The Effect of Chronic and Acute Stress on College Students' Unethical Behaviors

A Senior Comprehensive Project
Presented by:
Rebecca Cohen

Allegheny College

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Pledge: _____

Approved:

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Dr. Lydia Eckstein Jackson

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Dr. Sarah Conklin

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Abstract

There is no research directly linking chronic sleep restriction (resulting in chronic stress) and cheating. A gap also exists in the research of how acute stress may affect unethical behavior. 37 undergraduates were recruited to participant in the current study which examined the correlation between chronic sleep restriction and cheating and experimentally manipulated acute stress to test its effects on cheating. Chronic sleep restriction was measured using the Epworth Sleepiness Scale (Johns, 1991) while chronic stress was measured using the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983). These scales were correlated with the number of matrices solved and over-reported in number-search-paradigm frequently used to assess unethical behavior (Gino, Ayal, & Ariely, 2009). Participants were randomly assigned to one of two experimental conditions: in the acute-stress-condition, participants completed the Trier Social Stress Test (Kirschbaum, Pirk, & Hellhammer, 1993); participants in the no-acute-stress condition were asked to briefly brainstorm what they may say during a job interview. Results indicate limited support for the hypotheses that stress and sleep restriction are associated with increased cheating. More research is needed to fully explore the effects of chronic sleep restriction, chronic stress, and acute stress since these factors may result in immoral behavior. Knowledge of what motivates and impacts individual's behaviors is essential for understanding how larger groups and organizations function- such as college students, businesses, and other subgroups of society where an individual's immoral behavior is typically discouraged for the benefit of the greater good.

Keywords: Acute stress, chronic stress, immoral behaviors

The Effect of Chronic and Acute Stress on College Students' Unethical Behaviors

Imagine you are about to embark on the overwhelming journey that is the first finals week of your college career. Your priority is not sleeping; in fact you may have to stay up all night to study for an exam the next day. When you get to the exam, not only are you exhausted, you are stressed because you need to receive a high grade on this exam to keep your A in the class. College students often sacrifice their sleep and mental well-being in order to exceed academically while adults often sacrifice their sleep for their job and to deal with the accumulation of pressure and opportunities of modern society (Crispim et al, 2007). The news is replete with headlines such as "Colleges open their eyes: ZZZs are key to GPA" (Pope, 2012) and "5 Signs You're Seriously Overworked" (Stillman, 2014). These headlines reveal how chronic sleep restriction and stress are engrained in our culture and are hardly foreign to the general public.

Acute Stress

On average, American adults and college students alike have reported increased levels of feelings of stress in the past five years (APA, 2014). College students in general are prone to feeling high levels of stress, however, how much stress an individual feels is subjective and is influenced by an individual's ability to cope (Ross, Niebling, & Heckert 1999). An individual experiences stress when their evaluation of a situation or environments demands surpass their ability to meet or lessen these demands in interest of their comfort and well-being (Cohen, Janicki-Devers, & Miller, 2007; Lazarus, DeLongis, Folkman, & Gruen, 1985). There are two forms of stress: acute and chronic. Acute stress is the most common form of stress and is brought on by sudden, intense, and relatively short durations of typical everyday demands (Ellis, 2006). For college students, acute stress can be caused by anticipating an exam or even during the exam

when the pressure is increased to perform well. Adults may feel acute stress when work deadlines are approaching, they are moving, or even for happy events like marriages and births. Too much acute stress can result in exhaustion, psychological distress, and a range of other physical symptoms such as migraines, increased heart rate and blood pressure, as well as a decrease in libido (Köhler & Haimerl, 1990; Adam & Epel, 2007).

Chronic Stress

Chronic Stress is stress that is felt long term and continues for an extended period of time (Matheson, Moineddin, Dunn, Creatore, Gozdyra, &, Glazier, 2006). Because chronic stress is constant, it can negatively affect an individual's psychological, emotional, and physical health (Cohen, Janicki-Devers, & Miller, 2007). While chronic stress has more clear long-term negative effects than acute stress, it is often harder for individuals to recognize when they are experiencing chronic stress because it is a constant state potentially caused by recurring situations in an individual's life that can have a gradual and subtle onset (Matheson, Moineddin, Dunn, Creatore, Gozdyra, &, Glazier, 2006). Possible causes of higher chronic stress stem from the worries about the unstable economy and job market, family and personal relationships, finances, caregiving for ill loved ones, and work-related issues (Puterman, Lin, Blackburn, O'Donovan, & Adler, 2010).

Chronic Stress and Health

The factors listed above can lead to negative effects on an individual's physical health (Puterman, Lin, Blackburn, O'Donovan, & Alder, 2010). For example, chronic stress can increase the likelihood of an individual adopting poor eating habits. Although the likelihood of skipping meals increases when experiencing chronic stress, individuals are more likely to eat high-calorie and high fat comfort food when eating during times of high stress (Dallman, et al.,

2003). The overall intake of comfort food increases during times of high stress as well (Dallman, et al., 2003), in part because individuals experiencing chronic stress are also more likely to use eating and smoking as a relief to the stress they are experiencing (Adam & Epel, 2007). Chronic stress also increases the amount of fat stored in an individual's body compared to when they are not feeling stressed (Adam & Epel, 2007). Research has shown that individuals with larger waistlines typically respond more poorly to stress and that stress can lead to higher central body fat distributions (Epel et al., 2000). Obesity is a rising epidemic and central body fat has been connected to a vast amount of other health issues such as diabetes, coronary heart disease, hypertension, and strokes (Epel et al., 2000).

Chronic stress can also alter and weaken the immune system, increasing the risk for various sicknesses and diseases, having negative consequences on an individual's health (Gouin, Glaser, Malarkey, & Beversdorf, 2012; Padgett & Glaser, 2003; Segerstrom & Miller, 2004). Chronic high stress can lead to increased risk for type 2 diabetes, hypertension, levels of inflammation, coronary artery disease, cardiovascular disease, more viral infections such as the flu, and the common cold (Chandola, Brunner, & Marmot, 2005; Cohen, Janicki-Devers, & Miller, 2007; Eggers, 2007; Puterman, Lin, Blackburn, O'Donovan, & Adler, 2010). Other diseases such as HIV/AIDS, herpes, and asthma have also shown to be influenced negatively by chronic stress (Cohen, Janicki-Devers, & Miller, 2007; Gouin, Glaser, Malarkey, & Beversdorf, 2012). Chronic stress has also been shown to increase the likelihood of insulin resistance, the time of wound healing, migraines, and poor responses to vaccines (Eggers, 2007; Gouin, Glaser, Malarkey, & Beversdorf, 2012; Puterman, Lin, Blackburn, O'Donovan, & Adler, 2010).

Stress also affects an individual's mental health. Feeling overwhelmed, lonely, nervous, or worried commonly occurs when an individual perceives a situation as stressful (Ross,

Nielbling, & Heckert, 1999). Depression and anxiety have also been linked to individuals experiencing chronic stress (Cohen, Janicki-Devers, & Miller, 2007; Eggers, 2007). In sum, the prolonged experience of stress has a wide range of potentially serious consequences. Because the societal demands that are increasing chronic stress levels show no signs of decreasing in the near future, the health consequences of chronic stress should cause major public health concerns

Stress and Sleep

Acute and chronic stress can lead to changes in sleep patterns and fatigue (Akersted, 2006; Sadeh, Keinan, Daon, 2004). Chronic stress can worsen sleep patterns and poor sleep patterns can worsen chronic stress, a harmful cycle to be caught in (Akerstedt, 2006; Barber & Munz, 2010; Minkel, Banks Htalk, Moreta, & Jones, 2012). Chronic sleep restriction and poor sleep quality is increasing in college-aged students due in part to the potential challenges of sleeping in a new environment with new influences that students may not been introduced to previously (Breus, 2010). Lack of sleep has also increasingly become a public health concern; between 50-70 million American adults reportedly have a sleep disorder (Center for Disease Control and Prevention, 2014). College students are already at a high risk for chronic sleep restriction but with the added stress, the effects can be detrimental to the student's academic performance (Macan, Shahani, Dipboye, &Phillips, 1990). College students consistently list stress and sleep difficulties in the top three obstacles to academic success (Forquer, Camden, Gabriau, & Johnson, 2010). Additionally, they score lower on cognitive tasks due to increased sleepiness and a decreased ability to pay attention (Pilcher & Walter, 1997).

Sleep duration has also decreased by as much as two hours on average for the typical adult in America (Crispim et al, 2007). Individuals experiencing stress may have difficulty falling asleep or experience fragmented sleep patterns (Sadeh, Keinan, & Daon, 2004). It is

possible that the increased access and desire for technology, as well as the high demands of work and family have caused a shift in societal tendencies for sleeping less (Center for Disease Control and Prevention, 2014). Chronic sleep restriction may lead to worsened immune systems, increased mortality rates in men, hypertension, obesity, heart attacks, stroke, diabetes, learning, memory, and other cognitive functions. (Cohen, Doyle, Alper, Janicki-Deverts, & Tuner, 2009; Moller-Levet et al, 2013; Vgontzas et al, 2010; Yoo, Gujar, Jolesz, & Walker, 2007).

