

COGS 101: Introduction to Cognitive Science

Fall 2014 Group Project

Students in COGS 101 came up with 30 research projects that could serve as Capstone Projects. If you'd like to use one of them, you'd need to get permission from the group (contact info on the slide).

Assignment

Based on your journal experiences (topic were sleep, procrastination, and threat), design a research study that could be carried out by an undergraduate in 1-2 semesters as a SAGES Capstone (<http://www.case.edu/sages/Capstone.html>). Create slide that describes the study so it could be understood by someone unfamiliar with the topic, including research question, method, data, and your predictions.

Does Productivity Extension Software Reduce Procrastination?

Group 1: Karbi Choudhury, Santosh Coorg, Thomas McCall, Timothy Nicholas Contact: klc99@case.edu

Background

Technology can be utilized to reduce procrastination, if implemented early in the semester.

In light of the fact that students with high GPAs are significantly less likely to procrastinate due to optimal self-imposed deadlines, researchers propose combating procrastination by imposing enforced, intermediate deadlines on assignments (Zarick & Stonebraker 2009). Researchers also found that people who procrastinated early in the semester, with low levels of perfectionism, showed the highest levels of psychological distress (Rice, Richardson, Clarissa & Clark, 2012) Psychological detachment – defined as a lack of interest in one's work – increases levels of procrastination. Researchers also found that there was a strong relationship between workload and fatigue: a heavy workload leads to procrastination. (DeArmond, Matthews, and Bunk 2013) Short Message Service (SMS) reminder systems have a significant impact on reducing procrastination levels, but not necessarily on performance levels (Davis and Abbitt 2013).

References:

*Davis, Darrel R., and Jason T. Abbitt. "An Investigation of the Impact of an Intervention to Reduce Academic Procrastination Using Short Message Service (SMS) Technology." *Journal of Interactive Online Learning* 12.3 (2013): 78-102. Web. *I'll Do It Tomorrow: the Logic of Procrastination. Zarick, Lisa M.; Stonebraker, Robert. College Teaching, 2009, Winthrop University. *Perfectionism, procrastination, and psychological distress. Rice, Kenneth G.; Richardson, Clarissa M. E.; Clark, Dustin. Journal of Counseling Psychology, Vol 59(2), Apr 2012, 288-302. *DeArmond, Sarah, Russell Matthews, and Jennifer Bunk. "Workload and Procrastination: The Roles of Psychological Detachment and Fatigue." *International Journal of Stress Management*. N.p., 2013. Web.

Proposed Study

Research Question: Does productivity extension software, such as Stayfocsd, reduce internet procrastination and improve performance?

Method: Students in a course with weekly, online quizzes (such as COGS101) will be assigned to one of two groups. The first group will utilize no productivity extension software during the length of the course, while the second group will utilize productivity extension software during the length of the course that blocks "time-wasting" websites, such as social media sites and gaming sites.

Data: Weekly quiz scores will be analyzed, along with when the students completed the quizzes relative to the date of assignment.

Prediction: Students with the productivity extension will have higher scores and will complete it earlier than students without the productivity extension.

Can Short Naps Prior to Testing Improve Test Scores?

Group 2: Ryan Konrad, Liza Burlingame. Contact: rrk53@case.edu

Background

Having sound sleeping habits, multiple wake/rest cycles, and short napping periods prior to preparing for tests has been shown to improve memory recall and overall scores on said tests.

On average, people had better overall memory recall on active retrieval vocabulary tests following short sleep periods (Lahl, Wispel, Willigens, & Pietrowsky, 2007). Having multiple sleep periods, rest/wake cycles, in between study sessions allowed for greater improvement of memory recall (Tucker, Tang, Uzoh, Morgan, & Stickgold, 2011). The testing effects were reduced or even eliminated after sleep, because sleep benefited recall of restudied items but left recall of retrieved items unaffected (Bauml, Holterman, & Abel, 2014). Executive functions take longer to return to asymptotic performance after sleep than does performance of simpler tasks which are less reliant on executive functions (Groeger, Burns, Lo & Dijk, 2011).

Proposed Study

Research Question: Do students who take short 50 minutes naps prior to taking tests receive better overall scores than those who take the test without a short nap?

Methods: Students in a course with weekly vocabulary tests will be asked to participate in a semester long study. Of those who agree one-third will randomly assigned to one of three conditions, 50 minute sleep period, 50 minute rest period or 50 minute quiet period. Students will then be given a 30 minute buffer period before being administered a written vocabulary test. Those in the resting and quiet period will not be allowed to sleep or socialize with other students.

Data: Weekly vocabulary test scores will be recorded.

Prediction: Average weekly test scores will be compared across the three different groups of students. We predict that the vocabulary test scores will be highest for the students who slept for 50 minutes before the vocabulary test.

Sources:

Baumel, K., Holterman, C., and Abel, M. (2014). Sleep Can Reduce the Testing Effect: It Enhances Recall of Restudied Items but Can Leave Recall of Retrieved Items Unaffected. *American Psychological Association*. 1568-1581.

Groeger, J. A., Burns, C. G., Lo, J. C. Y., Dijk, DJ. (2011) Effects of sleep inertia after daytime naps vary with executive load and time of day. *Behavioral Neuroscience*, 125(2), 252-260.

Lahl, O., Wispel, C., Willigens, B., and Pietrowsky, R. (2007). An ultra short episode of sleep is sufficient to promote declarative memory performance. *Institute of Experimental Psychology*. 3-10.

Tucker, M., Tang, S., Uzoh, A., Morgan, A., and Stickgold, R. (2011). To Sleep, to Strive, or Both: How Best to Optimize Memory. *Department of Psychiatry, Harvard Medical School*. 1-6.

Can lucid dreaming improve intrinsic motivation?

Group 3: Cristina DiFranco, Mark Kaminski, Alexander Meltsner, Maining Fu; Contact: mmk145@case.edu

Background

Lucid dreaming is knowing that you are in a dream and being able to control your own dreams. Research studies have shown that lucid dreams can be altered to fit the desires of the dreamer.

To reach the goal of lucid dreams, one study illustrated details about how to learn lucid dreaming by autosuggestion and mnemonic induction (LaBerge, 1980). One of the studies suggested that persistent lucid dreamers have an increased cognitive ability (specifics unknown) compared to non-lucid dreamers (Blagrove, 2010). One study suggests that lucid dreams have the potential to decrease the frequency of nightmares (Spoomaker, 2003). Lucidity in dreams has also been shown to be associated with the use of electronic media during the daytime, especially video games (Gackenbach, 2009).

Source:

- * Blagrove, M. & Wilkinson, A. (2010). Lucid dreaming frequency and change blindness performance. *Dreaming*, 20(2), 130-135.
- * Gackenbach, Jayne. 2009. Electronic Media and Lucid-Control Dreams: Morning After Reports. *Dreaming*, 19(1), 1-6
- * LaBerge, Stephen. 1980. Lucid dreaming as a learnable skill: a case study. *Perceptual and motor skills*, 51, 1039-1042.
- * Spoomaker, V., van den Bout, J., & Meijer, E. (2003). Lucid Dreaming Treatment for Nightmares: A Series of Cases. *Dreaming*, 13(3), 181-186.

Proposed Study

Research Question: Can lucid dreaming to orient dreams towards reaching academic success improve the intrinsic motivation of a college student?

