THE ROLE OF RESILIENCE, EMOTION REGULATION, AND PERCEIVED STRESS ON COLLEGE ACADEMIC PERFORMANCE

By

Katherine Pendergast

Irene N. Ozbek
Professor of Psychology
(Chair)

Amanda J. Clark
Assistant Professor of Psychology
(Committee Member)

Katherine H. Rogers
Assistant Professor of Psychology
(Committee Member)
THE ROLE OF RESILIENCE, EMOTION REGULATION, AND PERCEIVED STRESS ON COLLEGE ACADEMIC PERFORMANCE

By

Katherine Pendergast

A Thesis Submitted to the Faculty of the University of Tennessee at Chattanooga in Partial Fulfillment of the Requirements of the Degree of Master of Science: Psychology

The University of Tennessee at Chattanooga
Chattanooga, Tennessee

May 2017
Copyright © 2017

By Katherine Anne Pendergast

All Rights Reserved
ABSTRACT

Stress is a common problem for college students. The goal of this thesis was to examine the relationships between protective and risk factors to experiencing stress and how these factors may predict academic performance in college students. 125 college students were surveyed twice over the course of a semester on emotion regulation strategies, trait resilience, and perceived stress. The relationships between these variables and semester GPA were analyzed using correlational, multiple regression, and hierarchical regression analyses. It was determined that trait resilience scores do predict use of emotion regulation strategies but change in stress and trait resilience do not significantly predict variation in academic performance during the semester. Limitations and future directions are further discussed.
DEDICATION

To my father, who always emphasized the value of a quality education and instilled in me a dedication to hard work and a passion for learning. To my mother, who encouraged me to pursue my dreams and taught me to never underestimate the potential of a well-educated woman. Also, to my friends and colleagues who supported me through both the highs and lows of obtaining this degree.
ACKNOWLEDGMENTS

Thanks to my advisor, Dr. Ozbek, and committee members, Dr. Clark and Dr. Rogers, for invaluable feedback and support. Additional thanks to Dr. Jonathan Davidson, M.D., for his permission to use the CD-RISC to better understand resilience in the college population. Also, I would like to extend thanks to Linda Orth, Sandy Zitkus, and the entire records office staff of the University of Tennessee at Chattanooga for their willingness to collaborate and assist with this project. Lastly, I would like to thank the faculty and students of the Psychology Department for their overall support.
TABLE OF CONTENTS

ABSTRACT ................................................................................................................... iv
DEDICATION .................................................................................................................. v
ACKNOWLEDGMENTS ............................................................................................... vi
LIST OF TABLES ......................................................................................................... ix
LIST OF FIGURES ....................................................................................................... x
LIST OF ABBREVIATIONS ......................................................................................... xi

CHAPTER

I. INTRODUCTION ......................................................................................................... 1
   Physical Effects of Stress .......................................................................................... 2
   Psychological Effects of Stress ................................................................................ 2
   Protective and Risk Factors ...................................................................................... 4
   Other Factors that Affect Academic Performance .................................................... 17
   Current Study ........................................................................................................... 18
      Literature Search ................................................................................................... 18
      Hypotheses ........................................................................................................... 19

II. METHOD ..................................................................................................................... 22
   Participants ............................................................................................................... 22
   Measures .................................................................................................................. 23
      Connor Davidson Resilience Scale (CD-RISC) ...................................................... 23
      Perceived Stress Scale (PSS) ................................................................................ 23
      Emotion Regulation Questionnaire (ERQ) ............................................................. 24
      HEXACO-60 (HEX60) ......................................................................................... 24
      Semester GPA ....................................................................................................... 25
      Demographics ...................................................................................................... 25
   Procedure .................................................................................................................. 26
      Phase I Data Collection ......................................................................................... 26
      Phase II Data Collection ...................................................................................... 26
III. RESULTS........................................................................................................28
   Change in Perceived Stress.................................................................28
   Resilience by Year ..............................................................................28
   Correlations .........................................................................................28
   Gender Differences in Suppression ....................................................29
   Emotion Regulation and Resilience ......................................................30
   Relationship between Resilience, Perceived Stress, and GPA ..........30
   Additional Exploratory Analyses .........................................................33

IV. DISCUSSION AND CONCLUSIONS.............................................................37
   Limitations ...............................................................................................43
   Future Directions ...................................................................................44
   Conclusions .............................................................................................45

REFERENCES ..................................................................................................46

APPENDIX
   A. PERCEIVED STRESS SCALE...............................................................59
   B. EMOTION REGULATION QUESTIONNAIRE ........................................61
   C. HEXACO-60 PERSONALITY ITEMS ..................................................63
   D. DEMOGRAPHIC QUESTIONS .............................................................67
   E. IRB APPROVAL LETTER ......................................................................70

VITA ................................................................................................................72
# LIST OF TABLES

2.1 Sample Demographic Characteristics ...........................................................................................................22

2.2 Descriptive Statistics for Age, Participation Delay, Resilience, Perceived Stress, Emotion Regulation, Control Variables, and Semester GPA .................................................................27

3.1 Intercorrelations between Reappraisal, Resilience, Semester GPA, Change in Perceived Stress, and Suppression ..................................................................................................................29

3.2 ACT, Conscientiousness, Resilience, Perceived Stress as Predictors of Semester GPA ............32

3.3 ACT, Conscientiousness, Resilience, Time 1 Perceived Stress as Predictors of Semester GPA ..................................................................................................................................................35

3.4 ACT, Conscientiousness, Resilience, Time 2 Perceived Stress as Predictors of Semester GPA ..................................................................................................................................................35
LIST OF FIGURES

4.1 Relationship between Mean Level of Perceived Stress and Semester GPA..........................41
LIST OF ABBREVIATIONS

CD-RISC, Connor- Davidson Resilience Scale
ERQ, Emotion Regulation Questionnaire
HEX60, HEXACO-PI-R 60
PSS, Perceived Stress Scale- 10
PTSD, Post-traumatic stress disorder
CHAPTER I

INTRODUCTION

Stress is a common problem for college students. In the National College Health Assessment by the American College Health Association (Association, 2014, 2015a, 2015b, 2016a, 2016b), over the course of five semesters from the spring of 2014 to the spring of 2016, students reported on the extent to which certain emotional and situational factors affected their academic performance. Stress was identified as the number one reason for a lapse in academic performance for 3 out of every 10 students (30.56%) across semesters. This implies almost a third of college students experience enough stress for it to affect their academic performance. In the same survey, over the 5 semesters, on average, over half (54.08%) of the students surveyed responded that they experienced what they would call "more than average" or "tremendous" levels of stress during the past 12 months. This indicates that many college students not only feel stressed but feel stressed at what they consider above average levels and perceive that this stress affects their eventual performance in classes. Students deal with stressors such as separation from friends and family and financial restrictions (Bitsika, Sharpley, & Rubenstein, 2010), increased workload and changes in eating habits (Ross, Niebling, & Heckert, 1999), and increased pressure to succeed academically and professionally (Beiter et al., 2015). Beyond academic performance, stress can also impact physical health.
Physical Effects of Stress

When the body is stressed, the adrenal gland releases cortisol which is a glucocorticoid hormone derived from cholesterol that helps living creatures adapt to stressful situations (McKay & Cidlowski, 2003). Normally, the release of cortisol helps the body function adaptively in acutely stressful situations, but in chronically stressful situations, it leads to less adaptive bodily responses like slowed metabolism, impaired cognition, and a weakened immune system (McEwen, 2004). Students often experience increased cortisol and cholesterol levels in the days leading up to an important test or evaluation which are common in academia (Bhende, Zade, Wasu, & Sitre, 2010). Prolonged exposure to stress, and therefore cortisol, leads to weakened immune responses and a higher likelihood of contracting both chronic and infectious diseases (Glaser & Kiecolt-Glaser, 2005). Developing either a chronic or infectious disease can further limit the ability of a student to attend classes or study appropriately, which could, in turn, lead to the experience of more stress.

Psychological Effects of Stress

Not only can chronic stress cause physical disorders, it can also have negative mental health outcomes. Dealing with stressors specific to attending college, in addition to any non-academic stressors, may have a cumulative effect on college students. As one stressful event ends, another personal event, test, or deadline is likely to appear as a new stressor. This persistent state of stress exposes students to heightened levels of cortisol, which can have detrimental effects on the brain (Goosens & Sapolsky, 2007).

The hippocampus, a part of the brain necessary for certain types of memory consolidation and learning, is strongly affected by the presence of glucocorticoids, particularly cortisol. During
extended exposure to high levels of cortisol, functioning in the hippocampus is reduced and cells have been shown to atrophy (Goosens & Sapolsky, 2007; McEwen, 2004). There are a similar number of glucocorticoid receptors in the prefrontal cortex, the brain area responsible for working memory and executive functioning, which can also be affected by high levels of cortisol. Young, Sahakian, Robbins, and Cowen (1999) found that performance of healthy males on visuospatial working memory tasks was impaired with chronic exposure to cortisol injections. This indicates that the functions of the frontal lobe and prefrontal cortex are significantly affected by the presence of elevated and extended cortisol levels. Similarly, if college students are exposed to heightened levels of cortisol for long periods, such as during a semester of college, they may also experience a decreased memory and learning capacity. This deficiency may be particularly apparent at the end of the semester when classes are most demanding and there is more pressure to finish the semester strong. It is likely that students will feel higher levels of stress at this point of the semester than when they first began due to the cumulative wear of the semester as well as the heightened demands of the immediate future.

