The Roles of Resilience, Grit, and Academic Resilience on Student Achievement While Controlling for Depression, Anxiety, and Stress

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DEDICATIONS

I would like to dedicate this work to my family without which I never would have made it to this point. To my mom for being there for strength and support whenever I needed it, even if I didn't know it at the time. To my dad for being a north star to guide me, even when he may not have known it. To my brothers, Shawn and Austin, for always being there for me through thick and thin no matter what. Also, to all my friends for pushing me on when I may have stopped. Lastly, to all those who may never know, or be able to hear, how much their words of encouragement, support, and love helped me to finish, thank you.

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ABSTRACT

The current study explored the relationships between resilience, academic resilience, and grit with student achievement while controlling for depression, anxiety, and stress. One hundred and sixty-one participants were administered assessments measuring resilience, academic resilience, grit, depression, anxiety, and stress, as well as a demographics questionnaire which included their self-report GPA. The results showed a significant relationship between grit and GPA, while controlling for the other covariates measured in the study. Neither resilience nor academic resilience had a significant relationship with any of the other constructs or with GPA. Implications for these findings and future directions for research are discussed.

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CHAPTER I

INTRODUCTION

The World Health Organization defines mental health as, ". . .a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community" (World Health Organization, 2014). This definition implies that mental health is more than just the absence of mental illness, but also the ability to be productive in life. This falls in line with the dual factor model of mental health which considers mental health to be both the absence of negative indicators and the presence of positive indicators of mental health (Hu, Zhang, & Wang, 2015). Unfortunately, for many students in our nation's colleges and universities they are falling short in both aspects. Not only are they being affected by mental illness, but they are also suffering academically because of it or dropping out due to mental illness.

The National Institute of Independent Colleges and Universities (1989) reported that close to 60% of university students leave college without finishing their degree, and most of these students leave within the first two years of college because of an inability to manage depression, anxiety, and/or stress. Steinberg and Darling (1994) reported that approximately half of all students who consulted mental health services complained of anxiety and depression, and that those conditions affected their academic achievement. More recently, Furr, Westefeld, McConnell, and Jenkins (2001) found that 53% of college students surveyed at four different universities reported experiencing what they would consider depression, but only 17% sought help. Another study found that out of 2,785 students who screened positive for major

depression, only 45% had received services compared to 57% in the general population; this was despite the fact that the students had near universal health insurance and free access to mental health services (Eisenberg, Golberstein, & Gollust, 2007).

Other recent studies have further solidified the negative relationships between academic performance and depression, anxiety, and stress (Ahmed & Julius, 2015; Safree, Yasin, & Dzulkifli, 2011). However, even with seemingly high rates of mental health issues and stress, many college students successfully complete college and perform well academically; why is this? The constructs of resilience, academic resiliency, and grit may be a promising avenue to answer this question. As Safree et al. (2011) note, psychological well-being is important for success, and these three personality traits may hold answers as to how best to help students succeed and prosper.

Resilience

Research into resilience began during the 1970s in response to the resilience shown in children who had been deemed at risk for psychopathology and/or problems in development, but did not manifest these issues (Masten, 2001). The earliest concepts of how resilience worked were as a sort of scale, where protective factors hopefully outweighed the negative consequences of whatever event took place (Forbes & Fikretoglu, 2018). At first many researchers thought this resiliency must have been a rare phenomenon that occurred in some individuals. However, through the years research has shown that resiliency is not as rare a phenomenon as originally thought, and it is in fact more of an ordinary adaptation that arises from ordinary processes. This research, which began with children, quickly spread to encompass all age groups, but in the near half century since its inception into research and the

general public there are still many issues pertaining to resilience which have not been agreed upon.

One issue to date, with resilience, is the lack of a unifying theoretical construct (Davydov, Stewart, Ritchie, & Chaudieu, 2010). The definition of resilience used by the American Psychological Association (2014) is "the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress (para. 4)." As Dr. Southwick notes, this definition is useful, but it is also simplistic and does not capture the complexity of resilience (Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). Fletcher and Sarkar (2013) suggest positive life events that are not associated with undesired outcomes, such as a job promotion that may necessitate resilience in adapting to new and novel stressors, could be relevant in defining resilience. However, due to this complexity, resilience research currently suffers, primarily because the construct does not have a definition that encapsulates all of its intricacies. Therefore, there are multiple definitions and approaches used in research of this complex construct.

Resilience is defined in the literature in one of three ways, as a trait, an outcome, or a process (Fletcher & Sarkar, 2013). The first of the three views resilience as a fixed and stable personality trait for overcoming substantial stress or trauma acting on the individual (Lee et al., 2013). This view is criticized primarily because it does not account for interactions between individuals and their environment. The outcome approach ". . .refers to a class of phenomena characterized by good outcomes in spite of serious threats to adaptation or development" (Masten, 2001, p. 228). The third view focuses on resilience as a dynamic trait that is adaptive

and depends on multiple interactions of systems within and around the individual (Lee et al., 2013).

To complicate matters more, there are three main approaches taken in resilience research. There are harm reduction, protection, and promotion approaches (Davydov et al., 2010). Some researchers define the harm reduction approach to resilience by timely and efficacious recovery after stress or the ability to "bounce back" after some type of adversity (Tugade & Fredrickson, 2004). As Davydov et al. (2010) note, this is similar to biological recovery after infection of pathogens and denotes the individual's ability to bounce back after adversity. The protection approach defines resilience by the presence of protective mechanisms, which serve to maintain mental health when an individual is confronted by stress or trauma (Patel & Goodman, 2007). This would be analogous to physical barriers or mechanisms which protect against invasive pathogens, such as mucous membranes or skin, if we continue with the biological comparisons.

The third approach, the promotion approach, has two sub-types associated with it. In general, the promotion approach concentrates on the development of resources that are used by the individual in concert with the harm-reduction and/or protection approaches (Davydov et al., 2010). The first sub-type of this approach is the *anti-stress fortification* type, which maintains that fewer negative adversities or more positive experiences in the past helps maintain mental health in the face of current adversity (Davydov et al., 2010). The second sub-type is *anti-stress training*, which holds that successful adaptation to current adversity is the outcome of successful overcoming by the individual of past adversity. This is comparable to how vaccines work on biological adversities in the body (Davydov et al., 2010).

The comparison of resilience and its inoculations to stress psychologically with a biological model of stressors to the immune system, i.e. pathogens, lends itself well to describing what we know of the workings of resilience and how to foster greater resilience. With the promotion approach in mind, it can be seen that resilience may work on a dose-response relationship. That is, too little adversity in an individual's life may not necessitate the development of the necessary mechanisms to confront and overcome obstacles in life, but too much adversity early in life could also lead to decreased tolerance of stress (Davydov et al., 2010). As in most biological systems, a homeostatic conception of psychological resilience is seen, a balance of negative and positive experiences is essential for the proper development of mechanisms and coping skills to overcome adversity.