Method: Students doing poorly in their classes will be asked to participate. Those who agree will fill out The Self-Regulation Questionnaire - Academic Self-Regulation Questionnaire (SRQ-A) from *selfdeterminationtheory.org* to determine the level of their intrinsic motivation. They will then attempt lucid dreaming through the mnemonic induction method to study and earn A's on their exams in their dreams. If they achieve lucid dreaming, then they will take the questionnaire again after every lucid dream and the level of intrinsic motivation will be recorded.

Data: Scores from SRQ-A would be collected.

Prediction: Intrinsic motivation scores for each participant will be compared over time. We predict that the intrinsic motivation scores will increase after every lucid dream for a participant.

DOES PROCRASTINATING LEAD TO SHORT TERM HAPPINESS AT THE COST OF PERFORMANCE AND LONG TERM SATISFACTION?

Group 4: Marcos Agaiby, Laya Bahrani, Jonathan Freeman, Denise Nitkowski Contact: agaiby@case.edu

BACKGROUND

Poor mental health, dynamic deadline-based stress, avoidance of effective coping behaviors, and self-control issues are all associated to procrastination, especially in students in academic environments.

Students who regularly procrastinate were found to have poorer mental health and were less likely to seek help, especially younger men (Stead, Shanahan, Neufeld, 2010). Students who procrastinated at the beginning of a semester experienced less stress than non-procrastinators, but tended to have greater stress and poorer academic performance as deadlines approached (Tice & Baumeister, 1997). Procrastinators were less likely to use effective coping behaviors and improve mental health (Ferrari & Diaz-Morales, 2014). A negative correlation between self-control and procrastination was found from data measuring workload, psychological detachment, fatigue and procrastination (DeArmond, Matthews, Bunk, 2014).

SOURCES

- *Stead, R. Shanahan, M. J. Neufeld, R. W. J. (2010). "I'll go to therapy, eventually": Procrastination, stress and mental health. *Personality and Individual Differences*, 49, 175-180.
- *Ferrari, J.R. & Diaz-Morales, J.F. (2014) Procrastination and mental health coping: A brief report related to students. *Individual Differences Research*, 12 8-11
- *DeArmond, S., Matthews, R. A., & Bunk, J. (2014). Workload and procrastination: The roles of psychological detachment and fatigue. *International Journal of Stress Management*, 21(2), 137-161.
- *Tice, D. M. Baumeister, R. F. (1997). Longitudinal study of procrastination, performance, stress, and health: The costs and benefits of dawdling. *Psychological Science*, 8, 454-458.
- 1. *Lay, C.H. (1986). At last, my research article on procrastination. *Journal of Research in Personality*, 20, 474-495.
- 2. *Diener, E. Emmons, R. A. Larsen, R. J. Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49, 71-75.

PROPOSED STUDY

Research Question: Are procrastinators less or more satisfied with their lives than non-procrastinators? How does this change throughout a semester and how is it impacted by their performance?

Method: Students (who agree to participate) in a class (COGS102) will be measured by the General Procrastination Scale (GP; Lay, 1986)¹ at the start of the semester, and divided into two groups: procrastinators and non-procrastinators. They will also take the Satisfaction With Life Scale (SWLS; Diener et al., 1985)² at the beginning of the semester. At quarter intervals of the semester, all students will retake the SWLS and their class grades will be collected.

Data: At semester start, scores from GP scale and SWLS. Quarterly, class grades (in percent) of student performance and the SWLS scores.

Prediction: We predict that students, both procrastinators and non-procrastinators, will initially have equal SWLS scores but as the semester continues, the scores of procrastinators will decrease, beginning in the third quarter.

Is Sleep Deprivation Irritability Contingent on Eveningness & Morningness?

Group 5: Dallas Eckman, Monroe Chen, Vanitha Raguveer, Rita Maricocchi

Contact: dse21@case.edu

BACKGROUND

Sleep deprivation causes heightened responses to low stressors and negatively affects executive control.

Sleep-deprived people (awake for 24 hours) put in high stress and low stress situations only performed significantly worse in low stress situations (Minkel, Banks, and Htaik 2012). Furthermore, sleep-deprived people only suffered in one of the three categories of attention: executive control. The other two categories, alerting and orienting, were not significantly affected (Jugovac, Cavallero, 2012). Chronotypes separate individuals into either morningness or eveningness categories. The morningness and eveningness preferences determines when individuals are most alert, and are a their peak performance (Putilov, Donskaya, and Verevkin 2014).

Sources

- Jugovac, Davide, Cavallero, Corrado (2012). Twenty-four hours of total sleep deprivation selectively impairs attentional networks. *Experimental Psychology*, Vol 59(3), 2012, 115-123.
- Lahl, Olaf, Christiane Wispel, Bernadette Willigens and Reinhard Pietrowsky (2007). An ultra short episode of sleep is sufficient to promote declarative memory performance. doi: 10.1111/j.1365-2869.2008.00622.x
- Minkel, J. D. Banks, S. Htaik, O. (2012). Sleep deprivation and stressors: evidence for elevated negative affect in response to mild stressors when sleep deprived. *Emotion*, 12(5), 1015-1020. DOI: 10.1037/a0026871
- Tucker, MA, Tang SX, Uzoh A., Morgan A, Stickgold R. (2011).. To Sleep, to Strive, or Both: How Best to Optimize Memory. *Plos ONE* 6(7): e21737. doi:10.1371/journal.pone.0021737
- Putilov, Arcady A.; Donskaya, Olga G.; Verevkin, Evgeniy G (2014). Phase difference between chronotypes in self-reported maximum of alertness rhythm: An EEG predictor and a model-based explanation. *Journal of Psychology*, Vol 28(4), 2014, 242-256.
- Goel, N., Rao, H., Durmer, J., & Dinges, D. (2009). Neurocognitive Consequences of Sleep Deprivation. *Seminars in Neurology*, 29(4), 320-339.

PROPOSED STUDY

Research Question: Do sleep deprived students' irritability response depend on the chronotype (eveningness or morningness) of said student?

Method: Case Western students randomly selected to participate as per a qualifying survey which indicates students preference to eveningness or morningness. Equal numbers of either extreme chronotype will be selected for the study. Students will be asked to stay awake for 24 hours prior to beginning the study and to abstain from consuming caffeine and/or energy supplements. Study will take place at both evening and morning timeslots where subjects are sorted randomly to either time. Subjects will be exposed to high stress and low stress activities (e.g. Stroop test, serial subtraction tests, divided attention tasks) and will be given a follow-up questionnaire (POMS test) to gauge their stress response to the given activities.

Data: Responses will be categorized by three POMS test subscales: Depression-dejection, tension-anxiety, and anger-hostility.

Prediction: We predict that there will be a lower irritability response from students with compatible chronotype to that of their given time slot.

The Legacy Decision: Do patients who know someone else with the same diagnosis experience less medical decision-making anxiety?

Group 6: Hannah Kent, Caitlin Hearn. Contact: Hannah Kent hgk13@case.edu

Background:

Researchers have studied patients in medical decision making and found that, over environmental, emotional, and mental factors, decision making is likely a stable personality trait (Petersen et. al, 2003). The study analyzed four types of decision making: information seeking, information processing, advice following, and ruminating. They also found that style of decision making to be “one component of complex management style for emotion” (Petersen et. al, 2003, 329).

