The Effects of Self-Efficacy on ROTC College Students

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Auburn, Alabama

August 3, 2024

Keywords: ROTC, Self-Efficacy, Achievement Goal Orientation, Performance Approach, Mixed Methods

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Abstract

The purpose of this mixed methods study was to better understand the relationship between various motivational constructs and success among ROTC students at a southeastern public university. The study assessed the ability to predict cadet success using known measures of performance, such as student GPA and Physical Fitness scores, and the motivational constructs of self-efficacy and Achievement Goal Orientation when compared to the ranking done by ROTC detachment leadership. Though motivational theory and constructs are often looked at in educational settings, there is little research into their effect in military training settings and even less when looked at within the context of ROTC detachments on a university campus. Ordinal Linear Regression was used to determine the relative impact any of the independent variables had on final cadet rankings. An in-person survey method was used to gather demographic information and information related to ROTC Self-Efficacy and AGQ-R (Elliot & Murayama, 2008).The eight item ROTC Self-Efficacy scale (RSE) was adapted from the General Self-Efficacy Scale by Chen et al. (2001), and displayed high reliability, $\alpha = .831$. The sample was drawn from the total cadets of the Air Force ROTC detachment at the university. Of the 129 cadets, 118 cadets responded, and 105 adequately completed their surveys and had all GPA and physical fitness information available for analysis. Overall, GPA and the Performance Approach and Avoidance constructs of Achievement Goal Orientation were shown to predict the final ranking.

In addition to the quantitative analysis 6 cadets were interviewed regarding their experiences within ROTC to determine if they felt self-efficacy was important and that theirs had grown since entering the program. The responses of the cadets all indicated that they felt self-

efficacy was important and that they had experienced personal growth since entering the program. Additionally, the theme of relationships and its importance to the growth of the cadets in many areas emerged as an important finding from the interviews.

Acknowledgements

To try and put into words how grateful I am for this experience is truly daunting. The opportunity to explore and think on these subjects has been invaluable and I am excited to put the skills and knowledge I have learned to use for the Air Force.

I would like to thank all the professors throughout my time here at Auburn. First, Dr. Strom and Dr. Salisbury-Glennon, thank you for taking a chance on me and serving as mentors during these past few years. Without both of you, this would not have been possible. Dr. Marshall, thank you for your support and confidence that someone who vehemently swore off math after high school could learn and put into practice methods they had never heard of at the beginning of this journey. Dr. Teel, thank you so much for your support, your classes were some of the first ones I took, and you helped me understand that though a novice when it comes to adult education history and practices, my experience in the military had actually introduced me to many of these topics.

There are too many mentors and colleagues along the way to try and mention them all by name. A special thank you to Colonel Mike Power without whom this extraordinary opportunity would not have happened. To Colonel Chris Graves, thank you for your unwavering support, leadership, and willingness to see the goodness in this opportunity. To Lt Colonel Michael “B” Hampton, thanks for the many nights beside the firepit in Albuquerque, your constant friendship and willingness to listen these past three years. To Lt Colonel Quinn, thank you for opening the doors of the detachment to me. Without your support, this would have been much harder of a journey.

To my family thank you for your love and patience these past three years. To my wife, Hayley, thank you for your love and support over the past 19 years and urging me to be better every day. To my children, Logan and Addison, you are the two things I am most proud of in this world. To my father, Charles, I cannot imagine a better role model in the world than you. It is from you and mom that I learned

what it truly means to be an educator, and the importance of that profession to the world. To Hope and Bob, thank you for your support and friendship over the past two years. To my in-laws, thank you for your love and support of our family, I realize how lucky I am to have both of you.

Disclaimer

The views expressed in this study are those of the author and do not reflect the official policy or position of the United States Air Force, the Department of Defense, or the United States government.

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Introduction

Background

The United States Air Force (USAF) is one of five branches of the United States Military charged with organizing, training, and equipping military members to carry out their primary missions. The USAF was established on September 18, 1947, with the approval of the National Security Act of 1947, and became the fourth service branch alongside the Army, Navy, and Marines. Up until this time it had been created, grown, and existed as a department of the Army, much in the same way the United States Marine Corps is a Department of the Navy. However, the large role the Army Air Corps played in all phases of World War II led to the establishment of the USAF as a separate service responsible for land-based Air Power (*Air Force Handbook 1: Airman*, 2021). To accomplish its mission the USAF must develop and grow officers who are capable of leading in diverse environments from the day they enter active duty as second lieutenants. The three sources of officer accessions are the United States Air Force Academy, Officer Training School (OTS), and Reserve Officer Training Corps (ROTC). The United States Air Force Academy (USAFA) is a Direct Reporting Unit to the Chief of Staff of the Air Force whose mission is to "train and inspire men and women to become officers of character motivated to lead the United States Air Force and Space Force in service to our nation" (*United States Air Force Academy: Governance*, 2023; *United States Air Force Academy: Mission and Vision*, 2023). As a direct reporting unit to the Chief of Staff of the Air Force, USAFA is like the other four Federal Service Academies. While cadets who attend the service academies receive a four-year college degree, they do so in a military environment that is unlike almost anything found in public and private schools attended by the general public.

OTS is located at Maxwell Air Force Base, Alabama and is responsible for the training of personnel who already have received a baccalaureate degree from an accredited institution before applying and being accepted (Black, 2023; *Department of the air force guidance memorandum (DAFGM) to department of the air force manual (DAFMAN) 36-2032, military recruiting and accessions* 2023). This results in a more condensed version of officer training versus ROTC and USAFA, whose programs last for four years. Additionally, while at OTS, the trainees only need to focus on and excel at the information covered during the course. Since trainees enter already having completed their baccalaureate degree, they do not have to accomplish traditional college academic classes. Instead, they are put through an intense five-to-eight-week program aimed at developing them into leaders capable of "moral courage, physical courage, resilience, and a hardiness of spirit to serve and lead in the profession of arms" (*Air University: Officer training school*, 2023). While in training they will be put through courses centered around the Profession of Arms dealing on Professionalism, Communication, War Fighting, Leadership, and Mission Execution aimed at creating "warrior minded leaders of character ready to serve as commissioned officers in the world's premier Air and Space Forces" (*Air University: Officer training school*, 2023).

ROTC is tasked with preparing cadets to function as competent officers and leaders in the USAF following graduation and commissioning. The program is traditionally a four-year program broken down into two phases. The first phase is the General Military Course (GMC) phase, which takes place in the years prior to the cadet attending field training. These years are typically the freshmen and sophomore years at a university. Following their time as a cadet in the GMC, and if selected, they attend Field Training. Field Training is a multi-week training course aimed at "evaluating cadet's preparedness to lead at their AFROTC detachments" (*Department*

of the air force guidance memorandum (DAFGM) to department of the air force manual (DAFMAN) 36-2032, military recruiting and accessions 2023). Field training does this by placing cadets in a strenuous, unfamiliar, and dynamic environment that tests them physically, mentally, and emotionally while they complete the course between their sophomore and junior years of college and their AS200 and AS300 years of the ROTC program (*Department of the air force guidance memorandum (DAFGM) to department of the air force manual (DAFMAN) 36-2032, military recruiting and accessions* 2023). The Field Training program is analogous to a Basic Training environment but crafted for the development of young officers. After successful completion of Field Training, a cadet will transition to the Professional Officer Course (POC) portion of the ROTC program which takes place over the final two years of college. As a POC, the cadets, newly graduated from Field Training, will take on more of a leadership role in ROTC, to help better prepare them for their role as second lieutenants. They will be responsible for helping to organize and administer portions of the course and mentoring GMC cadets. While in ROTC, cadets must be fully eligible students at their university, and will also take part in their respective ROTC school courses, Leadership Laboratory, physical training, and other ROTC related duties.

In length, the ROTC program resembles the program at the USAFA, however the atmosphere is vastly different. Cadets who attend ROTC programs at civilian institutions do take place in military related courses and training, but they are doing so in a predominantly civilian environment, that is vastly different than the military like environment of the service academies (*AFROTC: Campus life*, 2023; *Department of the air force guidance memorandum (DAFGM) to department of the air force manual (DAFMAN) 36-2032, military recruiting and accessions* 2023; *ROTC: About*, 2023). Despite the differences in the two environments, the goal is the

same, to produce competent and capable leaders for the USAF, who are able to lead in a variety of situations and carry out the Air Force's mission of "Fly, Fight, and Win… Airpower anytime, anywhere" (*Air Force Instruction 1-1: Air force culture*, 2023). While all three environments provide unique challenges when compared to the other, this study will focus solely on the experiences and responses of ROTC cadets attending a large public land grant university in the southeastern United States.

