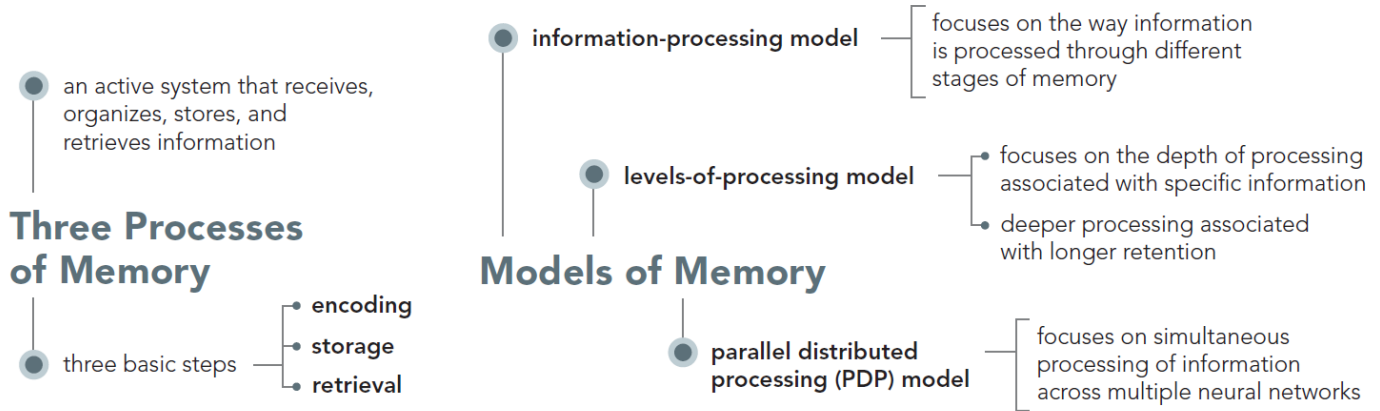
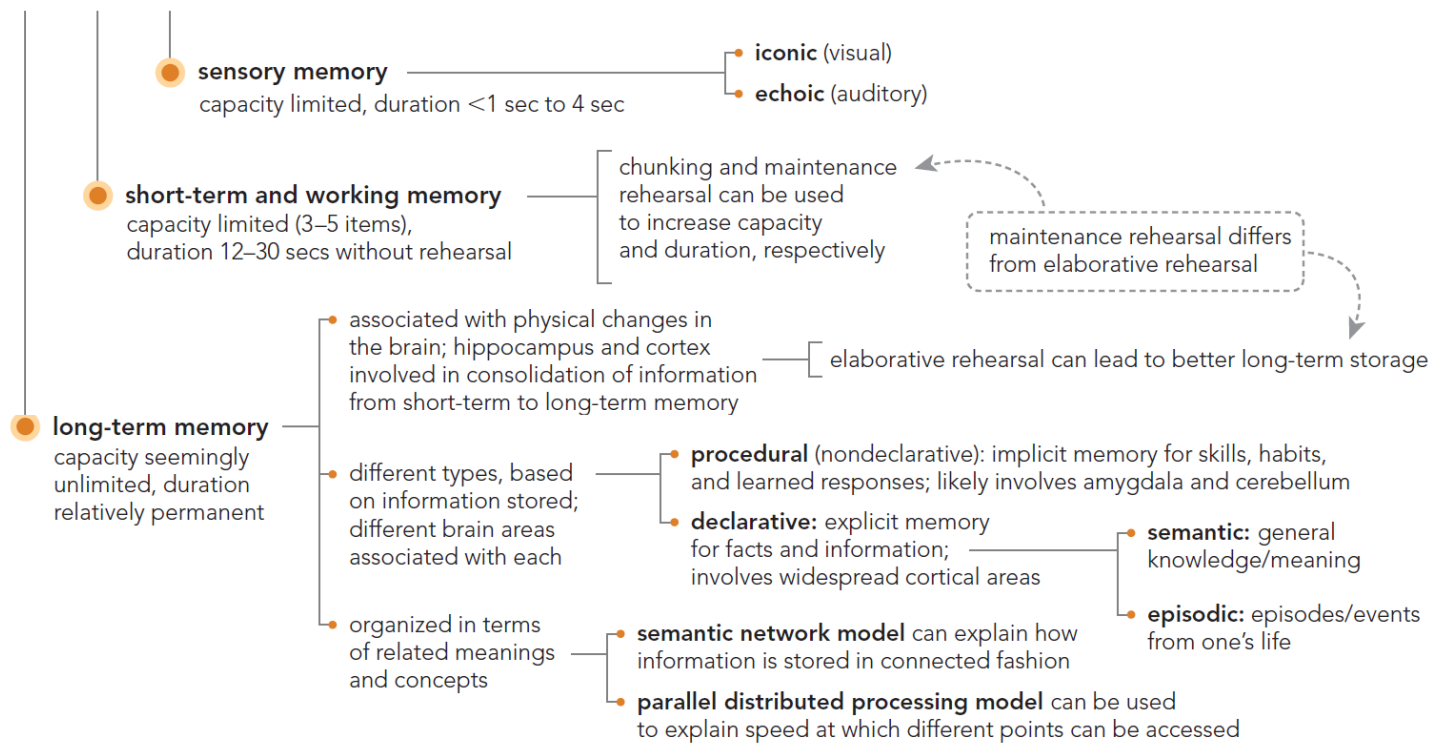