In 2010, researchers wanted to know how personality and patient perception of threat that diabetes poses affect newly diagnosed diabetes patients’ coping ability. After a recent diabetes diagnosis, participants took a personality trait test and a threat perception questionnaire. Two years after diagnosis, the same participants were given the Revised Illness Perception questionnaire and were evaluated on their coping mechanisms. Patients who perceived diabetes to be more threatening (often due to the way it was explained to them) were less likely to have good coping strategies and were less likely to believe in the effectiveness of treatment (Lawson et. al, 2010).

Sources:

* Lawson, V.L., Bundy, C., Belcher, J., and Harvey, J.N. (2010). Mediation by illness perceptions of the effect of personality and health threat communication on coping with the diagnosis of diabetes. *British Journal of Health Psychology*, 15(3), 623-642. DOI: 10.1348/135910709X478664

* Petersen, S., Schwartz, R. C., Sherman-Slate, E., Frost, H., Straub, J. L., & Damjanov, N.(2003). Relationship of Depression and Anxiety in to Cancer Patient’s Medical Decision Making. *Psychological Reports*, 93, 323-334.

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* Régner, I., Smeding, A., Gimmig, D., Thinus-Blanc, C., Monteil, J., Huguet, P. (2010). Individual Differences in Working Memory Moderate Stereotype-Threat Effects. *Association for Psychological Sciences* 21(11), 1646-1648.

Proposed Study

Research Question: Do patients recently diagnosed with Type 2 diabetes experience more or less anxiety in deciding on medical treatment when they know someone else who has had a similar diagnosis and prognosis?

Method: Potential patients (those who have a new diagnosis of Type 2 diabetes and are in the process of making decisions about their treatment) at the Center for Dialysis Care (CDC) and University Hospitals will be asked to participate via flyers around the center. They will be divided into two groups: one comprising people who personally know someone who has had a similar diagnosis and prognosis to theirs, and one comprising people who don’t personally know anyone with a similar diagnosis and prognosis to theirs. The State Trait Anxiety Inventory (STAI) will be administered to the two groups. On this inventory, a higher score correlates with higher anxiety levels.

Data: The STAI will be given to the control group and the test group.

Prediction: Average STAI score will be compared across the two groups. We predict that the STAI score will be higher for the group that does not know anyone else with a diagnosis and prognosis similar to theirs.

Does Caffeine Consumption Positively Impact Memory Performance in Sleep Deprived Individuals?

Group 7: Harini Ushasri, Christopher Gittings, Caitie Gaffney, Obinna Ugwuegbu Email: cwg28@case.edu

Background

Sleep deprivation has been shown in previous studies to decrease cognitive performance in memory tasks (Tucker, Tang, Uzoh, Morgan & Stickgold, 2011). Similarly, it has been shown that sleep, even napping, can improve memory abilities (Lahl, Wispel, Willigens & Pietrowsky, 2008). Meanwhile, caffeine has been shown in studies to improve mood and cognitive abilities in sleep deprived individuals (Childs & de Wit, 2008; Souissi, Chtourou, Abedelmalek, Ghozian, & Sahnoun, 2014). Other effects of caffeine include increased hyperactivity and aggression (Volger, Perkinson-Gloor, Brand, Grob & Lemola, 2014). Caffeine has also been shown to correlate with less sleep and more awakeness in individuals (Calamaro, Mason & Ratcliffe, 2009). Based on these previous studies, the current proposed study aims to look at the effects of caffeine specifically on memory and whether caffeine can lessen the negative effects of sleep deprivation on memory retention.

Proposed Study

Research Question: Will sleep deprived individuals perform better on a memory task after having caffeine?

Method: Forty undergraduate Students will be asked to participate. Those who agree to participate will be randomly assigned to one of two groups (a placebo decaffeinated coffee group and a caffeinated coffee group). Students in both conditions will be required to wake up at 8am the day before they undergo a memory test, and will be required not to sleep between that time and the test that will be administered the following day at 8am. One hour before a memory test is administered to all participating students, each student will be served a cup of coffee. Each student will receive a 16oz caffeinated or decaffeinated coffee to consume, depending on the subject group to which he or she is assigned. No student will be allowed to know whether the coffee he or she consumes is caffeinated for not. At 8am, a memory test will be administered to all students, and then data will be collected and analyzed.

Data: Data will be collected from the results of the memory test. The memory test will consist of a task in which a researcher will speak a list of 20 commonplace words in front the students, then students will be required to quietly wait for 30 seconds before each student is allowed to write down as many words as he or she can remember. The number of words correctly remembered will be used as this experiment's measure of memory performance.

Prediction: The researchers predict that sleep deprived participant students who ingest caffeinated coffee will have higher scores on the memory test task than the sleep deprived participants who ingest decaffeinated coffee.

Sources

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- ~Tucker, M.A., Tang, S.X., Uzoh, A., Morgan, A., Stickgold, R. (2011). To sleep, to strive, or both: How to best optimize memory. *PLoS ONE*, 6(7), e21737.

Do Friends Create Nightmares?

Proposed Study

Group 9: Alexis Lopez, Victoria El-Hayek, McCoy Edmonds, and Jason Harnack

Background

Contact: vxe21@case.edu

The people you spend your time with continue to affect you while you sleep. Studies have shown that poor friendship quality decreases quality of sleep (Tavernier & Willoughby, 2014). Plus, when dreaming, other people's thoughts and feelings affect your dream content. (Kahn & Hobson, 2005) Your own physical state also affects dream content. (MacFarlane & Wilson, 2006) This is a vicious cycle in that your friends who create this poor night's sleep will also influence you poorly when you are sleep deprived. (Christian, Ellis, Mai, & Welsh, 2014). Bad friends lead to poor sleep and mental states affect dream content.



Research Question: Does poor friendship quality affect the occurrence of social stress in dreams?

Method: Have subjects take the 18-Item Peer Attachment of the Inventory of Parent and Peer Attachment and the 37 Item CSC Dream Questionnaire. Take those with high quality of peer attachment and those with low peer attachment (not using the ones in the middle). Study is done in multiple rounds to get proper sample size.

Data: Frequency with which they experience social stress in their dreams (rejection, no support, not knowing what people think of you/constantly worrying about it, peer pressure, etc).

Prediction: Those with lower friendship quality would experience social stress in their dreams more often. Those with high friendship quality would experience social stress less often.

Sources:

- > Christian, M., Ellis, A., Mai, K., & Welsh, D. (2014). Building a Self-Regulatory Model of Sleep Deprivation and Deception: The Role of Caffeine and Social Influence. *American Psychological Association*, 99(6), 1268-1277. doi: 10.1037/a0036202
- > Kahn, David & Hobson, Allan. (2005). Theory of Mind in Dreaming: Awareness of Feelings and Thoughts in Other in Dreams. *Dreaming*, 15(1) 48-57. doi: 10.1037/1053-0797.15.1.48
- > Tavernier, R. & Willoughby, T. (2014). Bidirectional associations between sleep (quality and duration) and psychological functioning across the university years. *Development Psychology*, 50(3), 674-682. doi:10.1037/a0034258
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Dealing with Size: attempting to counteract the effects of group size on social loafing and procrastination

Group 10: Chloe Lim, Jason Xie, Adrianna Harris
Contact: chl28@case.edu, jyx6@case.edu, amh228@case.edu

Background

Social loafing is an aspect of working in groups but the promise of reward reduces the effect although social loafing is still present. (Mefoh & Nwanosike, 2012.)

