

THE EFFECTS OF STUDENT ENGAGEMENT ON ACADEMIC ACHIEVEMENT
AMONG COLLEGE STUDENTS

by

Courtney Brallier

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Thesis Committee:

Dr. Aimee Holt, Chair

Dr. Michael Hein

Dr. Seth Marshall

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ABSTRACT

This research study used the multidimensional construct of student engagement to predict students' academic achievement. Student engagement was analyzed by exploring variables related to cognitive, behavioral, and emotional engagement. It was predicted that variables related to emotional engagement (i.e., social support and test anxiety), behavioral engagement (i.e., study behaviors and procrastination), and cognitive engagement (i.e., goal orientation, grit, locus of control, and metacognition) would have a significantly relation to overall college GPA. A hierarchical multiple regression was used to analyze the relation between student engagement and overall college GPA. The overall model that contained measures of emotional, behavioral and cognitive engagement was significant and explained 57% of the variance in students' overall college GPAs. As predicted, prior achievement as measured by student reading ACT scores were a significant, unique predictor of overall college GPA. This relation remained significant in every step of the model. Variables related to emotional engagement (i.e., social support), and behavioral engagement (i.e., study behaviors) were found to have a significant relation to overall college GPA. Unlike what was hypothesized, variables related to cognitive engagement (i.e., goal orientation, grit, locus of control, and metacognition) were not found to uniquely predict overall college GPA.

TABLE OF CONTENTS

LIST OF TABLES	vi
CHAPTER I: INTRODUCTION	1
Overview	1
Prior Academic Achievement.....	1
Student Engagement.....	2
Cognitive engagement.....	3
Goal orientation	4
Grit.....	5
Locus of control.....	7
Metacognition.....	8
Behavioral engagement	10
Study behaviors	10
Procrastination.....	12
Emotional engagement.....	13
Social support	14
Test anxiety	16
Summary.....	18
Purpose	20
Hypotheses	20
Hypothesis 1	20
Hypothesis 2	20
Hypothesis 3	20
Hypothesis 4	20
CHAPTER II: METHODS.....	22
Participants	22
Measures.....	22
Demographic questions	22
Cognitive measures	23
Goal orientation	23
Grit.....	23
Locus of control.....	24

Metacognition.....	24
Behavioral measures.....	25
Study behavior in and out of class.....	25
Procrastination.....	25
Emotional measures.....	26
Social support.....	26
Test anxiety.....	27
Procedure.....	27
CHAPTER III: RESULTS.....	28
Descriptive Statistics and Correlations.....	28
Multiple Regression Predicting Overall College GPA.....	28
CHAPTER IV: DISCUSSION.....	34
Limitations.....	37
Future Direction.....	37
REFERENCES.....	38
APPENDICES.....	47
APPENDIX A.....	48
IRB APPROVAL.....	48

LIST OF TABLES

Table 1: Descriptive Statistics.....	29
Table 2: Correlations Between Variables.....	30
Table 3: Hierarchal Multiple Regression Analysis Predicting GPA	32

CHAPTER I

INTRODUCTION

Overview

Numerous factors have been associated with college academic achievement including instructional methods, assessment practices, student personality, technology, and presentation techniques (Schneider & Preckel, 2017). College academic achievement also has been found to be related to high school grade point average (GPA) and scores on college entrance exams, such as the American College Test (ACT) and the Scholastic Aptitude Test (SAT; e.g., Richardson, Abraham, & Bond, 2012; Robbins et al., 2004; Westrick, Le, Robbins, Radunzel, & Schmidt, 2015). Richardson and colleagues (2012) found a large correlation between performance self-efficacy and GPA, as well as medium sized correlations between other non-intellective constructs (i.e., academic self-efficacy [$r^+ = .31$], grade goal [$r^+ = .35$], and effort regulation [$r^+ = .32$]) and GPA. College achievement depends on how well a student can access and expand prior knowledge by connecting new information with information already obtained (e.g., Gottfried, Fleming, & Gottfried, 2001; Hambrick, 2003).

Prior Academic Achievement

Prior knowledge assists in the acquisition of new knowledge and becomes stable with age (e.g., Gottfried et al., 2001; Hambrick, 2003). For these reasons, prior academic achievement and intelligence are associated with and used to predict college success (Schneider & Preckel, 2017). Students must have been successful in prior school settings in order to qualify for higher education. In a meta-analysis analyzing the strongest variables associated with college academic achievement, high school grade point average

(GPA) was ranked 7th out of 105 variables with a large effect size ($d = .90$; Schneider & Preckel, 2017). Scores on college entrance exams, such as the ACT, SAT, and other standardized admission tests, ranked 10th with a large effect size ($d = .79$). Research has found intelligence to be the strongest predictor of academic achievement and has been reported to account for $\frac{1}{4}$ of students' academic achievement (e.g., Di Domenico & Fournier, 2015; Downey, Lomas, Billings, Hansen, & Stough, 2014; Duckworth, Peterson, Matthews, & Kelly, 2007; Gottfredson, 1997). However, Schneider and Preckel (2017) reported that intelligence had a medium effect size ($d = .47$) and ranked 30th.

Student Engagement

Student engagement is a fairly new, broad, and multidimensional construct, that is alterable and refers to student's participation in and commitment to academics and school-related activities (e.g., Christensen, Reschly, & Wylie, 2012; Fredricks, Blumenfeld, & Paris 2004; Reschly, Appleton, & Pohl, 2014). It is an interaction between students and their environment that helps us understand the antecedents and consequences of how students think, behave, and feel in school. Student engagement has been found to be important for learning, academic performance, persistence, retention, and academic achievement (e.g., Appleton, Christenson, Kim, & Reschly, 2006; Fredricks et al., 2004; Gunuc & Kuzu, 2015). It is affected by multiple factors, and has been associated with high school completion, lowered health risks, social-emotional well-being, and resiliency (e.g., Christensen et al., 2012; Finn & Zimmer, 2012; Fredricks et al., 2004).

Academically engaged students have been found to have better academic achievement in terms of higher GPAs and more course credits compared to disengaged students (Ketonen et al., 2016). Ketonen and colleagues (2016) also found that engaged students were more certain of their career choice, while disengaged students lacked interest or had uncertainty about their career path. Some researchers have conceptualized student engagement as a multidimensional concept with three distinct aspects: (a) cognitive; (b) behavioral; and (c) emotional (e.g., Appleton et al., 2006; Fredricks et al., 2004; Grier-Reed, Appleton, Rodriguez, Ganuza, & Reschly, 2012; Gunuc & Kuzu, 2015).

