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**The Impact of Faculty Growth Mindset on Student Mindset and Learning Engagement**

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A thesis submitted in partial fulfillment of the requirements for the

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### **Abstract**

Growth mindset is the belief that general intellectual ability is malleable and can be developed. This thesis describes the presence and cultivation of growth mindset in the academic experiences of six undergraduate students in the social sciences at a medium-sized, liberal arts and sciences college. Individual interviews were analyzed using narrative inquiry to explore the impact of instructor philosophy and pedagogy on student mindset and learning engagement. Research findings highlight that instructor embodiment of growth mindset, including relationality, modeling, and constructive delivery of feedback, as well as assignment design, were instrumental. Participants did not share a common definition of growth mindset, but that concepts of competence, choice, and grit were shared. Additionally, participants recognized that mindset exists on a continuum and articulated one or more ways they experienced a shift in their mindset. Recommendations for further research and pedagogical practice are provided.

*Keywords:* growth mindset, pedagogy, higher education

### **The Impact of Faculty Growth Mindset on Student Mindset and Learning Engagement**

Early in life, individuals develop self-theories—or beliefs about themselves (Sriram, 2014). Primarily studied in academic contexts, fixed mindset, or entity theory, is the belief that intelligence and academic ability are fixed; that is to say, fixed mindset suggests the intellectual skills students enter the classroom with cannot be improved or developed (Canning et al., 2019). On the contrary, those who espouse growth mindset, or incremental theory, believe that “ability is malleable and can be developed through persistence, good strategies, and quality mentoring” (Canning et al., 2019, p. 1). This distinction can be seen in instructor pedagogy, student approach toward learning, and persistence when faced with difficult material.

Whether or not faculty in higher education adopt or emphasize a growth mindset has been shown to impact student learning (Burnette et al., 2019; Canning et al., 2019; Rattan et al., 2012). Students enrolled in courses taught by faculty who embrace growth mindset tend to show greater achievement than those taking courses with faculty who believe intelligence is fixed (Canning et al., 2019). Faculty who believe students can grow in their intelligence tend to use pedagogical techniques linked to learning improvement. These strategies vary, but include using stories to teach about struggle and the power of perseverance (Lin-Siegler et al., 2016); teaching self-control strategies to improve studying habits outside the classroom (Duckworth et al., 2016); emphasizing grit, or perseverance when facing challenges (Sriram et al., 2018); and finding commonalities between instructors and students to develop a positive teacher-student relationship (Gehlbach et al., 2016). Student awareness of growth mindset has been shown to enhance learning (Dringenberg et al., 2018). For at-risk students, this can translate into increased retention and improved motivation, especially in STEM courses (Sriram, 2014; Yeager et al., 2016).

## **Review of the Literature**

This literature review addresses three areas related to growth mindset. The first section examines research related to mindset theory, including the neurological and psychological foundations for fixed and growth mindset as well as experimental mindset interventions. This section is followed by an exploration of research studies about how an instructor's mindset impacts pedagogy, student mindset, and learning engagement. Finally, the third section discusses research related to student mindset and how growth mindset impacts student performance and achievement.

### **Mindset Theory**

The beliefs individuals hold about themselves greatly impact their behavior (Dweck, 2002, 2016). Individuals who hold a fixed mindset feel the need to prove themselves over and over again, whereas those who have a growth mindset recognize it is impossible to foresee the outcome of present efforts; they are passionate about stretching themselves and persevering through the development process (Dweck, 2016). In this study, growth mindset will be generally defined as the belief that intellectual ability is malleable and can be developed through good learning strategies, quality mentoring, and persistence in the face of challenges (Canning et al., 2019). Fixed mindset will be generally defined as the belief that intelligence and ability are unchanging, or cannot be developed.

Mindset is influenced by parenting, as children begin developing self-beliefs as early as 14 months of age based on patterns of parental praise (Gunderson et al., 2013). Praising a child's inherent intellectual abilities encourages a fixed mindset, whereas praising effort fosters a growth-minded framework for approaching challenges in the future (Dweck, 2002). Children can sense their parents' mindset, since parents who believe failure is detrimental tend to encourage

their children to prove themselves through performance and avoid failure at all costs (Haimovitz & Dweck, 2016). The effect of praise is also seen in older children (Dweck, 2002). If students receive intelligence-based praise after completing a task (e.g., “You’re so smart!”), they are less likely to invest in challenging tasks; those who receive effort-based praise (e.g., “You tried really hard until you solved the problem!”), however, keep trying to complete challenging tasks. The type of praise received in childhood shapes an individual’s effort belief, or how they view the relationship between intelligence and the amount of effort needed to achieve a desired outcome; Dweck and Yeager (2019) suggested that growth-minded people believe “that effort is a positive thing that helps grow your ability, as opposed to a negative thing that demonstrates deficient ability” (p. 483). An individual’s effort belief influences how they approach challenging problems.

Neurological pathways are associated with mindset (Mangels et al., 2006). Individuals who hold a fixed mindset process learning-relevant feedback for a shorter duration of time than those who hold a growth mindset (Mangels et al., 2006). Neural activity also reveals that individuals with a growth mindset are more aware of mistakes than those with a fixed mindset (Schroder et al., 2017). Individuals with a growth mindset might bounce back more quickly from adverse feedback or mistakes because of their sustained semantic processing of the feedback; these individuals are better able to apply feedback for improvement on future tasks (Mangels et al., 2006; Schroder et al., 2017). Additionally, brain activity demonstrates that the positive approach towards challenge embodied by growth-minded participants mitigates the impact of adverse feedback (Mangels et al., 2006).

Mindset is not static. Individuals are not bound to fixed mindset; with “a carefully targeted intervention that changes a key belief and refocuses . . . motivation in highly productive

ways” (Dweck, 2002, p. 38), individuals can shift from fixed- to growth-mindedness. A number of interventions have been tested in recent decades, particularly for at-risk students. Following just three sessions of teaching about mindset, a group of African American students demonstrated a lasting change in their view of intelligence (Aronson et al., 2002). A mindset intervention program for students in remedial classes showed a significant change in student mindset and increased academic effort (Sriram, 2014). Mindset interventions should also target self-theories, especially in underrepresented racial/ethnic minority (URM) and female students (Sriram, 2014; Yeager et al., 2016). If a URM student is afraid of being judged by an ability stereotype, they may lose motivation (i.e., adopting a fixed mindset) and underperform, thus reinforcing the stereotype (Canning et al., 2019; Steele & Aronson, 1995; Yeager et al., 2016). When URM students are taught that challenges are commonplace and improvable (i.e., growth mindset), retention and academic achievement improve (Broda et al., 2018; Yeager et al., 2016). Lay theory intervention has been demonstrated to improve achievement and social experience for URM students. Lay theory interventions include discussions of growth mindset, handling adverse feedback, and cultural fit and belonging.

Community colleges have been another site for mindset intervention. Results from a national survey showed a positive correlation between growth mindset and GPA in both math and English courses at community colleges (Center for Community College Student Engagement [CCCSE], 2019). This finding sheds light on the need for mindset interventions in this vulnerable population. Oftentimes, students who attend a community college believe they are fundamentally disadvantaged, whether by finances, ethnicity, age, or some other family origin trait (CCCSE, 2019). Sadly, one quarter of community college faculty members who responded did not believe

students could change their intelligence level (CCCSE, 2019). This unfortunately perpetuates the cycle of a self-fulfilling prophecy of success in the community college student population.

Grit is a concept closely related to growth mindset. Grit is comprised of both passion and perseverance; passion relates to an individual's persistence over time, while perseverance relates to the strength of one's willpower when overcoming obstacles (Duckworth, 2016). The exercise of self-control, or willpower, has implications for how students approach learning (Mrazek et al., 2018). If students believe they have an unlimited amount of willpower, they are more likely to exercise self-regulative behaviors (e.g., time management, healthy sleeping patterns); these practices are correlated with higher GPA and skill development compared to peers who believe willpower is limited (Job et al., 2015). Focus on success is another trait often observed in individuals with a high level of grit, as both characteristics are needed in pursuit of long-term goals (Sriram et al., 2018). Additionally, Sriram et al. (2018) found that individuals who embrace a religion were more likely to have high levels of grit because the religious people surveyed practiced short-term self-control when avoiding temptations (Sriram et al., 2018).

