Memory

Made by

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Definition of Memory

- An internal record or representation of some prior event or experience

A set of mental processes that receives, encodes, stores, organizes, alters and retrieves information over time

Types of memory:

1- Sensory memory.

2- Short term memory.

3- Long term memory.

Sensory Memory

- refers to an **initial process** that receives and **holds environmental information** in its raw form for **a brief period of time**, from an **instant to several seconds.**

Sensory Memory

- Purpose: to **retain exact image** of sensory information **long enough** to focus on important information and **transfer it to next stage**
- All senses have a sensory memory
- Duration depends on the sense involved
- Capacity is relatively large

Short-term memory

Refers to another process that can hold only a **limited amount of information** for only **a short period of time** (Temporary storage of information)

Short-Term Memory

- Purpose - temporarily stores info until it is sent to LTM
- Duration - relatively limited
- Capacity: 5 to 9 items
- Duration and capacity can be increased with maintenance rehearsal and/or chunking
- Also known as “working memory”

Chunking

Is combining **separate items of information** into **a larger unit,** or chunk, and then remembering chunks of information rather than individual items

Chunking

For example, to remember the **11-digit phone number 16228759211**, we break it into **four or five chunks: 1-622-875- 92- 11**

Long term memory

Refers to the process of storing almost unlimited

amounts of information over long periods of time

Long Term Memory

- **Purpose is to keep information stored for long periods of time**
- **Unlimited capacity and duration**