Cognitive engagement. Cognitive engagement can be defined as students' willingness to make an effort to understand complex ideas and learn difficult skills (Fredricks et al., 2004). Constructs related to cognitive engagement include: (a) academic self-efficacy; (b) concentration; (c) motivation; (d) self-regulation; and (e) critical thinking (e.g., Appleton, Christenson, & Furlong, 2008; Appleton et al., 2006; Fredricks et al., 2004; Reschly et al., 2014; Schneider & Preckel, 2017). Positive academic outcomes are associated with indicators of cognitive engagement, such as with student self-efficacy and students perceiving their classwork as meaningful (e.g., Greene, Miller, Crowson, Duke, & Akey, 2004). Other indications of cognitive engagement include: (a) self-regulation; (b) motivation; (c) effort regulation; and (d) persistence (Reschly et al., 2014). A student's interest and investment in learning, perceptions of task value, and perceived control were found to be related to cognitive engagement (e.g., Appleton et al., 2006; Reschly et al., 2014). This current study will examine four

components of cognitive engagement: (a) goal orientation; (b) grit; (c) locus of control; and (d) metacognition.

Goal orientation. Goal orientation is a students' reasons for approaching and completing an academic task (Hsieh, Sullivan, & Guerra, 2007). There are several types of goal orientations. An intrinsic goal orientation emphasizes learning and mastery, while an extrinsic goal orientation emphasizes student performance, such as grades, and others approval (Pintrich, Smith, Garcia, & McKeachie, 1993). Students that desire to learn in order to gain new knowledge and skills are considered to be learning goal oriented. Learning goal orientations have been found to have small, positive effects on academic achievement ($d = .24$, rank 69th; Schneider & Preckel, 2017).

In Huang's (2011) meta-analysis of achievement goals, a statistically significant small correlation was found between mastery goal orientation and academic achievement ($r = .13$). The cognitive strategies students choose to use have been found to be related to academic achievement and a mastery goal orientation (Greene et al., 2004). Greene and colleagues (2004) found that students that perceive their educational assignments as meaningful and motivating are more likely to have an intrinsic or mastery goal orientation. Students in good academic standing have been found to have a higher mastery goal orientation and adopt more performance-approach goals than those on academic probation (Hsieh et al., 2007).

Performance goal orientation is the desire to prove competence, while performance avoidance goal orientation is the desire to avoid activities that might demonstrate a lack of knowledge or ability. Two meta-analyses have found small

positive correlations between performance goal orientation and academic achievement ($r = .13$, Huang's, 2011; $r^+ = .09$, 95% CI [.06, .12], Richardson et al., 2012). They both also found small negative correlations between performance avoidance goal orientation and academic achievement ($r = -.13$, Huang's, 2011; $r^+ = -.14$, 95% CI [-.18, -.09], Richardson et al., 2012). A later meta-analysis conducted by Schneider and Preckel (2017) also found small but significant effects between performance goal orientation ($d = .28$, rank 60th), performance avoidance goal orientation ($d = -.28$, rank 99th), and academic achievement. These findings associate performance goal orientation with higher academic achievement and performance avoidance goal orientation with lower academic achievement.

Grade goals are the target grades students set for themselves, and in a recent meta-analysis it was found to be the 5th strongest ranking with academic achievement with a large effect size ($d = 1.12$; Schneider & Preckel, 2017). It also was found that students with grade goals had higher achievement motivation ($d = .64$). In another meta-analysis, grade goal orientation was found to be the variable with the second largest correlation with GPA ($r^+ = .35$, 95% CI [.28, .42]; Richardson et al., 2012). These findings support the idea that high-achieving students set grade goals and have a higher achievement motivation.

Grit. Duckworth and colleagues (2007) define grit as a trait-like enthusiasm and determination for accomplishing long-term goals. It is a personality characteristic that involves working towards goals and maintaining interest and effort, despite facing setbacks, adversity, or even failure (Wolters & Hussain, 2015). Similar to grit is effort

regulation, academic motivation, conscientiousness, academic goals, and goal commitment. Schneider and Preckel (2017) define effort regulation as the persistence of effort during challenging academic situations. They also define academic motivation as a student's determination to be academically successful, while conscientiousness is the tendency to be dependable, organized, and achievement focused. Academic goals consist of a student's persistence and commitment to academic success, including their behavior and appreciation for attaining a college degree (Schneider & Preckel, 2017). Goal commitment is a student's dedication to staying in college and obtaining a degree (Schneider & Preckel, 2017). Schneider and Preckel (2017) found in their meta-analysis that effort regulation ranked 13th and had a large effect size ($d = .75$) when predicting academic achievement. Academic motivation ($d = .64$, rank 19th), conscientiousness ($d = .47$, rank 30th), and academic goals ($d = .36$, rank 45th) also ranked high for predicting academic achievement and had medium effect sizes. Goal commitment had a small, positive effect on academic achievement ($d = .24$, rank 69th).

According to Duckworth and colleagues (2007), grit has demonstrated better predictive validity for success than measures of cognitive ability and conscientiousness. Grittier individuals have been found to watch less television, earn higher GPAs, be less likely to drop out, attain more education, and make fewer career changes than their less gritty peers (Duckworth & Quinn, 2009). Both areas used to measure grit, consistency of interest ($r = -.36$) and perseverance of effort ($r = -.49$), have been found to be negatively correlated with procrastination (Wolters & Hussain, 2015). This suggests that grit could serve as a possible protective factor for academic achievement.

Locus of control. Locus of control is an individual's expectation that their beliefs can influence academic outcomes (Trice, 1985). People with an internal locus of control believe that their abilities, effort, and choices are what drive their success or failure (Rotter, 1966). Rotter (1966) described people with an external locus of control as believing that external forces, such as luck, fate, powerful others, and the difficulty of tasks, are what determine their achievement. Related to locus of control is control expectation, which is the personal perceptions a student has about their control over life events (Schneider & Preckel, 2017). In a recent meta-analysis locus of control ranked 58th ($d = .30$) and control expectation ranked 74th ($d = .22$) and had small, but positive effects on academic achievement (Schneider & Preckel's, 2017).

Gifford, Brinceno-Perriot, and Mianzo (2006) studied a large sample of college freshman students to examine the roles of ACT scores and locus of control as predictors of academic achievement. Students' end of the year cumulative GPA was used to measure academic achievement. They found that both ACT scores and locus of control were positively correlated with students' cumulative GPA. Students with an internal locus of control obtained higher GPAs than students with an external locus of control. Students with an internal locus of control who had higher GPAs also were found to be more likely to continue on to their sophomore year, while students with an external locus of control were seen to be more at risk for dropping out.

