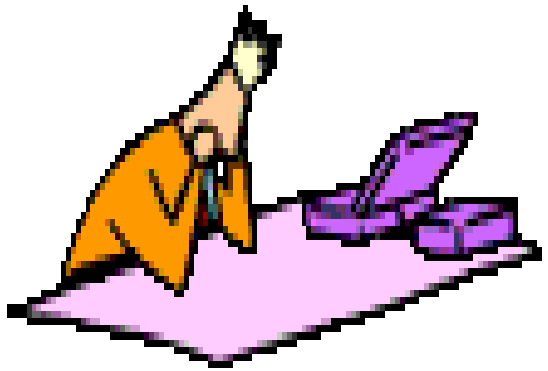
Memory



Memory

Memory

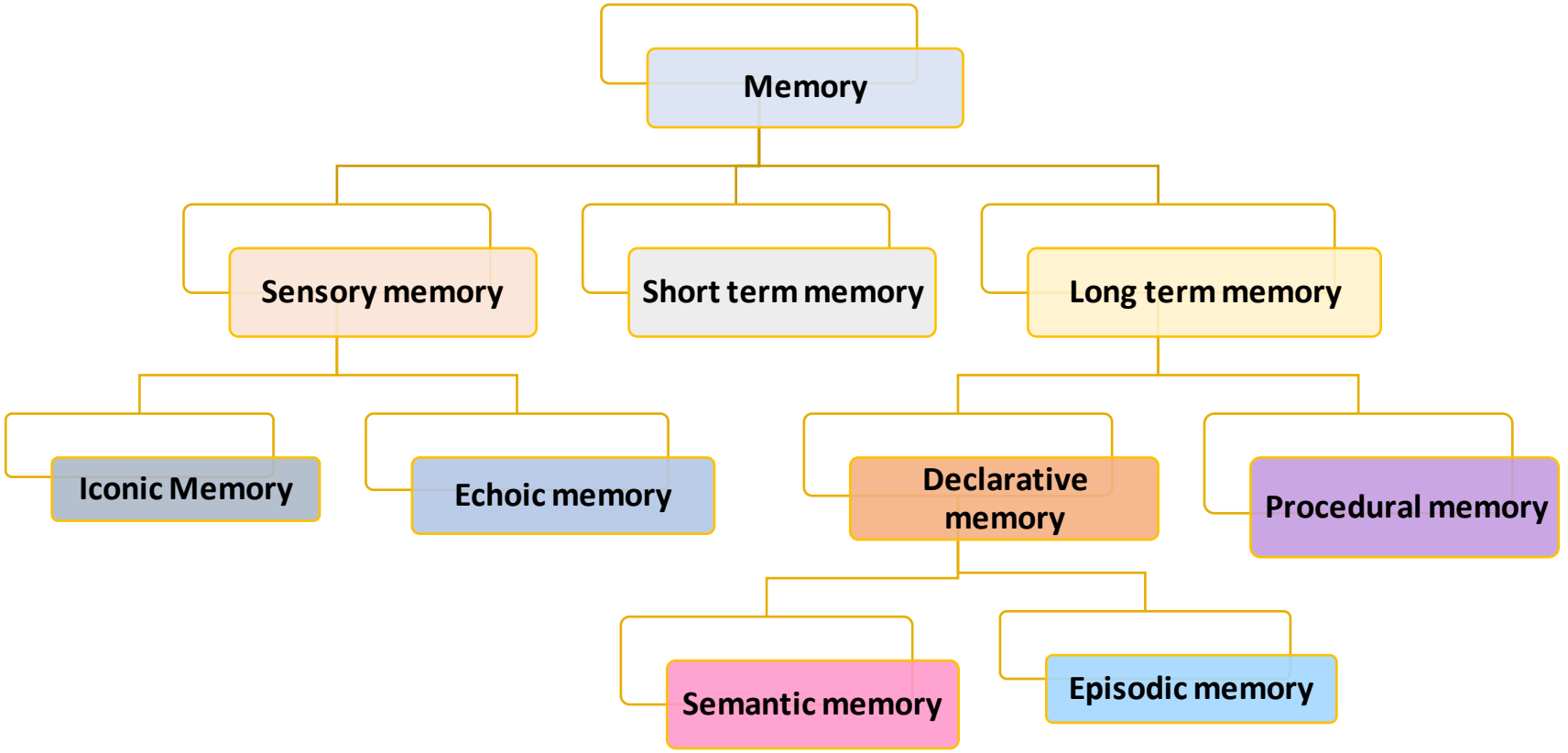
- Memory is the capacity to encode, retain/store and retrieve information. (Robert S. Feldman)

Information-processing model

- computer-like model used to describe way humans encode, store, and retrieve information

- How does information get into memory?
  - ENCODING
- How is information maintained in memory?
  - STORAGE
- How is information pulled back out of memory?
  - RETRIEVAL

Types of Memory



The Sensory Registers

Sensory registers

- The entry points for all of raw information from senses.
- Sensory memory lasts for an instant that is less than a second.
- The information is not always remembered.
- Visual and sensory registers studied most extensively.

Visual and Auditory Registers

Visual and Auditory Registers

- New information continues to enter visual register
- New visual information replaces old information almost immediately
- Auditory information fades more slowly