College students who experience chronic stress are also at higher risk for developing psychological disorders. The diathesis-stress model of psychopathology delineates the relationship between genetic or cognitive vulnerabilities (i.e. diatheses) and environmental stressors that can result in the development of a psychological disorder (Ingram & Luxton, 2005). Diatheses are biological or cognitive predispositions that increase the risk of developing a psychological disorder. Stressors can be any circumstances in either the external or internal (i.e. psychological or physiological) environment that disrupt the stability and functioning of an individual emotionally, cognitively, or physiologically. An individual with a diathesis has an increased probability of developing a psychological disorder given some amount of stress from
either the external environment or internal processes. The interaction of these two depends on the extent to which diatheses are present and affect functioning as well as the extent to which the individual experiences stress from their environment (Ingram & Luxton, 2005).

This relationship between stress, genetic predisposition, and the development of mental health issues outlined in the diathesis-stress model has been observed in those with depression, PTSD, and anxiety (Smoller, 2016), bipolar disorder (Gilman et al., 2015), and schizophrenia (Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2012). Therefore, if students are experiencing some level of stress that interrupts their ability to function, they may also be at risk of developing a psychological disorder that could further affect functioning.

Because stress can impact so many areas of a student's life, it is necessary to identify risk factors and protective factors to the experience of excessive stress so that intervention and prevention programs may be developed. If certain factors can be targeted for stress prevention efforts, students will be better equipped to thrive in college, as opposed to failing, because of excessive stress and low resilience. The protective factors to stress examined in the current study are resilience and cognitive reappraisal as an emotion regulation strategy. The potential risk factor considered is emotional suppression as an emotion regulation strategy.

**Protective and Risk Factors**

During and after stress, the body attempts to maintain functioning, recover from setbacks, and improve adaptive abilities (Zautra, Arewasikporn, & Davis, 2010) One characteristic that may impact the outcome of this process is resilience. In simple terms, resilience is adapting to and coping with adversity or stress in a positive and effective way (Luthar, Cicchetti, & Becker,
There is still debate in the literature as to the true nature of resilience and if it is best to define it as either a process, an outcome, or a trait.

When viewed as a process, resilience is viewed as a process of flexibly overcoming major stress or adversity (Fergus & Zimmerman, 2005; Luthar et al., 2000). Failure to complete the process of resilience would then theoretically lead to the experience of stress, anxiety, and possibly psychological trauma. As a process, however, it may prove difficult to parse out the various mechanisms that play a role or to find objective ways of measuring or observing the way this process operates. It may also be difficult to discern if the individual completed the resilience process if, for example, they maintained proper functioning at work, but suffered in their home life; this leaves the question of whether the process of resilience is all or nothing or if you can have a partially completed resilience process.

In the outcome-approach, resilience is considered an outcome where personal dysfunction brought on by stress or adversity is minimized based on how the individual behaved (Ahmed, 2007; Anderson & Bang, 2012; Troy & Mauss, 2011). If one does not behave or does not learn how to behave in an adaptive manner, the outcome of that situation or problem will be dysfunction rather than resilience. Resilience is essentially avoiding dysfunction. One issue with taking an outcome-approach is that there are many different outcomes that can be taken into account when looking at adversity. Some people may minimize dysfunction in one area (e.g. work life) but not in another (e.g. economic life, social life). If dysfunction was avoided in one area, but not all areas, this makes determining the level of resilience more ambiguous.

Taking a trait- or characteristic-approach would suggest that there may be a resilient personality or a trait of resilience that aids an individual in flexibly overcoming adversity (Connor & Davidson, 2003; Ong, Bergeman, Bisconti, & Wallace, 2006). If one does not possess
this flexibility under stress, they are more likely to react negatively to a potential stressor and will not be able to cope with the stress or adversity that accompanies the stressor. Assessing resilience as a trait may also prove difficult as there are multiple cognitive, social, or behavioral factors that may play into the individual’s response. It may also be that some facets of resilience are more effective than others when it comes to overcoming adversity, so it may be difficult to determine what factors are the most common or most effective at increasing overall trait resilience.

There is no consensus as to how best to define resilience. In a study that examined the psychometric properties of common measures of resilience, it was established that there is no “gold standard” when it comes to measuring resilience, but 4 of the 15 measures tied for the highest quality (Windle, Bennett, & Noyes, 2011). One of these four is the Connor-Davidson Resilience Scale (CD-RISC). This scale is a measure of resilience as a personal quality. Items reflect the cognitions and behaviors an individual generally tends to engage in when facing a potential problem (Connor & Davidson, 2003). The authors never specify which approach to resilience was used when designing the measure (i.e., process, outcome, or trait), however, the global nature of the way questions are phrased indicates a perspective that there is something an individual has to help them overcome adversity (i.e., a trait or characteristic). While the CD-RISC lacks some psychometric soundness (e.g., no “gold standard” measure to compare to for criterion validity, no reports of internal consistency on supposed subscales), there are extensive studies that support its construct validity. For example, individuals with PTSD who have high resilience as measured by the CD-RISC were more likely to experience greater post-traumatic growth (Duan, Guo, & Gan, 2015). Another study indicated that higher resilience predicted lower levels of alcohol misuse post-deployment in veterans (Green, Beckham, Youssef, &
Elbogen, 2014). Similarly in college students, higher resilience scores predict fewer problematic drinking habits and higher self-reported wellbeing (Johnson, Dinsmore, & Hof, 2011; Pidgeon & Keye, 2014). As the CD-RISC was considered one of the higher quality measure of resilience, the current study used this scale to measure resilience. Consequently, the trait-approach to resilience is adopted for this study. Therefore, future mention of the term resilience is in reference to resilience as a personal characteristic or trait.

Resilience is conceptualized as a personal characteristic that involves flexibility when approaching potential problems and an ability to adapt to stress or adversity without experiencing personal dysfunction (Genet & Siemer, 2011). Those who score higher on resilience measures are less likely to experience depressive symptoms or anxiety (Aroian & Norris, 2000; Hu, Zhang, & Wang, 2015). Additionally, people with bipolar disorder who score high on a resilience measures generally have fewer depressive episodes and report less impulsivity (Choi et al., 2015). Resilience has also been shown to be related to experiencing more positive emotion and can predict better psychological well-being. Resilience was found to predict faster physiological recovery from stress as measured by cardiovascular reactivity (Tugade & Fredrickson, 2004). This relationship was also mediated by positive emotionality, suggesting emotional experience plays a role in resilience. Self-reported resilience is related to cognitive and emotional flexibility in laboratory tasks, but is likely distinct from overall better cognitive functioning as it was found unrelated to working memory (Genet & Siemer, 2011; Waugh, Thompson, & Gotlib, 2011).

Flexibility when faced with a stressor relies on the internal cognitive mechanisms and traits as well as behavioral tendencies of an individual. Based on this interplay of cognitive and behavioral components when faced with a potential stressor, both must be considered when
assessing what constitutes a resilient individual. For this study, resilience is conceptualized as a dynamic characteristic that allows flexibility in how one thinks and acts such that they are regularly able to adapt in stressful situations without experiencing maladaptive levels of stress. The success of this flexibility relies on the use of adaptive cognitive processes that inform behavior when facing a challenge. The use of these cognitive processes and behaviors can also be impacted or altered by the outcome of previous stressful experiences. This definition frames three important aspects of resilience and the process of overcoming stress: 1) some cognitive processes are at work during a resilient response, 2) past behavior impacts and informs these processes, and 3) the eventual outcome of this interaction is adaptively managing and overcoming the potential adversity. All three of these aspects lend an individual’s ability to form and utilize a buffer to stress and effectively use coping strategies.

Theoretically, under the right circumstances, resilience can be built over time (Richardson, 2002). As mentioned earlier, resilience is a dynamic characteristic of an individual, meaning it can change over time or with experience. When someone fails to overcome a stressor successfully, they may not have been sufficiently resilient; their current level of flexibility was not enough to get them through unscathed. However, as that individual faces an increasing number of stressors or gains more experience, they have an opportunity to learn or develop new strategies to handle or avoid the stress. Perhaps this is through trial and error or by observing the coping strategies of others; regardless, how the individual specifically reacts to the stressful event (i.e., if the cognitive or behavioral strategies used are reinforced as effective), can increase overall levels of resilience to stress in the future. Following this logic, the more frequent stressful events an individual experiences, the more opportunity they have to become resilient. In this sense, there is a reciprocity between who an individual is, what they think, and how they behave.
The way the individual thinks and acts are influenced by their level of resilience and subsequently, their resilience is affected by how they think about a situation and how they behave in the situation.

For example, if someone finds him or herself in a stressful situation, such as overseeing a highly important project at work, the way that individual thinks about the situation (e.g. "While this is stressful, I am ready for the challenge", “I’m never going to be able to finish this project on time”) and how they behave in the situation (e.g. actively working to solve the problem and engaging other workers to help; ruminating on issues they cannot fix or trying to take on everything themselves) can impact how the potential stress affects the individual in the long run. Additionally, thoughts the person has about the stress impact the types of behaviors that will subsequently occur. Moreover, the outcome of the behaviors will reinforce certain types of thinking (e.g. "While it was difficult, the project was a success. This shows that I am good at this job and can handle future challenges."). This interaction leads to a feedback loop of cognitive traits and behavioral tendencies in which both inform each other and affect the adaptive ability of the individual and the outcome of a potentially stressful situation.

There is also empirical evidence to suggest that resilience may change over time and with experience. For example, patients with PTSD that both completed and responded well to treatment (i.e., overall clinical improvements were observed) also had a significant increase in reported levels of resilience (Connor & Davidson, 2003). This indicates that while resilience may be a semi-stable characteristic of an individual, it also has the capacity to change based on experience and cognitive changes associated with interventions.