Mastery of early stress situations may lead to stress inoculation. This could possibly be one reason why it is estimated that upwards of 50% of the general population will experience a traumatic event, but the prevalence rate of post-traumatic stress disorder is only 7.8% (Russo, Murrough, Han, Charney, & Nestler, 2012; Southwick & Charney, 2012). This necessity of mastery in early life for the formation of barriers to stress in later life underscores the developmental aspects of resilience. Resilience is a developmental process, in which children acquire the ability to use internal and external resources to positively adapt in the face of adversity (Yates, Egeland, & Sroufe, 2003). Li and Yang (2016) note that trait resilience is acquired through positive experiences of interacting with challenging life situations as well. The developmental aspect of resilience is further corroborated by Hu et al.'s (2015, p.24) meta-analysis which showed that "[a]ge moderated the relationship between trait resilience and negative indicators of mental health, with adults showing stronger than children and

adolescents. Conversely, age did not moderate the relationship between trait resilience and positive indicators of mental health." Even in the context of Erikson's theory of development, outcomes of core developmental crises predicted levels of resilience in individuals (Svetina, 2014).

There are two main psychological factors associated with resilience, risk factors and protective factors. Risk factors are those factors which increase the chances of maladaptation, while protective factors increase the likelihood of adaptation (Lee et al., 2013). Risk factors such as depression, anxiety and stress have been shown to have a significantly negative relationship with resilience in a study of women college students (Ahmed & Julius, 2015). Positive factors such as self-efficacy, optimism, positive affect, and self-esteem have been shown to be positively related to resilience (Lee et al., 2013). Hu et al.'s (2015) meta-analysis also indicated that resilience was negatively correlated with negative indicators of mental health and positively correlated with positive indicators of mental health. It has also been reported that resilience contributes significant variance, between 9-16%, in predictions of depression, anxiety, stress, and obsessive-compulsive disorder; and depression can account for up to 9% of variance in resilience scores (Ahmed & Julius 2015; Hjemdal, Vogel, Solem, Hagen, & Stiles, 2011).

These protective factors are important in the development and maintenance of resilience. In a panel discourse Dr. Masten notes though, that people differ and for some different protective factors may be important for specific outcomes in specific contexts (Southwick et al., 2014). This point is echoed in Davydov et al. (2010), "[r]esilience mechanisms and factors may also be different in relation to a range of context severity" (p. 490). Davydov et

al. (2010) also note that the role a resilience factor plays in one aspect of mental health does not necessarily mean it plays the same role in all aspects. Resilience is an active process with a variety of roles and parts, not just the absence of psychopathology. Enhancing protective factors, rather than reducing risk factors, is more effective in improving and promoting resiliency (Feder, Nestler, & Charney, 2009; Lee et al., 2013).

Another concept that is strongly associated with resilience is cognitive reappraisal, or the ability to replace negative thoughts with more positive thoughts (McRae, Ciesielski, & Gross 2012). Resilience is built upon a variety of factors that promote assets and protect from negative appraisals of stressors and influences the appraisal of stressors (Fletcher & Sarkar, 2013). Fletcher and Sarkar (2013) also note that resilience should be kept conceptually distinct from coping, but that resilience does influence the selection of coping strategies an individual may use following the appraisal of a stressor.

Li and Yang (2015) reported that trait resilience consistently predicts active coping strategies. Active coping strategies are generally considered adaptive, while avoidance strategies are regarded as maladaptive (Hunter, 1999; Mahmoud, Staten, Hall, & Lennie, 2012). Active coping strategies employed by college students include making plans, positively reframing the problem, and finding solutions; avoidant strategies used by the same population include denial, engaging in risky behavior, using substances (both legal and illegal), increased sleeping, and not attending class (Li & Yang, 2015). It is easy to see how these different coping strategies, influenced by an individual's resilience, can affect academic performance.

College students' academic performance may be attributable to many different factors, but levels of stress and various psychiatric symptoms/disorders may play a significant role.

Using the Depression, Anxiety, and Stress Scale, (DASS) Ahmed and Julius (2015) reported that in a sample of female college students there was a significant relationship between academic performance and depression, anxiety, and stress. In this same sample they also reported depression, anxiety, and stress significantly predicted academic performance (Ahmed & Julius, 2015). This is not surprising, as it is well known that depression can cause dysfunction in short-term memory processing, and anxiety can cause perseveration on details (Colby & Gotlib, 1988; Hembree, 1988). As previously mentioned, resilience has been shown to have a significant inverse relationship with internalizing psychiatric disorders such as depression, anxiety, and stress (Ahmed & Julius 2015; Hjemdal et al., 2011). However, resilience seems to have a larger significant relationship with positive emotionality in college students than it does with negative emotionality (Robinson, Larson, & Cahill, 2014.

As Masten (2001) noted, there are, in general, two approaches to studying resilience; the first is a variable focused approach, and the second is a person-focused approach. The variable-focused approach studies correlations between risk/adversity and characteristics or qualities that may protect a person from negative outcomes. The person-focused approach compares people with different profiles to determine what makes resilient individuals different from non-resilient individuals (Martin & Marsh, 2009). While each approach has its advantages, the advantage of the person-focused approach is the ability to be precise and purposeful about the research into the specific groups the researcher is interested in (Martin & Marsh, 2009). The current research will assume a person-focused approach to studying resiliency.

With consistent evidence showing the impediments psychiatric illnesses create in academic performance for college students, it is critical to evaluate effective strategies and

interventions to ensure every college student has the opportunity to succeed. Risks to college students' mental health are numerous, and many are built into the structure of college life, therefore it may be more practical to look at ways to increase student resilience by enhancing protective factors, rather than how to eliminate risk (Hartley, 2011; Hartley, 2013; Lee et al., 2013). In a meta-analysis of resilience training studies, Forbes and Fikretoglu (2018) found that resilience training was effective in around 55% of school settings. However, because of resilience's ever-changing definitions and conceptualization, many of these programs operationalized resilience differently, which in turn led to decisions in the training programs not supported by research.

Research into resilience has benefited psychology by changing the strategies, goals and assessment tools used in interventions in numerous situations and populations, but more research is needed to see how resilience relates to college students' health and success (Hartley, 2013; Masten, 2011).

Academic Resiliency

As noted earlier, it has become apparent in the literature that resilience may be better studied in context-specific ways (Southwick et al., 2014). One of the most prominent context-specific domains resilience is now being studied in is academics. Academic resilience has been defined as ". . .a student's capacity to overcome acute or chronic adversities that are seen as major assaults on educational processes," (Martin & Marsh, 2009, p. 353), ". . .student's ability to deal effectively with academic setbacks, stress, and study pressure," (Martin, 2002, p. 35), or as Morales defines it, "[a]cademic resilience is defined solely by exceptional academic achievement in the face of adversity" (Morales, 2008, p. 152).

As can be seen, the definition of academic resilience is very similar to the definitions of resilience noted earlier, the key difference being in the context of academics. A similar concept to academic resilience is academic buoyancy. However, academic buoyancy is related more to the everyday ups and downs students must contend with, whereas academic resilience focuses on acute and/or chronic adversity (Martin & Marsh, 2009). This research study is more concerned with relations among acute/chronic adversity in ordinary life and the acute adversities faced by students, so academic resilience is of more importance.

A key takeaway from the definitions of academic resilience, and the construct of resilience as well, is that in order for individuals to be considered resilient they must attain a positive outcome in spite of a high risk (Yavuz & Kutlu, 2016). This is important because it underlies one important area for research to focus on, and that is the consequences of academic resilience, namely "process" and "product" outcomes (Green, Martin, & Marsh, 2007). "Process outcomes include factors like effort, engagement, skill development, participation, attendance, work completion and enjoyment," while "[p]roduct outcomes include factors such as achievement, performance, rankings, scores, GPA and marks" (Martin & Marsh, 2009, p. 361). This current research study will be focused on product outcomes, specifically GPA, as an identifier of positive outcome.