The research literature indicates that by the time a student enters college, their mindset has been influenced by a number of factors, including parental praise, parental view of failure, self-theories, and potential mindset interventions. These findings suggest that, with a carefully targeted intervention, an individual's mindset can be shifted towards one that embraces challenges as opportunities for learning and growth. In the college setting, faculty and staff impact how students approach learning, so it is important to study the relationship between instructor mindset and student mindset.

### **Instructor Embodiment of Growth Mindset**

Faculty members have the responsibility to help students persevere through difficulties they face in the learning process; instructor belief about the malleability of intelligence and abilities influences pedagogical practices (Canning et al., 2019; Rattan et al., 2012). Rattan et al. (2012) found that instructors with a fixed mindset tended to comfort students that faced difficulty. Faculty members who held a fixed mindset were also significantly more likely to judge a student's ability by a single test score (Rattan et al., 2012). In response, they used comfort-oriented feedback and voiced statements such as: "It's okay; not everyone can be good at math." This, in turn, demotivated students and created an expectation of low achievement in math. Additionally, the mindset of the instructor was transferred to the student, and students began lowering their own expectations for future performance, thus developing a fixed mindset in that particular subject area (Rattan et al., 2012). However, when faculty offered strategy-oriented feedback (e.g., "I will help you change your studying habits so you can learn the material"), students sensed genuine interest and support from the instructor and their performance in the class improved (Rattan et al., 2012).

Faculty mindset has also been shown to be evident in subtle messages. Faculty members who hold a fixed mindset may demotivate URM students, which in turn leads to underperformance (Canning et al., 2019). For example, if an instructor believes URM students come to college under-prepared for college-level math, then that instructor probably will not offer helpful feedback or support throughout the course. They might even be dismissive of questions in class from these students, which would create an environment where the student feels unwelcomed and unable to get necessary support. Additionally, faculty who espouse a fixed

mindset are more likely to overlook contextual factors (e.g., roommate problems, illness) that may influence student performance on a single assignment or test (Rattan et al., 2012).

Students reported demotivation in courses taught by faculty who held a fixed mindset (Canning et al, 2019). They shared that these professors were less likely to use pedagogical techniques that encouraged learning and development. Students displayed a fixed mindset when taught by instructors who encouraged learning for the sake of meeting benchmarking or assessment standards (Park et al., 2016). Interestingly, there is no pattern among faculty who embody fixed mindset; it does not appear to be influenced by age, gender, race, tenure, or teaching experience (Canning et al., 2019).

There are a few pedagogical practices that have been demonstrated to improve learning engagement and academic achievement. When instructors emphasize grit while teaching new material, students are reminded to continue exerting effort until they are competent (Duckworth, 2016). Similarly, the use of struggle stories has been shown to improve learning in the sciences; when students read about prominent figures who struggled personally or intellectually before achieving greatness in their field, students felt connected to the stories and persevered through their own challenges in the course (Lin-Siegler et al., 2016). Learning also improved when instructors encouraged application of self-control strategies to aid in studying habits (Duckworth et al., 2016). When students and instructors acknowledged commonalities that became evident following a survey of interests, they developed a positive teacher-student relationship (Gehlbach et al., 2016). The perceived similarity between instructor and student was correlated with a higher course grade; this intervention can be applied for specific purposes, such as closing an achievement gap (Gehlbach et al., 2016). Finally, pedagogy of vulnerability has recently emerged as a teaching strategy in which instructors intentionally share personal stories and

acknowledge failure to cultivate a community of co-learning (Brantmeier, 2013). This allows students to mindfully reflect on the lived curriculum, which, in turn, increases learning engagement.

The research literature on instructor mindset and pedagogy is limited but indicates that instructors can greatly influence student mindset, academic performance, and learning engagement. This research suggests the importance of investing resources in faculty mindset interventions since instructor mindset impacts student performance. Additionally, growth mindset pedagogy facilitates student interest in a field of study and career selection as early as introductory courses in the first semester of college (Burnette et al., 2019).

### **Impact of Student Mindset on Approach Towards Learning**

Mindset is evident in the way students approach tasks. Students with a fixed mindset will overwhelmingly choose a task or path that seems “safe” so that they appear smart, rather than take on something new and risk making mistakes, even if they will learn valuable lessons from being challenged (Dweck, 2002). Fixed mindset plays out in a variety of ways in academia. For example, students with a fixed mindset might not study for an exam until the last minute. If they do well on the exam, they believe that it is because of their innate intelligence. On the other hand, if they perform poorly, students will cast blame, like inadequate study time or poorly designed questions (Dweck, 2002); thus, fixed-minded students can maintain the façade of being smart and live in the “could have been.” These students cling to the notion that they might have achieved a great deal had they not withdrawn from the learning process in the face of difficult material rather than admitting their struggle.

However, when students embrace growth mindset, they tend to approach the learning process more holistically (Burnette et al., 2019). These students choose more challenging tasks

with the intention of learning from the struggle and mistakes (Dweck, 2002). Growth-minded students tend not to compare their achievement to their peers; rather, they assess their own growth in the learning process. These students exert a great deal of effort in learning. In fact, these students enjoy difficulty (Dweck, 2002). Dweck (2016) described one student who, when presented with a puzzle, rolled up his sleeves and declared, “I love a challenge!” (p. 1). While not all students so eagerly declare their love for challenges, those with a growth mindset tend to enjoy the process of trying, failing, reevaluating, and trying again.

Exposing students to knowledge about mindset has been an area of further research. In a focus group-based study in which first-year engineering students read and discussed Dweck’s (2016) book, *Mindset*, participants favorably viewed the idea of having a growth mindset (Dringenberg et al., 2018). The focus group provided an outlet for processing past experiences that might have contributed to either fixed or growth mindset. Students were then able to reframe such experiences as opportunities for learning and growth. For many of the participants, this was the first exposure to such concepts; this experience will likely influence how they approach the remainder of their college education. As a result of participating in the focus group, students reported being able to process challenges within a growth mindset framework (Dringenberg et al., 2018). Additionally, students recognized “that growth mindset was not an all or nothing switch to be flipped” (Dringenberg et al., 2018, para. 3).

Mindset has been shown to be correlated with learning engagement. Students who believe mindset is malleable tend to have a higher GPA, increased learning engagement, and greater enjoyment of learning than their peers who believe intelligence is fixed (Aronson et al., 2002); this effect was more prominent in URM students, though still significant in White students. In a mindset intervention program for students in introductory computer science

classes, participants reported stronger growth mindset after a 10-week intervention (Burnette et al., 2019). While mindset was not predictive of overall course grade, growth mindset was positively correlated with interest in the field of computer science (Burnette et al., 2019). When students embrace a growth mindset, they are more likely to maintain interest in a new field when challenges arise (O’Keefe et al., 2018).

Much of the existing literature on growth mindset in college and university settings results from studies conducted in large, research-oriented universities, and/or in STEM fields. The use of growth mindset in pedagogical practices at smaller colleges or in other fields has yet to be studied. This context influenced the purpose and design of this study.

### **Research Design**

The overarching purpose of this qualitative study was to explore the impact of instructor embodiment of growth mindset for students in the social sciences at a medium-sized, faith-based, liberal arts and sciences college. Toward this end, the study sought to answer two research questions:

1. In what ways, if any, does faculty emphasis on growth mindset impact student mindset?
2. In what ways, if any, does learning about growth mindset impact the way students approach their learning?

The research design and methodological approach was qualitative, primarily drawing upon narrative inquiry (Clandinin & Connelly, 2000; Creswell, 2009).