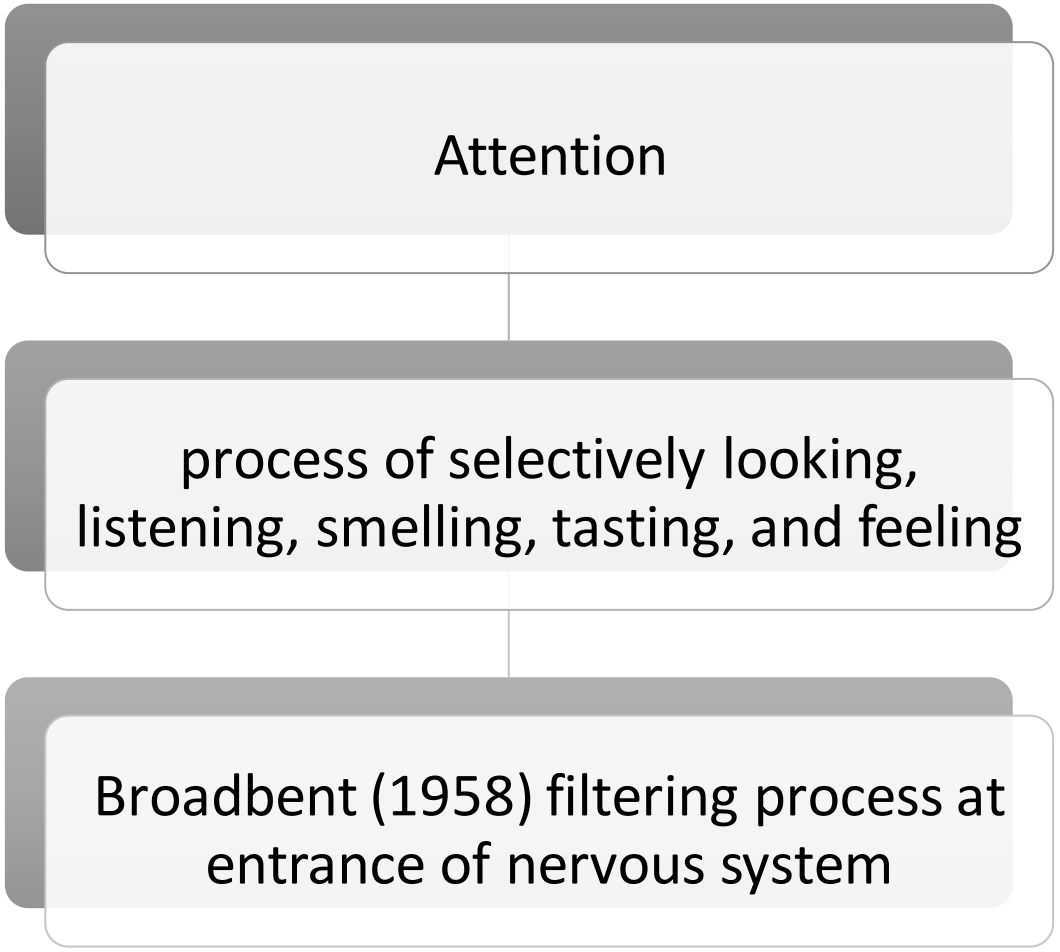
ICONIC MEMORY

Reflects information from visual system.

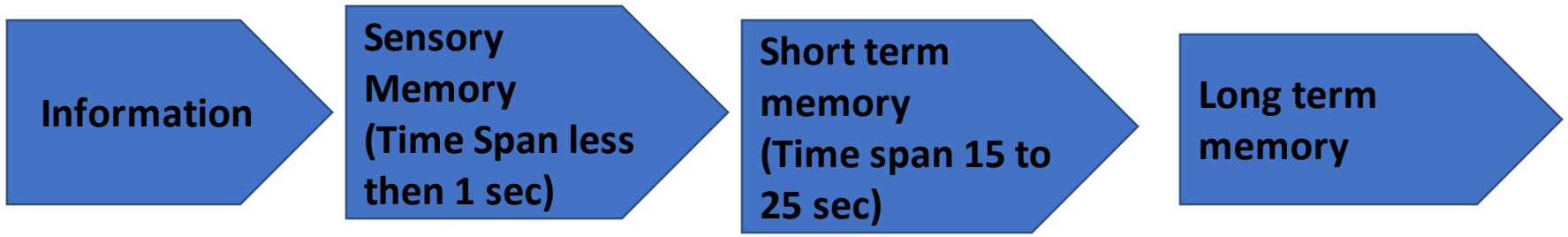
ECHOIC MEMORY

Reflects information from the auditory system.

Attention


Attention
process of selectively looking, listening, smelling, tasting, and feeling
Broadbent (1958) filtering process at entrance of nervous system

Three Stage Model Of Memory



Short-term Memory

Short-term memory functions

- Briefly store new information.
- Work on that (and other) information.

Capacity of STM

Short-term memory

- Can hold only as much information repeated or rehearsed in about 15 or 25 seconds.

Chunking

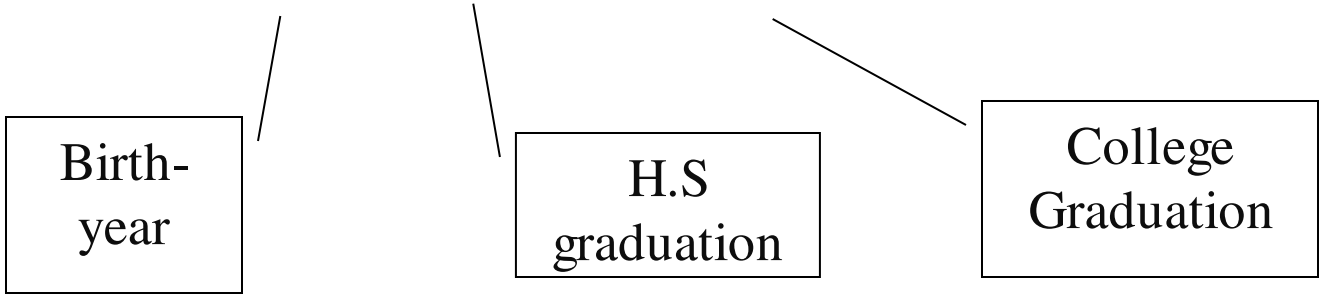
- Grouping of information into meaningful units.
- Helps increase this capacity.

Consolidation:
Getting Info From STM to LTM

- Mnemonic devices are strategies to improve memory by organizing information
  - **Method of Loci:** ideas are associated with a place or part of a building
  - **Peg-Word system**: peg words are associated with ideas (e.g. “one is a bun”)
  - **Interactive Images :** verbal associations are created for items to be learned

Research on Short-Term Memory & Consolidation

- Miller (1956)
  - Examined memory capacity
  - 7+/- 2 items or “chunks”
- Chunking -- organize the input into larger units
  - 1 9 8 0 1 9 9 8 2 0 0 3 - Exceeds capacity
  - 1980 1998 2003 - Reorganize by chunking.



SHORT TERM MEMORY

- A memory that holds information for 15 to 25 seconds.
- Specific amount of information can be stored in short term memory.
- Usually one can store up to 7 chunks ± 2 chunks.

CHUNKS

A meaning full group of stimuli that can be stored as a unit in short term memory.
EXAPMPLE

PBSFOXCNNABCCBSMTVNBC

Stated above are 23 words its hard to memorize them as a whole if we divide it like

PBS FOX CNN ABC CBS MTV NBC

Now when divided into 7 meaningful chunks its easy to memorize them.