Social loafing is largely caused by lack of identifiability; as such, group size tends to directly affect loafing, but this can be undone by keeping group members under the impression of identifiability. (Williams, Harkins, & Latané, 1981).

Social loafing has strong relationships with a great number of factors, including size of group (direct) and perceived fairness (inverse). (Linden, Wayne, Jaworski, & Bennett, 2004).

Sources

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Williams, Kipling et al. "Identifiability as a Deterrent to Social Loafing: Two Cheering Experiments." *Journal of Personality and Social Psychology* 40(2): 303-311

Proposed Study

Research Question

Does a larger group size increase or decrease the amount of procrastination an individual engages in due to their perceived social loafing of their groupmates? Furthermore, can the effect of group size be counteracted by enforcing a sense of accountability?

Method

Participants will be split up by two distinctions, making 4 subgroups. They may be in 2-person groups, or 6-person groups; and half of each type of group will be told that they will receive a reward depending on their level of involvement with the task. The task will be the simple physical task of rearranging chairs; but each week the experiment is done it should be into a different format. The task will involve more chairs for the larger groups to account for the presence of additional physical help. Researchers will be unseen and will time and observe the groups at their work. Regardless of what division they are in, all participants will receive the same reward at the end of the experiment.

Data

Calculated the rate of which the different groups (based on number and notification of the reward) took to complete each format task.

Prediction

Groups who were told there will be a reward based on how efficient they work (measured by finishing the task earlier) will work hard enough to overcome their own subconscious tendencies towards social loafing. Whereas those who were not told will inevitably succumb to social loafing, causing a clear difference in task completion rate between the smaller and the larger groups.

Effects of Parental Relationships on Student Procrastination

Group 9: Grace Karabinus, Caroline Gray, Emily Jensen, Shiori Heima
Contact: ekj9@case.edu

Background

Having a good relationship with parents, disconnecting from work at home, and not being a perfectionist leads to less procrastination for students.

You will procrastinate less if you can disconnect from your work at home (Dearmond, et. al 2013). You will be more likely to procrastinate if you are a perfectionist (Rice, et. al 2012). Students procrastinate less if they are self motivated rather than pressured by outside factors (Bong, et. al 2014). If parents have a positive relationship with their children, their children will procrastinate less and have better academic and interpersonal skills (Nadeau 2003).

Sources

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- Dearmond, S., Matthews, R., & Bunk, J. (2013). "Workload and Procrastination: The Roles of Psychological Detachment and Fatigue." *International Journal of Stress Management*, 21(2), 137-161.
- Nadeau, Marie-France. "Les Dèterminants De La Procrastination Académique: Un Modèle Médiationnel Du Contexte Familial Et Des Processus Du Soi." *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement* 35.2 (2003): 97-110.

Proposed Study

Research Question: How do parental relationships affect student procrastination while doing a long-term project?

Method: High school students take a survey immediately after project is assigned to answer when they plan on starting work on the project. Send an email to parents to inform them that there is a project. After project is completed, students take a survey that asks about how much parents encouraged working on their project, if they have a positive relationship with their parents, and when they actually started working on the project.

Data: Take survey of self-report data immediately after project is assigned to assess when student will start project. Take another survey of self-report data when project is due to assess factors relating to relationship with parents and when the project started.

Prediction: Students with a positive relationship with their parents and whose parents are encouraging of doing the project will begin the project closer to the estimated start time and will procrastinate less.

Will Attentional Deficits Lead to a More Severe Response to Test Anxiety?

Group 12: Chris Miles, Daniel Ryave. Contact: dar131@case.edu, cjm153@case.edu

Background

Test anxiety has been shown to diminish academic performance, however attentional control abilities have been shown in past research to influence anxiety-related attentional biases.

ADHD children showed more severe anxiety symptoms than did their non-ADHD peers (Kitchens, Rosen, & Braaten 1999). Cognitive test anxiety levels are strongly negatively correlated with academic performance (Cassady & Johnson 2001). Anxiety increases attention to perceived “hard” tasks, but greater attentional control mitigates this effect (Derryberry & Reed 2002).

References

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Proposed study

Research question: Do students who have attention deficits respond more strongly than students without attention deficits to increasing levels of test anxiety?

Method: Undergraduate college students in a chosen class will be divided into three groups: no attention deficits, diagnosed ADD, and diagnosed ADHD. These students will self-report test anxiety levels via questionnaire before taking an exam in the chosen class. Students’ performance on the test will be compared to their self-reported anxiety levels before the test.

Data: Questionnaire results will be collected as well as test scores from the chosen class.

Prediction: Students with attentional deficits will have performance that decreases more strongly with levels of test anxiety compared to those without attentional deficits

How do sleep problems and self perceived well-being affect GPA?

Group 13: Erika Cyphert, Victoria Neikam, Alannah Kennedy, Zigang Chen. contact:akk37@case.edu

Background

Families with lower socioeconomic status are more likely to have problems with sleep duration, efficiency, and variability. In addition to the sleep problems that extends into adulthood, the children were also more likely to have inadequate neurobehavioral development in-utero and during childhood. (Baglet, 2013). The effects of subjective socioeconomic position (SEP) on the sleep of children and adolescents were evaluated. In all age groups it was found that objective SEP was directly related to their self-report of sleep duration. Differences were found in the subjective SEP that are attributed to changes in sleep patterns with age. Overall, it was found that subjective SEP gradients do exist with sleep in children and adolescents (Jarrin, 2014). Quality and quantity of sleep affect the behavior of children entering adolescence. As the child gets older, quantity and quality of sleep can improve or worsen continuously affect anxiety, aggression, and other behavioral problems (Kelly, 2014). It has been found that that marital aggression in the form of physical and verbal abuse results in emotional insecurity within children. When marital aggression and feelings of emotional familial insecurity persist they, in combination, result in sleep problems (Kelly, 2013).

Proposed Study

Research Question: Does insecurity in one's sense of financial and familial well-being, and resultant sleep problems, impact college academic performance?

Method: A group of Case Western students will be randomly surveyed on sense of financial well-being, sense of familial well being, and GPA. Students who report a sense of both familial and financial well-being will be used as a control. Students who report a sense of familial insecurity, financial insecurity, or a combination of the two will serve as the experimental group(s). Sleep will then be examined using an actigraph bracelet done for 7-day intervals. At the completion of the 7-day periods, they will complete surveys asking about sleep habits and problems. In addition, GPA will be self-reported by each participant. All of this data will be taken in 3 rounds, one at the beginning, middle, and end of the semester.

Data: Sleep data obtained using actigraph and sleep surveys, familial well-being survey, and GPA from the 3 time points will be utilized in analysis.

Prediction: Perceived financial and familial insecurity, and subsequent sleep problems will result in a decline in academic performance.

Sources

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Does Sleep Affect Multitasking and Recall Abilities?