The transition from high school to a university is a momentous occasion for many 18-year-olds across the United States, however the happiness of this occasion often times masks many of the challenges and trials that await the newly graduated high school students once they begin college. For many of them it will be their first time away from home and the safety net their families provided for them for both mundane and important tasks. They will need to learn new skills related to school, adjust to different educational expectations, possibly manage their own budget, among any other things, but for the ROTC students this is only a portion of what awaits them. Along with the traditional stressors and challenges, they must also navigate balancing the competing requirements of an ROTC program. They will need to not only maintain good grades, but also maintain the required level of physical fitness and comply with more strict moral codes centered around Air Force Regulations and the Air Force Core Values (*Air Force Instruction 1-1: Air force culture*, 2023). Also, they will need to navigate and manage stress related to the program and their advancement in it. Towards the end of their sophomore year, the cadets participate in a process to determine if they are selected to attend Field Training and proceed further into the program. If not selected for Field Training they can be dismissed from the program. If a cadet fails a class or does not do well in an ROTC related class, it is not just a matter of applying for a grade forgiveness; as this could have potentially dire impacts on their

ability to continue in the program and receive a commission in the USAF. This requires cadets be able to not only navigate the challenging environment of the ROTC and field training but overcome setbacks and missteps that may occur during their cadet time, while in pursuit of their goals of achieving a commission and becoming an officer in the USAF.

Statement of the Problem

Motivation in its many forms is therefore a key proponent to the success of the ROTC cadet. The complexities of not only what they must navigate, but also overcome in pursuit of larger goals makes understanding what helped drive them central to understanding them and their actions over several years. By finding out what relation a cadet's success has to a singular or combination of psychological and other independent variables, the USAF might be able to better design the curriculum, experiences, and assessments to enable better instruction, absorption and applications of lessons aimed at producing cadets armed with the skills and understanding they need to grow into the leaders the USAF will need in the future.

Purpose of the Study

By looking at reliable, anecdotally well-known and popular psychological variables, like achievement goal orientation (Dweck, 2017) and Grit (Duckworth, 2016; Duckworth et al., 2007), and comparing them to less publicly well-known variables like self-efficacy (Bandura, 1997) it might be possible to instruct and instill in the cadets a firmer grasp of their own motivation, ways to positively affect it, and to increase the positive outcomes of the training. As noted by Bandura (2006) a person's efficacy has been shown to shape how a person views themselves, which in turn affects their motivation and how much resilience they show in the face of difficulty. By incorporating self-efficacy principles and lessons into training, ROTC might be able to prevent the loss of those talented young cadets who do not know how to deal with

hardships and trials, because they have never encountered them. Now some might say that we do not need those leaders who do not show mental fortitude in the face of adversity, but it might be worth considering how much any of us changed as we went through college and other formative times in our lives.

When talking about personal and organizational effectiveness Bandura (2012) specifically noted that "resilience must also be built by training in how to manage failure so that it is informative rather than demoralizing" (p. 185). As ROTC's mission is to train and develop cadets to be future leaders it only makes sense that they employ and instruct on the use and power of self-efficacy. Additionally, self-efficacy is important because it has displayed the ability to directly affect functioning while also indirectly affecting other determinants (Bandura, 2012). By focusing on self-efficacious practices, it may be possible to have a greater overall effect on other psychological variables as well. A person's efficacy beliefs play a pivotal role in how much a person is willing to persevere when facing adversity (Bandura, 1997; Bandura, 2012). As this closely aligns with General Brown's statement that the Air Force as an organization must demonstrate resilience (Brown, 2020), then self-efficacy seems like a logical addition to the curriculum, its design, and the instruction of ROTC. Additionally, it is not only those who quit that might be helped, but all cadets as well. By weaving the course and cadet experience around the correct motivational construct, you could help increase the performance of all cadets. This directly supports the Air Force's mission to "recruit, assess, educate, train, experience, develop, and retain Airmen… with the attributes required to compete, deter, and win in the high-end fight" (Brown, 2020, p. 5). This is no more evident than when this very point was also brought up in Lieutenant General Caroline Miller's testimony to the House Armed Services Committee regarding the Air Forces personnel posture (Military Department Personnel Hearing,

2020). Transforming the development of ROTC cadets is a top priority for the service as it looks to its future.

Research Questions

In an effort to evaluate self-efficacy's effect and ability to predict success in the ROTC environment, this study used qualitative and quantitative methods, and thus, a sequential mixed methodological approach to gather self-report survey and interview data related to the following research questions.

RQ1: To what extent, if any, did self-efficacy affect an AFROTC student's success in the AFROTC program?

RQ2: Does any relationship exist between self-efficacy, the other psychological variables contained on the survey instrument, and other cadet data?

RQ3: How did cadets perceive their own self-efficacy and how it affected their perception of ROTC?

RQ4: Do cadets believe that their self-efficacy helped them to positively navigate their AFROTC experience?

Significance of the Study

This study will seek to address the challenges issued by General Brown (2022) by researching ways in which we might transform how curriculum is delivered in order to better prepare our future airmen to lead in the dynamic and challenging environments they will encounter. It will build on and add to an area of study that is lacking in both breadth and depth, effect of motivational constructs in a military educational context. Through the successful completion of this study, it may be possible to adjust how we develop citizens into Airmen.

Assumptions of the Study

This study is derived from a pragmatic viewpoint aimed at providing an answer to Chief Brown's memo and action orders (Brown, 2022, 2020) to the USAF. By situating this study pragmatically, the problem is central to the research rather than the methods or research. This draws from the historical tradition of Dewey, but more recently Creswell (2009) as it did not ascribe there to be only one way to look at the problem, but sought to gather data in different methods. As such this study gathered both quantitative and qualitative data in a mixed methods design as this was most likely to gather sufficient data in regard to the holistic nature of the research. The use of quantitative self-report data allowed the researcher to develop a holistic view of the entire detachment and their self-perceptions. Following this with a qualitative study of senior cadets allowed the researcher to gain a fuller understanding of the lived experiences of cadets. Also, by using a sequential mixed methods design, the researcher was able to use the quantitative data to help inform the semi-structured interviews with cadets and better explore the results of the quantitative study (Creswell, 2009).

Limitations of the Study

The study will be limited by its population demographics as well as the population in which it is conducted. The AFROTC Detachment where the study is conducted is at a large rural land-grant university. Additionally, the Detachment is a large AFROTC detachment. These along with the demographic information discussed in Chapter 3 situate the results of the study contextually, and while the results may arrive at a specific conclusion; it would not be prudent to believe that these results are generalizable without further study in the various contexts (school and detachment types) in which ROTC programs are conducted. Additionally, as pointed out by Gilson et al. (2017) the body of research on the effects of self-efficacy in this context is limited and any addition to this literature will be adding to a still developing field.

Definition of Terms

Achievement Goal Orientation: Motivational construct that focuses on the primary driver, mastery or performance, in a person's pursuit of a goal and whether they display approach or avoidance characteristics related to the mastery or performance constructs (Dweck, 2017; Elliot & Church, 1997; Elliot & Murayama, 2008)

Active Duty: Enlisted or officer service members who are performing full-time military duties (Dictionary, 2021, November)

Air Force Reserve Officer Training Corps (AFROTC): A Department of the Air Force program that is responsible for educating, training, and motivating citizens who seek commissioned service (*AFROTC Instruction 36-2011: Volume 3 cadet operations*, 2021)

Detachment: The AFROTC organization at a civilian institution that is responsible for the education and training of the cadets attending that specific university

Cadet: Students who have intent to commission and are enrolled in the AFROTC program. (*AFROTC Instruction 36-2011: Volume 3 cadet operations*, 2021)

Cadre: Active Duty Air Force members, both officer and enlisted, who are responsible for the education and training of the cadets in the detachment (*AFROTC Instruction 36-2011: Volume 3 cadet operations*, 2021)

General Military Candidate: The first and second years of the 4-year program consisting of AS100, AS200, AS250, and AS500 (*AFROTC Instruction 36-2011: Volume 3 cadet operations*, 2021)

Grit: Demonstrated passion and perseverance over an extended period of time while in pursuit of goals (Duckworth et al., 2007)

Professional Officer Candidate: Normally, the third and fourth years of the 4-year program or the first and second years of the 2-year program consisting of AS300 and AS400 courses as prescribed under 10 U.S.C. 2104 (*AFROTC Instruction 36-2011: Volume 3 cadet operations*, 2021)

Self-Efficacy: A person's ability to evaluate their own capabilities and then use their own self-evaluation to inform their actions in pursuit of desired goals (Bandura, 1977a, 1986)

Organization of the Study

Chapter 1 introduced the topic and contextual setting of the study. Additionally, the problem statement, purpose of the study, research questions, significance, and definition of important terms. Chapter 2 includes a review of the literature as well as the theoretical grounding for the study. Chapter 3 introduces the reader to the proposed model and the methods used during this study as well as the description of both populations, quantitative and qualitative, instruments and analysis procedures. Chapter 4 examines the results of the study, and Chapter 5 summarizes the study while presenting the implications and providing recommendations for future research and practice.