Encoding in STM

Encoding in STM

- Most verbal and visual information stored in STM phonologically.
- Other information stored in visual form.
- Memory for images better than memory for words.

Maintaining STM

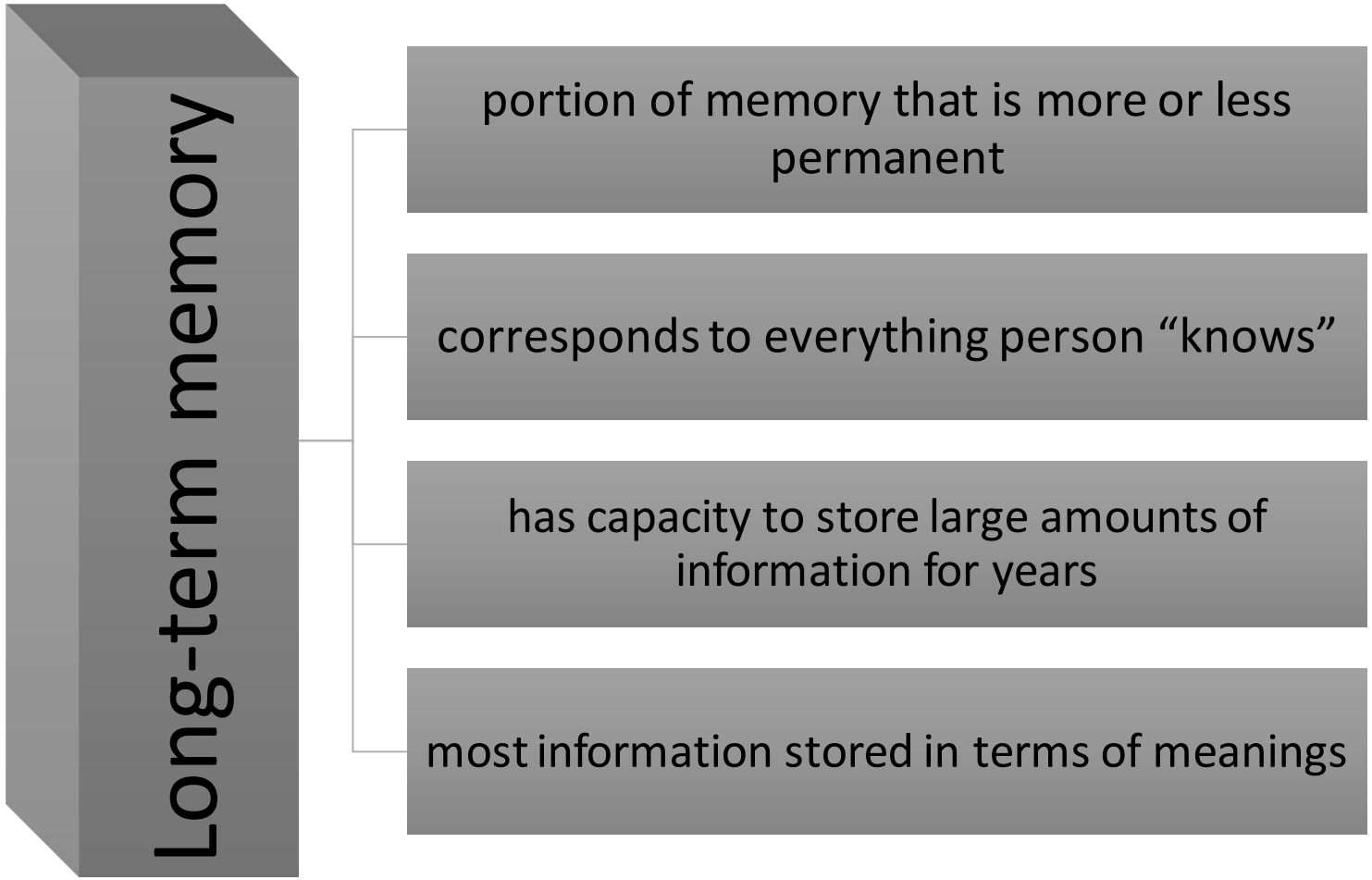
Rote rehearsal

- Repeating information repeatedly.
- Useful in holding information in short-term memory.

Maintaining STM

Ability to store large amounts of information for an indefinite periods of time is essential to mastering complex skills and to remember personal experiences

Long-term Memory



Serial Position Effect

Research has shown that what we remember is influenced by the serial position effect.

Serial position effect

When asked to recall list of unrelated items, performance is better for items at beginning and end of list

- **Serial effect**

  It is ability to recall information in a list depending upon where in the list an item appears