Memory

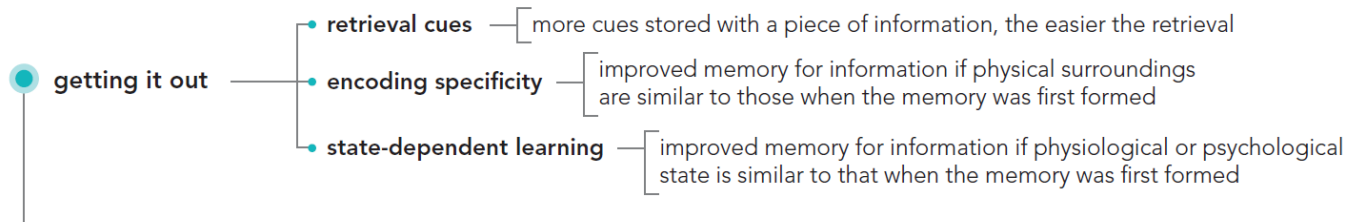


The Information-Processing Model

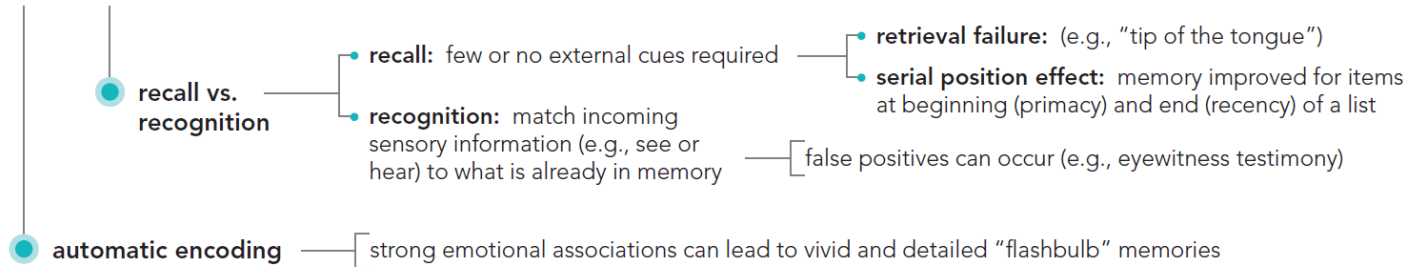
(proposes three stages that vary both in duration and capacity; information must be processed effectively at earlier stages before long-term storage occurs)