Stress and lack of sleep go hand-in-hand and may compound each other's negative effects on mental and physical well-being. The extensive undesirable consequences of chronic stress and chronic sleep restriction show dire need to address it as a public health concern (Center for Disease Control and Prevention, 2014). Chronic sleep restriction can causes public safety hazards when individuals get behind the wheel. Close to 20% of car accidents occur when individuals are tired (Institute of Medicine, 2006). Many of the health concerns such as obesity and depression have been on the rise and can increase individual's medical costs drastically. Estimates put increased healthcare costs of doctor and emergency room visits, prescriptions, and other medical costs in the hundred billions (Institute of Medicine, 2006).

Ego Depletion and Self-control

Chronic sleep restriction has also been linked to increased rates of ego depletion (Barnes, Shaubroeck, Huth, & Ghumman, 2011). Ego depletion refers to a temporary decrease in an individual's willingness to participate in behavior that requires conscious choices. When an individual experiences ego depletion their self-control is decreased as well (Baumeister, Braslavsky, Muraven, & Tice, 1998). Self-control is the ability to behave in a socially acceptable manner by superseding the urge to behave in a manner considered to be inappropriate in the current situation (Mead, Baumeister, Gino, Schweitzer, & Gino, Ayal, &Ariely, 2009). Like any

physical muscle, self-control can be depleted over time without rest and draws from a limited source of strength (Baumeister, Vohs, & Tice 2007; Baumeister, Braslavsky, Muraven, & Tice, 1998; Muraven & Baumeister 2000). Any behavior that requires choice draws on self-control and further increases ego depletion, similar to how a muscle tires after activity (Baumeister, Vohs, & Tice 2007; Baumeister, Braslavsky, Muraven, & Tice, 1998). Previous behaviors that require self-control, such as choosing to snack on vegetables instead of desserts, will decrease future performance on tasks that require self-control (Baumeister, Braslavsky, Muraven, & Tice, 1998). Like muscles, rest and sleep can restore the strength needed to increase self-control (Barnes, Schaubroeck, Huth, & Ghumman, 2011; Kouchaki & Smith, 2013).

When self-control is depleted, individuals are unable to use this resource to stop themselves from acting in an unethical manner (Baumeister, Braslavsky, Muraven, & Tice, 1998). Ego depletion can lead to behaviors such as overeating and over consumption of alcohol. (Baumeister, Vohs, & Tice, 2007). Ego depletion can have serious consequences such as an increased level of aggression towards other (DeWall, Baumeister, Stillman, & Gailliot, 2007; Stucke & Baumeister, 2006). While individuals are typically able to exert self-control over aggressive behaviors, in a series of five experiments depleting self-control levels of participants by asking them to resist temptations, participants showed an increase in aggressive behaviors towards others when instigated (DeWall, Baumeister, Stillman, & Gailliot, 2007; Stucke & Baumeister, 2006). While aggressive and other negative behaviors are typically controlled by social standards it is important to understand the potentially devastating consequences of depleting levels of self-control in individuals (DeWall, Baumeister, Stillman, & Gailliot, 2007).

Chronic Sleep Restriction and Unethical Behavior

There is growing evidence supporting that chronic sleep restriction can deplete self-

control which, in return, may increase immoral behaviors (Barnes, Schaubroeck, Huth,& Ghumman, 2011).Immoral behaviors are socially unacceptable and unethical behaviors that go against socially defined norms and morals (Barnes, Schaubroeck, Huth,& Ghumman, 2011; Gino, Schweitzer, Mead, & Ariely, 2011). Common examples of immoral behaviors are cheating, stealing, and dishonesty. Multiple studies have found ego-depletion to be linked to immoral behaviors such as cheating and dishonesty due to a decreased ability to self-regulate behavior (Krouchaki & Smith, 2013; Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009). For instance, in recent research, participants that had low quality of sleep or decreased amount of sleep the night before, had decreased amounts of self-control and therefore had higher instances of using their company's time and internet access for personal use the following day at work (Wagner, Barnes, Lim & Ferris, 2012). While this immoral behavior is seemingly small and benign, it can compound to greatly harm a company's profits and productivity if employers are consistently using company time for personal use.

There are many environmental and situational factors that can influence how morally an individual behaves. The degree to which an individual may behave immorally increases by dimming the lights in a room, allowing for expansive postures, and experiencing positive affect (Gamliel & Peer, 2013; Vincent, Emich, & Gancalo, 2013; Yap, Wazlawek, Lucas, Cuddy & Carney, 2013). Further research shows that because self-control is depleted solely from everyday activities, individuals are more likely to act immorally later in the day (Kouchaki & Smith, 2013). Further bolstering the idea that fatigue and ego depletion promote immorality, 200 milligrams of caffeine (or one 12 ounce cup of coffee) has recently been shown to replenish self-control that was depleted throughout the day, therefore showing this is one way of increasing an individual's self-control (Welsh, Ellis, Christian, & Mai, 2014).

While large company heads often make the news with scandals of immoral behaviors, individual immoral behaviors have a wide range of negative effects that can collectively make a hefty impact in various industries. The retail industry loses approximately $16 billion in monetary revenue a year from stealing and insurance companies are negatively affected by fraud every year by the 25% of adults who say it is acceptable to overstate claims (Gamliel & Peer, 2013; Mazar & Ariely, 2006). From tax fraud alone, the Internal Revenue Service estimates a $345 billion difference between actual and claimed taxes (Shu, Mazar, Gino, Ariely, & Bazerman 2012). Lastly, it is estimated that $250 billion dollars is lost globally each year due to intellectual theft (Mazar & Ariely, 2006). The loss of revenue and intellectual property as well as the increase in fraud is not from a few people cheating in high amounts but rather many individuals cheating in small amounts that allows for financial gains for the individual (Gamliel & Peer, 2013). Individuals may not have a large impact alone, however, the collective impact of societal immoral behaviors can cause negative consequences that expand globally as well as through country, states, and individual organizations (Gamliel & Peer, 2013).

Immoral behaviors also extend to academic communities (McCabe & Trevino, 1993). Approximately 70 percent of college students have self-reported acting immorally by cheating on assignments (Owunwanne, Rustagi, & Dada, 2005). A variety of factors motivate students to cheat such as a competitive environment, peer factors (such as others' cheating behavior), lower GPAs, pressure to be successful, low self-image, and laziness (Drake, 1941; McCabe, Trevino, & Butterfield, 2001). Students that cheat academically in college may continue to cheat in their future jobs because they have become desensitized to the negative impacts their cheating can cause (Batson, 2013). Batson suggests that individuals that act immorally once, experience moral erosion and are more likely to continue to act immorally, gradually becoming so accustomed to it

they may not even think twice about doing so (Batson, 2013). If this is true, further insight on what causes immoral behavior is essential to decrease students' dishonest behavior before their moral standards erode further, particularly if it is something as widespread as sleep deprivation and as easily fixable as an individual increase in the amount they sleep.

The Present Study

Previous research has shown the connection between chronic sleep restriction and ego-depletion as well as the link between ego-depletion and immoral behaviors. However, there is not any research directly seeking the connection between chronic sleep restriction (resulting in chronic stress) and cheating. A gap also exists in the research of how acute stress can affect an individual's likelihood to cheat. Therefore, the current study aimed to address the effects of chronic and acute stress on immoral behavior. Specifically, the present study examined the correlation between chronic sleep restriction and cheating and an experiment with a one factor between subjects design measuring cheating in acute stress vs. non acute stress conditions to measure cheating in college students.

Methods

Participants

37 college students were recruited from Allegheny College, a small liberal arts college in Meadville, Pennsylvania. There were 10 male and 26 female participants; an additional participant did not wish to disclose their gender. The mean age was 19.1 years (*SD*=.91)**.** In addition, participants that had previously participated in a peers' research project were excluded from participating in this study due to similarity in procedures and topic of research. Depending on the policy of the professor, participants received extra credit or research credit for participating in the study. Participants had the option to enter a raffle with raffle tickets earned during the testing to win one of two gift cards to The Market House, a local store and restaurant.