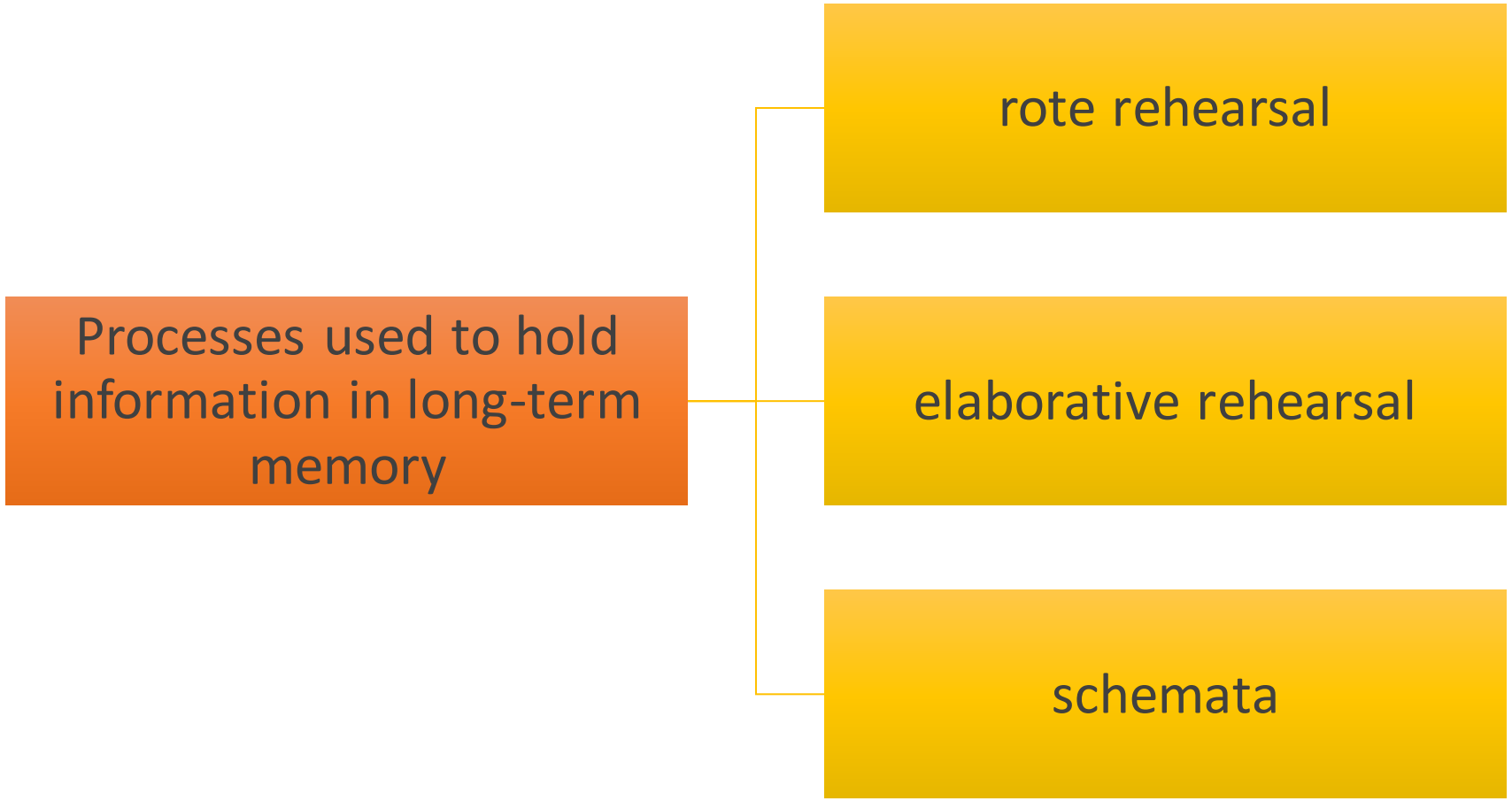
  - **Primacy Effect**

    Items presented early in the list are remembered better.

  - **Recency effect**

    Items presented later or in the end of the list are remembered better.

Maintaining LTM



- ROTE REHARSAL
  - The repetition of information that has entered short term memory .
- ELABORATIVE REHEARSAL
  - It occurs when the information is considered and organized in some fashion.

MNEMONICS

They are formal techniques for organizing information way that makes it more likely to be remembered.

Example:

S= P/H

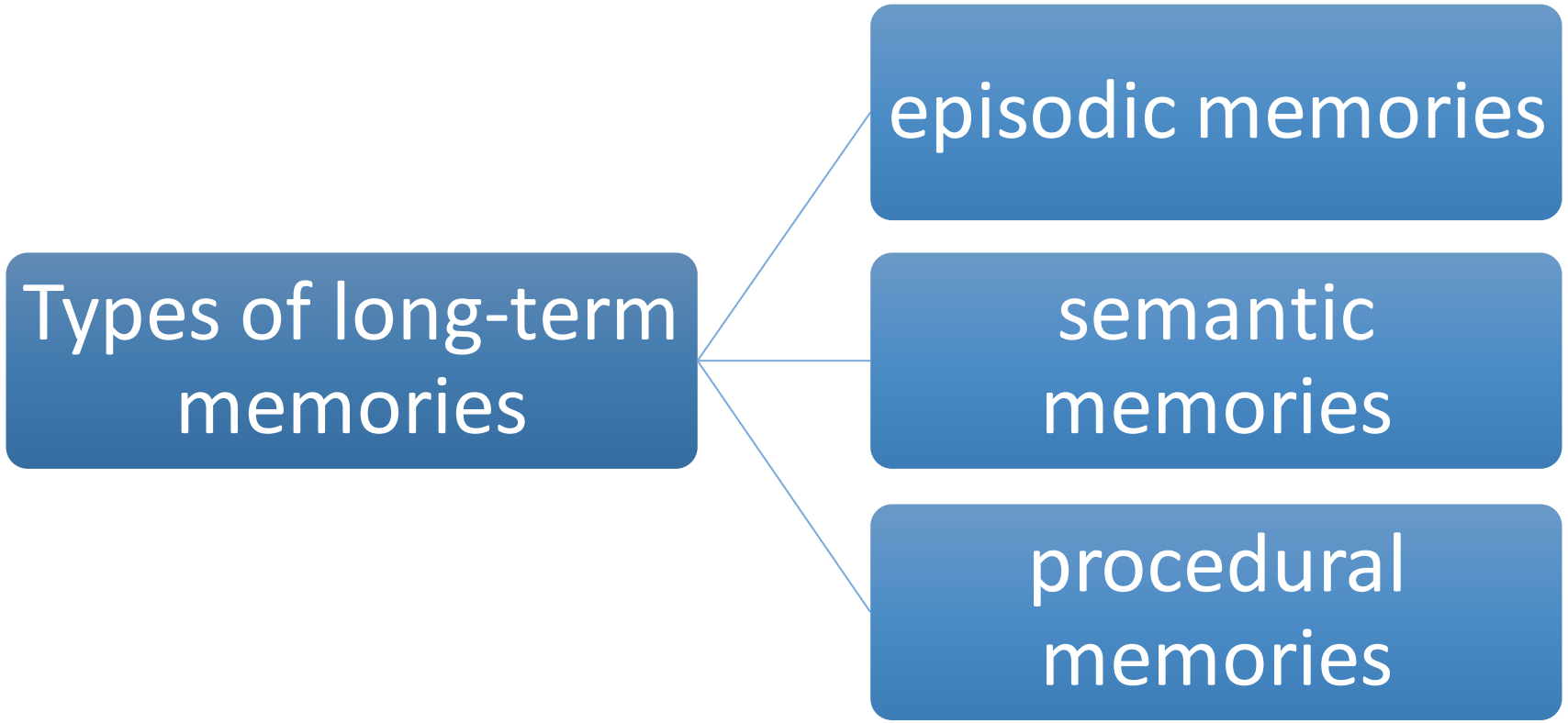
C=B/H

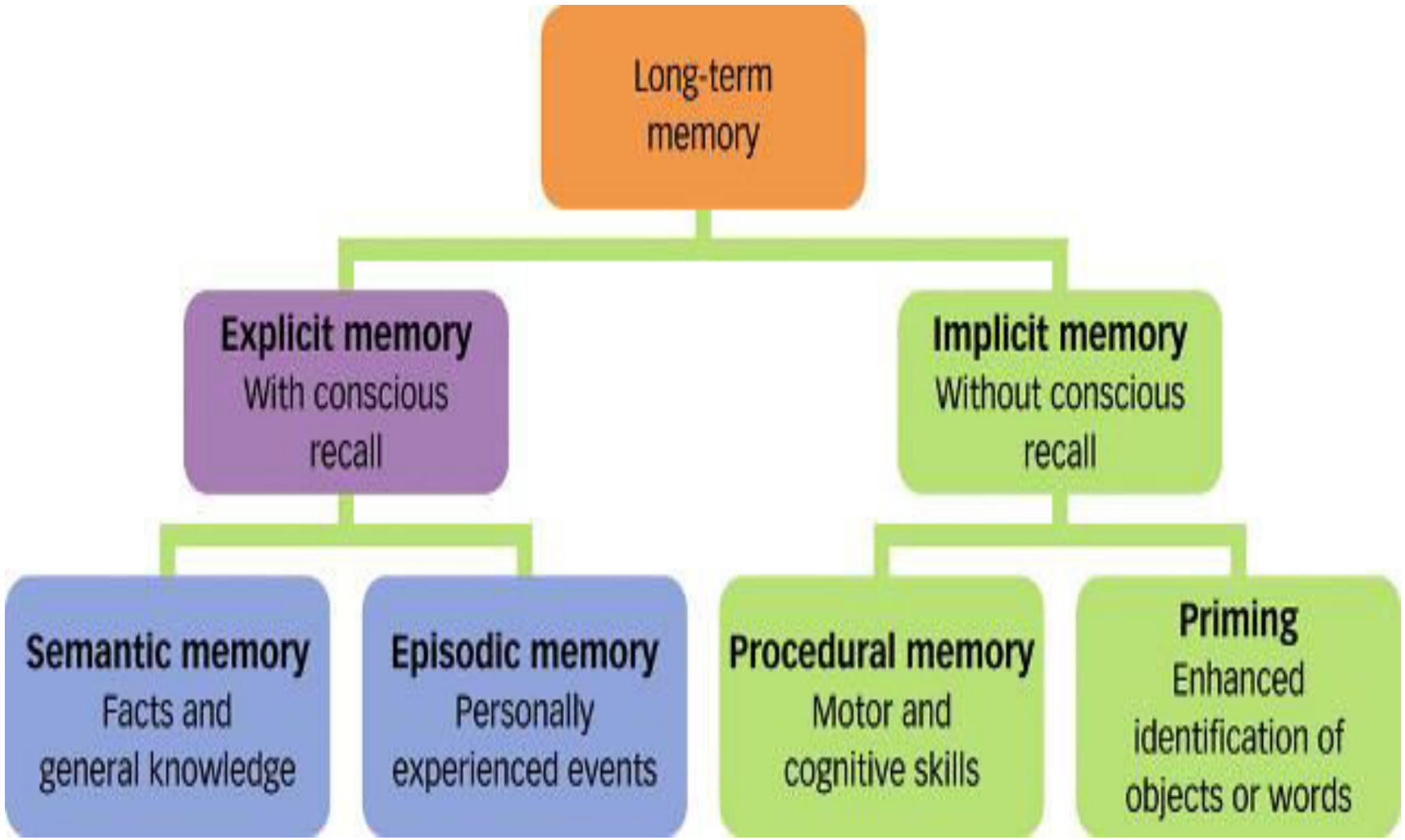
T=P/B

- SCHEMAS

Organized bodies of information stored in memory that bias the way new information is interpreted, stored, and recalled

Types of LTM


Types of long-term memories
episodic memories
semantic memories
procedural memories


Long-term memory
Explicit memory
With conscious recall
Implicit memory
Without conscious recall
Semantic memory
Facts and general knowledge
Episodic memory
Personally experienced events
Procedural memory
Motor and cognitive skills
Priming
Enhanced identification of objects or words

Explicit and Implicit Memory

Explicit memory

- memory for information readily expressed in words
- It can be intentionally retrieved

Implicit memory

- memory for information not readily expressed in words
- It cannot be intentionally retrieved from memory

Explicit and Implicit Memory

Priming studies

- demonstrates distinction between explicit and implicit memory

Tip of the tongue phenomenon

- knowing word but not being able to immediately recall it
- demonstrates distinction between explicit and implicit memory

