FIXED AND GROWTH MINDSET IN UNDERGRADUATE STUDENTS: IMPACTS ON ACADEMIC ACHIEVEMENT AND RESILIENT BEHAVIORS

by
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ABSTRACT

ANN LOUISE SEABROOK: Fixed and Growth Mindset in Undergraduate Students: Impacts on Academic Achievement and Resilient Behaviors
(Under the direction of Dr. Carey Bernini Dowling)

The study of mindset is relevant to various outcomes that occur across the span of a college student's career. There are two different mindsets that all students view themselves through the lens of, a fixed mindset and a growth mindset. The fixed mindset implies that traits are unchangeable, whereas the growth mindset implies that traits are malleable (Dweck 2015). The current study sets out to examine the relationship between mindset and academic achievement, mindset and resilient behaviors, and the potential meditational variables between mindset and academic achievement, in an undergraduate population. Participants completed a Federal Educational Rights and Privacy Act (FERPA) release form for their official semester GPA and measures assessing mindset, procrastination, study habits, self-handicapping habits, depressive symptoms, and intrinsic versus extrinsic motivation. Participants completed questionnaires in a lab in the Psychology department for research credit. Mediational analyses were not run due to a lack of variability in the data that produced a negative relationship between growth mindset and GPA in participants. The predicted relationship between emotion growth mindset and lower levels of depressive symptoms was found. Further research on this topic is necessary to explore results that are inconsistent with the present literature on the topic.

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Fixed and Growth Mindset In Undergraduate Students: Impacts On Academic Achievement and Resilient Behaviors

To a certain extent, all students hold some belief about their potential to change, achieve, and grow (Dweck, 2015). These beliefs are known as implicit theories. Dweck, Chiu, and Hong (1995) refer to implicit theories as core assumptions, which are beliefs that shape the ways in which individuals view themselves and the world around them. Implicit theories are not direct determinants of peoples' behavior; however, they do play a significant role in the ways in which individuals make decisions, set goals, and respond to events in their lives (Dweck et al., 1995). In regards to changeability of traits, there are two self-theories that exist. The first is the idea that traits are changeable and malleable, often called the growth mindset or the incremental theory (Dweck et al., 1995). The second is the idea that traits are unchangeable, or fixed, often called the fixed mindset or entity theory (Dweck et al., 1995). All individuals see themselves through the lens of one of these theories (Dweck et al., 1995).

Implicit Theories of Intelligence

Individuals can have mindsets about a variety of personal aspects, but the study of mindset in relation to intelligence has multiple implications. In terms of intelligence and academic potential, individuals with a fixed mindset will view their

intellectual abilities as unable to change (Dweck et al., 1995). Whereas these individuals might be able to advance and learn new things successfully, those with a fixed mindset do not believe that their actual intelligence is changeable (Dweck et al., 1995). Dweck & Master (1999) present the idea that for those with a fixed mindset, failure is a result of their lack of ability, rather than a result of their lack of effort. The fixed mindset implies that people do not have the potential to succeed at the task which they wish to complete, creating a seemingly hopeless situation where one is forced to set mediocre goals and not achieve his or her fullest potential (Dweck & Master, 1999). A fixed mindset promotes the idea that everything individuals do is a measure of their ability and potential, leading to situations where failure is not seen as an opportunity to improve, but rather an indicator of a lack of ability (Yeager & Dweck, 2012).

In contrast, an individual with a growth mindset regarding intelligence and academic potential will view his or her intellectual abilities as malleable (Dweck et al., 1995). So along with being able to learn new things and achieve goals, these individuals view their intelligence as something that can grow and improve with time and effort (Dweck et al., 1995). Dweck & Master (1999) explain that for an individual with a growth mindset, failure does not indicate that one cannot succeed; rather, failure indicates that one's efforts need to be altered and improved. The growth mindset has much more hopeful outcomes, creating a situation in which one can pick up and start again and set goals that may seem unattainable to some, but are reasonable to one who understands the importance of hard work (Dweck et al., 1999). A growth mindset promotes the view that challenge is a good thing, and that

failure is not bad, rather failure is an opportunity to learn and grow (Yeager & Dweck, 2012).

From the moment we are born, we are learning and growing in many different ways. The study of mindsets allows us to understand what motivates students and how we can use these motivations to encourage students to fulfill their potential and succeed to the best of their ability (Dweck, 2015). Overall, students' implicit theories have large impacts on the goals they set and the ways in which they respond to challenge in various situations (see Yeager & Dweck, 2012). Correlationally, research has shown that beliefs about willpower have implications for the ways in which undergraduates perform in school and in areas of self-regulation, implying that implicit theories are impactful in general areas of life (Job, Walton, Bernecker, & Dweck, 2015).

Research has also found that in terms of academics, a growth mindset usually leads to better academic outcomes (see Castella & Byrne, 2015; Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015; Yeager, Johnson, Spitzer, Trzesniewski, Powers, & Dweck, 2014). Experimentally, research has found that increasing students' belief in the growth mindset has positively influenced academic outcomes, such as an enduring growth mindset, more concern for academics, and higher grades in college students (Aronson, Fried, & Good, 2002); improving grades after a mindset intervention in middle school children (Blackwell, Trzesniewski, & Dweck, 2007); and better end of semester grades post-mindset intervention in high school students (Yeager, Johnson, Spitzer, Trzesniewski, Powers, & Dweck, 2014). Research with middle school students found that a growth mindset leads to higher grades

over a school year (Romero, Master, Paunesku, Dweck, & Gross, 2014). Blackwell et al. (2007) studied the specific ways in which implicit theories interact with academic achievement in mathematics in junior high students and found that growth mindset was positively correlated with grades in these classes. In high school students from varying backgrounds, research has found that online growth mindset interventions had an overall positive effect on these students' grades within a semester after receiving a growth mindset intervention (Paunesku et al., 2015). Finally, Aronson et al. (2002) found that when given a growth mindset intervention over a period of thirty days, African-American undergraduates were more likely to have higher grade point averages (GPAs) and better attitudes regarding academic ability at the end of the semester when the intervention was implemented.

