**Memory**

Specific regions of the brain are largely responsible for memory, and therefore are the most important for this project. When one learns something new, it is immediate registered as part of the sensory memory. This information is sent to the brain to be retained for future reference, first in the short-term memory, then in the long-term memory. However, along the way to long-term storage, the nerve connections that allowed the person to initially perform the new task are strengthened and solidified in a process called �consolidation�. Consolidation is said to be the �fundamental process involved in learning something new�, because it reinforces the neural connections and our ability to quickly recall a skill or thought.  (Gordon 78)

 Two regions are pertinent in allowing solidification to take place: the hippocampus and the thalamus. The hippocampus, located inside the Temporal Lobe, is named in Latin for is physical resemblance of a �seahorse�, and contains 40 million nerve cells. The limbic system of the hippocampus plays a major role in recognition and memory. The thalamus, situated deep within the center of the brain, functions to integrate sensory information. While these two regions help store the information, another, the amygdala, helps access and recognize what has been stored. Located near the hippocampus, the amygdala measures how familiar a sight or action is. (Gordon 71)

            The brain has the remarkable ability to store the memories in the brain in two different forms: activated and permanent. A memory in its activated form is likely part of one�s consciousness, and is characterized by nerves communicating with each other in response to a visual stimulation. The same memory may also be a part of our long-term memory, but has to be �re-activated� to be retrieved and become part of our consciousness once again. Skills and thoughts that are in our long-term storage require stimulation for reactivation. If stimulated, a map of connections between various nerves recreates the initial communication of the active memory, bringing the memory into clear focus for the person. After or without stimulus, the map of nerve-connections remains dormant as part of one�s long term memory. (Gordon 76-77)

            While we are asleep at night, our brain is busy performing many of the previously discussed functions. One very important period during sleep that potentially relates to the storage of memories is Rapid Eye Movement (REM), which was discovered in 1953. According to the Society for Nueroscience, REM sleep is �an active period of sleep marked in humans by intense activity in the brain and rapid bursts of eye movements.� During REM sleep, the brain is working overtime while the rest of the body is paralyzed. Scientists have learned that dreams occur during REM sleep, and that patients who are awakened during a period of REM sleep can vividly remember their dreams. REM sleep is interestingly related to thoughts and memory because of the brain structures that are active during the sleep. Scientists are still learning more about this important period of sleep, but now know that it begins in the brainstem, in the pons. The pons communicates via neurotransmitters with the thalamus, which is associated with thought processes and memory. The pons also sends signals to the cerebral cortex, telling this structure near the spinal cord to temporarily paralyze the body. Much has yet to be discovered about the mysterious process of sleep and the brain regions involved; however, what we know thus far can help us form significant theories on the correlation of sleep deprivation and memory. (www.sfn.org)

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