Types of Memories

TABLE 6-1 Types of Memories

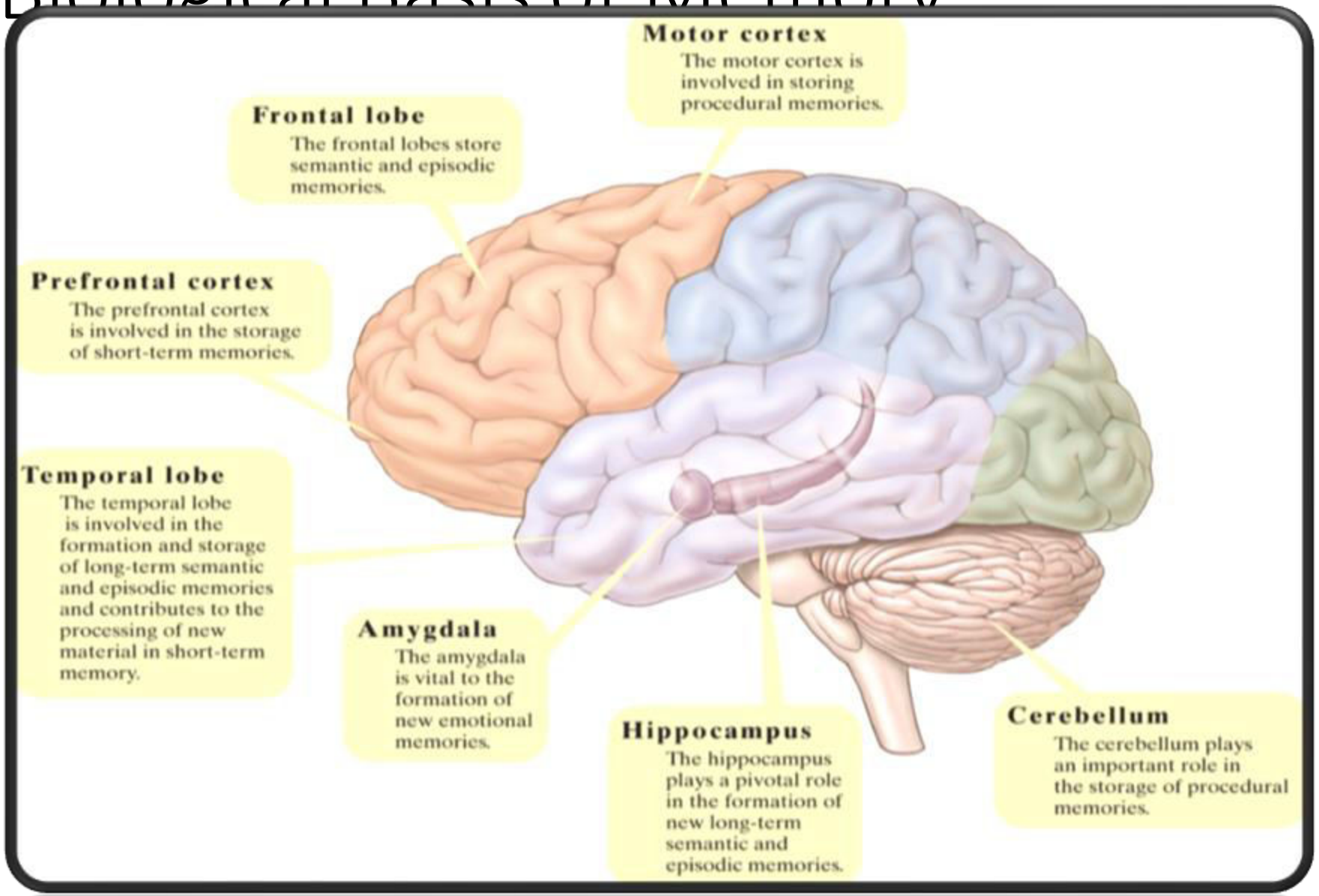
Explicit		Implicit	
Semantic	Episodic	Procedural	Emotional
Memories of facts and concepts	Memories of personally experienced events	Motor skills and habits	Learned emotional reactions
Example: recalling that Albany is the capital of New York	*Example:* recalling a trip to Albany	*Example:* ice skating	*Example:* recoiling at the sight of a rat

Where Are Memories Stored?

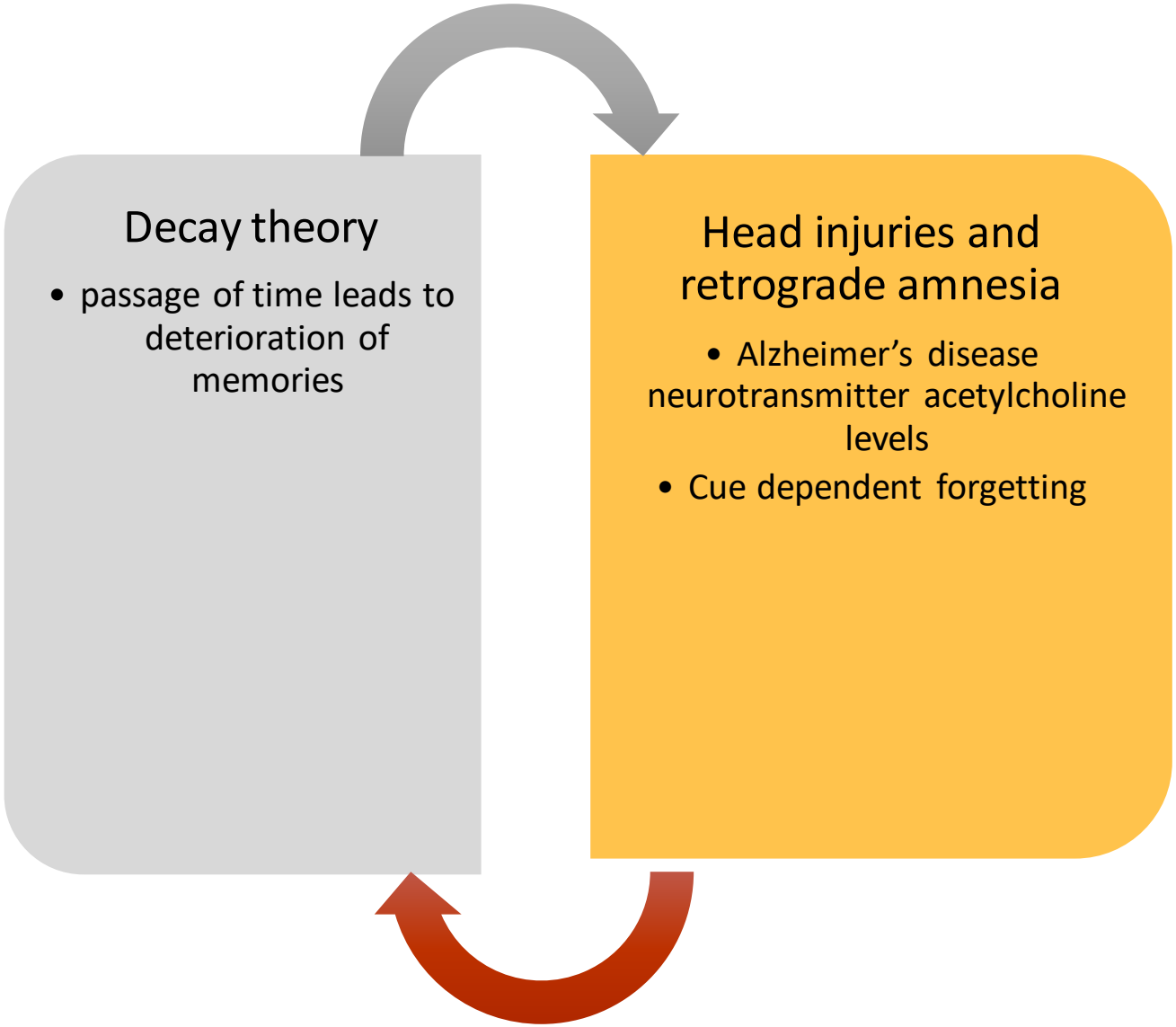
Different types of memory stored in different parts of brain

- episodic memories - frontal and temporal lobes
- procedural memories - cerebellum
- semantic and episodic memories - hippocampus

The Biological Basis of Memory



The Biology of Forgetting



Forgetting Is a Process, Too!