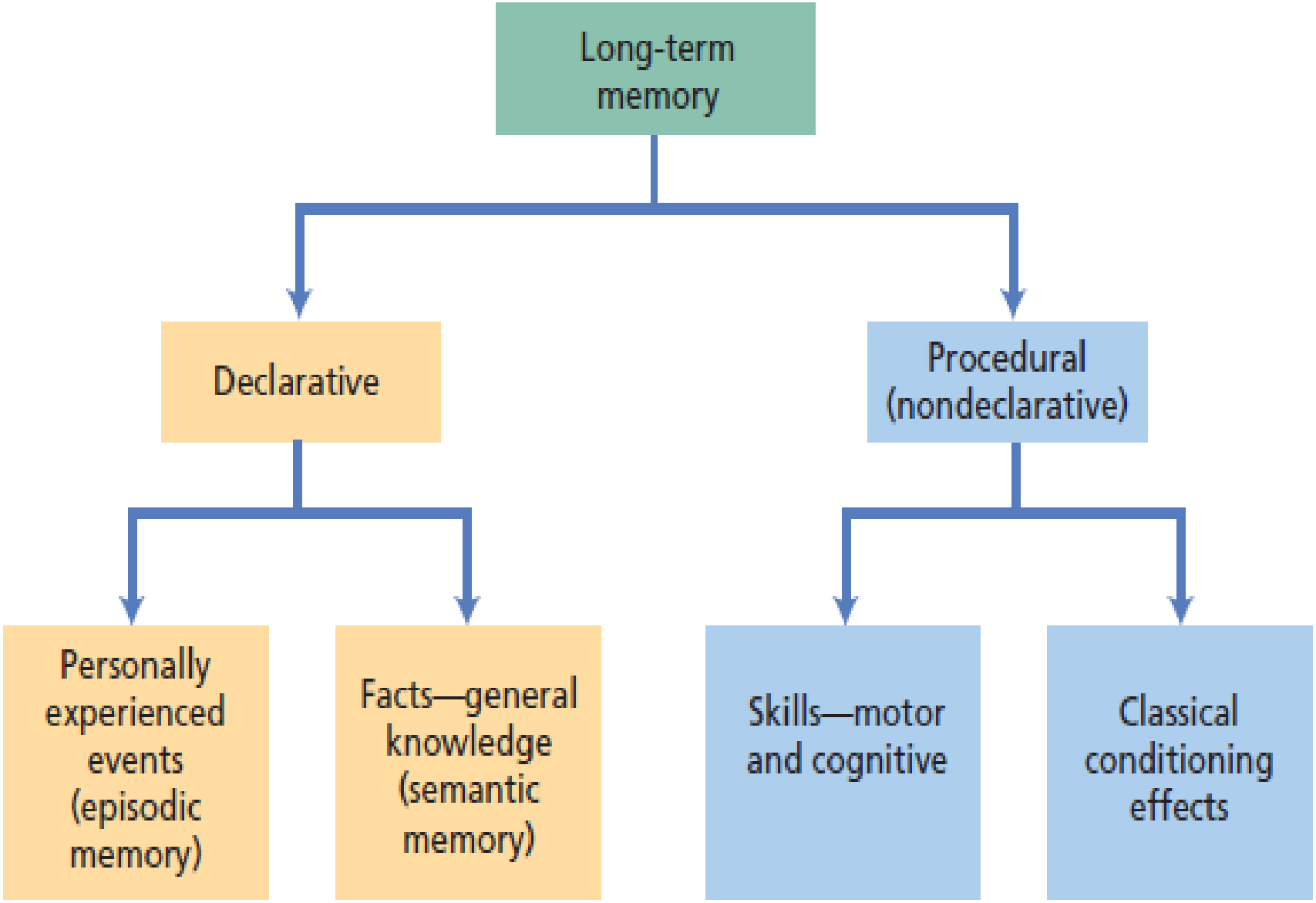

Long-term memory
Declarative
Procedural (nondeclarative)
Personally experienced events (episodic memory)
Facts—general knowledge (semantic memory)
Skills—motor and cognitive
Classical conditioning effects

