

**EVERYONE WANTS AN “A”: THE ROLE OF ACADEMIC
EXPECTATIONS IN ACADEMIC PERFORMANCE**

by

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TABLE OF CONTENTS

LIST OF TABLES	5
LIST OF FIGURES	7
ABSTRACT	8
INTRODUCTION	9
Past Experiences and Expectations	10
Specific Expectations from Trait Expectations	11
Do Expectations Influence Performance?	12
Potential Mechanisms of Expectations Influencing Performance	12
Why is The Relationship between Expectations and Performance Complicated?	13
Examining Gaps in the Literature	14
CURRENT STUDY	16
RESEARCH AIMS AND HYPOTHESES	17
METHODS	20
Design and Setting	20
Measures	22
Previous GPA	22
Academic Expectations	22
Academic Performance	22
Hope	22
Optimism	23
Perceived Stress	23
Study Time	24
Analytic Plan	24
Preliminary Analysis	24
Multiple Imputations	26
RESULTS	27
Aim 1: Linear Regression	30
Aim 2: Mediation	33
Aim 3: Moderation	39

DISCUSSION.....	44
Aim 1	44
Aim 2	47
Aim 3	51
Limitations	55
Future Directions	57
REFERENCES	59
APPENDIX.....	66

LIST OF TABLES

Table 1: Sample characteristics and descriptive statistics	27
Table 2: Zero order correlations between study variables.....	30
Table 3: Linear Regression Model of hope, optimism, and previous GPA predicting academic expectations, run in SPSS	31
Table 4: Linear regression model of hope, optimism, and previous GPA predicting academic expectations. Results from each of the 5 data sets formed using Multiple Imputations, run in R.	32
Table 5: Linear Regression Model of hope, optimism, and previous GPA predicting academic expectations. Pooled results of Multiple Imputations, run in R.....	33
Table 6: Mediation model of academic expectations predicting academic performance via study time, run in SPSS	34
Table 7: Mediation model of academic expectations predicting academic performance via perceived stress, run in SPSS.....	35
Table 8: Mediation model of academic expectations predicting academic performance via study time. Results from each of the 5 data sets formed using Multiple Imputations, run in R.....	36
Table 9: Mediation model of academic expectations predicting academic performance via study time. Pooled results of Multiple Imputations, run in R.....	37
Table 10: Mediation model of academic expectations predicting academic performance via perceived stress. Results from each of the 5 data sets formed using Multiple Imputations, run in R.	38
Table 11: Mediation model of academic expectations predicting academic performance via perceived stress. Pooled results of Multiple Imputations, run in R.	39
Table 12: Moderation Model of academic expectations predicting academic performance, moderated by previous GPA run in SPSS.....	40
Table 13: Moderation Model of academic expectations predicting academic performance, moderated by previous GPA. Results from each of the 5 data sets formed using Multiple Imputations, run in R.	42

Table 14: Moderation Model of academic expectations predicting academic performance, moderated by previous GPA. Pooled results of Multiple Imputations, run in R. 43

LIST OF FIGURES

Figure 1: Conceptualization of hypothesized relationships between all measured variables.	16
Figure 2: Conceptual model of Aim 1 hope, optimism, and previous GPA as predictors of academic expectations.	17
Figure 3: Conceptual model of Aim 2 study time and perceived stress as mediators for of academic expectations predicting academic performance.	18
Figure 4: Conceptual model of Aim 3 previous GPA as a moderator of academic expectations predicting academic performance.	19
Figure 5: Visual representation of the interaction between academic expectations and previous GPA on academic performance.	41

ABSTRACT

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Title: Everyone Wants an “A”: The Role of Academic Expectations in Academic Performance

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Expectations are a key aspect of human success and behavior that predict outcomes in a variety of settings, including academics. Trait expectations (e.g., hope and optimism) and previous experiences appear relevant to the formation of specific expectations. Specific expectations predict outcomes, with positive expectations predicting better outcomes. In academics, positive specific expectations predict improved academic performance; however, there are aspects of this relationship that are unclear. This study sought to examine the formation of specific academic expectations and the relationship between these expectations and academic performance. The current study aimed to replicate previous research about the unique influences of academic expectations, expand this knowledge by examining possible mechanisms of the relationship between academic expectations and academic performance, and test how previous academic experience affected this relationship. Results of this study showed that previous GPA and optimism, but not hope, predicted academic expectations. Academic expectations predicted academic performance, but this relationship was not mediated by study time or stress. Finally, previous GPA moderated the relationship between academic expectations and academic performance, such that the positive association between academic expectations and academic performance was stronger for those with poorer prior performance.

INTRODUCTION

“All brains are, in essence, anticipation machines.” – Daniel Dennett

A major role of the mind is to anticipate the future. Seligman, Railton, Baumeister, and Sripada (2016) argue that anticipating and evaluating the future to guide current thought and action is crucial to human success. People invest substantial time and energy creating these anticipations and pursuing the outcomes. Anticipations help people navigate their way through life, working toward their goals (Tavory & Eliasoph, 2013).

Anticipations, known in psychology as *expectations*¹, are subjective beliefs about the likelihood that something will happen in the future (Carver & Scheier, 1998). By believing that something will happen or be achieved in the future, people can create paths and alter behaviors to help them achieve this future. As behavior plays a key role in determining outcomes, expectations are important drivers of human adjustment and well-being (Seligman et al., 2016).

There are different types of expectations. For example, there are expectations that one can perform a behavior (i.e., self-efficacy) and expectations that a behavior will result in an outcome (i.e., outcome expectations; Bandura, 1977). Bandura found that expectations significantly contribute to successful behavior change (Bandura, 1977; Bandura, Adams, & Beyer, 1977). Self-efficacy, specifically, was found to significantly contribute to the level of motivation and performance in meeting desired outcomes (Bandura, 1977, 1997; Bandura & Adams, 1977; Bandura & Locke, 2003).

¹ Expectations are also referred to as expectancies in the literature (Carver & Scheier, 1998). For the purpose of this study, the term *expectation* is used.

Expectations that people form about situations predict outcomes in those situations. Studies have shown that expectations of treatment predict treatment side effects and intentions to continue treatment in cancer patients (Heisig et al., 2016). Expectations regarding wind farm placement predicted subsequent response to the wind farm noise, such as how the noise affected people's moods and physical symptoms resulting from the noise (i.e., headaches, tiredness, and ear pressure; Crichton et al., 2014). Patients with negative preoperative expectations for orthopedic, neurologic, and cardiovascular surgeries reported more postoperative pain and disability compared to those with positive expectations (Waljee, McGlenn, Sears, & Chung, 2014). In general, positive expectations tend to predict better outcomes. However, this is not always the case. For example, recent research showed that high positive expectations predicted therapeutic misconceptions in cancer patients (Jansen et al., 2016) and reduced adherence to postoperative instructions and slowed recovery (Neuprez et al., 2016; Sweeny & Andrews, 2017). Given the role that expectations play in life outcomes, researchers are interested in understanding the origin of expectations.

Past Experiences and Expectations

Bandura (1977) argued that expectations are based on previous experiences in similar situations. Expectations are rooted in people's judgments of how well they will perform in situations; thus, previous experience of the situation is key to forming expectations of outcomes (Bandura, 1983). In a study of treatment for phobias, Bandura and colleagues (1977) found that those who received treatments related to skills they had previously mastered had more optimistic expectations than those who had vicarious treatment or no treatment. Bandura (1997) posited that expectations are situation-specific and have limited generalizability.

Specific Expectations from Trait Expectations

Subsequent research has shown that expectations are not only influenced by prior experiences but also by more general beliefs. For example, Rotter (1992) found evidence that a general belief called *locus of control* predicted expectations across several domains of life. Among chronically ill patients, Basińska and Anna (2016) found that patients with higher internal locus of control had higher expectations about education on their disease and its effects on their lives than patients higher in external locus of control. Carver and Scheier (1998) further conceptualized expectations as occurring within a hierarchy from trait expectations to specific expectations, with trait expectations influencing specific expectations.

Hope and optimism are two of the most commonly studied trait expectations (Carver & Scheier, 1998; Snyder, 1994). Hope is the belief that one will achieve one's goals (Snyder, 1994), and optimism is the belief that good things will happen and bad things will not (Scheier & Carver, 1985). Research has shown that hope and optimism predict specific expectations (Carver & Scheier, 1998; Rand, 2009; Snyder et al., 2002). Among college students, higher hope predicted higher academic expectations, which then predicted better academic performance (Curry, Snyder, Cook, Ruby, & Rehm, 1997; Rand, 2009; Snyder et al., 2002).

However, it remains unclear how trait expectations differentially predict specific expectations in academics. Rand (2009) showed that unique aspects of hope, but not optimism, predicted specific academic expectations. Feldman and Kubota (2015) expanded on this showing that trait hope predicted academic-specific hope, which in turn predicted academic performance. However, Feldman and Kubota, did not examine specific expectations of academic performance or previous academic performance. Research has shown that trait expectations and previous academic performance predict specific academic expectations and subsequent academic

performance (Hall & Sverdlik, 2016; Kreig, 2013; Rand, 2009; Ruthig, Haynes, Perry, & Chipperfield, 2007), but there is a paucity of evidence on the unique aspects of trait expectations and previous experience in predicting specific expectations.

Do Expectations Influence Performance?

Specific expectations predict performance. Kreig (2013) found that setting positive expectations for social and family interactions predicted better social relationships and increased positive interactions with families in first-year college students. Rand (2009) showed that, among undergraduates, course performance was predicted by specific grade expectations. In a study of first-year undergraduate students, Chemers, Hu, and Garcia (2001) found that students with high expectations and confidence in their academic abilities had significantly better grades than those with low expectations and less confidence. Expectations have been shown as the strongest predictors of students' academic performance compared to student motivation, self-confidence, and parental education levels (Tavani & Losh, 2003). Similarly, Suárez-Álvarez, Fernández-Alonso, and Muñiz (2014) found that specific expectations significantly predicted academic performance in mathematics and science courses, when controlling for self-concept, motivation, and socioeconomic and cultural index. It is clear that specific expectations predict performance, but it is less clear by what mechanisms expectations might influence performance.