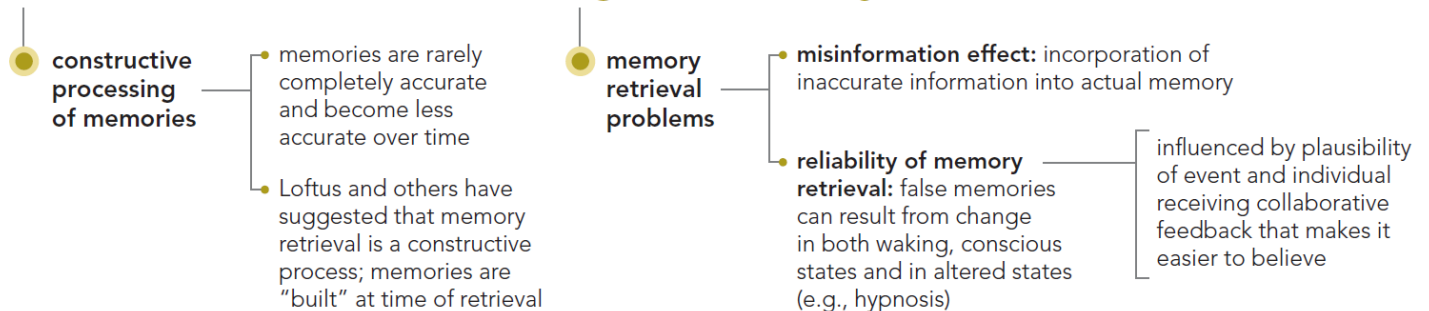
Memory



Retrieval of Long-Term Memories



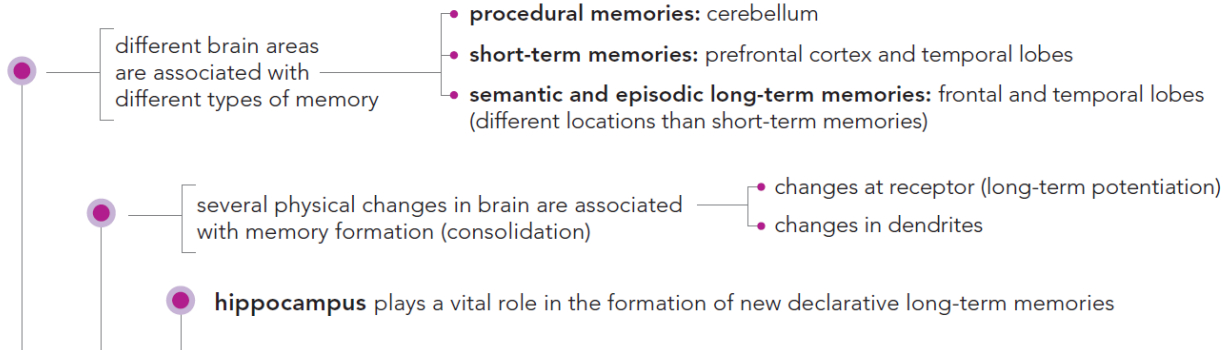
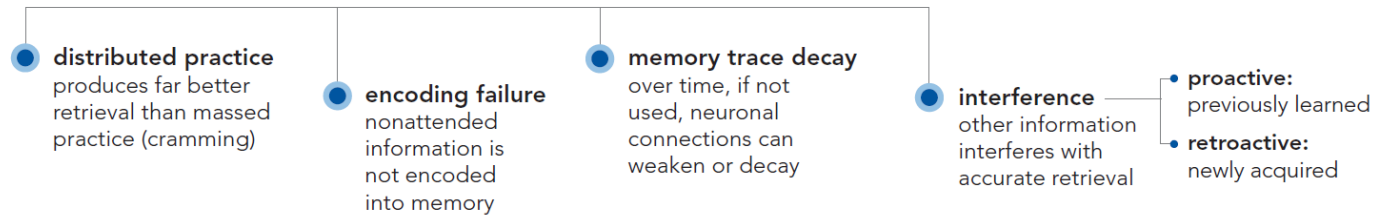
The Reconstructive Nature of Long-Term Memory



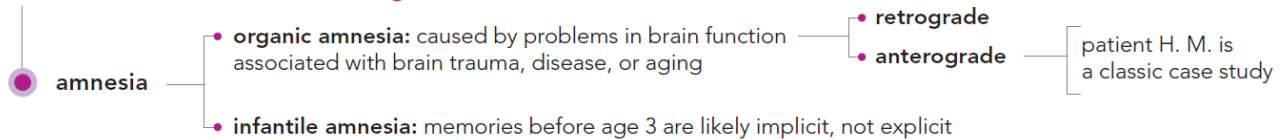
Memory

Forgetting

(originally studied by Ebbinghaus in 1913, research produced forgetting curve)



Neuroscience of Memory





6 memory

6.1

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an active system that receives, organizes, stores, and retrieves information