Although traits are considered relatively stable over time, there is evidence to suggest that traits can change after certain experiences. For example, there is evidence to suggest that average
levels of personality characteristics change based on age throughout the lifespan (Roberts & Mroczek, 2008; Roberts, Walton, & Viechtbauer, 2006). There is also evidence to suggest that personality traits can change following specific life events such as undergoing psychological treatment (Roberts et al., 2017). Patients completing treatment for a variety of psychological disorders experienced a significant change in self-reported emotional stability, extraversion, and to a lesser extent, agreeableness and conscientiousness after completing therapy. The amount of change depended on the type of disorder as well as the length of treatment with the greatest changes observed in treatment of anxiety disorders and treatments greater than four weeks.

Research also suggests that an individual can deliberately and actively change certain personality traits (Hudson & Fraley, 2015). Across 16 weeks, those who had higher goals to change certain personality traits experienced changes in mean levels of that trait (for extraversion, agreeableness, conscientiousness, or emotional stability) more so than if there were lower goals to change. A similar pattern was seen between those with higher goals and an increase in daily trait-related behaviors for extraversion, agreeableness, and emotional stability. Additionally, when presented with a structured intervention, the specificity of goals became important to the success of personality change. If change goals were more specific (i.e., “if [I do]…, then [I will become more]…”), levels of conscientiousness, emotional stability, or extraversion more readily changed than if the goals were vague (Hudson & Fraley, 2015). This evidence indicates that traits often considered fairly stable can, in fact, change significantly given enough experience or cognitive restructuring.

While there is literature on resilience that addresses this characteristic as it relates to acutely stressful situations, resilience also relates to adversity experienced due to chronic stress (Agaibi & Wilson, 2005; Bonanno, 2005; Connor, Davidson, & Lee, 2003; Schetter & Dolbier,
Long lasting and difficult situations with a seemingly nebulous duration (e.g. living with low socioeconomic status, unpleasant or demanding working conditions) can cause stress that challenges the physical, cognitive, and emotional resources an individual has to spare. As mentioned previously, chronic stress has major physiological and cognitive repercussions, however, some individuals can withstand situations that could cause chronic stress in others. This means they experience less stress, no stress at all, or the stress they do experience lasts for a shorter duration. Under chronic stress, certain characteristics have been identified that may help an individual avoid stress with less difficulty and fewer interruptions in functioning (Schetter & Dolbier, 2011). These characteristics are referred to as "resilience resources", which facilitate the process of resilience to stress and coping.

In a review by Schetter and Dolbier (2011), these resilience resources were classified into six categories. The first category is personality or dispositional resources, such as positive affectivity, hardiness, and emotional stability. The second category is related to self and ego-related resources such as an individual’s self-esteem, self-concept flexibility, and autonomy. The third category includes interpersonal and social resources such as perceived social support and quality of close relationships. The fourth category is related to world views and culturally-based beliefs and values such as spirituality, personal purpose in life, and assumptions about the world. The fifth category is behavioral and cognitive skills such as emotion regulation, cognitive reappraisal, social skills, or cognitive flexibility. The last category was labeled other resources and included factors such as genetic predisposition to good health, intelligence, and social standing. Resilience resources can be either individual internal factors or factors that the individual can access in their environment. The use of these resources can be either innate or learned from experience. Generally, one’s resilience resources are stable over months or years,
but may change over time due to experience (Bonanno, Westphal, & Mancini, 2011; Segerstrom, 2007).

As demonstrated previously, attending college could cause chronic stress. When attending college, students are often moving away from home for the first time, taking out loans or working long hours to afford tuition, and dealing with a rigorous academic environment for two to four or more years. Although a college semester does have a definite end, the intensity of the demands students face over an extended duration and the cumulative effect these demands seem to have over the semester implicates the experience of college as something closer to chronic stress than an acutely stressful incident.

Therefore, assessing how important characteristics and resources related to resilience are to performance in college and identifying what possible factors lead to resilience (i.e. resilience resources) can help to better inform future ventures to prevent burnout or improve retention. Also, identifying resilience resources that can be taught or practiced could potentially reduce the incidence of mental health disorder diagnoses in college students due to excessive stress. Hartley (2011) found that resilience was related to academic persistence in college students. Specifically, the author found that intrapersonal resilience traits (i.e. tenacity, spirituality, tolerance) were associated with higher cumulative GPA in college students, while resilience resources of a more interpersonal nature (i.e. social support) were not significantly associated with GPAs. Given this information, resilience resources related to more intrapersonal processes may have more of an impact on resilience when considering stress related to the college setting. For example, emotion regulation, another intrapersonal process, may play a crucial role as a resilience resource.

Emotion regulation is a process through which people manage their thoughts and behaviors given an emotion-eliciting event (Gross & John, 2003). This process is accomplished
through the use of various emotion regulation strategies that are thought to be used both consciously and unconsciously in order to reach what an individual considers an acceptable level of emotional arousal (Mauss, Bunge, & Gross, 2007). Depending on the strategy implemented, engaging in emotion regulation does not always protect against the experience of emotions. For example, an individual can engage in a particular strategy meant to decrease the experience of an emotion, but can experience no change in emotional intensity or valance (Gross, 1998b).

Additionally, while certain emotion regulation strategies are more effective at managing emotional experience than others across many contexts, context of a situation can also play a role in determining which strategies are more effective. For example, duration of emotional regulation, the intensity and valance of the initial emotional response, or level of control an individual has on the situation can impact how effective an emotion regulation strategy is in the moment (Augustine & Hemenover, 2009; Troy, Shallcross, & Mauss, 2013).

The idea that emotion regulation may be related to resilience and could affect stress levels is further supported as research on resilience as a trait often relates the concept to emotional flexibility (Genet & Siemer, 2011; Waugh, Wager, Fredrickson, Noll, & Taylor, 2008), in the sense that those who can better control the use of emotional resources when facing an emotion-eliciting event are more resilient to the experience of stress. Unnecessary use of energy and cognitive faculties on either positively or negatively valanced situations may lead to undue stress or excessive wear on the individual’s ability to cope. Coping appropriately with emotions also relies on the strategies used. If an individual can properly regulate their emotions in the moment, they will likely experience an extended or more intense emotional reaction than if they engaged in a more effective strategy.
Two commonly studied emotion regulation strategies are cognitive reappraisal and emotional suppression (Gross, 1998b). Cognitive reappraisal entails changing how one thinks about a situation so that it becomes less emotionally charged. For example, someone who overhears a friend complaining about them may want to go and argue with their friend initially, but after reappraisal, they decide maybe they misunderstood what they overheard and should go try to talk it out calmly instead. Emotional suppression, on the other hand, involves inhibiting an emotional behavior one may otherwise engage in during a situation. Some examples of this could be keeping silent when someone says something offensive, or trying to hide an emotional response when one hears bad news. These two strategies are not mutually exclusive, however, reappraisal has consistently been shown to be more effective at reducing the physiological and emotional experience of negative emotions than suppression (Goldin, McRae, Ramel, & Gross, 2008; Gross, 1998b; Hofmann, Heering, Sawyer, & Asnaani, 2009).

There is literature to suggest that the use of reappraisal is related to resilience to stress and experiences of positive emotion (Folkman & Moskowitz, 2000; Troy & Mauss, 2011). Being able to reassess situational factors and reevaluate cognitive experiences in a less negative light may lead to higher resilience when facing a potentially stressful or anxiety evoking situation. When instructed to reappraise emotions in the laboratory setting, participants generally are able to reduce both physiological arousal related to experiencing an emotion as well as the subjective experience of the emotion (Gross, 2002). In a series of studies, Gross and John (2003) determined that those who reappraise emotions experience and express more positive emotions than those who tend to suppress and experiences less negative emotion. They also discovered that those who tend to reappraise share their emotions more with others and have more close relationships (as rated by peers). Those that reappraise also tend to be rated as more likeable,
have lower frequency of depression symptoms and higher life satisfaction, optimism, self-esteem, and overall wellbeing.

In terms of suppression, there is evidence that suppression can lead to negative psychological and emotional outcomes. In the same set of studies by Gross and John (2003) described in the previous section, those who suppress tend not to share their emotions with others and have fewer close relationships (as rated by peers). Those that suppress also have higher frequency of depression symptoms and lower life satisfaction, optimism, self-esteem, and overall wellbeing. Beyond wellbeing and emotional outcomes, when instructed to engage in emotional suppression, participants are unable to effectively decrease the experience of negative emotions, and their physiological arousal actually increases following suppression (Gross, 2002).

Although suppression is related to an increase in physiological arousal, it is not necessarily related to higher levels of initial stress. This is because, in comparison to cognitive reappraisal, use of suppression is not associated with producing more cortisol in an acutely stressful situation (Lam, Dickerson, Zoccola, & Zaldivar, 2009). However, when cortisol is measured throughout the day as someone experiences a chronically stressful environment, those who generally tend to suppress emotions experience overall higher levels of cortisol than those who reappraise (Katz, Greenberg, Jennings, & Klein, 2016). This may indicate that while in the short-term, reappraisal and suppression do not have significantly different immediate effects on cortisol levels (i.e., extent of stress reactivity), extended or regular use of suppression can lead to higher levels of strain on the stress system and could more easily lead to negative psychological or physiological outcomes related to chronic exposure to cortisol. Because suppression increases physiological load on the body, is associated with higher chronic levels of cortisol, and does not truly reduce negative emotions, the use of this strategy could exacerbate perceived stress.
These two emotion regulation strategies may be used within the academic setting. Use of both reappraisal and suppression has been documented in college students (Gross & John, 2003). The use of cognitive reappraisal is similar across men and women, however, suppression tends to be higher in males than females. The higher general usage of suppression in men may lead to men experiencing more frequent negative outcomes related to suppression such as lower interpersonal functioning or more depressive symptoms. In terms of when these strategies may be used, there is no empirical literature to suggest a comprehensive range of situations in which reappraisal or suppression strategies are specifically used in an academic setting, however there is literature on the use of these strategies in college-relevant situations. For example, the use of positive reappraisal (i.e., reappraising a situation in a more positive light) is associated with higher academic self-efficacy after experiencing a perceived academic failure (Hanley, Palejwala, Hanley, Canto, & Garland, 2015). Reappraisal of stress is also associated with better exam performance and less evaluation anxiety than in participants who were told to ignore stress (Jamieson, Peters, Greenwood, & Altose, 2016). Additionally, use of reappraisal is associated with fewer problems with alcohol consumption in college students while general use of suppression is associated with more alcohol related problems (Norberg et al., 2016).