Student engagement, which is positively related to college grades, has been shown to be affected by the personal control students perceive over their performance (i.e., locus of control, Schlenker, Schlenker, & Schlenker, 2013). College students have

become increasingly external in comparison to college students in the 1960s (Tweng, Zhang, & Im, 2004). In their meta-analysis, Credé and Kuncel (2008) found a negative relation between external locus of control and both study habits ($r_{obs} = -.16$) and study attitudes ($r_{obs} = -.28$). Academic locus of control has been found to be affected by metacognition, in that students with a high internal locus of control were more likely to use metacognitive strategies than those with a high external locus of control (Arslan & Akin, 2014).

Metacognition. Metacognition consists of self-regulatory techniques students use to help them control their cognition, such as planning and self-monitoring (Pintrich et al., 1993). These strategies include a student's ability to plan, select, monitor, evaluate, and modify their use of self-regulated learning strategies. When compared to lower achieving students, higher achieving students report using a greater number of self-regulated learning (SRL) strategies (Ruban & Reis, 2006). Students who use more metacognitive strategies to learn also are more likely to use strategies to self-regulate their motivation to learn; therefore, working hard and staying engaged on academic tasks (Wolters & Benzon, 2013). Schneider and Preckel's (2017) meta-analysis showed a small, positive effect for metacognition on academic achievement ($d = .28$) with a 60th ranking.

Two studies compare first-year college GPA and metacognitive reading and study strategies for students with and without a history of reading difficulties (Bergey, Deacon, & Parrila, 2017; Chevalier, Parrila, Ritchie, & Deacon, 2017). Both studies used the Metacognitive Reading Strategies Questionnaire (MSRQ) and Learning and Study Strategies Inventory (LASSI) to measure students use of reading related metacognitive

strategies, such as reading to achieve goals, comprehension, making inferences, selecting main ideas, and processing information. They found that students with a history of reading difficulties had lower GPAs than students without a history of reading difficulties. Bergey and colleagues (2017) also found that, while both groups attempted the same number of credit hours, those with a history of reading difficulties completed 3 hours less, or the equivalent of one course fewer. Both studies also found students with a history of reading difficulties used fewer metacognitive reading and study strategies than those without a history of reading difficulties. Students with a history of reading difficulties had lower scores on measures of attitude, concentration, information processing, motivation, selecting the main idea, testing strategies, anxiety (i.e., higher rate of anxiety), and metacognitive reading strategies.

Cognitive engagement is associated with positive academic outcomes, which includes: (a) goal orientation; (b) grit; (c) locus of control; and (d) metacognition (e.g., Appleton et al., 2008; Appleton et al., 2006; Fredricks et al., 2004; Greene et al., 2004; Reschley et al., 2014; Schneider & Preckel, 2017). Students' goal orientations effect their academic achievement. For example, students with learning goal orientations, mastery goal orientations, performance goal orientations, and grade goals have positive effects on their academic achievement (e.g., Huang, 2011; Richardson et al., 2012). Grit has been shown to be a better predictor of academic success than measures of intelligence or conscientiousness (Duckworth et al., 2007). Students with an internal locus of control have higher academic achievement than students with an external locus of control

(Gifford et al., 2006). Metacognition also has been found to be positively related to academic achievement (Schneider & Preckel, 2017).

Behavioral engagement. Behavioral engagement can be defined as participation in academic and extracurricular activities, and it has been found to be critical for preventing school dropout and other negative academic outcomes (Fredricks et al., 2004). Constructs related to behavioral engagement include: (a) student conduct; (b) preparation for class and school; (c) attendance; (d) and on-task behaviors, such as displaying effort, paying attention, asking questions, and contributing to class discussions (e.g., Appleton et al., 2008; Appleton et al., 2006; Fredricks et al., 2004; Reschly et al., 2014; Schneider & Preckel, 2017). Behavioral engagement is more observable and easier to measure, which makes it the most common component studied (Appleton et al., 2008).

Fredricks and colleagues (2004) found a relation between behavioral engagement and higher academic achievement across multiple samples and ages. The most common concerns parents and educators have expressed are those of behavioral disengagement (Reschly et al., 2014). Reschly and colleagues (2014) also state that certain outcomes such as, academic achievement, school completion and dropout rates, as well as general physical and emotional well-being, have been associated with behavioral engagement. In the current study, we examined (a) study behaviors in and out of class; as well as, (b) procrastination to measure behavioral engagement.

Study behaviors. Credé and Kuncel's (2008) meta-analysis gives evidence for their idea that study habits and skills are the third pillar to college academic success. They exhibited strong relations with college academic performance and study skills ($p =$

.33) and study habits ($p = .28$). A recent meta-analysis found a strong effect between academic achievement and class attendance ($d = .98$; Schneider & Preckel, 2017). With a 6th place ranking, significantly better academic achievement was found for students who had higher rates of attendance than for those with lower rates. Moderate effects sizes also were found for study time management ($d = .41$, rank 37th) and concept maps ($d = .36$, rank 45th). Other researchers have found concept maps to be more effective if they depict main ideas ($d = .60$, CI [.40, .79]) and few details ($d = .20$, CI [.02, .39]; Nesbit & Adesope, 2006). Schneider and Preckel (2017) reported a small effect size for time spent studying ($d = .32$, rank 54th) and students note taking ($d = .14$, rank 78th). In regard to note taking ranking so low, it could be because note taking has been found to be more effective if instruction does not include the use of presentation slides ($d = .43$) than when presentation slides are used ($d = -.02$; Kobayashi, 2005).

Numan and Hasan (2017) studied the effects study habits have on the academic achievement of undergraduate students. They identified students with effective study habits as having higher scores in the following six dimensions: (a) textbook reading; (b) note-taking; (c) memory; (d) test preparation; (e) concentration; and (f) time management. Those with effective study habits had better academic achievement than those with ineffective study habits. In terms of gender differences, they found that girls had better study habits than boys. They also found that study habits could predict test anxiety, and students with ineffective study habits were more likely to experience higher levels of test anxiety.

Procrastination. Procrastination can be defined as a tendency to delay tasks or decisions despite knowing that they will eventually need to be completed (Steel, 2010). Interest, teacher expectations, the ease of studying for the test, knowledge of the task, prior knowledge of the subject, and task difficulty have been identified as antecedents to procrastination (Schraw, Wadkins, & Olafson, 2007). College students' procrastination has been found to be related to self-efficacy and a mastery-avoidant goal orientation (Howell & Watson, 2006; Wolters, 2003). Predictors of procrastination include disorganization, lower cognitive and metacognitive strategy usage, task aversiveness, task delay, self-efficacy, and impulsiveness (Howell & Watson, 2006; Steel, 2007). Conscientiousness and its characteristics of self-control, organization, and achievement motivation also have been cited as predictors of procrastination (Steel, 2007).