FIGURE 8.12

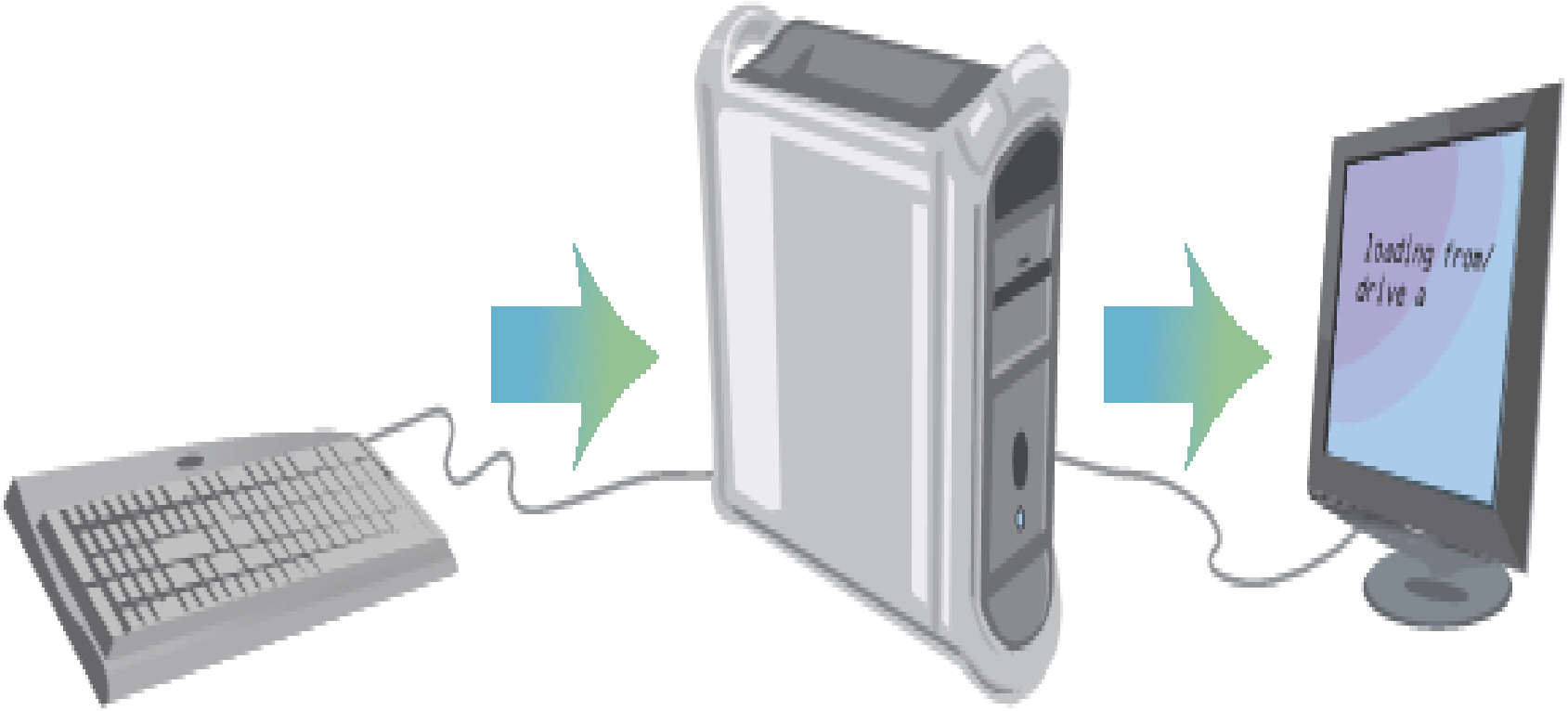
Memory Process

- Encoding, Storage, Retrieval Model
- How is info changed as it moves through these operations?
- Process can be compared to a computer

Encoding
(Initial recording of information)

Storage
(Information saved for future use)

Retrieval
(Recovery of stored information)



Encoding

- Encoding refers to getting information into the system by translating it into a neural code that your brain processes.

- refers to making mental representations of information

Storing

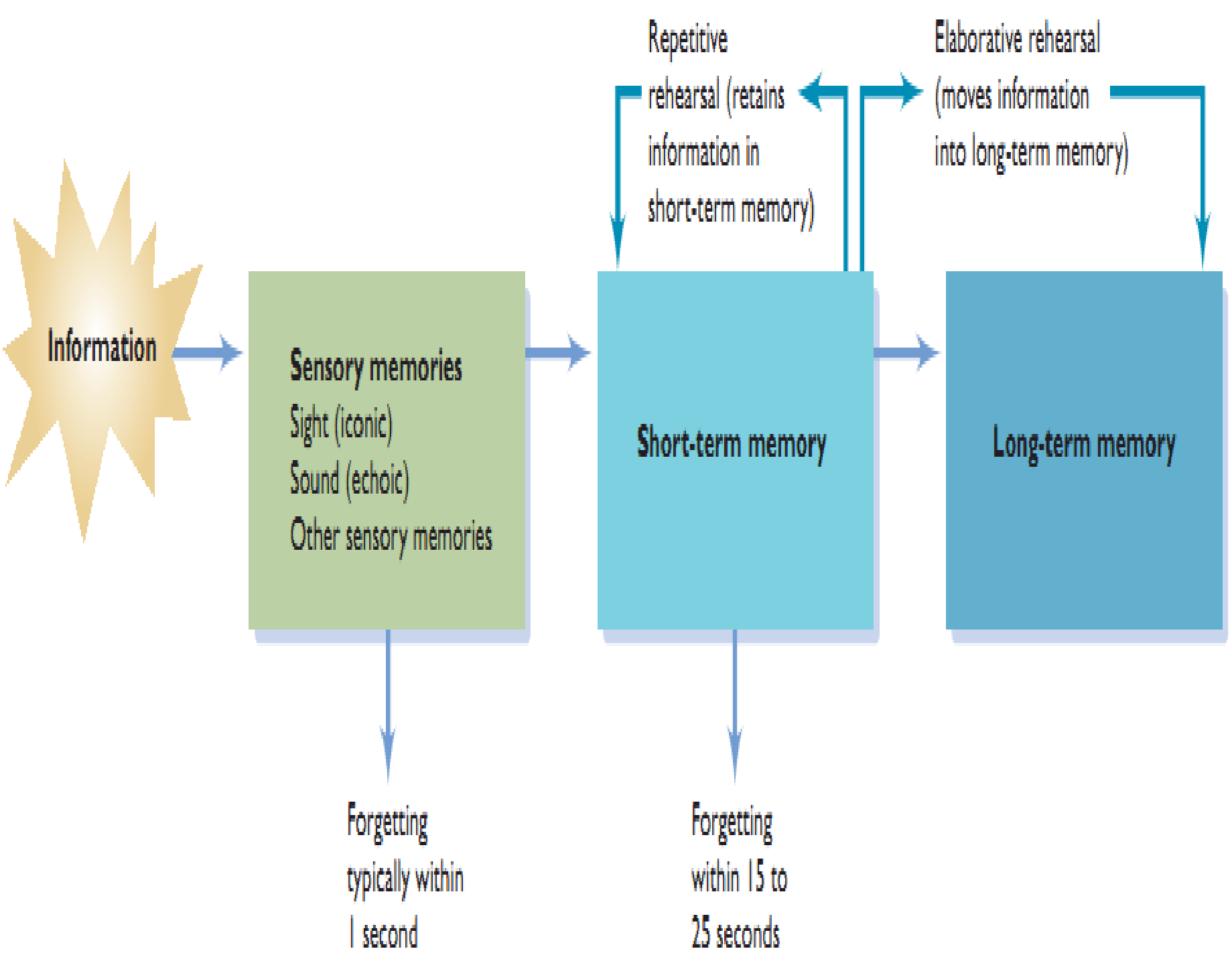
- involves retaining information over time.