The general use of suppression upon transitioning into college, as well as changes in suppression use specific to entering the college setting, are related to less perceived social support, closeness with others and social satisfaction (Srivastava, Tamir, McGonigal, John, & Gross, 2009). This indicates that general use of suppression may make functioning in college more difficult, particularly in social situations such as living with roommates, group projects, interacting with professors or teaching assistants, and making friends. Suppression may also play
a role in taking exams as there is evidence that the use of suppression is accompanied by degraded memory and problem solving abilities (Richards, 2004).

It is worth noting that endorsing the general usage of an emotion regulation strategy does not indicate that it was used for specific stressors or that it was effective in the moment. However, endorsing more usage of a particular strategy indicates a higher likelihood of engaging in that strategy when faced with an emotion-eliciting event and thereby the specific psychological outcomes discussed earlier.

Other Factors that Affect Academic Performance

Other personal factors beyond perceived stress, resilience, and regulation of emotions affect how students perform during the semester and should be taken into consideration. One such factor is existing academic ability. ACT scores indicate the academic ability of a student prior to acceptance into college. ACT scores are significantly related to cumulative GPA, which has been conceptualized as academic ability developed since beginning college (Park & Kerr, 1990). Because these measures are so closely related, it suggests that existing academic ability will have a bearing on how a student performs while in college, even if they do develop great ability once they begin classes.

Another personal factor that affects academic performance is personality. One personality factor, conscientiousness, has shown to be related to academic performance. In a study by Nofitle and Robins (2007), conscientiousness assessed by the HEXACO personality scale was found to be a predictor of college and high school GPA, but was not significantly related to SAT verbal or math scores. The positive relationship between conscientiousness and GPA also persisted after
controlling for gender and SAT scores. This indicates that both existing cognitive ability and conscientiousness predict unique differences in college GPA.

**Current Study**

**Literature Search**

In addition to the preceding discussion of relevant empirical findings, a literature search was completed to assess if the specific relationships tested in the current study had been studied together in previous research. A review of the literature was completed on Google Scholar and PsychInfo. Search terms used included “resilience expressive suppression”, “resilience emotional suppression”, “resilience suppression”, “resilience emotion regulation college”, “resilience perceived stress semester GPA”, and “resilience perceived stress academic performance”. The first 50 results from Google Scholar were checked and each result from PsychInfo was checked. A study was found that was similar to hypothesis 6, however, that study did not test a mediation model and did not look at the difference scores of perceived stress (i.e., a longitudinal approach), but rather perceived stress at a single point (Cheng & Catling, 2015). Another study (Xi, Zuo, & Wu, 2013) assessed emotion regulation strategies related to resilience, however, this study did not predict resilience scores based on emotion regulation strategies, divided individuals into categories of low, intermediate, and high resilience as opposed to keeping it continuous, assessed adolescents, and used a different measure for assessing resilience. Although literature on similar topics exists, it was decided that testing the hypotheses specific to the current study could still add to the existing literature.

The literature lacks an investigation into the relationship between emotion regulation, resilience to stress and academic performance in college students. The current study explores the
relationships between reappraisal, suppression, social support, resilience, perceived stress and academic performance while controlling for other factors that may affect academic performance. The goal of this research was to establish if these predictors can uniquely predict real world performance in the form of semester GPA and if certain mechanisms of emotion regulation can be targeted for stress prevention efforts in the college population.

Hypotheses

Hypothesis 1: There will be a significant change in reported perceived stress levels between the beginning of the semester and the end of the semester. Assessing the trend of perceived stress will show if students had a change in stress levels from the beginning of the semester (Time 1) to the end of the semester (Time 2). It is likely that students will have a higher level of stress at the end of the year as they will have been experiencing the demands of the semester for longer than at the beginning of the semester and it is anticipated that these demands will have a cumulative effect.

Hypothesis 2: Students in their senior year will report more resilience to stress on average than students in their freshman year at Time 1. Resilience and the coping strategies that accompany can be developed over time or over multiple experiences with stress (Richardson, 2002). Students who are not very resilient in their first year may fail their classes or drop out of college, while those who have higher resilience will either maintain their resilience or develop new and more effective strategies to meet the increasing requirements of each semester.

Hypothesis 3a: There will be positive correlations between reappraisal, resilience, and academic performance. As reappraisal is an effective emotion regulation strategy and
theoretically related to resilience, it is anticipated that reappraisal tendencies, resilience levels, and subsequent academic performance will all be positively related.

Hypothesis 3b: Reappraisal, resilience and academic performance will all be positively correlated to difference scores in perceived stress. As stress will likely change throughout the semester, difference scores were used to assess changes in stress that may have occurred across the semester as opposed to looking at stress at a single point in time. Difference scores were computed by subtracting stress scores from the end of the semester (Time 2) from the stress scores at the beginning of the semester (Time 1). Those who experience more stress at the end of the semester will likely not use adaptive emotion regulation strategies, such as reappraisal, will have a lower resilience to experiencing stress, and will generally perform worse academically during the semester as a result.

Hypothesis 3c: Suppression will be negatively correlated to difference scores in perceived stress, academic performance, and resilience. As suppression will likely not be sufficient to aid in the reduction of emotions, those who tend to suppress their emotional reactions will fail to reduce stress or inadvertently increase the stress responses they experience during the semester, which, in turn, will decrease their ability to cope and perform well.

Hypothesis 4: Men and women will differ in the amount of emotional suppression in which they engage. There are documented differences in the use of suppression between men and women (Gross & John, 2003), therefore, it is possible this study will replicate this difference.

Hypothesis 5: Resilience will significantly predict variation in the reported usage of cognitive reappraisal and/or emotional suppression. Higher resilience will predict more usage of cognitive reappraisal and lower levels of resilience will predict less usage of this strategy. Higher
levels of resilience will predict less usage of suppression and lower levels of resilience will predict more usage.

Hypothesis 6a: The impact of resilience at the beginning of the semester on semester GPA will be mediated by the change in perceived stress between the beginning and end of the semester (See Fig. 1 for full model). Those who are high in resilience in the beginning of the semester will have lower perceived stress at the end of the semester or no change due to a greater ability to cope with the cumulative demands of college. This lower perceived stress will lead to a student feeling fewer effects of stress and spending less time coping with these effects. With lower or no change in perceived stress to the demands of the semester, the student will likely perform better during the semester overall than those who have an increase in stress. Therefore, those who have a decrease, no change, or only a small increase in stress between the beginning of the semester and the end of the semester are expected to have higher resilience at the beginning and a higher GPA at the end of the semester. Alternatively, if a student has lower resilience at the beginning of the semester, they may have a very large increase in stress from the beginning of the semester to the end of the semester. Therefore, those who have a large increase in stress between the beginning of the semester and the end of the semester are expected to have lower resilience at the beginning and a lower GPA at the end of the semester.

Hypothesis 6b: Resilience and the difference in perceived stress from Time 1 to Time 2 will both account for significant variation in GPA while controlling for conscientiousness and ACT scores. Semester GPA will be affected by how conscientious a student is as well as how much existing academic ability they possess. Controlling for these variables will allow for the examination of how resilience and changes in perceived stress still impact performance beyond other common predictors.
CHAPTER II

METHOD

Participants

Participants were 125 college students who were 18 years or older. This was determined to be a large enough sample to detect an effect size of $f^2 = .064$ using G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009). Students were recruited through psychology classes at the University of Tennessee at Chattanooga. The mean age of the sample was 19.53 ($SD = 3.294$). Females made up 80.8% of the sample. The sample was 82.4% white and consisted of 57.6% freshmen. A summary of demographic characteristics can be found in Table 1.

Table 2.1

Sample Demographic Characteristics

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>103</td>
<td>82.4</td>
</tr>
<tr>
<td>Black</td>
<td>13</td>
<td>10.4</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Mixed Race</td>
<td>6</td>
<td>4.8</td>
</tr>
<tr>
<td>Did not Specify</td>
<td>2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>72</td>
<td>57.6</td>
</tr>
<tr>
<td>Sophomore</td>
<td>18</td>
<td>14.4</td>
</tr>
<tr>
<td>Junior</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Senior</td>
<td>18</td>
<td>14.4</td>
</tr>
<tr>
<td>Graduate</td>
<td>2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>101</td>
<td>80.8</td>
</tr>
<tr>
<td>Male</td>
<td>24</td>
<td>19.2</td>
</tr>
</tbody>
</table>
Measures

Connor-Davidson Resilience Scale (CD-RISC)

The CD-RISC is a 25-item self-report measure of trait resilience (Connor & Davidson, 2003). Responses are made on a 5-point scale and range from not at all true to true nearly all the time. The CD-RISC has often been used in clinical populations to measure resilience to stress or trauma but has shown acceptable internal consistency (α = .89) in a community sample (Connor & Davidson, 2003). Within this sample, internal consistency was acceptable (α = .93). Test-retest reliability in this sample was also acceptable (r = .75, p < .001). The CD-RISC has convergent validity as it correlates strongly and positively with the Kobasa hardness scale. While the CD-RISC has been used in general college populations (Ebrahimi, Keykhosrovani, Dehghani, & Javdan, 2012; Johnson et al., 2011), few have used it to predict academic performance (Hartley, 2011). When the CD-RISC has been used as a predictor for academic outcomes, resilience significantly predicted academic persistence in the form of cumulative undergraduate GPA.