In essence, academic resilience is a way to explore student resilience by academic achievement rather than through the notion of mental health and well-being as traditional resilience measures do (Martin, 2002). This is important for a variety of reasons. Despite highs and lows in the economy, the most direct route for escaping poverty remains college graduation (Perna, 2005). As Morales notes, the National Center for Education Statistics (2013)

found that only a little more than half of students beginning college in the fall will graduate with a degree within 6 years (2014). Morales also notes that students of similar academic ability, but from economically disadvantaged backgrounds, have lower graduation rates than their more well-off peers (2014). This may be in part due to lower academic resilience, resulting from an imbalance of risk to protective factors.

In academic resilience terms, risk factors may include things such as inferior schools, lack of access to technology, or insufficient means to purchase textbooks; while protective factors that may mitigate these risks could be caring teachers, mentors, quality schools, etc. (Morales, 2014). A previous study by Morales (2008) found that there were primary themes related to students who had been deemed resilient and these included: stress caused by cultural mismatches, and erosion of individuality and self-esteem. The adversities these students overcame have been corroborated in other studies as well that have shown academic resilience predicts enjoyment of school, class participation, and general self-esteem (Martin & Marsh, 2006).

Research into academic resilience has uncovered a wealth of knowledge about its correlates and how it may help students. Martin (2013) found academic resilience to be significantly negatively correlated with anxiety, failure, avoidance, uncertain control, self-handicapping, and disengagement. In a sample of 259 nursing students, Hwang and Shin (2018) reported that students with high academic resilience more commonly had good family and interpersonal relationships, were more satisfied with their major, showed less stress related to their studies, and higher grades. In Morales's (2014) study, 92% of students with high academic resilience identified a belief in their own ability to affect change as a key to their success. Self-

efficacy was defined by Bandura (1977) as a belief in a person's ability to successfully enact the behavior required to produce an outcome. This belief in self-efficacy may be a key correlate of academic resilience, as Morales (2014) also showed that increased self-efficacy led to higher effort on academics, while a lack of self-efficacy reduced effort spent on academics.

Martin and Marsh (2006) found that five factors predicted academic resilience; self-efficacy, control, planning, low-anxiety, and persistence. They proposed what they called a 5-C model of academic resilience: confidence (self-efficacy), coordination (planning), control, composure (low anxiety), and commitment (persistence). These five C's are important to understanding how academic resilience can be fostered in students. However, traditional predictors for factors such as persistence have been shown to not be as important for students with the lowest mental health scores (Hartley, 2013).

These factors are also remarkably similar to many of the factors predicting and encompassed by traditional resilience and the construct of grit. Academic Resilience is an extremely valuable tool for potentially helping students be successful and retained in colleges, despite setbacks from mental health issues. It also may be beneficial for not only low-achieving students, but also may help high-achieving students overcome the problems and mental health issues that occur with perfectionism (Dickinson & Dickinson, 2015). However, there is still much to uncover about it including its relationship with other constructs shown to mediate academic performance and completion.

Grit

Positive psychology's growth since the late 20th century has primarily been due to the work of Martin Seligman and colleagues (Seligman & Csikszentmihalyi, 2000). Recently, a key

trait demonstrated by research in positive psychology, perseverance, has been semi-rebranded and popularized by Angela Duckworth and colleagues as grit (Duckworth, 2016). Grit is defined as "…the tendency to pursue long-term challenging goals with perseverance and passion…" (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011, pg. 175). This new personality trait was first introduced by Duckworth, Peterson, Matthews, and Kelly (2007).

Since grit's debut a little over a decade ago, it has become a hot topic of research and discussion in both academic and non-academic circles. In Duckworth et al.'s (2007) seminal research on grit, they performed five separate studies to determine grit's incremental validity over more common predictors of success. These studies included adults over the age of 25, university students, The United States Military Academy at West Point cadets, and Scripps National Spelling Bee contestants. These seminal studies provided compelling evidence of a newly found personality trait.

Duckworth et al. (2007) found that grit was highly correlated with the Big 5 trait of conscientiousness, but not positively correlated with IQ. Grit also provided incremental predictive validity of success over that of IQ and conscientiousness. In their study of adults, they reported that more educated adults were higher in grit than less educated adults of the same age, and that grit tended to increase with age. The sample of university students showed that grit was associated with higher cumulative GPA, even more strongly so when SAT scores were held constant, but it was associated with lower SAT scores. This may suggest that among relatively intelligent peers, individuals who are less intelligent than their peers, make up for this by working harder and with more determination, or in other words, are more gritty (Duckworth et al. 2007). Duckworth et al. (2007) also found grit to predict summer attrition at West Point

better than conscientiousness. All of this evidence pointed to the idea that grit was a newly found, or newly operationalized, personality trait that needed further exploration.

Since Duckworth et al.'s (2007) research there has been a popular interest in the idea of grit and its function. Duckworth and Quinn's (2009) development of the short grit scale (grit-s) has helped this research. This measure of grit has two factors which load to grit as second-order factors, consistency of interest and perseverance of effort. Using this scale Duckworth et al. (2011) found in a sample of national spelling bee contestants those competitors who engaged in deliberate practice, practice which was less intrinsically rewarding but more effective, showed higher levels of grit and went further in the spelling bee. Deliberate practice mediated prediction of the final performance by the trait of grit (Duckworth et al., 2011). In general, grittier individuals seem to be less distracted by immediate goals and are less likely to give in due to obstacles in their path or failures (Credé, Tynan, & Harms, 2017).

However, this research has not come without its criticisms. Wolters and Hussain's (2015) study on grit and its relations to students self-regulated learning and academic achievement, which used the short grit scale, showed that perseverance of effort predicted achievement before, but not after, self-regulated learning was accounted for. They also reported that consistency of interest showed no relation to achievement. Duckworth and Quinn (2009) had reported that neither subscale was more predictive than the other, and that in most cases they were more predictive when used together, and that grit should be viewed as a higher-order structure because it worked better than a single factor model. Credé et al. (2017) argue that, based on Kline (2011), a model with one second-order factor and two first order

factors, as Duckworth and Quinn (2009) had proposed grit was, should not be identified as a higher-order structure.

Credé et al.'s (2017) meta-analytic study found that grit only modestly related to GPA, which is in opposition to Duckworth et al.'s (2007) findings of grit's relationship to GPA. They also argued that grit may perform differently in different contexts. Following up on this, Cormier, Dunn, and Causgrove Dunn (2019) reported that grit levels did vary as a function of the context used in. This led them to reason that grit should be viewed and conceptualized as a domain specific construct.

It is also worth considering the limitations of grit, that is, that grit may be useful in difficult and well-defined tasks, but it may be detrimental in tasks requiring creativity or the rejection of previously tried and unsuccessful strategies (Credé et al., 2017). The relation between grit and performance of a task may also be subject to moderation by the individual's general ability to perform the task at hand. No matter the amount of grit an individual has, if the subject is physically, intellectually, or otherwise unable to perform the task, their grit may end up being more harmful than beneficial. High levels of grit may also be problematic if the perseverance and consistency of effort shown by the individuals stop them from seeking help when needed (Credé et al., 2017).