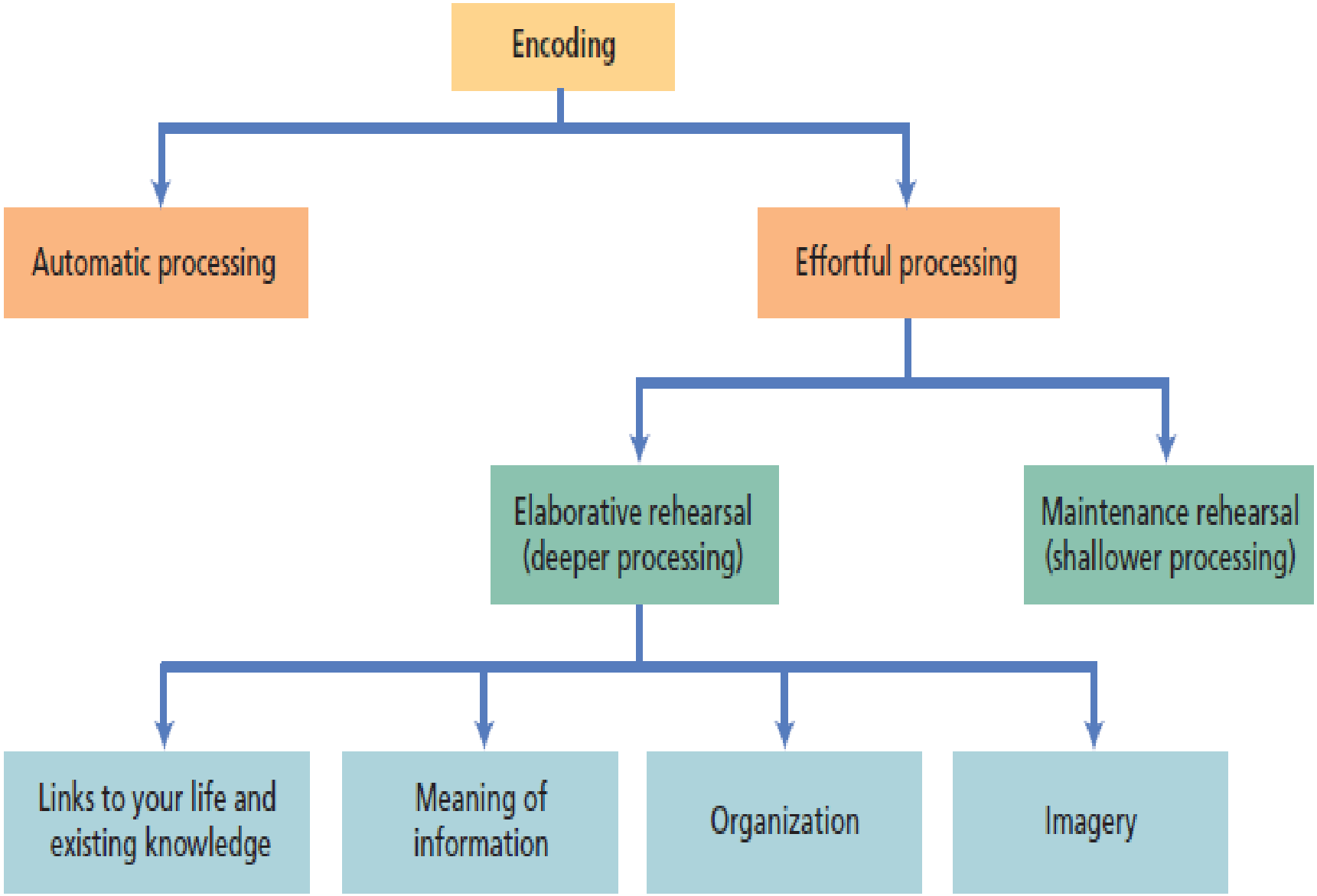
- New information that is stored by **making associations** with **old or familiar information is much easier to remember, or retrieve**