Materials

Pre Experimental Questionnaire. Upon arrival in the lab, participants were asked to complete the Epworth Sleepiness Scale (ESS) (Johns, 1991). The ESS consisted of eight questions that asked participants to rate how likely they are to fall asleep during several situation on a four point scale (0=never doze, 3= high chance of dozing). This measure assessed the participant's general daytime sleepiness. ESS scores increase comparatively with increased sleep deprivation (Johns, n.d.). The participants could score between zero and twenty-four. A score of 10 or more was considered to be sleepy and a score of 18 or more was considered very sleepy. Participants were also asked to complete an adaption of the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) to gauge how the participants perceived their recent stress levels. The PSS consisted of ten questions asking how often the participant had experienced feelings and thoughts such as nervousness and irritations. The participants answered on a five point scale (0= never, 4= very often). Three additional questions asked participants to rank their current stress level, their average daily stress level, and if the participant was currently experiencing any unusual stressors such as familial problems or new financial problems that have increased their stress levels recently. Lastly, participants were asked to complete basic demographic information such as gender and age. A complete list of surveys can be found in Appendix 1.

Experimental Manipulation. Upon completion of the initial surveys, participants in the acute stress condition participated in a modified version of the Trier Social Stress Test (TSST), a commonly used paradigm, to induce feelings of acute stress (Kirschbaum, Pirk, & Hellhammer, 1993). The TSST consisted of two parts, the first lasting ten minutes and the second five minutes. In the first part participants received instructions asking them to take on the role of a job

applicant and prepare a five minute speech introducing themselves to the manager. Participants were given a pencil and paper to outline their speeches but were not able to use their preparations in their speech. After ten minutes the experimenter entered the room as the “manager”. Participants had five minutes to give their speech to convince the manager that they should be hired for the position. The TSST has been used extensively and most frequently in stress research, and has become the standard test to induce acute social stress in participants (von Dawans, Kirschbaum, & Heinrichs, 2010). The standardized procedures for the TSST reliably causes a brief cortisol response in participants leading to psychological stress in participants (Dickerson & Kemeny, 2004). However, due to the short duration of the TSST, participants do not experience a long-lasting change in their cortisol levels that could potentially cause detrimental effects to participants (Dickerson & Kemeny, 2004). Participants in the no acute stress condition were asked to outline what they might say on a job interview. They were told to think of it as a warm up writing assignment or brainstorming session so that they were not stressed about giving a writing sample. A complete list of instructions and the experimenters script can be found in Appendix 1.

Manipulation Check. Participants were asked to answer five questions after either completing the TSST for the acute stress condition or the writing outline for the no acute stress condition. Questions asked them how stressed, anxious, nervous, overwhelmed, and tired they felt at the time on a five point scale (0= not feeling that way at all, 4= having extreme feelings of said emotion). The manipulation check was used to see if the TSST had the designed effect of inducing stress in the experimental group relative to the control group. This survey can be found in Appendix 1.

Assessing Immorality. Finally, participants were asked to complete a number search task (Gino, Ayal, & Ariely, 2009). The task consisted of 20 matrices, each with 12 three digit numbers. The matrices each had two numbers that added to ten, such as 1.62 and 8.38. In line with previous research participants had five minutes to complete as many matrices as they could (Zhong, Bohns, & Gino, 2010**)**. Completion of the matrices was incentivized by offering participants one raffle ticket for each correctly solve matrix. Once participants completed the number search task they completed a response sheet reporting how many matrices they answered correctly and how many raffle tickets they earned. Participants were asked to grade the matrices themselves and then throw out the test and answer sheet. This allowed participants to grade in private and unsupervised by the experimenter. They were also asked what they believe the hypothesis of this experiment was. The number in the bottom right hand corner of the matrix used as an example on the response sheet was the same as the number in the bottom right hand corner of the last matrix on the test sheet and was used to identify each participant so cheating could be assessed. Cheating was be assessed in two ways. First, participants reported scores were compared with how many matrices they actually solved. If participants over reported how many matrices they solved it was considered as cheating. Secondly, in previous studies, participants were able to solve an average of seven matrices in five minutes. Therefore, cheating was also measured by self-reported scores exceeding seven (Zhong, Bohns, & Gino, 2010). The instructions, response sheet, test sheet, and answer sheet can be found in Appendix 1.

Procedure

The participants partook in a single testing session. Testing began several weeks into the semester to give students time to feel stressed or sleep deprived because of the typical pattern of college schedules. Testing occurred in the human research lab, room 212, in the psychology

building at Allegheny College at a standard time. Deception was used in this study. A cover story led participants in this study to believe testing was measuring the effect of chronic and acute stress on cognitive tasks to obscure the fact that the measure of interest was morality, a topic that evokes strong normative responses from participants. Participants were randomly assigned to the no acute stress or acute stress condition before their arrival in lab. When the participants arrived they signed in, were given information about the purpose of the study ("effects of stress on academic performance"), and read and sign a consent form. Participants were then given a packet with instructions, the Epworth Sleepiness Scale, Perceived Stress Scale, and a basic demographic questionnaire. Instructions led participants to complete the packet in order and then return it to the experimenter once completed.

Once the participants finished all surveys, participants in the acute stress condition were given the instructions for the Trier Social Stress Test along with paper to outline their speech if they so choose. Participants were asked to take the role of a job applicant interviewing for an open position. They were asked to prepare a five minute speech introducing themselves and convincing the experimenter, who was playing the role of the manager, that they were the best fit for the position available after ten minutes of preparation time. Participants were led to believe that this task was used to assess their written and oral academic skills. Participants were left alone for ten minutes to prepare their speech. Although participants could use the paper and pen to make notes or an outline for their speech, they were not allowed to use them during the actual speech. Participants were led to believe that their speech would be recorded using a video camera. There was also a timer counting down from five minutes displayed in front of the participant. Following the ten minutes of preparation time the experimenter entered the room as the manager and the participant was asked to begin their speech. When the participant completed

their speech with time remaining the experimenter said “You still have time life, please continue.” If the participant finished a second time before the five minutes had ended the experimenter then began to ask standardized questions. When the five minutes had passed the “manager” (experimenter) thanked the participant for their interview and gave them the manipulation check survey. Participants in the no acute stress condition were given a writing prompt asking them to outline a letter to the manager of a company that they were applying to introducing themselves. Participants were told that their writing sample would be used to assess their written academic skills. Participants were given ten minutes to complete this task.

Participants then completed a short questionnaire as a manipulation check. These questions were used to assess if the acute stress manipulation was successful.

The next set of instructions then asked the participants to complete the number search matrices, ostensibly a measure of academic performance, and a timer was set for five minutes. Once completed participants were given the answer sheet to check their own answers and self-report how many matrices they correctly completed. Upon completion participants gave the response sheet to the experimenter and had the option to be given the corresponding number raffle tickets for chance to win one of two gift cards to The Market House. All other papers were collected in separate box to remain confidential. The participants were asked to throw their test and answer sheet away in a waste basket provided in the testing room so no other participants would see their answers. The experimenter retrieved the test sheet after each session to compare participant’s actual score to their reported score to further assess cheating. At the end of the session participants were then given the first part of the debriefing. The full debriefing was sent in an email once all testing was complete to protect the integrity of the research, as some

information provided in the debriefing could have influenced future participant's responses in a way that threatens the validity of the design and the interpretation of any data.

Design

The design of this study was a one-factor between-subjects design with amount of acute stress (TSST vs. no TSST) as the independent variable. The dependent variable was the amount a participant cheated. Participants' cheating was measured by the difference between the number of matrices they report answering correctly on the response sheet and how many they actually answered correctly on the original worksheet as well as how many matrices they solved exceeding seven. A correlational design was also used to assess if there was a relationship between chronic sleep restriction and chronic stress and immoral behaviors.

Results

Chronic Sleep Restriction, Chronic Stress, and Immoral Behavior

On average, participants solved 5.54 matrices in five minutes (*SD*=4.27). A Pearson's product-moment correlation coefficient was computed to assess the relationship between chronic sleep restriction, as measured by the total score on the Epworth Sleepiness Scale, and matrices solved. There was no correlation between the two variables $r(35)= -.05$, $p=.77$. The relationship between chronic sleep restriction and cheating as measured by over reporting was evaluated through an independent samples t-test. Contrary to what literature suggests, dishonest participants (*M*=5.5, *SD*= 2.12) were marginally significantly less sleepy than honest participants (*M*=9.51, *SD*=3.09), $t(35)=1.80$, $p=.08$ indicating that as chronic sleep restriction increases, immoral actions decrease, that is, participants become more truthful. Chronic sleep restriction was further unrelated to cheating as measured by reported scores over seven. There was no correlation between the two variables $r(35)=-.07$, $p=.70$. A Pearson's product-moment

correlation coefficient was computed to assess the relationship between chronic stress, as measured by the participants' total score on the Perceived Stress Scale and cheating as measured by reported scores over seven. There was a marginally significant correlation between the two variables $r(35) = .32$, $p = .06$, indicating that as chronic stress increases, participants are more likely to act more immoral and cheat. Lastly, the relationship between chronic stress and cheating as measured by over reporting was assessed using an independent samples t-test. There was not a significant difference in scores for dishonest participants ($M = 19.49$, $SD = 5.77$) and honest participants ($M = 17.5$, $SD = .71$) in chronic stress levels; $t(35) = .48$, $p = .63$. Chronic sleep restriction and chronic stress were unrelated $r(35) = .07$, $p = .68$.