### **Narrative Inquiry**

As is typical with qualitative research in the social sciences, this study was guided by questions for exploration rather than based on testing hypotheses. This is consistent with narrative inquiry, as this research allowed participants to explore their personal experience

(Creswell, 2015). The aim was to allow participants' reflections to frame the story of how an instructor's mindset and pedagogy might impact participants' mindset and learning engagement. This approach allowed the researcher to make meaning of the stories shared as they relate to the impact of a single professor encouraging a mindset shift (Creswell & Poth, 2018). The narrative approach also allowed the researcher to reflect on her own experience as it related to that of the participants (Clandinin & Connelly, 2000). This led to self-reflection, which allowed for a deeper level of understanding of the shared experiences.

### **Setting**

The study took place at a medium-sized, faith-based, liberal arts and sciences college in the northeastern United States with an undergraduate enrollment of 2,709 students (Miller & Custer, 2019). At this college in the fall of 2019, 61% percent of students identified as female, 14.4% were classified as belonging to URM populations, and another 4.1% were international students. Approximately 12.5% of students were first-generation college students. The college offered over 85 undergraduate majors. At the time of the study, there were 225 students enrolled in a major in the social sciences (Miller & Custer, 2019).

### **Site and Participants**

Two upper-level psychology courses were selected as the site for this study: Psychological Testing and Counseling Skills. The selected courses were taught by the same social science professor who frequently emphasized growth mindset in her courses. The instructor was identified by a contact in the Psychology Department and she agreed to serve as the site. This study was approved by the Institutional Review Board.

From these courses, six undergraduate students (five female and one male) volunteered to participate in individual interviews. All six participants were enrolled in Psychological Testing,

and three were concurrently enrolled in Counseling Skills. Participants were third- and fourth-year students majoring in the social sciences. The researcher used a convenience sampling method to select participants who were available and willing to participate in the study during evening hours (Creswell, 2009). After the researcher presented the study in-person to each class, participants were invited to volunteer for the study by responding to an email from the researcher. Participants were offered extra credit by the course instructor as compensation for participation. An alternate, optional, extra credit assignment was prepared for students who chose not to participate. Thus, coercion to participate was minimized because all students had an equal opportunity to earn extra credit.

### **Procedure and Research Instruments**

Data were collected through individual interviews with the researcher during the last week of classes in the fall 2019 semester. The interviews were intended to “elicit views and opinions” (Creswell, 2009, p. 181) about the participants’ lived experience with growth mindset through the semester. Each interview took place in a private office to ensure confidentiality. Each interview was audio-recorded and transcribed for accuracy. The shortest interview was 20 minutes 51 seconds, and the longest interview lasted 37 minutes 55 seconds.

The interview protocol was designed by the researcher and consisted of 12 open-ended questions that guided the conversation (see Appendix). Some of the questions were adjusted based on information that participants disclosed. For example, if students shared they were graduating in December, then they were asked how they anticipated applying growth mindset in their new job instead of in spring semester courses. Interview Questions 1-2 were designed to gauge motivation for participation and familiarity with growth mindset. Questions 3-5 were scenario-based and intended to elicit specific and actual responses to failure. Questions 6-8 were

designed to gather participants' perception of instructor embodiment of growth mindset and course design. These interview questions aligned with Research Question 1: *In what ways, if any, does faculty emphasis on growth mindset impact student mindset?* Interview Questions 9-11 were designed to address Research Question 2: *In what ways, if any, does learning about growth mindset impact the way students approach their learning?* The interview protocol concluded with Question 12, which asked if participants had anything else they wanted to share that was not addressed by a previous question.

### **Data Analysis and Interpretation**

Interview transcriptions were the first data analyzed. The transcribed interviews were analyzed and categorized in terms of research questions and emergent themes. A coding method was used to organize interview data into a limited number of themes around these questions (Creswell, 2009). First, a general sense of meaning was determined from each interview by listening to the recording and making notes of key ideas that were repeated. These ideas were grouped into six themes that emerged from the data. Next, each transcribed interview was reread carefully and divided into segments related to each theme. These sections were further coded into specific concepts as they related to each theme (Creswell, 2009).

### **Researcher Positionality**

The researcher completed her undergraduate education in the social sciences at the same institution where this study was conducted. However, she did not take Psychological Testing or Counseling Skills, so the interviews were conducted without preconceived notions about how the classes were taught. The decision to study growth mindset stemmed from the researcher's interest in teaching and learning. Growth mindset is an emerging area of research as studies begin to demonstrate the impact of mindset interventions on student achievement; there are still

many educational fields and intervention methods that have yet to be studied. The researcher hopes to use the findings about how growth mindset impacts student learning to influence the way she teaches. This study challenged the researcher to think about her own mindset and how it shifted as a result of instructors who mentored her with a growth-minded approach. The researcher's personal connection to growth mindset should be considered when reading the discussion of findings and implications for practice.

### **Findings**

The following section presents four broad themes, each with sub-categories based on analyses of participant interviews. The first theme to emerge was each *individual's concept of mindset theory*, both how they define it and that there are many components that contribute to their own mindset. The second theme relates to *course design that encouraged growth mindset*. The third theme that emerged was the *instructor's embodiment of growth mindset*, both through sharing her personal growing experiences and in the way she presented feedback. Finally, the fourth theme involves how *participants' experience with growth mindset affected their concept of learning* in many areas by changing their view of learning in general and by expanding their perception of self-potential.

### **Mindset Theory**

Two components of mindset theory came to light through the interviews: the definition and application of growth mindset. When explaining mindset, participants highlighted several concepts related to growth mindset, such as the pursuit of competence. Participants also shared their personal application of growth mindset, acknowledging that mindset is not static and needs to be intentionally developed.

### *Definition of Growth Mindset*

A shared definition of growth mindset was not evident across participants, although several words or phrases were used consistently. First, participants identified that striving for competence tends to be a goal for growth-minded people. Participants also shared that growth mindset is a choice about how they respond to challenges or failure. Finally, the related term of grit was discussed as it relates to persistence in the learning process.

Many participants emphasized competence as a goal for growth-minded people; such learners are focused more on developing the skills necessary to be successful than on the grade for a particular course. Sarah phrased her definition of growth mindset as “*understanding that you have an increase in competence as you learn things and . . . that you have the capability to change and progress.*” When asked how participants might cope with an unexpectedly low grade on either an exam or a paper, most responded that they would invest more effort into understanding the material and applying it in their own lives, rather than simply memorizing for the exam or assignment and promptly forgetting. Thus, they have learned to value competence. Emily summarized the tension between competence and grades: “*Growth mindset also increases . . . anticipation and hope for competence. And so when you’re striving for competence, then growth and learning go hand-in-hand because you can’t just gain competence through grades and achievement.*” Emily recognized that competence might hold more long-term value than a grade.

Additionally, growth mindset is a choice. Emily defined growth mindset as “*an action . . . of valuing . . . learning and competence over immediate success.*” Erik articulated growth mindset as being “*willing to improve or take criticism or just be more open-minded. . . . Where fixed people would fail, they give up, and [with] growth mindset, people who fail use that as an*

*opportunity to learn.*” Ashley also mentioned that in addition to determination and motivation, growth-minded people are able to encourage themselves: *“If you can’t see yourself being motivated enough . . . or confident enough to be able to change then you’re not going to.”* Most participants mentioned that with growth mindset, people are more likely to believe in their ability to learn something new or accomplish a task if they set their mind to it. Erik said, *“Your mindset’s flexible in that you’re open to difficulties and even if you can’t do something now you have it in you that you could learn how to do it later.”* Participants’ understanding of growth-mindset contends that people choose not to get stuck and recognize that it takes time and effort to learn new things.

To a lesser extent, students expressed grit as part of growth mindset. Emily brought up grit as an extension of growth mindset:

*Growth mindset is more of the immediate action and how it relates to the emotions of the moment. But grit is more of that constant perseverance and . . . implementing of a growth mindset to reach a further goal.*

Erik further connected grit and growth mindset to perseverance and rebounding from failure:

*[I have] grit to do things I don’t really want to do. Like, oh, I don’t want to read for this gen ed class, but I should be able to look past that. Also just again, I’m still learning how to see a failure or something I wasn’t expecting and use it as a growth opportunity.*

Both growth mindset and grit encourage perseverance when students might otherwise be tempted to give up.