Perceived Stress Scale (PSS)

The PSS is a self-report measure of perceived stress (Cohen, Kamarck, & Mermelstein, 1983). Participants respond to questions about stress experienced during the last month on a 5-point scale that ranges from never to very often. The original PSS included 14 items, however, later analyses found that a 10-item version of the scale was just as reliable as the original (Cohen & Williamson, 1988). The 10-item PSS is correlated with the average amount of stress experienced during a week and the use of depressants. In this sample, internal consistency was acceptable (α = .81–.89). The longer version has been shown to correlate with social anxiety and depressive symptoms in college students, although the same analyses have not been conducted.
on the slightly shorter version (Cohen et al., 1983). A difference score will be calculated for this measure between the score at beginning of the target semester and the score at the end of the semester in order to assess the amount of change in stress levels that occurred. For the full scale of items, see Appendix A.

**Emotion Regulation Questionnaire (ERQ)**

The ERQ is a 10-item self-report measure of the general use of cognitive reappraisal and emotional suppression emotion regulation strategies (Gross & John, 2003). Participants respond on a seven point Likert scale that ranges from *strongly disagree* to *strongly agree* to items regarding how they tend to handle both positive and negative emotions. The ERQ had acceptable internal consistency for the four items regarding suppression ($\alpha = .75$) and for the six items regarding reappraisal ($\alpha = .84$) in this sample. For the full scale of items, see Appendix B.

**HEXACO-60 (HEX60)**

The HEXACO-60 is a shortened version of the 200 item HEXACO-PI-R scale that assesses the six personality factors of honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience (Ashton & Lee, 2009). This assessment contains 60 items on a five point Likert-scale ranging from *strongly disagree* to *strongly agree*. There are 10 items related to conscientiousness that will be used in this study. The internal consistency of the conscientiousness items is acceptable ($\alpha = .80$). The HEX60 correlates highly with the NEO- Five Factor Inventory items related to conscientiousness which supports convergent validity of this scale. For the full list of items from the HEXACO-60, see Appendix C (*Note: Conscientiousness items are in bold*).
Semester GPA

Semester GPA will be assessed by acquiring these values for each participant through the university records office. The participants will sign an informed consent document at time 2 that states that they agree to release a semester GPA value to the researchers at the end of the semester. The records office provided the GPAs early in the spring semester after final grades were posted from the fall semester. The semester GPAs were entered into a data sheet where each participant has been assigned a subject number that is kept confidential. Only researchers listed on the IRB form are allowed access to the concordance chart between student IDs and participant numbers. Any paperwork or documents from the records office regarding sensitive or personal information was shredded or deleted upon completion of data entry.

Demographics

Students were asked to answer questions regarding several demographic categories. Students were asked to respond to questions related to 1) general information (e.g., age, sex, major, ethnicity, etc.), 2) common stressors (e.g., how many hours they work on and off campus, if they are in-state, out-of-state, or international students, if they live at home or on their own, and if they have received a clinical diagnosis of a psychological disorder, etc.), and 3) types of resources the student may have or take advantage of (e.g., disabilities center, counseling center, fraternity/sorority, etc.). (See Appendix D for full list). Assessing this information will give context to the results of just how much stress the students in the sample experience on average and how they may defer some of the stress that they have through available resources.
Procedure

Phase I Data Collection

Following approval by the Institutional Review Board (See Appendix E), undergraduate students were recruited from a southeastern public university through the SONA Systems online research participation system. SONA is an online research pool platform that allows students to participate in research projects. At the beginning of each semester, students complete an electronic informed consent document and a prescreen that allows researchers to gather baseline information for participants or find students that meet participation criteria. Students as part of the SONA prescreen, students completed the PPS, the HEX60, and the CDRISC at Time 1 in late August and September. The cutoff date was September 30th.

Phase II Data Collection

In early November, students were given the opportunity to complete another informed consent document and all the questionnaires again on the SONA system for Time 2. Average number of days between participating in Time 1 and Time 2 was 63.30 (SD = 13.27). The students completed demographics, PSS, ERQ, the CDRISC (to calculate test-retest reliability), a measure of perceived social support and a measure of post-traumatic stress symptoms collected for another study and were not analyzed. At this time, as part of the informed consent document, students who signed the electronic consent form agreed to release their semester GPA to the researcher. After the end of the semester, GPAs became available. Students that do not complete the prescreen by September 30th, 2016 were excluded from Time 2 final analyses. Descriptive statistics on study variables can be found in Table 2.
Table 2.2

*Descriptive Statistics for Age, Participation Delay, Resilience, Perceived Stress, Emotion Regulation, Control Variables, and Semester GPA*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>Median</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>125</td>
<td>19.53</td>
<td>19.00</td>
<td>3.29</td>
<td>18.00</td>
<td>49.00</td>
</tr>
<tr>
<td>Days between Participation</td>
<td>125</td>
<td>63.30</td>
<td>64.00</td>
<td>13.27</td>
<td>30.00</td>
<td>106.00</td>
</tr>
<tr>
<td>Resilience at Time 1</td>
<td>125</td>
<td>74.26</td>
<td>74.00</td>
<td>14.41</td>
<td>33.00</td>
<td>99.00</td>
</tr>
<tr>
<td>Perceived Stress at Time 1</td>
<td>125</td>
<td>19.46</td>
<td>19.00</td>
<td>5.57</td>
<td>7.00</td>
<td>33.00</td>
</tr>
<tr>
<td>Perceived Stress at Time 2</td>
<td>125</td>
<td>19.98</td>
<td>20.00</td>
<td>7.56</td>
<td>5.00</td>
<td>38.00</td>
</tr>
<tr>
<td>Perceived Stress Difference Score</td>
<td>125</td>
<td>-0.53</td>
<td>0.00</td>
<td>7.00</td>
<td>-18.00</td>
<td>18.00</td>
</tr>
<tr>
<td>Reappraisal</td>
<td>125</td>
<td>28.87</td>
<td>28.00</td>
<td>6.51</td>
<td>12.00</td>
<td>42.00</td>
</tr>
<tr>
<td>Suppression</td>
<td>125</td>
<td>14.92</td>
<td>15.00</td>
<td>5.25</td>
<td>4.00</td>
<td>28.00</td>
</tr>
<tr>
<td>Conscientiousness (Avg.)</td>
<td>125</td>
<td>4.95</td>
<td>5.00</td>
<td>0.86</td>
<td>2.40</td>
<td>6.80</td>
</tr>
<tr>
<td>ACT</td>
<td>125</td>
<td>23.71</td>
<td>24.00</td>
<td>3.73</td>
<td>14.00</td>
<td>36.00</td>
</tr>
<tr>
<td>Semester GPA</td>
<td>125</td>
<td>3.27</td>
<td>3.36</td>
<td>0.63</td>
<td>0.86</td>
<td>4.00</td>
</tr>
</tbody>
</table>
CHAPTER III

RESULTS

Change in Perceived Stress

When perceived stress at Time 1 ($M = 19.46, SD = 5.57$) was compared to perceived stress at Time 2 ($M = 19.98, SD = 7.56$), it was determined that the expected change in perceived stress was not significant ($t(124) = -0.84, p = .40$). This indicates that there was no change in perceived stress. The average change between Time 1 and Time 2 was -0.53 ($SD = 7.00$) with an absolute change score of 5.41 ($SD = 4.45$).

Resilience by Year

Counter to hypothesis 2, that seniors ($n = 18; M = 74.17$) would be more resilient than freshman ($n = 72, M = 74.99$), no significant difference was found ($M_{diff} = -0.82, t(88) = .22, p = .83$). Also, variance in scores was not significantly different between freshmen and seniors ($F(88) = .08, p = .78$).

Correlations

To examine relationships between variables, a bivariate correlation analysis was conducted on reappraisal, suppression, resilience, difference scores in perceived stress, and semester GPA. See Table 3.1 for full list of correlations. Reappraisal was positively related to resilience scores and change in perceived stress, but not semester GPA. Resilience was positively
correlated with semester GPA and change in perceived stress, but negatively correlated with suppression. Semester GPA was positively correlated with change in perceived stress, but was not correlated with suppression. Change in perceived stress was not correlated with suppression.

Table 3.1

<table>
<thead>
<tr>
<th>Variables</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reappraisal</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Resilience</td>
<td>.34 ***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Semester GPA</td>
<td>.01</td>
<td>.22 *</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Change in PS</td>
<td>.20 *</td>
<td>.22 *</td>
<td>.18 *</td>
<td>--</td>
</tr>
<tr>
<td>5. Suppression</td>
<td>-.04</td>
<td>-.21 *</td>
<td>-.17</td>
<td>-.12</td>
</tr>
</tbody>
</table>

Note. * = p < .05; ** = p < .01; *** = p < .001

Gender Differences in Suppression

Hypothesis 4 suggested there may be differences in suppression based on gender in the sample. The sample contained 24 males with a mean suppression score of 15.54 (SD = 5.66) and 101 females with a mean suppression score of 14.77 (SD = 5.17). No detectable difference was found between males and females on suppression scores (t(123) = .64, p = .52). Variance in suppression scores was equal across males and females (F(123) = .66, p = .42).
Emotion Regulation and Resilience

As expected, resilience significantly predicted the use of reappraisal ($R^2 = .11, F(1, 123) = 15.83, p < .001$) and suppression ($R^2 = .043, F(1, 123) = 5.59, p = .02$). Resilience predicted the use of reappraisal such that higher resilience scores were associated with more usage of reappraisal ($b = .34, p < .001$). Suppression on the other hand, had a negative relationship with resilience such that those with higher resilience scores used less suppression ($b = -.209, p = .02$).