Three Processes of Memory

three basic steps

- encoding
- storage
- retrieval

Models of Memory

information-processing model

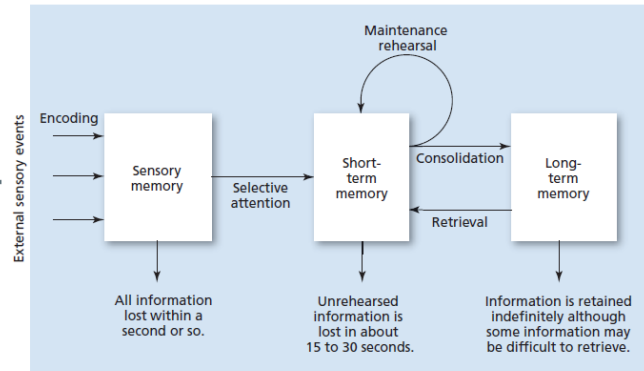
focuses on the way information is processed through different stages of memory

parallel distributed processing (PDP) model

focuses on simultaneous processing of information across multiple neural networks

levels-of-processing model

- focuses on the depth of processing associated with specific information
- deeper processing associated with longer retention



6.2

6.3

6.4

6.5

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The Information-Processing Model

(proposes three stages that vary both in duration and capacity; information must be processed effectively at earlier stages before long-term storage occurs)

short-term and working memory

capacity limited (3–5 items), duration 12–30 secs without rehearsal

chunking and maintenance rehearsal can be used to increase capacity and duration, respectively

long-term memory

capacity seemingly unlimited, duration relatively permanent

sensory memory

capacity limited, duration <1 sec to 4 sec

- iconic (visual)
- echoic (auditory)

- associated with physical changes in the brain; hippocampus and cortex involved in consolidation of information from short-term to long-term memory
- different types, based on information stored; different brain areas associated with each
- organized in terms of related meanings and concepts

- semantic network model
- parallel distributed processing model



Long-term memory

Declarative memory (Explicit memory)

Procedural memory (Implicit memory)
Motor skills, habits, classically conditioned reflexes

Episodic memory
Events experienced by a person

Semantic memory
Facts, general knowledge



6.6

6.7

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getting it out

- retrieval cues
- encoding specificity
- state-dependent learning

Retrieval of Long-Term Memories

recall vs. recognition

- recall:** few or no external cues required
- recognition:** match incoming sensory information (e.g., see or hear) to what is already in memory

automatic encoding

strong emotional associations can lead to vivid and detailed "flashbulb" memories



6.8

6.9

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constructive processing of memories

- memories are rarely completely accurate and become less accurate over time
- Loftus and others have suggested that memory retrieval is a constructive process; memories are "built" at time of retrieval

The Reconstructive Nature of Long-Term Memory

memory retrieval problems

- misinformation effect
- reliability of memory retrieval

6.10

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Forgetting

(originally studied by Ebbinghaus in 1913, research produced forgetting curve)

distributed practice produces far better retrieval than massed practice (cramming)

encoding failure nonattended information is not encoded into memory

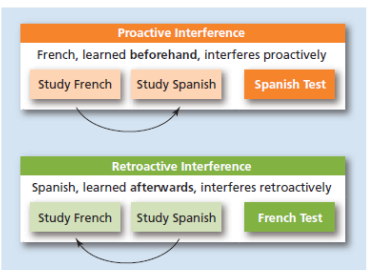
memory trace decay over time, if not used, neuronal connections can weaken or decay

interference other information interferes with accurate retrieval

Table 6.1

Reasons for Forgetting

REASONS	DESCRIPTION
Encoding Failure	The information is not attended to and fails to be encoded.
Decay or Disuse	Information that is not accessed decays from the storage system over time.
Proactive Interference	Older information already in memory interferes with the retrieval of newer information.
Retroactive Interference	Newer information interferes with the retrieval of older information.



6.11

6.12

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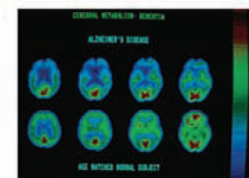
amnesia

- organic amnesia
- infantile amnesia

several physical changes in brain are associated with memory formation (consolidation)

- changes at receptor (long-term potentiation)
- changes in dendrites

- procedural memories
- short-term memories
- semantic and episodic long-term memories



Neuroscience of Memory

hippocampus plays a vital role in the formation of new declarative long-term memories