### ***Growth Mindset Exists on a Continuum and is Contextual***

Participants also identified that growth mindset is not a static concept. When asked if they held a growth mindset, it was challenging for participants to answer with complete

confidence. After noting that she used to believe that mindset was an either/or construct, Ashley shared her current perspective:

*I've been able to just let myself hang out in a gray area where it's like, this is not something I understand right now; it's . . . an area of ambiguity for a moment, but it's being able to tolerate that and be okay with that that lets you move on from that area and experience a different perspective that you didn't have before.*

Upon prodding, several participants acknowledged that while they approached courses with a growth-minded perspective, there were other areas, such as friendship, that they struggled with and found themselves caught in a pattern of fixed-minded thoughts. Ashley also reflected on how embracing growth mindset in the classroom impacted several areas of her personal life:

*I would say that in most of the areas of my life in the beginning of the semester, I didn't have [a growth mindset]. I didn't have it in my learning at school here. And I also didn't have it . . . within myself either when it came to social interactions. . . . But as I've progressed over the last few months I think that I've developed an extreme amount of growth mindset when it comes to my learning, and because of that, I've applied it in different areas of my life where . . . I'm being more adventurous or trying new things or interacting with people I wouldn't have necessarily before. . . . For example, I'm doing a cross cultural in January. I would never in a million years consider doing that just because I don't know anyone. I'm quiet . . . but I told myself, you know, if I can do this intellectually and in my classes and grow that way, I can certainly grow socially.*

Sarah echoed the freedom to grow and challenge herself that she found through embracing growth mindset:

*I used to think I was pretty good, pretty stable, you know, now I'm like, there are things I can work on from my own life and my own being and stuff and it's good because I do like the process of self-discovery and being able to challenge myself and knowing that . . . not having that pressure of perfection in my life . . . is great.*

Participants applied what they learned from having a growth mindset in class to several areas of their life.

Interestingly, Rachel said that her mindset was about 85% growth-oriented; she attributed the other 15% as being comprised of areas where she is not driven or open to improvement. In particular, she referenced her experience in specific art classes:

*There's some . . . processes for block printing and things that I just never really got. And when I did it and I did it again, it always was kinda pretty sloppy and bad. But I kind of accepted that and it was like I can be better at these other areas and not that.*

Rachel mentioned she is not motivated to adopt a growth mindset in all areas and is okay with living at 85%. She shared that it is not worth her time or mental energy to develop the other 15%. Course design can play a big role in encouraging students to be 100% invested in learning.

### **Course Design**

Several elements of course design, specifically assignment parameters, reflected a growth mindset orientation. In both Psychological Testing and Counseling Skills, the structure allowed students to drop two or three of their lowest quiz grades; this was a tangible way for them to understand learning from failure without a detrimental effect on their overall course grade.

Rachel described the impact of this structure as she learned how to adapt her studying habits for each of her courses:

*Maybe not every class will have the [option] to drop three quizzes, but I think for me at least it's important for me to have grace with myself so that I don't just get down and [think], "Oh, this is going to be horrible." But take, maybe you got the bad grade, but what can you do better now? And letting go of having grades be any definition of me, but just focusing on how I can learn and to get better and understand the content more.*

Through the structure of the course, many were able to learn how to process unexpectedly difficult feedback on assignments.

Writing assignments were also designed to foster growth mindset. In Counseling Skills, students completed 10 short reflective assignments at the conclusion of random classes. Additionally, there were three longer reflective papers that challenged students to consider the application of course material to the way they approach counseling. In particular, Sarah mentioned the final paper as it related to self-assessing how competent she felt towards having the necessary skills to be an effective counselor.

In Psychological Testing, the big assignment for the semester was a literature review on a psychological test. The paper was divided into five segments; throughout the semester, students conducted a peer review for each section. Then, students submitted a rough draft to the professor, received feedback, revised, and submitted again at the end of the course. Almost every participant mentioned this project as helpful in developing growth mindset. Erik said that instead of getting upset after receiving a low grade on the first draft, he chose to assess the situation more objectively:

*I took a step back and I'm like, "This is what [my professor] said." If I say, "Oh, it was never going to be good," or, "I can't write a good paper," that's lying to myself. But if I say, "Hey, these are just stepping stones that I can improve on," that's a better way to*

*look at it. And I feel like if I wasn't able to see it that way, I just would have got frustrated and would have not tried as hard on my second revision.*

The other participants reiterated the sentiment that spending a long time on an assignment and working through several drafts allowed them to apply growth mindset during challenging stages of the process. They sought feedback and were able to apply writing principles from this project to papers written for other courses as well.

Finally, mock counseling sessions were also structured to develop resilience and growth mindset. Like the literature review for Psychological Testing, mock counseling sessions were a crucial component of Counseling Skills that students gradually worked up to. Claire said that the instructor modeled her approach after a “Couch to 5K” program: “[*Practice*] starts off one minute, just counseling time in class with the person that you're sitting next to, slowly pushing you to three minutes, four minutes, five minutes, until a whole session. That was really helpful.”

The students enrolled in Counseling Skills appreciated that the sessions allowed them to practice the skills they were learning and grow in their self-confidence as future counselors. Additionally, since their sessions were recorded, they had the opportunity to watch themselves and determine areas for improvement in the future. The instructor was intentional in designing her courses to facilitate development of growth mindset.

### **Instructor Embodiment of Growth Mindset**

Two aspects of the instructor were highlighted by participants as reflecting growth mindset: setting an example and delivery of feedback. Setting an example, or modeling, was observed through the use of stories in her pedagogy. Additionally, feedback was delivered with the intent of helping students gain competence in the material; participants valued her relationality as they applied feedback to improve future performance.

### *Setting an Example*

Several participants articulated appreciation for how their instructor not only talked the talk about growth mindset, but also shared openly from her personal journey. Rachel described an in-class discussion that stemmed out of her instructor's decades of experience in the field:

*She's told us references back to stories or times where she's had to learn about, for example, updated versions of . . . psych tests that are constantly being revised. . . . It's not what she studied in grad school and it changes and that's okay. And it's been changed for a reason and that's good. So she's had to take the time and put effort into doing that even though it wasn't for an assignment, but just because that's how you . . . administer those tests well in her career; that's why she's focused on that.*

Many participants cited such conversations as increasing the credibility of the instructor when she encouraged them to maintain a growth mindset; if growth mindset was this beneficial to her over her career, then the participants could begin seeing its value now, as students. Furthermore, there were a few instances during class that the students got to witness their instructor rebounding from failure. Emily shared one story that resonated with her:

*When she was giving the tests that we participated in over the semester, she fumbled over her words a couple times and in the moment . . . she was like, "Ugh, see, I have been doing this for years and I still mess up the words so nobody's perfect."*

A few other participants also found these real-life moments to be reassuring by sending the message that it was okay not to be perfect in the class.

A few participants mentioned the passion and enthusiasm their instructor brought to teaching both the course material and growth mindset. Sarah said that she felt inspired to keep learning as a result of being around this instructor:

*If I was a professor someday [I'd] have that same kind of passion and really care for my students. She really does care for us and wants to make sure we're learning things instead of just lecturing to us and throwing up PowerPoints and being like, "Here, this is the information." She really makes it personal and cares for us.*

Ashley also described how the instructor transformed the classroom with her enthusiasm and care for her students. This passion was one way the instructor made a challenging course interesting and engaging for students.