Mindset is often assessed and studied in children and adolescents, but not as often in undergraduates. Studies have been conducted to assess the relationship between mindset and academic achievement (Aronson et al., 2002; Blackwell et al., 2007; Castella et al., 2015; Paunesku et al., 2015; Yeager et al., 2014) and attitudes about academic habits (Aronson et al., 2002); however, at this point in time few studies have examined the relationships between mindset and academic achievement in an undergraduate population. Aronson et al.'s (2002) study found a mindset intervention influenced GPA in undergraduates; however, I am unaware of any correlational studies examining the relationship between mindset and GPA in undergraduates. Thus, the present study adds to the literature by measuring the relationship between mindset and GPA in undergraduates. To fill this gap, the present study sets out to assess the relationship between mindset and academic

achievement in an undergraduate population. This is important because if research indicates a positive correlation between a growth mindset and academic achievement in college, we can better understand how to promote higher levels of achievement through mindset interventions. Previous research indicates a growth mindset is a predictor of higher grades; therefore, I hypothesized that there would be a positive correlation between mindset in undergraduates and grade point average (GPA), such that higher levels of the growth mindset will be associated with higher GPAs.

Implicit Theories of Intelligence and Resilient Behaviors

Interestingly, research has found that ability level does not have much to do with the ways in which individuals respond to challenge, but mindsets do have a distinct influence over the ways in which individuals, specifically children, respond to challenge (Dweck & Leggett, 1988). Resilience is a broad topic, but in general, resilience can be defined as "good outcomes in spite of serious threats to adaptation or development" (Masten, 2001, p. 228). Yeager and Dweck (2012) defined resilient behavior as any form of response to a challenging situation that leads to positive outcomes. Thus, for the present study, behaviors such as lower levels of procrastination and academic self-handicapping and better study habits fall into the category of resilient behaviors.

As students go through school, academic standards change and become more challenging, and students either respond resiliently, changing the methods they were using to succeed academically in order to better fit their current situation, or they do not (Yeager & Dweck, 2012). A growth mindset usually leads to more

resilient reactions in challenging academic situations in adolescent students (Yeager & Dweck, 2012). When examining the role of mindset in situations where adolescents experience peer conflict and victimization, Yeager and Dweck (2012) found that students with a growth mindset are more resilient in these scenarios. Rickert, Meras, and Witkow (2014) assessed relationships between mindset and self-handicapping behaviors and procrastination in adolescents, and found that a fixed mindset was associated with higher levels of these behaviors, which are likely to undermine resilience. In the study, individuals with a fixed mindset were not completely unresponsive to challenge; however, they tended to respond in less effective ways, using higher levels of procrastination and self-handicapping behaviors in the face of challenging situations (Rickert et al., 2014).

Blackwell et al. (2007) assessed the relationship between mindset and self-handicapping behaviors (e.g., helplessness) and effort in junior high students – both indicators of resilience if resilience is defined as positive responses to challenging situations (Yeager & Dweck, 2012) – and found growth mindset was positively correlated with lower levels of self-handicapping and better attitudes about effort. In terms of an intervention, Blackwell et al. (2007) also found that teaching middle school students a growth mindset led to more effort put forth inside and outside of the classroom, indicating more resilient habits in the face of challenge. Mueller and Dweck (1998) conducted six studies involving children, trying to determine whether the type of praise had an effect on children's response to failure and learning goals, and found that when encouraged with a growth mindset, children were more likely to be resilient, facing and choosing challenge rather than seeing it

as a reason to quit. Castella & Byrne (2015) assessed mindset in an adolescent population, and found a fixed mindset was associated with self-handicapping behaviors, indicating low levels of resilient behavior.

Thus, previous research and interventions conducted to assess the relationship between mindset and student resilience have revealed that there seems to be a relationship between growth mindset and higher levels of resilience, specifically in children and adolescents (Yeager et al., 2012, Rickert et al., 2014, Blackwell et al., 2007, Mueller et al., 1998, Castella et al., 2015). To my knowledge, no studies to date have specifically addressed the relationship between undergraduates' academic mindset and resilience. Therefore, the second goal of the present study is to assess the relationship between academic mindset and resilient behaviors in an undergraduate population. I hypothesized that a growth mindset will be positively correlated with higher levels of resilient behaviors.

Furthermore, since past studies have pointed to the positive correlation between mindset and academic achievement along with a relationship between mindset and resilient behaviors, the present study sets out to assess what mediates the relationship between mindset and academic achievement. I hypothesized that procrastination, academic self-handicapping, and study habits would be mediators of the relationship between mindset and academic achievement. Specifically, I hypothesized a positive correlation between mindset and study habits; a negative correlation between mindset and procrastination; and a negative correlation between mindset and academic self-handicapping. I also hypothesized a positive correlation between study habits and GPA; a negative correlation between

procrastination and GPA; and a negative correlation between academic self-handicapping and GPA.