REVIEW OF LITERATURE

The study of motivation has been a key focus area for the field of psychology and educational psychology since the early part of the 20th century. Why, how, and what motivates people in all forms, stages, and positions of life is a question that researchers, educators, bosses, coaches, and parents continually ask and seek answers for. However, as we have come to understand, motivation is not a simple reaction to a positive stimulus, but rather a complex set of interactions that we ourselves must navigate and regulate in pursuit of our goals. Our understanding and regulation of the forces these motivations exert on us is important to understand, because it allows us to better navigate these motivational forces in pursuit of larger goals and persevere when encountering difficulties (Bandura, 1989, 2012).

Looking into and understanding a person's motivation allows us to begin to understand those factors not related to a person's IQ that can be determinant in a person's effectiveness in acquirement and usage of new skills (Dweck, 1986). Research into the cognitive portion of motivation was poorly understood until after the beginning of the cognitive revolution of the 1950's and the explosion of work the 1960's and 1970's. Only then did research begin to produce a body of consistent and educationally relevant findings (Dweck, 1986; Weiner, 1990; Yilmaz, 2011). Prior to the cognitive revolution, the prevailing understanding of motivation was written by the behaviorist camp, who viewed actions as responses to various stimuli present in the environment. During this time period, motivation was looked at through a much more physical lens as researchers examined topics like the effects of praise, feedback, competition, and reward and punishment (Weiner, 1990).

The behaviorists sought to show empirical evidence of the functions of the behavior and how they could be manipulated through the development and employment of scientifically sound

experiments (Bredo, 1997; Yilmaz, 2011). This linkage of motivation with energy continued into the 1960s as Melvin Marx viewed motivation as the energy which moved a machine into action and had not made the linkages that today's educational psychologists find relevant (Weiner, 1990). This view of motivation, or rather reaction to stimuli, is ill-suited to explain motivation in the context of the military. Often the stimuli faced by military members is of the type one would prefer to not experience again or that when presented it would make no sense for a person to willingly rush towards a first time, much less again and again. In this realm, behaviorism falls short in explaining the motivation of military members who choose to display the perseverance, resilience, and courage necessary to keep pushing towards achieving the mission in the face of sometimes very daunting and intimidating circumstances, or stimuli.

Cognitivism

While cognitivism as a school of thought had been around since the early days of psychology, it was consistently overshadowed by the behaviorists and its ascension in the middle part of the 20th century can be seen as reaction to behaviorism (Bredo, 1997). This change can be mainly attributed to behaviorism's inability to explain the process by which the mental processes work (Yilmaz, 2011). For cognitivists, learning is an active process that involves the movement and reorganization of received information inside the human mind. Information is not simply slotted into the first available open slot but must be either constructed or integrated into the already existing schemas (Derry, 1996; Yilmaz, 2011). It is an active internal process in which the learner must move through stages of disequilibrium into equilibrium as they work to assimilate or accommodate what may be completely new information, modify existing mental structures, or erase erroneously constructed mental structures.

Through their constant interaction with the environment, a person is consistently rearranging their mental structures based on what they experience and know about the world (Newman, 2022). Newman and Newman (2022) defined a scheme as "any organized, meaningful grouping of interrelated actions, images, feelings, or ideas that determine how a person interacts with the environment" (p. 127). This process helps to build mental models which are used to examine complex situations or problems which people encounter in the real world. The foundational blocks for these models are found in the previously built schemas, but rather than being static they are consistently being reorganized and integrated as new information is presented (Derry, 1996). This process helps to build a cognitive field which "is a distributed pattern of memory activation that occurs in response to a particular event… [and serve to] mediate between experience and learning" (Derry, 1996, p. 168).

It is this understanding of how the mind works that allowed researchers to begin building the models that began unlocking the inner workings of our minds. Understanding the complexities that exist in the models in how the human mind makes sense of experiences, both personal and vicarious, helps researchers understand how experience shapes the process of learning (Bandura, 1997). Through these experiences people build new or modify existing schemas that they will then use to process information and help us make decisions in the outside world. In the instance of Reserve Officer Training Corps (ROTC) cadets, they will begin gaining these experiences from the moment they set foot on campus. These experiences will then be incorporated into their cognitive processes and affect how they deal with events that come their way.

The Air Force does not expect the cadets to move from cadet to officer in the span of a few experiences but recognizes that in most cases it will take a while for the hoped-for

development to occur. Also, it will not be possible for them to be taught everything they will ever encounter; therefore, cadets must develop useful mental models to deal with unexpected events that will come up in both the training and active-duty environment. In order for this to happen, Derry (1996) points out that the "one condition of continuous intellectual development is that the developing schemas be activated and used frequently" (p. 171). This activation and frequency happens as cadets move through their time in ROTC. The engagement time and frequency move from four hours per week in the first two years to at least seven hours per week in the last two years before commissioning and graduation. However as pointed out by Bandura, integration does not occur equally with all information. Rather it is a somewhat personal process by which people assign weights, or importance, to the received information and that affects how they integrate it into their mental framework (1997).

Using this as a guide one can see how different the effects of an event can be on different people, based on the contexts of the different lived perspectives. While an event may be viewed as miniscule and benign by someone, it can be viewed as an event of great importance by another. The relative unpredictability of how this occurs can make for a frustrating time of assessing whether or not a lesson or idea was learned and understood by cadets. Also, it is possible that a cadet may have learned the lesson but does not have the necessary experience to understand the importance and applicability of it to them. Finally, as pointed out by Bandura (1993), while it is important to understand how the system of the mind works, we must also understand the processes which help to drive, govern, and influence how the mind works.

Social Cognitive Theory

Social Cognitive Theory, and the belief that the environment in which people live plays an important role in development and learning has played an important role in field of education since the 1960s. Bandura (1989) espoused that:

> Persons are neither autonomous agents nor simply mechanical conveyers of animating environmental influences. Rather, they make causal contribution to their own motivation and action within a system of triadic reciprocal causation. In this model of reciprocal causation, action, cognitive, affective, and other personal factors, and environmental events all operate as interacting determinants (p. 1175)

One of Social Cognitive Theory's (Bandura, 1986) main tenets is triadic reciprocality and that the key to understanding the learning process is to also understand the interactions between the person, behavior, and environment. This non-static view of the learning process is similar to the sociocultural theory of Vygotsky (Schunk, 2020a, 2020b) who espoused that humans also shaped the environment in which they learned, much in the same way that Bandura (1997) felt that "people are producers as well as products of social environment… because influence flows bidirectionally" (pp. vii - viii).

When Zhang and Brundrett (2010) researched leadership development in the field of education, they noted the social nature of learning and that most respondents believed their learning occurred via informal routes in the school. They found that though formal classes have their place, most participants believed the social informal learning methods were the ones that were most beneficial for them in their everyday jobs. In his research on Army ROTC Cadets, Campbell (2017) found that receiving feedback from a mentor was viewed as more effective than classroom learning about the same subject. In both cases we are able to see the impact of the social aspect of learning and the role that it plays. In the study by Campbell (2017), we can see

the use of the zone of proximal development, or scaffolding (Vygotsky, 1978; Wood et al., 1976), as the cadre members take on the role of mentor and guide the ROTC students throughout the leadership learning process.

Bandura noted that "mastery by mutual structuring of environments conducive to growth of knowledge, competencies, and affirmative self-beliefs bears some likeness to Vygotskian tutoring by social guidance" (1997, p. 227). Through the execution of their duties as cadre members, the ROTC leadership is helping to guide the young cadets towards the knowledge of how to be a leader in different situations. However, this is not possible if both the environment and relationships are not conducive for the growth of the necessary skills.

Bandura believed, like Vygotsky, that social and non-biological influences could have enormous influences on how a person learns (Bandura, 1977b; Campbell, 2017; Vygotsky, 1978). The role of the person and their agentic ability is central to Bandura's Social Cognitive and Self-Efficacy theories (Bandura, 1989; Bandura, 1997). He believed that people learn many important things not only through their own experiences, but also through their own vicarious observations of others. These experiences are then fed into a complex internal computational system that a person must navigate and operate in order to inform their own judgements in regard to their own ability in a given situation. These complex mental schemas allow for people to better estimate their own ability in the face of a challenge. Also, it is worth noting that the type of thoughts by a person plays an important role. People who participate in efficacious thoughts are more likely to experience success as their thought process helps guide them through positive actions, while the inverse is true for those that experience non-efficacious thoughts while in an event (Bandura, 1977b, 1989). The social aspect of ROTC and its instruction model which uses active duty Air Force officers is one that seeks to build an environment where cadets are able to

engage in experiential and vicarious learning activities, while receiving instruction and guidance from leaders, in the form of both cadre and more senior cadets.