Potential Mechanisms of Expectations Influencing Performance

One potential mechanism by which specific expectations may influence academic performance is *studying*. In a study of Australian secondary students, Dandy and Nettelbeck (2000) found that Chinese Australian students were more likely to report significant increases in study time based on their specific academic expectations than their Caucasian peers. Students'

specific expectations of themselves and their motivation to meet these expectations predicted increased studying behaviors, which in turn predicted increased performance (Jyoti & Devi, 2008). Studying has predicted academic performance beyond student aptitude and attitude, according to research (Credé & Kuncel, 2008; West & Sadoski, 2011). As expectations predict studying and performance, and studying predicts performance, studying may be one mechanism by which expectations influence performance.

Another potential mechanism by which expectations may influence academic performance is *stress*. A study of students in Singapore found that high expectations for academic success from the students themselves, their parents, and their teachers predicted increased academic stress for the students (Tan & Yates, 2011). In qualitative studies, undergraduate students reported that the main source of their academic stress was from their specific academic expectations (Hurst, Baranik, & Daniel, 2013; Nguyen, 2017). Students also felt increased stress when their expectations were unmet or violated (Krieg, 2013; Rice, Ray, Davis, DeBlaere, & Ashby, 2015). These increased feelings of stress were found to result in decreased performance (Jyoti & Devi, 2008; Rice et al., 2015). Because expectations predict stress and performance, and stress predicts performance, stress may be a mechanism by which expectations influence performance.

Expectations predict not only performance, but also studying and stress as well. However, there is a paucity of evidence that studying and stress act as mechanisms in the relationship between expectations and performance.

Why is The Relationship between Expectations and Performance Complicated?

Positive expectations do not inevitably lead to better performance. Most research suggests positive expectations are associated with better performance (Krieg, 2013; Suárez-

Álvarez et al., 2014; Tavani & Losh, 2003), but emerging research shows this relationship to be more complex (Jyoti & Devi, 2008; Neuprez et al., 2016; Sweeny & Andrews, 2017). In a study of competitive bridge players, positive expectations of their abilities to win games predicted enhanced performance, but for players who did not consider their previous win rates, positive expectations predicted decreased performance (Simons, 2013). Poorer-performing players predicted winning the same number of games as higher-performing players and experienced a negative relationship between their expected wins and actual wins (Simons, 2013). Hall and Sverdlik (2016) found that students with higher expectations for academic performance in science, technology, engineering, and math (STEM) had more academic setbacks compared to their peers with lower expectations. Rice and colleagues (2015) also found that when STEM students became fixed on their high expectations, the expectations predicted increased stress and decreased grade point averages (GPA). The relationship between expectations and performance appears to be complex, and further exploration of the relationship is needed.

Examining Gaps in the Literature

Although there is substantial research on expectations and their relationship with performance, there are several gaps in our current understanding. Specifically, 1) we do not know the differential roles of trait expectations and previous experience in predicting specific expectations; 2) we do not understand the mechanisms by which specific expectations influence performance; and 3) we do not understand how previous performance might moderate the relationship between specific expectations and performance.

This study focused on college students and the specific expectations they formed regarding their academic performance. Undergraduate students pursuing academic goals provide a reasonable model for how people use expectations to pursue more general life goals. These

specific expectations could be influenced from the student's previous GPA and their trait expectations (Rand, 2009; Snyder et al., 2002). This allowed for exploration of the differential roles of previous experiences and trait expectations in the formation of specific expectations. Coping behaviors and stress may serve as mechanisms by which specific expectations affect performance. Studying (i.e., the amount of time spent studying) and stress are factors that influence student's academic performance (Credé & Kuncel, 2008; Jyoti & Devi, 2008; Rice et al., 2015; West & Sadoski, 2011) and can be influenced by student expectations (Dandy & Nettelbeck, 2000; Hurst et al., 2013; Krieg, 2013). Previous experience may serve as a factor that alters the relationship between expectations and performance. Students who formulate specific academic expectations based on previous academic achievement may exhibit increased academic performance; whereas, those who do not consider previous academic achievement in forming their specific expectations may exhibit decreased academic performance.

CURRENT STUDY

The current study aimed to examine the relationships among academic expectations (i.e., specific expectations students have for their semester grades), previous GPA, academic performance (i.e., grades the student receives at the end of the current semester), trait expectations (i.e., hope and optimism), perceived stress, and the time studying (Figure 1). As the model in Figure 1 shows, I predicted that specific academic expectations are predicted by both previous academic achievement and trait expectations (i.e., hope and optimism). Additionally, I predicted that specific academic expectations influence academic performance through two separate mechanisms: studying and perceived stress. Specifically, higher academic expectations lead to greater studying, which leads to better academic performance. In contrast, higher expectations lead to greater perceived stress, which leads to poorer academic performance. Previous GPA moderates the relationship between academic expectations and academic performance, such that the relationship between academic expectations and performance would be negative for students with poorer previous GPA.

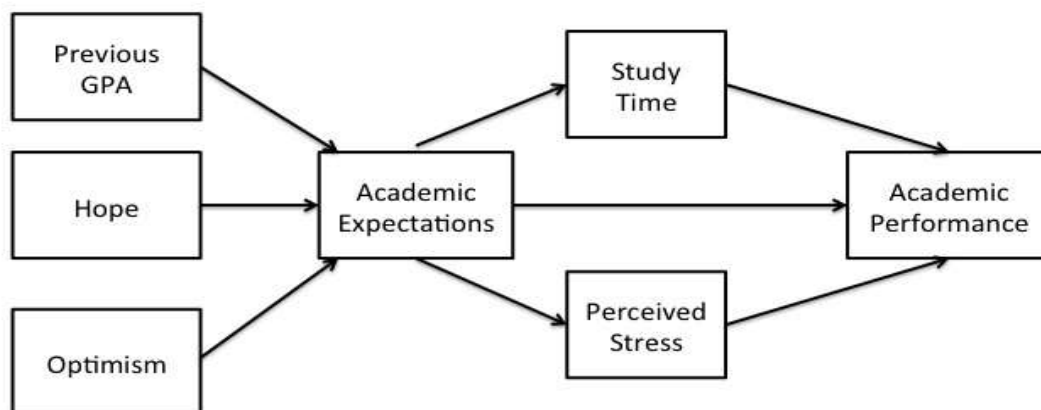


Figure 1: Conceptualization of hypothesized relationships between all measured variables.

RESEARCH AIMS AND HYPOTHESES

Aim 1: Examine the differential ability of trait expectations (i.e., hope and optimism) and previous GPA to predict academic expectations (Figure 2).

Hypothesis 1.1. Previous GPA will be positively associated with academic expectations.

Hypothesis 1.2. Hope, but not optimism, will be positively associated with academic expectations independent of previous GPA.

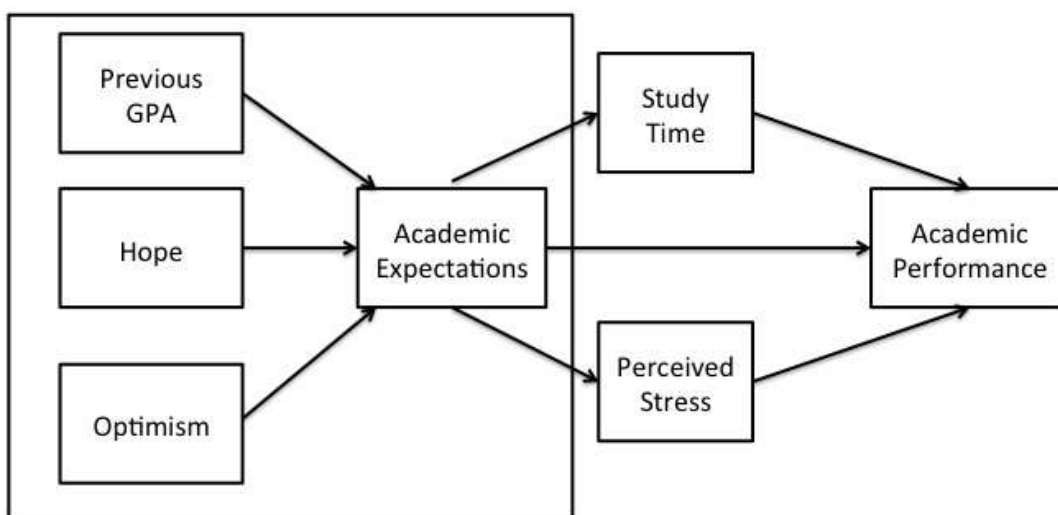


Figure 2: Conceptual model of Aim 1 hope, optimism, and previous GPA as predictors of academic expectations.

Aim 2: Examine potential mediators of the relationship between academic expectations and academic performance (Figure 3).

Hypothesis 2.1. Studying will partially mediate the relationship between academic expectations and academic performance, such that higher academic expectations will be associated with increased time spent studying, which will predict better academic performance.

Hypothesis 2.2. Perceived stress will partially mediate the relationship between academic expectations and academic performance, such that higher academic expectations will be associated with greater stress, which will predict poorer academic performance.