Group 14: Talia Adler, Victoria Hamilton, Tracy Pang, Thomas Huang

Background

Research has shown that a decreased amount of sleep has an increased effect on cyberloafing. Conversely, the more sleep you have, the less likely you are to cyberloaf, and the more likely you will focus on work (Wagner, Barnes, Lim, Ferris, 2012). Better sleep continuity, in young adults, leads to better processing and working memory, while disruptions in sleep have strongly negative effects on ability to perform on different tasks. (Wilckens, Woo, Kirk, Erickson, Wheeler, 2014). Sleep consolidates specific motor patterns, increasing accuracy and decreasing rate of error, when experienced after a period of learning (Fischer, Hallschmid, Elsner, Born, 2002). Although sleep is essential to memory consolidation, children show less improvement performing procedural tasks after retention sleep than to wakefulness, thus indicating that sleep-dependent procedural memory consolidation is linked to development. (Wilhelm, Diekelmann, Born, 2008.)

Proposed Study

Research Question: How does amount of sleep affect one's recall and multitasking abilities?

Method: Subjects will be taught the same lesson (such as a historical event). Subjects will be split up into three groups: 9 hours of sleep, 6 hours of sleep, and 3 hours of sleep. The varying periods of sleep will immediately follow the learning period (to last an hour). After the sleep period, subjects will be tested on the lesson material while an application like Facebook is simultaneously running.

Data: The accuracy of the test scores and also how much time was spent cyberloafing.

Prediction: When test scores are compared across the three sleep conditions, we predict that the group experiencing 9 hours of sleep will have the highest scores. Additionally, those with less sleep will tend to spend more time on facebook than those with more sleep.

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Do students procrastinate on homework assignments more than extra credit assignments?

Group 15: Professor Pharrill, Nutley. Contact : fey.pharrill@case.edu

Background

Procrastination is affected by a variety of factors such as psychological detachment, fear of failure, importance of task to the performer, and the nature of deadlines.

Even though everyone procrastinates, not everyone is a procrastinator. Procrastinators by definition consistently put off work. More specifically, studies show that the more important the task, the longer the procrastination period. Procrastination is a self defeating habit and feeds off people feeling better about themselves in the moment. (Tice, Ferrari 2000). There is a strong correlation between psychological detachment and procrastination. Therefore, the less a person cares about the work they are doing, the more likely they will put off doing it. In addition to detachment, fatigue also greatly affects how likely a person is to get there work done. If a person is more tired, they care less and are more susceptible to procrastinate (Matthews, Russell, Bunk 2014). Procrastination may be fostered by context-specific factors that promote students' fear of failure, evaluation anxiety, feelings of incompetence, or task aversiveness (Wolters 2003). There are two ways to overcome procrastination. The first, by focusing on the process, we can avoid procrastination by increasing self-efficacy. Furthermore, if we focus on the outcome, we can avoid procrastination by overcoming task aversiveness. Specifically, it has been shown that self imposed deadlines result in lower performance on tasks than external evenly spaced deadlines, but higher performance levels than absolute end deadlines (Ariely & Wertenbroch, 2002)

Matthews, S., Russell, A., & Bunk, J. (2014). Workload and procrastination: The roles of psychological detachment and fatigue. Jennifer International Journal of Stress Management, 21(2), 137-161. Jaffe, Eric. "Why Wait? The Science Behind Procrastination." Association for Psychological Science RSS. N.p., n.d. Web. 30 Nov. 2014. Kathrin, K. (2014). How to beat procrastination: the role of goal focus. European Psychologist, 19, 132-144. Ariely, Dan., Wertenbroch, Klaus. (2002). Procrastination, Deadlines, and Performance: Self-Control By Precommitment. Psychological Science, 13, 219-224.

Proposed Study

Research question: *Are students in a class more likely to procrastinate on mandatory class assignments or on extra credit assignments?*

Method: *Students in a course with regular homework assignments and an extra credit assignment will be chosen to participate. Participants will not be informed they are taking part in a study. Each student will be assigned an online homework assignment and an extra credit assignment that are due on the same day. The homework assignment is worth 10 points and the extra credit assignment is worth 5 points. The progress they make on each assignment will be tracked online. This situation will happen five times over the course of the semester and each time students will have one week to complete both assignments.*

Data: *Times students start and submit each assignment will be recorded.*

Prediction: *Average times of start and submission will be averaged. We predict that overall students will start and turn in the extra credit assignments at an earlier time than the homework assignments.*

..... *Stereotype Threat*

Group 16
Angel Bai
Eva Barrett
Matt Zyle
yxb92@case.edu

Background

Both positive and negative stereotypes can affect working memory in high stakes situations by causing the individual who is subject to the stereotype to either lose or gain confidence in themselves.

In a study in which participants took math tests, the group that was told that the test showed a difference in results between the genders, women underperformed men (Spencer et al 1999). The same study also revealed that when the participants were not told that the test revealed a gender discrepancy, women and men performed equally well. It has also been noted in a research study by Regner and others that individuals with high WM are better able to resist stereotype threat because of their focus on success rather than the expectation of failure (Regner et al 2010).

Proposed Study

Research Question: Will being the only member of a minority group in a group of test takers affect working memory performance based on stereotypes associated with that minority?

Methods: Participants will be assigned to either the diverse or minority condition. In the minority condition, a single participant will be put in a group of confederates who are all different from the confederate (woman participant in a group of men, Asian participant in a group of Hispanics, etc). In the diverse condition, a variety of ethnicities and genders will be represented. Participants will take a math test taken from the SAT

Data: Test scores will be collected and compared.

Prediction: Participants in the minority condition will perform better or worse than the rest of their group according to the stereotype with which they are associated than participants in the diverse condition.

Stereotype Threat and Women's Math Performance. Spencer, Steven J.; Steele, Claude M.; Quinn, Diane M. *Journal of Experimental Social Psychology* vol. 35 issue 1 January, 1999. p. 4-28

Individual Differences in Working Memory Moderate Stereotype-Threat Effects

Regner, Isabelle., Smeding, Annique., Gimming, David., Thinus-Blac, Catherine., Monteil, Jean-Marc., Hueguet, Pascal. *The Association for Psychological Science*, 21, 1646-1648.

How does sleep and interference affect memory recall?

Group 17: Acadia Fairchild, Aradhika Sarda,
Jia-Min Ooi
Contact: arf62@case.edu

Background:

There is a general consensus that sleep is beneficial to declarative memory recall (Gais, Lucas, & Born, 2006). Compared to staying awake, even short periods of sleep, such as napping, can help a person store memories more effectively so that recall is greater (Lahl, Wispel, Willigens, & Pietrowsky, 2008). Also both immediate as well as delayed sleep can help a person's memory recall compared to being awake (Backhaus, Hoeckesfeld, Born, Hohagen, & Junghanns, 2007). Further research has shown that sleep can protect declarative memories from subsequent interference (Ellenbogen, Hulbert, Stickgold, Dinges, & Thompson-Schill, 2006). However, in this research interference only occurred after a 12 hour period of sleep or wake. Since the results showed that sleep is beneficial compared to being awake for protecting memories from interference we wondered if whether the interference occurred before or after the sleep affected the subjects recall.

Sources:

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Proposed Study:

Research Question: Is memory recall affected by whether interference of newly learned knowledge occurs before or after sleep?

Method: A large group of college-aged students will learn a list of 20 word pairs at 8 pm. Their recall will be tested immediately after learning the pairs by being verbally tested by being told the first word and having to recall the appropriate pair. Then a third of the participants will be in the control group where they sleep for 12 hours with no interference and then are re-tested. The interference-sleep group will, after the initial word pair learning, have to learn a new list of 20 word pairs before sleeping for 12 hours. The sleep-interference group will sleep for 12 hours and after waking learn 20 new word pairs right before retest. In both of the interference groups the recall will be tested only on the initially learned words. Recall will be tested after 12 hours of sleep by verbally presenting the subjects with the first word in the pair and having them state the appropriate match.