The vicarious learning espoused by Social Cognitive Theory is linked with the construct of self-efficacy (Bandura, 1997). Additionally, Social Cognitive Theory has been shown to have links to the Achievement Goal Orientation Framework (Dweck & Leggett, 1988; Schunk & DiBenedetto, 2020; Wolgast & Keller-Schneider, 2024) and research by Wolgast and Keller-Schneider (2024) showed that a student's mastery is related to their perception of social relationships in a positive manner, but the study did not show bidirectional effects where a student's mastery orientation was affected by their peer relationships.

Achievement Goal Orientation

The 1980's saw the rapid emergence of what many of us today would recognize as research into the field of motivation, as achievement goal theory. The preceding 10 to 15 years had seen the emergence of a body of consistent and educationally relevant findings (Dweck, 1986) concerning the study of motivation. Independent research using different theoretical frameworks by Dweck, Ames and Archer, and Nicholls, began to differentiate between mastery and performance goals, their respective traits, and how they affected both performance and learning of students (Senko et al., 2011). These studies showed an understanding that cognitive mediators played a greater role than previously thought on how information is processed (Dweck, 1986).

Early research into this area of motivation by Nicholls defined achievement behavior as being "directed at developing or demonstrating high rather than low ability" (Nicholls, 1984, p. 328) and that it is judged either in reference to one's own past performance or relative to others performing the task. Dweck eschewed further research into cognitive ability choosing to look

into how individuals acquired new skills and then how effectively they used them (Dweck, 1986). Dweck (1986); Dweck and Leggett (1988) began to notice certain trends they categorized as adaptive and maladaptive behaviors, looked at their underlying cognitive processes, and at interventions and practices based on empirical data. Dweck's research focused on the differentiation between learning (mastery) and performance goals and how those differences could affect the outcome.

Learning goals are instances when individuals seek to increase the competence, ability, or understanding of a new process or idea, whereas performance goals occur when individuals seek a positive review of their current level of competence or ability. Using these definitions Dweck characterized adaptive patterns as those that enhance the formation and preservation of the newly attained skills in pursuit of challenging and valued goals, and maladaptive patterns as those that do not enhance the formation and preservation of skills and goals, and that may actually constrain one's striving for those goals (Dweck, 1975; Dweck, 1986). Dweck and Leggett (1988) attributed this to what was known as the incremental and entity theories of intelligence which stated that intelligence was able to be grown and developed in the case of incremental theory or fixed in the case of entity theory. Additionally, their research demonstrated that children who believed intelligence as being incremental in nature pursued learning (mastery) goals, while those who believed in entity chose performance goals.

This description of adaptive patterns nests with the guiding principles found in the Air Force's Little Blue Book which outlines many foundational concepts and ideas, but perhaps the most important thing it touches on are the Core Values. When describing the third Core Value, excellence in all we do, the little blue book directs Airmen to "continuously advance our craft and increase our knowledge… [by having] a passion for continuous improvement" (*A profession*

of arms: Our core values, 2022, p. 11) Additionally, adaptive behavior patterns have shown distinct characteristics related to achievement behavior, with the adaptive behavior showing sustained persistence in the face of obstacles and the maladaptive behavior showing low persistence in the face of obstacles or difficulty (Dweck, 1975; Dweck, 1986). Interestingly though Dweck uncovered that these maladaptive patterns are not only exhibited by those who fail to succeed early on, but also those who show the same high ability and aptitude of the mastery learners. She discovered that some high performers exhibited maladaptive behaviors (Dweck & Leggett, 1988).

The ability to show persistence in the face of obstacles is especially key for the development of leaders in the Air Force. Though many people's minds may go to the worst that could happen, the need for perseverance in the face of danger. Often it is the trait of perseverance in the execution of their daily duties that leads to success for officers and their unit. Additionally, though different labels were proposed for the foci of the achievements, theorists converged on the terms mastery and performance, and the idea that mastery orientation promoted more growth than performance orientation (Senko et al., 2011). Mastery orientation is that which seeks to compare to oneself and prior performance, while performance orientation compares performance relative to peers (Dweck, 1986; Dweck, 2017; Nicholls, 1979, 1984). The pursuit of mastery goals allows for all participants in a given endeavor to set and achieve goals centered around improvement and excellence while, performance goals are situated around measuring a person's performance relative to their peers. Therefore, the goals/standards around which performance is centered and judged can either enhance learning and performance for a small few in the case of performance orientation, or for the entirety of the population in the case of mastery orientation.

For this reason, early studies tended to show negative indicators that centered around performance orientation (Nicholls, 1979, 1984; Senko et al., 2011). Nicholls (1979, 1984) looked at achievement behavior around the same time and conducted research to look at the differences in persons that sought to demonstrate mastery of abilities and ones that sought to evade demonstrating inability. Nicholls used the term exogenous, to describe when the activity is done at the behest of a reason outside of the task itself, and the task does not give satisfaction. Conversely, endogenous attribution is used to describe an event where the individual is interested in the event itself (Nicholls 1979, 1984). Senko, Hulleman, and Harackiewicz (2011) in their review of the Nicholls study noted that the focus on mastery goals allows for greater self-confidence and that this should lead to more positive outcomes. This can be attributed to the fact that when in pursuit of mastery, learning itself becomes the goal, not performance against another student or students. This allows the student or person to feel more intrinsically motivated, because they are doing what they want to and they are accomplishing their goals (Elliot & Church, 1997; Nicholls, 1984). At first glance, this would lead one to believe that performance orientation is negative in nature, but that was not always true as pointed out by Elliot (1999). The decision to focus singularly on mastery goals if you wanted greater engagement and learning (Dweck, 1986; Nicholls, 1984) began to shift as new research began to show that for some learners, normative (performance) based goals could result in more engagement and interest relative to mastery goals (Elliot, 1999; Harackiewicz & Elliot, 1993; Wolters et al., 1996).

This new research led to a growth in the understanding of achievement goal theory and its theoretical underpinnings. New research done by Elliot and Church (1997) supported the positive outcomes of approach-oriented versions of performance related motivations and the

restructuring of achievement goal theory into a hierarchical model comprised by performance and mastery orientations, with approach and avoidance subdivisions. Approach orientation is characterized by movement toward a positive stimulus, while avoidance is characterized as the movement away from a negative stimulus (Elliot, 2006). Elliot (2006) stated "that the approach-avoidance distinction is fundamental and basic to motivation, so much so that it may be used as a conceptual lens through which to view the structure and function of self-regulation" (p. 113). Elliot and Church (1997) believed that this could explain why past research into performance orientation, if not broken out between approach and avoidance, could have resulted in decidedly varied observed results. This along with other research led them to propose an updated version of achievement goal theory that contained mastery goal, performance approach, and performance avoidance to the motivational construct (Elliot, 1999; Elliot & Harackiewicz, 1996). This further subdivision inside the areas of mastery and performance labels helped to further refine motivation as understood through the lens of achievement goal theory.

The division used the words approach and avoidance to categorize these categories, with the approach category being positive and avoidance being negative. Approach orientation is centered around a desire to learn or improve one's skills, while avoidance seeks to not have any drop off or declination in one's skills (Elliot, 1999; Senko et al., 2011). Furthermore, as pointed out by Elliot (2006), the driving factors of this subdivision themselves play an important role in explaining their effect. Avoidance motivated actions are oriented around avoiding negative outcomes, which can make success at this avoidance feel like mere survival, even when the goal is achieved. This can be seen in actions like self-handicapping, where a person will take or enact deliberate actions or strategies or actions to account for poor performance in order to protect their own perceived self-worth. Chen et al. (2009) and Elliot and Thrash (2001) view self-

handicapping as an action that is closely linked to a fear of failure and therefore is enacted to help people avoid failing at events and feeling embarrassed of their performance. The link between self-handicapping and fear of failure was previously found and supported by Elliot and Church (1997). When contrasted against the approach orientation which either leads to a positive outcome or the absence of negative outcome when achieved, it is little wonder how this can affect a person both physically and psychologically. This subdivision between approach and avoidance helped to explain negative findings that centered around high anxiety, disorganization, help-avoidance, low self-efficacy, poor performance, etc. (Hulleman et al., 2010; Senko et al., 2011).