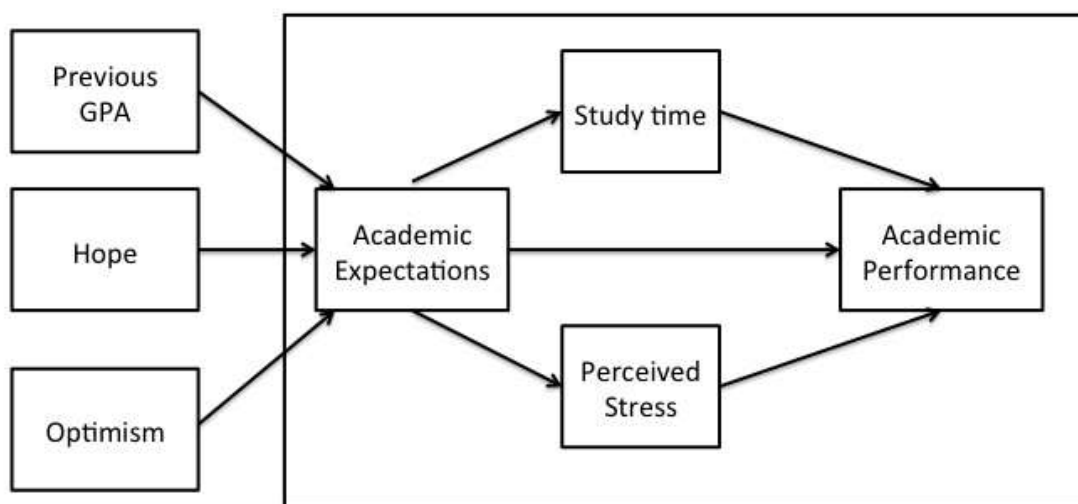


Figure 3: Conceptual model of Aim 2 study time and perceived stress as mediators for of academic expectations predicting academic performance.

Aim 3: Examine previous GPA as a moderator of the relationship between academic expectations and academic performance (Figure 4).

Hypothesis 3.1. Previous GPA will moderate the relationship between academic expectations and academic performance such that students with higher previous GPA will have a positive association between academic expectations and performance; whereas, students with lower previous GPA will have a negative association between academic expectations and performance.

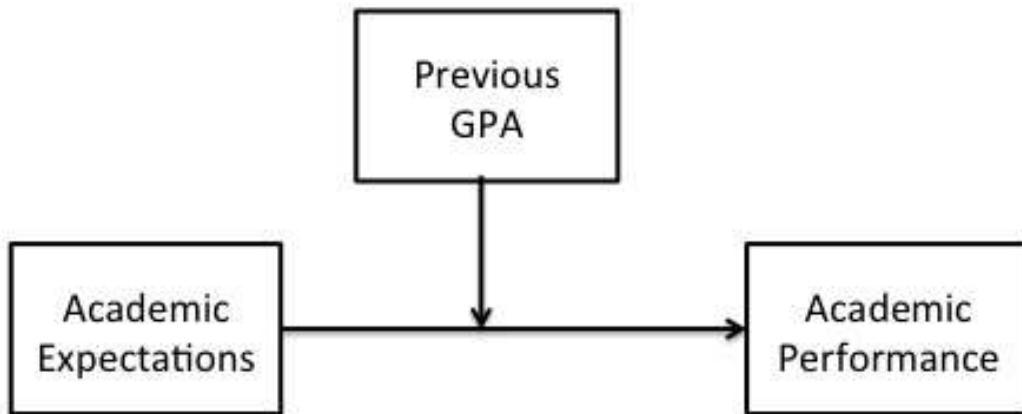


Figure 4: Conceptual model of Aim 3 previous GPA as a moderator of academic expectations predicting academic performance.

METHODS

Design and Setting

The present study was a longitudinal examination of introductory psychology students at Indiana University-Purdue University Indianapolis (IUPUI) from the spring 2018 semester. Participants were recruited through the SONA² system. The study consisted of three time points. Time 1 was an in-person study visit during the first seven weeks of the semester (January-February); Time 2 was an online survey completed from any computer with internet access between week 9 and 11 of the semester (March); and Time 3 was an online survey completed from any computer with internet access between week 14 and 16 of the semester (April). Following completion of each time point, participants were awarded credit through SONA that went toward their research requirement for the introductory psychology course.

During the first seven weeks of the semester participants signed up for a 90-minute in-person study appointment with a trained research assistant. When participants arrived to their study appointment they were asked to read, review, and sign a general informed consent and consent for release of their academic records including fall 2017 semester GPA and cumulative GPA and spring 2018 semester GPA and cumulative GPA. Upon consenting to the study, participants completed in-lab activities with the trained research assistant and the set of questionnaires using the secure lab computer³. All questionnaires were presented in the same order to each participant. Data collected through the questionnaire at this time point included:

² SONA is the online psychology recruitment system for the managed by the IUPUI Psychology Department. All students enrolled in introductory psychology are required to complete research credits for the course, all studies that can count toward this research credit are found on the SONA site.

³ This study is a subset of a larger study. Additional data were collected on: height, weight, grip strength, self-control, index-to-ring finger ratio, intelligence, goals, satisfaction with life, positive and negative affect, meaning in life, death anxiety, depression, anxiety, and stress.

demographic information, specific academic expectations (i.e., expected semester GPA), and measures of hope, optimism, and perceived stress. After completing Time 1, participants received credit through SONA and were reminded that they would be contacted in March to complete Time 2. Following Time 1 completion, participants were given a study ID number, allowing the information from the three time points to be linked.

In week 9 of the semester, participants received an email inviting them to complete Time 2 of the study. The email reminded them of the first time point of the study and asked them to complete the Time 2 survey before the end of week 11 of the semester. A survey link was provided in the email. Participants were informed that this survey could be completed from any computer with internet access and would take roughly 30 minutes to complete. All questionnaires were presented in the same order to each participant. Data collected at this point time included: name, self-reported current semester GPA and measures of perceived stress and study time. After completing Time 2 participants received credit through SONA and were reminded that they would be contacted in April to complete Time 3.

Following the completion of the semester,⁴ academic records were collected from the IUPUI registrar. During Time 1, participants consented to release of academic records allowing the registrar to release fall 2017 semester and cumulative GPA and spring 2018 semester and cumulative GPA. The Institutional Review Board at IUPUI approved this study.

⁴ In week 14 of the semester, participants received a link via email to complete a self-report questionnaire for Time 3. They were asked to complete the questionnaire before week 16 of the semester. At Time 3, participants were asked to complete the survey using any computer with internet access. Data collected at this time point included: self-reported class grade and semester GPA, and perceived stress. Following completion of Time 3 participants received credit through SONA. This survey data was collected, but is not analyzed for this study.

Measures

Previous GPA

Previous GPA was measured using fall 2017 cumulative GPA. Fall 2017 cumulative GPA was obtained from the IUPUI registrar and was based on a 4.0 scale.

Academic Expectations

Expected GPA was measured using a self-report of the GPA that participants predicted they would receive during the current semester (spring 2018), which was collected during the Time 1 survey. Academic expectation was assessed with the question: “What is your expected semester GPA?” Self-report GPA expectations are analyzed based on a 4.0 scale.

Academic Performance

Academic Performance was measured as the participant’s semester GPA at the end of the semester that the study was obtained (spring 2018). Spring 2018 semester GPA was obtained from the IUPUI registrar and was based on a 4.0 scale.

Hope

Trait hope was measured using the Adult Hope Scale (AHS; (Snyder et al., 1991). The AHS is a self-report scale of 12-items consisting of four items assessing pathways (i.e., “I can think of many ways to get out of a jam”), four items assessing agency (i.e., “I’ve been pretty successful in life”), and four items serving as distractors. In completing this scale, participants are asked to indicate the extent to which each statement describes them using an 8-point Likert-type scale ranging from definitely false to definitely true (Appendix A.1). Higher scores indicate higher levels of trait hope. The AHS generates subscale scores for pathways and agency, as well

as an overall hope score combining the pathway and agency scores. The AHS is commonly used in samples of undergraduates and has been shown to be reliable and produce valid scores for this sample population (Snyder et al., 1991). Only total hope scores will be used in the analysis.

Cronbach's alpha for total hope in this study was .85.

Optimism.

Trait optimism was measured using the Life Orientation Test-Revised (LOT-R; (Scheier, Carver, & Bridges, 1994). The LOT-R is a self-report scale of 10-items consisting of six items assessing optimism, three normally-scored items (i.e., "In uncertain times, I usually expect the best") and three reverse-scored items (i.e., "If something can go wrong for me it will"), and four items serving as distractors. In completing this scale, participants are asked to indicate the extent to which they agree with each statement using a 5-point Likert-type scale ranging from strongly disagree to strongly agree (Appendix A.2). High scores indicate higher levels of trait optimism. The LOT-R is commonly used in samples of undergraduates and has been shown to be reliable and produce valid scores for this sample population (Scheier et al., 1994). Cronbach's alpha for the LOT-R in this study was .82.

Perceived Stress.

Perceived stress was measured using the Perceived Stress Scale (PSS; (Cohen, Kamarck, & Mermelstein, 1983). The PSS is a four-item self-report scale consisting of items assessing general life stress. It consists of two normally-scored items (i.e., "Have you felt that you were unable to control the important things in your life?") and two reverse-scored items (i.e., "Have you felt confident about your ability to handle your personal problems?"). In completing this scale, participants are asked to indicate the extent to which they have felt or thought about each

item over the last month using a 5-point Likert-type scale ranging from never to very often (Appendix A.3). High scores indicate higher levels of perceived stress. The PSS is commonly used in samples of undergraduates and has been shown to be reliable and produce valid scores for this sample population (Cohen et al., 1983). Cronbach's alpha of the PSS in this study was .74.

Study Time.

Study time was measured using the following self-report question: "How many hours a week do you spend studying?" This question was taken from a set of eight self-report questions adopted from the Self-Regulatory Effort Measure (Critcher & Ferguson, 2016). The adopted questions consist of five free response items, and three items using an 11-point Likert-type scale, ranging from significantly less than others to significantly more than others. For the free response items, participants are asked to provide information on how many hours per week they spend studying, how many times they have missed class, how early they begin working on exams or assignments, and how much they pay attention in class. For the Likert-type scale items, participants are asked to compare their study behaviors on hours spent studying, class attendance, missing assignments, and paying attention in class (Appendix A.4).