Retrieving

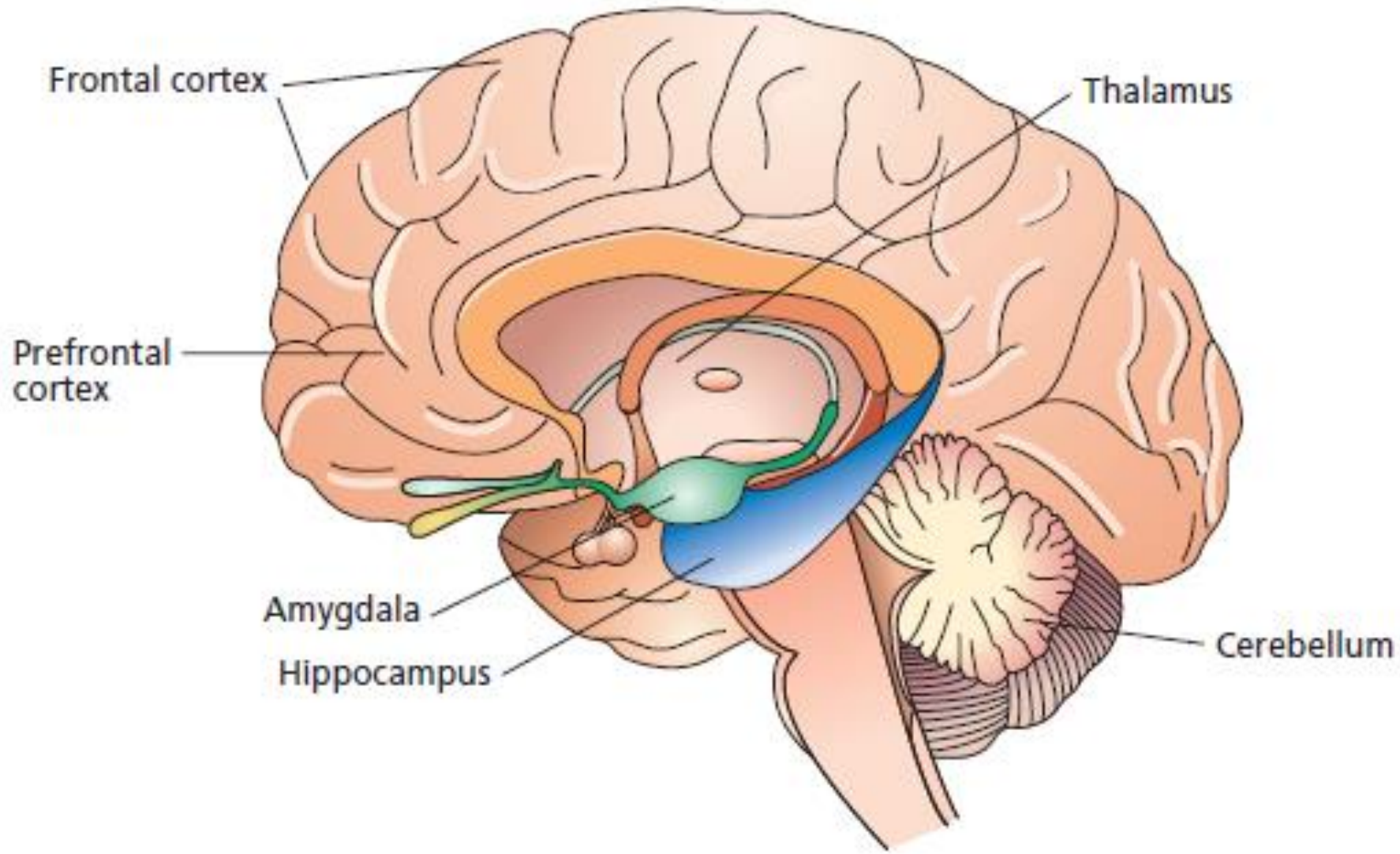
is the process of getting or recalling information that has