Balkis, Duru, and Bulus (2013) investigated the relations between undergraduate students' academic rational and irrational beliefs, procrastination, time preferences to study for exams, and academic achievement. They found that students with irrational academic beliefs, or beliefs that were illogical and inconsistent with reality, had higher levels of procrastination. They also found that procrastination has a direct impact on academic achievement and an indirect impact through time preferences to study for exams. For example, they found that students who underestimated the time needed to study for exams, and preferred to study for exams the night before, had higher levels of procrastination.

In a recent meta-analysis procrastination was ranked the lowest variable at 105th and had the highest negative relation to academic achievement ($d = -.52$; Schneider &

Preckel, 2017). In another meta-analysis, Kim and Seo (2015) reputed that procrastination also was negatively correlated with academic performance ($r = -.13, p = < .01$), and that this relation is affected by the measurement used. Procrastination was more negatively correlated with academic performance when it was observed or externally assessed, rather than self-reported (Kim & Seo, 2015).

Behavioral engagement is the most common concern of parents and educators, as well as the most common aspect of student engagement studied (e.g., Appleton et al., 2008; Reschly et al., 2014). It includes (a) study behaviors and (b) procrastination. The study habits and skills students choose has been shown to have a positive effect on students' academic achievement (e.g., Credé & Kuncel, 2008; Numan & Hasan, 2017). Conversely, procrastination has a negative impact on students' academic achievement (e.g., Balkis et al., 2013; Kim & Seo, 2015, Schneider & Preckel, 2017).

Emotional engagement. Emotional engagement, or affective engagement, is a student's awareness of their academic ability, and their ability to assess their beliefs about succeeding in an academic setting (Reschly et al., 2014). Constructs related to emotional engagement include: (a) students' attitudes about school; (b) their affective reactions in the classroom; (c) their sense of belonging; (d) how they identify with school; (e) school connectedness; (f) their interests and values; and (g) their positive and negative responses to school, peers, teachers, and academics (e.g., Appleton et al., 2008; Fredricks et al., 2004; Reschly et al., 2014). Emotional engagement can directly affect the other subtypes of student engagement and academic achievement constructs (Finn & Zimmer, 2012). Gunuc and Kuzu (2015) found that emotional engagement was not only related to student

engagement, but to students' valuing their education, their sense of belonging, their cognitive engagement, and their behavioral engagement. They also stated that positive emotions, such as student interest and happiness are related to student engagement, while negative emotions like boredom and anxiety are related to student disengagement. College students' emotional engagement has been found to be predicted by their self-efficacy, the availability of environmental supports, and life satisfaction (Garriot, Hudyma, Keene, & Santiago, 2015). Research has shown that students who were emotionally engaged have more of a learning goal orientation, believe that they have an extended learning capacity, and were absolutely and relatively engaged (Handelsman, Briggs, Sullivan, & Towler, 2005). Social support and test anxiety are two components of emotional engagement analyzed in the current study.

Social support. Social support is the availability of family, peers, professors, and significant others (Richardson et al., 2012). Similar to social support is social involvement, or the extent to which a student feels connected to the school environment, peers, and faculty. It can also incorporate how involved students are in campus activities. Social involvement ($d = .29$, rank 59th) and social support ($d = .22$, rank 74th) have been found to have small, but positive effects on academic achievement (Schneider & Preckel, 2017). Another meta-analysis also discovered a positive correlation between social support and GPA ($r^+ = .08$, 95% CI [.03, .12]; Richardson et al., 2012). Additionally, Robbins and colleagues (2004) found a positive relation between social support and college retention ($r = .20$, $p = .26$). Students' perceptions of social support have been found to not only be related to grades, but also to students' cognitive strategy use and

their motivation (Green et al., 2004). College students perceived lack of needed support was found to be more strongly related to college outcomes than the actual presence of support for first generation ethnic minority students (Dennis, Phinney, & Chuateco, 2005). These findings help support the idea that social support is an important component of academic success for college students.

When it comes to social interactions between professors and students, strong associations have been found between academic achievement and a professor's encouragement of questions and class discussion ($d = .77$, rank 11th), their availability and helpfulness ($d = .77$, rank 11th), and their concern, respect, and friendliness towards students ($d = .47$, rank 30th; Schneider & Preckel, 2017). Teacher verbal immediacy is demonstrated through energy and concern for student learning, being inclusive, clearly communicating class expectations, and being encouraging. A small, but positive effect size was also found for academic integration ($d = .26$, rank 64th), or a student's perceived support from a professor (Schneider & Preckel, 2017). These variables help promote an atmosphere for social interaction between students, professors, and their peers.

Meeuwisse, Born, and Severiens (2011) examined how family-study conflict and family-study facilitation affects students' academic outcomes. Students reported experiencing more family-study facilitation than family-study conflict. When analyzing gender differences, it was found that women perceived more family support, participated in more family activities, were more involved with family, and experienced more family-study facilitation than men. Ethnic minority students also participated in more family activities and were more involved with family than ethnic majority students. Ethnic

majority students reported experiencing less family-study conflict than ethnic minority students. Overall, student participation in family activities, family involvement, and family support were positively related to family-study facilitation. However, the more family activities students participated in the more family-study conflict they experienced. Family-study conflict negatively impacted students' effortful behaviors, which in turn negatively affected their academic achievement.

Students' relationships with parents and professors change as they progress through college, which makes it more likely that they will rely heavily on their peers for support (Thompson, 2008). Parents are more physically absent in college, and more professional relationships develop with professors. Perceived lack of peer support has been found to be a strong predictor of negative college adjustment and lowered college GPA for first generation, ethnic minority students (Dennis et al., 2005). Dennis and colleagues (2005) further found that first generation minority students reported that peer support was the most helpful strategy for solving academic problems. Small-group learning with 2 to 10 peers has been found to have a moderate relation ($d = .51$) with academic achievement (Schneider & Preckel, 2017).

Test anxiety. Test anxiety occurs when students feel worried and uneasy about taking exams (Pintrich et al., 1993). Test anxiety can inhibit students from expressing their true knowledge on exams, which can result in an untrue measure of a students' actual proficiency. Test anxiety has been found to have a moderate negative relation with academic achievement and ranked 104th out of the variables identified as predicting

positive academic achievement ($d = -.43$; Schneider & Preckel, 2017). Thus, those with lower levels of test anxiety have higher levels of academic achievement.

Chapell and colleagues (2005) investigated the relation between test anxiety and GPA for undergraduate and graduate students at two northeastern universities. They found an inverse relation between test anxiety and GPA. Undergraduate students with lower test anxiety had higher GPAs than students with moderate or high test anxiety levels. Specifically, undergraduate students with low test anxiety averaged a 3.22 GPA for men and a 3.35 GPA for women, whereas those with high test anxiety averaged a 2.97 GPA for men and a 3.12 GPA for women.