Data: Data will be collected based on the number of correct pairs recalled by the subjects. This information will be recorded as the percent of pairs recalled correctly at retest as well as the difference in number of words recalled after the initial learning and the recall test.

Prediction: We predict that the percentage of pairs recalled correctly at the re-test will be lower than the percentage of pairs recalled correctly at the initial test. We also predict that the group that received interference before going to sleep will have a lower recall percentage when tested after waking up compared to those who received interference after waking up. In all, we believe that recall will be best for those who do not receive any interference, followed by those who receive interference after sleep, and that recall will be worst for those who receive interference before going to sleep.

Which improves memory and recall more, daytime napping, nighttime sleeping, or wakefulness with caffeine?

Group 18: Kris Holloway, Matt Hadiono, David Bacisin, Tim Sesler. Contact: mah226@case.edu

Overview

Naps, when optimized for individuals in terms of timing, length, and napping preference, have been shown to restore cognitive ability lost due to insufficient sleep, with benefits lasting longer than those provided by caffeine.

Caffeine improves cognitive performance for only a short time after use, whereas prophylactic sleep maintains high cognitive performance for almost 24 hours of waking activity (Bonnet, Gomez, Wirth, & Arand 1995). Napping and nighttime sleep, in comparison to wakefulness, have a positive effect on the memorization, and recall, of related and unrelated word pairs (Lo, Dijk, & Groeger 2014). While short naps (10 minutes) quickly restored cognitive ability and performance lost to insufficient sleep, longer naps (30 minutes) had benefits that were delayed by an hour (Tietzel & Lack 2001). Based on their napping preference (appetitive or replacement) some people feel very rejuvenated after a nap, while others feel even more tired than they did beforehand (Evans et al. 1977).

Proposed study

Research Question: Do students who take 10-minute naps, students who use caffeine, or students who get 7 hours of nighttime sleep perform better in memorization and recall?

Method: Students will be surveyed for their napping preference (either appetitive or replacement). They will then be asked to memorize 40 word/unrelated-image pairs before going to sleep. One group will take a 10-minute nap, the second group will be given 400 mg caffeine prior to the test, and the last group will sleep for 7 hours. 20 minutes of distracting games will be played after the nap/caffeine/7 hour sleep period. Then, each group will then be tested on their ability to recall a word when presented with the image.

Data: Memorization test scores will be collected. Student scores will be compared with consideration of their nap preference. Scores also will be compared across the three groups.

Prediction: We predict that scores will be highest in the 10 minute nap group.

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Does Procrastination Lead to Stress?

Group 19: Jermaine Coleman, Marisa Harner, James Kaminski, Tiffany Yip.

I'll do it
later...

Background

Contact: jmk247@case.edu

Proposed Study

Students who procrastinate may feel more stressed because they are more underprepared than those who do not procrastinate.

In addition to causing stress in students' lives, procrastination has also been shown to have distinct correlations with narcissism, Machiavellianism, and psychopathy (Lyons & Rice, 2014). Studies show that procrastinators tend to feel less stressed initially, but this bliss is only temporary, leading them to be more stressed than those who do not procrastinate (Jaffe, 2013). Not only are they more stressed, but also more likely both to get sick (adding stress) and to do poorly on the actual work (Tice & Baumeister, 1997). Fatigue created through insufficient psychological detachment from the workplace has been shown to relate to both stress and procrastination (DeArmond, Matthews, & Bunk, 2014).

Sources:

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- *DeArmond, Sarah; Matthews, Russell A. & Bunk, Jennifer. (2014) Workload and procrastination: The roles of psychological detachment and fatigue. *International Journal of Stress Management*, 21(2), 137-161.
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Research Question: Do students who procrastinate feel more stressed than those who don't?

Method: We asked undergraduate students at Case Western Reserve University who were about to enter finals week whether they were stressed and whether they had procrastinated or were studying. We plan to survey 100 people.

Data: The data will be compiled and the correlation between procrastination and stress will be determined.

Prediction: We predict that a higher percentage of students who said they procrastinated will be stressed. Those who did not procrastinate will likely not be as stressed.

Mikalah Singer, Kaitlin Murphy, and Shannon Stork
mls270@case.edu, kam186@case.edu, scs94@case.edu

Sleep Disorders: Impairment of Memory vs. Adaptation

Overview of Papers: The sleep disorders primary insomnia and obstructive sleep apnea are believed to affect cognition, particularly memory consolidation, but the nature of these effects is somewhat controversial. Sleep apnea does negatively impact attention, which leads to negative effects on memory consolidation, but the relationship between sleep apnea and cognition is indirect due to the plethora of factors involved (Gelir). Insomnia also impairs memory, but the nature of this impairment is unclear; conflicting studies disagree on whether insomnia patients have normal procedural memory and diminished declarative memory (Griessenberger) or normal declarative memory and diminished procedural memory (Nissen).



Research Question: Do Sleep Disorders Ultimately result in an Impairment of Memory or do the Individuals' Memories Adapt?

Method: Two groups- One group split between participants with sleep apnea and insomnia (experimental) and another group without sleep disorders (control). Participants will be given different memory tasks that range from easy to hard and will be scored on the tasks. Participants will meet once a week for one semester and will be scored each time they meet. The scores will be analyzed primarily across the experimental and control groups and secondarily across the two sleep disorders analyzed in this study.

Data: Each individual's scores on the different memory tasks will be the data collected and analyzed in this study.

Prediction: We predict that over the semester there will be a clear difference between how the group with sleep disorders scores versus how the group without the disorders scores, suggesting that sleep apnea and insomnia result in impairment of one's memory.

Sources:

Gelir E, Basaran C, Bayrak S, Yagcioglu S, Budak MT, et al. (2014) Electrophysiological Assessment of the Effects of Obstructive Sleep Apnea on Cognition. *PLoS ONE* 9(2): e90647. doi:10.1371/journal.pone.0090647

Griessenberger, Hermann, et al. "Susceptibility To Declarative Memory Interference Is Pronounced In Primary Insomnia." *Plos ONE* 8.2 (2013): 1-10. *Academic Search Complete*. Web. 8 Dec. 2014.

Nissen, Christoph, et al. "Sleep-Related Memory Consolidation In Primary Insomnia." *Journal Of Sleep Research* 20.1 part II (2011): 129-136. *Academic Search Complete*. Web. 8 Dec. 2014.

Can sleeping on memory foam improve memory consolidation?

Group 21: Saagar Pamulapati, Stephen Kolison, Peter Thompson. Contact: svp20@case.edu

Background

Acquiring, expecting, or believing that you have had healthy sleep after learning new material improves your memory of that material.

Those who maintain a healthy sleep schedule after being presented with new vocabulary are more likely to remember that vocabulary when learning is shortly followed by healthy sleep (Gais, et al. 2006). To many people, the health benefits of sleep are very well known. That said, even the perception of having a deep slumber can have a positive effect on cognitive functions, regardless of the conditions of sleep (Draganich and Erdal, 2014). Researchers have concluded that a small period of uninterrupted sleep is important for memory consolidation (Rolls, et al 2011). Purchasers of memory foam mattresses obviously are searching for a better night's sleep, but what effects might it have on memory still need to be explored.