Relationship between Resilience, Perceived Stress, and GPA

To assess the relationship between resilience, changes in perceived stress, and semester GPA a test for mediation was conducted. Following the procedure outlined by Baron and Kenny (1986), a four step analysis was completed in order to assess if differences in perceived stress mediated resilience scores at Time 1 and semester GPA. First, the relationship between resilience at Time 1 and semester GPA was established ($R^2 = .05, b = .27, p = .015$). Second, the relationship between resilience at Time 1 and difference scores in perceived stress was calculated ($R^2 = .05, b = .22, p = .013$). Third, the relationship between difference scores in perceived stress and semester GPA was assessed.

The intent of using difference scores was to determine if a change in stress was a mediator to the relationship between resilience and semester GPA. However, difference scores alone do not lend themselves well to comparison. As suggested by Furr (2011), it is good practice when using difference scores to control for a component part of the difference score. Because of this, mean level perceived stress across Time 1 and Time 2 were also included to control for any variance that may be due to the high or low value at which a participant scores. Controlling for the mean level at which a participant was scoring isolates the effect of a change
in stress, regardless of how high or low the average level of responding. Including an interaction term also allows for the control of interactive effects in stress reports due to where the participant was scoring and how much change there had been. This allows for the isolation of variation related to the change in scores over time without the relationship being overshadowed by the average level at which the participant responded or possible main effects reflected in perceived stress scores. While controlling for mean level of stress and the interaction between mean level and difference scores components, perceived stress difference scores were not significant ($R^2 = .06$, $b = -.11$, $p = .774$). Because the predictor did not significantly correlate with the outcome, there is no mediation to assess. The next set in the process was completed, nonetheless. A multiple regression was used to assess the effect of perceived stress difference scores on semester GPA while controlling for resilience at Time 1, mean level of perceived stress, and the interaction between difference scores and mean level of responding. The relationship between difference scores in perceived stress and semester GPA was nonsignificant ($b = -.017$, $p = .639$). Again, this indicates that there was no observable mediation effect of difference scores in perceived stress on the relationship between resilience at Time 1 and semester GPA.

Although the mediation analysis was not significant, hypothesis 6b was still analyzed. To test if resilience at Time 1 and the difference in perceived stress both accounted for significant variation in GPA while controlling for conscientiousness and ACT scores, a hierarchical multiple regression was conducted. Within the hierarchical regression, in the first step, the control variables ACT scores and conscientiousness were entered. Next, resilience scores at Time 1 were entered in step 2. Lastly, change in perceived stress, mean level perceived stress, and an interaction coefficient between change in perceived stress and mean level stress were entered in step 3. Full results are displayed in Table 3.2. Although a significant model ($R^2 = .258$, $F(6,118)$
= 6.85, p < .001), this analysis indicated that there was no significant prediction of GPA by resilience or changes in perceived stress when controlling for ACT scores and conscientiousness. When controlling for ACT scores and conscientiousness, resilience at Time 1 was not a significant predictor of semester GPA (b = .001, p = .857). In the third step, neither resilience (b = -.002, p = .654) nor change in perceived stress (b = -.013, p = .690) were significant predictors of semester GPA.

Table 3.2

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Scores</td>
<td>.33 ***</td>
<td>.32 ***</td>
<td>.33 ***</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.28 **</td>
<td>.27 **</td>
<td>.26 **</td>
</tr>
<tr>
<td>Resilience at T1</td>
<td>.02</td>
<td>-.04</td>
<td></td>
</tr>
<tr>
<td>PS Change</td>
<td></td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>MeanPS</td>
<td></td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>PSChange x MeanPS</td>
<td></td>
<td>.23</td>
<td></td>
</tr>
</tbody>
</table>

| ΔR²                      | .23     | .00     | .02     |
| ΔF                       | 18.66 ***| 0.03    | 1.27    |

Adjusted R²               | .22     | .22     | .22     |

F                        | 18.66 ***| 12.35 ***| 6.85 *** |

Note. N = 125; * = p < .05; ** = p < .01; *** = p < .001
Additional Exploratory Analyses

Some additional exploratory analyses were completed to assess other relationships within the data that were not specifically specified in the hypotheses. As the sample was close to 60% freshmen, it was worth considering if freshmen, in general, tended to have higher levels of perceived stress at Time 1 than other students. Contrary to this idea, no significant difference was found ($M_{\text{diff}} = -.52$; $t(123) = -.513, p = .609$) such that freshmen ($n = 72; M = 19.24, SD = 5.43$) did not report more stress than other years at Time 1 ($n = 53, M = 19.75, SD = 5.79$). Variance was equal across groups ($F(123)= .43, p = .51$).

As resilience scores had been correlated to semester GPA, it was of interest to determine if resilience was correlated with ACT scores or conscientiousness. It was discovered that conscientiousness was highly correlated with resilience as defined by total scores on the CDRISC ($r = .430, p < .001$) and to a lesser extent, ACT scores ($r = .258, p = .004$).

To assess if resilience scores were, in fact, predictive of changes in perceived stress over the course of the semester, a linear regression was conducted to see if resilience scores predicted differences in perceived stress. The results reveal that resilience at Time 1 did significantly predict differences in perceived stress ($R^2 = .049, F(1,123) = 6.321, p = .013$) such that those who had an increase in stress from Time 1 to Time 2 had lower resilience scores at Time 1 ($\beta = .221, p = .013$).

To determine if some of the demographic variables were significantly related to perceived stress or performance, semester GPAs and perceived stress at Time 2 were correlated with the demographic variables related to work, extracurricular, living situation, number of children/ caretakers, religion, relationships, academic behaviors, and personal listed in Appendix D. The only variable related to perceived stress at Time 2 was if an individual was currently in a
romantic relationship \((r = -0.19, p = 0.04)\) such that those who were in a relationship experienced less stress at Time 2. The variables related to semester GPA were participation in extracurricular activities \((r = 0.33, p < 0.001)\), number of caretakers available to care for children \((r = 0.19, p = 0.04)\), and frequency of attending lectures \((r = 0.18, p = 0.0498)\). The relationship between extracurricular participation and GPA was such that those who did participate had higher GPAs, however GPA was unrelated to the number of hours spent participating \((r = -0.04, p = 0.66)\). The relationship between number of caretakers and GPA was such that those who have more caretakers for their children had higher semester GPA. Finally, those who attended lecture more frequently had higher semester GPA.

When using difference scores, Furr (2011) suggests also running the same analyses with each component of the difference score as well to assess the significance of prediction of the individual parts of a difference score. Completing these analyses allows for a better understanding of how the two component parts may be affecting the outcome variable disregarding the change in scores over time. That being the case, the regression assessing the effect of perceived stress and resilience was conducted once with Time 1 perceived stress and once with Time 2 perceived stress in the place of difference scores.

The results of the analysis with Time 1 perceived stress are in Table 3.3. The results of the analysis with Time 2 perceived stress are in Table 3.4. From these results, it appears neither stress at Time 1 or Time 2 were significant predictors of semester GPA, although perceived stress at Time 2 approached significance \((b = -0.16, p = 0.065)\).
Table 3.3

ACT, Conscientiousness, Resilience, Time 1 Perceived Stress as Predictors of Semester GPA

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Semester GPA</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td>ACT Scores</td>
<td>0.33 ***</td>
<td>0.32 ***</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.28 ***</td>
<td>0.27 **</td>
</tr>
<tr>
<td>Resilience at T1</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>PS T1</td>
<td>-0.06</td>
<td></td>
</tr>
<tr>
<td>ΔR²</td>
<td>0.23</td>
<td>0.00</td>
</tr>
<tr>
<td>ΔF</td>
<td>18.66 ***</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Adjusted R² 0.22 0.22 0.21
F 18.66 *** 12.35 *** 9.35 ***

Note. N = 125; * = p < .05; ** = p < .01; *** = p < .001

Table 3.4

ACT, Conscientiousness, Resilience, Time 2 Perceived Stress as Predictors of Semester GPA

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Semester GPA</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td>ACT Scores</td>
<td>0.33 ***</td>
<td>0.32 ***</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.28 ***</td>
<td>0.27 **</td>
</tr>
<tr>
<td>Resilience at T1</td>
<td>0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>PS T2</td>
<td>-0.16</td>
<td></td>
</tr>
<tr>
<td>ΔR²</td>
<td>0.23</td>
<td>0.00</td>
</tr>
<tr>
<td>ΔF</td>
<td>18.70 ***</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Adjusted R² 0.22 0.22 0.23
F 18.66 *** 12.35 *** 10.32 ***

Note. N = 125; * = p < .05; ** = p < .01; *** = p < .001

Also of note, while assessing whether the degree of change in stress (regardless of the direction) was associated with performance, the absolute value of difference scores in perceived
stress were not predictive of semester GPA \(R^2 = .00, b = -.02, p = .86\). The correlation between perceived stress at Time 1 and Time 2 was .47 \(p < .001\). The correlation between Time 1 and the difference scores was .29 \(p < .001\). The correlation between Time 2 and the difference scores was -.71 \(p < .001\). This indicates that the difference scores were far more strongly related to perceived stress scores at Time 2 than at Time 1.
CHAPTER IV
DISCUSSION AND CONCLUSIONS

The goal of the current study was to assess the relationship between emotion regulation strategies, resilience, stress, and academic performance. A few expected relationships were observed. Resilience was positively correlated with semester GPA, changes in perceived stress, and reappraisal and negatively correlated to suppression. Change in perceived stress correlated positively with semester GPA and reappraisal such that those who had no increase or had a decrease in perceived stress had higher GPAs and endorsed the use of more reappraisal. Both reappraisal and suppression predicted unique variation in resilience scores. The results support the idea that an individual’s level of resilience as defined by the Connor-Davidson resilience scale impacts the usage of both suppression and reappraisal.