Implicit Theories of Emotion

For the most part, past research has focused primarily on intelligence when studying fixed and growth mindset (Tamir, John, Srivastava, & Gross, 2007). Implicit theories of emotion are similar to implicit theories of intelligence because individuals with a growth mindset believe that their emotions are malleable and that they can change their emotions. In contrast, those with a fixed mindset about emotions believe that their emotions cannot be changed; therefore, they are much less likely to engage in strategies of emotional regulation (Tamir et al., 2007). Higher levels of growth mindset have demonstrated relationships with better levels of emotional regulation in individuals enduring a transition to college, and higher levels of fixed mindset have demonstrated a relationship with higher levels of negative emotions (Tamir et al., 2007). A fixed mindset about emotions has also been associated with higher levels of depression in first-semester undergraduates (Tamir et al., 2007). In middle school students, a growth mindset about emotions has been associated with fewer depressive symptoms (Romero et al., 2014).

Thus, the last goal of the present study was to assess the relationship between mindset in regards to emotion and depressive symptoms in undergraduates. I hypothesized that a growth mindset in regards to emotions would be negatively correlated with levels of depressive symptoms, indicating that as students have more of a growth mindset about their emotions, they will have lower levels of depressive symptoms.

Method

Participants

Participants were one hundred seventy undergraduates (32 males and 138 females) at the University of Mississippi in the Fall 2016 semester. Students ranged from 18 to 29 years of age (M = 19.04, SD = 1.6) and consisted of 100 freshmen, 22 sophomores, 30 juniors, 15 seniors, and 1 post-baccalaureate student. Seventy-eight point two of students identified as White, 16.5% identified as African-American, 3.5% identified as Hispanic, 3.5% identified as Asian or Pacific Islander, 1.8% identified as Native American, and 0.6% identified as Middle-Eastern, 3% of these students identified as multi-ethnic. Students were recruited from five Psychology classes: General Psychology, Social Psychology, Developmental Psychology, Parenting Psychology, and Learning Psychology. All students received information and signed up to participate in the study online, either through the Psychology Department website or their class website. Participants received research credit for participation.

Procedure

Participants came into the lab, where they were given instructions and an information sheet approved by the university's Institutional Review Board to review prior to participation and were given the opportunity to ask questions. Students then filled out a Federal Educational Rights and Privacy Act (FERPA) release form,

Allowing researchers access to the participants' official GPA for the Fall 2016 semester. Access to GPA was obtained at the end of the Fall 2016 semester by digitally submitting signed forms and student information to the registrar's office. Upon consenting to participate, students were given one packet containing all measures for the present study (see Appendices). Students then filled out the questionnaires and returned the packet to the researcher. Students then were given the opportunity to sign up for a workshop in the following semester that gave tips for academic success and emotion management. Upon completion, students were thanked for their participation and credit for participation was given. The study took approximately 20 - 30 minutes to complete.

Measures

GPA. Official end-of-the-semester grade point averages (GPAs) were obtained from the University Registrar's office for all participants who gave FERPA consent at the end of the semester in which participants participated in the study. We obtained end-of-the-semester GPAs to ensure that all participants' GPAs were based on the same time period and ensure that first-semester freshman participants would have a GPA. Grades were reported on a 4-point scale (0 = "F" to 4.0 = "A").

Intrinsic and extrinsic motivation. Participants' levels of intrinsic versus extrinsic motivation were assessed using a modified version of the Self-Regulation Questionnaire for Learning (Cerasoli & Ford, 2014). Twelve questions, presented in a mixed order, assessed the extent to which students were motivated intrinsically or extrinsically. There were four intrinsic items (e.g. "I will participate in my current classes because I feel like it's a good way to improve my understanding of the

material.") and eight extrinsic items (e.g. "The reason I will work to expand my knowledge of topics covered in my current classes is because I want others to see that I am intelligent."). Students ranked these statements on a 7-point scale (1 = *not at all true* to 7 = *very true*). For analysis purposes, we computed the Relative Autonomy Index (RAI) by subtracting the extrinsic subscale *Z*-score from the intrinsic subscale *Z*-score. A score greater than zero on the RAI indicates intrinsic motivation, a score of zero on the RAI indicates neither intrinsic nor extrinsic motivation, and a score less than zero on the RAI indicates extrinsic motivation (see Williams & Deci, 1996; Black & Deci, 2000). This measure has been found to have good internal consistency and construct validity (Williams & Deci, 1996) (α for the present study = .72). We included this measure to determine if mindset and intrinsic/extrinsic motivation are unique constructs, as well as to determine if intrinsic/extrinsic motivation has a higher influence on GPA than mindset.

Implicit theories of intelligence. Participants' implicit theories of intelligence were assessed using the Theories of Intelligence Scale (TIS) —Self Form For Adults (Dweck, 1999). This scale consists of eight statements, four indicative of a growth mindset and four indicative of a fixed mindset. Examples of such statements are: "You have a certain amount of intelligence, and you can't really do much to change it" and "You can always substantially change how intelligent you are." Students rated these statements on a 6-point scale (1 = *strongly agree* to 6 = s*trongly disagree*). The growth mindset statements were reverse-scored and all items were averaged to obtain a score with *1* representing a pure fixed mindset and *6* representing a pure growth mindset (see Blackwell et al., 2007; Rickert et al.,

2014). This scale has demonstrated good internal reliability and test-retest reliability (Dweck et al., 1995). The Theories of Intelligence Scale also has been used in multiple other studies as a predictive measure (see Blackwell et al., 2007; Castella & Byrne, 2015; Dweck et al., 1995; Paunesku et al., 2015; Rickert et al., 2014; Romero et al., 2014; Tamir et al., 2007) (α for the present study = .91). and based on these results, the scale appears to have good predictive validity.