Analytic Plan

Preliminary Analysis

I calculated descriptive statistics (i.e., means, standard deviations, frequencies, ranges) of the sample's demographic characteristics to characterize the sample. I analyzed data for normality, linearity, outliers, and missing data. I assessed normality using Kline's (2015) guidelines of skewness ($<|3|$) and kurtosis ($<|8|$). I ran all analysis with the completed data set,

and then I used multiple imputation for participants missing entire measures (Tabachnick & Fidell, 2012). Multiple imputation was completed using the MICE package in R (van Buuren & Groothuis-Oudshoorn, 2011). I ran all analysis with complete data as well imputed data for sensitivity analysis.

Aim 1. I used multiple linear regression in SPSS (version 24.0, Armonk, NY, USA) to examine the differential relationship between trait expectations (i.e., hope and optimism) and previous experience in predicting specific expectations. I used multiple regression to analyze hope, optimism, and academic achievement as predictors of academic expectations (Aim 1).

Aim 2. I used the PROCESS macro bootstrapping procedures (Hayes, 2013) in SPSS to examine perceived stress and study time as mediators for the relationship between academic expectations and academic performance (Aim 2). I examined a mediation model for each mediator individually. PROCESS estimated the coefficients for the model, providing information on the direct and indirect effects. Total, direct, and indirect effects were analyzed for significance at a 95% confidence interval. If the interval includes zero, then zero cannot be ruled out as a plausible value for the effect.

Aim 3. I examined previous GPA as a moderator for academic expectations and academic performance (Aim 3) using PROCESS macro (Hayes, 2013) in SPSS. PROCESS mean-centered the variables, created the interaction term, and generated data points one standard deviation above and below the mean for the moderator (Hayes, 2013). In order for the interaction effects to be significant, their supported coefficients needed to be statistically different from zero. All significant interactions were graphed using Excel based on the values generated from the PROCESS output.

Multiple Imputations.

Multiple imputations were run using the MICE package in R (van Buuren & Groothuis-Oudshoorn, 2011; RStudio Team, 2016). There were five imputed data sets computed (Rubin, 1989; van Buuren & Groothuis-Oudshoorn, 2011), and subsequent analysis of the imputed data was completed in R. Linear regressions were run for each of the imputed data sets. The results of the regressions for each of the five data sets were pooled using Rubin's Rule (Rubin, 1989; van Buuren & Groothuis-Oudshoorn, 2011). Results were analyzed using completed data and imputed data for sensitivity analysis.

RESULTS

I recruited 149 undergraduates from a large Midwestern urban university to participate in this study. Most participants were female (75.8%) and Caucasian (69.8%). Most participants identified as freshman (52.3%) or sophomores (24.8%) in college, with the mean of 20.98 years and a standard deviation of 4.12 years. All demographic data are presented in Table 1.

Table 1: Sample characteristics and descriptive statistics

Variable	Median	SD
Age	20.98	4.12
<i>Sex</i>	N	(%)
Female	113	75.8
Male	36	24.2
<i>Ethnicity</i>		
Asian	13	8.7
African-American	16	10.7
Hispanic/Latino	11	7.4
White	104	69.8
Other	5	3.3
<i>Year in School</i>		
Freshman	78	52.3
Sophomore	37	24.8
Junior	19	12.8
Senior	6	4.0
Other	9	6.0

I examined data for missingness and outliers. A total of 22.8% of participants were missing data either from Time 2 or from the registrar. A total of 14.8% of participants were

missing previous GPA data, 8.0% were missing study time data, 6.7% were missing perceived stress data, and 0.6% were missing academic performance data. I ran a series of independent samples t-tests to examine potential differences between the participants missing data and those not missing data. There were no significant differences for participants missing previous GPA data based on alpha of 0.05. However, participants missing any data had a significant difference in hope scores (Missing: $M = 43.48$, $SD = 9.02$; Non-Missing: $M = 46.86$, $SD = 7.69$; $t(147) = -2.14$, $p = 0.03$) and in academic performance (Missing: $M = 2.68$, $SD = 1.31$; Non-Missing: $M = 3.18$, $SD = .92$; $t(147) = -2.44$, $p = 0.02$). Participants missing study time data had significant differences in optimism (Missing: $M = 10.17$, $SD = 4.84$; Non-Missing: $M = 14.80$, $SD = 4.50$; $t(147) = 3.40$, $p = 0.001$) and academic performance (Missing: $M = 2.19$, $SD = 1.43$; Non-Missing: $M = 3.14$, $SD = .96$; $t(146) = 3.02$, $p = 0.003$). Participants missing perceived stress data had significant differences in optimism (Missing: $M = 9.60$, $SD = 4.95$; Non-Missing: $M = 14.78$, $SD = 4.49$; $t(147) = 3.50$, $p = 0.001$) and academic performance (Missing: $M = 2.13$, $SD = 1.43$; Non-Missing: $M = 3.13$, $SD = .98$; $t(146) = 2.89$, $p = 0.004$). Participants who did not complete the study had lower levels of trait expectations and academic performance. The difference in academic performance is concerning as weaker students were more likely to be missing data. This may influence the relationship between academic expectations and academic performance, specifically when testing study time and perceived stress as mechanisms for this relationship. All analysis was run using the participants with complete data, then run using multiple imputations, creating five complete data sets for all 149 participants.

Non-numeric responses or number range responses were converted to single numbers for academic expectations and study time variables. For example, expected GPA responses of letter grades were converted to their numerical equivalent (i.e., a response of “B” became a “3.0”), and

responses of GPA ranges were converted to the mean of the range (i.e., a response of “3.7-3.9” became a “3.8”). Study time responses of a range of hours spent studying were converted to the mean of the range (i.e., a response of “10-12” became “11”). Distractor items were removed, negatively worded items were reverse scored, and scale scores were computed.

Scale totals and single item variables were examined for normality using absolute values of the skew ($<|3|$) and kurtosis ($<|8|$; Kline, 2015). Scale scores and single items for all variables had acceptable skew indices (0.05 to 1.63) and kurtosis indices (0.05 to 4.11; Kline, 2015). The means, standard deviations, and correlations for all variables, as well as the Cronbach’s alphas for hope, optimism, and perceived stress are presented in Table 2.

Table 2: Zero order correlations between study variables.

Variable	Expected GPA	Hope	Optimism	Previous GPA	Current GPA	Study Time	Perceived Stress
Expected GPA	-	0.17*	0.35**	0.62**	0.68**	0.2*	-0.11
Hope		-	0.36**	0.11	-0.03	0.03	-0.30**
Optimism			-	0.17	0.28**	0.21*	-0.51**
Previous GPA				-	0.69**	-0.09	-0.04
Current GPA					-	0.14	-0.12
Study Time						-	-0.13
Perceived Stress							-
Mean	3.51	46.11	14.43	3.17	3.07	14.54	6.46
SD	0.44	8.10	4.68	0.81	1.03	11.83	2.87
α		0.85	0.82				0.74
Min	2.00	25.00	2.00	0.00	0.00	0.00	0.00
Max	4.00	63.00	24.00	4.00	4.00	72.00	14.00

Note: *significant at $p < .05$, **significant at $p < 0.01$

Aim 1: Linear Regression

To test my first research aim and subsequent hypotheses, I ran a linear regression of hope, optimism, and previous GPA predicting expected GPA. Participants with missing previous GPA data were removed before running the regression, leaving a total of 126 participants. The model predicting academic expectations from hope, optimism, and previous GPA was significant and accounted for 46.2% of the variance, $R^2 = .46$, $F(3, 123) = 35.17$, $p < 0.001$. Optimism, $B =$

.02, $p = 0.001$, and previous GPA, $B = .30$, $p < 0.001$, both significantly predicted academic expectations when controlling for hope. Hope, $B = 0.004$, $p = .27$, did not significantly predict academic expectations. See Table 3 for regression results. This means that as a person increased in one unit of optimism, they increased by .02 units in academic expectations. Similarly, as they increased one unit in previous GPA, they increased by .30 units in academic expectations.

Variance Inflation Factors (VIF) for hope, optimism, and previous GPA were 1.19, 1.21, and 1.03, respectively. Based on VIF for each variable being below five and correlations between variables being below .8 (see Table 3), the criteria for multicollinearity concern have not been met (Vatcheva, Lee, McCormick, & Rahbar, 2016).

Table 3: Linear Regression Model of hope, optimism, and previous GPA predicting academic expectations, run in SPSS

Variable	B	SE	t	p
Hope	0.004	0.004	1.12	0.265
Optimism	0.022	0.007	3.38	0.001
Previous GPA	0.298	0.035	8.43	<0.001

Note: B, unstandardized coefficient; SE, standard error; t, t-test; p, probability. N=126

To test for sensitivity, I used multiple imputations in R to predict academic expectations from hope, optimism, and previous GPA for all 149 participants. Results are the pooled linear regression results from the five data sets, results were pooled using Rubin's rule (Rubin, 1989). Optimism, $B = 0.02$, $p = 0.001$, and previous GPA, $B = .32$, $p < 0.001$, both significantly predict academic expectations when controlling for hope. Hope, $B = .003$, $p = .45$, did not significantly predict academic expectations. These results are consistent with the results found from the

completed data. See Table 4 for regression results of all five data sets and Table 5 for regression results of pooled data.

Table 4: Linear regression model of hope, optimism, and previous GPA predicting academic expectations. Results from each of the 5 data sets formed using Multiple Imputations, run in R.

Variable	B	SE	t	p
Data Set 1				
Hope	0.003	0.004	0.72	0.476
Optimism	0.02	0.01	3.44	<0.001
Previous GPA	0.33	0.03	9.99	<0.001
Data Set 2				
Hope	0.003	0.004	0.69	0.492
Optimism	0.02	0.01	3.52	<0.001
Previous GPA	0.30	0.03	8.77	<0.001
Data Set 3				
Hope	0.003	0.004	0.95	0.342
Optimism	0.02	0.01	3.56	<0.001
Previous GPA	0.32	0.04	9.20	<0.001
Data Set 4				
Hope	0.002	0.004	0.60	0.552
Optimism	0.02	0.01	3.05	0.003
Previous GPA	0.32	0.04	9.19	<0.001
Data Set 5				
Hope	0.003	0.004	0.89	0.373
Optimism	0.02	0.006	3.81	<0.001
Previous GPA	0.32	0.03	9.38	<0.001

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability. N=149

Table 5: Linear Regression Model of hope, optimism, and previous GPA predicting academic expectations. Pooled results of Multiple Imputations, run in R.