Manipulation Check

The stress survey used as a manipulation check consisted of five items ($\alpha = .715$), which were averaged to build a composite stress score for each participant. An independent samples t-test was conducted to compare stress scores after the manipulation in the acute stress and no acute stress conditions. There was a significant difference in the scores for the acute stress ($M = 2.18$, $SD = .75$) and no acute stress ($M = 1.65$, $SD = .78$) conditions; $t(35) = 2.13$, $p = .04$, $d = .69$, indicating that the acute-stress manipulation was successful.

Effects of Acute Stress on Immoral Behavior

An independent-samples t-test was conducted to compare cheating as measured by over reporting in the acute stress and no acute stress conditions. There was not a significant difference in the scores for the acute stress ($M = .06$, $SD = .24$) and no acute stress ($M = .05$, $SD = .23$) conditions; $t(35) = .04$, $p = .97$, $d = .04$. Repeating the analysis using matrices solved exceeding seven as the outcome variable yielded similar results: no significant difference in the scores for

the acute stress (*M*=-1.17 *SD*=1.04), and no acute stress (*M*=.-1.74, *SD*=.99) conditions; *t*(35)=.39, *p*=.70, *d*=.56.

For mean scores of matrices solved, matrices solved exceeding seven, and matrices over reported please see table 1. For the mean composite manipulation check scores for acute stress and no acute stress conditions please see figure 1.

Discussion

The ever increasing pressure and demands from school, jobs, and relationships have increased chronic sleep restriction and chronic stress across society. Less sleep has been related to increased levels of ego depletion, which lowers self-control in individuals (Barnes, Shaubroeck, Huth & Ghumman, 2011; Baumeister, Braslavsky, Murvan, & Tice, 1998). Lower levels of self-control limit an individual's ability to behave morally (Barnes, Schaubroeck, Huth, & Ghumman, 2011). The purpose of this study was to test the effects of chronic sleep restriction, chronic stress, and acute stress on immoral behavior. Previous research has shown an effect of chronic sleep restriction and an increase in immoral behaviors, however, there has been no direct link between chronic stress and acute stress on immoral behaviors (Barnes, Schaubroeck, Huth, & Ghumman, 2011). Therefore, the hypothesis of this study was that chronic sleep restriction, chronic stress, and acute stress would increase individual's immoral behavior, specifically academic cheating.

Chronic sleep restriction was measured using the Epworth Sleepiness Scale (Johns, 1991) while chronic stress was measured using the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983). These scales were correlated with both the number of matrices over reported and the number of matrices exceeding seven (an indicator of cheating). There was no correlation between chronic sleep restriction and the number of matrices solved by participants.

Unexpectedly, chronic sleep restriction increased the participant's likelihood of being more truthful when reporting the number matrices they solved. However, there was no significant correlation between chronic stress and cheating by over reporting the number of matrices solved. Contrary to the predicted hypothesis, there was also no significant relationship between chronic sleep restriction and the number of matrices solved over seven. However, there was a positive correlation between chronic stress and the number of matrices solved over seven. This indicates that participants that reported higher perceived stress scores were more immoral. There was no correlation between chronic sleep restriction and chronic stress.

The most surprising result with marginal significance was that increased chronic sleep restriction decreased immoral behavior. This result completely contradicts previous research and the study's hypothesis suggesting that chronic sleep restriction depletes self-control which typically increases immoral behaviors (Barnes, Schaubroeck, Huth, & Ghumman, 2011). This could be due to participants' awareness of their participation in one of their peer's research. It is also important to note that there was very little variability in the participants that cheated. Only two participants cheated, one from each condition, and each only over reported their score by one. Therefore, the results are not likely very robust as a consequence of lack of variability and such a small number of cheaters. While self-control is typically weakened when an individual is tired, self-awareness may have mitigated this effect and therefore increased the participants' self-control and therefore decreased their immoral behaviors.

As predicted, chronic stress marginally increased participants' likelihood of cheating by reporting scores exceeding seven on the matrices. Participants experiencing higher chronic stress may have felt more pressure to solve more matrices, therefore increasing the likelihood of solving more than seven in five minutes. The increased pressure may have decreased

participants' ability or willingness to self-regulate their behaviors which consequently increased their levels of cheating.

The lack of support of the hypotheses that chronic sleep restriction would be associated with cheating. The average participants scored a total of 9.29 on the Epworth Sleepiness Scale (SD=3.11). The total possible score was 24, however, a score of ten is considered to be sleepy while a score of 18 is considered to be very sleepy. Therefore it is possible that participants were just not tired enough to cheat. Participants averaged a total of 19.38 out of 40 (SD=5.62) on the Perceived Stress Scale. This is only a moderate level of perceived stress. It could be possible that participants weren't tired or stressed enough to have caused consequences on their level of self-control. Perhaps if the study has been completed later in the semester when test, papers, and other stressors had time to accumulator, the results would have been different.

The lack of association between chronic sleep restriction and chronic stress was surprising since previous studies have found associations between chronic sleep restriction and chronic stress (Akersted, 2006; Barber & Munz, 2010; Minkel, Banks, Htalk, & Jones, 2012; Sadeh, Keinan, Daon, 2004). It is possible that ESS and PSS scores were not individually high enough, resulting in no correlation between the two due to a restriction in range.

Participants in the acute stress condition were asked to complete the Trier Social Stress Test (Kirschbaum, Pirk, & Hellhammer, 1993), while participants in the no acute stress condition were asked to briefly write an outline brainstorming what they may say during a job interview. Participants in the acute stress condition perceived their stress levels to be higher than those in the no acute stress condition. This indicated that the manipulation was successful and acute stress was induced in the participants that completed the Trier Social Stress Test. Even though participants in the acute stress condition experienced higher perceived stress levels, there was no

significant difference between the no acute stress condition in the amount they over reported or scored over seven on the matrices which contradicted the predicted hypothesis.

There are several possible reasons that there were no significant results supporting the hypothesis that acute stress would increase cheating in participants. First, while participants in the acute stress condition were significantly more stressed than participants in the no acute stress condition post experimental manipulation, their overall stress levels were only mild to moderately high. On a scale of five, participants in the acute stress condition had a mean score of 2.19 which does not even reach the halfway mark for high stress levels. While participants experienced acute stress, it was at such a low level that it may not have had the intended effect of increasing immoral behaviors.

One possibility for the low levels of acute stress could be due to an experimenter effect. The experimenter effect is any effect, typically unintentional, that the researcher has on the participants in their study (Rosenthal, 2002). The experimenter who took the role of the interviewer during the experimental manipulation was a young, white, female who may have been less intimidating to a participant then a male experimenter, who would typically be seen as the more dominant, powerful, and influential sex, or a group of managers (Carli, LaFleur, & Loeber, 1995). The experimenter effect could have lessened the stress that participants felt while completing the Trier Social Stress Test, lowering their overall acute stress during the experiment. Participants were also aware that this was not a real job interview and their speech held no real consequences, lowering the intensity of the task and stress felt. The experimenter was also attending the same college as participants and therefore considered to be one of their peers instead of an authority figure. Additionally, the TSST is typically completed using a panel of two interviewers that are unfamiliar to the participants which could further increase the stress of

giving a speech more so than a single individual that is viewed as their equal peer. Past research has shown that experimenters acquainted with their participants find different results than experimenters that are completely unfamiliar with their participants (Rosenthal, 2002). Lastly, while the TSST is widely used in health psychology to induce acute stress, it is also possible that social stress does not decrease individuals' self-control, however, cognitive stress could have a different consequence. It is probable that a cognitive stressor, such as the Pace Auditory Serial Addition Test, would have increased acute stress levels more as well as decreased self-control, leading to an increased frequency of cheating. Future research should address these possibilities.

Why so Little Cheating?

Instances of cheating were very low across both acute stress and no acute stress conditions. While it is possible the chronic sleep restriction, chronic sleep, and acute stress rates were just not high enough to decrease participants' self-control and increase cheating, there are also several other environmental situations that could have limited cheating in participants. On average participants scored the appeal of the possibility of winning a gift card to The Market House Grille favorably (M=5.08 on a scale of seven). While the incentive to cheat was there, the majority of participants showed no significant increase of reporting scores over the average matrices solved of seven. While the incentive was high, the reward was not immediate and therefore could have lessened the desire to cheat for the reward. The lack of cheating could have also been due in part to participants' awareness of their participation in one of their peer's research and that their answers may affect the researcher's results. Not wanting to disrupt the researcher's project, participants would be more aware of the weight of their reporting of their matrices, leading them to be self-aware, and therefore more honest. Also, there was a window separating the participant from the experimenter, and although the experimenter turned their

back to the participants while they completed the matrices, the participants may have felt like they were being observed, further increasing their self-awareness. Duval and Wicklund's objective self-awareness theory (OSA) argues when individuals are made to focus on themselves their self-awareness increases and they evaluate themselves in terms of the relevant standards (Phillips & Silvia, 2005). In the case of this experiment, participants' self-awareness could have been increased by the presence of the experimenter as well as the setting of the testing. Testing was completed in a lab located in an academic building where classes are taken. In the classroom environment cheating is forbidden and while participants were not in a formal class, they could have still been aware of the standards typically upheld in the classroom. Therefore, just being present in the academic building could increase the participants' self-awareness of the relevant standards of that particular environment.

