

Memory

Dr Elena Gregoria Chai Chin Fern
Faculty of Social Sciences
Universiti Malaysia Sarawak



This OpenCourseWare@UNIMAS and its related course materials are licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.



- Note: Main reference and resource of this topic is taken from Feldman R (2013) Understanding Psychology. 11th edition. McGraw –Hill.



The man with no memory

- Henry Molaisan (HM)
- 9 yrs old – was hit by a bicycle
- Severe epileptic seizures
- Hippocampus on both sides of brain was removed
- Lost ability to form new memory
- Living forever in present
- “Star Tracing Task” – Procedural Memory

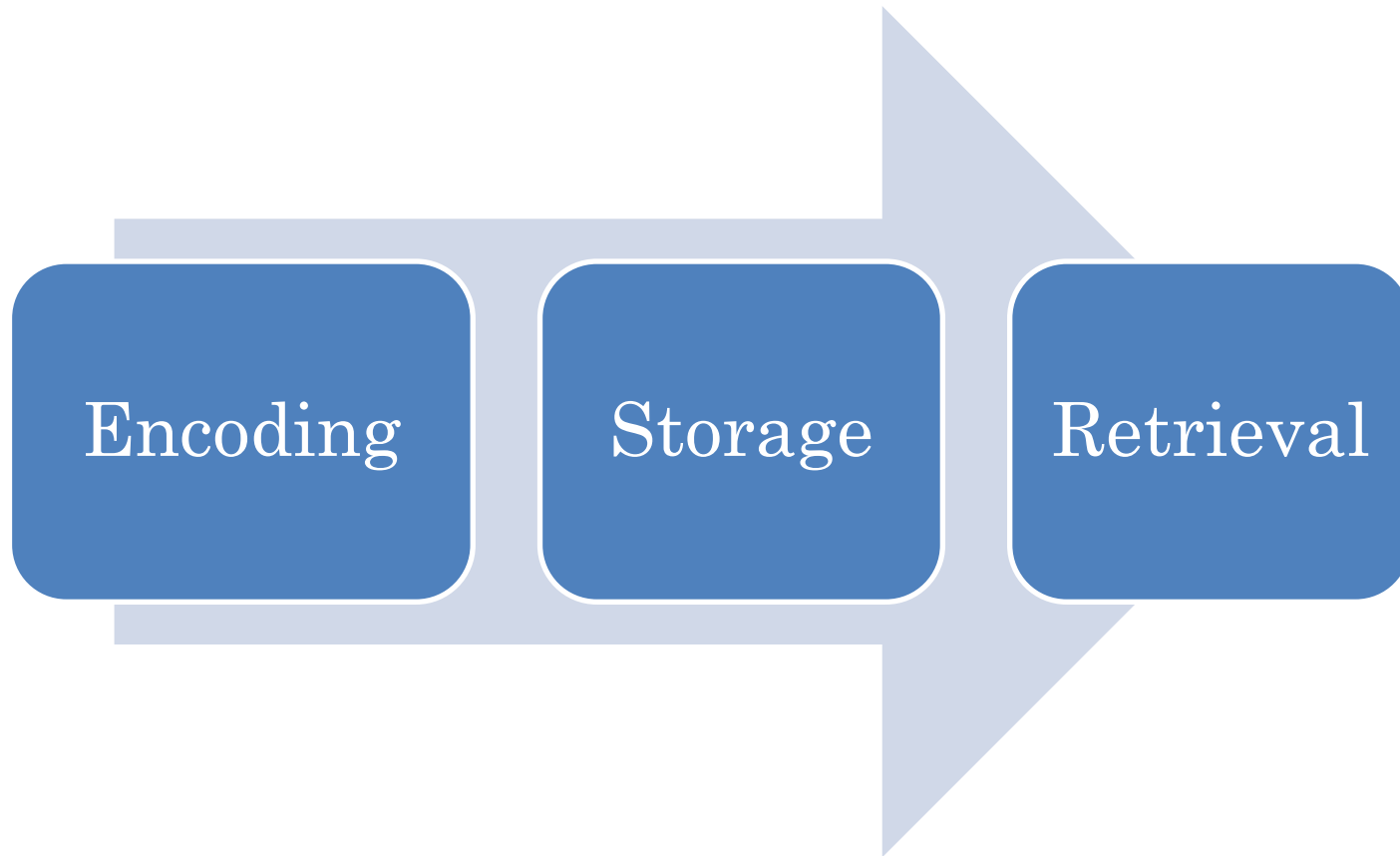


The Foundations of Memory

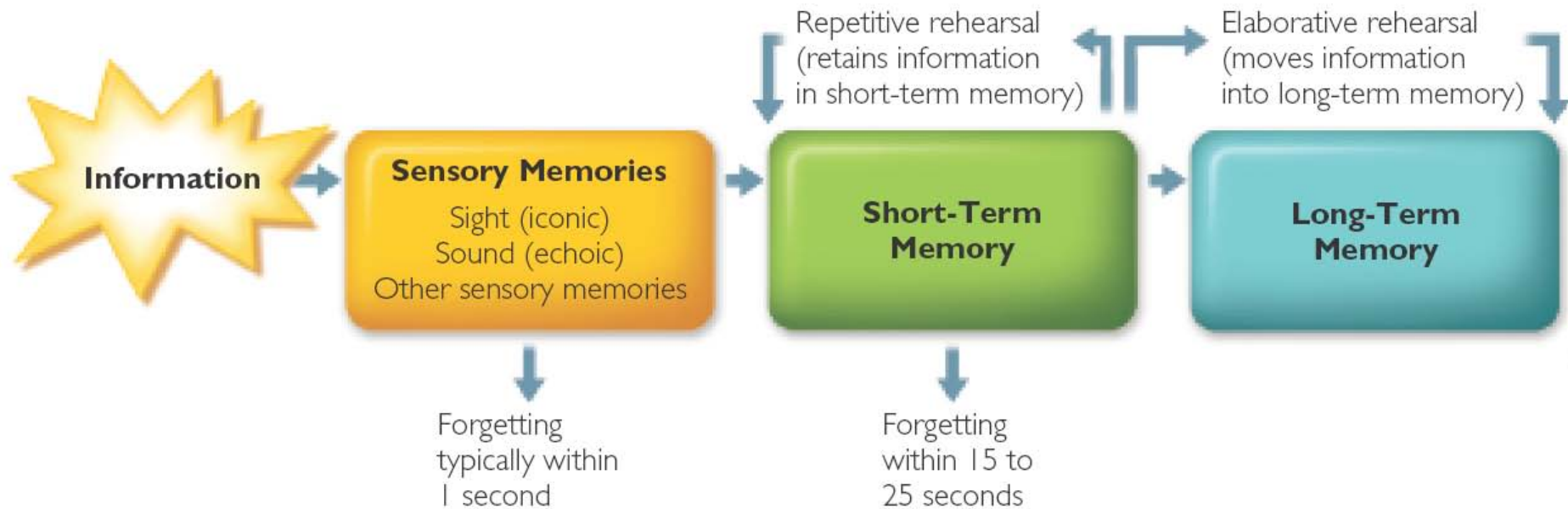
- What is memory?
- Are there different kinds of memory?
- What are the biological bases of memory?



Information Processing Models



Three-Stage Model of Memory



Source: Feldman R (2013) Understanding Psychology. McGraw –Hill.

Sensory Memory

- Operates as a kind of snapshot that stores information for a brief moment in time
- Iconic memory - Reflects information from the visual system
- Echoic memory - Stores auditory information coming from the ears



Short-Term Memory

- Memory store in which information first has meaning
 - **Chunk:** Grouping of information that can be stored in short-term memory
 - Eg. 60145557982 ----- 60-14-5557982
 - Eg. 1300882525 -----1300-88-2525
- Turn left after you reach a T-junction, then go straight. At the second right junction, turn in.....
- When no longer need the info....we forget it.
- Information in short-term memory is lost after 15 to 25 seconds



Short-Term Memory

- Rehearsal
 - Elaborative rehearsal - Information is considered and organized in some fashion
 - Mnemonics - Organizing information in a way that makes it more likely to be remembered
 - Eg. MJKHBIU or ROYG.BIV...for colours of rainbow
 - Sequence of planets??