Implicit theories of emotion. Participants' implicit theories of emotion were assessed utilizing the Theories of Emotion Scale(TES)—Self Form for Adults (Romero et al., 2014). This scale consists of four statements such as "You can learn to change your emotions" and "The truth is, you have very little control over your emotions". Participants ranked these statements on a 6-point scale (1 = *strongly agree* to 6 = *strongly disagree*). Growth mindset statements were reverse scored and scores were averaged so a high score represented a growth mindset, and a low score represented a fixed mindset. I am unaware of any psychometric studies on this measure; however, this measure has been used in similar studies as a predictive measure (see Romero et al., 2014 and Tamir et al., 2007), and based on the results in these studies, the scale appears to have good predictive validity (α for the present study = .87).

Study habits. Participants' study habits and work behaviors were assessed using a twenty-four-item sub-scale of the original Survey of Study Habits and Attitudes: Work Habits Subscale that assessed academic behaviors (Brown & Holtzman, 1955). Participants were asked the level to which they agreed with these items on a 5- point scale (1 = *highly disagree* to 5 = *highly agree*). Examples of the

questions include: “I will complete my homework on time”, “I will keep all the notes for each subject together, carefully arranging them in some logical order”, and “I will skip over figures, graphs, and tables in a reading assignment.” Eight items were reverse-scored in order to make a higher score indicative of higher levels of positive academic behaviors. This scale has demonstrated strong internal consistency and predictive validity (Brown & Holtzman 1955). The scale has also been used as a predictive measure (Cerasoli & Ford 2014) (α for the present study = .71).

Depressive symptoms. Participants’ depressive symptoms were assessed using the Major Depression Inventory, which asks individuals to rank on a 5-point scale (1 = *all the time* to 5 = *at no time*), how much of the time in the past week they have experienced certain symptoms (Beck, Kimmerby, Martiny, Lunde, & Soendergaard, 2015). Sample questions include: “Have you felt less self-confident?”, “Have you lost interest in your daily activities?”, and “Have you felt subdued or slowed down?” This scale has demonstrated clinical validity as a means of measuring depression severity (Beck, Kimmerby, Martiny, Lunde, & Soendergaard, 2015). Scores were assessed using a sum, and higher scores on this scale indicated more depression, or a higher level of depressive symptoms, in an individual (α for the present study = .87).

Self-handicapping behaviors. Participants’ self-handicapping behaviors were measured using the Patterns of Adaptive Learning Scales’ (PALS) Academic Self-Handicapping Subscale (Midgley et al., 2000). This six-item scale includes statements like “Some students fool around the night before a test. Then if they don’t do well, they can say that is the reason. How true is that of you?” and “Some

students purposely don't try hard in class. Then if they don't do well, they can say it is because they didn't try. How true is this of you?" They rated these statements on a 5-point scale (1 = *not at all true* to 5 = *very true*). Participants' scores were created by averaging their scores for each item, with higher scores indicating higher levels of self-handicapping behaviors. This scale has demonstrated good internal consistency (Midgley et al., 2000) and has been used as a predictive measure in other studies to assess self-handicapping (see Midgley et al., 2000; Rickert et al., 2014) (α for the present study = .80).

Procrastination behaviors. Participants' procrastination behaviors were measured using Tuckman's (1991) 35-Item Procrastination Scale. This scale consists of 35 statements such as "I needlessly delay finishing jobs, even when they're important" and "I'm a time waster now but I can't seem to do anything about it". Participants rated these statements on a 4-point scale (1 = *that's not me for sure* to 4 = *that's me for sure*). Ten items were reverse-scored in order to make a score of 4 indicate high levels of procrastination. This scale has demonstrated excellent reliability and validity (Tuckman, 1991), and it has been used as a predictive measure in other research (Rickert et al., 2014) (α for the present study = .90).

Behavioral measure of mindset. At the end of the study, participants were given the opportunity to sign up for a workshop in the following semester that offers growth mindset skills to improve academic success and emotion management. There was no incentive to sign up other than an opportunity to learn, and there were no consequences for not signing up. The top of the sign-up sheet read, "Are you interested in learning new ways to succeed academically in college?

Do you want to learn ways to productively manage your emotions?" We used this simple behavioral task to measure if students who reported a high growth mindset were more likely to sign up for the workshop, in order to determine if students with a growth mindset truly were different in behavior.

Results

Preliminary Analyses

Prior to analyses all major study variables were examined for outliers and assumptions of normality. Descriptive statistics for major study variables can be found in Table 1. Official GPA data was highly skewed and kurtotic, so the data was reflected and transformed using a logarithm transformation to make the data more fitting to the assumptions of normality. Therefore, for the remainder of the results, a 4.00 on the GPA scale becomes a 0.00, and a 0.00 on the GPA scale becomes a 0.70. Two outliers were found on the Theories of Intelligence scale, so these scores were modified to be the same as the next lowest scores in order to decrease their effects on results (as recommended by Tabachnick & Fidell, 2001). Due to violations of normality, scores of the PALS were also logarithm transformed.