Participants were pooled from a small college community of only 2,100 students. Students on a small campus are not accurate representatives of the general population which is limiting to the success of the study. Allegheny College students are also expected to uphold the Honor Code which forbids cheating. While there was no mention of the Honor Code, being part of a community that supports it could potentially subconsciously influence participants' decision to not cheat. The Honor Code could also factor into the participants self-awareness as another factor of relevant standards to compare themselves too. There were also 13 freshman participants who had recently completed orientation and begun freshman seminar classes which heavily emphasize the importance of the Honor Code and academic integrity.

Limitations

There were several limitations to this study. First, the study had a small sample size of only 37, which drew from a small college community of about 2,100. Second, the experimental

manipulation was relatively successful in increasing participants' acute stress, however it was not absolutely successful in increasing participants in the acute stress condition stress levels very high, thereby limiting the effect acute stress could potentially have on individuals' likelihood to act immorally.

While there was limited support for the hypotheses found in this study, it is important that this study be replicated using a larger sample size and new experimental manipulation that increases participants acute stress to higher levels. The possible confounding effect of participant's awareness of their own participation in a research study should also be controlled for. Ideally the participants would complete the testing session in a room with no windows with an experimenter that was not from their community. There should also be at least one more "interviewer" in the testing room for the TSST. Lastly, sample size should be increased and participants should be pooled from a larger population size.

Societal pressures and demands show no signs of decreasing anytime soon for individuals, and they can cause harmful effects on sleep and stress. More research is needed to fully explore the effects of chronic sleep restriction, chronic stress, and acute stress since these factors may result in immoral behavior. Knowledge of what motivates and impacts individuals' behaviors is essential for understanding how larger groups and organizations function- such as college students, businesses, and other subgroups of society where an individual's immoral behavior is typically discouraged for the benefit of the greater good. In the future, a thorough exploration of the effects of chronic sleep restriction, chronic stress, and acute stress would be helpful in the process of understanding what drives individual's choices and behaviors. Likewise, a more detailed understanding of these processes may contribute to interventions. If chronic or acute stress, in fact, does contribute to unethical behavior, it seems feasible to study the role of

exercise, relaxation, yoga, or meditation in reducing stress, and as a result, potentially unethical behavior. Given the impact of the large negative costs that is done by many small unethical acts, even small interventions may have substantial consequences.

References

Adam, T. C. & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology & Behavior,* 91(4), 449-458.

Akerstedt, T. (2006). Psychosocial stress and impaired sleep. *Scandinavian Journal of Work, Envionment, & Health,* 32(6), 493-501.

American Psychological Association, Harris Interactive, Inc, &Vanguard Communications. (2014). *Stress in America* No. 6) American Psychological Association.

Barber, L. & Munz, D. (2010). Consistent-Suffi cient Sleep Predicts Improvements in Self-Regulatory Performance and Psychological Strain. *Stress and Health,* 27, 314–324.

Barnes, C. M., Schaubroeck, J., Huth, M., & Ghumman, S. (2011). Lack of sleep and unethical conduct. *Organizational Behavior and Human Decision Processes, 115*(2), 169-180.

Batson, C. D. (2013). *What's Wrong with Morality? A Different Approach to Moral Psychology.* Unpublished manuscript.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*(5), 1252-1265.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Direction in Psychological Science, 16*(6), 351-355.

Breus, M. J. (2010, August 26). A new challenge for college students: The freshman 8, not 15! Retrieved March 9, 2010, from http://www.huffingtonpost.com/dr-michael-j-breus/a-new-challenge-for-colle_b_694538.html.

Carli, L. L., LaFleur, S. J., & Loeber, C. C. (1995). Nonverbal behavior, gender, and influence. *Journal of Personality and Social Psychology,* 68(8), 1020-1041.

Center for Disease Control and Prevention. (2014). *Insufficient Sleep Is a Public Health Epidemic*. Centers for Disease Control and Prevention.

Chandola, T., Brunner, E., & Marmot, M. (2005). Chronic stress at work and the metabolic syndrome: prospective study. *The BMJ*, 332, 521.

Cohen, S., Doyle, W. J., Alper, C. M., Janicki-Deverts, D., & Turner, R. B. (2009). Sleep Habits and Susceptibility to the Common Cold. *American Medical Association,* 169(1) 62-67.

Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological Stress and Disease. *American Medical Association*, 298(14), 1685-1687.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A Global Measure of Perceived Stress. *Jounal of Health and Social Behavior,* 21 (4), 385-395.

Crispim, C. A., Zalcman, I., Dattilo, M., Padilha, H. G., Edwards, B., Waterhouse, J.,…de Mello, M. T. (2007). The influence of sleep and sleep loss upon food intake and metabolism. *Nutrition Research Reviews,* 20, 195-212.

Dallman, M. F. ., Pecoraro, N., Akana, S. F., la Fluer, S. E., Gomes, F., Houshyar, H., & Manalo, S. (2003). Chronic Stress and Obesity: A New View of "Comfort Food." *Proceedings of the National Academy of Sciences of the United States of America*, 100(20), 11696-11701.

DeWall, C. N., Baumeister, R. F., Stillman, T. F., & Gailliot, M. T. (2006). Violence restrained: Effects of self-regulation and its depletion on aggression. *Journal of Experimental Social Psychology*, 43(2007), 62-76.

Dickerson, S.S. & Kemeny, M.E. (2004). Acute Stressors and Cortisol Responses: A Theoretical Integration and Synthesis of Laboratory Research. *Psychological Bulletin*, 130 (3), 355-391.

Drake, C. A. (1941). Why Students Cheat *The Journal of Higher Education*, 12(8) 418-420.

Eggers, A. (2007). Redrawing Papez' circuit: A theory about how acute stress becomes chronic and causes disease. *Medical Hypotheses,* 69(4), 852-857.

Ellis, A. P. J. (2006). System Breakdown: The Role of Mental Models and Transactive Memory in the Relationship between Acute Stress and Team Performances. *Academy of Management,* 49(3), 576-589.

Epel, E. S., McEwen, B., Seeman, T., Matthews, K., Catellazzo, G., Brownwell, K. D.,…Ickovics, J. R. (2000). Stress and Body Shape: Stress-Induced Cortisol Secretion Is Consistently Greater Among Women With Central Fat *Psychomatic Medicine*, 63, 623-632.

Forquer, L. M., Camden, A. E., Gabriau, K. M., & Johnson, C. M. (2008). Sleep patterns of college students at a public university. *Journal of American College Health, 56*(5), 563-565.

Gamliel, E., & Peer, E. (2013). Explicit risk of getting caught does not affect unethical behavior. *Journal of Applied Social Psychology,* 43, 1281-1288.

Gino, F., Ayal, S.,& Ariely, D. (2009) Contagion and Differentiation in Unethical Behavior: The Effect of One Bad Apple on the Barrel. *Association for Psychological Science*, 20(3) 393-398.

Gino, F., Schweitzer, M. E., Mead, N. L., & Ariely, D. (2011). Unable to resist temptation: How self-control depletion promotes unethical behavior. *Organizational Behavior and Human Decision Processes*, 115, 11-203.

Gouin, J., Glaser, R., Malarkey, W. B., & Beversdorf, D. (2012). Chronic Stress, Daily Stressors, and Circulating (Markers. *Health Psychology*, 31(2), 264 –268.

Institute of Medicine. (2006). *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem.* Washington, DC: The National Academies Press.

Johns, M. W. (1991). A New Method for Measuring Daytime Sleepiness: The Epworth Sleepiness Scale. *Sleep*, 14 (6), 540-545.

Johns, M. W. (n.d.) The Epworth Sleepiness Scale. Retrieved May 22, 2014, from http://epworthsleepinessscale.com/about-epworth-sleepiness/.

Kirschbaum, C., Pirk, K., & Helhammer, D. H. (1993). The 'Trier Social Stress Test'- A Tool for Investigating Psychobiological Stress Responses in a Laboratory Setting. *Neuropsychobiology*, 28, 76-81.