Researchers have studied many characteristics and constructs related to perseverance and effort such as tenacity, will, conscientiousness, and self-efficacy for decades. Many of these other constructs have striking similarities to grit. This has led some to the belief of the potentiality that the construct of grit has fallen into the "jangle fallacy," the belief that two things are different because they have different names, with conscientiousness (Credé et al.,

2017). Grit has been found to have high correlations with conscientiousness in many different studies (Duckworth et al., 2007; Duckworth & Quinn, 2009).

Self-efficacy is another psychosocial construct that has been shown to be an important predictor of achievement. Self-efficacy is an individual's belief in their ability to accomplish a given task (Bandura, 1977). As such, the relationship between self-efficacy and grit has been explored recently. Usher, Li, Butz, and Rojas (2018) reported that self-efficacy was shown to be a mediator of grit. If self-efficacy is a mediator of grit then it would be likely that no matter how gritty individuals are, they may not be able to perform well unless they believe themselves capable (Usher et al., 2018).

Self-control, or self-regulation as these are often used synonymously, is the ability to regulate emotions, thoughts, or behaviors, particularly when it is to inhibit an impulse to do something else in favor of a different task that will lead to a more beneficial outcome for the individual in the long run (Willingham, 2016). Self-control has been shown to be closely tied to grit and conscientiousness as well (Tangney, Baumeister, & Boone, 2004; Wolters & Hussain, 2015). The consistency of effort portion of grit and self-control are remarkably similar in terms of definition and the action taken, but Willingham (2016) has provided a succinct real-world example of the difference between conscientiousness, grit, and self-control. He said, "…the conscientious teen practices piano because he knows he is supposed to. The teen with good self-control practices even when he is tempted to play Xbox instead. But the gritty teen practices because he is passionate about his dream of playing in a jazz trio" (Willingham, 2016).

Parsing out grit's unique place in personality theory may require more research, but it does appear to be on the right track. How expansive or constricted grit is in its value, what

contexts it works best in, and how much variance in success is due to passion and perseverance of effort all remain to still be determined more fully. While grit does seem to have commonalities with other constructs such as conscientiousness and self-control, it also seems to have its own utility in an individual's achievement, and it would be a folly to throw the bathwater out before fully exploring whether the baby is in it.

Summary

The constructs of resiliency, academic resilience, and grit are three promising avenues in developing ways to not only prevent college students from dropping out by fostering protective factors, but also help them achieve success despite various psychopathologies. As stated above, many college students report depressive symptoms, anxiety symptoms, and stress related to not only schoolwork, but also managing life in college (Eisenberg, Golberstein, & Gollust, 2007; Furr et al, 2001; Porter, 1989; Steinberg & Darling, 1994). Resiliency, grit, and academic resilience have been shown to have positive correlations with student achievement, if through their own unique pathways, but also these three may be acting on individuals concurrently. However, which may contribute the largest share to student success, in particular despite difficulties the student may be facing?

All three of these constructs have shown significant contributions to student success and achievement, but with limited resources available to universities, or even more broadly to students in general, how can we best support the students? If one of these factors may contribute a larger share to the success of students, it may be more advantageous to focus services on building and fostering that factor beyond the others. The utilization and growth of these constructs in students may be paramount to helping under-served students or those at

risk of, or currently dealing with depression, anxiety, or stress to achieve at the optimal level they are able to. By finding which of the aforementioned factors contributes most to academic success despite psychopathology we may unlock new avenues and abilities to help promote the greatest possible good for the greatest possible number of students.

Study Purpose and Hypotheses

While the aforementioned constructs' abilities to predict achievement have been explored, there is not much literature on how these constructs interact with each other. Each factor shows utility in either preventing or moderating psychopathologies, or predicting achievement, but it is not clear which may be more responsible or effective in this pursuit. The purpose of this study is to explore how resilience, academic resilience, and grit affect student achievement, especially in students with higher scores of depression, anxiety, and stress. This study is also intended to further the literature on the utility of each of these constructs, as well as possibly help explain the amount of variance each construct provides in explaining achievement despite psychopathology.

Hypothesis 1: Each of the variables (resilience, academic resilience, and grit) will be positively correlated with cumulative self-reported GPA when controlling for depression, anxiety, and stress.

Hypothesis 2: Each of the variables (resilience, academic resilience, and grit) will be positively correlated with cumulative self-reported GPA when controlling for depression, anxiety, and stress, as well as controlling for the other two protective variables.

Research Question 1: Does the relationship between the constructs of resilience, academic resilience, and grit have a moderating effect on the relationship between GPA and psychopathology?

CHAPTER II

METHOD

Participants

The participants were students from the Middle Tennessee State University research pool. The students obtained from this pool participate in it in order to fulfill certain course requirements, or to receive extra credit for their participation. Due to the nature of the research pool, it was anticipated that the majority of the respondents will be freshman college students. To be included in this study, respondents must be at least 18 years old and must have completed at least one semester of college credits. A minimum of 150 students were required for this study.

In this study 358 respondents completed the survey. However, 161 respondents were omitted from the study due to a survey question omission, which left their responses unusable for the current study. The survey was corrected, with the previously omitted question added back to the survey. Of the 197 participants who completed the rectified survey, 22 respondents were omitted due to missing GPA data.

Furthermore, a standard of three out of four correct responses to the attentional check questions was used in order for participant responses to be considered valid. All respondents but one correctly answered the four attentional check questions. The one individual who did not answer all four correctly answered three out of the four correctly and was therefore still used in analyses. Final analyses were based on 161 participant responses.

Materials and Apparatus

Demographics. Respondents were asked to provide demographic information including their age, gender, ethnic information, year in college, and cumulative self-reported GPA (APPENDIX A).

Short Grit Scale (Grit-S; Duckworth et al., 2007; Duckworth & Quinn, 2009). The Short Grit Scale (Grit-S) was used to measure grit. It is an abbreviated version of the original Grit Scale (Grit-O), which was designed to measure an individual's grit, or trait-level perseverance and passion for long-term goals (Duckworth et al., 2007; Duckworth & Quinn, 2009). The Grit-S was created by removing two items from each of the two subscales (consistency of interest and perseverance of effort) of the Grit-O (Duckworth & Quinn, 2009). The Grit-S retained the two-factor structure with improved psychometric properties. The Grit-S has shown acceptable internal consistency, with alpha's ranging from .73 to .83, and the two subscales have alphas ranging from .73 - .79 for the consistency of interest subscale and .60 - .78 for the perseverance of effort subscale (Duckworth & Quinn, 2009). The Grit-S has also shown acceptable test-retest reliability, $r = .68$, $p < .001$, in a study of Grit-S scores one year apart from each other (Duckworth & Quinn, 2009).

The scale has eight items that ask the individual to compare themselves to most other people in the world. The respondent answers by checking whether each statement is "very much like me," "mostly like me," "somewhat like me," "not much like me," or "not like me at all" (Duckworth et al., 2007; Duckworth & Quinn, 2009). Questions 2,4,7, and 8 are scored on a Likert scale from "1 = Not like me at all" to "5 = Very much like me," questions 1, 3, 5, and 6 are

reverse coded and scored from “1 = Very much like me” to “5 = Not like me at all,” the scores are then added up and divided by 8 to find the score (Duckworth et al., 2007; Duckworth & Quinn, 2009). The maximum score is 5 (extremely gritty) and the lowest score is 1 (not at all gritty; Duckworth et al., 2007; Duckworth & Quinn, 2009).