Proactive interference:

Old information interferes with recall of new information

Retroactive interference:

New information interferes with recall of old information

Decay theory:

Memory trace fades with time

Motivated forgetting:

Involves the loss of painful memories (protective memory loss)

Retrieval failure:

The information is still within LTM, but cannot be recalled because the retrieval cue is absent

Memory Disorders

- Alzheimer's Disease

  An illness characterized in part by severe memory problems. It is a progressive disorder due to the degeneration of neurons.

- Amnesia

  Memory loss that occurs without other mental difficulties.

  - Retrograde Amnesia

    Memory loss that occurs for the events prior to the occurrence of the trauma or injury.

  - Anterograde Amnesia

    Memory loss of the events that happen after the injury

Memory Disorders

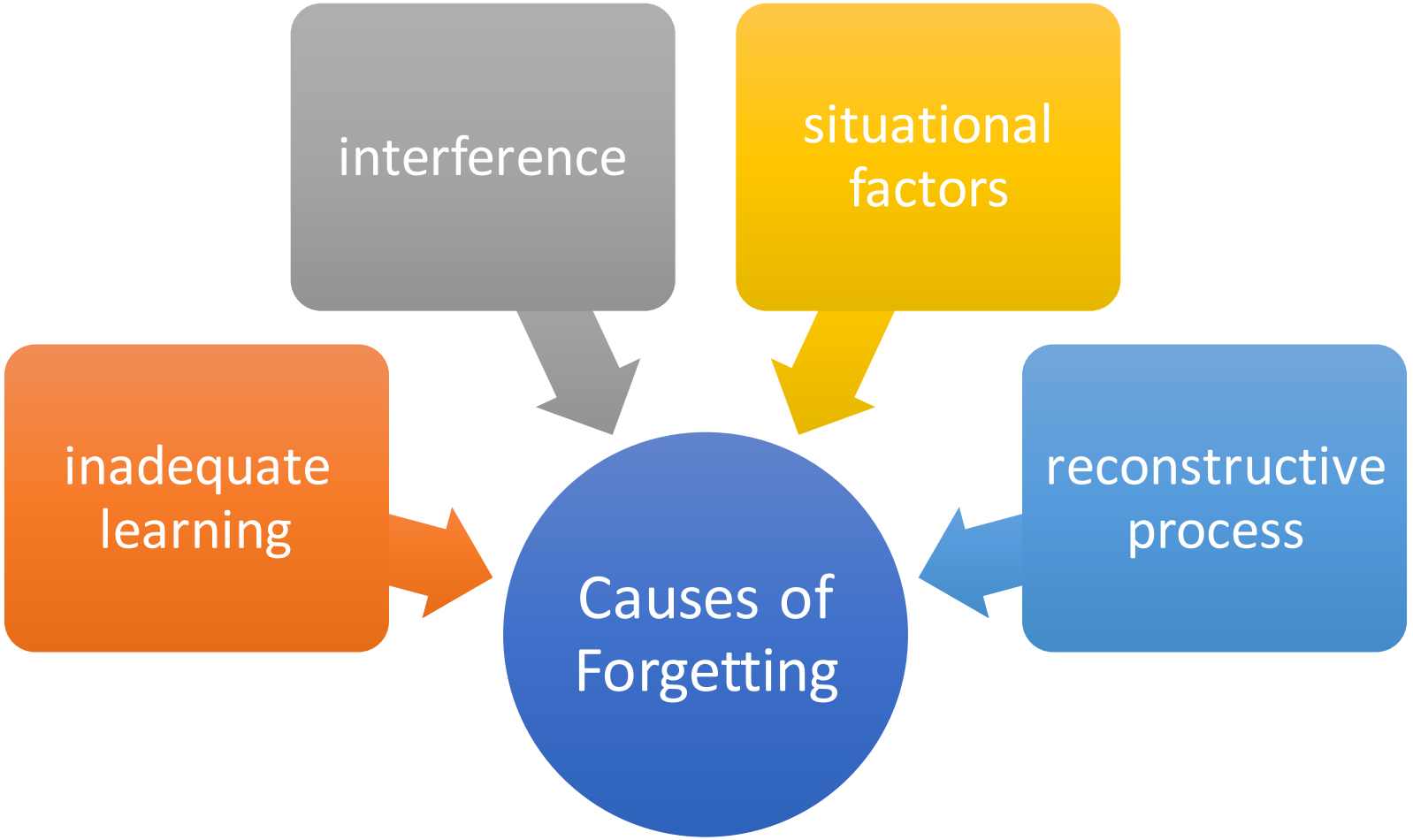
- Korsakoff's syndrome

A disease that afflicts long term alcoholics. Korsakoff's sufferers display a strange array of symptoms including hallucinations and repetition of the same story again and again.

- Fugue

It is extensive form of amnesia. In this disorder a person's mind is too much shattered by the stress that he flees away from his home he not only forgets his name and address but also all details about his past.

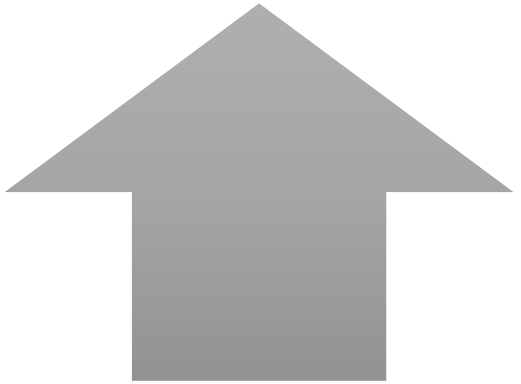
Experience and Forgetting



Cultural Influences

Culture influences types of things that people remember

People more likely to remember information about things that are relevant to their culture



