**Plans for this Experiment**

Unfortunately, I have spent many nights typing or reading away, simply because there aren�t enough hours in the day. Sometimes, no matter how I prioritize or organize, demanding classes leave me with hours of homework per night, and I have no other choice than to cut into my sleep time.  I was intrigued to research this information because although I was aware that �sleep deprivation is bad�, my knowledge on the issue was basic at best. I realized that it is my own body after all that I may or may not be harming with my lack of sleep; why not find out, to the best of my ability, what is really going on when I stay up late doing homework.

Ultimately, the feeling of sleep deprivation is very common; I also suspect that there is a conscious or subconscious recognition by those suffering from lack of sleep that their thinking and cognitive ability is at least somewhat altered. The degree to which ability can be altered, however, has left me shocked and concerned. Beyond the obvious, detrimental physical health effects, the significant effects of sleep deprivation on the brain is an issue that I feel more students should be aware of. If memories are transferred from short-term to long-term storage during REM sleep in one�s nightly rest, then it is understandable why a student who has pulled an �all-nighter� to learn 20 new Spanish vocabulary words really can�t remember the terms come the test the next day. If the brain�s remarkable ability somehow allows the student to pass the test because of repetition the hour before the test, then the student has lucked out for the short-run. However, as studies are beginning to show, additional storage of new information continues to occur in the nights following the initial transfer of memories. Basically, it seems that this tired student has no hope of retaining the Spanish words long-term if he continues to deprive himself of sleep during following nights. Because the aforementioned student could be almost any student I know, this experiment will be extremely pertinent to my life. More importantly, the information that I broadcast could benefit busy students and motivate them to change their sleeping and studying habits not only for their health, but also for their ability to remember information come finals in June.

The actual effect of sleep deprivation on memory is clear and established: complete sleep deprivation leads to the inability to remember new concepts learned from the previous day. This of course proves that storage of new memories must occur during sleep. Until MIT�s most recent study, it has been assumed that the majority of this storing occurs during REM sleep. However, Matthew Wilson�s results do in fact show that encoding of memories may occur during REM and non-REM sleep. Based on other studies, however, and the brain regions that are activated both during the learning of a new task and during REM sleep, I feel that REM sleep does play a major role, and is what I plan to focus on for this experiment.

To avoid simply repeating what is already established about the effects of sleep deprivation and memory, I plan to cater my experiment to specifically address what some of my peers might be wondering. Is there any middle ground between storage of memories during a full nights rest and (lack of) storage during complete deprivation?

    Many students, myself included, tend to get four, five or six hours of sleep per night, not deprivation but also not a full nights rest. I plan to look at the most crucial time periods during sleep for memory storage. Simply for purposes of memory encoding, what is the difference between four and eight hours of sleep?

            REM periods of sleep tend to get longer as a human�s night of sleep passes. During an eight-hour period of sleep, humans go through a five-stage sleep cycle several times, which can include up to five periods of REM sleep (Meyers). If one only gets four hours, they would likely only experience two REM periods. How will this effect memory storage, and the ability to remember come the next day? I plan to find out.

            I plan to use rodents for my experiment, because of the importance of monitoring the subjects� sleep habits closely. To perform this experiment successfully, I need to teach a new, cognitive task then effectively deprive my subjects of controlled amounts of sleep. Rodents have an affinity for mazes and nocturnal sleeping patterns, which makes them prime subjects. While the human sleep cycle repeats every 90 minutes, rats have extremely short sleep cycles that repeat every 10 minutes. However, this shouldn�t pose a problem to the accuracy of my results, because as their even though the experience more sleep cycles, their REM sleep is still presumed 20-25% of all of their sleep, just like humans. (Griffin 84)

        Ultimately, I hope that my results will point to a specific amount of sleep that seems crucial for memory function. I hope that other busy students will be able to benefit from this information and plan their sleep accordingly, so that there memory will be least diminished as they struggle to budget their time.

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