Hartman, Waisielski, and Whatley (2017) found that student's high in emotional dysregulation also were high in test anxiety, indicating that students may have trouble staying on task due to emotional stressors. Their analysis found that difficulties engaging in goal-directed behavior, nonacceptance of emotional responses, difficulties with impulse control, and limited access to emotion regulation strategies were predictors of test anxiety. The use of emotion-focused coping strategies (e.g., positive reinterpretation and growth, acceptance, and humor) were associated with lower four-year GPAs, which suggest that both emotion regulation and self-regulation skills are needed to decrease test anxiety and increase academic achievement (Thomas, Cassady, & Heller, 2017).

Emotional engagement can affect students cognitive and behavioral engagement and includes the components of (a) social support and (b) test anxiety (Finn & Zimmer, 2012). Social support is an important component of academic success for college students, which includes the assistance of professors, family, and peers. Students' social

support is associated with positive academic outcomes (Richardson et al., 2012; Schneider & Preckel, 2017). An inverse relation has been found between test anxiety and student academic achievement (Chapell et al., 2005; Schneider & Preckel, 2017). Meaning students with higher levels of test anxiety have lower levels of academic achievement.

Summary

To enter college, students must first demonstrate prior success in other academic settings. Prior academic achievement, such as high school GPA and scores on college entrance exams, predicts college academic achievement (e.g., Di Domenico & Fournier, 2015; Richardson et al., 2012; Schneider & Preckel, 2017; Westrick et al., 2015). A fairly new, broad, and multidimensional construct, student engagement, has been used to explore student's participation and commitment to higher education (Christenson et al., 2012; Fredricks et al., 2004; Reschly et al., 2014). Student engagement fosters resiliency in students and leads to positive academic outcomes (Finn & Zimmer, 2012). Student engagement includes cognitive, behavioral, and emotional aspects (Appleton et al., 2006; Fredricks et al., 2004; Grier-Reed et al., 2012; Gunuc & Kuzu, 2015).

Cognitive engagement is a fundamental aspect of academic achievement and includes students: (a) goal orientation; (b) grit; (c) locus of control; and (d) metacognition (e.g., Duckworth et al., 2007; Schneider & Preckel, 2017). In college, goal orientation has an important role in student success and persistence (Duckworth et al., 2007; Richardson et al., 2012). Grit has been found to be a better predictor of college success than intelligence and conscientiousness measures (Duckworth et al., 2007). Locus of

control is a precursor to academic achievement and student engagement (Gifford et al., 2006; Schlenker et al., 2013). The use of metacognitive reading strategies has been found to be related to academic achievement (Bergey et al., 2017; Chevalier et al., 2017).

Behavioral engagement is the most measured aspect of student engagement and is the most common concern among parents (e.g., Appleton, et al., 2008; Reschly et al., 2014). Academic outcomes, such as academic achievement and school completion, are associated with behavioral engagement (e.g., Fredricks et al., 2004; Reschly et al., 2014). It consists of students' study behaviors and procrastination. Study behaviors include class attendance, study time management, time spent studying, and students note taking, which are all significantly related to academic achievement (Schneider & Preckel, 2017). For students who procrastinate, a negative impact on academic achievement has been found (Kim & Seo, 2015; Schneider & Preckel, 2017).

Emotional engagement can eminently influence the other aspects of student engagement, as well as their academic achievement (e.g., Finn & Zimmer, 2012; Gunuc & Kuzu, 2015). Emotional engagement consists of social support and test anxiety. Social support has a positive effect on academic achievement (e.g., Richardson et al., 2012; Schneider & Preckel, 2017). It includes the social interactions between professors, family, and peers that are important to students' academic outcomes (e.g., Dennis et al., 2005; Meeuwisse et al., 2011; Schneider & Preckel, 2017). Students with high levels of test anxiety have lower levels of academic achievement and are high in emotional dysregulation (e.g., Chapell et al., 2005; Hartman et al., 2017; Schneider & Preckel, 2017).

Purpose

The purpose of the current study was to explore the relation between student engagement and academic achievement for students enrolled in undergraduate psychology courses. Student engagement is a relatively new, broad, and multidimensional construct that is being used to measure student's academic outcomes, participation, and commitment to higher education (Finn & Zimmer, 2012; Fredricks, Blumenfeld, & Paris 2004; Reschly et al., 2014). Three subtypes of student engagement were analyzed, (a) cognitive engagement; (b) behavioral engagement; and (c) emotional engagement were analyzed. Academic achievement was measured by students' overall GPA. A hierarchical multiple regression was used to analyze the following hypotheses:

Hypotheses.

Hypothesis 1: It was hypothesized that student reading ACT scores would be a significant predictor of overall GPA (step 1 in the model).

Hypothesis 2: After controlling for previous achievement (reading ACT scores), it was hypothesized that variables related to emotional engagement (i.e., social support and test anxiety) would significantly predict overall GPA (step 2 in the model).

Hypothesis 3: After controlling for reading ACT scores and emotional engagement, it was hypothesized that variables associated with behavioral engagement (i.e., study behaviors and procrastination) would significantly predict overall GPA (step 3 in the model).

Hypothesis 4: After controlling for all previous variables (reading ACT scores, emotional engagement, and behavioral engagement), it was hypothesized that variables

related to cognitive engagement (i.e., goal orientation, grit, locus of control, and metacognition) would significantly predict overall GPA (step 4 in the model).

CHAPTER II

METHODS

Participants

Participants consisted of 61 undergraduate students (24% men, 73% women, and 3% self-identified having other gender identities) from a southeastern, midsize, public university enrolled in undergraduate psychology courses. Participants included freshmen, sophomores, juniors, and seniors age 18 and older. The majority of the participants were 22-23 years old (36%). Additionally, 18% self-reported to be 18-19 years old, 31% were 24-25 years old, and 15% were 26 years old or older. Most were Caucasian (78%), but the sample also included African Americans (14%) and those from other racial ethnic backgrounds (8%). A large number of participants were juniors (27%) or seniors (34%), while a smaller number of freshman (17%) and sophomores (22%) participated. In exchange for their participation, a majority of respondents were given research credit for their psychology courses.

Measures

A survey was used to analyze the areas of student engagement that help predict academic achievement. Academic achievement was measured by overall GPA. The following areas were used to assess student engagement: (a) cognitive; (b) behavioral; and (c) emotional.