In a study by Elliot and McGregor (1999) that looked at how motivation could affect test anxiety, performance on a test, and as mediators to test anxiety. The authors found performance approach actions were positively correlated with test performance and performance avoidance negatively affected test performance. It is worth noting that mastery goals showed no relation to exam performance. When acting as mediators they found that performance avoidance showed a statistically significant relationships, $F(1, 142) = 27.50$, $p < .001$, (β=.43), with pre-test anxiety and worry during the exam, $F(1, 138) = 10.83$, $p < .005$, (β=.29). This led to the conclusion that

> "the two approach forms of achievement regulation were shown to facilitate performance outcomes—performance-approach goals positively predicted exam performance, and mastery goals promoted the retention of exam-relevant material. Thus, the optimal regulatory framework for individuals in the present research may have been the simultaneous adoption of a performance-approach goal to facilitate performance in the short run and a mastery goal to facilitate performance in the long run (and, of course, the absence of a performance-avoidance goal,

which was shown to debilitate both types of performance) (Elliot & McGregor, 1999, pp. 640 - 641)"

Thus, one can easily surmise the need to move away from avoidance behaviors when looking to build, demonstrate, and retain competence while avoiding negative physical and psychological reactions (Elliot, 2006; Elliot & Harackiewicz, 1996).

This led to the development of the multiple goals theory and how the combination of both mastery and performance approaches might be combined synergistically to achieve even greater motivation (Senko et al., 2011). This updated definition and explanation marry well with what ROTC hopes to create in both instances, a mastery of various topics and demonstrating their mastery as well. The goal is for cadets to begin their journey towards commissioning and begin the journey of learning what it means to be an officer in the Air Force. This means cadets need to be able to develop and demonstrate skills and abilities in a myriad of settings. By focusing on both mastery and performance ROTC could achieve greater engagement, learning, and demonstrated ability of the cadets moving through the program.

In research conducted by Ames and Ames (1984), a qualitative view of motivation was researched in which students, teachers, and learning environments were categorized as to their effects on each other. The research showed that varying motivational states were the product of how the students and teachers constructed their own social reality based on environmental and individual differences (Ames & Ames, 1984). The study also showed how student motivation is affected by classroom goal structures. Building on this research, instructors could help students understand the importance of both mastery and performance goals in the pursuit of both ideals. However, the research did set limitations related to the small amount of research into how classroom goal structures can be affected by individual values and how student differences

interface with classroom goals (Ames & Ames, 1984). Building on the work regarding goal structures Ames and Archer (1988) found that in situations where students are more likely to compare themselves to each other, it is more likely they will show more performance-oriented actions and compare themselves to others in the class. However, if it is made clear that the focus should be on improvement versus the task standard, students stay more focused on mastery related practices. Therefore, the researchers concluded that the pursuit of mastery goals would lead to greater student involvement while learning and increase the potential that a student would engage in additional tasks. Lastly, Ames and Archer (1988) concluded that mastery habits led to students using more effective learning strategies and were more likely to prefer challenging assignments, enjoy their class, and trust the linkages between effort and success.

GRIT

Along with the focus on mindset, the past two decades have seen another powerful idea come to the forefront of motivational studies, that of Grit. The term coined by Angela Duckworth and popularized in her bestselling book (2016) by the same name sought to bring this new concept to the forefront of popular culture and out of only academia. In beginning to research the trait that would be called Grit, Duckworth, began by looking at West Point Military Academy and the manner in which they graded and tried to predict who would be successful at completing their intensive summer program, Beast, as well as the four-year degree program and commissioning as a United States Army officer. West Point historically used what they called the Whole Candidate Score, which is a holistic assessment of various factors West Point has historically viewed as important, as a basis for trying to predict success. However, it was admittedly bad at doing so and those with high scores were just as likely to quit as those with

low scores (Duckworth, 2016). It was here that Duckworth would begin her research into the trait of Grit.

Grit is defined as "passion and perseverance for long term goals" (Duckworth et al., 2007, p. 1087) and is characterized by a willingness to work at overcoming trials, persistence of effort and focus over a long span of time while encountering obstacles. As noted by Duckworth et al. (2007), she was not the first researcher to look for a link that would explain why some people were more successful and achieved more. Duckworth notes that work from between 100 and 80 years ago itself noted that successful individuals exhibited qualities that aligned closely with how Grit was coming to be defined in the literature (Cox, 1926; Galton & Darlington, 1972; Terman & Oden, 1947). The idea of Grit encompasses many traits that feel familiar to achieving success, resilience, self-control and perseverance (Bashant, 2014) and has been shown to be linked with positive educational outcomes (Duckworth, 2016; Duckworth & Quinn, 2009; Muenks et al., 2017; Robertson-Kraft & Duckworth, 2014).

In working to better define Grit, Duckworth et al. (2007) leaned on framework provided by the Big Five Model as a method of describing traits that can predict success. In using the model to see if the concept of grit existed other places, they began to coalesce around the trait of conscientiousness. Future studies would show a great deal of covariance between the Grit perseverance subscale and conscientiousness (Credé et al., 2017). Duckworth et al. (2007) notes that conscientious individuals are "characteristically thorough, careful, reliable, organized, industrious, and self-controlled" (p. 1089) and that while all of these traits can contribute to achievement it is worth considering the type of achievement that is being pursued. It is worth noting that another study showed that conscientious adults not only earned and saved more money, but showed an overall greater satisfaction with life when compared to other personality

traits measured on the Big Five Model (Duckworth et al., 2012). Thus, conscientiousness showed a relationship with both concrete and abstract measures of success.

One can see that achievement and the descriptors used for Grit overlap, but it is important to note that "the gritty individual not only finishes tasks at hand but pursues a given aim over years" (p. 1089). Though Duckworth and her team leaned on the Big Five model in the beginning to help define the traits they felt best described Grit, the combination of passion and perseverance remaining constant over extended periods of time came to be the accepted definition of grit. Additionally, the researchers characterized it as a dispositional trait, rather than one linked to activities (Southwick et al., 2019).

When considering or measuring Grit it therefore becomes important to consider the length of focus, perseverance, and resilience an individual shows in pursuit of specific goals over the course of many years and sometimes even a lifetime (Bowman et al., 2015; Duckworth et al., 2007; Duckworth & Quinn, 2009). In 2015, Bowman et al. conducted a study at two large universities that sought to measure how the two previously mentioned dimensions of Grit, perseverance of effort and consistency over time, might predict various student outcomes. By conducting the research at two different universities, the researchers were able to replicate and extend any findings because of the different academic contexts. The researchers found that the two dimensions predicted various outcomes at both universities, both academic and non-academic. Perseverance of effort was a stronger predictor for both academic and non-academic outcomes and the perseverance dimension could predict GPA increases, and there was no significant correlation with any student demographics (Bowman et al., 2015). These conclusions led the researchers to conclude that college admissions offices might do well to consider Grit in their own historical and traditional decision-making processes. Lastly, they concluded students

that displayed more perseverance were more satisfied with the whole college experience, which may lead to them not only appreciating college more, but also understanding its benefits and therefore achieving higher academic degrees and levels of achievement (Bowman et al., 2015). This realization can be easily related to benefiting the military. By looking for individuals with high Grit and encouraging the growth of Grit, the military can help its personnel understand not only the benefit service provides, but also how Grit can relate to positive career advancement.

As discussed, Grit is composed of two distinct facets, effort and interest. Though distinct, they have been shown to be related (r= .45) (Von Culin et al., 2014). As the understanding of Grit as a trait has matured, so has research into motivational dispositions and their relationship to Grit (Borghans et al., 2008). Research into Grit's relationship to happiness has shown that grittier adults were more likely to experience happiness through engagement and those that sought out pleasure in life tended to be less gritty. This first finding was related to the effort facet of grit, while the second one was related to its interest facet (Von Culin et al., 2014).

This understanding of the motivation of persons may help understand how much Grit an individual may display in their daily lives. If a person is driven to find deeper understanding, meaning, and engagement they are more likely to exhibit sustained performance over time (Von Culin et al., 2014), which is a key characteristic of Grit (Duckworth, 2016; Duckworth et al., 2007). Conversely, the seeking of pleasure by individuals, seems to indicate the opposite when it comes to the likelihood that they will exhibit sustained performance over time (Von Culin et al., 2014). This indication that a pleasure-seeking motivational drive for an individual indicates a lower likelihood of Grit, fits within the theoretical framework as failure is often not pleasurable for anyone experiencing it. Additionally, this bears some resemblance to the performance avoidance construct seen in the Achievement Goal Orientation motivational construct.

Specifically, in the Performance Avoidance construct of Achievement Goal Orientation. Performance Avoidance is characterized by a desire to not experience a failure by avoiding outcomes. Individuals who exhibit these behaviors and motivators are seeking pleasure by seeking to avoid negative outcomes (Elliot, 1999, 2006; Elliot & McGregor, 1999).

