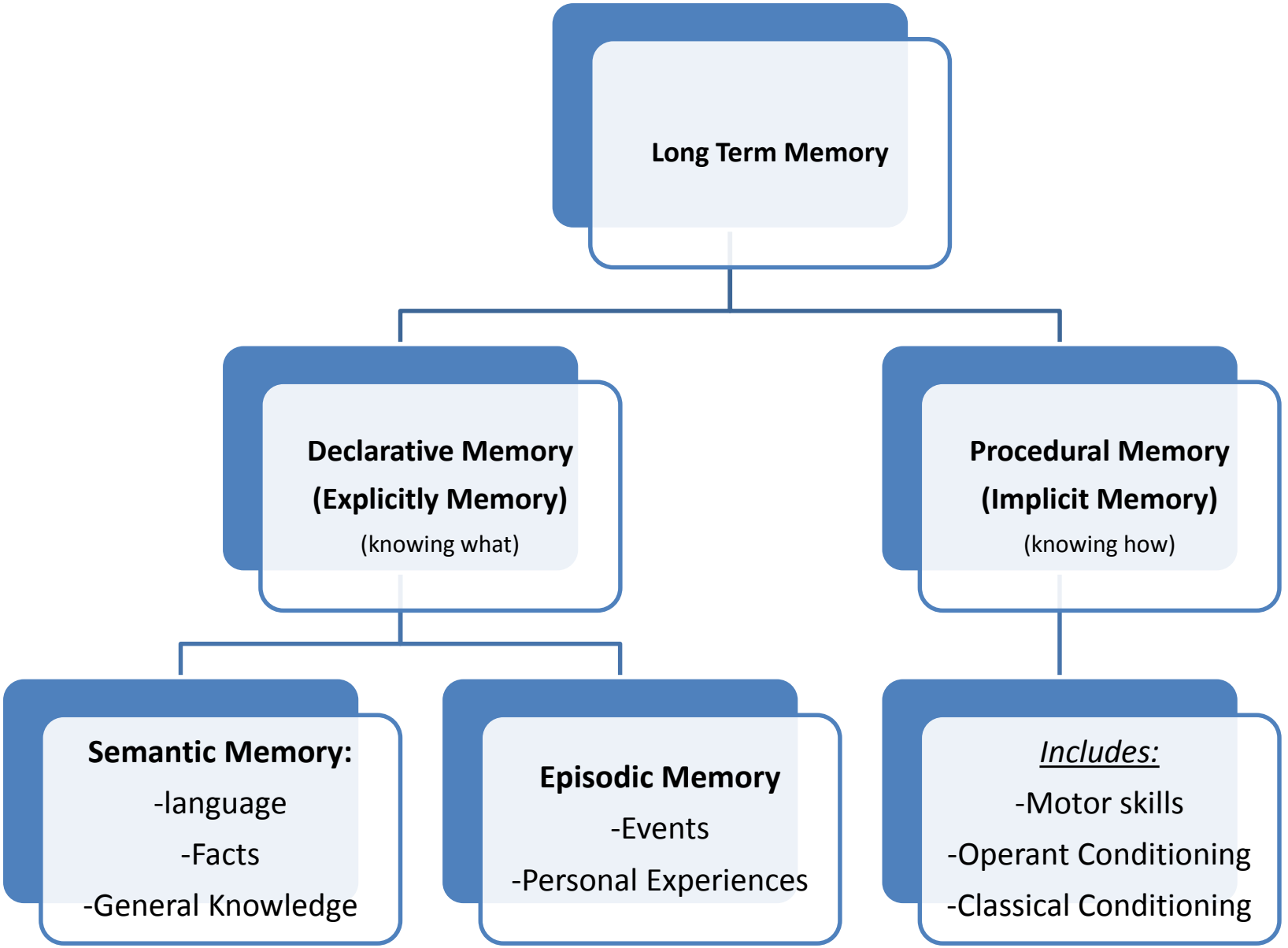
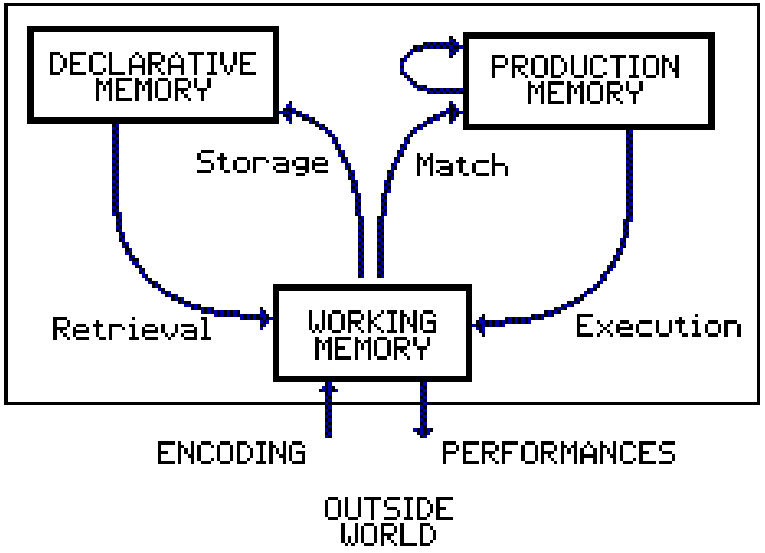
Structure and Function of LTM