### ***Delivery of Feedback***

All participants emphasized the importance of the relationality of the professor. Ashley shared that one of the professor's mantras was: *"I'm not always nice, but I'm kind."* The instructor provided feedback that was meant to challenge students to grow, but her intention was to see them succeed. Ashley also shared that Psychological Testing and Counseling Skills were two challenging courses that would be even more difficult if students were left to find their own way through the material. Their instructor, however, came alongside them throughout the course. Ashley described the instructor-student relationship: *"She facilitates a relationship with you where you feel special and you just feel like you're cared for but also being challenged in the best way possible. She's understanding you as a whole individual."* Claire also emphasized how the instructor helped students understand difficult material so they would not feel stuck.

Several participants mentioned the frequency with which the instructor would remind them about growth mindset, especially at the beginning of the semester. Sarah described how the instructor's dialogue changed over those four months:

*At the beginning of the semester [our instructor] just kept saying, "You guys are incompetent but you're growing in competence," and now she's like, "you have definitely*

*grown in competence but you're still not completely competent," 'cause we're not licensed counselors. . . . I might feel a little more defeated if I did something wrong or just feel like I'm never going to get good. But she made it clear that wait, we're still learning and it's okay to make mistakes.*

The instructor frequently reminded students that grades did not define their identity, and most participants mentioned their appreciation of the sentiment. In addition to sharing about mindset on the first day of class, the instructor also reminded students to adopt a growth mindset whenever she sensed discouragement or decreased morale. Rachel described some of these exchanges:

*If she ever picked up on it in class, she would bring it up. So if someone said something, she'd be like, "No, no, no, we need to have a growth mindset." So she would half call us out on it. Or even if no one verbally said something, she would be like, "If you're feeling this way, remember, have a growth mindset."*

Rachel also mentioned that almost every class for the first month started with a quiz. While students sometimes struggled with not performing well, she reminded them that the lowest quiz grades would be dropped and that their learning was improving. Erik described an email the students received shortly before the instructor provided grades and feedback for the first draft of their major research paper:

*She sent out an announcement saying, "Hey, it's going to be harsh." She warned us that it was going to be bad because I think she thought a lot of us prob—I'm fairly sure the whole class assumed we were going to do really well. . . . But she warned us beforehand. So I guess she knew that we would be disappointed and was like, "Hey, don't take it personally. Use it to improve." And she talked about the reminder of a growth mindset.*

The students who recounted similar experiences when the instructor primed them for challenging feedback with a conversation about growth mindset all appreciated the reminder that a single grade did not define them. They were able to recover from the setback, think objectively, approach the instructor for help, and improve on the next assignment or exam.

### **Impact of Mindset on Student Approach Towards Learning**

Three concepts emerged within the theme of how mindset impacted student approach towards learning: view of failure, greater appreciation for the learning process, and renewed belief in self. Most participants disclosed a healthy response to failure, recognizing that challenges were stepping stones along the path to competence. Every participant shared at least one change in the way they approached learning as a result of embracing growth mindset. A few participants also grew in self-confidence about their ability to be successful in their future career as a result of embracing growth mindset.

### ***Student Approach Towards Failure***

Participants were presented with two scenario questions in the interviews. In the first, they were asked: *Let's say that you hand in an exam and feel confident about your submission. You receive your grade, and it's a C—much lower than you were anticipating. How do you respond? What will you do differently next time?* The second question is phrased identically, except this time they are told that it is a paper. All participants responded that they would be upset with an unexpected low grade on an assignment. Additionally, most participants pointed to at least one real life situation from the fall semester that fit the description of the hypothetical scenario; they answered from the perspective of how they actually handled the situation and how they improved performance going forward. Participants were eager to learn how to improve their

work. They met with the instructor several times throughout the semester and implemented all the advice she provided to improve their writing or test-taking ability.

### ***Greater Appreciation for the Learning Process***

Every participant articulated a shift in how they approached learning over the course of the semester. Ashley grew in her ability to study well and learn new material as a result of developing growth mindset over the semester:

*The way I approach learning has changed. I don't feel as anxious in beginning to study for something. Instead of saying, "Oh, I don't have enough time to do this," or, "I don't have the skills to perform in this session," or, "I just don't have the capacity to think this outside of the box." I went from that to saying, "Okay, I'm going to learn by just expanding upon what I know," and just taking it steps at a time to learn in a more open way . . . I just switched the mindset of something that I can't do to, "Let me explore all the different areas of this topic to better understand it and apply it to myself instead of just regurgitate it on an exam."*

Throughout the interview, Ashley passionately recounted her own transformational journey with growth mindset. She learned to embrace constructive criticism and shifted her mindset towards academics so that she could enjoy the learning process with less stress and anxiety.

Erik shared about his journey in recognizing failure and disappointment as learning opportunities instead of excuses to give up: *"I think grades are pushed so badly. Like, 'Oh, be perfect or you're not enough.' That having that internal reminder and be like, 'Hey, it's okay. You can get better from this.'"* Erik also resonated with his instructor's reminders that the students are worth more than their performance on a single assignment:

*She always tells us that your grade doesn't define you as a person. And that was kind of cool to learn. I don't think grad schools care about that, but . . . I think in the real world that has meaning to it and I think that was kind of helpful.*

Though Erik was still processing what it meant for him to embrace imperfection and not shut down or give up when faced with challenges or critical feedback, he was grateful for the progress he made over the semester.

Rachel talked about how she was able to make connections across courses. Because the psychology courses were designed to gradually build on information from week-to-week, Rachel said that she had to truly learn it. She then found that she was able to talk about information from these classes in other, non-departmental classes because everything seemed so much more interconnected. She also identified that key assignments, like the research paper, were worth the effort of multiple revisions and submissions. She was able to prioritize what was most important to her and not worry about the rest, such as what she described as her less-exciting art classes.

Sarah also emphasized how learning about and developing her growth mindset enabled her to make connections across courses outside of the department, specifically in regard to an African music class:

*Even though I feel like I'm just regurgitating information back on a test or something, I definitely have learned a lot from this class and I really like to see the broad picture of wow, I didn't know that beforehand. Before this semester, I didn't know anything about that kind of music or whatever. And now I know more and I could share that with people and it's more relevant than I think, even though we're learning about African drumming and stuff like that, that I would never think of listening to on my own time.*

Sarah also talked about how she continued to learn new things in her field of study. Because of growth mindset, she can see that there is a bigger picture than a single assignment or grade and can better handle adverse feedback.

Claire reported that she developed self-confidence throughout the semester. At first, she felt inferior compared to her peers, especially during the mock counseling sessions. However, through practice and affirmation, her love of learning emerged:

*Eventually my love for learning and just doing counseling and my love for really pursuing problem solving [triumphed] over my fears. And I was actually able to focus more on helping [my client] with her problems rather than like, “Oh man, is my recording gonna be weird? Am I touching my hair too much? Am I clicking my pen too much?”*

Claire was nervous for these two classes, but she finished them with a new love for learning and increased confidence in her potential.

Like Claire, Emily described how she came into the semester with the mindset that Psychological Testing stood between her and graduation, so she just needed to complete the bare minimum to get through; there was little enthusiasm. However, she learned how her actions and mindset directly impacted personal learning outcomes: *“Being able to value what you’re studying and what you’re doing and seeing it as . . . growing competence increases the desire to manage time in a way that will benefit the outcome that you’re seeking.”* Emily chose to define her ability as *“changeable and malleable,”* which allowed her to take ownership of her learning.

### ***Renewed Belief in Self***

A few of the participants described some noteworthy personal transformation as a result of learning about growth mindset and being taught by this instructor. Ashley came into the

courses thinking she just needed to get through it to graduate yet emerged with a renewed passion for her field and desire to enroll in advanced degree programs:

*Honestly, this semester . . . was just transforming for me. I had taken a counseling theories class last year and by the end of that class I was like, “Oh my gosh, I’m in a clinical psych degree and I hate counseling.” It was more just because I felt like I couldn’t do it. I was like, “Oh, if I can’t tolerate ambiguity, I can’t be a competent counselor. That’s not my area of expertise. I’m an anxious person. I’m skeptical. There’s no way that this can translate into a career for me.” So I went into Counseling Skills saying, “I’m just going to get through this semester somehow. I’m just going to do the bare minimum. . . . I know I don’t want to be a counselor.” But this semester has been crazy for me because [my instructor] has really guided me and taught me, saying, “I can’t do something,” is not true. And she’s shown me that there’s so much room for potential and that I need to keep an open mind in my perspective on my competency as well. So this semester has been crazy for me because I’ve gone from saying that I wasn’t even going to consider counseling to now I’m looking into PsyD programs and I’m just in love with the profession and I’ve really, really enjoyed it and I think that’s mainly because I was able to experience what the growth mindset really means and stepping out of the boundaries I’ve created for myself.*

Ashley’s story is not unique, as most participants strengthened their self-confidence to some degree. However, her robust transformation illustrates the power of a mindset shift.