Köhler, T., & Haimerl, C. (1990). Daily Stress as a Trigger of Migraine Attacks: Results of Thirteen Single-Subject Studies. *Journal of Consulting and Clinical Psychology*, 58(6), 870-872.

Kouchaki, M., & Smith, I. H. (2014). The morning morality effect: The influence of time of day on unethical behavior. *Psychological Science, 25*(1), 95-102.

Lazarus, R. S., DeLongis A., Folkman, S. & Gruen, R. (1985). Stress and Adaptational Outcomes: The Problem with Cofound Variables. *American Psychologist*, 40(7), 770-779.

Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *American Psychological Association*, 82(4), 760-768.

Matheson F.I., Moineddin R., Dunn J.R., Creatore M.I., Gozdyra P., & Glazier R.H. (2006) Urban neighborhoods, chronic, stress, gender and depression. *Social Science and Medicine*,63, 2604–2616.

Mazar, N., & Ariely, D. (2006). Dishonesty in Everyday Life and Its Policy Implications. *Journal of Public Policy and Marketing*, 25(1), 117-126.

McCabe, D. L., & Trevino, L. K. (1993). Academic Dishonesty: Honor Codes and Other

Contextual Influences. *The Journal of Higher Education*, 64(5), 522-538.

McCabe, D. L., Trevino, L. K., & Butterfield, K. D. (2001). Cheating in Academic Institutions: A Decade of Research. *Ethics and Behavior*, 11(3), 219-232.

Mead, N. L., Baumeister, R. F., Gine, F., Schweitzer, M. E., & Ariely, D. (2009). Too tired to tell the truth: Self-control resource depletion and dishonesty. *Journal of Experimental Social Psychology, 45*, 594-597.

Minkel, J. D., Banks, S., Htaik, O., Moreta M., & Jones, C. W. (2012). Sleep deprivation and stressors: Evidence for elevated negative affect in response to mild stressors when sleep deprived. *Emotion*, 12(5), 1015-1020.

Moller-Levet, C. S., Archer, S. N., Bucca, G., Laing, E. E., Slak, A., Kabiljo, R.,…Dijk, D. (2013). Effects of insufficient sleep on circadian rhythmicity and expression amplitude of the human blood transcriptome. *Proceedings of the National Academy of Sciences,* 110(12), 1132-1141.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247-259.

Owunwanne, D., Rustagi, N., & Dada, R. (2005). Students' Perceptions of Cheating and Plagiarism in Higher Institutions. *Journal of College Teaching & Learning*, 7(11) 59-68.

Padgett, D. A. & Giaser, R. (2003). How stress influences the immune system. *Trends in Immunology*, 24(8), 444-448.

Phillips, A. G., & Silvia, P. J. (2005). Self-awareness and the emotional consequences of self-discrepancies. *Personality and Social Psychology Bulletin,* 31, 703-713.

Pilcher, J. J., & Walters, A. S. (1997). How sleep deprivation affects psychological variables related to college students' cognitive performance. *Journal of American College Health, 46(3),* 121.

Pope, J. (2012, August 30). Colleges open their eyes: ZZZs are key to GPA. Retrieved March 9, 2014, from http://www.huffingtonpost.com/2012/08/31/colleges-open-their-eyes-_n_1846148.html.

Puterman, E., Lin, J., Blackburn, E., O'Donovan, A., & Adler, N. (2010). The Power of Exercise: Buffering the Effect of Chronic Stress on Telomere Length. *PLoS ONE,* 5(5).

Rosenthal, R. (2002). Experimenter and Clinician Effects in Scientific Inquiry and Clinical Practice. *Prevention and Treatment*, 5(38), 1-12.

Ross, S. E., Niebling, B. C., & Heckert, T. M. (1999) Sources of stress among college students. *College Student Journal*, 33(2), 312-317.

Sadeh, A., Keinan, G., & Daon K. (2004). Effects of Stress on Sleep: The Moderating Role of Coping Style. *Health Psychology*, 23(5), 542–545.

Segerstrom, S. C. & Miller, G. E. (2004). Psychological Stress and the Human Immune System: A Meta-Analytic Study of 30 Years of Inquiry. *Psychological Bulletin*, 130(4), 601-630.

Shu, L. L., Mazar, N., Gino, F., Ariely, D., & Bazerman, M. H. (2012). Signing at the beginning makes ethics salient and decreases dishonest self-reports in comparison to signing at the end. *Psychological and Cognitive Sciences,* 109 (38), 15197-15200.

Stillman, J. (2014). 5 Signs You're Seriously Overworked. Retrieved September 2, 2014, from http://www.inc.com/jessica-stillman/5-signs-you-re-seriously-overworked.html.

Stucke, T. S. & Baumeister, R. F. (2005). Ego depletion and aggressive behavior: Is the

inhibition of aggression a limited resource? *European Journal of Social Psychology*, 36, 1-13.

Vincent, L. C., Emich, K. J., & Goncalo, K. A. (2013). Stretching the Moral Grey Zone: Postive Affect, Moral Disengagement, and Dishonesty. *Psychological Science*, 24(4), 595-599.

Von Dawans, B., Kirschbaum, C., & Heinrichs, M. (2011). The Trier Social Stress Test for Groups (TSST-G): A new research tool for controlled simultaneous social stress exposure in a group format. *Psychoneuroendocrinology*, 36, 512-522.

Vgontzas, A. N., Liao, D., Pejovic, S., Calhoun, S., Karataraki, M., Basta, M.,… Bixler, E. (2010). Insomnia with Short Sleep Duration and Mortality: The Penn State Cohort. *SLEEP*, 33(9), 1159-1164.

Wagner, D. T., Barnes, C. M., Lim, V. K. G., & Ferris, D. L. (2012). Lost sleep and cyberloafing: Evidence from the laboratory and a daylight saving time quasi-experiment. *Journal of Applied Psychology, 97*(5), 1068-1076.

Welsh, Ellis, Christian, & Mai (2014). Building a Self-Regulatory Model of Sleep Deprivation and Deception: The Role of Caffeine and Social Influence. *Journal of Applied Psychology*, doi:http://dx.doi.org/10.1037/a0036202.

Yap, A. J., Walzlawek, A. S., Lucas, B. J., Cuddy, A. J. C., & Carney, D. R. (2013). The Ergonomics of Dishonest: The Effect of Incidental Posture on Stealing, Cheating, and Traffic Violations. *Psychological Science,* 24(11), 2281-2289.

Yoo, S., Gujar, N., Jolesz, F., & Walker, M. P. (2007). The human emotional brain without sleep- a prefrontal amygdala disconnect. *Current Biology,* 17(20), 877-878.

Zhong, C., Bohns, V. K., & Gino, F. (2010). Good Lamps Are the Best Police: Darkeness

Increases Dishonesty and Self-Interested Behavior. *Psychological Science* 21(3), 311-314.

Table 1
Different mean scores in experimental conditions

	Total Number of Matrices Solved		Matrices Solved Exceeding 7 (Difference)*		Matrices Over Reported	
Condition	Mean	SD	Mean	SD	Mean	SD
Acute Stress	5.83	4.423	-1.17	4.423	.06	.236
No Acute Stress	5.26	4.344	-1.74	4.344	.05	.229

Note. *Difference scores that are negative values indicate the number of matrices reported below seven

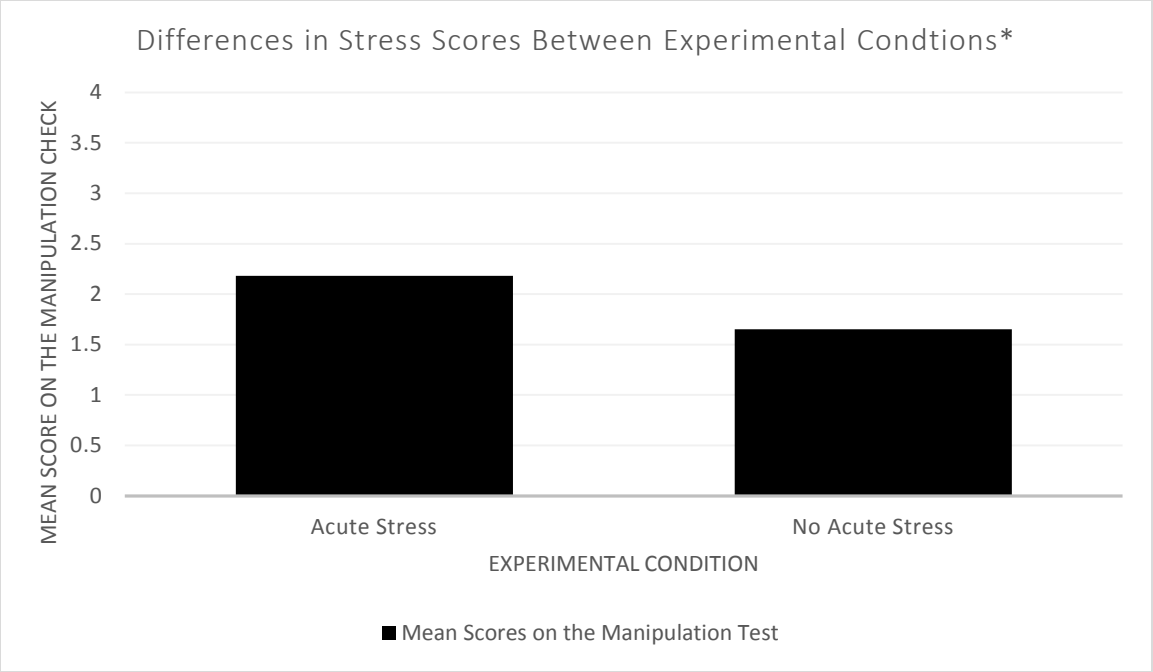


Figure 1. The mean composite scores of the manipulation check stress survey for acutes tress and no acute stress.