Variable	B	SE	t	p
Hope	0.003	0.004	0.76	0.449
Optimism	0.02	0.006	3.34	0.001
Previous GPA	0.32	0.04	8.71	<0.001

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability. N=149

Aim 2: Mediation

To test my second aim and subsequent hypotheses, I ran two mediation models utilizing Hayes (2013) PROCESS macro and 10,000 bootstrap samples. Each model predicted academic performance from academic expectations, with the first model examining the indirect effect of study time and the second model examining the indirect effect of perceived stress. Participants missing study time or perceived stress were removed from their subsequent models, leaving 137 participants for the study time model and 139 participants for the perceived stress model.

Study Time. There was not a significant indirect effect of academic expectations on academic performance via study time (.0046; 95% CI: [-.04, .08]). However, there was a significant effect of academic expectations on study time (5.28; 95% CI: [.61, 9.95]) and a significant direct effect of academic expectations on academic performance (1.51; 95% CI: [1.22, 1.80], $R^2 = .44$). When examining the effect of study time on academic performance when academic expectations were

constant, the relationship was not significant (.0009; 95% CI: [-.01, .01])⁵. See Table 6 for mediation results.

Table 6: Mediation model of academic expectations predicting academic performance via study time, run in SPSS

Path	B	SE	p	95% CI
a	5.23	2.36	0.027	0.61, 9.95
b	0.001	0.005	0.8715	-0.01, 0.01
c	1.51	0.14	<0.001	1.22, 1.80
c'	1.51	0.15	<0.001	1.21, 1.80
ab	0.005	0.03		-0.04, .078

Note: B, unstandardized coefficient; SE, standard error; p, probability; 95% CI, 95% confidence interval. N=137

Perceived Stress. There was not a significant indirect effect of academic expectations on academic performance via perceived stress (.01; 95% CI: [-.02, .07]). However, there was a significant direct effect of academic expectations on academic performance (1.53; 95% CI: [1.24, 1.83], $R^2 = .45$). When examining the effect of academic expectations on perceived stress and perceived stress on academic performance when academic expectations were constant, the relationships were not significant (-.74; 95% CI: [-1.88, .40] and -.01; 95% CI: [-.06, .03] respectively).⁶ See Table 7 for mediation results.

⁵ Mediation analysis was run with study time predicting academic performance via academic expectations. There was a significant indirect effect of study time on academic performance via academic expectations (.01; 95% CI: [.0003, .02], but there was not a significant direct effect of study time on academic performance (.001; 95% CI [-.01, .01]). There was a significant effect of study time on academic expectations (.01; 95% CI [.001, .01], and academic expectations on academic performance (1.51, 95% CI [1.21, 1.80]).

⁶ Mediation analysis was run with perceived stress predicting academic performance via academic expectations. There was not a significant indirect effect of perceived stress on academic performance via academic expectations (-.02; 95% CI: [-.06, .1]), direct effect of perceived stress on academic performance (-.01; 95% CI [-.06, .03]), or perceived stress on academic expectations (-.02; 95% CI [-.04, .01]). There was a significant effect of academic expectations on academic performance (1.53, 95% CI [1.24, 1.83]).

Table 7: Mediation model of academic expectations predicting academic performance via perceived stress, run in SPSS

Path	B	SE	p	95% CI
a	-0.74	0.58	0.201	-1.88, 0.40
b	-0.02	0.02	0.506	-0.56, 0.03
c	1.55	0.15	<0.001	1.26, 1.83
c'	1.53	0.15	<0.001	1.24, 1.83
ab	0.01	0.02		-0.03, 0.63

Note: B, unstandardized coefficient; SE, standard error; p, probability; 95% CI, 95% confidence interval. N=139

To test for sensitivity, I used multiple imputations in R to predict academic performance from expected GPA via perceived stress or study time for all 149 participants. Results are the pooled linear regression results from the five data sets, results were pooled using Rubin's rule (Rubin, 1989).

Study Time. There was a significant effect of academic expectations on study time (5.56, $p = .014$), and a significant direct effect of academic expectations on academic performance (1.62, $p < .001$). When examining the effect of study time on academic performance when academic expectations were constant, the relationship was not significant (.003, $p = .623$), similarly the calculated indirect effect was not significant (.02). See Table 8 for mediation results of all five data sets and Table 9 for mediation results of pooled data. These results are consistent with the results found from the complete data run in PROCESS.

Table 8: Mediation model of academic expectations predicting academic performance via study time. Results from each of the 5 data sets formed using Multiple Imputations, run in R.

Path	B	SE	t	p
Data Set 1				
a	5.91	2.15	2.75	0.007
b	0.001	0.01	0.15	0.883
c	1.56	0.15	10.40	<0.001
c'	1.57	0.15	10.80	<0.001
ab	0.005			
Data Set 2				
a	5.39	2.15	2.50	0.013
b	0.003	0.01	0.72	0.474
c	1.62	0.15	11.00	<0.001
c'	1.64	0.14	11.40	<0.001
ab	0.02			
Data Set 3				
a	6.26	2.15	2.91	0.005
b	0.003	0.01	0.61	0.543
c	1.59	0.15	10.80	<0.001
c'	1.61	0.14	11.20	<0.001
ab	0.02			
Data Set 4				
a	4.93	2.17	2.28	0.024
b	0.002	0.01	0.36	0.718
c	1.66	0.15	11.30	<0.001
c'	1.67	0.15	11.60	<0.001
ab	0.01			
Data Set 5				
a	5.31	2.15	2.46	0.015
b	0.004	0.01	0.73	0.468
c	1.65	0.15	11.20	<0.001
c'	1.67	0.15	11.60	<0.001
ab	0.02			

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability.

N=149

Table 9: Mediation model of academic expectations predicting academic performance via study time. Pooled results of Multiple Imputations, run in R.

Path	B	SE	t	p
a	5.54	2.30	2.49	0.014
b	0.003	0.01	0.49	0.623
c	1.62	0.15	10.43	<0.001
c'	1.63	0.15	10.70	<0.001
ab	0.02			

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability. N=149

Perceived Stress. There was a significant direct effect of academic expectations on academic performance (1.61, $p < .001$). When examining the effect of academic expectations on perceived stress and perceived stress on academic performance when academic expectations were constant, the relationships were not significant (-.82, $p = .138$; and -.03, $p = .276$ respectively). Similarly, the calculated indirect effect was not significant (.02). See Table 10 for mediation results of all five data sets and Table 11 for mediation results of pooled data. These results are consistent with the results from the complete data run in PROCESS.

Table 10: Mediation model of academic expectations predicting academic performance via perceived stress. Results from each of the 5 data sets formed using Multiple Imputations, run in R.

Path	B	SE	t	p
Data Set 1				
a	-0.69	0.53	-1.30	0.195
b	-0.03	0.02	-1.21	0.227
c	1.55	0.15	10.60	<0.001
c'	1.57	0.15	10.80	<0.001
ab	0.02			
Data Set 2				
a	-0.82	0.54	-1.52	0.131
b	-0.02	0.02	-1.04	0.301
c	1.62	0.15	11.20	<0.001
c'	1.64	0.14	11.40	<0.001
ab	0.02			
Data Set 3				
a	-0.72	0.53	-1.37	0.172
b	-0.02	0.02	-0.80	0.427
c	1.60	0.15	11.10	<0.001
c'	1.61	0.14	11.20	<0.001
ab	0.01			
Data Set 4				
a	-0.98	0.54	-1.80	0.074
b	-0.04	0.02	-1.70	0.092
c	1.64	0.15	11.30	<0.001
c'	1.67	0.15	11.60	<0.001
ab	0.04			
Data Set 5				
a	-0.90	0.53	-1.69	0.093
b	-0.02	0.02	-1.08	0.284
c	1.65	0.15	11.30	<0.001
c'	1.67	0.15	11.60	<0.001
ab	0.02			

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability.

N=149

Table 11: Mediation model of academic expectations predicting academic performance via perceived stress. Pooled results of Multiple Imputations, run in R.

Path	B	SE	t	p
a	-0.82	0.55	-1.49	0.138
b	-0.03	0.02	-1.1	0.276
c	1.61	0.15	10.6	<0.001
c'	1.63	0.15	10.7	<0.001
ab	0.02			

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability. N=149

Aim 3: Moderation

I examined the relationship between academic expectations predicting academic performance, previous GPA predicting academic performance, and the interaction between academic expectations and previous GPA predicting academic performance using Hayes (2013) PROCESS macro moderation model. Participants with missing previous GPA data or academic performance were removed before running the regression, leaving a total of 125 participants. Before running the moderation model in PROCESS, I mean centered academic expectations and previous GPA. Then I ran the process model with the mean centered academic expectations and previous GPA predicting academic performance. I found that academic expectations significantly predicted academic performance ($b = .79, p < .001$), previous GPA significantly predicted academic performance ($b = .55, p < .001$), and the interaction between academic expectations and previous GPA significantly predicted academic performance ($b = -.43, p = .007$). See Table 12 for moderation results. I probed the interaction, observing the conditional effect of academic expectations for previous performance at the mean, one standard deviation above the mean, and

one standard deviation below the mean. Results showed that the interaction was significant for mean previous performance ($b = .68, p = .001$) and at one standard deviation below the mean ($b = 1.08, p < .001$), but was not significant for one standard deviation above the mean ($b = .48, p = .05$). A visual representation of the interaction between academic expectations and previous GPA on academic performance is shown in Figure 5.

