve information learned earlier, as on a fill-in-the-blank test. (p. 345)

**recognition:** a measure of memory in which the person need only identify items previously learned, as on a multiple-choice test. (p. 345)

**relearning:** a memory measure that assesses the amount of time saved when learning material for a second time. (p. 345)

**priming:** the activation, often unconsciously, of particular associations in memory. (p. 347)

**déjà vu:** that eerie sense that “I’ve experienced this before.” Cues from the current situation may subconsciously trigger retrieval of an earlier experience. (p. 348)

**mood-congruent memory:** the tendency to recall experiences that are consistent with one’s current good or bad mood. (p. 349)

**proactive interference:** the disruptive effect of prior learning on the recall of new information. (p. 353)

**retroactive interference:** the disruptive effect of new learning on the recall of old information. (p. 353)

**repression:** in psychoanalytic theory, the basic defense mechanism that banishes anxiety-arousing thoughts, feelings, and memories from consciousness. (pp. 355, 557)

**misinformation effect:** incorporating misleading information into one’s memory of an event. (p. 357)

**source amnesia:** attributing to the wrong source an event we have experienced, heard about, read about, or imagined. (Also called source misattribution.) Source amnesia, along with the misinformation effect, is at the heart of many false memories. (p. 358)
To remember any event, we must get information into our brain (encoding), retain that information (storage), and later get it back out (retrieval).

Psychologists have proposed several information-processing models of memory. One modern model, connectionism, views memories as emerging from interconnected neural networks.

Richard Atkinson and Richard Shiffrin proposed that we form memories in three stages:
1. We first record to be remembered information as a fleeting sensory memory.
2. From there, we process information into a short-term memory bin, where we encode it through rehearsal.
3. Finally, information moves into long-term memory for later retrieval.

ENCODING

Thanks to your brain’s capacity for simultaneous activity (for parallel processing), an enormous amount of multitasking goes on without your conscious attention. For example, without conscious effort you automatically process information about space, time, frequency and well-learned information.

We encode and retain vast amounts of information automatically, but we remember other types of information, only with effort and attention, Effortful processing often produces durable and accessible memories.

We can boost our memory through conscious repetition, or rehearsal.

Hermann Ebbinghaus: The pioneering researcher of verbal memory.

Those who learn quickly also forget quickly.

We retain information better when our rehearsal is distributed over time (spacing effect).

WHAT WE ENCODE

When processing verbal information for storage, we usually encode its meaning, association it with what we already know or imagining.

Three kinds of memory encoding
1. Visual encoding: the encoding of picture images
2. Acoustic encoding: the encoding of sound, especially the sound of words.
3. Semantic encoding: the encoding of meaning, including the meaning of words.

Processing a word deeply by its meaning (semantic encoding)- produces better recognition later than does shallow processing, such as visual encoding or acoustic encoding.

Chunking: We more easily recall information when we can organize it into familiar, manageable chunks.

Hierarchical groups of Encoding

ENCODING
- MEANING (SEMANTICS)
- IMAGERY (VISUAL ENCODING)
- ORGANIZATION
  - CHUNKS
  - HIERARCHIES

SENSORY MEMORY

Researcher George Sperling revealed that we have photographic memory called iconic memory.

Any human can recall a part of an image in great detail even if we are only allowed to look at it for a few tenths of a second.

The same goes for auditory stimuli when someone is talking to you, words go into your echo chamber. The echoes tend to linger for three to four seconds. For example, if you are not paying attention in class, you should still be able to pick up the last three or four seconds and repeat it back to the teacher.

WORKING SHORT TERM MEMORY

If short term memory does not encode, the memory is lost immediately.

Short term memory is limited by duration and capacity, typically storing about 7 digits of information.
LONG TERM MEMORY
- Long term memory is limitless.