The Brief Resilience Scale (BRS; Smith et al., 2008; Smith et al., 2013). The Brief Resilience Scale (BRS) was used to measure resilience. It was created as a unidimensional measure to assess resilience in its original definitional form, the ability to bounce back or recover from stress (Smith et al., 2008). Although brief, it is to date, the only resilience scale which measures resilience in this original definitional form. The BRS is a six-item scale with items 1, 3, and 5 worded positively and items 2, 4, and 6 negatively worded, and scored on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree; Tansey et al., 2016). It is scored by reverse coding items 2, 4, and 6, then finding the mean of the six items. The authors note that scores can be interpreted as 1.00-2.99 = low resilience, 3.00-4.30 = normal resilience, and 4.31-5.00 = high resilience (Smith et al., 2013). The BRS has very good internal consistency, Cronbach’s alpha ranged from .80-.91 in four distinct samples (Smith et al., 2008). The BRS has also shown good convergent and discriminant validity when compared with other resilience measures, such as the Connor-Davidson Resilience Scale and the Ego Resiliency Scale (Smith et al., 2008).

The Academic Resilience Scale (ARS-30; Cassidy, 2016). The Academic Resilience Scale (ARS-30) was used to measure academic resilience. It was created to measure academic resilience based on the individual’s responses to academic adversity (Cassidy, 2016). The thirty items in the scale represent a sample of positively and negatively phrased cognitive-affective

and behavioral responses to academic adversity, based on a small vignette provided (Cassidy, 2016). Each item is answered based on a five-point Likert scale from likely (1) to unlikely (5). Scores may range from 30-150, with a higher score signifying higher academic resilience. The scale has a global score, but also three factors (perseverance, reflecting and adaptive help-seeking, and negative affect and emotional response; Cassidy, 2016). The ARS-30 shows good internal consistency, with Cronbach's alpha being .90 for the global scale, .83 for Factor 1 (perseverance), .78 for Factor 2 (reflecting and adaptive help-seeking), and .80 for Factor 3 (negative affect and emotional response; Cassidy, 2016). There is also evidence for concurrent validity with a significant positive correlation ($r = 0.49$, $p < 0.01$) with the General Academic Self-Efficacy Scale (GASE), and discriminant validity was supported by significant mean differences in two independent versions of the vignette that were not explained by group differences in academic self-efficacy (Cassidy, 2016). The ARS-30 was created in the UK and used terminology more suited for students in that context, for use in a university in the United States certain words were changed. The words "tutor" and "mark" were changed to "professor" and "grade" respectively.

Depression, Anxiety, and Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995). The Depression, Anxiety, and Stress Scales- 21 (DASS-21) was used to measure depression, anxiety, and stress. It was developed as a short version of the DASS-42, composed of seven items from each of the three subscales (depression, anxiety, and stress; Lovibond & Lovibond, 1995). The scores are then doubled in order to compare to the full scale, the DASS-42 (Antony, et al., 1998). The 21 questions are scored on a four-point Likert scale from 0 (did not apply to me at all) to 3 (applied to me most of the time), respondents are asked to rate how each question

applied to them over the last week (Moore, Dowdy, & Furlong, 2017). The DASS-21 has shown good internal consistency with high alpha scores for the total scale and sub-scales (Depression α = .94, Anxiety α = .87, Stress α = .91, total α = .93; Antony et al., 1998; Tully, Zajac, & Venning, 2009). The DASS has shown significant convergent and discriminate validity in its sub scales with various other measures including the Beck Depression Inventory (depression sub-scale r = .75), Beck Anxiety Inventory (anxiety sub-scale r = .83), PANAS – Negative Affect (stress sub-scale r = .72), Penn State Worry Questionnaire (stress scale r = .60; Brown et al., 2007).

Attention Check Questions. Attention check questions were used throughout the surveys to ensure attention to directions and questions. These were simple math questions which should be easily understandable and able to be completed without the use of a calculator (APPENDIX B).

Procedure

Approval from Middle Tennessee State University's Institutional Review Board was obtained prior to conducting this online study (APPENDIX C). Participants were directed to the study, which was administered via Qualtrics, through the university's online research pool. After providing their informed consent, following their review of the informed consent document (APPENDIX D), participants were administered the DASS-21, BRS, ARS-30, and Grit-S in a randomized order. Afterward, participants were then asked to complete the demographics questionnaire. This was followed by a debriefing statement (APPENDIX E) and the conclusion of the study.

CHAPTER III

RESULTS

Demographics and Descriptive Statistics

In looking at the data it was determined that 8 individuals had taken the survey multiple times, leading to 14 duplicate observations. These cases were detected due to identical demographic data and GPA's. In all cases the first survey response was used to limit bias in the completion of the questionnaires, as well as more attention having been given to the survey in the participants' first response to it.

Of the 161 participants, 54 (33.5%) were psychology majors, with the rest being from various college majors. Out of the 161 participants, 41 (25.5%) were male and 120 (74.5%) were female.

The participants' grade levels were reported as 13.7% being freshmen, 26.7% being sophomores, 29.8% being juniors, 19.9% reported being seniors, and 9.9% reported being graduate students. The participants' ethnicity was predominantly white (62.1%), 16.1% black or African American, 12.4%, Hispanic, 3.7%, Asian, and 5.6% other. Only 126 of the 161 participants reported their age. Ages ranged from 18 to 43, and of those who reported their age, the average age was 22.4 (*SD* = 5.1).

Descriptive statistics for GPA, the scales and the DASS-21's subscales are presented in Table 1. The mean score of overall resilience would be considered in the normal range of resilience.

Table 1

Descriptive Statistics for Scales/Subscales and GPA (N = 161)

	Mean	*SD*
Academic Resilience	108.84	18.10
Depression	13.02	11.15
Anxiety	13.44	9.70
Stress	17.73	9.74
Resilience	3.04	0.37
Grit	3.21	0.61
GPA	3.29	0.59

As shown in Table 2, Academic resilience was significantly negatively correlated with depression, anxiety, and stress. It was positively correlated with grit. Overall resilience was significantly positively correlated with stress and anxiety, but it was significantly negatively correlated with grit and student GPA. Grit showed a significant positive correlation with GPA.

Table 2

Pearson Correlations for the Measures

	Academic Resilience	Stress	Anxiety	Depression	Resilience	Grit
Stress	-.30**					
Anxiety	-.31**	.73**				
Depression	-.36**	.67**	.67**			
Resilience	-.04	.19**	.16*	.13		
Grit	.44**	-.28**	-.23**	-.30**	-.14*	
GPA	.05	-.04	-.02	-.14*	-.15*	.28**

[a]*N = 161*

**p* < .05

***p* < .01

Hypothesis 1 was that each variable would be positively correlated with GPA when controlling for depression, anxiety, and stress. As can be seen in Table 3 only grit was positively correlated with GPA. Hypothesis 2 was that each variable would be positively correlated with GPA when controlling for depression, anxiety, and stress as well as the other two constructs. Grit was positively correlated with GPA when controlling for depression, anxiety, stress, and the other two variables, but resilience and academic resilience were not (see Table 3).