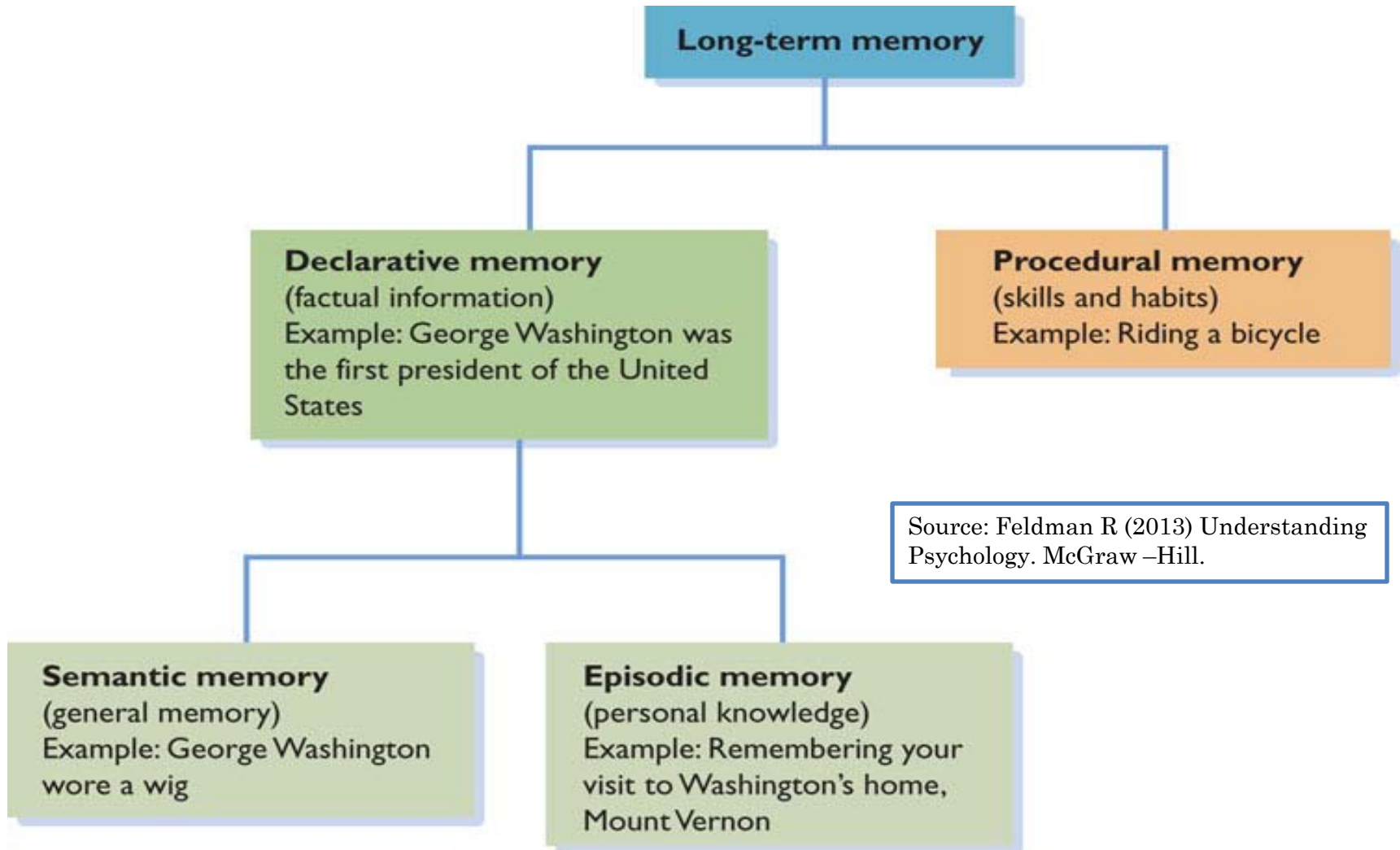


Long-Term Memory

- Serial position effect - Ability to recall information in a list depends on where the item appears in the list
 - Primacy effect (we remember items at the beginning of the list)
 - Recency effect (we remember items at the end of the list)