Drawing a line from related research by Elliot and McGregor (1999) related to test anxiety and motivation, an individual who exhibits the avoidance portions of either performance or mastery will seek to avoid the displeasure of failing a test or related item. This could lead the individual to not take the class or using self-handicapping measures to explain their poor performance, rather than take part in the Gritty behavior of engaging in intensive studying and preparation in order to increase the likelihood of success on the test. In conducting research related to Grit, Wolters and Hussain (2015) looked at its relation to self-regulated learning and academic achievement and came to the aforementioned conclusion. The study showed the perseverance facet to be a greater predictor than the interest facet. Those students with higher levels of Grit were shown to engage in less handicapping and more proactive motivation strategies, value, self-efficacy, cognitive and meta-cognitive strategies, etc., that increased their levels of academic achievement. This finding was in line with other research that showed how Grittier individuals are more likely to stick with and complete arduous tasks like military training, strenuous exercise, completion of a four-year degree (Maddi et al., 2012; Reed et al., 2013; Strayhorn, 2014).

In another study, Duckworth (2019) and colleagues performed a mega-analysis of nine cohorts that went through the West Point Military Academy. This analysis included longitudinal data from 11, 258 cadets measuring cognitive ability, Grit, and physical ability. The study found that cognitive ability was negatively correlated with both Grit and physical ability, which were

positively correlated with each other. In the initial 2007 study by Duckworth, she sought out predictors of who would finish the demanding summer event known as Beast Barracks. In the study, Grit scores predicted completion better than other standard scores previously used. Higher Grit scores increased the likelihood of a cadet completing Beast by 60% (Duckworth et al., 2007), which was confirmed by the 2019 mega-analysis; however, the percentage dropped to 54% (Duckworth). Lastly, the 2019 study showed that while cognitive ability was the best predictor of GPA, the combination of physical ability and Grit most accurately predicted completion of the four-year degree program and showed that the lowest likelihood of graduation existed in the population that had the lowest levels of Grit, cognitive and physical abilities. In a study by Braund et al. (2020), the researchers assessed the effect of Grit on mothers entering university. Though definitely not the same type of stress and demand encountered by the West Point cadets, anyone who has gone to college while balancing the demands of being a caregiver can attest to the difficulties and need for grit. This look at non-traditional students shined light on an increasing segment of the population as the authors noted a rise in populations that come from these backgrounds, and mothers in particular representing a growing segment of that population. The study found that 93 percent of women surveyed believed they had displayed grit throughout their studies and as central and compelling force throughout their time. They also stated that one of the leading grit characteristics they recognized in themselves were endurance and resilience.

The willingness to stick with and complete these tasks is important in both educational and professional military senses as it shows educators and military leaders that their students and troops will know how to persevere. That they will know and display resilience in the face of trying times. Mohan and Kaur (2021) described resilience as allowing “people to optimistically look at overwhelming situations” (p. 40). In this sense, it allows the individual to understand that

though the upcoming event may not be pleasurable, it is still able to be completed and there may be something positive that can be derived from it. While this may sound similar to Grit, it is somewhat different as Grit is often described as the ability to focus efforts and energy on important goals over a long period of time (Duckworth et al., 2007), and "inclines an individual to battle setbacks, disappointment, exhaustion, [and] plateaus" (Southwick et al., 2019, p. 4). In the Mohan and Kaur (2021) study, the team found Grit and Academic Resilience to be positively correlated, but slightly different. However, they do have a complex interplay with each other as it is hard to imagine anyone being able to display Grit in pursuit of a goal over a long period of time without also displaying resilience.

In her examination of new teachers in under resourced schools, Duckworth et al. (2009) examined the theory of Grit in a new setting. This examination of teachers and their Grit was important because it extended the idea of Grit beyond the classroom and educational settings and moved it into the professional realm. Though new at the time, this was not the first-time research had been done on high performers and the characteristics that defined them.

Nearly a century earlier Cox (1926) looked through the records of 301 high achievers from various fields and concluded that those who went on to achieve prominence in given fields did display keen intellects, they also displayed "persistence of motive and effort" (p. 218) and displayed a dogged determination to finish what they had started. Southwick (2019) notes that "gritty individuals choose pursuits that are congruent rather than conflicting with their goals" (p. 4) and that they displayed willingness to stay focused on them for months and sometimes even years. For this there must be some order or precedent to explain a person's motivation to remain engaged over such a long span. There needs to be a type of alignment that helps to guide those actions of perseverance in the lean times, a:

> harmonic alignment of specific actions—including thoughts, feelings, and behaviors—with lower-order goals, which in turn serve higher-order goals that are progressively more abstract, extended in time, and identity-relevant. Paragons of grit hold a single superordinate goal that is aligned with personal values and interests and that directs, energizes, and imbues meaning to nearly everything they do" (Southwick et al., 2019, p. 5),

and that in more complex or abstract professions Grit may matter even more than in others. That is not to say that these superordinate goals are forever static, but that they can exhibit both stability and flexibility over the course of time depending on where a person may find themselves when in pursuit of those goals (Duckworth, 2016; Duckworth & Gross, 2014; Duckworth et al., 2007; Southwick et al., 2019).

This hierarchical understanding of goals and how it informs Gritty action is important because it shows how Grit organizes wants and desires. Additionally, it has been proven that a culture of Grit is important in work environments. However, in these discussions of culture it is worth noting that Grit itself is not the only topic discussed, but that of a growth mindset. Park et al. (2018) in their study of middle school students and their school culture show how the perceived importance of intrinsic learning also see improvements in Grit scores as well as grades. These findings confirm additional research by Park et al. (2020) in which they found Growth Mindset and Grit as mutually beneficial to each other.

Grit has been shown to be a predictor of performance, but whether or not it could be grown or developed was a question. In research by Whipple and Dimitrova-Grajzl (2023) at Virginia Military Institute (VMI), it was shown that over a four-year period, perceptions of grit

could change over time. Though not exactly like the confines of West Point, it is worth noting the similarity of VMI to that of West Point in its contextual setting. VMI is a public institution that puts students through a demanding curriculum that includes academics, as well as military and physical training. In regard to grit, the authors noted that grit levels dropped during the first year, but increased during the remaining time. The researchers hypothesized that this change might be due to the extremely challenging environment that VMI presents to its students during the first year that leads to them eschewing far off goals and focusing on day-to-day concerns. However, after they have made it through the initial blitz of the first year, they are able to reflect on their experiences and re-evaluate their grit and perseverance levels. This led the researchers to the conclusion that grit is malleable and flexible as well as to suggest that careful design of the learning environment and educational practices could help to promote the growth of grit (Hwang & Nam, 2021).

However, as with any theoretical construct, it is also important to look at the results and see if they are also of practical significance. In research by Hodge et al. (2018), it was found that grit was only able to explain 2.4% of the variance in academic productivity and 3.2% of the variance in engagement. This led the authors to conclude that though a popular topic in academic circles, it may be worth looking into grit's theoretical and practical applicability. It is also worth noting that grit is not a magic cure all for as pointed out by Credé et al. (2017) if a person lacks a general ability, be it physical or mental, to pass a respective test then no amount of grit will help them. In fact, grit in that instance could become detrimental as it could become maladaptive and lead one to not engage in more adaptive behaviors that would lead to success. So while it is important to have grit, it cannot be the only trait that one possesses. Additionally, as pointed out by Credé et al. (2017):

> Grit as a predictor of performance and success and as a focus of interventions holds much intuitive appeal, but grit as it is currently measured does not appear to be particularly predictive of success and performance and also does not appear to be all that different to conscientiousness" (p. 504).

It is easy to like what Grit espouses as an idea, but does it really hold the magic that it is purported to. In a meta-analysis by Muenks et al. (2017), the authors pointed out how even though grit was able to account for 11% of variance in student's grades, that when other variables were included those new variables were stronger predictors than grit.

Self-Efficacy

Psychologists define self-efficacy as a person's ability to evaluate their own capabilities and then have their self-evaluation inform their actions in pursuit of goals. It is essential to understand why and to what extent individuals will take up and follow through on a given course of action. Studies have shown self-efficacy can be predictive in diverse settings including academics, social skills, athletics, and professional settings (Bandura, 1986; Chen et al., 2001; Schunk, 1989, 1991; Schunk & Dibenedetto, 2016). Bandura (1977a, 1977b) hypothesized that self-efficacy was instrumental in understanding several things. He felt it could help explain the choices a person would make in regard to selecting an interest, the follow-on effort they would muster and display as they engaged in the interest, and the perseverance they showed when they encountered obstacles or difficulties. He believed the higher the self-efficacy, the more likely a person was to participate in a task despite its level of perceived difficulty. Conversely if a person exhibited low self-efficacy they were more likely to avoid a task or not display perseverance in the face of difficulty (Locke et al., 1984; Schunk, 1989, 1991; Wood & Bandura, 1989).

