Psychology Week 7: Gen

Packet Overview:

<table>
<thead>
<tr>
<th>ESSENTIAL QUESTION:</th>
<th>What is memory? How does it impact our behavior?</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK TO BE RETURNED:</td>
<td>Day 1: Introduction to Memory</td>
</tr>
<tr>
<td></td>
<td>Day 2: Parts of the brain involved in with memory</td>
</tr>
<tr>
<td></td>
<td>Day 3: Problems with memory and how to enhance memory.</td>
</tr>
<tr>
<td>RESOURCES:</td>
<td>Assignment 1: After reading through the introduction answer the five questions related to the text.</td>
</tr>
<tr>
<td></td>
<td>Assignment 2: After reading the text on the parts of the brain, answer the questions in complete sentences.</td>
</tr>
<tr>
<td></td>
<td>Assignment 3: Constructed response</td>
</tr>
<tr>
<td>TIME ALLOCATED:</td>
<td>3 (20) minute lessons</td>
</tr>
</tbody>
</table>

Memory is an information processing system; therefore, we often compare it to a computer. **Memory is the set of processes used to encode, store, and retrieve information over different periods of time** (Figure 8.2).

**Encoding**

We get information into our brains through a process called encoding, which is the input of information into the memory system. **Once we receive sensory information from the environment, our brains label or code it.** Visual encoding is the encoding of images, and acoustic encoding is the encoding of sounds. An example of acoustic encoding. You are driving in your car and a song comes on the radio that you haven’t heard in at least 10 years, but you sing along, recalling every word.

**The self-reference effect** is the tendency for an individual to have better memory for information that relates to their life, or that they are interested in. For example, in school you may enjoy learning about subjects that you are interested in or that you are good at, rather than a subject that does not relate on a personal level.

**Storage**

Once the information has been encoded, we have to somehow retain it. **Our brains take the encoded information and place it in storage.** Storage is the creation of a permanent record of information.

**Stimuli from the environment are processed first in sensory memory:** storage of brief sensory events, such as sights, sounds, and tastes. It is very brief storage—up to a couple of seconds. We are constantly bombarded with sensory information.
Short-term memory (STM) is a temporary storage system that processes incoming sensory memory. Long-term memory (LTM) is the continuous storage of information. Unlike short-term memory, the storage capacity of LTM has no limits. It encompasses all the things you can remember that happened more than just a few minutes ago to all of the things that you can remember that happened days, weeks, and years ago.

### Assignment 1

**Directions**: After reading the introduction information on memory, answer the questions below in complete sentences.

1. What is Memory?

2. Explain what encoding is. Give one example.


4. How does the environment impact your memory? Give an example.

5. What is the difference between short term and long term memory?

### Parts of the Brain involved with Memory:

- Prefrontal cortex
- Amygdala
- Hippocampus
- Cerebellum
First, let’s look at the role of the amygdala in memory formation. The main job of the amygdala is to regulate emotions, such as fear and aggression. The amygdala plays a part in how memories are stored because storage is influenced by stress hormones. For example, if you went into a haunted house and were chased by a man with a chainsaw then your amygdala most likely produced a fear and stress hormone that will then stick in your memory. Therefore next time your friends want to go to a haunted house you may not want to go because you are scared of the man with the chainsaw.

The Hippocampus

The hippocampus connects and stores memory. It also helps transfer new learning into long-term memory. Injury to this area leaves us unable to process new memories. One famous patient, known for years only as H. M. had both his left and right temporal lobes (hippocampi) removed in an attempt to help control the seizures he had been suffering from for years. As a result, his memory was significantly affected, and he could not form new knowledge. He lost the ability to form new memories, yet he could still remember information and events that had occurred prior to the surgery.

Neurotransmitters

There also appear to be specific neurotransmitters involved with the process of memory, such as epinephrine, dopamine, serotonin, glutamate, and acetylcholine. Although we don’t yet know which role each neurotransmitter plays in memory, we do know that communication among neurons via neurotransmitters is critical for developing new memories. It is also believed that strong emotions trigger the formation of strong memories, and weaker emotional experiences form weaker memories; this is called arousal theory. For example, strong emotional experiences can trigger the release of neurotransmitters, as well as hormones, which strengthen memory; therefore, our memory for an emotional event is usually better than our memory for a non-emotional event. When humans and animals are stressed, the brain secretes more of the neurotransmitter glutamate, which helps them remember the stressful event.

Assignment 2

Directions: Answer the questions below in complete sentences and then answer the multiple choice questions using the text above.

1. What might happen to your memory system if you sustained damage to your hippocampus?
2. What is the purpose of the Amygdala? Give an example of how the amygdala impacts our memory.
3. Name at least three neurotransmitters involved in the process of memory.
4. What is arousal theory?
5. What are the four parts of the brain involved in memory?
Problems with Memory

Amnesia is the loss of long-term memory that occurs as the result of disease, physical trauma.

Retrograde amnesia is loss of memory for events that occurred prior to the trauma. People with retrograde amnesia cannot remember some or even all of their past. They have difficulty remembering episodic memories. What if you woke up in the hospital one day and there were people surrounding your bed claiming to be your spouse, your children, and your parents? The trouble is you don’t recognize any of them.

The formulation of new memories is sometimes called construction, and the process of bringing up old memories is called reconstruction. Yet as we retrieve our memories, we also tend to alter and modify them. A memory pulled from long-term storage into short-term memory is flexible. New events can be added and we can change what we think we remember about past events, resulting in inaccuracies and distortions. People may not intend to distort facts, but it can happen in the process of retrieving old memories and combining them with new memories.

When someone witnesses a crime, that person’s memory of the details of the crime is very important in catching the suspect. Because memory is so fragile, witnesses can be easily (and often accidentally) misled due to the problem of suggestibility. Suggestibility describes the effects of misinformation from external sources that leads to the creation of false memories.

Ways to Enhance Memory

Most of us suffer from memory failures of one kind or another, and most of us would like to improve our memories so that we don’t forget where we put the car keys or, more importantly, the material we need to know for an exam. In this section, we’ll look at some ways to help you remember better, and at some strategies for more effective studying.

Memory-Enhancing Strategies

What are some everyday ways we can improve our memory, including recall? To help make sure information goes from short-term memory to long-term memory, you can use memory-enhancing strategies. One strategy is rehearsal, or the conscious repetition of information to be remembered (Craik & Watkins, 1973). Think about how you learned your multiplication tables as a child. You may recall that 6 x 6 = 36, 6 x 7 = 42, and 6 x 8 = 48. Memorizing these facts is rehearsal.

Another strategy is chunking: you organize information into manageable bits or chunks.

Mnemonic devices are memory aids that help us organize information for encoding. They are especially useful when we want to recall larger bits of information such as steps, stages, phases, and parts of a system (Bellezza, 1981). Brian needs to learn the order of the planets in the solar system, but he’s having a hard time remembering the correct order. His friend Kelly suggests a mnemonic device that can help him remember. Kelly tells Brian to simply remember the name Mr. VEM J. SUN, and he can easily recall the correct order of the planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. You might use a mnemonic device to help you remember someone’s name, a mathematical formula, or the order of mathematical operations.
Assignment 3

Directions: Answer the constructed response question below in at least 5-8 sentences. Use examples from your own life and from the text.

Question: Your friend is in a car accident and suffers a brain injury. She is unable to remember long-term memories. What part of the brain has she injured? Due to the injury what memory problem is she now dealing with? What are a few ways she can enhance her memory?