Table 12: Moderation Model of academic expectations predicting academic performance, moderated by previous GPA run in SPSS

Variable	B	SE	p	95% CI
Academic Expectations	0.79	0.47	<0.001	1.22, 3.1
Previous GPA	0.55	0.56	0.003	.97, 3.17
Academic Expectations * Previous GPA	-0.43	0.16	0.007	-.75, -.12

Note: B, unstandardized coefficient; SE, standard error; t, p, probability; 95% CI, 95% confidence intervals. N=125

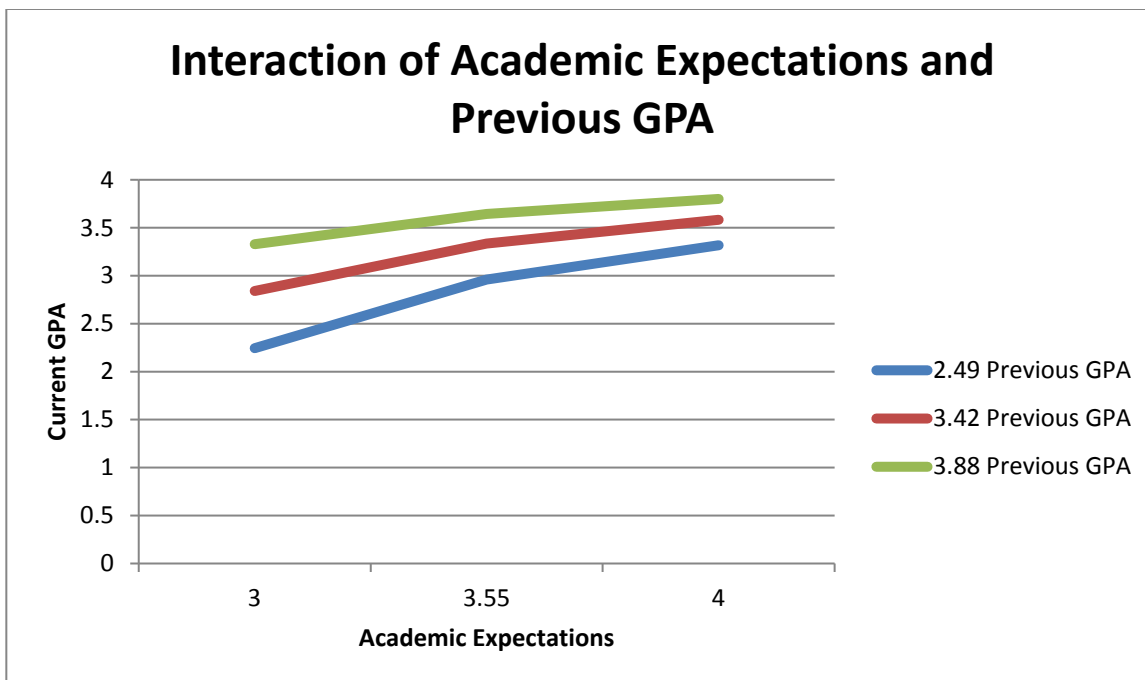


Figure 5: Visual representation of the interaction between academic expectations and previous GPA on academic performance.

To test for sensitivity, I used multiple imputations in R to examine the interaction between academic expectations and previous GPA predicting academic performance for all 149 participants. Before imputing the data, I mean centered academic expectations and previous GPA, allowing the regressions to be run with the mean centered data. Results are the pooled linear regression results from the five data sets, results were pooled using Rubin's rule (Rubin, 1989). Academic expectations and previous GPA significantly predicted academic performance ($b = .79, p < .001$; $b = .55, p < .001$ respectively). The interaction between academic expectations and previous GPA also significantly predicted academic performance ($b = -.43, p = .007$). See Table 13 for moderation results of all five data sets and Table 14 for moderation results of pooled data. These results are consistent with the results from the complete data run in PROCESS.

Table 13: Moderation Model of academic expectations predicting academic performance, moderated by previous GPA. Results from each of the 5 data sets formed using Multiple Imputations, run in R.

Variable	B	SE	t	p
Data Set 1				
Academic Expectations	0.79	0.19	4.23	<0.001
Previous GPA	0.55	0.09	6.01	<0.001
Academic Expectations * Previous GPA	-0.43	0.16	-2.27	0.007
Data Set 2				
Academic Expectations	0.79	0.19	4.23	<0.001
Previous GPA	0.55	0.09	6.01	<0.001
Academic Expectations * Previous GPA	-0.43	0.16	-2.74	0.007
Data Set 3				
Academic Expectations	0.79	0.19	4.23	<0.001
Previous GPA	0.55	0.09	6.01	<0.001
Academic Expectations * Previous GPA				0.007
GPA	-0.43	0.16	-2.74	
Data Set 4				
Academic Expectations	0.79	0.19	4.23	<0.001
Previous GPA	0.55	0.09	6.01	<0.001
Academic Expectations * Previous GPA	-0.43	0.16	-2.74	0.007
Data Set 5				
Academic Expectations	0.79	0.19	4.23	<0.001
Previous GPA	0.55	0.09	6.01	<0.001
Academic Expectations * Previous GPA	-0.43	0.16	-2.74	0.007

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability.

N=149

Table 14: Moderation Model of academic expectations predicting academic performance, moderated by previous GPA. Pooled results of Multiple Imputations, run in R.

Variable	B	SE	t	p
Academic Expectations	0.79	0.19	4.22	<0.001
Previous GPA	0.55	0.09	6.01	<0.001
Academic Expectations * Previous GPA	-0.43	0.16	-2.74	0.007

Note: B, standardized coefficient; SE, standard error; t, t-test; p, probability.

N=149

DISCUSSION

This study sought to examine predictors of academic expectations and the relationship between academic expectations and academic performance. Previous GPA, hope, and optimism were examined as predictors of academic expectations. Academic expectations, perceived stress, and study time were examined as predictors of academic performance. Academic expectations were predicted by previous GPA and optimism, but not by hope. Academic expectations predicted academic performance. This relationship was not mediated by perceived stress or study time, but was moderated by previous GPA.

Aim 1

Aim 1 examined the differential abilities of hope, optimism, and previous GPA in predicting academic expectations. Results showed that only previous GPA and optimism predicted academic expectations.

These findings align with previous research examining the link between academic performance and specific academic expectations. For example, Bandura (1977, 1983) found that expectations are anchored in previous experience of similar situations and that previous experiences are predictors of expectations regarding performance. Similarly, Rand (2009) found that high school GPA predicted undergraduate student expectations for their course grade in a psychology class. Hackett, Betz, Casas, and Rocha-Singh (1992) found that SAT scores correlated with student expectations for semester performance, successfully completing an undergraduate engineering degree, and getting a job following graduation. Overall, prior research and results of this study show that previous performance predicts individual's specific expectations.

In line with the results of this study, Carver and Scheier (1998) suggested expectations occur in a hierarchy with trait expectations (e.g., optimism) predicting specific expectations. Previous research has found that optimism is associated with specific academic expectations. Robbins, Spence, and Clark (1991) found that optimism was associated with student academic expectations and academic strivings. Lee, Ashford, and Jamieson (1993) also found that optimism was associated not only with student academic strivings but also with examination and course grades. In a sample of first-year undergraduate students, optimism predicted student's academic expectations regarding meeting academic goals and performing well academically (Chemers et al., 2001). Prior research aligns with results of this study, showing that optimism plays an important role in predicting specific expectations.

In contrast, the findings that optimism, but not hope, predicted academic expectations are not in line with previous studies examining this relationship. Hope, as a trait expectation, is more goal-oriented and specific than optimism (Snyder, Sympson, Michael, & Cheavens, 2001). Hope is the belief that one will achieve one's goals (Snyder, 1994). Hope has been shown to play an important role in academics, not only in predicting academic expectations, but also in predicting academic outcomes. Rand (2009) found that hope predicted undergraduate student course expectations, whereas optimism did not. Feldman and Kubota (2015) expanded on this research and showed that hope predicted academic specific expectations, measured through academic hope and academic self-efficacy. Snyder and colleagues (2002) found that hope predicted undergraduate academic performance and graduation rates, and that higher-hope students were more likely to have a clear conceptualization of their academic goals. Hope was also found to predict graduation in undergraduate students above and beyond intelligence, other personality traits, and previous academic achievement (Day, Hanson, Maltby, Proctor, & Wood, 2010).

Hope has been found to play an important role in student's specific academic expectations and specific academic outcomes.

The deviation of the results in this study from what has been found previously could be explained by the generality of the academic expectations or the association between hope and optimism in the sample. Academic expectations of semester grades are more general than the academic expectations of particular course grade (e.g., Rand, 2009) or academic hope and self-efficacy (e.g., Feldman & Kubota, 2015) measured in previous studies. With the conceptualization of academic expectations being more general in this study than in previous studies (i.e., semester GPA versus course grade), it is possible that the more general trait expectation, optimism, is the stronger predictor.

It is also possible that students found it more difficult to predict semester GPA than specific course grade. Predicting semester GPA requires students to not only think of the individual classes they are taking but also the number of classes they are taking and other external factors that might influence their overall performance for the semester. If there are more external factors associated with the expectation of semester GPA, a trait expectation that includes more external influences may serve as a better predictor.