Autobiographical Memory

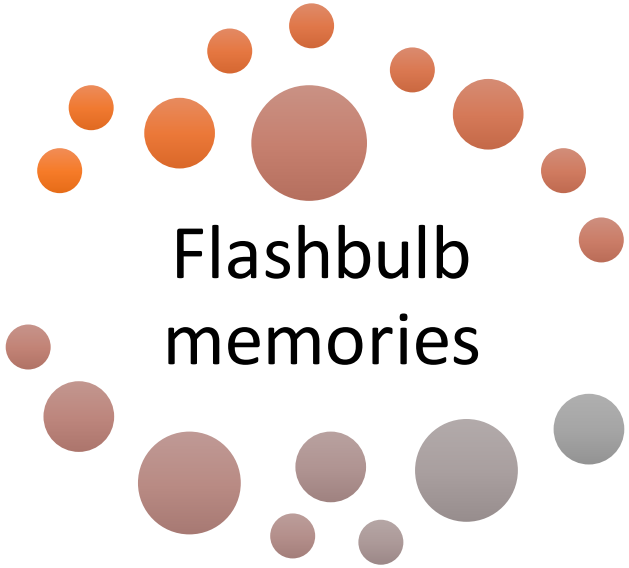
Autobiographical memories

- Recollection of events and event dates that have happened in our life
- Memories central to identity and emotional experiences
- Recent life events usually easier to recall than earlier ones

Extraordinary Memory

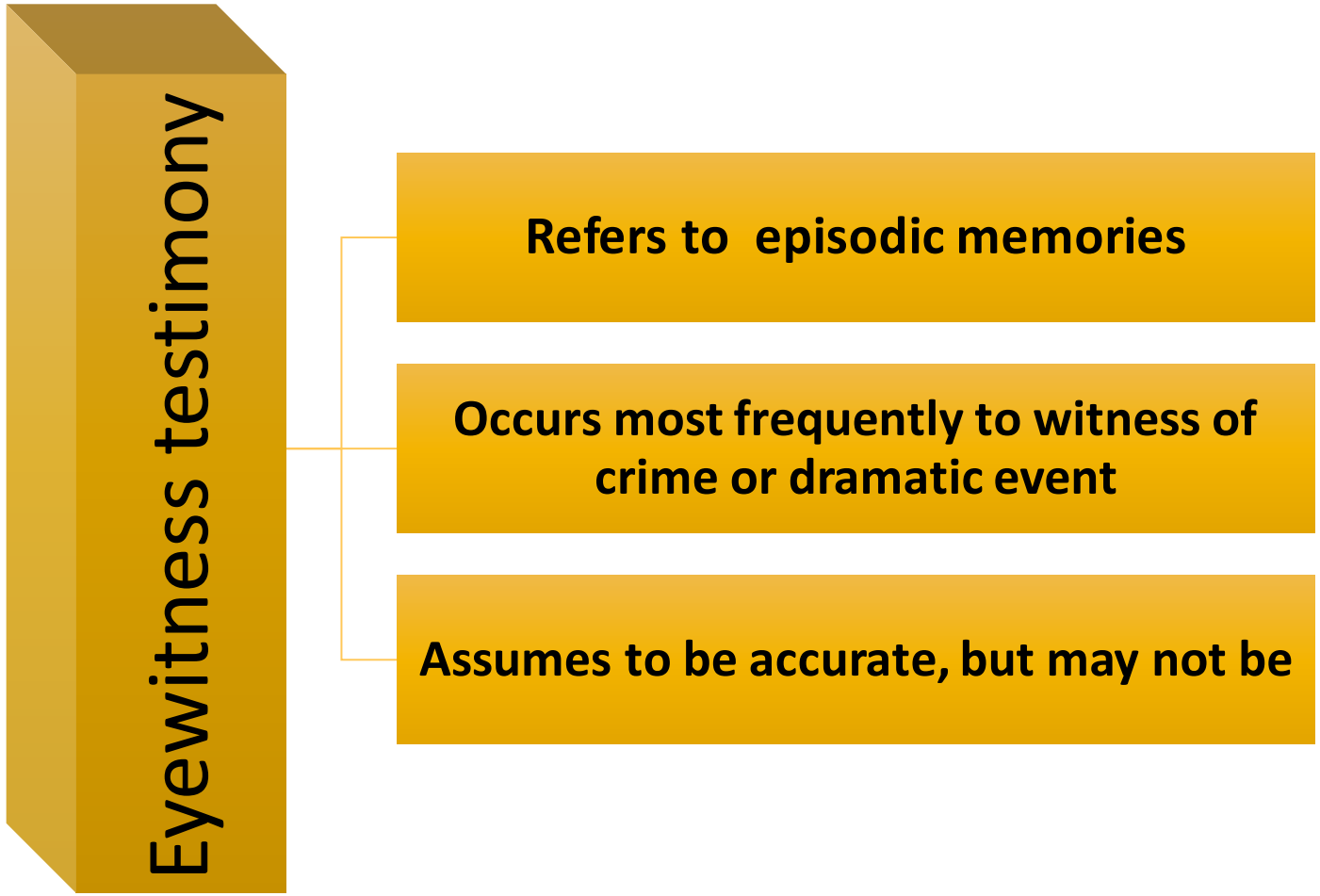
- Eidetic imagery
- Mnemonists

Flashbulb Memories



- vivid recollections of certain events and incidents surrounding it
- even after significant amount of time has passed
- not likely accurate

Eyewitness Testimony



Eyewitness Testimony

Eyewitness testimony is often inaccurate

Source error

Confusion about what was heard about event with what was actually witnessed

Individual Differences

- Some people are more susceptible to misinformation than others
  - 7 out of 24 participants
- People high at risk for misinformation acceptance have
  - Poor general memory
  - High scores on imagery vividness
  - High empathy scores

The Reconstructive Nature of Memory

Factors that affect Eye Witness Testimony

- **Stereotypes -** Allport and Postman (1947) Participants shown a cartoon of a black and a white man on a subway train. Most recalled that the black man had the razor in his hand. The razor was actually in the white man's hand. (stereotype – more prone to violence).
- Conclusion: When an actual perceptual fact doesn't match our expectations, we trust our expectation more than the real situation.
- We see what we expect to see and this forms the basis for the memory for an event.

The Reconstructive Nature of Memory

- Loftus & Palmer (1974)
  - Participants viewed a film of a car accident
  - IV – question content
    - "About how fast were the cars going when they (smashed, hit, contacted) each other?"

The Reconstructive Nature of Memory