There was a substantial lack of variability in official GPA data. Measured on a scale of 0-4, the mean was 3.33 and the median 3.43. Seventy-six point eight percent of GPAs were above a 3.00. Likewise, there was a substantial lack of variability in the TIS data. Measured on a six-point scale, the mean was 4.44, and 75.2% of participants scored within the range considered to indicate a growth mindset. It is a prerequisite of correlational analyses that variability is present, and variability was not present in this data for the present study. I originally hypothesized that there would be a positive correlation between growth mindset and official GPA in

participants, and in order to run meditational analyses between these two factors, I ran preliminary correlational analyses to determine if this correlation was present for the present study. I used an alpha level of .05 for all statistical analyses. Contrary to my hypotheses, the results showed a significant positive correlation between reflected and log transformed GPA and academic growth mindset, $r(165) = .16$, $p = .037$, such that as original GPA scores increase, growth mindset decreases. Rather than running the planned mediational analyses, I ran correlational analyses between the variables originally measured as potential mediators of growth mindset and GPA in order to determine what, if there were any significant relationships between these mediators and GPA (see Table 2).

Table 1.
Descriptive Statistics for Major Study Variables

Measure	*M*	*SD*	Min	Max
Log transformed official GPA	0.20	0.14	0.00	4.00
Official GPA	3.33	0.63	0.75	4.00
Implicit theories of intelligence	4.44	0.93	2.00	6.00
Procrastination behaviors	2.15	0.59	1.00	4.00
Study habits	3.51	0.38	3.00	4.00
Self-handicapping habits, Log transformed	0.25	0.17	0.00	1.00
Intrinsic and extrinsic motivation	0.02	1.19	-4.00	3.00
Implicit theories of emotion	4.16	1.04	1.50	6.00
Depressive Symptoms	14.68	8.89	0.00	38.00

Correlations between Mindset and Resilient Behaviors

The first goal of the study was to test the relationship between mindset of undergraduate and GPA. The hypothesized positive relationship between a growth mindset and GPA (reflected and log transformed) was not found; however, results indicate a relationship between mindset and other variables tested in the study (see Table 2). Implicit theories of intelligence were positively correlated with intrinsic motivation, r (167) = .22, p = .003, indicating a positive relationship between an academic growth mindset and intrinsic motivation such that as academic growth mindset increases, intrinsic motivation increases. Implicit theories of emotion were significantly correlated with three measures. Implicit theories of emotion and depressive symptoms had a significant negative correlation, r (168) = -.28, p = .000, such that as emotion growth mindset increases, depressive symptoms decrease. Implicit theories of emotion were also significantly negatively correlated with procrastination behaviors, r (168) = -.18, p = .022, such that as emotion growth mindset increases, procrastination levels decrease. Lastly, implicit theories of emotion significantly positively correlated with the study habits, r (168) = .165, p = .032, such that as emotion growth mindset increases, good study habits increase also.

Correlations between Resilient Behaviors and GPA

Results showed multiple significant bivariate correlations between resilient behaviors and GPA. One of the goals of the study was to test the relationship between potential meditational variables, which also have been referred to resilient behaviors, and GPA. Procrastination behaviors were significantly correlated with

official GPA (reflected and log transformed), r (165) = .2, p = .009, such that as procrastination increases, grades decrease. Study habits also had a significant negative correlation with GPA (reflected and log transformed), r (165) = -.25, p = .001, such that as study habits increase, grades increase also. Lastly, the academic self-handicapping behaviors had a significant positive correlation with GPA (reflected and log transformed), r (165) = .22, p = .004, such that as academic self-handicapping increases, grades decrease.

Table 2.
Bivariate Correlations Among Major Study Variables

Measure	1	2	3	4	5	6	7	8	9
1. Log. transformed official GPA	-	.162*	-.006	.2**	.040	.081	-.256**	.224**	.005
2. TIS Scale Total Score		-	.151*	-.045	-.133	.004	.049	.056	.224**
3. TES Scale Total Score			-	-.175*	-.148	-.282**	.165*	-.075	.181*
4. Tuckman Factor 1				-	.682**	.327**	-.584**	.427**	-.214**
5. Tuckman Factor 2					-	.368**	-.496**	.362**	-.257**
6. Major Depression Inventory						-	-.247**	.144	-.164*
7. Survey of Study Habits and Attitudes							-	-.324**	.369**
8. PALS Total Score Log. Transformed								-	-.124
9. SRQ-L Relative Autonomy Index									-

* $p < 0.05$
**$p < .01$

Correlations between Mindset and Behavioral Tasks

Following testing for assumptions of the point biserial correlation, the point biserial correlation was utilized to test the correlation between mindset and whether or not individuals signed up for the mindset workshops. This formula was utilized because the behavioral task was a dichotomous variable, whereas the mindset scale was a scaled variable. Seventeen participants signed up for this workshop, which was held in the spring of 2017. Results showed no significant correlation between mindset and the behavioral task, $r(168) = .08$, $p = .25$, such that there is no statistically significant relationship between mindset and likelihood of signing up for a growth mindset workshop.

Discussion

Our primary hypothesis, that there would be a positive correlation between academic growth mindset and higher official GPA, was not supported. Instead, we found a negative correlation between these two variables. These results indicate a relationship between a growth mindset and lower grades for the present data set. This result is inconsistent with previous research (see Aronson, Fried, & Good, 2002; Castella & Byrne, 2015; Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015; Yeager, Johnson, Spitzer, Trzesniewski, Powers, & Dweck, 2014). There were also no significant correlations found between academic growth mindset and resilient behaviors, which is also inconsistent with the present research (Blackwell et al., 2007; Castella et al., 2015; Mueller et al., 1998; Rickert et al., 2014; Yeager et al., 2012). This is likely due to the lack of variability in the implicit theories of intelligence and GPA data. This lack of variability may have occurred because I accidentally targeted a specific set of students in the way I recruited participants. Because participants were recruited through Psychology classes early in the semester, many of the students who signed up for the study were those who get their work complete early in the semester, looking to get their extra-credit taken care of sooner rather than later.