*There was a significant difference in the mean composite scores for acute stress (M=2.13, SD=.75) and no acute stress (M=1.65, SD=.78) conditions; $t(35)=2.13$, p=.04, d=.69.

Appendix 1
Research Participation Consent Form

The Effect of Chronic and Acute Stress on College Students Academic Performance
Allegheny College-Department of Psychology

Purpose of Research: The purpose of this study is to examine how chronic and acute stress may effect a college student's academic performance.

Procedure: I understand that I will be asked to complete a series of questionnaires about my typical daytime sleepiness as well as my perceived stress levels. I understand that I will also be asked to participate in two tasks measuring my academic performance. Finally, I understand that I will be asked about my demographics. In all, the study will take approximately 40-45 minutes (the equivalent of 2 SONA credits).

Risks to the Individual: I understand that there will be no more risk other than what is normally experienced in everyday life.

Compensation: I understand that I may receive extra credit at the discretion of my instructor, and that I can choose to be entered into a raffle to win one of two $25 gift cards to The Market House Grille

Confidentiality: I understand that my name will never be associated with the data I provide and will be completely confidential. I understand that the researcher is interested in patterns in the data as a whole as opposed to individual scores. Any reports made based on the data will focus solely on these general patterns. Furthermore, I understand that all data will be stored under lock and key in the Psychology Department at Allegheny College. I understand that my consent form will be stored in a locked cabinet separately from my data. When the data I provide today are no longer needed, they will be destroyed.

Voluntary Nature of Participation: I understand that I do NOT have to participate in this experiment. Furthermore, upon beginning the experiment, I may choose to withdraw my participation at any time without penalty. I understand that I may skip any individual questions that I do not wish to answer, and I may choose not to participate in any part of the study without being questioned.

Contact Information: If I have any questions about this research project, I can contact Rebecca Cohen at cohenr@allegheny.edu or the research advisor, Dr. Lydia E. Jackson at ljackson2@allegheny.edu or at (814) 332 5955. If I have questions or concerns about the treatment of research participants, I can contact Dr. Ann Kleinschmidt, Chair of the Allegheny Institutional Review Board (IRB) at akleinsc@allegheny.edu.

I understand that my signature below indicates that I am at least 18 years of age at the time of my participation in this study, and that I have a received a copy of this informed consent form. I have carefully read and understood the information on this form and all of my questions thus far have been answered. I hereby agree to participate in the study.

Participant's Signature _____ date _____

Participant's Name (print) _____ date _____

Researcher's Signature _____ date _____

ID #_____
Please do not write above this dotted line, for researcher's purpose only

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Part 1: Thank you for participating in this study. There will be three parts of this study. First, you will be completing a sleep and stress survey, a demographic questionnaire, followed by two sets of cognitively challenging tasks. The researcher is looking to find if there is a correlation between chronic and acute stress and cognitive functions. Please complete the packet of surveys first. When you are finished please let the researcher know.

The Epworth Sleepiness Scale is used to determine the level of daytime sleepiness. Use the following scale to choose the most appropriate number for each situation:

0 = would *never* doze or sleep.
1 = *slight* chance of dozing or sleeping
2 = *moderate* chance of dozing or sleeping
3 = *high* chance of dozing or sleeping

Situation	Chance of Dozing or Sleeping
Sitting and reading	____
Watching TV	____
Sitting inactive in a public place	____
Being a passenger in a motor vehicle for an hour or more	____
Lying down in the afternoon	____
Sitting and talking to someone	____
Sitting quietly after lunch (no alcohol)	____
Stopped for a few minutes in traffic while driving	____

Please use the following scale to choose the most appropriate number for each situation.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?..... 0 1 2 3 4

2. In the last month, how often have you felt that you were unable to control the important things in your life? 0 1 2 3 4

3. In the last month, how often have you felt nervous and “stressed”? 0 1 2 3 4

4. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4

5. In the last month, how often have you felt that things were going your way? 0 1 2 3 4

6. In the last month, how often have you found that you could not cope with all the things that you had to do? 0 1 2 3 4

7. In the last month, how often have you been able to control irritations in your life?..... 0 1 2 3 4

8. In the last month, how often have you felt that you were on top of things?.. 0 1 2 3 4

9. In the last month, how often have you been angered because of things that were outside of your control? 0 1 2 3 4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? 0 1 2 3 4

11. How stressed do you currently feel (0-extremely relaxed, 4-extremely stressed)…….... 0 1 2 3 4

12. How stressed do you feel on an average day (0-extremely relaxed, 4-extremely stressed)?..... 0 1 2 3 4

13. Are you currently experiencing higher stress then usual from unusual added stressors in your life (such as parents divorce, death of a loved one, etc.)? If yes, please share what the unusual stressor is if you are comfortable doing so.

1. Gender? _____ Male ____ Female ____Do not wish to disclose
2. Age? _____
3. Class standing:
_____ First Year _____Sophomore _____ Junior _____ Senior

4. Race/Ethnicity. Check all that apply
___ American Indian/Alaska Native
___ Asian
___ Black or African American
___ Native Hawaiian or Other Pacific Islander
___ White
___ Hispanic
___ Latino/Latina
___ Other (Please specify) _____

Part 2: Pretend you have applied to a job. For the next ten minutes outline a draft of what you might say on your interview. Think of this as a warm-up writing assignment or brainstorming exercise. It does not need to be very detailed or polished.

Part 2: Your task in this experiment is the following: please imagine that you have applied for a job and have been invited for an interview. In contrast to a real interview, however, you are supposed to give a talk, in which you are to convince the manager in five minutes why you think that you would be the best candidate for this position. Please note that you will be recorded by a camera and a microphone for subsequent voice and behavioural analysis. The manager is trained in behavioural analysis and will take notes during your talk. You should try to leave the best possible impression, and assume the role of the applicant for the duration of the talk as best as you can. The manager will reserve the right to ask follow-up questions in case of uncertainties to receive all necessary information from you. You may take some notes now, which you must not use during your talk. This task will be used to assess your oral and public speaking academic skills

Trier Social Stress Test Script for Experimenter

- “Please step behind the line and begin your talk".

- If participant stops before five minutes, wait for about 20s and then say: “You still have time”.
- If participant stops before five minutes a second time, start asking questions the following questions:

- Why do you think you are especially well-qualified for this task?
- Why do you think you are better qualified then the other applicants?
- What do your family/friends especially appreciate about you?
- What do you appreciate about your friends?
- What do you appreciate about colleagues?
- You just pointed out that you were especially good at…, what other characteristics qualify you?
- You just mentioned you qualities in respect to…, what do you in particular think about…?
- You just spoke about…, what exactly do you then think about…?
- Please complete the following sentence: “I am the best at/in…”
- Please list your strengths!
- Please list your weaknesses!
- What kind of leading qualities do you have?
- What do you think about teamwork?
- Where do you see your position in a team?
- What can you constructively add to a team?
- You just mentioned that you really appreciate teamwork, what do you think about lone fighters?
- What do you think about job interviews?
- What do your employees appreciate about you most?
- Would you be willing to work overtime without compensation?
- Would you be willing to work on the weekends if this be deemed necessary?
- What kind of leading qualities do you expect from your employees?
- What kind of qualities to you expect from your co-workers?
- Under what circumstances would you be willing to compensate for the mistakes your co-workers make?
- Would you lie in order to gain an advantage?
- What do you think about the saying “Everybody determines his own luck”

ID #_____
Please do not write above this dotted line, for researcher's purpose only
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Now please complete this brief questionnaire. When you are finished please return it to the researcher and they will give you the final task of the experiment.

Use the following scale to choose the most appropriate number for each question.