Central to the belief of self-efficacy is that of agency, or that an individual can exercise some degree of control over their environment and important events in their lives through their own actions (Bandura, 1989, 1993; Schunk & DiBenedetto, 2020). Dweck (1975) looked at this concept when she examined the concept of learned helplessness in children with extreme reactions to failure. The children who attributed their failure to a lack of ability showed continued degradation of functioning, while those that underwent treatment showed signs of improvement. The group of children who demonstrated learned helplessness "took less personal responsibility for the outcomes of their behavior and tended to place less emphasis on the role of effort in determining success and failure than did the persistent children" (p. 679). The learned helplessness children did not display any agency, while the other group did and showed correspondingly positive results. Those children who viewed the failure event as beyond their control could not bring themselves to persist in their efforts, while the others did exactly the opposite by showing a growing belief in themselves, the effort the expended, and their ability to persist in the face of difficulty (Dweck, 1975). Control is exercised by the individual through the implementation of self-regulatory practices through which they are able to work towards achieving goals, by performing at individual specified levels (Bandura, 1977a; Bandura, 1997; Schunk & DiBenedetto, 2020). It is important to note that Self-efficacy is not viewed as a static construct, but a malleable one that is informed through the triadic reciprocality of three factors: behavior, environmental and personal (Bandura, 1986; Schunk & DiBenedetto, 2020). While it is important to understand how the triad affects the person and their change, it is also important to understand one's agency in this process, by which individuals place themselves in specific environments by which they are acted on and interact with (Bandura, 1997).

Personal influences are those influences that are ascribed as belonging to the individual and help to motivate and focus the individual in their pursuit of specific achievement (Bandura, 1986; Bandura, 1997; Schunk & DiBenedetto, 2020). Key to this discussion is the understanding of the goal as the motivator. A more nebulous goal that is hazy and ill understood, will not be a good motivator. However, as research has shown a goal that accurately captures the properties of specificity, proximity, and difficulty is more likely to be successful in capturing the initial motivation and helping to maintain it through goal completion (Bandura, 1986, 1989; Locke et al., 1984; Locke et al., 1981; Schunk & DiBenedetto, 2020; Zimmerman et al., 2015). Along with proper goal setting, research has shown that providing rewards linked to properly constructed goals can help increase self-efficacy. It was hypothesized that this was caused by engendering a higher degree of goal commitment at the outset, thereby leading the subjects to want to perform better and taking actions that helped them to do so (Schunk, 1984). However, it is important to note that rewards may not always be available or even prudent. Additionally, another study (Schunk, 1985) showed that participating in the process of goal setting also had a significant effect on an individual's self-efficacy. In this study, groups of students either set their own goals, had them set for them, or did not receive or set any goals. The first two groups had larger increases in self-efficacy, with the self-set goals group showing the highest self-efficacy. In his research on agency, Bandura (1989) showed that the more challenging the goal the more power it provided towards one's motivation and performance.

In looking at goals again, research has shown that learning goals are more conducive to better learning and motivational outcomes over prolonged periods of time. This occurs through a student making judgements against themselves and the goals when setting learning goals, and against peers and others when setting performance goals (Schunk & DiBenedetto, 2020). Though

not mentioned by Schunk and DiBenedetto, this explanation falls in line with both the description and explanation of the benefit of mastery goals in the achievement goal orientation construct (Dweck, 2017). Additionally, these children are more likely to view ability as something that can be developed rather than something that one is born with. Thus, they seek out opportunities that will help them grow and develop, even though they know they will more than likely encounter difficulties (Bandura, 1993; Nicholls, 1984).

Behavioral influences on motivation are the behaviors which the individual exhibits. When considering motivation, this can include decisions about what activities to participate in, what goals to set, how much effort to expend while in pursuit of those goals, and when one should stop the pursuit of those goals (Schunk & DiBenedetto, 2020). Bandura (1986) espoused that response-outcome contingency beliefs influenced behavior by helping to inform an individual decision on whether or not to participate in a given activity, given well established skills. Without the benefit of well-established skills, the individual is incapable, or at least, not highly likely to possess sufficient knowledge to help them make an informed decision regarding engagement in said behavior. Additionally, though espousing the numerous benefits of self-efficacy, it is worth noting self-efficacy is not a silver-bullet, magic cure all. As noted by Schunk, "high self-efficacy will not produce competent performances when requisite skills are lacking" (1991, p. 209).

The environment in which an individual finds themselves can have a significant effect on their self-efficacy and follow on actions. Individuals who find themselves in environments with positive models from which they can learn are more likely to have higher self-efficacy and exhibit the desirable follow on actions of engagement and persistence (Bandura, 1986; Schunk & DiBenedetto, 2020). However, as pointed out by Schunk (1989), not all models are equal when

assessing their affect as “models who are similar or slightly higher in competence provide the best information for assessing one’s capabilities” (p. 183). Thus, anyone observing the action of another is likely to gain the most if the person being observed is similar to them in ability (Schunk, 1989).

In instances where there may be no model, self-efficacy still exists and understanding the nature of its existence is important as well. In Kitchen et al. (2023) Researchers looked at college students who were either one or some combination of the following categories low-income, first generation, or racially minoritized and a transition program that sought to help develop their own self-efficacy related to college major and follow on career. Students from these backgrounds suffer from lower self-efficacy related to both their college major and follow on career choice (MCSE), which can have detrimental effects on their willingness and ability to display the adaptive behaviors needed to succeed in new environments, be it college or career (Betz, 2004; Dweck, 1975; Hackett & Betz, 1981; Schunk, 1989, 1991). The researchers highlight the important role that context plays in establishing the barriers these types of students face in this new environment and the effect it has on their MCSE. They propose an idea known as Ecological Systems Theory (EST), which explains the complex and interrelated systems in which these students are operating for the first time. The researchers espouse the importance of teachers in their model as they are the ones who are most able to shape the environment the students interact with day to day, and which can most affect their MCSE. This study could pay dividends for Air Force ROTC programs across the U.S. as the Air Force annually implements its Gold Bar Recruiter Program which is aimed at increasing diversity in the Air Force by recruiting directly from underrepresented populations (Manske, 2020).

In seeking to deepen understanding of self-efficacy, Chen et al. (2001) began to look at self-efficacy as a more general trait like construct rather than the more situational construct proposed by Bandura. Rather than looking at one's perception or ability across a narrow subject, general self-efficacy is more concerned with the perception of one's competence over a multitude of situations. GSE can be looked at as a more holistic assessment of one's total self-efficacy that is affected by the sum of their total experiences in many various domains. It is not meant to overtake or replace situational specific self-efficacy, but rather complement it, by predicting situationally specific self-efficacy, predict performance criteria, and act as a buffer against effects of poor performance on various situational specific self-efficacy (Bandura, 1997; Chen et al., 2001; Schunk, 1991; Sherer et al., 1982).

The ability of self-efficacy to help influence adaptive behaviors, as well as indirectly affecting other psychological determinants (Bandura, 2012), in challenging situations has been well established in the literature, and it is for that reason that it along with grit and psychological flexibility were selected to try and predict effective squad leadership by U.S. Army Reserve Officer Training Cadets during their field training exercises (Gilson et al., 2017). The researchers compared the three variables to the cadets' field training exercise (FTX) scores. The FTX is a culminating event for Army ROTC students that sees them put through various scenarios upon which completing they receive a score that indicates they are working towards not only learning, but applying the leadership lessons they are receiving as part of their course work. In their analysis it was shown that only the self-efficacy scores of cadets proved to have a statistically significant relationship with the performance of cadets. Furthermore, the results also showed that for every one-unit change in self-efficacy, the cadets were more than twice as likely to be ranked

in the next group up in the rankings (Gilson et al., 2017). These results in a lightly researched area further show the possibilities of self-efficacy in a military context.

Methods

Research Design

For this study of self-efficacy's effect on the performance of cadets in the Air Force Reserve Officer Training Corps (AFROTC) a sequential mixed methods case study method that utilized the triangulation strategy (Creswell, 2009; Johnson & Onwuegbuzie, 2004) was designed to analyze quantitative and qualitative data to determine if the results show a relationship. According to Creswell (2009), a mixed methods model has the benefit of being used "as a means to offset the weaknesses inherent within one method with the strengths of the other (or conversely, the strength of one adds to the strength of the other)… and can result in well-validated and substantiated findings" (p 196 - 197), with the end goal being to "use a method and philosophy that attempt to fit together the insights provided by qualitative and quantitative research into a workable solution" (Johnson & Onwuegbuzie, 2004, p. 16). Also, as pointed out by Lund (2012) the generation of multiple types of data can help the researcher to investigate and answer more complex questions, than by only relying on one form of data. The case study method was chosen as it seemed most appropriate based on the fact that the researcher was not interested in the need to control for behaviors but was specifically interested in the behaviors of cadets and how it affected their performance in the AFROTC program (Yin, 2009).