However, there were several significant correlations between resilient behaviors and GPA in the present data set. Consistent with hypotheses, procrastination, academic self-handicapping, and study habits all had significant relationships with GPA. Lower levels of procrastination were associated with higher grades, which is not consistent with previous research (Rickert et al., 2014), but has positive implications for undergraduates. This implies that if undergraduates learn to not engage in procrastination behaviors, their grades may be higher. Better study habits were associated with higher grades, which is consistent with previous research (Rickert et al., 2014). This result implies that if undergraduates engage in more effective study habits, their GPAs will likely be higher. Higher levels of self-handicapping were associated with lower grades, which is also consistent with previous research (Rickert et al., 2014). This implies that if undergraduates engage in lower levels of self-handicapping behaviors (e.g. looking for reasons to avoid studying, purposefully getting involved in lots of activities), they will likely have more academic success. These results suggest that with higher levels of good study habits and lower levels of procrastination and self-handicapping-type behaviors, students may have higher grades across a semester. Whereas I pointed out lack of variability in both GPA and TIS data, it is interesting that GPA significantly correlated with resilient behaviors and the TIS did not. This is possibly because the TIS has not been used in this population to my knowledge, and it may not have the same validity in an undergraduate population as it does in younger groups.

Our last hypothesis, that emotion growth mindset would be negatively correlated with symptoms of depression, was supported. As the emotion growth

mindset increased, levels of measured depressive symptoms decreased. This relationship is consistent with previous research (see Tamir et al., 2007, Romero et al., 2014). This result also has implications for students, indicating that if students are encouraged to view their emotions as able to change and given tools to view themselves in this way, they may be less likely to experience higher levels of depressive symptoms during their college experience.

Several limitations should be noted. First, this study was conducted early in the semester, and because of this, it is reasonable to assume that many of the students who participated were those students who get their assignments out of the way ahead of time. This is problematic because those who complete assignments early in the semester are likely academically motivated, and academically motivated students are likely to have higher grades, and it is reasonable to assume that they would have more of a growth mindset about academics. Our population was not very diverse in gender, year in school, or ethnicity; therefore, we think that this lack of diversity influenced the results because the similarity in the participants led to similar data. It is reasonable to assume that this is what led to the lack of variability in the TIS and GPA data. Secondly, the Theories of Intelligence Scale has mainly been used in adolescent and childhood populations in the past, so this measure may not be a valid or reliable measure of implicit theories of intelligence in and undergraduate population. Even though this measure has been used as a predictive measure in the past (see Blackwell et al., 2007; Castella & Byrne, 2015; Dweck et al., 1995; Paunesku et al., 2015; Rickert et al., 2014; Romero et al., 2014; Tamir et al.,

2007), it is reasonable to assume that a more thorough academic mindset measure could have resulted in more variation in the measurement of mindset.

In the future, we suggest that researchers implement this study over the length of an entire semester in order to target a more diverse student group. This would target a more academically diverse population by gaining participants who are more likely to complete their work later in the semester. Second, future research needs to access the psychometric validity of the Theories of Intelligence Scale in an undergraduate population. Lastly, it would be beneficial to measure academic achievement in a way other than GPA, so that we may obtain a more comprehensive measure of student academic success. Because of the plethora of literature currently present on the topic and the results that we found that are contrary to the literature, further research is needed to determine if the results for the present study are duplicated.

Although several hypotheses were not supported by the data set, this study does have several strengths that are worth highlighting. First of all, the current study adds to the current literature by examining multiple variables that could contribute to resilient behaviors and academic outcomes in undergraduates. Secondly, all of the measures used in the study had been used in prior studies measuring similar situations, and the measures had strong internal consistency for the present study. Third, the study used official GPA, rather than a self-report, which is beneficial because it ruled out the possibility of inaccurate data in regards to academic achievement. Another notable strength is that the large sample size resulted in enough power to find significant results if they were present. Thus, even

though these results were inconsistent with previous research, it is possible that the relationship between implicit theories of intelligence and GPA is different in certain populations of undergraduate students than younger samples. Because of the correlations found between resilient behaviors and GPA, these factors may actually be far more important than mindset; however, further research is necessary to determine if this it true. The fifth major strength of the study is that it included a behavioral task that measured mindset. Although no significant results were found in this study for this variable, this is still a strength because all of the measures were not based on questionnaires only. Lastly, this study has demonstrated strong implications for further research on this topic, implying that a new questionnaire for academic mindset needs to be added, and a larger sample size assessed across an entire semester needs to be obtained.

In conclusion, the present study set out to test the various relationships between the fixed and growth mindset in college students, and how this mindset impacts levels of depressive symptoms, resilient academic behaviors, and academic achievement. Not all hypotheses were supported by the present data set; however, a significant relationship between emotion growth mindset and lower depressive symptoms was found, along with a significant relationship between several resilient academic behaviors and GPA. The lack of variability in the data is likely one of the main reasons that the other hypotheses were not supported in this study. If the negative correlation between GPA and the TIS are replicated in the future, this could imply that mindset impacts academic achievement differently in undergraduates than it does in younger populations. Lastly, the relationships found between

procrastination, study habits, self-handicapping, and GPA all have implications for how undergraduates' resilient behaviors impact their achievement in school.

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Appendices

Authorization to Release FERPA-Protected Student Records to Researchers

Self-Perceptions and Their Impacts on Undergraduate Students
Investigators who will have access to identified student records: Carey Dowling, Ph.D.

I understand that, by signing this release, I am giving University researchers access to the FERPA-protected academic records listed below.