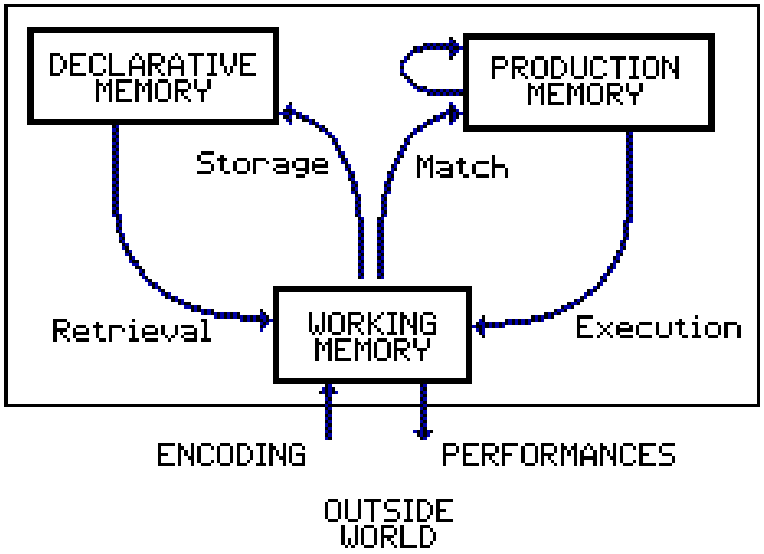
Long Term memory

- *Procedural memory (implicit)* is the part of long term memory where we store memories of how things are done.



Long Term memory

- *Declarative memory (explicit)* is the part of long term memory where we store specific information such as facts and events.
  - More often than procedural memory, declarative memory requires some conscious mental effort.



Declarative (Explicit) Memories

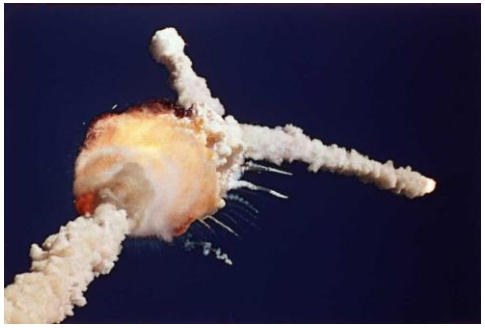
- Episodic Memories - This is the portion of memory that stores personal events or "episodes."
  - This is the storage of things like time and place.
- Semantic Memories - This portion of memory stores general knowledge, facts and language meaning.
  - This is specifically where all the information you "know" is stored.

Studies: implicit vs. explicit

- People with amnesia who read a story once, will read it faster a second time, showing implicit memory.
  - There is no explicit memory though as they cannot recall having seen the text before

- People with Alzheimer's who are repeatedly shown the word *perfume* will not recall having seen it.
  - If asked the first word that comes to mind in response to the letters *per*, the say perfume readily displaying learning.

Flashbulb Memory



- A particularly vivid, detailed, and long-lasting memory of an event that is highly significant and emotional.

Where were you when?

1. You heard about 9/11

2. You heard about the death of a close family member

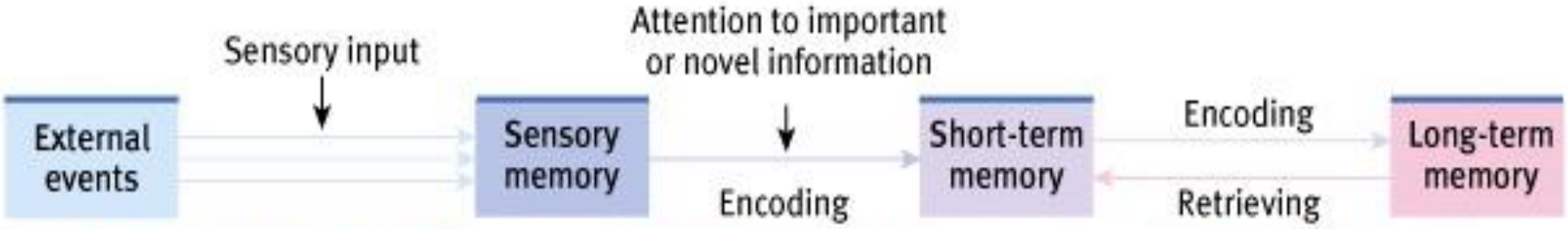
Other important memory concepts you need to know.

- **Autobiographical memory**
  - As we age, we tend to remember most our adolescence and early adulthood
    - We especially remember transitional firsts, such as 1st and 4th years of high school and college
- **Prospective memory**
  - Memory for things that need to be done in the future
    - Remembering to do some thing at a particular time and remembering what to do at that time
- **Metamemory**
  - People's knowledge of their own memory skills and abilities
    - The accuracy with which people guess how likely it is that they will remember something or how effective some memory strategy or learning strategy may be for them
  - Your metamemory has failed you when you think you've studied enough for an exam, but then do poorly.