been placed into short-term or long-term storage.


Repetitive rehearsal (retains information in short-term memory)
Elaborative rehearsal (moves information into long-term memory)
Information
Sensory memories
Sight (iconic)
Sound (echoic)
Other sensory memories
Short-term memory
Long-term memory
Forgetting typically within 1 second
Forgetting within 15 to 25 seconds


Encoding
Automatic processing
Effortful processing
Elaborative rehearsal (deeper processing)
Maintenance rehearsal (shallower processing)
Links to your life and existing knowledge
Meaning of information
Organization
Imagery

Biological basis of memory:



Biological basis of memory

1- our visual, auditory, and other sensory systems to detect stimulus information **transform it into neural codes**, and send it to the brain, where sensory areas of the cerebral cortex **initially process it.**

Biological basis of memory

2- The frontal lobes—especially the prefrontal cortex—play key roles in working memory.

3- Amygdala : emotional memory.

4- Hippocampus: Transferring Memories & Retrieving Memories

Just as the "Save" command on your computer transfers a file into permanent storage on your hard drive, the **hippocampus transfers words, facts, and personal** events from short-term memory into permanent long-term memory.

*This hypothetical and gradual binding process is called **memory consolidation.***

Forgetting

- Forgetting refers to **the inability to retrieve, recall, or recognize information that was stored or is still stored in long-term memory.**

Theories of Forgetting

- Decay Theory：***which proposed that with time and disuse the long-term physical memory trace in the nervous system fades away.***
- Interference Theory
  - Proactive interference
  - Retroactive interference
- Encoding Failure
- Retrieval Failure Theory

Proactive interference

- ***occurs when material*** *learned in the past interferes with recall of newer material.*

Retroactive interference

Occurs when newly acquired information interferes with the ability to recall information learned at an earlier time.

Amnesia

- The term amnesia *commonly refers to memory loss due to* special conditions, such as brain injury, illness, or psychological trauma.

Types of Amnesia

- **Retrograde amnesia**
- *represents memory loss for events that took place sometime in life **before** the onset of amnesia.*
- Football players experience retrograde amnesia when they are knocked out by a concussion, regain consciousness, and cannot remember the events just before being hit.
- **Anterograde amnesia *refers to memory loss for*** *events that occur **after** the initial onset of amnesia*

Thank you