Sources:

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Proposed Study

Research Question: Do students who sleep on memory foam beds have greater memory retention than students who sleep on coil-spring beds?

Method: A group of students in a diverse class (COGS 101) will be asked to participate. Those who agree will be randomly assigned to two conditions, memorizing a list of words for 10 minutes and then sleeping on memory foam beds or memorizing the same list for 10 minutes and then sleeping on coil-spring beds. Students in the memory foam condition will be provided a memory foam mattress pad and instructed to sleep on it that night. Students in the down condition will be told to sleep on the university standard coil-spring mattress.

Data: Students will list all of the words they remember the following morning and this data will be collected for the two separate groups. All students will be asked whether or not they feel well-rested after sleeping on memory foam mattress pad.

Prediction: Average number of words recalled will be compared across the two groups. We predict the memory foam group will feel better-rested and have a higher average number of words recalled.

Are Self-Control and Procrastination Related?

Group 22: Collin Kemeny, Stephen Constantakes, David Nelson. Contact: cmk164@case.edu

Background

University students who procrastinate on assignments are more likely to exhibit low Academic performance. This is potentially attributed to a lack of self-control.

Students performed better on tests when they took practice tests that helped them begin their studying at an earlier date (Perrin, Miller, Ivy, Neef, 2011). Cognitive factors, not only study skills, contribute to procrastination behavior (Solomon and Rothblum, 1984). Procrastination is best managed when efficient restrictions are set (Ariely, 2002). Procrastination is correlated with conscientiousness and self-loading (Ferrari, 2012). Perfectionism and academic performance are both negatively correlated with procrastination (Bong, Hwang, Noh, Kim, 2014).

Sources

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Proposed Study

Research Question: Do students who show high levels of procrastination also low levels of self control in social situations?

Method: Students in a class where online exams are offered will be asked to participate. The exam will be made available starting 5 days before the due date. Students will have unlimited time to complete the exam, and the time and date will be logged when they open the exam. The exam will have two sections: one that tests the students knowledge of the material taught in the course, and a second that displays a picture and asks the student to list five words that describe it. The pictures will be of people and places.

Data: The time when students began their exams, and the responses given in response to the pictures.

Prediction: Students who procrastinate will have less self-control and will be more likely to answer the picture questions with racial stereotypes when presented with picture of people.

Effect of Exogenous Melatonin Treatment on College Students' Cognitive Performance

Group 23: Abel (ack73), Patrick (pmm90), Shanaz (sxr424), David (dxh344)

INTRODUCTION

Sleep inertia describes the phenomenon where immediately following awakening cognitive performance is decreased compared to baseline status. Subjects tested after waking on an addition task performed two standard deviations below the baseline, and remained below baseline for 2-4 hours after waking (Jewett et al., 1999). This impairment is similar to, but distinct from, the impairment that sleep deprivation creates (Lim & Dinges, 2008).

Melatonin is a pineal hormone produced by the body to regulate sleep and wake cycles. In darkness, the body produces more melatonin to initiate sleep in the body. Melatonin supplements can possibly regulate sleep cycles, insomnia, jet lag, or anxiety but the research is contradictory due to many factors (Wilhelmsen-Langeland et al., 2013; Jean-Louis et al., 1998).

PROPOSED STUDY

Research question: Do subjects who take doses of melatonin before sleep have decreased sleep inertia (i.e. increased cognitive performance) immediately following waking?

Method: Case Western students will be asked to sleep in controlled conditions. Those who agree will be randomly assigned to one of three conditions: melatonin pill, placebo pill, and no pill. Subjects will take 2-4 mg doses of melatonin within 30 minutes of beginning sleep. Upon waking, subjects will take cognitive tests.

Data: Sleep quality data will be collected throughout the night through a headset, cognitive functioning tests will be administered on waking, and subjective ratings of sleepiness will be collected.

Prediction: Cognitive functioning and sleep quality will be slightly higher in the melatonin-assigned group compared to the other two, while subjective ratings of sleepiness will be lower.

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How does cumulative sleep loss affect working memory and attention?

Group 24: John Brogan, Benjamin Haybron, Olivia Lezcano, Mandy Wong contact: mxw432@case.edu

Background

Sleep loss and sleep deprivation have been shown to have negative effects on cognitive performance.

Sleep deprivation has been shown to affect vigilant attention which results in slower reaction times, increased number of errors, and diminished attentional capabilities as one works on a task (Lim & Dinges, 2008). Self-perception is also affected by sleep loss; sleep-deprived subjects not only objectively perform worse but subjectively feel worse about their performance as well (Sallinen *et al.*, 2013). Temporal memory is also negatively affected by sleep deprivation (Harrison & Horne, 2000). However, tasks of short duration are not affected as significantly of those that were longer (Sagaspe *et al.*, 2003).

Sources

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Proposed Study

Research Question: Do students who have less sleep cumulatively perform worse on a Luminosity test that tests attention and working memory than students who sleep normally or have no cumulative sleep loss?

Method: Gather subjects of 18-25 who have no history of alcoholism, smoking, and sleep issues. The participating subjects will be asked to log their sleep the nights of the week before they come in to take a Luminosity test. The subjects are classified into groups according to the hours they slept.

Data: Sleep logs and Luminosity scores will be collected.

Prediction: cumulative sleep deprivation will have a negative effect on Luminosity performance.

Is napping after studying more beneficial to memory consolidation than watching television?

Group 25: Michelle Chen, Madeline Clark, Molly Philips, Suhib Jamal Contact: mxc677@case.edu

Background

- * Sleep, as opposed to wakeful activities, generally improves aspects of cognition like memory.

Sleep helps individuals recall information even if they were asked to forget the information presented to them compared to being awake (Abel, 2012). Sleep affects academic performance while other variables such as caffeine or medication do not (Eliasson, 2010). Dr. Jane Gaultney concluded that college students with at least one sleeping disorder had significantly lower GPAs than students without a sleeping disorder (Gaultney, 2010). People who had ultra short naps positively effected declarative memory recall (Lahl, Wispel, Willigens, Pietrowsky 2008). There is no way to overcome sleep especially if you are awake for longer periods of time (Someren, 2010).

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Proposed Study

- * Research Question: Do students who nap after studying have better memory recall than students who watch television after studying?
- * Method: Random sample of 100 CWRU students are given an identical list of 50 unrelated terms. All students study the list for 20 minutes. Fifty students were assigned to immediately nap after studying the list and fifty students were assigned to immediately watch TV after studying the list. After their break, each student will be asked to write down the order of the terms on the list.
- * Data: Data will be recorded on the number of words each student can correctly recall in order before making a mistake i.e. If the 3rd word on the student's list does not match the official term list then the student receives a score of "2".
- * Prediction: Scores will be compared between both groups. Participants who were chosen to nap after studying will have a significantly higher score than the participants who were chosen to watch TV.

Can exercise affect procrastination?

Group 26: Eric Pearce-Smith, Davina Oke, Previn Kumar. Contact: emp72@case.edu

Background

Procrastination is a product of several personal causes including fear of failure, task aversiveness and laziness, among others, with positive correlations with perfectionism and negative with social loafing and conscientiousness; working with groups and exercising help cope with procrastination.