Long-Term Memory Modules

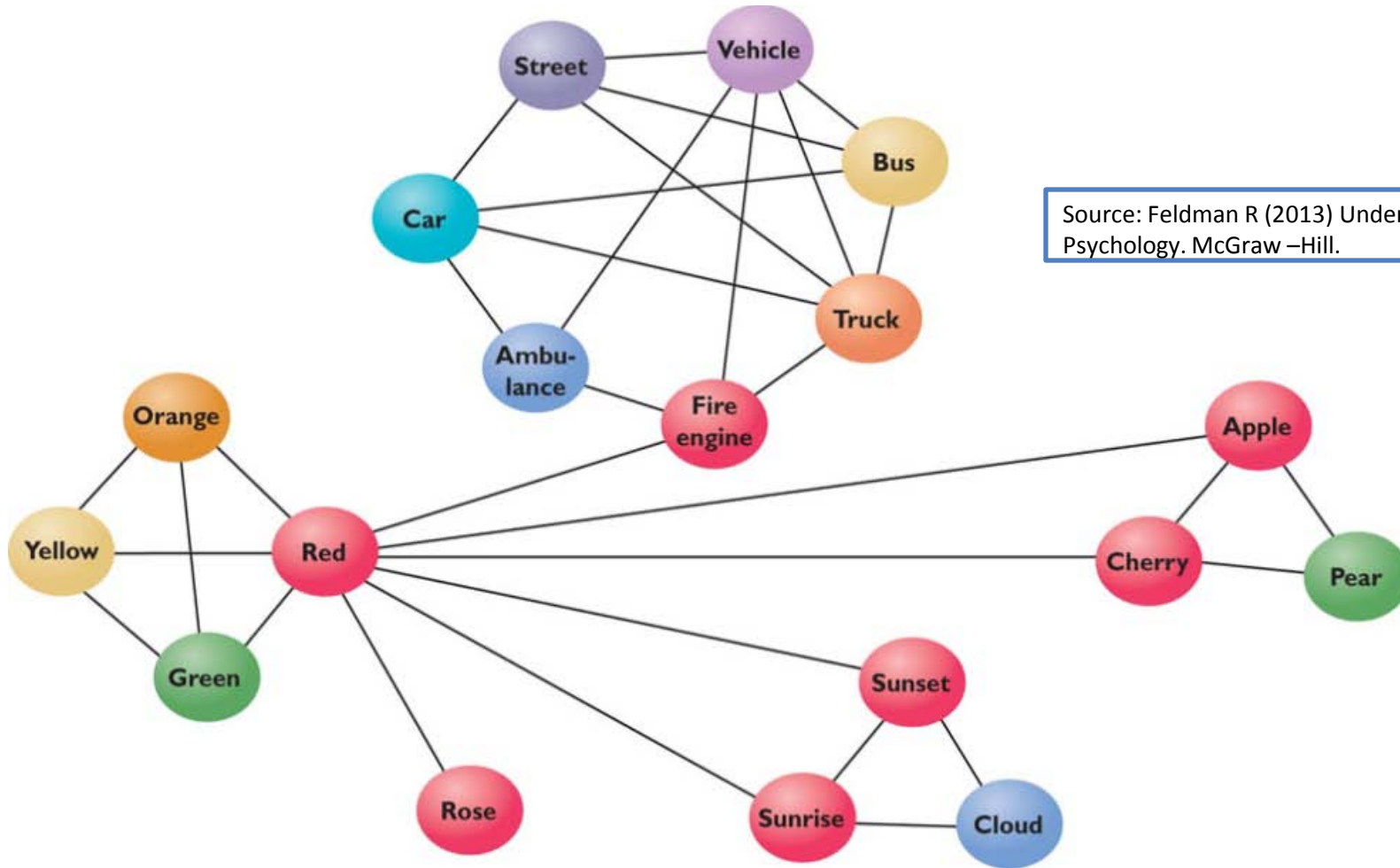


Long-Term Memory

- **Semantic networks:** Mental representations of clusters of interconnected information
 - Spreading activation - Activating one memory triggers the activation of related memories



Semantic Networks



Source: Feldman R (2013) Understanding Psychology. McGraw –Hill.

Long-Term Memory

- The neuroscience of memory
 - Engram - Physical memory trace in the brain that corresponds to a memory
 - Hippocampus - Plays a central role in the consolidation of memories
 - Amygdala - Involved with memories involving emotion



Long-Term Memory

- Memory at the level of neurons
 - Long-term potentiation - Certain neural pathways become easily excited while a new response is being learned
 - Consolidation - Memories become fixed and stable in long-term memory



Forgetting

- **Tip-of-the-tongue phenomenon:** The inability to recall information that one realizes one knows



Retrieval Cues

- Stimulus that allows us to recall more easily information that is in long-term memory
- **Recall:** Specific piece of information must be retrieved
- **Recognition:** Occurs when one is presented with a stimulus and asked whether he has been:
 - Exposed to it previously, or is asked to identify it from a list of alternatives



Levels of Processing

- Emphasizes the degree to which new material is mentally analyzed
 - At shallow levels, information is processed in terms of its physical and sensory aspects
 - At the deepest level of processing, information is analyzed in terms of its meaning



Explicit and Implicit Memory

- **Explicit memory:** Intentional or conscious recollection of information
- **Implicit memory:** Memories of which people are not consciously aware
 - Can affect subsequent performance and behavior
 - **Priming:** Exposure to a word or concept later makes it easier to recall related information



Flashbulb Memories

- Memories related to a specific, important, or surprising event that are recalled easily