Two of the participants graduated after completing the fall semester and were planning to start new jobs. Emily anticipated bringing growth mindset into her new role because she would be doing unfamiliar work:

*Having a growth mindset through . . . the interim between graduating and starting a job of managing my time and my resources in a way of studying more of the material that I'll be implementing within that job, but also within that job when I don't do it perfectly for the first couple months because that's what happens. Being able to confidently ask for help and ask questions when I need it. And not feel . . . like I'm burdening other people when I'm asking questions about how to do my job in a way that would report well and benefit the people that I'm helping.*

Claire imagined that her experience with growth mindset in the classroom would prepare her to process decisions or challenges more slowly and thoughtfully instead of rushing to rash conclusions as a result of facing challenges.

Each participant disclosed personal benefits from being instructed by a professor who emphasized growth mindset. In the end, participants were still in the process of growing, but they recognized and mostly embraced the process because they experienced the impact of having a growth mindset.

### **Discussion**

The purpose of this study was to explore the influence of instructor embodiment of growth mindset for students in the social sciences at a medium-sized, faith-based, liberal arts and sciences college. Considering the findings in light of the review of the literature, this research affirmed and advanced the literature on growth mindset, especially in regard to understanding of and impact of growth mindset. This research also revealed some areas for further consideration, including ways to design courses to advance growth mindset.

### **Mindset Theory**

While a common definition for growth mindset was lacking across participants, a few concepts came up repeatedly, including competence and grit. This finding aligns with the growth mindset literature, which notes that individuals with a growth mindset tend to appreciate the learning process and overcoming obstacles in pursuit of mastery, or competence, of the task at hand (Dweck, 2016). Most participants identified obstacles they faced throughout the semester. Some were personal obstacles, like Claire's self-doubt or Ashley's lack of desire to be a counselor. Others faced academic obstacles, such as challenges with the research paper, quizzes, or presentations. Through the learning process, participants set a goal for a specific competency and worked towards it, rather than simply trying to meet the rubric requirements for an A. Erik, for example, shared that when he was trying to satisfy the rubric for the research paper, he dismissed several articles about his topic because they were not from peer-reviewed journals. He later recognized if he had the minimum number of scholarly sources, he could also incorporate as many other non-scholarly sources as he desired. His goal then became writing a good paper instead of getting an A. This helped him improve both his paper and his understanding of the topic.

Participants in this study also recognized that they needed to put in effort to achieve the outcomes they desired, thus equating effort with competence (Dweck & Yeager, 2016). Participants reflected findings from previous research that embodiment of growth mindset leads to increased academic effort (Sriram, 2014). Several participants mentioned that before taking Psychological Testing, they had not approached writing a research paper with such intentionality. Participants experienced how effort enabled them to achieve a desired outcome; this further helped to develop growth mindset since the effect of effort had personal relevance. Most

participants reported changing studying and writing habits to ensure their time investment was worthwhile and effective. As they pursued competence, or mastery of course material, they put in the required effort with the help of their professor. They also felt more confident in their ability to continue exerting the effort needed to master new challenges in future contexts.

Grit was mentioned a few times by participants. In prior research, grit was observed to be stronger among religious individuals (Sriram et al., 2018). While religiosity was not surveyed in the present study, the participants were all enrolled in a Christian college. There is a chance that religious commitment influenced students' exercise of willpower and adoption of growth mindset, though that was not assessed in this study. Likewise, the belief that willpower is unlimited is connected to self-regulative behaviors and greater learning engagement (Job et al., 2015). Many participants disclosed certain studying or time management practices that could be influenced by their faith or willpower beliefs. This contributes to grit by helping students develop the self-regulative patterns necessary for perseverance in pursuit of long-term goals (Mrazek et al., 2018).

Finally, participants recognized that growth mindset is not static. Dringenberg et al. (2018) also found that a key takeaway for students learning about growth mindset was that it exists on a continuum. Growth mindset is not something that can be adopted at a moment's notice, nor is it something that will automatically be applied to all areas of an individual's life. Rather, mindset interventions offer the skills students need to continue developing growth mindset and intentionally apply it to areas of their life beyond the intervention. Participants reported developing some of the skills that have been found to relate to resilience and willpower, such as time management and self-control (Dweck et al., 2016; Job et al., 2015; Sriram et al., 2018). Participants recognized the dynamic nature of mindset and finished the semester with the

skills necessary to continue developing growth mindset in future contexts (Dringenberg et al., 2018).

### **Course Design**

Growth mindset literature has not explicitly discussed course design, which was a key finding of this study. Each course was designed by the professor to facilitate development of skills related to growth mindset. In Psychological Testing, students spent an extended time working on a research paper and in the process sought and applied feedback to improve competence in writing. In Counseling Skills, students slowly developed the skills necessary to conduct a counseling session, again applying feedback throughout the process. Both of these processes challenged students to develop perseverance (Dweck, 2002). Reflective assignments challenged students to consider how they grew through the semester and areas for future growth, which personalized the learning (Brantmeier, 2013). Also, because the lowest quiz scores were not factored into the final grade, students learned to process poor performance and use the experience to develop better studying habits. There is little in the literature specific to how courses can be designed to facilitate development of growth mindset, so this is an area that should be further explored.

### **Instructor Embodiment of Growth Mindset**

The instructor modeled growth mindset throughout the semester. The professor frequently shared stories from different points in her career as they related to both course material and growth mindset. As she shared openly about lessons learned through personal experiences, the instructor taught with a pedagogy of vulnerability (Brantmeier, 2013). The technique invited the students into her journey as co-learners. Ideally, a pedagogy of vulnerability promotes deep learning through reflective and contemplative activities so that

students will embrace the material long after the course ends (Brantmeier, 2013). This study did not assess depth of learning but did ask participants to share how they anticipated applying growth mindset beyond the scope of course requirements (i.e., Interview Question 10: *How will the skills you learned in this class transfer to the way you approach learning in other courses?*). Based on interview analyses, participants' learning went deeper than mere regurgitation of the definition of growth mindset. Pedagogy of vulnerability also incorporates contemplative teaching, which focuses on what can be learned in a specific moment (Brantmeier, 2013). A few participants recalled instances when the instructor acknowledged mistakes in the moment (e.g., when she struggled with wording while administering a practice test in Psychological Testing). The contemplative nature of the pedagogy of vulnerability encourages students to continue to apply growth mindset. Pedagogy of vulnerability has not yet been studied in relation to growth mindset, so this is an area that can be explored further.

The instructor also used stories to facilitate learning. Participants shared several of her stories during the interviews and why they were personally impactful. Claire, for example, resonated with the Couch to 5K analogy for Counseling Skills because she found comfort in the idea of slowly building up to the end goal instead of being expected to achieve it without proper training. The instructor's willingness to share from personal experience might be connected to the way in which students persevered through the course (Lin-Siegler et al., 2016). Some participants mentioned they viewed the class as an obstacle on the way to graduation; they had no desire to put in more than the minimum amount of effort required. Because of the way the professor taught her classes, participants developed an intrinsic desire to work harder to gain competence and achieve personal goals.