Demographic questions. The questionnaire contained demographic items regarding age, gender, ethnicity, year in school, and self-reported GPA as well as ACT scores. Age consisted of five options: 18-19 years; 20-21 years; 22-23 years; 24-25

years; and 26 years and above. Three options were given for gender, which are male, female, and other. Ethnicity had three options: (a) African American; (b) Caucasian; and (c) other. Freshman, sophomore, junior, and senior class statuses were used to measure year in school. Participants were also asked to indicate their overall GPA, reading ACT score, and overall ACT score in their psychology course. This information was confirmed for accuracy through the University's data dashboard.

Cognitive measures. The following four components of cognitive engagement were measured: (a) goal orientation; (b) grit; (c) locus of control; and (d) metacognition.

Goal orientation. Both the intrinsic and extrinsic goal orientation subscales of the Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich, Smith, Garcia, & McKeachie, 1991) were used in the current study. The intrinsic goal orientation subscale contains 4 items that assess a student's perception of the reasons they are engaging in a learning task ($\alpha = .74$ Pintrich et al., 1991; $\alpha = .79$ current study). The extrinsic goal orientation subscale (4 items) concerns the degree to which the student's engagement is due to obtaining good grades, competition, approval from others, or other rewards ($\alpha = .62$ Pintrich et al., 1991; $\alpha = .69$ current study). Both subscales were answered on a 5-point Likert scale with response options ranging from 1 (*not at all true of me*) to 5 (*very true of me*).

Grit. To assess grit, participants completed the Short Grit Scale (Grit-S). The Grit-S measures individual characteristics of determination and fervor for achieving long-term goals (Duckworth & Quinn, 2009). It consists of 8 items that can be divided into a two-factor model including consistency of interest (4 items) and perseverance of effort (4

items). Items were measured on a 5-point Likert scale ranging from 1 (*not at all like me*) and 5 (*very much like me*). According to the scale authors (Duckworth & Quinn, 2009), internal consistency was found to be good overall ($\alpha = .82$), and was similar to the findings in the current study ($\alpha = .80$).

Locus of control. The revised Academic Locus of Control Scale for College Students was utilized to measure the cognitive component of locus of control (Curtis & Trice, 2013). It contains 21 True/False items. Items are clustered into four components: (a) hopelessness; (b) distractibility; (c) poor student attitude; and (d) impaired planning. Scores range from 0 to 28 with low scores indicating a more internal orientation and high scores indicating a more external orientation. According to Curtis and Trice (2013) the revised overall internal consistency was adequate ($\alpha = .68$), and similar to the findings in the current study ($\alpha = .73$).

Metacognition. Wolters and Hussain (2015) utilized a modified version of the cognitive strategies and the metacognitive strategies subscales of the MSLQ (Pintrich et al., 1991), which also was used in this study to measure students' metacognition. Metacognitive strategies (9 items) measure students' use of strategies for planning, monitoring, and managing their learning strategies. While cognitive strategies (9 items) assesses students' use of strategies such as elaboration when engaged in academic tasks. Wolters and Hussain (2015) found good internal consistency for the modified metacognitive strategies subscale ($\alpha = .83$) and cognitive strategies scale ($\alpha = .83$); however, both were found to be lower in the current study ($\alpha = .69$ for the metacognitive strategies; $\alpha = .68$ for the cognitive strategies).

The Metacognitive Reading Strategies Questionnaire (MRSQ) measures college students' use of reading strategies while reading educational material (Taraban, Kerr, & Rynearson, 2004). The MSRQ measures two constructs of reading: (a) analytic; and (b) pragmatic. Analytic strategies relate to reading comprehension cognitions, while pragmatic strategies are behaviors related to studying and academic performance. Students rated 22 items on how often they use those strategies using a 5-point Likert scale ranging from 1 (*never use*) to 5 (*always use*). According to the test authors, overall internal consistency was good ($\alpha = .84$); the findings were similar in the current study ($\alpha = .83$).

Behavioral measures. Study behavior in and out of class, as well as procrastination were the components used to measure behavioral engagement.

Study behavior in and out of class. In the current study, a modified version of a measure by Holt, Marshall, Jin, and Frame (2016) was used to assess students' self-reports of study behaviors utilized during and outside of class. The 8 items used in the current study were answered on a 5-point Likert scale with response options ranging from 1 (*never*) to 5 (*very often*). The original scale had a moderate internal consistency reliability ($\alpha = .71$) and was similar to what was found in the current study ($\alpha = .70$).

Procrastination. The behavioral component procrastination was measured using the Pure Procrastination Scale (PPS). It contains 12 items measuring students' tendency to put tasks off, such as making decisions or beginning assignments (Steel, 2010). The adapted version of this scale by Wolters and Hussain (2015) was used because it was modified for academic contexts. A 5-point Likert scale ranging from 1 (*not at all true of me*) and 5 (*very true of me*) was used. According to Wolters and Hussain (2015) the

same high internal consistency was found for both the original and the adapted version ($\alpha = .92$). In the current study internal consistency also was found to be high ($\alpha = .94$)

Emotional measures. Emotional engagement was measured using the following components: (a) social support and (b) test anxiety.

Social support. Participants completed the Student Engagement Instrument (SEI; Appleton et al., 2006). This instrument measures student engagement by considering how different contexts (e.g. family, peers, schools) may influence students. The survey was originally created for middle and high school students to assess cognitive and affective engagement, but Grier-Reed et al., (2012) modified the SEI to accommodate college students. They did this by altering the language used. For example, *college/university* replaced *school* or *high school* and *faculty and staff* replaced *teachers*.

The SEI includes 33 items measuring five factors: (a) teacher-student relationships (TSR-9 items); (b) peer support at school (PSS-6 items); (c) family support for learning (FSL-4 items); (d) control and relevance of school work (CRSW-9 items); and (e) future aspirations and goals (FG-5 items). To measure emotional engagement, three of the five factors, TSR, PSS, and FSL, were used in this study. Items were scored using a 4-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*).

Overall low scores indicated a high level of student engagement. Reliability and validity were found to be comparable to the original SEI that assessed high school students.

Good internal consistency also was reported by Grier-Reed et al., (2012) (TSR $\alpha = .85$, PSS $\alpha = .82$, and FSL $\alpha = .79$). In the current study the three subscale were combined to measure social support and the internal consistency was found to be good ($\alpha = .85$).

Test anxiety. The test anxiety subscale of the MSLQ (Pintrich et al., 1991) contains 5 items that are used to measure test anxiety, or the fear and anxiety students may feel when administered a test. These items were answered on a 5-point Likert scale with response options ranging from 1 (*not at all true of me*) to 5 (*very true of me*). The authors of this subscale report the internal consistency reliability to be good for this subscale ($\alpha = .80$) and it was found to be similar in the current study ($\alpha = .86$).

Procedure

Approval was obtained from the Institutional Review Board prior to data collection. Psychology students were then obtained to complete the survey. Before completing the survey, participants provided informed consent.