 - Source amnesia - When an individual has a memory for some material:
 - But cannot recall where he or she encountered it
 - Example - September 11th, 2001



Constructive Processes in Memory: Rebuilding the Past

- Processes in which memories are influenced by the meaning one gives to events
 - **Schemas:** Organized bodies of information stored in memory that bias the way new information is:
 - Interpreted
 - Stored
 - Recalled



Forgetting: When Memory Fails

- Why do we forget information?
- What are the major memory impairments?



Memory Failure

- Memory failure is essential to remembering important information
 - Forgetting helps keep unwanted information from interfering
 - Forms general impressions and recollections



Why We Forget

- Failure of encoding
 - Did not pay attention to material
- **Decay:** Loss of information through nonuse
 - Memory traces - Physical changes that take place in the brain when new material is learned



Why We Forget

- Interference and cue-dependent forgetting are key processes in forgetting
 - **Interference:** Information in memory disrupts the recall of other information
 - **Cue-dependent forgetting:** When there are insufficient retrieval cues to rekindle information that is in memory



Proactive and Retroactive Interference

- **Proactive interference:** Information learned earlier disrupts the recall of newer material
 - Progresses in time
- **Retroactive interference:** Material that was learned later disrupts the retrieval of information that was learned earlier
 - Retrogresses in time



Memory Dysfunctions: Afflictions of Forgetting

- **Alzheimer's disease:** Characterized in part by severe memory problems
- **Amnesia:** Brain disorder that heads to a gradual and irreversible decline in cognitive abilities
 - **Retrograde:** Memory is lost for occurrences prior to a certain event
 - **Anterograde:** Memory is lost for events that follow an injury
- **Korsakoff's syndrome:** Afflicts long-term alcoholics; tendency to repeat the same story