Procrastination is a behavioral problem that people attempt to curb through self-imposed deadlines (Ariely & Wertenbroch, 2002). Procrastination negatively correlates with conscientiousness and social loafing (Ferrari & Pychl, 2012). Perfectionism and procrastination have a positive correlation, and the two are associated with increased psychological distress among students (Rice, Richardson, & Clark, 2012). Fear of failure and aversiveness to a task account for most of the variance in factors leading to procrastination. One difference between students who procrastinate because of aversiveness of the task and those who procrastinate because of fear of failure is that the latter also report high anxiety (Solomon & Rothblum, 1984). A sufficient model of procrastination shows the phenomenon results from time limitations, laziness, and personal interest levels; suggested coping techniques include working in groups and exercise (Schraw, Wadkins, & Olafson, 2007).

Proposed Study

Research Question: How does exercise affect how much a student procrastinates.

Method: We plan to have three sections of an introductory course participate in our study. One group will be instructed to exercise 3 times a week for 1 hour. The second group would be instructed to not exercise. The third group will not be given any directions specifying an amount of exercise. The course will have a self-paced quiz related to each chapter covered. These quizzes can be completed any day before the end of the semester for possible full credit. The third group will be surveyed about their personal exercise habits for the semester after the completion of the course.

Data: Date of quiz submissions and exercise levels will be collected.

Prediction: Our prediction is that students in the third group who voluntarily exercise will procrastinate the least, followed by first group who were told to exercise, and then by those in the second and third group who did not exercise at all.

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Does Arousal Procrastination Lead To Failure?

GROUP 27: GREGORY BAUMAN, SHIRA YELLIN, YUNG YU, GRAHAM ZIMMERMANN
CONTACT: SHY16@CASE.EDU

Background

Researchers have found that in all domains of life, procrastination is most common in academic and work related activities (Klingsieck, 2013). It has also been found that the more self-efficacy a person has, the less likely they are to procrastinate (Krause, Freund 2014), and that procrastination due to fear of failure (avoidant procrastination) was correlated with an increase in self-reported depression and anxiety (Solomon, Rothblum 1984). Finally, arousal procrastinators, those who do it for the thrill, were found to have significantly higher levels of regret versus avoidant and non-procrastinators in multiple life domains (Ferrari, Barnes, Steel 2009).

Proposed Study

Research Question: Does the type of procrastinator you are, arousal, avoidant, or non-procrastinator, have an effect on your test scores.

Method: Students in a large lecture class (Biol215) would be asked to participate. Those who agree will be given questionnaires to determine what type of procrastinator they are. They will proceed with the class normally.

Data: Results from the questionnaire and average exams scores will be collected.

Prediction: At the end of the semester, the average exam scores of each student will be compared for a statistically significant difference between the groups. We predict that being an arousal procrastinator is correlated with lower test scores.

Sources

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Can Sleeping 7-8 hours every night for a semester improve a student's performance on exams?

Group 28: Sara Ahmed, Zaid Al Bahrani, Alexis Blocton, Tora Williams. **Contact:** sxa436@case.edu

Background

Obtaining an adequate amount of sleep at night is shown to improve cognitive and emotional processes. Declarative memory is optimized, attentional capacities are improved, and thought processing as well as learning are enhanced.

Individuals who did not obtain quality sleep (Gilbert & Weaver, 2010) and were sleep deprived had a more difficult time paying attention to the tasks at hand (Tucker, 2013). Sleep has a beneficial effect on retention over a period of time than when deprived of it (Idzikowski, 1984). Declarative memory is improved by sleep through the consolidation processes by cortico-cortical connections, which then refreshes the encoding capacity allowing for more information to be acquisitioned (Walker, 2010). Also, with an adequate amount of sleep individuals experience more time in slow wave sleep and REM sleep. These stages are responsible for integrating information into known knowledge and concepts about the world (Walker, 2010). A correlation is found between more quality sleep and a higher GPA (Gilbert & Weaver, 2010). When learning new information the medial temporal lobe is activated in those that were not sleep deprived, indicating a thorough understanding of material (Walker 2010). Memory is better when an individual receives more sleep than when knowing a reward will be given after remembering a piece of learned knowledge (Tucker, 2013). When sleep deprived, interference is more likely to occur because the over-worked neurons cannot function or coordinate information properly, losing the ability to retrieve previously learned material (Lahl, Wispel, Willigens, Pietrowsky, 2007). Emotion is also regulated by sleep. Individuals are more prone to being negative and irritated when not fully rested (Walker, 2010).

Sources

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Proposed Study

Research Question: Do students who sleep 7-8 hours every night throughout the semester after studying subject material perform substantially better on exams compared to students who are sleep deprived and obtain an average of 4-5 hours of sleep throughout the semester?

Method: Students in a course that requires studying the subject material 3-5 hours every night to perform well in the class (such as BIOCHEM 307) will be asked to participate. Those who agree will either be assigned as the control, to sleep 8 hours every night, or assigned to be sleep deprived, where majority of nights students will obtain 3-5 hours of sleep. Those individuals will only have about 12 sporadic nights where they will be able to gain a full 8-10 hours of sleep. However, students cannot sleep that amount near the class exams. Near exams students are allowed to study for 4-6 hours each night with 10 minute breaks between each hour. Weekend hours of sleep are not accounted for in this study. To account for course load, each student should have at least 3 other academic rigorous classes in addition to BIOCHEM to participate in the study. Students will have to engage in individual, active studying for the 3-5 hours every night with 10 minute breaks between each hour, and attend class every day at 8:30 AM. Their attention in class will be measured by the accuracy of answering clicker questions in class. Also, both groups will fill out questionnaires about their mood and emotions a week before the class exams and right after the exams are taken.

Data: Exam scores, fMRI scans (if feasible) when the students are studying new material and when they are sleeping, questionnaires, clicker question points

Prediction: Students in the control group will have higher test scores due to a better recall of information. they will be better attuned, muster greater motivation and they will experience positive and more stabilized moods. They will also have greater activation in their medial temporal lobe and reactivation in their hippocampus.

Can Physical Activity Improve Mental Health?

Group 29: Jared Ong, Bob Zimmerman, Chenhui Yang, Sonju Kim

Background

Studies have shown correlations between physical activity and a reduction in anxiety.

Exercise had a positive impact across neurological mechanisms (Anderson and Shivakumar, 2013). Depression, anxiety, and burnout were seen to decrease with higher levels of activity (Lindwall, et al., 2014). Exercise was also seen to increase outlook on life and work productivity in some cases (Freitas et al., 2014). Anxiety was reduced with aerobic exercise, with greater changes seen in individuals with high state anxiety (Matilla, 2011).

Sources:

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Proposed Study

Research Question: Which level/intensity of physical activity is the most efficient at reducing anxiety?

Method: 40 randomly selected CWRU students would engage in three different levels of physical activity for 4 weeks, with a control of no exercise. The 3 levels would be walking, jogging, and running, each for 30 minutes periods a day. The students would take an assessments measuring anxiety before and after the treatment—only the students testing positive (low, medium, high) for those conditions would be used in the study.

Data: Anxiety questionnaire scores before and after the treatment.

Prediction: Average of test scores would be compared across the different levels of anxiety and exercise. We expect the group with low/medium exercise and high anxiety to show the most improvement in anxiety levels.

	Low Exercise (Walking)	Medium Exercise (Jogging)	High Exercise (Running)
Low Anxiety			
Medium Anxiety			
High Anxiety	☆	☆	