Storage

How we retain the information we encode

Review the three stage process of Memory



Sensory memory registers incoming information, allowing your brain to capture for a fleeting moment a sea of faces.

We pay attention to and encode important or novel stimuli—in this case an angry face in the crowd.

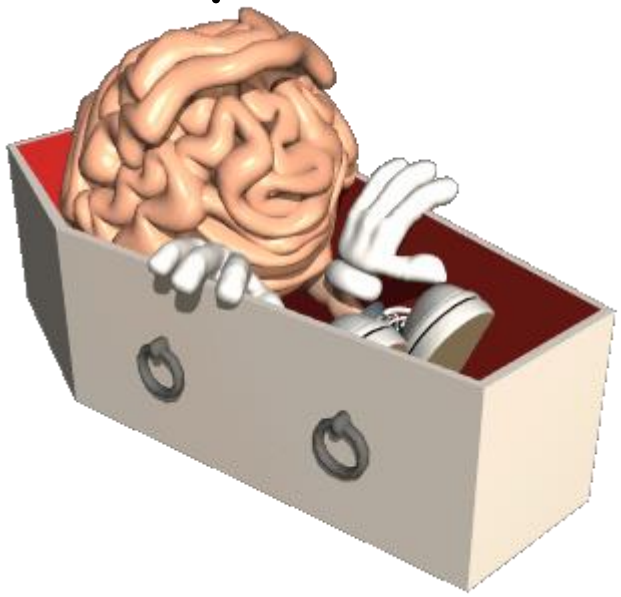
If we stare at the face long enough (rehearsal), or if we're sufficiently disturbed by it (it's deemed "important"), we will encode it for long-term storage, and we will, an hour later, be able to call up an image of the face.

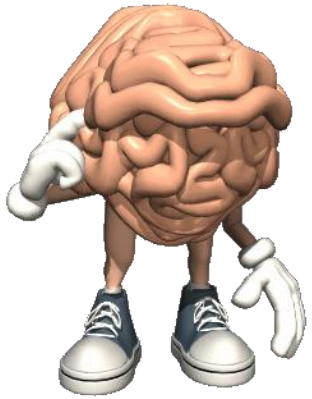
Review

- We have addressed:
  - Working memory and its components
  - Procedural Memory
  - Declarative
    - Semantic
    - Episodic
  - Flashbulb Memory

How does our brain store long-term memories?

- Memories do NOT reside in single specific spots of our brain.





•They are not electrical (if the electrical activity were to shut down in your brain, then restart- you would NOT start with a blank slate)

Synaptic Changes and storage

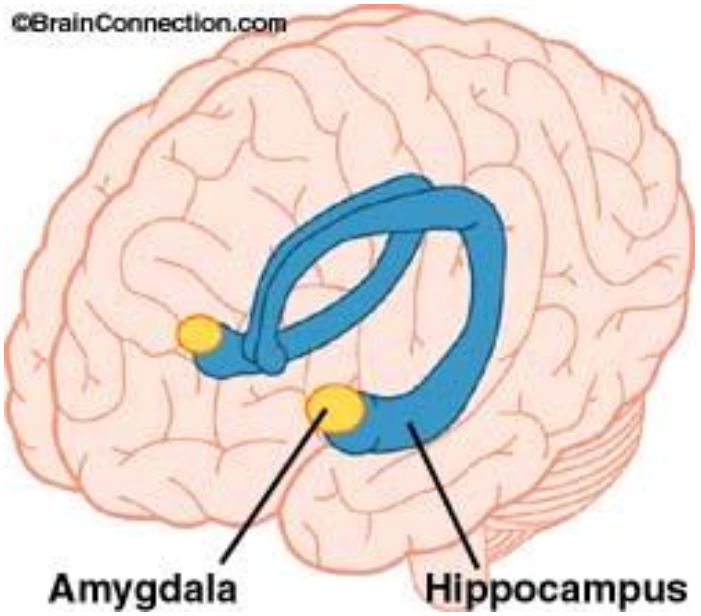
- Memories begin as impulses whizzing through the brain circuits, leaving a semi-permanent trace.
  - The more a memory is utilized, the more potential strength that neuron has, called ***long-term potentiation.***
    - This is the neural basis for learning and remembering associations.
    - The more you utilize specific brain cells, the longer they last.
    - If you practice your foreign language and not algebra, you will better remember the foreign language.

This stuff gets super complicated…lets keep it simple for now

Parts of the brain used in memory

- Two parts of the brain psychologists know for sure are involved in memory are the hippocampus and the amygdala.

- The amygdala seems to play a role in strengthening memories that have strong emotional connections.



The hippocampus is active during sleep and processes and files memories for later retrieval.

Hippocampus

- Involved in the conscious processing and storage of explicit memories.
- Also involved with spatial awareness
- **Damage to the area can prevent a person from forming new memories, even though memories from before the damage remain intact.**

Key Point

Clive Wearing – Life Without Memory