Table 3

Partial Correlations for Hypotheses 1 and 2

	Resilience	Academic Resilience	Grit
Correlation with GPA when controlling for depression, anxiety, and stress	-.18*	.01	.25*
Correlation with GPA when controlling for depression, anxiety, stress, and the other two resilience variables	-.16	-.09	.25*

* $p < .05$ (two-tailed)

Linear Regression Models for Research Question 1

Linear regression was used to evaluate the research question of moderation effects. Interaction terms used to evaluate the moderation hypotheses were mean centered to avoid issues with collinearity. Based on variance inflation factor there were no issues with collinearity. The residuals were approximately normally distributed based on qq-plots and histograms. However, one individual appeared as an outlier in all four of the regression models (studentized deleted residual = -4.74 for model 1, -4.72 for model 2, -4.45 for model 3, and –4.64 for model 4). Therefore, this outlier was not used in the regression models. Thus, all regression models were based on a sample size of 160.

The linear regression model for evaluating resilience, model 1, was not significant ($F(7,152) = 1.44$, $p = .20$, Adj. $R^2 = .02$), as seen in Table 4. None of the interaction terms were

significant which indicates resilience did not moderate the relationship between the psychopathology predictors and GPA. Resilience was related to GPA and depression was marginally related to GPA. When the outlier was included in the regression model depression was significantly related to GPA (β = -.26, p = .03) and resilience was not (β = .15, p = .08).

Academic resilience was not a significant predictor of GPA (F (7,152) = 1.37, p = .22, Adj. R^2 = .02) as shown in model 2. Academic resilience also did not moderate the relationship between psychopathology predictors and GPA, see Table 4.

The regression model for evaluating grit, model 3, was significant (F (7,152) = 2.53, p = .02, Adj, R^2 = .06). However, none of the interaction terms were significant, which indicates that grit does not moderate the relationship between depression, anxiety, stress and GPA. Grit was significantly related to GPA, as shown in Table 4.

Table 4

Relationship Between GPA and Psychopathology: Individual Tests of Moderation for Resilience, Academic Resilience, and Grit

	Model	B	SE	Beta	*t*	*p*	R^2	Compared to Model 0
0	(Constant)	3.34	0.09		36.56	.00	.02	
	Stress	0.00	0.01	.03	0.26	.80	*F* = 1.30	
	Anxiety	0.01	0.01	.11	0.89	.37	*p = .28*	
	Depression	-0.01	0.01	-.22	-1.92	.06		
1	(constant)	4.15	0.38		10.90	.00	.06	R^2change = .04
	Stress	0.00	0.01	.07	0.59	.55		*F*change = 1.52
	Anxiety	0.01	0.01	.10	0.83	.41		*p = .20*
	Depression	-0.01	0.01	-.23	-1.96	.05		
	Resilience	-0.28	0.13	-.19	-2.22	.03*		
	Resil_Dep.	0.01	0.02	.04	0.34	.73		
	Resil_Anx.	0.02	0.02	.13	0.76	.45		
	Resil_Stress	-0.02	0.02	-.12	-0.74	.46		
2	(constant)	3.48	0.33		10.50	.00	.06	R^2change = .04
	Stress	0.00	0.01	-.02	-0.15	.88		*F*change = 1.42
	Anxiety	0.01	0.01	.15	1.23	.22		*p = .23*
	Depression	-0.01	0.01	-.19	-1.64	.10		
	Acad. Resil.	0.00	0.00	-.03	-0.38	.71		
	Acad._Dep.	0.00	0.00	.18	1.17	.24		
	Acad._Anx.	0.00	0.00	.13	0.84	.40		
	Acad._Stress	0.00	0.00	-.13	-0.93	.36		
3	(constant)	2.61	0.28		9.37	.00	.10	R^2change = .08
	Stress	0.00	0.01	.07	0.55	.58		*F*change = 3.38
	Anxiety	0.01	0.01	.10	0.81	.42		*p = .01**
	Depression	-0.01	0.01	-.16	-1.42	.16		
	Grit	0.21	0.07	.23	2.80	.01*		
	Grit_Dep.	0.01	0.01	.12	1.01	.31		
	Grit_Anx.	0.01	0.01	.11	0.97	.33		
	Grit_Stress	-0.01	0.01	-.11	-0.89	.38		

Note. Dependent Variable: GPA B = Unstandardized Regression Coefficient, SE = standard error, Beta = Standardized Regression Coefficient

*p <.05

Model 4 was used to determine if resilience, academic resilience, and grit would predict GPA while controlling for depression, anxiety, and stress as well as each of the other two variables. Since Model 3 was the only model which significantly predicted GPA, model 4 was also compared to model 3 to determine if it predicted GPA significantly better than grit alone.

The linear regression model for evaluating all three variables while controlling for psychopathology and the two other protective variables was significant (F (15,144) = 2.00, p = .02, Adj. R^2 = .09) compared to model 0, as shown in Table 5. In model 4 grit and resilience were significantly related to GPA, but academic resilience was not. None of the interaction terms were significant, indicating resilience, academic resilience, nor grit moderated the relationship between the psychopathology predictors and GPA. Compared to model 3, model 4 did not provide a significant increase in predictive value, as shown in Table 5.

Table 5

Relationship Between GPA and Psychopathology: Joint Tests of Moderation for Resilience, Academic Resilience, and Grit

	Model	*B*	*SE*	*Beta*	*t*	*p*	R^2	Compared to Model 0	Compared to Model 3
4	(constant)	3.81	0.53		7.24	.00	.17	R^2change = .15 *F*change = 2.15 *p = .02**	R^2change = .07 *F*change = 1.49 *p = .17*
	Stress	-0.01	0.01	-.15	-1.34	.18			
	Anxiety	0.01	0.01	.11	0.87	.39			
	Depression	0.00	0.01	.07	0.55	.58			
	Grit	0.26	0.08	.29	3.17	.01*			
	Grit_Dep.	0.01	0.01	.08	0.58	.56			
	Grit_Anx.	0.00	0.01	.02	0.20	.85			
	Grit_Stress	-0.01	0.01	-.05	-0.41	.68			
	Resilience	-0.28	0.12	-.19	-2.27	.03*			
	Resil_Dep.	0.00	0.02	-.02	-0.17	.87			
	Resil_Anx.	0.03	0.02	.25	1.54	.13			
	Resil_Stress	-0.03	0.02	-.19	-1.23	.22			
	Acad. Resil.	0.00	0.00	-.15	-1.61	.11			
	Acad._Dep.	0.00	0.00	.12	0.72	.47			
	Acad._Anx.	0.00	0.00	.18	1.09	.28			
	Acad._Stress	0.00	0.00	-.13	-0.94	.35			

Note. See Table 4 for Model 0 and Model 3.
Dependent Variable: GPA, B = Unstandardized Regression Coefficient, SE = Standard Error, Beta = Standardized Regression Coefficient
**p* = <.05

CHAPTER IV

DISCUSSION

In this study, three constructs, which in previous research have all demonstrated an ability to independently support student achievement, were further examined. These three constructs were resilience, academic resilience, and grit. As previously stated, and explained, resilience has had ample research over the last fifty years, albeit with some differing conceptual and definitional issues related to it, in its utility. Academic resilience is a newer construct which began with the idea that resilience may be more context specific than generalized, as originally thought. Research into grit, the newest of the three presently studied constructs, began a little under two decades ago, and has conceptually looked at one's ability to pursue long term goals passionately and with perseverance.