Despite these findings, several hypotheses were not supported. There was no average difference in perceived stress from Time 1 to Time 2. The minimum number of days between participation was 30, with only a few participants waiting less than 40 days between test phases ($n = 7$). Initially, it was expected that the large number of freshmen in the sample were responsible for this lack of difference, as students with little to no experience in college may be more nervous or stressed about their first semester than other students. Additional analyses, however, did not support this possibility. One limitation of the current study is that it is unclear what specific stressors were experienced by the sample. A general measure like the perceived
stress scale cannot give specific data on what stressors are present at the beginning versus the end of the semester or what different stressors are present for freshmen or upperclassmen. Freshmen may be concerned about what college classes will be like or stressed from moving away from home, where as juniors or seniors may be worried about the novel world of job applications or balancing a part-time job and more advanced coursework. Misra, McKeen, West, and Russo (2000), describe that there are similar stressors students across years face at similar rates such as self-imposed pressure and academic pressure. Because there was no measure of what specifically was stressing students, it is possible that both the beginning and the end of the semester can be similarly stressful for different reasons. This supports the idea that assessing the general change in stress over the semester may not necessarily be any more helpful than assessing stress at one critical point (such as the end of the semester). Although we had some demographic data on common stressors, only a few were marginally significant predictors of stress at Time 2 or semester GPA. To get a clearer picture of the specific stressors in a student’s life, it may be more beneficial to ask students to report their most pressing stressors at the time as opposed to their general level of stress.

Neither emotion regulation strategy was correlated with semester GPA. This indicates that how students generally regulate their emotions may not impact their overall performance during a semester. It may be that students use other emotion regulation strategies more frequently when faced with academic stress and that these strategies have a bigger impact on academic performance. For example, attentional deployment is also considered an emotion regulation strategy that could impact resilience (Troy & Mauss, 2011). How a student attends to the stress they are facing, for example through distraction (i.e. diverting attention and thoughts from the stressor) or rumination (i.e. near constant worrying related to the stressor), may impact
semester performance in the long run. Previous research suggests that when emotion regulation strategies related to attention are used in the academic setting, they can affect performance (Keogh, Bond, French, Richards, & Davis, 2004). Additionally, coping strategies are not always effective in the moment. An individual usually uses a number of coping strategies and based on the context of the situation, coping may not have been effective (Carver, Scheier, & Weintraub, 1989; DeLongis & Holtzman, 2005). Also, it is possible that the general use of reappraisal or suppression does not predict the use of these emotion regulation strategies in the academic setting. It may be beneficial in the future to contextualize the use of emotion regulation strategies to whichever setting in which they are being assessed, in this case, an academic setting.

While controlling for conscientiousness and ACT scores, resilience scores were not a significant predictor of semester GPA and difference scores in perceived stress did not mediate this relationship. One issue that may be related to why overall resilience scores were not related to semester GPA is that the Connor-Davidson resilience scale is a general measure of resilience. Because it assesses cognition and behaviors more generally, there is no guarantee that students use these thoughts and actions when facing school-specific stress. Resilience has been studied in clinical populations (Carli et al., 2014; Deegan, 2005; Wenzel et al., 2002), in children and adolescents (Cleverley & Kidd, 2011; Hammen & Brennan, 2003) and those who have experienced some form of acute trauma (Ahmad et al., 2010; Calcote, Carson, Peskin, & Emery, 2013; Connor et al., 2003; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009), and only more recently has it been considered a trait in the general population as research suggested resilience was more common than previously thought (Masten, 2001). Resilience can supposedly account for flexibility and growth under various types and degrees of stress; therefore, in situations where successfully overcoming stress likely relies on other significant factors beyond
resilience or coping (e.g. intelligence in academic success or workplace performance) a contextualized approach may be more appropriate to parse out the role of resilience in overcoming these general or chronic stressors.

There was a lack of mediation as well as a lack of significance in perceived stress difference scores and resilience to predict academic performance. It may be that it is not enough to have an increase or decrease in stress to predict performance, but rather the relationship between stress and performance is more complicated. For example, in motivation research, there is an inverted U-curve to the relationship between motivation or arousal and performance (i.e. the Yerkes-Dodson Law); in other words, there is an optimal range of arousal to perform specific tasks and arousal levels that are too low or too high may be detrimental to performance (Teigen, 1994). Figure 4.1 illustrates the relationship between average perceived stress reported across Times 1 and 2 by semester GPA. There is a clear non-linear relationship between stress levels and overall performance. Because of the presence of this potential effect, future research may benefit from identifying what ranges of scores on the PSS are optimal for academic performance. Additionally, if there is an optimal spot for stress or arousal, there may be an optimal spot for resilience. Perhaps too much resilience to stress would lead to apathy regarding performance beyond some level. Future research may benefit from assessing if resilience has a linear or non-linear relationship to performance academically or otherwise.
Related to the lack of mediation and the non-significance of resilience and perceived stress as predictors of academic performance, it is also worth noting that semester GPA likely had a ceiling effect. As students cannot score above a 4.0 \((n = 26)\), it is likely some variation was lost due to the restriction of the upper part of the GPA distribution.

The intent of using difference scores was to observe if there was a change in stress over time related to an individual’s resilience score. While this may be the case, there are a number of issues with using pure difference scores (Edwards, 2001; Furr, 2011), even when controlling for mean level of responses and the interaction between difference scores and level of responding.
For example, the reliability of the difference scores can both inflate or minimize the observable effects of the change variables on the outcome measure. This leads to easily misinterpreted coefficients when assessing correlational data including difference scores. Additionally, reliability of difference scores is often less than the two component parts. This means that there is more likely to be error involved in the computations involving difference scores. Difference scores also make it difficult to determine the underlying model that the pattern of data follows (Griffin, Murray, & Gonzalez, 1999). In the current study, difference scores were not predictive of performance during the semester. The additional results suggest stronger relationships to stress at Time 2. Future research assessing how resilience affects perceived stress should consider if change scores are truly predictive of anything (beyond making intuitive sense), the benefit of collecting more data points, and using more advanced statistical techniques when change over time is concerned (such as with polynomial regression or response surface modelling (Edwards, 2001).

In exploratory analyses, it was discovered that there is a moderate correlation between resilience as measured by the CD-RISC and conscientiousness. As resilience has been correlated with each of the factors in the Big Five (Campbell-Sills, Cohan, & Stein, 2006; Fayombo, 2010; Yu & Zhang, 2007), it is not surprising that a relationship was found between resilience and conscientiousness. Perhaps because conscientiousness in college students may buffer against stress, it is possible controlling for conscientiousness partially clouded the relationship between the CD-RISC and GPA. Similarly, it is also possible that some of the items of the CD-RISC may be interpreted as measuring some aspect of conscientiousness (e.g. “I give my best effort no matter what the outcome may be”). Future research will need to clarify the amount of variation in resilience due to personality variables versus other traits or factors.
Limitations

There are several limitations to the current study. The most relevant issue is the sample size. Data from only 125 students was usable for analyses. Of the 170 students that completed both Times 1 and 2, 45 had to be dropped. Some participants \(n = 18\) were missing electronic consent form signatures at Time 2. Others \(n = 22\) completed questionnaires in unreasonably short periods of time \(<15\text{min for Time 1 [~230 questions]}; < 8 \text{ min for Time 2 [~120 questions]}\). The rest \(n = 5\) were missing or had not provided necessary information such as ACT scores or student IDs for GPAs. Because of the low number of students, analyses performed were not as powerful and a structural equation model of the variables was unable to be completed, as was the initial intention of the current study. It may be worth holding questionnaire sessions in person to make sure students that wish to participate sign the consent form to avoid this issue in the future. Future research can also keep the number of questions in a survey to a minimum to decrease the number of participants that finish quickly without putting decent thought into their responses. Another limitation was that we are only assessing these relationships based on data at two time points. While it would be better to assess stress, resilience, and performance regularly throughout a semester, retention of participants would likely drop. We also did not observe or track specific stressors during the semester but assessed general levels of stress. This left room for non-academic stressors to affect the data, such as work, economic, or family matters, so future endeavors will need to track what stressors are having the most impact on students.

Generalizability in the sample was also an issue. The sample lacked diversity, therefore the results may not generalize well across ethnicity, age, or gender. Another possible limitation
was that with the number of questionnaires students were filling out could have led to a lack of
attention to what the questions were asking and an increase in random responding. Questions to
check for how much attention students are paying to the content of the surveys may be
implemented in the future. If students did read each question carefully before answering, they
may still be responding in socially desirable ways or experiencing practice effects for questions
they completed twice.

**Future Directions**

One future direction of this research is to explore the idea of a contextualized measure of
resilience. Stress can occur in several settings due to many causes. If adding academic context
into the prompts for this and other measures of resilience increases the accuracy of prediction,
specific contextual measures may need to be developed for future assessment and practice.
Another direction for possible research is assessing the impact of other emotion regulation
strategies not considered in this study on academic performance and resilience. For example,
attentional deployment strategies, such as distraction, may be stronger predictors of academic
performance in the long run. Distracting oneself from school-related stress could be detrimental
and increase stress if used too often. It may also be beneficial to assess individual differences in
how stress is manifested. For example, some students may gain weight as an outcome of
excessive stress while others simply perform worse in classes. The determinants of how stress is
manifested in individuals may also give some insight into how self-concept, cognitive biases, or
genetics can play a role in the experience of stress. Future research will also need to identify on
which outcomes resilience scores may have an impact, whether in college or in the general
population.
Conclusions

While emotion regulation strategies predict scores on resilience, general resilience and use of emotion regulation strategies are not good predictors of academic performance within a semester, particularly when controlling for conscientiousness and ACT scores. More research must be done to identify what affects stress levels during a semester, how resilience and emotion regulation may affect stress levels in college or the general population, and if stress prevention efforts are possible for new college students. Also, research to differentiate resilience from other related constructs such as conscientiousness may help validate research findings and clarify overlapping aspects of each. If traits or tendencies that do predict lower stress in college students can be identified, prevention programs may be developed to help students form a buffer against stress which, in turn, can lead to better retention and an overall healthier college population.
REFERENCES


Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of

doi:10.1016/j.jad.2014.10.054


APPENDIX A

PERCEIVED STRESS SCALE
Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

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
APPENDIX B

EMOTION REGULATION QUESTIONNAIRE
Instructions and Items
We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1. ____ When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about.