1. How stressed do you currently feel? (0-extremely relaxed, 4-extremely stressed)……0 1 2 3 4

2. How anxious do you currently feel? (0-not anxious at all, 4-extremely anxious)……0 1 2 3 4

3. How overwhelmed do you currently feel? (0-not overwhelmed at all, 4-extremely overwhelmed)……..……0 1 2 3 4

4. How nervous do you currently feel? (0-not nervous at all, 4-extremely nervous)……0 1 2 3 4

5. How tired do you currently feel? (0-not tired at all, 4-extremeley tired……..……...…0 1 2 3 4

Part 3: You will have five minutes to complete a set of 20 number-search problems. When you are finished please let the researcher know and you will be given an answer sheet and response sheet so you can report the number of matrices you answered correctly. For each matrix that you solve correctly you will be given one raffle ticket.

When you are finished please give just the response sheet to the experimenter and they will give you your raffle tickets. Please place all other materials back in the box in the front of the room to be discarded and put your student ID and box number on the raffle tickets and leave them in the bucket. At the end of the experiments two raffle tickets will be pulled for a $25 gift certificate to The Market House

ID Number:
Please do not write about the dotted line, for researcher's purpose only
---

Instructions & Collection Slip

ext, you will find a test sheet with 20 matrixes as the one below:

Example

3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

Got it ☐

In each matrix you should look for a set of numbers that **sum up exactly to 10**.
When you find a set, circle the numbers, and mark the corresponding 'Got It' Box below, as in the example below:

Example

3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

Got it ☑

For each matrix you solve, you will receive a ticket that will be entered into a raffle for a gift card. You have **5 minutes** for this task.

Once 5 minutes are up please do the following:

1. Count the number of correctly solved matrixes.
2. Write down the number of correctly solved matrixes together and answer the following questions.
3. Throw away the test sheet with the matrixes in the trash can in the room (so other participants won't accidently see your test sheet).
4. Submit only this sheet to the experimenter, who will give you your raffle tickets.

Response sheet to be turned in after completion of matrices

1. I got _____ Boxes, and which translates to _____raffle tickets (1 box=1 raffle ticket)

2. What do you think the hypothesis of this study was?

TEST SHEET

1.69	1.82	2.91
4.67	4.81	3.05
5.82	5.06	4.28
6.36	5.19	4.57

Got it ☐

7.17	4.89	7.76
5.66	1.86	5.11
9.83	5.95	4.25
7.01	6.28	3.82

Got it ☐

0.49	0.74	1.17
3.72	2	1.22
3.75	5.22	5.67
8.83	8.23	7.7

Got it ☐

0.47	4.58	2.57
3.15	3.82	4.38
4.94	5.42	5.98
2.95	4.86	7.54

Got it ☐

2.92	4.98	4.34
0.39	0.72	5.53
9.61	3.57	3.36
6.8	0.53	8.58

Got it ☐

0.81	1.31	2.09
4.55	3.75	3.19
5.62	9.41	6.81
7.02	8.48	8.51

Got it ☐

0.17	2.46	2.44
6.02	5.6	2.63
6.05	6.21	6.6
8.22	8.19	7.54

Got it ☐

4.74	4.78	0.83
1.61	5.97	4.09
5.96	3.29	9.09
0.89	9.17	2.71

Got it ☐

6.21	2.47	9.57
1.68	9.52	4.52
8.7	7.69	1.47
6.4	4.44	8.32

Got it ☐

3.08	9.42	5.87
3.94	5.41	3.42
4.02	5.06	4.12
4.13	4.65	2.86

Got it ☐

0.15	0.95	1.31
4.98	2.9	2.88
6.66	6.73	7.67
9.75	9.85	8.17

Got it ☐

0.63	0.65	1.02
2.64	2.34	2.12
2.89	5.98	8.89
9.49	9.37	9.33

Got it ☐

2.22	4.5	7.13
9.33	9.77	5.96
7.04	4.04	5.22
2.28	1.72	8.16

Got it ☐

0.74	4.55	3.19
8.51	7.91	8.68
5.62	0.81	2
3.75	3.72	2.09

Got it ☐

5.97	9.62	9.41
3.6	7.4	7.01
5.49	0.59	2.62
7.51	5.71	0.49

Got it ☐

4.73	2.12	8.99
0.63	8.89	9.33
1.02	2.34	4.98
1.11	0.65	2.9

Got it ☐

0.12	0.71	0.74
4.27	3.07	2.27
5.09	5.73	5.82
9.27	7.03	6.79

Got it ☐

0.74	1.93	2.76
7.24	5.03	3.14
7.71	6.38	3.8
8.28	9.18	9.48

Got it ☐

0 14	0.67	2.22
5.96	5.58	5.22
7.04	7.59	9.33
9.77	9.5	8.52

Got it ☐

2.16	4.51	1.66
8.29	8.05	9.03
4.73	7.84	9.86
5.21	3.94	2.46

Got it ☐

Answer Sheet

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6.36	5.19	4.57

Found it ☐

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1.11	0.65	2.9

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4.73	7.84	9.86
5.21	3.94	7.18

Found it ☐ Found it ☐ Found it ☐ Found it ☐

Research Participation Debriefing Form, Part 1

The Effect of Chronic and Acute Stress on College Students Academic Performance
Allegheny College
Department of Psychology

Purpose of Research: The purpose of this research was to understand the effect of chronic and acute stress on academic performance. Previous research has shown that college students experience higher levels of stress and chronic sleep restriction. While there is a vast amount of research supporting chronic stress impacting an individual's health negative, there is very little directly interested in academic performance. More information about this study will be sent upon its completion

Compensation: Some students may receive extra credit from their professors for their participation if the course allows it. Participants may also enter their name into a raffle for one of two $25 gift cards to The Market House Grille.

Confidentiality: The data you provided for this research project will be confidential and your name will never be associated with your results. Furthermore, when your data is no longer needed, it will be shredded.

To Learn More: For further information about this topic, please consult the following sources:

American Psychological Association, Harris Interactive, Inc, &Vanguard Communications. (2013). *Stress in America* No. 6) American Psychological Association.

Forquer, L. M., Camden, A. E., Gabriau, K. M., & Johnson, C. M. (2008). Sleep patterns of college students at a public university. *Journal of American College Health*, *56*(5), 563-565.

Pope, J. (2012, August 30). Colleges open their eyes: ZZZs are key to GPA. Retrieved March 9, 2014, from http://www.huffingtonpost.com/2012/08/31/colleges-open_ their_yes_n_1846148.html

Contact Information: If you have any questions about this research project, please consult the information below:

Experimenter: Rebecca Cohen E-mail: cohenr@allegheny.edu
Faculty Advisor: Dr. Lydia E. Jackson E-mail: ljackson2@allegheny.edu
IRB Committee Chair: Dr. Ann Kleinschmidt E-mail: akleinsc@allegheny.edu
Counseling Center (Reis Hall Room 304) - (814) 332-4368

If you would like a copy of the results of this research study, please fill out and tear off the bottom portion of this debriefing statement and return it to the researcher.

I would like to receive a summary of the results of this study.

Yes O No O
If yes, what is your Box #? _____

Research Participation Debriefing Form, Part 2

The Effect of Chronic and Acute Stress on College Students Academic Performance
Allegheny College
Department of Psychology

Purpose of Research: The purpose of this study was to study the effects of chronic and acute stress on immoral behavior. Previous research has shown the connection between chronic sleep restriction and ego-depletion as well as the link between ego-depletion and immoral behaviors. However, there is not any research directly seeking the connection between chronic sleep restriction (resulting in chronic stress) and cheating. There is also a gap in the research of acute stress on an individual's likelihood to act immorally. Because the study sought to collect data on immoral behavior the exact nature of the study could not be reveal until all the data was collected.

Compensation: Some students may receive extra credit from their professors for their participation if the course allows it. Participants may also enter their name into a raffle for one of two $25 gift cards to The Market House Grille.

Confidentiality: The data you provided for this research project will be confidential and your name will never be associated with your results. Furthermore, when your data is no longer needed, it will be shredded.

To Learn More: For further information about this topic, please consult the following sources:

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Direction in Psychological Science, 16*(6), 351-355.

Kouchaki, M., & Smith, I. H. (2014). The morning morality effect: The influence of time of day on unethical behavior. *Psychological Science, 25*(1), 95-102.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247-259.

Contact Information: If you have any questions about this research project, please consult the information below:

Experimenter: Rebecca Cohen E-mail: cohenr@allegheny.edu
Faculty Advisor: Dr. Lydia E. Jackson E-mail: ljackson2@allegheny.edu
IRB Committee Chair: Dr. Ann Kleinschmidt E-mail: akleinsc@allegheny.edu
Counseling Center (Reis Hall Room 304) - (814) 332-4368

If you would like a copy of the results of this research study, please fill out and tear off the bottom portion of this debriefing statement and return it to the researcher at box 1469.

I would like to receive a summary of the results of this study.
Yes O No O
If yes, what is your Box #? _____