The current study focused on two hypotheses: the first being that all three constructs, resilience, academic resilience, and grit, would be positively correlated with self-reported GPA when controlling for depression, anxiety and stress; the second hypothesis being that each of the three constructs would be positively correlated with self-reported GPA when controlling for both psychopathology and the other two variables. One research question was also posed, considering whether resilience, academic resilience, or grit had a moderation effect on depression, anxiety, or stress. These hypotheses and the research question were evaluated using linear regression models and Pearson correlations.

The first hypothesis postulated that resilience, academic resilience, and grit would all individually be positively correlated with self-reported GPA when controlling for depression, anxiety, and stress. The results of these correlations were unexpected. Looking at the Pearson

correlations, resilience was significantly negatively correlated with GPA. This result shows that, in this sample, as resilience increases GPA decreases, or vice versa. This, again, would not necessarily be expected based on prior research as reviewed earlier. It could be that in this sample pool, those with a more pronounced ability to bounce back from adversity, maybe being lower grades, have continued to persevere through college despite setbacks, which would relate to the next finding.

Grit was shown to be significantly positively correlated with self-reported GPA, meaning that with higher grit scores students in this sample reported higher academic achievement. As previously stated, this could indicate that students who have higher passion and perseverance in their studies tend to do better academically. This intuitively would make sense, if what you are learning is something you have a passion for, it would lend itself to the possibility that you may study more, pay more attention, or forgo other activities to focus on your studies. Along with passion, the related aspect of perseverance in grit may attenuate students' loss of stamina or focus through their years of college. A university degree is not only a practice in learning or ability to learn, but also in a student's ability to continue through many years of, what could be, stress, fatigue, and years of sacrifice for a long-term goal, which is exactly what grit, definitionally, is.

Somewhat more surprisingly, academic resilience showed no significant correlation with self-reported GPA. As previously explored, academic resilience is a more context-specific form of resilience. It is a student's ability to overcome acute or chronic adversities to their academic process or education. It would seem based on this definition that higher academic resilience would imply higher achievement, but showing no significant correlation in this sample,

indicates that an ability to overcome adversities to one's education does not necessarily imply an ability to academically achieve, but maybe only an ability to still carry on.

This thought may be further implied based on the significant positive correlation shown between academic resilience and grit. Those with higher academic resilience showed higher grit, implying that a higher ability to overcome adversities may relate to an ability to also persevere through them. It could also be that by the time a student is in college, they may already have the resources to overcome adversities to education, thus it is no longer impactful to whether they succeed or not. That is to say, there are many other factors that impact academic achievement in college students over their academic resilience.

The second hypothesis was that each variable would be positively correlated with GPA when controlling not only for depression, anxiety, and stress, but also when controlling for the other two variables. As shown in Table 3, only grit was significantly positively correlated with GPA when controlling for the other 5 variables. Resilience and academic resilience were not significantly correlated, and even showed, although non-significant, a negative correlation with GPA when controlling for the other variables.

In evaluating the regression models, which were used to explore the possible moderation effects of resilience, academic resilience, and grit on depression, anxiety, and stress with GPA, it was shown that in this study's sample there were no significant moderation effects of resilience, academic resilience, or grit on psychopathology in relation to student academic achievement, for which self-reported cumulative GPA was used as a proxy. This was surprising as, at least intuitively, it would seem these protective constructs would moderate

psychopathology, and a recent study has shown moderation effects of resilience, on depression, anxiety, and stress (Abuejheisheh, et al., 2024). This study's finding would indicate that these constructs do not significantly lessen the impact of depression, anxiety, and stress on students as it relates to their academic achievement.

The implications of these findings could be a good starting point for higher education institutions to look at utilization of resources that would most benefit students. While resilience and academic resilience both have prior research to show utility for students, the current research indicates that grit is the primary source, out of these mentioned factors, that contributes to their academic achievement. Thus, if educators and administrations wish to help students succeed, then grit should be something they actively work to foster.

While it may be easy to say we should foster more grit in students, the practicality of this is somewhat uncertain. As discussed, grit is still a relatively new construct that is being studied, and its utility and ability to be taught are among facets still being explored. Recent research has shown that at least the perseverance aspect of grit may be taught and improved in students, the consistency of effort or passion portion of grit cannot be (Arias et al., 2022). This alone should not deter institutions and educators from continuing to pursue ways to teach and foster grit in its students though. Grit is still in its nascency, and more research into ways to teach or instill grit is needed, but it may be a fruit worth bearing.

As stated earlier, the effects of psychopathology, including but not limited to depression, anxiety and stress, can be devastating to students. This can not only affect their short-term academic life but also have far ranging consequences for their future if it leads to

them not succeeding and finishing college. It is imperative that we learn to mitigate these factors the best we can, but it is not only the deleterious effects of psychopathology that we should be concerned about.

It may not be enough, however, to only understand how to combat mental health issues, we must also understand what factors promote student learning and success, and how those can be fostered in students to help them achieve in spite of the numerous challenges life may give students. As the World Health Organization's definition of mental health implies, it is not only the absence of mental illness that promotes mental health, the positive aspects of mental health must also be tended to and grown for the full flourishing of life to occur.

Limitations

Every study is burdened by certain limitations, and this study was no exception. This study's sample size could have been a limiting factor in two ways; the sample size itself could have been larger, possibly leading to more robust findings, it was also limited to a single southern university in the United States. Many of the participants were psychology majors, as well as a majority being white, and a larger cross section of students, with more varied majors and ethnicity, would certainly have been welcomed. Students from other regions of the country, and more broadly possibly, could also have produced differing results.

This study also used cumulative GPA as a proxy for academic achievement, but it could be that using other proxies for academic achievement may result in differences than what this study found. While GPA is a good indicator of a student's achievement, it could be argued that other aspects of academia could be used or collected to further the understanding of a

student's achievement. Namely, things such as possible article publications, poster presentations, honors class enrollment, or even membership in academic clubs could all be other forms of achievement which were not used in this study. These are all less traditional forms of achievement, but they are important, nonetheless.

The average GPA reported in this study was moderately high in relation to a 4.0 GPA scale. This high average could be a limitation in the sense that participants involved in this study were relatively well-achieving students. This study, and its recruitment strategies, may have not captured a full spectrum of students. If the study were to have captured lower achieving students as well, the results may have differed significantly. It is possible resilience, academic resilience, and grit function differently in low vs. High achieving students.

While grit and resilience were shown to be significant predictors of GPA in the linear regression models, the variance they provided was small. Due to this, other factors could have been included to help explain more variance in students' GPA. These factors may have included other personality traits, IQ scores, socioeconomic burdens, Adverse Childhood Event scores, and possibly many more. By including these factors or others, a greater understanding of what contributes to a student's achievement could be gathered.

Lastly, as with any research, the need to be replicated should not be understated. As previously mentioned, the surprising result of resilience being negatively correlated alone could be grounds for further replication, but all the results deserve further study and consideration. Therefore, further studies examining these constructs and their relation to student GPA, as well as each other and effects on psychopathology should be pursued.

Future Directions

Further research into the effects of resilience, academic resilience, and grit on student achievement is warranted. In this study, surprising results related to the correlation of these constructs with GPA were found, as well as unexpected utility in using these factors to predict student GPA. These results should be replicated and explored further in broader cross-sections of students as well as differing regions.