Another factor to consider is that the association between hope and optimism in the present study was weaker than in previous studies. In this study, the correlation between hope and optimism was 0.36; whereas, previous studies have found stronger correlations, ranging from 0.49 to 0.53 (Feldman & Kubota, 2015; Gallagher & Lopez, 2009; Rand, 2009, 2011). The difference in the correlation between hope and optimism could play a role in the predictive abilities of hope and optimism. The differing relationship between hope and optimism in this sample may have affected the relative abilities of hope and optimism to predict academic

expectations. The difference between hope and optimism in this study compared to other studies could be the result of the association between hope and optimism varying across populations or varying based on time of year. The sample in this study was majority female and white, like many of the other studies conducted. However, for this study participants were on average older and more racially and ethnically diverse than previous studies (Feldman & Kubota, 2015; Rand, 2009). The differences in the sample demographics could provide information on how hope and optimism vary across populations. Based on the sample differences, it can be hypothesized that hope and optimism may have a weaker correlation in more diverse urban populations. The time of year that hope and optimism were measured could also play a role in the strength of their correlation. Data were collected for this study at the beginning of the spring semester; whereas, in previous studies data had been collected in the beginning of the fall semester (Rand, 2009, 2011). As students progress through their schooling, the relative roles that hope and optimism play may change. Hope may become less prominent as the school year progresses and students begin to feel more external influences on their performance. As they feel these external influences more, optimism may become more prominent for students, thus a weaker relationship between hope and optimism is found.

Aim 2

Aim 2 examined study time and perceived stress as potential mediators for the relationship between academic expectations and academic performance. Results showed that academic expectations predicted academic performance, but this relationship was not mediated by study time or perceived stress.

In line with the results of this study, prior research shows that academic expectations predicted studying behaviors (Dandy & Nettelbeck, 2000; Jyoti & Devi, 2008). As students

formed expectations of their academic performance, the higher the expectation was, the more time the students reported studying. Expectations regarding outcomes have been found to influence the behaviors necessary for reaching those outcomes (Bandura, 1977). When people form expectations and believe that the outcome is likely and desirable, they will more readily pursue the outcome (Carver & Scheier, 1998). Looking specifically at academic expectations, students form expectations of higher grades, so they study more to improve their performance in classes. A previous study found that as student expectations increased, their study behaviors, measured through a study diary, also increased (Dandy & Nettelbeck, 2000). When looking at academic expectations that students place on themselves, student expectations predicted increased study time (Jyoti & Devi, 2008).

Although academic expectations predicted study time, study time did not predict academic performance. This contrasts with previous research showing that study behaviors and studying are predictors of academic performance (Credé & Kuncel, 2008; Jyoti & Devi, 2008; West & Sadoski, 2011). The relationship between studying and academic performance in this study are in the predicted direction, but the sample may have been underpowered to detect a significant association. Credé and Kuncel (2008) conducted a meta-analysis on study habits and skills and found that study time was associated with academic performance, but that individual's study skills, study attitudes, study habits, and study motivation played a more impactful role on academic performance. In a sample of undergraduates, Rogaten, Moneta, and Spada (2013) found that study time alone did not predict academic performance, but that strategic studying (i.e., target-oriented comprehension of new information) predicted academic performance (i.e., course and semester grades) while surface studying (i.e., rote learning without in-depth understanding) predicted examination performance (i.e., test or exam grade). Time spent

studying does not necessarily translate into understanding of the material, so this may explain the lack of association between study time and academic performance in the present study. The quality of the studying, the study environment, student motivation, and learning approaches all impact how study time influences academic performance (Everaert, Opdecam, & Maussen, 2017; Plant, Ericsson, Hill, & Asberg, 2005). West and Sadoski (2011) measured study strategies using the Learning and Study Strategies Inventory (Weinstein, Zimmermann, & Palmer, 1988), measuring not only the amount of time spent studying, but also attitude when studying, motivation, information processing, study aids, and time management. Study time is an important factor in academic performance, but as previous research shows, several factors influence the relationship between studying and academic behavior beyond time spent studying.

It is possible that study time was not found as a mediator of the relationship between academic expectations and academic performance because of the way that study time was measured. In this study, study time was measured using general retrospective recall, which has been shown in previous research to be less accurate than diary methods of measurement (Lewandowski, Palermo, Kirchner, & Drotar, 2009; Okupa, Sorkness, Mauger, Jackson, & Lemanske, 2013). Data collected through retrospective recall should be used with the knowledge that a portion of people will have inflated or inaccurate recall (Howard, 2011). Retrospective recall has also been shown to be more accurate if the recall is of specific things. Hilton (1989) found that recall of alcoholic beverages consumed was slightly more accurate when participants were recalling specific types of beverages instead of just the total amount consumed. By measuring study time through a general retrospective recall question of “How many hours a week do you study?” instead of a more specific recall regarding hours spent studying that week

or hours studying overall, the chances of having inflated or inaccurate recall is increased, thus decreasing the predictive ability of study time.

In contrast to previous research, academic expectations did not predict perceived stress, and perceived stress did not predict academic performance in the present study. Previous studies have shown that academic expectations predict stress (Hurst et al., 2013; Nguyen, 2017; Tan & Yates, 2011) and stress predicts academic performance (Jyoti & Devi, 2008; Rice et al., 2015). In this study, stress was measured using the PSS (Cohen et al., 1983). Perceived stress is a measure of the general stress an individual perceived in her or his life over the past month and is not specific to academics. Thus, it may not have the same association with academic expectations and performance as academic stress does. Hackett and colleagues (1992) examined the relationship between expectations and stress and found that stress was only associated with negative expectations (i.e., “I won’t get a fair shake in the job market”), not positive expectations (i.e., “I will get a well-paying job”). In this study academic expectations were measured as positive expectations for the student’s academic performance, thus they may not have been related to stress. In other studies, stress was measured specifically related to academics (Hackett et al., 1992; Hua, Song, & Li, 2016; Nguyen, 2017) or through questions such as, “I feel stressed when I do not live up to my own standards” (Tan & Yates, 2011). The lack of relationship between academic expectations and academic performance may have been the result of measuring general stress rather than academic-specific stress.

Current findings of academic expectations predicting academic performance are in line with previous research (Rand, 2009; Suárez-Álvarez et al., 2014). In general, specific expectations predict outcomes, with expectations being associated with behavior changes necessary for the desired outcome to occur (Bandura, 1977; Bandura et al., 1977). Rand (2009)

found that specific grade expectations for an introductory psychology course predicted the overall course performance. Suárez-Álvarez and colleagues (2014) found that academic expectations predicted academic performance in mathematics and science courses. Academic expectations have also been found to predict semester and cumulative GPA (Feldman & Kubota, 2015; Hackett et al., 1992; Robbins et al., 1991). In this study and others, specific expectations have been shown to be strong predictors of performance.

Aim 3

Aim 3 examined previous GPA as a moderator of the relationship between academic expectations and academic performance. In contrast to the hypothesized relationship, results showed that previous GPA moderated the relationship between academic expectations and academic performance, such that expectations were stronger predictors for students who had lower previous GPAs than for students who had higher previous GPAs.

Current findings are in line with prior research showing that there is a complex relationship between expectations and outcomes. In a sample of competitive bridge players, Simons (2013) examined the relationship between predicted winning rates (i.e., expectations) and actual winning rates. Players had positive expectations of what their winning rates would be, with expectations averaging approximately 2% higher than their average win rate. When examining the relationship between these expectations and winning, the top two thirds of the players (i.e., players expecting to win less than average 2% more games than their average) had a positive relationship between expectation and game outcome, while the bottom third of players (i.e., players expecting to win an average 3% more than their average) had a negative relationship between expectation and game outcome (Simons, 2013). Similar to the study of bridge players, this study found that expectations had a different relationship with performance

based on the student's previous performance, though there was not a directional change for the relationship between expectations and performance for those with poorer performance (Jyoti & Devi, 2008; Rice et al., 2015).

Findings suggest that positive academic expectations are associated with better performances for all students, but that expectations have a stronger predictive ability among students with poorer previous performance. There are two possible explanations for this finding: 1) students with poorer performance may strive harder; or 2) the results are an artifact of a ceiling effect on GPA. In the study of bridge players, expectations were a stronger predictor of games won for players who had won fewer previous games than those who had won more previous games (Simons, 2013). Similarly, in this study expectations were the stronger predictors of performance for students who were one standard deviation below the mean on previous performance and were the weaker predictors of performance for students who were one standard deviation above the mean. The differences in the relationship based on previous performance show that previous performance may play a role in the pursuit of outcomes and in the formation of expectations. In a study of college students, Ramdass and Zimmerman (2011) found that when presented with high expectations of themselves and their academic performance, students who had done poorly in the past were more motivated to develop self-regulatory behaviors to reach their expected performance. For students with poorer previous performance, expectations may play a stronger role in predicting performance. Alternatively, students with higher previous performance are limited in their expectations of performance, as they cannot improve much from their previous performance. Due to the ceiling effect of GPA, higher academic expectations cannot correlate with higher academic performance for students who are close to or at the ceiling measurement of GPA (i.e., students who have a 4.0 predicting a 4.0). The increased strength in

predictive ability of expectations is consistent with prior research, showing that previous experiences impact the relationship between expectations and outcomes.

The results of this study may have been influenced by the differences in the participants who completed all measures and those who had missing data. Academic performance was different for participants missing any data compared to those with completed data and was different for measures of study time and perceived stress. Hope scores were different for participants missing any data compared to those with completed data sets. Optimism scores were different for participants missing measures of study time and perceived stress. The differences for participants with missing data from those without missing data are a potential threat to the validity of the study. The students who did not complete the study and had missing measures were students who had lower academic performance, lower optimism scores, and lower hope scores. Based on the differences seen between participants with completed or missing data, it appears that participants with lower hope and optimism were less likely to complete the study, which could influence their predictive ability. Participants with completed or missing data had significantly different study time and perceived stress score, thus bringing into question the predictive ability of perceived stress and study time in mediating the relationship between academic expectations and academic performance. Participants with completed data had higher academic performance, thus the results of the study may not generalize to students with lower academic performance, as these participants were more likely to drop out of the study.