The instructor was relational and approachable, especially when delivering feedback on performance. Every participant described individual interactions with the instructor as they sought feedback to improve performance on assignments. While the feedback might not have always been favorable, the instructor was clear in her expectations and coached students as they developed their skills. Rattan et al. (2012) called this strategy-oriented feedback. When students felt supported by their instructor when processing a low grade, they were more likely to persevere and ended the course with a higher grade than if the instructor acted in a comforting manner (Rattan et al., 2012). Participants did not disclose any comforting behaviors but rather the “tough love” approach of challenging students to improve. Participants did not mention any of the instructor’s feedback as being intelligence- or effort-based. However, the course design encouraged consistent growth through each stage of the research paper in Psychological Testing or the mock counseling sessions in Counseling Skills. By offering recommendations to improve for the next assignment, the instructor acknowledged student effort and encouraged growth (Dweck, 2002).

### **Impact of Mindset on Student Approach Towards Learning**

Participants reported a greater appreciation for the learning process at the end of the fall semester. Aronson et al. (2002) found that students who viewed mindset as malleable tended to have a higher GPA and greater learning engagement than those with a fixed mindset. While GPA was not measured in the present study, participants self-reported being more invested in the learning process through behaviors like seeking feedback and valuing competence more highly than their grade in the course. Since participants were third- and fourth-year students, they were invested in completing their major in the social sciences, even if they felt discouraged about employment options after graduation. Growth mindset encourages students to persevere through

challenging seasons when developing their passion, which was evident in the mindset shifts described by participants (O’Keefe et al., 2018).

Participants were able to rebound from failure. All humans rebound from failure, but growth mindset provides a framework for effectively applying feedback and learning from mistakes (Mangels et al., 2006; Schroder et al., 2017). The two scenario-based interview questions asked students to imagine how they would respond to an unexpectedly low grade on a paper and an exam. Every participant shared strategies for improvement, and most had a tangible example that they drew upon when answering the interview questions. Participants articulated how embracing a growth mindset helped them learn from failure and improve future performance (Dweck, 2002).

Participants also disclosed a renewed belief in self-potential. Every participant articulated takeaways from the semester related to how they can apply growth mindset in other contexts. This is evidence of the deep learning fostered by a pedagogy of vulnerability (Brantmeier, 2013). Burnette et al. (2019) found that a growth mindset intervention caused students to look favorably upon a field of study, regardless of academic performance in the course. As a result of taking Psychological Testing and Counseling Skills, both Claire and Ashley viewed the counseling profession more positively than they had at the start of the semester.

This research fits within the existing literature on growth mindset in the higher education context. Mindset interventions have been shown to improve learning engagement and academic achievement (e.g., Broda et al., 2018; Yeager et al, 2016). In this study, the incorporation of growth mindset pedagogy was connected to participants’ self-reported greater engagement with the learning process. Furthermore, the instructor’s use of a pedagogy of vulnerability was also

impactful for participants. Every participant was appreciative of the ways learning about growth mindset helped them shift their views of self, academia, assignments, and failure.

### **Limitations**

There were a few limitations to this study. First, the findings were not generalizable due to the qualitative nature of this study. There was no controlled mindset intervention to be analyzed or refined for future research. Second, the findings were limited in scope by the self-selection of students who desired extra credit in class in exchange for participating in this study. There was a chance that already high-achieving students volunteered just to ensure they maintained a grade in the class that they deemed satisfactory. Also, the perceived similarity between the instructor and study participants may have contributed to the self-selection of participants. Third, there were no observations of the classes. References to the instructor's incorporation of mindset into teaching and assignments varied across participants; some said the instructor discussed mindset almost every class, while others could only recall a handful of references. Without observations, it was impossible to know for certain the frequency with which the instructor discussed mindset. Likewise, instructor feedback on assignments was shared through the lens of participant interpretation and paraphrase. These limitations suggested future directions for designing an experimental mindset intervention.

### **Implications for Practice**

Based on the findings from this study, there are several implications for practice. First, for students, the findings suggest the importance of a personal mindset shift, as participants repeatedly mentioned how helpful they found it to have a growth mindset framework when processing adverse feedback or challenging material in their classes. Second, students should work towards developing self-control in other areas of life (e.g., healthy sleeping patterns) since

self-regulation is correlated with academic achievement. Third, instructors should design courses with reflective components that challenge students to deepen their learning and apply concepts beyond the scope of the class, especially if teaching about growth mindset. Fourth, the findings revealed that the way feedback is delivered impacts how students receive it. Faculty members should deliver feedback in a constructive manner, perhaps priming students with a conversation about growth mindset in preparation for adverse feedback. Instructors should also encourage students to connect with them when processing challenging material or feedback since the instructor-student relationship is important when pursuing competence. Additionally, faculty members should consider using a pedagogy of vulnerability, as the use of stories and co-learning has been shown to improve learning engagement. Finally, university administrators or staff working in Centers for Teaching and Learning should consider training instructors in how to teach from a growth-minded perspective and deliver feedback in a constructive manner, as these practices hold promise for positive outcomes for students.

### **Recommendations for Future Research**

Based on the findings in this study, there are several recommendations for future research. First, it would be valuable to look at the mindset of students in other distinctive groups, such as honors students who are high-achieving or students in the arts who regularly receive critical feedback and apply it to improve their work. Second, it would be helpful to study how two different groups of students might engage with the material depending on whether or not their instructor incorporated growth mindset into pedagogy. This could be realized through one professor teaching two different sections of the same course and adding additional growth mindset material into one section, or two different professors teaching different sections of the same course in their own distinct ways. Finally, there was little in the literature related to course

design that facilitates development of growth mindset, so it would be prudent to study different course structures and assignment types as they relate to outcomes in mindset, academic achievement, and learning engagement.

### **Conclusion**

Three major conclusions can be drawn from this study. First, students often respond positively to conversations about growth mindset. Learning about growth mindset impacted the way students approached learning and failure. Second, course design made a difference for student learning. Assignment structure, type, and duration were noted to be impactful in the present study. Finally, pedagogical interventions should be explored so that instructors are developed and trained to incorporate growth mindset into their teaching. Literature shows that if faculty do not hold a growth mindset, students will disengage from learning and develop a fixed mindset in that content area. The power of story as a learning method is especially relevant to growth mindset. The qualitative nature of this study encouraged students to reflect on lessons learned by sharing their own story about mindset shift.

### References

- Aronson, J., Fried, C. B., & Good, C. (2002). Reducing the effect of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology, 38*, 113–125. <https://doi.org/10.1006/jesp.2001.1491>
- Brantmeier, E. J. (2013). Pedagogy of vulnerability: Definitions, assumptions, and applications. In J. Lin, R. L. Oxford, & E. J. Brantmeier (Eds.), *Re-Envisioning higher education: Embodied pathways to wisdom and transformation* (pp. 95–106). Information Age Publishing.
- Broda, M., Yun, J., & Schneider, B. Yeager, D. S., Walton, G. M., & Diemer, M. (2018). Reducing inequality in academic success for incoming college students: A randomized trial of growth mindset and belonging interventions. *Journal of Research on Educational Effectiveness, 11*, 317–338. <https://doi.org/10.1080/19345747.2018.1429037>
- Burnette, J. L., Hoyt, C. L., Russell, V. M., Lawson, B., Dweck, C. S., & Finkel, E. (2019). A growth mind-set intervention improves interest but not academic performance in the field of computer science. *Social Psychological and Personality Science, 11*, 107–116. <https://doi.org/10.1177/1948550619841631>
- Canning, E. A., Muenks, K., Green, D. J., & Murphy, M. C. (2019). STEM faculty who believe ability is fixed have larger racial achievement gaps and inspire less student motivation in their classes. *Science Advances, 5*(2), eaau4734. <https://doi.org/10.1126/sciadv.aau4734>
- Center for Community College Student Engagement. (2019). *A mind at work: Maximizing the relationship between mindset and student success*. Austin, TX: The University of Texas at Austin, College of Education, Department of Educational Leadership and Policy, Program in Higher Education Leadership.

- Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research*. Jossey-Bass.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). SAGE Publications.
- Creswell, J. W. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (5th ed.). Pearson.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). SAGE Publications.
- Dringenberg, E., Shermadou, A., & Betz, A. R. (2018). *Reactions from first-year engineering students to an in-depth growth mindset intervention* [Conference paper]. AEEE Annual Conference & Exposition, Salt Lake City, UT. <https://peer.asee.org/reactions-from-first-year-engineering-students-to-an-in-depth-growth-mindset-intervention.pdf>
- Duckworth, A. (2016). *Grit: The power of passion and perseverance*. Scribner.
- Duckworth, A. L., White, R. E., Matteucci, A. J., Shearer, A., & Gross, J. J. (2016). A stitch in time: Strategic self-control in high school and college students. *Journal of Educational Psychology, 108*, 329–341. <https://doi.org/10.1037/edu0000062>
- Dweck, C. S. (2002). Messages that motivate: How praise molds students' beliefs, motivation, and performance (in surprising ways). In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 37–60). Academic Press.
- Dweck, C. S. (2016). *Mindset: How we can learn to fulfill our potential*. Ballantine Books.
- Dweck, C. S., & Yeager, D. S. (2019). Mindsets: A view from two eras. *Perspectives on Psychological Science, 14*, 481–496. <https://doi.org/10.1177/1745691618804166>

- Gehlbach, H., Brinkworth, M. E., King, A. M., Hsu, L. M., McIntyre, J., & Rogers, T. (2016). Creating birds of similar feathers: Leveraging similarity to improve teacher-student relationships and academic achievement. *Journal of Educational Psychology, 108*, 342–352. <https://doi.org/10.1037/edu0000042>
- Gunderson, E. A., Gripshover, S. J., Romero, C., Dweck, C. S., Goldin-Meadow, S., & Levine, S. C. (2013). Parent praise to 1- to 3-year-olds predicts children's motivational frameworks 5 years later. *Child Development, 84*, 1526–1541. <https://doi.org/10.1111/cdev.12064>
- Haimovitz, K., & Dweck, C. S. (2016). What predicts children's fixed and growth intelligence mind-sets? Not their parents' views of intelligence but their parents' views of failure. *Psychological Science, 27*, 859–869. <https://doi.org/10.1177/0956797616639727>
- Job, V., Walton, G. M., Bernecker, K., & Dweck, C. S. (2015). Implicit theories about willpower predict self-regulation and grades in everyday life. *Journal of Personality and Social Psychology, 108*, 637–647. <https://doi.org/10.1037/pspp0000014>
- Lin-Siegler, X., Ahn, J. N., Chen, J., Fang, F.-F. A., & Luna-Lucero, M. (2016). Even Einstein struggled: Effects of learning about great scientists' struggles on high school students' motivation to learn science. *Journal of Educational Psychology, 108*, 314–328. <https://doi.org/10.1037/edu0000092>
- Mangels, J. A., Butterfield, B., Lamb, J., Good, C., & Dweck, C. S. (2006). Why do beliefs about intelligence influence learning success? A social cognitive neuroscience model. *Social Cognitive and Affective Neuroscience, 1*, 75–86. <https://doi.org/10.1093/scan/nsl013>

Miller, L., & Custer, D. (2018). *Messiah College factbook 2019-2020*. Messiah College.

<http://mcweb.messiah.edu/documents/institutional-research/secure/Factbook/2018-19/2018-19%20Factbook%20FINAL.pdf>

Mrazek, A. J., Ihm, E. D., Molden, D. C., Mrazek, M. D., Zedelius, C. M., & Schooler, J. W.

(2018). Expanding minds: Growth mindsets of self-regulation and the influences on effort and perseverance. *Journal of Experimental Social Psychology, 79*, 164–180.

<https://doi.org/10.1016/j.jesp.2018.07.003>

O’Keefe, P. A., Dweck, C. S., & Walton, G. M. (2018). Implicit theories of interest: Finding your passion or developing it? *Psychological Science, 29*, 1653–1664.

<https://doi.org/10.1177/0956797618780643>

Park, D., Gunderson, E. A., Tsukayama, E., Levine, S. C., & Beilock, S. L. (2016). Young children’s motivational frameworks and math achievement: Relation to teacher-reported instructional practices, but not teacher theory of intelligence. *Journal of Educational Psychology, 108*, 300–313. <https://doi.org/10.1037/edu0000064>

Rattan, A., Good, C., & Dweck, C. S. (2012). “It’s ok — Not everyone can be good at math”: Instructors with an entity theory comfort (and demotivate) students. *Journal of Experimental Social Psychology, 48*, 731–737. <https://doi.org/10.1016/j.jesp.2011.12.012>

Schroder, H. S., Fisher, M. E., Lin, Y., Lo, S. L., Danovitch, J. H., & Moser, J. S. (2017). Neural evidence for enhanced attention to mistakes among school-aged children with a growth mindset. *Developmental Cognitive Neuroscience, 24*, 42–50.

<https://doi.org/10.1016/j.dcn.2017.01.004>

- Sriram, R. (2014). Rethinking intelligence: The role of mindset in promoting success for academically high-risk students. *Journal of College Student Retention: Research, Theory, & Practice, 15*, 515–536. <https://doi.org/10.2190/CS.15.4.c>
- Sriram, R., Glanzer, P. L., & Allen, C. C. (2018). What contributes to self-control and grit? The key factors in college students. *Journal of College Student Development, 59*, 259–273. <https://doi.org/10.1353/csd.2018.0026>
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69*, 797–811. <https://doi.org/10.1037/0022-3514.69.5.797>
- Yeager, D. S., Walton, D. M., Brady, S. T., Akcinar, E. N., Paunesku, D., Keane, L., Kamentz, D., Ritter, G., Duckworth, A. L., Urstein, R., Gomez, E. M., Markus, H. R., Cohen, G. L., & Dweck, C. S. (2016). Teaching a lay theory before college narrows achievement gaps at scale. *Proceedings of the National Academy of Sciences of the United States of America, 113*, E3341–E3348. <https://doi.org/10.1073/pnas.1524360113>

## Appendix

### Interview Protocol

#### *Motivation*

- 1) I'd like to begin by asking what motivated you to participate in this research study.

#### *Understanding of Growth Mindset*

- 2) This study seeks to understand "growth mindset" in college students. What is your understanding of this term? When did you first hear of growth mindset?

#### *Student Behaviors and Growth Mindset*

- 3) Let's say that you are required to take a course that you anticipate being difficult. What might make you anticipate it being difficult? How do you engage that course the same as one you feel confident in? How might you engage differently?
- 4) Let's say that you hand in an exam and feel confident about your submission. You receive your grade, and it's a C—much lower than you were anticipating. How do you respond? What will you do differently next time?
- 5) Now suppose that you spend 2-3 weeks writing a research paper and you feel proud of your submission. You receive your grade, and it's a C—much lower than you were anticipating. How do you respond? What will you do differently next time?

#### *Student Perceptions of Instructor Emphasis on Growth Mindset*

- 6) What, if anything, have you learned about growth mindset in the context of this course? How did you learn these things?
- 7) To what extent has your instructor emphasized growth mindset this semester? In what ways has she emphasized this idea?
- 8) In what ways, if any, did class assignments connect to growth mindset in content? In structure? If so, how? If no, why not?

#### *Course Impact on Student Mindset*

- 9) Think back to the beginning of the semester. How would you describe your mindset toward learning then? Has it changed over the last two months? If so, how has it changed?
- 10) Are there skills that you've learned in this class that relate to growth mindset? If so, what are they? How will the skills you learned in this class transfer to the way you approach learning in other courses?
- 11) Define "growth mindset." Based on your definition, would you say you have a growth mindset? Why or why not? To what extent do you embody growth mindset?

#### *Closing*

- 12) As I noted in my invitation to participate, the purpose of this study is to *explore the impact of faculty growth mindset on student mindset and learning engagement*. Given that purpose, is there any question I haven't asked that you'd like to answer? Or any further reflections/observations you'd like to share?