2. ____ I keep my emotions to myself.

3. ____ When I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about.

4. ____ When I am feeling positive emotions, I am careful not to express them.

5. ____ When I’m faced with a stressful situation, I make myself think about it in a way that helps me stay calm.

6. ____ I control my emotions by not expressing them.

7. ____ When I want to feel more positive emotion, I change the way I’m thinking about the situation.

8. ____ I control my emotions by changing the way I think about the situation I’m in.

9. ____ When I am feeling negative emotions, I make sure not to express them.

10. ____ When I want to feel less negative emotion, I change the way I’m thinking about the situation.

Note: Do not change item order, as items 1 and 3 at the beginning of the questionnaire define the terms “positive emotion” and “negative emotion”.

Scoring (no reversals)
Reappraisal Items: 1, 3, 5, 7, 8, 10; Suppression Items: 2, 4, 6, 9.
APPENDIX C

HEXACO-60 PERSONALITY ITEMS
On the following pages you will find a series of statements about you. Please read each statement and decide how much you agree or disagree with that statement. Then write your response in the space next to the statement using the following scale:

5 = strongly agree
4 = agree
3 = neutral (neither agree nor disagree)
2 = disagree
1 = strongly disagree

Please answer every statement, even if you are not completely sure of your response.

1. I would be quite bored by a visit to an art gallery.
2. I plan ahead and organize things, to avoid scrambling at the last minute.
3. I rarely hold a grudge, even against people who have badly wronged me.
4. I feel reasonably satisfied with myself overall.
5. I would feel afraid if I had to travel in bad weather conditions.
6. I wouldn’t use flattery to get a raise or promotion at work, even if I thought it would succeed.
7. I’m interested in learning about the history and politics of other countries.
8. I often push myself very hard when trying to achieve a goal.
9. People sometimes tell me that I am too critical of others.
10. I rarely express my opinions in group meetings.
11. I sometimes can’t help worrying about little things.
12. If I knew that I could never get caught, I would be willing to steal a million dollars.
13. I would enjoy creating a work of art, such as a novel, a song, or a painting.
14. When working on something, I don’t pay much attention to small details.
15. People sometimes tell me that I’m too stubborn.
16. I prefer jobs that involve active social interaction to those that involve working alone.
17. When I suffer from a painful experience, I need someone to make me feel comfortable.
18. Having a lot of money is not especially important to me.
19. I think that paying attention to radical ideas is a waste of time.
20. I make decisions based on the feeling of the moment rather than on careful thought.
21. People think of me as someone who has a quick temper.
22. On most days, I feel cheerful and optimistic.
23. I feel like crying when I see other people crying.
24. I think that I am entitled to more respect than the average person is.
25. If I had the opportunity, I would like to attend a classical music concert.
26 When working, I sometimes have difficulties due to being disorganized.
27 My attitude toward people who have treated me badly is “forgive and forget”.
28 I feel that I am an unpopular person.
29 When it comes to physical danger, I am very fearful.
30 If I want something from someone, I will laugh at that person's worst jokes.
31 I've never really enjoyed looking through an encyclopedia.
32 I do only the minimum amount of work needed to get by.
33 I tend to be lenient in judging other people.
34 In social situations, I’m usually the one who makes the first move.
35 I worry a lot less than most people do.
36 I would never accept a bribe, even if it were very large.
37 People have often told me that I have a good imagination.
38 I always try to be accurate in my work, even at the expense of time.
39 I am usually quite flexible in my opinions when people disagree with me.
40 The first thing that I always do in a new place is to make friends.
41 I can handle difficult situations without needing emotional support from anyone else.
42 I would get a lot of pleasure from owning expensive luxury goods.
43 I like people who have unconventional views.
44 I make a lot of mistakes because I don't think before I act.
45 Most people tend to get angry more quickly than I do.
46 Most people are more upbeat and dynamic than I generally am.
47 I feel strong emotions when someone close to me is going away for a long time.
48 I want people to know that I am an important person of high status.
49 I don’t think of myself as the artistic or creative type.
50 People often call me a perfectionist.
51 Even when people make a lot of mistakes, I rarely say anything negative.
52 I sometimes feel that I am a worthless person.
53 Even in an emergency I wouldn’t feel like panicking.
54 I wouldn't pretend to like someone just to get that person to do favors for me.
55 I find it boring to discuss philosophy.
56 I prefer to do whatever comes to mind, rather than stick to a plan.
57 When people tell me that I’m wrong, my first reaction is to argue with them.
58 When I’m in a group of people, I’m often the one who speaks on behalf of the group.

59 I remain unemotional even in situations where most people get very sentimental.

60 I’d be tempted to use counterfeit money, if I were sure I could get away with it.

Items related to Emotionality: 5, 11, 17, 23, 29, 35 (reversed), 41 (reversed), 47, 53 (reversed), 59 (reversed)

Items related to Conscientiousness: 2, 8, 14 (reversed), 20 (reversed), 26 (reversed), 32 (reversed), 38, 44 (reversed), 50, 56 (reversed)
APPENDIX D

DEMOGRAPHIC QUESTIONS
Demographic Questions

– What is your current age?

– Sex (Select one): Male, Female

– Gender (Select one): Male, Female, Other

– What is your college major?

– How many semesters have you completed in college (at UTC or otherwise)?

– Year in college (Select one): Freshman, Sophomore, Junior, Senior, Graduate

– Ethnicity (Select one): White, African-American/Black, Hispanic/Latino, Multiracial, Native American, Asian/Pacific Islander, Other

– Did you take any advanced placement (AP) classes in high school? Yes, No

– Had you ever attended another college before beginning your current degree at UTC? Yes, No

– Do you currently hold a completed bachelor’s degree? Yes, No

– Graduate/Professional degree? Yes, No

– How many hours do you work off-campus for pay each week? 1-10, 11-20, 21-30, 30+

– How many hours do you work on-campus for pay each week? 1-10, 11-20, 21-30, 30+

– Do you participate in any extracurricular activities? Yes, No

– How many hours a week do you dedicate to these activities?

– Do you make use of the disabilities center on campus? Yes, No

– Are you a NCAA athlete? Yes, No

– Are you in a fraternity or sorority? Yes, No

– Are you an in-state student, an out-of-state student, or an international student?

– How would you describe your current living situation? Living alone; Living with roommate(s)/significant other; Living with extended family; Living with immediate family
– Have you ever been CLINICALLY diagnosed with any of the following psychological disorders?:
  ADHD/ ADD, Depression or mood disorder, any anxiety disorder, Posttraumatic Stress Disorder,
  Obsessive Compulsive Disorder, Other
– Do you have any children?: 0, 1, 2, 3, 4+
– If you have children, besides yourself, how many other caretakers are generally available to take
  care of your children (spouse/ significant other, parents, friends, siblings, coworkers, etc.)? 0, 1, 2, 3,
  4+, N/A
– How important is academic success in your life? Not at all, Somewhat, Very (1-7 scale)
– What was your score on the ACT? The SAT?
– Would you consider yourself to be religious or spiritual? Yes, No
– Are you currently in a romantic relationship? Yes, No
– Are you currently receiving psychological therapy from a clinical professional? Yes, No
– Do you make use of the counseling center on campus? Yes, No
– How frequently do you make it to lectures during the semester on average? Almost Never,
  Occasionally, Most of the Time, Almost Always
APPENDIX E

IRB APPROVAL LETTER
MEMORANDUM

TO: Katherine Pendergast  
    Dr. Nicky Ozbek  
FROM: Lindsay Pardue, Director of Research Integrity  
       Dr. Amy Doolittle, IRB Committee Chair  
DATE: July 25, 2016  
SUBJECT: IRB #16-087: Semester impact on Individual Factors in College Students

The IRB Committee Chair has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project # 16-087.

Annual Renewal. All approved research is subject to UTC IRB review, at least once a year. Please visit our website (http://www.utc.edu/research-integrity/institutional-review-board/froma.php) for the Form B (continuation / change / completion form) that you will need to complete and submit if your project remains active and UTC IRB approval needs to be renewed for another year. Unless your research moves in a new direction or participants have experienced adverse reactions, then renewal is not a major hurdle. You as Principal Investigator are responsible for turning in the Form B on time (2 weeks before one year from now), and for determining whether any changes will affect the current status of your project. When you complete your research, the same change/completion form should be completed indicating project termination. This will allow UTC’s Office of Research Integrity to close your project file.

Please remember to contact the IRB immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page http://www.utc.edu/irb or email irbinfo@utc.edu.

Best wishes for a successful research project.
VITA

Katherine “Katie” Pendergast was born in Kokomo, IN, to Mark and Rosemarie Pendergast. She is the second of two children with an older brother, Martin. She attended elementary and high school through the Taylor Community School System. Afterward, she attended Purdue University in West Lafayette, Indiana and became involved in research and developed a passion for clinical psychology. She earned a Bachelor of Science degree in May 2015 in Brain and Behavioral Science. She then attended the University of Tennessee at Chattanooga for a Master of Science degree in Research Psychology. After completing her Master of Science degree in Research Psychology in May 2017, she is working towards acceptance into a clinical psychology Ph.D. program.