I consent to have only the following UM academic records released from the University Registrar to the investigators listed above:

- Current UM Overall GPA
  The Researchers:
  - May use the information only for purposes of the approved research project. Any new use of the information requires new approval from the participant.
  - Must provide adequate protection for the information to ensure that it is not compromised or subject to unauthorized access.
  - Ensure that no one outside the research team has access to the information.

This authorization expires on: January 31, 2017 (Date)

_____ _____
Participant's Signature Date Full Name (as on ID Card) – Printed

_____
Student ID Number

I understand that (1) I have the right not to consent to the release of my education records, (2) I have the right to inspect any written records released pursuant to this Consent, and (3) I have the right to revoke this Consent at any time by delivering a written or emailed revocation to the investigator & copied to the IRB office (irb@olemiss.edu).

This information is released subject to the confidentiality provisions of appropriate state and federal laws and regulations which prohibit any further disclosure of this information without the specific written consent of the person to whom it pertains, or as otherwise permitted by such regulations.

The American Psychological Association recommends that researchers report major demographic characteristics of all research participants (e.g., age, gender, etc.). To assist us in collecting this information, we request that you complete this brief questionnaire. All data are confidential, and will not be used in any manner that identifies you. **If you are uncomfortable responding to any of the items, feel free to disregard them.**

Age: _____

Year in school: [ ] Freshman [ ] Sophomore [ ] Junior [ ] Senior

[ ] Other (please specify) _____

What is your gender? _____

What is your best estimate of your current GPA? _____

What is your cultural identity? Please check all that apply.

[ ] Asian or Pacific Islander [ ] Black/African American (not of Hispanic origin) [ ] Hispanic

[ ] Native American [ ] White (not of Hispanic origin) [ ] Other (please specify)_____

SRQ-L. The following questions relate to your reasons for participating actively in your classes. Different people have different reasons for their participation in classes, and we want to know *how true* each of the reasons is for you. Thinking about the classes you are currently registered for this semester, please use the following scale to indicate how true each reason is for you in the spaces provided:

1	2	3	4	5	6	7
Not at all true			Somewhat true			Very true

A. I will participate actively in my current classes:

1. Because I feel like it's a good way to improve my understanding of the material. _____

2. Because others might think badly of me if I didn't. _____

3. Because I would feel proud of myself if I did well in the courses. _____

4. Because a solid understanding of my classes is important to my intellectual growth. _____

B. I am likely to follow my instructor's suggestions for studying in my current classes:

5. Because I would get a bad grade if I didn't do what he/she suggests. _____

6. Because I am worried that I am not going to perform well in the courses. _____

7. Because it's easier to follow his/her suggestions than come up with my own study strategies. _____

8. Because he/she seems to have insight about how best to learn the material. _____

C. The reason that I will work to expand my knowledge of topics covered in my current classes is:

9. Because it's interesting to learn more about the topics covered in my current classes. _____

10. Because it's a challenge to really understand the topics covered in my current classes. _____

11. Because good grades in my current classes will look positive on my record. _____

12. Because I want others to see that I am intelligent. _____

TIS—Self Form For Adults. This questionnaire has been designed to investigate ideas about intelligence. There are no right or wrong answers. We are interested in your ideas.

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements by writing the number that corresponds to your opinion in the space next to each statement.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

_____ 1. You have a certain amount of intelligence, and you can't really do much to change it.

_____ 2. Your intelligence is something about you that you can't change very much.

_____ 3. No matter who you are, you can significantly change your intelligence level.

_____ 4. To be honest, you can't really change how intelligent you are.

_____ 5. You can always substantially change how intelligent you are.

_____ 6. You can learn new things, but you can't really change your basic intelligence.

_____ 7. No matter how much intelligence you have, you can always change it quite a bit.

_____ 8. You can change even your basic intelligence level considerably.

TES—Self Form For Adults. This questionnaire has been designed to investigate ideas about emotions. There are no right or wrong answers. We are interested in your ideas.

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements by writing the number that corresponds to your opinion in the space next to each statement.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

_____ 1. You can learn to change your emotions.

_____ 2. If you want to, you can change the emotions that you have.

_____ 3. The truth is, you have very little control over your emotions.

_____ 4. No matter how hard you try, you can't really change the emotions you have.

SSHA

In reference to my current classes…	Highly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Highly Agree
1. When I get behind in my school work for some unavoidable reason, I will make up back assignments without prompting from the teacher.	1	2	3	4	5
2. I will keep all the notes for each subject together, carefully arranging them in some logical order.	1	2	3	4	5
3. When I am having difficulty with my school work, I will try to talk over the trouble with the teacher.	1	2	3	4	5
4. Telephone calls, people coming in and out of my room, "bull-sessions" with my friends, etc., will interfere with my studying.	1	2	3	4	5
5. When in doubt about the proper form for a written report, I will refer to an approved model to provide a guide to follow.	1	2	3	4	5
6. When reading a long textbook assignment, I will stop periodically and mentally review the main points that have been presented.	1	2	3	4	5
7. Problems outside of school-financial difficulties, being in love, conflict with parents, etc.- may cause me to neglect my school work.	1	2	3	4	5
8. I will complete my homework assignments on time.	1	2	3	4	5
9. I like to have a radio, record player, or television set	1	2	3	4	5

turned on while I'm studying.					
10. When preparing for an examination, I may arrange facts to be learned in some logical order- order of importance, order of presentation in class or textbook, order of time in history, etc.	1	2	3	4	5
11. I will study three or more hours per day outside of class.	1	2	3	4	5
12. At the beginning of a study period I organize my work so that I will utilize my time most effectively.	1	2	3	4	5