STORING MEMORIES IN THE BRAIN
- Memory is not stored in a certain place in the brain, but the hippocampus is the control center for memory.
- When learning occurs, serotonin is released at certain synapses. The synapses then become more efficient. This is called long term potential.
- The more emotion a person has the more he/she will remember. This is known as the mood congruent theory.
- People with amnesia; which means you can’t form new memories—unconsciously can learn new they just can’t recall it.
- Explicit memories are laid down by the hippocampus and are facts or known material.
- With the left hippocampus damaged, people can remember visual information. With the right hippocampus damaged, people can only remember verbal information.
- Implicit memory is stored in the cerebellum.

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Memory Construction

A. How do misinformation, imagination, and source amnesia influence our memory construction? How real seeming are false memories
   a. “Misinformation acquired after an event alters memory of the event” – Daniel Gilbert
   b. Elizabeth Loftus and John Palmer conducted an experiment that showed that word choice of questions can influence and alter memory the second time you go to retrieve that memory. Example: One question used the word smashed and the other used hit. Then when asked if there was broken glass on the scene the ones who were asked the question with the word smashed answered yes even though the answer was false
   c. Misinformation Effect: After exposure to subtle misinformation, many people misremember
   d. Source Amnesia: We retain the memory of the event, but not the context in which we required it
   e. False memories created by suggested misinformation and misattributed sources may feel as real as true memories and may be very persistent
   f. We more easily remember the gist than words themselves
   g. When authority type figures asking suggestive questions many of the eye witnesses or victims are more likely to change what they actually saw happened. When asked neutral questions and not interrupting the victim, their story was accurate

Repressed or constructed memories of abuse?

B. What is the controversy related to claims of repressed and recovered memories?
   a. Sexual abuse, injustice and forgetting happens
   b. Memories of things happening before the age of three are unreliable and so are memories “recovered” under hypnosis or the influence of drugs
   c. What is debated is whether the unconscious mind sometimes forcibly represses painful experiences, and if so, whether these memories can be retrieved
   d. Memories, whether real or false can be upsetting

Improving memory

C. How can an understanding of memory contribute to more effective study techniques
a. Study repeatedly: To master material use distributes (spaced) practice and take advantage of life’s little intervals such as car rides, walks and waiting for class to start
b. Make the material meaningful: Take text and class notes and make them into your own words and patterns, then apply the concepts to your own life
c. Activate retrieval cues: Mentally re-create the situation and the mood in which your original learning occurred
d. Use mnemonic devices: Chunk information into acronyms and rhythmic rhymes
e. Minimize interference: Study before sleeping and don’t study subjects that are close together at relatively the same time
f. Sleep more: During sleep your brain organizes and consolidates information for long-term memory
g. Test your knowledge, both to rehearse it and to help determine what you do not know yet:
   Don’t be lulled into overconfidence by your ability to recognize information

**RETRIEVAL:**
- Memory is a recall, the ability to retrieve information not in conscious awareness.
- Recognizing or relearning information also counts as a memory.
- If you once learned something then forgot, you will probably relearn it more quickly.
- Retrieval Cues are anchor points you can use to access the target information when you want to retrieve it later.
- Priming is a “wakening of association” Priming is often “memoryless memory.”

**CONTEXT EFFECTS**
- Words are best remembered in the place you first heard them.
- Deja Vu is cues from current situations may subconsciously trigger retrieval of an earlier experience. Deja Vu is french for already seen.
- Events is the past may have aroused a specific emotion that later primes us to recall its associated events.
- Our moods are mood congruent because emotions accompany good and bad events.
- Mood also effects memory retrieval.

**FORGETTING**
- Three sins of Forgetting: Absent Mindedness, Transience, and blocking.
- Three sins of Distortion: Misattribution, Suggestibility, Bias
- One sin of Intrusion: Persistence
- Age effects our ability to encode efficiency.
- Sometimes we don’t have enough information to retrieve a memory.
- Proactive Interference occurs when new information makes it harder to recall something you have learned earlier.
- Retroactive Interference occurs when new information makes it harder to recall something you have learned earlier.
- Information presented in the hour before sleep is protected from retroactive interference because the opportunity for interfering events is minimized.
- We repress painful memories to protect our self concept and to minimize anxiety.