Overall the results of this study align with the proposed hypotheses in the finding that previous performance predicted academic expectations, academic expectations predicted academic performance, and previous performance moderated the relationship between expectations and performance; however, the results of this study deviate from proposed

hypotheses as optimism, not hope, predicted academic expectations, and study time and perceived stress did not mediate the relationship between expectations and performance. The hypotheses of this study were formed using prior research on the relationship between expectations and performance, but the nomological network of the variables in this sample may be different than that of prior studies. The sample used in this study was on average older (cf., Dandy & Nettelbeck, 2000; Feldman & Kubota, 2015; Jyoti & Devi, 2008; Rand, 2009), more racially and ethnically diverse (cf., Dandy & Nettelbeck, 2000; Rand, 2009), consisted of undergraduate students (cf., Jyoti & Devi, 2008; West & Sadoski, 2011), consisted of more 2nd-5th year undergraduate students (cf., Feldman & Kubota, 2015; Rand, 2009), and took place in a different geographic region (cf., Dandy & Nettelbeck, 2000; Feldman & Kubota, 2015; West & Sadoski, 2011). The students in this sample on average had spent more time in college and were older than students in other studies. An older sample may differ from a younger sample as the older sample has increased life experience. Increased life experience could result in the participants having a better understanding of external factors that influence their lives (Molinari & Niederehe, 1985; Twenge, Zhang, & Im, 2004), thus changing the predictive abilities of hope (Shanahan, Fischer, & Rand, 2019) and study time. The differences in the participants in this study and those in previous studies may account for some of the non-significant results. The differential abilities of hope and optimism to predict academic expectations may have been influenced by the racial and ethnic diversity of the sample, the sample age, or the year in school of the participants. Prominent studies focusing on study time predicting academic performance looked specifically at high school students (Jyoti & Devi, 2008) and first year medical students (West & Sadoski, 2011), thus it is possible that study time had different predictive ability based on the education level of the population. Overall there are many differences between the sample

characteristics of these studies. There may be group differences in ages, geographical locations, gender, and race on how people utilize trait expectations and how expectations predict outcomes.

Limitations

There are several limitations in this study worth noting. A potential limitation of this study is the interplay between personality and expectations. Carver and Scheier (1998) described optimism as a trait expectation, but optimism has also been described as a distinct personality trait (Alarcon, Bowling, & Khazon, 2013). Personality plays a role in many different aspects of academics, thus the interplay of between trait expectation and personality may influence aspects of the analysis of the formation of specific expectations. Personality has been shown to play a role in how studying (Credé & Kuncel, 2008) and stress (Pettit & DeBarr, 2011) impact performance. It is also possible that if trait expectations are in fact aspects of personality, that they will be affected by the changing of environments (Caspi & Moffitt, 1993). Caspi and Moffitt (1993) postulate that personality differences are likely to appear during times of transition, which may then affect how strongly the personality traits influence one's behaviors. Academic expectations were collected during the beginning of the spring semester, which could have served as a transition point for participants, thus making it possible that hope and optimism were fluctuating at this time.

A key variable in this study was student's expectations for their semester academic performance. Students were asked to respond to the open-ended question of: "What is your expected semester GPA?" However, students may not fully understand what GPA means. We did not provide students with a key of the GPA equivalent for each letter grade, thus they may not fully understand that an A- is a 3.7 and a B+ is a 3.3. The possible confusion with the

measure of GPA could have introduced error into the expectations variable that was key to all other analysis.

Sample size and subsequent lack of power is another potential limitation of this study. Mediation analysis requires a large sample size in order to detect results with a power of 0.8. Fritz and Mackinnon (2007) analyzed multiple mediation analyses finding that the majority of mediation analyses were underpowered to detect small effects. They concluded that to find a small effect between the independent variable and the mediator, the mediator and the dependent variable, and an indirect effect, a sample size of around 200 is necessary (Fritz & Mackinnon, 2007). Pan, Liu, Miao, and Yuan (2018) examined the required sample size for mediation analysis of longitudinal data, finding that a sample size of 220 was necessary to detect a medium effect and a sample of 400 was necessary to detect a small effect. Based on the sample size of 149 participants, this study was only powered to find a large effect in mediation analysis, thus limiting the mediation analysis.

Finally, this study was limited due to reliance on self-report measures and the participants that made up the sample. Most of the information collected from students was through self-report measures, which could result in a biased collection of data (Rosenman, Tennekoon, & Hill, 2011). The participants for this study were recruited through an introductory psychology course, resulting in a less diverse student sample, than the overall school population. Most participants in this sample were studying science, engineering, or health related topics; thus bringing into question the generalizability of the results of this study. The overall school population is majority science, engineering, or health related majors; but there are increasing number of business, liberal arts, and art students on campus. The results of this study may not translate to students in non-science and health areas, as those students may be of a different population than the sample

studied. The study also took place in at an urban campus located in the Midwestern United States. The school that the sample was recruited from is located in the middle of a large city, so the school is heavily influenced by the city. By being located in such a unique area, the school attracts a different population than that of other schools in the same region. This may mean the results found for this specific sample do not generalize to other populations outside of the city.

Though this study is limited due to a variety of factors, there are some strengths to the study. A key strength of the study is that the academic data (i.e., previous GPA and academic performance) were collected from the IUPUI Registrar. In collecting data through the registrar, we were able to have access to the official semester and cumulative GPAs of the participants in this study, reducing the bias. Another strength of this study is longitudinal design and high completion rate (77.2%). Information from this study was collected over the course of 5 months, with initial collection in January, mid semester collection in March, and academic data in May. Throughout this time, we only had 22.8% of the sample fail to complete measures, allowing for a more complete data set to be analyzed. The use of longitudinal data in this study is an important strength in regards to the information gathered. Previous studies have utilized cross-sectional data (Feldman & Kubota, 2015), or collected data from students once and from another source later (Rand, 2009, 2011). Longitudinal research has advantages over cross-sectional research as there is stronger evidence of the sequence of events, follows change over time, and providing a more comprehensive understanding of the sample.

Future Directions

The results of this study indicate that optimism and prior performance play a role in specific expectations; specific expectations subsequently play a role in future performance. It may be beneficial to further examine the predictive abilities of hope and optimism in the

formation of specific expectations. Previously it was found that hope, but not optimism, predicted course grade expectations (Feldman & Kubota, 2015; Rand, 2009; Snyder et al., 2002). This study found that optimism, but not hope, predicted semester grade expectations. By further examining hope and optimism as predictors of specific expectations with varying levels of generalizability we may be able to understand more of how generalizability plays a role in expectations. It may be beneficial to improve the measurement of study behaviors to measure type of studying (Rogaten et al., 2013), quality of studying (Plant et al., 2005), and learning style (Everaert et al., 2017). This may allow for a more accurate picture of the role of studying in expectations and performance. A positive relationship was found for expectations predicting performance at all levels of previous experience, thus it could be beneficial to look into ways to manipulate expectations in order to improve performance further. Shepperd, Sweeny, and Cherry (2007) looked at manipulating the expectation of wait time when on the phone or at a restaurant and found that if people expect a longer wait time and are helped in less time, they are more satisfied with the experience. It may be beneficial to study how manipulating student academic expectations can influence their performance.

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APPENDIX

A.1: Goals Checklist

Directions: Read each item carefully. Using the scale shown below, please select the number that best describes YOU and put that number in the blank provided.

1 = *Definitely False*

2 = *Mostly False*

3 = *Somewhat False*

4 = *Slightly False*

5 = *Slightly True*

6 = *Somewhat True*

7 = *Mostly True*

8 = *Definitely True*

___ 1. I can think of many ways to get out of a jam.

___ 2. I energetically pursue my goals.

___ 3. I feel tired most of the time.

___ 4. There are lots of ways around any problem.

___ 5. I am easily downed in an argument.

___ 6. I can think of many ways in life to get the things that are most important to me.

___ 7. I worry about my health.

___ 8. Even when others get discouraged, I know I can find a way to solve the problem.

___ 9. My past experiences have prepared me well for my future.

___ 10. I've been pretty successful in life.

___ 11. I usually find myself worrying about something.

___ 12. I meet the goals I set for myself.

A.2: LOT-R

Instructions: Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:

0 = strongly disagree

1 = disagree

2 = neutral

3 = agree

4 = strongly agree

Be as honest as you can throughout, and try not to let your responses to one question influence your responses to other questions. There are no right or wrong answers.

- _____ 1. In uncertain times, I usually expect the best.
- _____ 2. It's easy for me to relax.
- _____ 3. If something can go wrong for me, it will.
- _____ 4. I'm always optimistic about my future.
- _____ 5. I enjoy my friends a lot.
- _____ 6. It's important for me to keep busy.
- _____ 7. I hardly ever expect things to go my way.
- _____ 8. I don't get upset too easily.
- _____ 9. I rarely count on good things happening to me.
- _____ 10. Overall, I expect more good things to happen to me than bad.

A.3: Perceived Stress Scale

Directions: The questions below ask you about your feelings and thoughts during the **LAST MONTH**. In each case, you will be asked to indicate how often you felt or thought a certain way. Please read each one as a separate question and rate each one using the following:

0 = never 1 = almost never 2 = sometimes 3 = fairly often 4 = very often

<u>Never</u>					<u>Very Often</u>	<u>In the last month, how often...</u>
0	1	2	3	4		1. Have you felt that you were unable to control the important things in your life?
0	1	2	3	4		2. Have you felt confident about your ability to handle your personal problems?
0	1	2	3	4		3. Have you felt that things were going your way?
0	1	2	3	4		4. Have you felt that difficulties were piling up so high that you could not overcome them?

A.4: Study Habits Questions

1. How many hours a week do you spend studying?
2. How much do you study compared to your peers? 0=significantly less than others, 5=about the same as others, 10=significantly more than others
3. How many times have you skipped classes this semester?
4. How often do you skip class compared to your peers? 0=significantly less than others, 5=about the same as others, 10=significantly more than others
5. Compared to your peers, how often do you have late or missing assignments?
0=significantly less than others, 5=about the same as others, 10=significantly more than others
6. How many days before an exam do you typically start studying?
7. How many days before an assignment is due do you typically start working on it?
8. When you attend class what percentage of the time do you pay attention?