While the construct of resilience has had many decades of research to explore various aspects of it, there is still much to learn about resilience and its effects on student achievement. One area to consider may be looking at what aspects of a student's life, other than academic achievement, could resilience help them in for them to succeed. Another may be looking at whether resilience plays a larger role in student's lives at various grade levels or ages.

Academic resilience in this study did not show as much impact on students as originally expected, but this too is a chance for further research. While academic resilience may not play a major role in college students' abilities to succeed, it may play a larger role in lower grade levels. Further research on academic resilience may explore whether this context-specific form of resilience is more important at earlier stages of education. It may be more important for younger students to be able to bounce back from academic adversity than it is for older students who have already become accustomed to the rigors of academic life.

Finally, grit is still in its nascency, albeit maybe in the later stages of nascency, of understanding. There are many more areas to explore for future research such as how it is utilized by people or students, what are its full effects on students, or how it relates to other

characteristics, traits, or constructs previously established in the field. Based on the current study's findings though, one of the most important areas for further research may be in how we can promote grit or whether it can be taught and how we could do so.

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APPENDICES

APPENDIX A

DEMOGRAPHICS QUESTIONNAIRE

1. What is your age? _____

2. What is your biological sex?
    a. Male
    b. Female

3. What is your ethnicity?
    a. White
    b. Black
    c. American Indian or Alaska Native
    d. Asian
    e. Native Hawaiian or Pacific Islander
    f. Hispanic/ Latino
    g. Other

4. What is your grade level?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Graduate Student

5. What is your college major? _____

6. What is your cumulative GPA? _____

APPENDIX B

ATTENTION CHECK QUESTIONS

1) What is 2 + 2? _____

2) What is 7 + 5? _____

3) What is 3 + 6? _____

4) What is 1 + 9? _____

APPENDIX C

MTSU IRB APPROVAL LETTER

Office of Research Compliance
2269 Middle Tennessee Blvd.
Sam H. Ingram Bldg (ING) Room 010A
Box 124
Murfreesboro, TN 37132
www.mtsu.edu/irb

Date: February 22, 2024
PI: Jeremy Shirey
Department: Middle Tennessee State University, Psychology
Re: Initial - IRB-FY2024-158
Measuring Student Resilience, Grit, and Academic Resilience in the Context of Psychopathology

The Middle Tennessee State University Institutional Review Board has rendered the decision below for the above referenced study.

Decision: Exempt
Category: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

Findings:
Research Notes:

Please note that even though your proposed study is deemed exempt from further IRB review, the following apply to your approved study:

1. In accordance with 45 CFR 46.110, expiration dates do not apply to research eligible for Exempt Review under the Common Rule, and continuing review is not required by the IRB.
2. Any unanticipated harm to participants or adverse events must be reported to the Office of Compliance.
3. All modifications to the approved study must be submitted for review through Cayuse IRB for approval before their implementation. Adding new researchers constitutes a modification to the protocol. Per MTSU Policy, a researcher is defined as anyone who handles the data or interacts with participants. Everyone meeting this definition for this project must have completed the required CITI training and received IRB approval prior to becoming actively involved in the project.
4. Closure of the study must be submitted within Cayuse when the study ends or when personal identifiers are removed from the data and all codes and keys are destroyed.
5. All research materials must be retained by the PI for at least three (3) years after study completion and then destroyed in a manner that maintains confidentiality and anonymity.

Sincerely,

The Middle Tennessee State University Institutional Review Board

APPENDIX D

INFORMED CONSENT DOCUMENT

INFORMED CONSENT

Study Title: The Roles of Resilience, Grit, and Academic Resilience on Student Achievement While Controlling for Depression, Anxiety, and Stress
Protocol Number: IRB-FY2024-158
Approval Date: February 22nd, 2024
Principal Investigator: Jeremy Shirey
Institution: Middle Tennessee State University

You are being asked to participate in a research project. The following information is provided to inform you about the research project and your participation in it.

1. Purpose of the study: This study is designed to find what or if there are moderating effects of resilience, academic resilience, and grit on psychopathology in students, as well as which of these variables may contribute the most to student academic success in spite of depression, anxiety, and/or stress.

2. Description of procedures to be followed and approximate duration of the study: Participants will follow a Qualtrics link from SONA to complete a survey. The survey consists of four questionnaires designed to measure resilience, academic resilience, grit, depression, anxiety, and stress. They will also complete a demographics section in the survey. Participants will be debriefed at the end of the study. Participation should take between 30-45 minutes.

3. Compensation for participation: Course credit or extra credit will be given as per the participants' class policy.

Here are your rights as a participant:

a) Your participation in this research is voluntary.
b) You may skip any item that you don't want to answer, and you may stop the research at any time. Note that if you leave an item blank, you will be warned that you missed one, just in case it was an accident. You can still click that you don't want to answer. Some items may be required in order to accurately present the study.
c) There are no risks associated with your participation besides the time taken to complete the study.
d) The benefits of participation in the study will depend on your professor and class policy, but may be course credit or extra credit, as well as possibly learning something from the research.

e) You will NOT be asked to provide any identifiable personal information.
f) All efforts, within reason, will be made to keep the personal information in your research record private, but total privacy cannot be promised. Your information may be shared with people at MTSU (such as the MTSU Institutional Review Board) or other agencies (such as the Federal Government Office for Human Research Protection) if you or someone else is in danger or if we are required to do so by law.

Contact Information: If you should have any questions about this research study please contact:
Principal Investigator: Jeremy Shirey
Contact Information: jds2cz@mtmail.mtsu.edu
Faculty Advisor: James Tate
Contact Information: james.tate@mtsu.edu

For additional information about giving consent or your rights as a participant in this study, please contact the Middle Tennessee State University (MTSU) Office of Compliance at 615-494-8918 or via email at irb_information@mtsu.edu. (http://www.mtsu.edu/irb)
If you're ready to get started, please make your choice below before clicking the arrow button. Thanks again for volunteering your time to this project!
I have read the information above. I am at least 18 years old. I believe I understand the purpose, risks, and benefits of the research, and I know what I will be expected to do as a study participant.

I consent to participate _____
I decline to participate _____

APPENDIX E

DEBRIEFING STATEMENT

Debriefing Statement

The purpose of this study was to measure student levels of depression, anxiety and stress in relation to their cumulative G.P.A, and evaluate whether overall resilience, academic resilience or grit had a larger moderating effect on this. This was measured by you completing the Brief Resilience Scale, Academic Resilience Scale-30, Short Grit Scale, and the Depression, Anxiety, and Stress Scale-21, which were all completed as part of the Qualtrics survey. We predicted that each of the resiliency variables will be positively correlated with cumulative G.P.A when controlling for depression, anxiety, and stress, as well as when controlling for depression, anxiety, stress, and the other two variables. We are also exploring whether the relationship between resiliency, academic resiliency, and grit has a moderating effect on psychopathology. If you have any questions you may contact the following for more information:

Jeremy Shirey: jds2cz@mtmail.mtsu.edu

James Tate: james.tate@mtsu.edu

For additional information about giving consent or your rights as a participant in this study, please contact the Middle Tennessee State University (MTSU) Office of Compliance at 615-494-8918 or via email at irb_information@mtsu.edu. (http://www.mtsu.edu/irb).