In reference to my current classes…	Highly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Highly Agree
13. In preparing reports, themes, term papers, etc., I will make certain that I clearly understand what is wanted before I begin work.	1	2	3	4	5
14. I will give special attention to neatness on themes, reports, and other work to be turned in.	1	2	3	4	5
15. I will memorize grammatical rules, definitions of technical terms, formulas, etc., without really understanding them.	1	2	3	4	5
16. I will keep my place of study business-like and cleared of unnecessary or distracting items such as pictures, letters, mementos, etc.	1	2	3	4	5
17. In taking notes, I may tend to take down material which later turns out to be unimportant.	1	2	3	4	5
18. I will skip over figures, graphs, and tables in a reading assignment.	1	2	3	4	5
19. My studying is done in a random, unplanned manner-is impelled mostly by the demands of approaching classes.	1	2	3	4	5
20. I will utilize the vacant hours between classes for studying so as to reduce the evening's work.	1	2	3	4	5
21. I will copy the diagrams, drawings, tables, and other illustrations that the instructor puts on the blackboard.	1	2	3	4	5

22. I may lose points on true-false or multiple-choice examinations because I change my original answer only to discover later that I was right the first time.	1	2	3	4	5
23. If time is available, I will take a few minutes to check over my answers before turning in my examination paper.	1	2	3	4	5
24. I will keep my assignments up to date by doing my work regularly from day to day.	1	2	3	4	5

MDI. The following questions ask about how you have been feeling over the past week. Please indicate the extent to which you have felt this way according to the numbers below.

5	**4**	**3**	**2**	**1**	**0**
all the time	most of the time	slightly more than half the time	slightly less than half the time	some of the time	at no time

1. Have you felt in low spirits or sad? _____

2. Have you lost interest in your daily activities? _____

3. Have you felt lacking in energy and strength? _____

4. Have you felt less self-confident? _____

5. Have you had a bad conscience or feelings of guilt? _____

6. Have you felt that life wasn't worth living? _____

7. Have you had difficulty in concentrating, e.g., when reading the newspaper or watching television? _____

8. Have you felt very restless? _____

9. Have you felt subdued or slowed down? _____

10. Have you had trouble sleeping at night? _____

11. Have you suffered from reduced appetite? _____

12. Have you suffered from increased appetite? _____

PALS. Here are some questions about yourself as a student. Please indicate the number that best describes what you think.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

1. Some students fool around the night before a test. Then if they don't do well, they can say that is the reason. How true is this of you? _____

2. Some students purposely get involved in lots of activities. Then if they don't do well on their class work, they can say it is because they were involved with other things. How true is this of you? _____

3. Some students look for reasons to keep them from studying (not feeling well, having to help their parents, taking care of a brother or sister, etc.). Then if they don't do well on their class work, they can say this is the reason. How true is this of you? _____

4. Some students let their friends keep them from paying attention in class or from doing their homework. Then if they don't do well, they can say their friends kept them from working. How true is this of you? _____

5. Some students purposely don't try hard in class. Then if they don't do well, they can say it is because they didn't try. How true is this of you? _____

6. Some students put off doing their class work until the last minute. Then if they don't do well on their work, they can say that is the reason. How true is this of you? _____

Tuckman

How much are the following indicative of yourself?
1 = That's not me for sure
2 = That's not my tendency
3 = That's my tendency
4 = That's me for sure

_____ 1. I needlessly delay finishing jobs, even when they're important.
_____ 2. I postpone starting in on things I don't like to do.
_____ 3. When I have a deadline, I wait till the last minute.
_____ 4. I delay making tough decisions.
_____ 5. I stall on initiating new activities.
_____ 6. I'm on time for appointments.
_____ 7. I keep putting off improving my work habits.
_____ 8. I get right to work, even on life's unpleasant chores.
_____ 9. I manage to find an excuse for not doing something.
_____ 10. I avoid doing those things which I expect to do poorly.
_____ 11. I put the necessary time into even boring tasks, like studying.
_____ 12. When I get tired of an unpleasant job, I stop.
_____ 13. I believe in "keeping my nose to the grindstone."
_____ 14. When something's not worth the trouble, I stop.
_____ 15. I believe that things I do not like doing should not exist.
_____ 16. I consider people who make me do unfair and difficult things to be rotten.
_____ 17. When it counts, I can manage to enjoy even studying.
_____ 18. I am an incurable time waster.
_____ 19. I feel that it's my absolute right to have other people treat me fairly.
_____ 20. I believe that other people don't have the right to give me deadlines.
_____ 21. Studying makes me feel entirely miserable.
_____ 22. I'm a time waster now but I can't seem to do anything about it.
_____ 23. When something's too tough to tackle, I believe in postponing it.
_____ 24. I promise myself I'll do something and then drag my feet.
_____ 25. Whenever I make a plan of action, I follow it.
_____ 26. I wish I could find an easy way to get myself moving.
_____ 27. When I have trouble with a task, it's usually my own fault.
_____ 28. Even though I hate myself if I don't get started, it doesn't get me going.
_____ 29. I always finish important jobs with time to spare.
_____ 30. When I'm done with my work, I check it over.
_____ 31. I look for a loophole or shortcut to get through a tough task.
_____ 32. I get stuck in neutral even thought I know how important it is to get started.
_____ 33. I never met a job I couldn't "lick".
_____ 34. Putting something off until tomorrow is not the way I do it.
_____ 35. I feel that work burns me out.