CHAPTER III

RESULTS

Descriptive Statistics and Correlations

Descriptive statistics are reported in Table 1. Similar to previous research (e.g., Wolters, 2003; Wolters & Hussain, 2015) many of the means for the predictor variables were found to be near the middle of the response scales. Regarding correlations between the variables, overall college GPA was positively correlated with Reading ACT scores, and measures of both study behaviors and grit. (see Table 2). It was negatively correlated with procrastination. Study behaviors were positively correlated with grit and use of both cognitive and metacognitive strategies. Interestingly they also were positively correlated with both internal and external goal orientation. Study behaviors were negatively correlated with external locus of control and procrastination. Procrastination was negatively correlated with use of both cognitive and metacognitive strategies as well as internal goal orientation, and grit. Grit was negatively correlated with test anxiety. Other significant correlations can be seen in Table 2.

Multiple Regression Predicting Overall College GPA

A hierarchical multiple regression was used to explore the relation between aspects of student engagement and overall college GPA. For Step 1 of the model, students' reading ACT scores were used to predict overall GPA. In Step 2, after controlling for reading ACT scores, variables related to emotional engagement (i.e., social support and test anxiety) were entered into the model used to predict overall GPA. In Step 3, variables

Table 1.

Descriptive statistic.

Variable	<u>M</u>	<u>SD</u>
Overall GPA	3.4	1.1
Reading ACT	20.3	4.7
Social Support ¹	1.86	0.3
Test Anxiety ²	3.0	1.2
Study Behaviors ²	3.8	0.7
Procrastination ²	2.6	1.0
Intrinsic Goal Orientation ²	3.8	0.8
Extrinsic Goal Orientation ²	3.7	0.7
Grit ²	3.6	0.6
External Locus of Control ³	6.8	3.7
Reading Metacognition ²	3.7	0.6
MSLQ Metacognition ²	3.9	0.6
MSLQ Cognition ²	3.9	0.5

Note. ¹ based on a 4 point Likert-scale; ² based on a 5 point Likert scale; ³ scores range from 0 to 28 with low scores indicating more internal orientation

Table 2.

Correlations between variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 MSLQ Cog												
2 MSLQ Metacognition	.68***											
3 Reading Metacognition	.34**	.12										
4 External Locus of Cont	-.37**	-.37**	-.05									
5 Grit	.43***	.43***	-.12	-.75***								
6 Extrinsic Goal	.25*	.34**	-.09	-.17	.21							
7 Intrinsic Goal	.22	.29*	.31*	-.48***	.32*	.19						
8 Procrastination	-.51***	-.43**	-.03	.61***	-.76***	-.13	-.37**					
9 Study Behaviors	.41***	.36**	.17	-.55***	.46***	.34**	.35**	-.53***				
10 Test Anxiety	.18	.25*	.01	.31*	-.32*	.14	-.20	.05	-.01			
11 Social Support	-.36**	-.18	-.09	.14	-.22	.03	-.09	.21	-.11	-.03		
12 Reading ACT	.06	.14	-.08	-.07	.22	.07	.15	-.19	.17	-.18	.15	
13 Overall GPA	.30*	.29*	.04	-.21	.34*	.17	.14	-.47***	.50***	-.03	-.15	.55***

Note. * $\leq .05$; ** $\leq .01$; *** $\leq .001$.

associated with behavioral engagement (i.e., study behaviors and procrastination) were used to predict overall GPA after controlling for reading ACT scores and emotional engagement. In Step 4, variables related to cognitive engagement (i.e., goal orientation, grit, locus of control, and metacognition) were entered into the model predicting overall GPA after controlling for all previous variables (i.e., reading ACT scores, emotional engagement, and behavioral engagement).

Support was found for Hypothesis 1, student reading ACT scores significantly predicted their overall college GPAs ($F = 21.179, p \leq .001$). Reading ACT scores explained 30% of the variance in overall GPA in this step of the model. As can be seen in Table 3, reading ACT scores were the strongest predictor of overall GPA in every step in the model.

Partial support was found for Hypothesis 2. Reading ACT scores and variables related to emotional engagement (i.e., social support and test anxiety) were found to significantly predict overall college GPAs ($F = 8.79, p \leq .001$). However, as can be seen in Table 3, the addition of measures related to emotional engagement only explained an additional 6% of the variance in overall college GPA. After controlling for reading ACT scores, social support had a significant, negative relation to overall GPA (see Table 3). Unlike what had been hypothesized, test anxiety was not a significant predictor of overall GPA in this step of the model.

Additionally, partial support was found for Hypothesis 3. The overall model containing reading ACT scores, emotional engagement variables, and variables associated with behavioral engagement (i.e., study behaviors and procrastination)

Table 3.

Hierarchical Multiple Regression Analysis Predicting GPA.

Predictor Variable	β	F	R^2	ΔF	ΔR^2
Step 1		21.18***	.30		
Reading ACT	.55***				
Step 2		8.79***	.36	2.11	.06
Reading ACT	.60***				
Social Support	-.23*				
Test Anxiety	.06				
Step 3		10.28***	.53	8.39***	.17
Reading ACT	.49***				
Social Support	-.15				
Test Anxiety	.06				
Study Behaviors	.30*				
Procrastination	-.19				
Step 4		4.26***	.57	0.52	.04
Reading ACT	.48***				
Social Support	-.17				
Test Anxiety	-.07				
Study Behaviors	.37*				
Procrastination	-.38				
Intrinsic Goal Orientation	-.14				
Extrinsic Goal Orientation	.04				
Grit	-.11				
External Locus of Control	.17				
Reading Metacognition	.04				
MSLQ Metacognition	.09				
MSLQ Cognition	-.07				

Note. * $\leq .05$; ** $\leq .01$; *** $\leq .001$.

significantly predicted overall college GPA ($F = 10.28, p \leq .001$) and the change in the model at this step was significant (see Table 3). This model explained over 50% of the variance in overall GPA; including behavioral engagement variables in this step explained an additional 17% of the variance in overall GPA. After controlling for reading ACT and emotional engagement variables, study behaviors had a significant, positive relation to overall GPA. The negative relation between procrastination and overall GPA was not significant.

Partial support also was found for Hypothesis 4. As can be seen in Table 3, the full model containing reading ACT scores, emotional engagement variables, behavioral engagement variables, and cognitive engagement variables (i.e., goal orientation, grit, locus of control, and metacognition) significantly predicted overall college GPA ($F = 4.26, p \leq .001$). While the full model explained 57% of the variance in overall GPA, the addition of the cognitive engagement variables did not produce a significant change in the model (see Table 3). None of the variables related to cognitive engagement were significantly related to overall GPA. Reading ACT scores and study behaviors had a significant, positive relation to overall college GPA in the full model.

CHAPTER IV

DISCUSSION

This study used previous academic achievement (i.e., reading ACT scores) and three aspects of student engagement (i.e., emotional engagement, behavioral engagement, and cognitive engagement) to predict college students' overall GPA. As hypothesized, and consistent with previous research, (e.g., Di Domenico & Fournier, 2015; Downey et al., 2014; Duckworth et al., 1997, Schneider & Preckel, 2017) students' previous academic achievement significantly predicted overall GPA. This was true throughout all four steps in the model.

While the addition of variables related to emotional engagement (i.e., social support and test anxiety), did not result in a significant change in the model predicting overall GPA, the overall model at this step was statistically significant. This finding is consistent with previous research related to the relation between emotional engagement and academic performance (e.g., Finn & Zimmer, 2012; Gunuc & Kuzu, 2015). Social support's negative relation to overall GPA, however, is inconsistent with previous research findings of small, positive effects of social support on academic achievement (e.g., Richardson et al., 2012; Schneider & Preckel, 2017). In the current study, social support was measured by combining perceptions of student-professor relationships, peer support at school and family support for learning. The negative relation in the current study could be influenced by family-study conflict as found by Meeuwisse and colleagues (2011) or a perceived lack of peer support as found by Dennis and colleagues (2005). In the current study, the relation between test anxiety and overall GPA was not

significant. This finding also is inconsistent with previous researchers (e.g., Chappell et al., 2005; Schneider & Preckel, 2017) who have reported a negative relation between test anxiety and academic achievement (e.g., students with lower levels of test anxiety have been found to have higher levels of academic achievement).

There was a significant change in the model predicting overall GPA when variables related to behavioral engagement were added. This model, which contained measures related to previous achievement (i.e., reading ACT) emotional engagement (i.e., social support and test anxiety) and behavioral engagement (i.e., study behaviors and procrastination), explained over half of the variance in college student's overall GPA. This relation between behavioral engagement and academic achievement is consistent with previous research (e.g., Fredricks et al., 2004). In this study, study behaviors had a significant impact on overall GPA, after controlling reading ACT scores, and measures of emotional engagement. Previous research (e.g., Credé & Kuncel, 2008; Numan & Hasan, 2017) has found that the study habits and skills students use have a strong effect on academic achievement. Previous research (e.g., Balkis et al., 2013; Kim & Seo, 2015; Schneider & Preckel, 2017) also has found that procrastinate negatively impacts academic achievement. While not statistically significant, this study continued to find a negative relation between procrastination and overall GPA.

Although the overall final model was significant, the variables related to cognitive engagement (i.e., goal orientation, grit, locus of control, and metacognition) were not found to significantly predict overall GPA. Previous research has found that cognitive engagement is associated with positive academic outcomes (e.g., Appleton et al., 2006;

Appleton et al., 2008; Fredricks et al., 2004; Greene et al., 2004; Reschley et al., 2014; Schneider & Preckel, 2017). Specifically, previous research has shown that students' goal orientations have positive effects on their academic achievement (e.g., Huang, 2011; Richardson et al., 2012). Grit has been found to predict academic success (e.g., Duckworth et al., 2007). Additionally, students with an internal locus of control have higher academic achievement than those with an external locus of control (e.g., Gifford et al., 2006). Metacognition also is positively related to academic achievement (e.g., Schneider & Preckel, 2017). The lack of statistical significance for cognitive variables predicting academic success in the current study could in part be due to limited power related to the number of variables in the model at that step given the small sample size. Another possibility is that since those variables were entered in the last step of the model, the variables that were entered before them had a stronger relation to overall GPA.

Interestingly, in the full model, study behaviors still had a significant relation with overall GPA. This finding gives further evidence to Credé and Kuncel's (2008) idea that the third pillar to college academic success is good study habits and skills. Numan and Hasan (2017) identified the following six dimensions of study habits: (a) textbook reading; (b) note-taking; (c) memory; (d) test preparation; (e) concentration; and (f) time management. They found that students who used these study habits effectively had better academic achievement and experienced lower levels of test anxiety. The findings from both of these studies, along with the current study's findings, give support for the idea that secondary education should focus on teaching students effective study habits and skills, so that they are more likely to experience better academic achievement in college.

Limitations.

The sample size was small. Given the number of variables explored in the current study, the small sample size limited power. This may have negatively affected the ability to detect the relation between overall GPA and individual variables related to cognitive engagement (i.e., goal orientation, grit, locus of control, and metacognition), behavioral engagement (i.e., procrastination), and emotional engagement (i.e., test anxiety). Results may have been more consistent with previous research findings if the sample size had been larger. Much of the previous research exploring student engagement and academic achievement has focused on a single area of student engagement or a limited number of individual variables.

Future Direction.

Data should continue to be collected to determine if an increase in the sample size would result in findings more consistent with previous research. This study also should be replicated using a sample of secondary education students to see if results generalize to that population as well. Future research exploring factors that predict academic achievement should continue to examine a wide variety of variables associated with student engagement (i.e., cognitive engagement, behavioral engagement, and emotional engagement). More research exploring student engagement and its related components could help identify which variables are the most salient to academic success.

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APPENDICES

APPENDIX A

IRB APPROVAL

INSTITUTIONAL REVIEW BOARD

Office of Research
 Compliance, 010A Sam
 Ingram Building, 2269
 Middle Tennessee Blvd
 Murfreesboro, TN 37129



IRBN001 - EXPEDITED PROTOCOL APPROVAL NOTICE

Principal Investigator Aimee Holt (Faculty)
 Investigator Email(s) Aimee.Holt@mtsu.edu
 Department Psychology
 Protocol Title Factors Effecting Academic Achievement Among College Students
 Protocol ID 20-2153

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXPEDITED** mechanism under 45 CFR 46.110 and 21 CFR 56.110 within the category (7) *Research on individual or group characteristics or behavior*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated below:

IRB Action	APPROVED
Date of Expiration	3/31/2021
Sample Size	500 (FIVE HUNDRED)
Participant Pool	Target Population: Primary Classification: Healthy Adults (18 or older) Specific Classification: MTSU Students enrolled in Psychology classes
Exceptions	1. Contact information is permitted to coordinate the study. 2. Permitted to record Academic Performance Records (with consent)
Restrictions	<ul style="list-style-type: none"> • Mandatory SIGNED informed consent. • IRB must be notified of an Adverse Event. • Mandatory final report (refer last page). • Contact information must be destroyed upon data processing.
Approved Templates	MTSU templates: Signature informed consent and IRB flyer Non-MTSU Templates: Recruitment script