This study looked at the AFROTC program in a holistic manner seeking to capture quantitative self-reported data from cadets using survey instruments as well as qualitative interview data from fourth year cadets who have navigated four years of college, detachment requirements, cadet life, and are soon on their way to becoming a second lieutenant in the United States Air Force. The unique experiences of cadets also further support the need for a case study design as their unique contextual experiences during their time in ROTC are important to

understanding both the quantitative and qualitative data generated by this research. As put forth by Yin (2009) case study research should be used when a researcher sets out to understand events as they occur in everyday life, but such understanding cannot be separated from those contextual conditions. Given the unique experience of the AFROTC cadet in having to navigate the requirements of both college and corps life, case study research is extremely well adapted for this research topic. Cadets must navigate all of the normal challenges that face college students across the United States, while also assuming those associated with military service. While cadets are not officially part of the active-duty Air Force until after graduation and their commissioning program, they must conform to military rules and regulations that other students do not while going through ROTC. They have extra requirements levied on them regarding grooming standards, physical fitness standards, standards of conduct outside of the classroom, and a stricter code of conduct. These along with many other significant details create important contextual differences between cadets and the rest of the student population on campus.

This study gathered both quantitative and qualitative data in order to gain a fuller understanding on the possible impact of self-efficacy on the success of AFROTC cadets as they move through the program. The quantitative measurement of overall cadet Grade Point Average, their Physical Fitness Test Scores, ROTC Self-Efficacy (RSE) scores, Achievement Goal Orientation scores, and their interactions with one another were fixed within the complex contextual landscape centered around their roles as both university students and AFROTC cadets. As such, while quantitative methods would have measured and captured data related to these scales, it would have failed to capture the cadet's own interpretations of their lived experiences while progressing through the program. Therefore, the decision to capture qualitative data regarding the cadet's own perception of their self-efficacy and why they felt it

mattered to them was essential to understanding the construct from the perspective of the cadets. The use of both quantitative and qualitative methods to capture data related to self-efficacy is supported by Anita Woolfolk who notes that "each approach can tell us some things and not others" (Woolfolk & Shaughnessy, 2004, p. 155). In using qualitative methods, I am hoping not to get a measurement of the cadet's self-efficacy but to understand if and why they felt it was important to them as they navigated the AFROTC program. As pointed out by Woolfolk and Shaughnessy (2004) in their research on teachers' self-efficacy, it has been shown that events that happen earlier in a teacher's career are some of the most influential. Building on this, it stands to reason that AFROTC can serve as an important time for a future officer to help develop and build self-efficacy through mastery experiences, vicarious participation in the activities of others, and the evaluation of their performance by AFROTC Cadre and senior corps members (Bandura, 1997).

Setting

The University

The setting for this study is a major southeastern university located in East Central Alabama and approximately 50 miles away from major Air Force and Army bases. The research took place in the spring semester of 2024. The university is a land-grant university and has a total enrollment of approximately 31,500 total students. Of those students, approximately 25,000 are undergraduate students and 5,500 are graduate students. The student to faculty ratio is 20:1. Demographically, the school is 50% male and female (University, 2022). The race demographics can be found in Table 1.

Table 1

Enrollment by Ethnicity/Race	***N***	***%***
American Indian or Alaska Native	78	.26
Asian	895	3
Black or African American	1,560	5.25
Hispanic	1,270	4.3
Native Hawaiian/ Pacific Islander	19	.06
White	25,007	94.29
Two or More Races	873	2.9

Note: Race/Ethnicity was unknown for 109 students, 1953 students were non-resident aliens

The Detachment

At the beginning of the 2023 academic year, the AFROTC detachment at the university was comprised of 157 cadets in four year groups organized into a hierarchical wing structure that resembles that of actual Air Force wings. The cadet wing is led by the Cadet Wing Commander who is responsible for leading the cadets, ensuring proper organization, and the completion of orders given to him by the ROTC cadre. The detachment cadre is made up of a team of seven active duty Air Force members who are charged with carrying out the overall AFROTC mission to "Develop Air and Space Force leaders of character whom we expect to fight and win our nation's wars" (Quinn, 2023) by carrying out their mission to "develop the next generation of accountable leaders who are driven to embrace the challenges of an ever-changing battle space" (Quinn, 2023). The six cadre are led by a Lieutenant Colonel Squadron Commander. The remaining cadre are two Majors, one Technical Sergeant, one Staff Seargeant, and two civilians. One of the civilians is an employee of the university and serves in the position of the business coordinator for the entire detachment, and the other is a contractor who instructs classes for the detachment due to a manning shortage. This civilian contractor has previously worked at the detachment and is a Lieutenant Colonel in the Alabama Air National Guard.

The majority of the cadets are in the first two year groups, AS100 and AS200, as the cadets must compete against cadets nationwide at the end of the sophomore year to be selected to attend field training. Along with the competition for field training spots, there is natural attrition that can be ascribed to any number of issues including medical problems, academic problems, physical fitness, or a lack or want to continue in the program. Of the 157 cadets, 62 of them are receiving technical degrees, 94 are receiving non-technical degrees, and one is receiving a specialty degree (Quinn, 2023). Table 2 shows the breakdown of all the cadets who are on scholarship while attending the university.

Table 2

Cadets with Scholarships

AS100	AS200	AS300	AS400	AS+	Totals
17/53	14/42	29/29	20/20	5/7	85/157

Of the entire cadet corps 54% receive a scholarship while they are attending school. Some cadets receive scholarships for their entire time in the AFROTC program, while others may have them awarded after entering the corps. If a cadet is selected to attend and they complete field training in between the summer of their AS200 and AS300 year, they will transition from the General Military Course (GMC) cadet to a Professional Officer Course (POC) cadet. With the completion of field training and the transitioning to a POC a cadet may be awarded a scholarship, if they are not already on scholarship, which is meant to help them cover the cost of attending college. This scholarship covers tuition, books, and includes a monthly stipend, of which the amount will vary depending on the year of the cadet. After completion of Field Training and acceptance into the POC ranks, cadets are expected to take on leadership roles inside the cadet wing to help prepare them for active duty service.

In a cadet's career there are two major boards, or screenings, for advancement and selection into programs. The first board that occurs is the selection process that occurs in a cadet's AS200 year and determines if they are selected to attend Field Training. The board's selection of a cadet to attend field training is the culmination of a cadet's first two years in the ROTC program and determines whether they will have the opportunity to continue their progress in the corps and ultimately receive a commission as a second lieutenant in the United States Air Force. As such, it is an extremely important and stressful time for all of the AS200s. The board process is a centrally managed process by Headquarters AFROTC (HQAFROTC), but they receive information from the 145 individual detachments that enable them to make their decision. The most important of which is the cadet ranking by the AFROTC Cadre. This ranking is conducted each semester and is an iterative process that builds on all prior semester's rankings. This process is very similar to the process used by active-duty units to determine the rankings of their own airmen.

The Researcher

I am an active-duty Air Force Officer with approximately 19 years of service in the Air Force. I graduated from this university and received my commission 19 years ago. My career in the military has encountered not only traditional service roles but also, many training and educational ones as well. It was in those roles that I was able to witness airmen of all different ranks, experience levels, and aptitudes encounter and deal with obstacles and hardships. Not all of them faired equally or even met with success. During my time as a flight commander at the Air Force's Squadron Officer School, I was responsible for facilitating14 classes with over 200 students. This six-week class is designed to challenge our young officers as they prepare themselves for greater leadership roles in their units. This allowed me a front row seat to observe

both individuals and teams and began my fascination with why some were more successful than others. Along with the front row seat during my time as a flight commander, I often thought back to my time in ROTC and questioned what made certain cadets more successful than others. The experience as a military educator jump started my fascination with how and why some teams and individuals faired better and succeeded more than others. As I navigated the courses for my degree I was introduced to several motivational constructs that further deepened my interest in this topic, those were self-efficacy, achievement goal orientation, and grit. It is through the combination of my life experiences as a cadet, military member, military educator, and student that I settled upon this research topic.

Purpose of the Study

The purpose of this study is to increase the knowledge surrounding self-efficacy and its effects in a military educational environment, by determining the degree to which it affects the outcome of ROTC students.

Research Questions

The impact of self-efficacy on the performance of AFROTC students was examined through the following research questions:

RQ1: To what extent did self-efficacy predict an AFROTC students' success in the AFROTC program?

RQ2: Does any relationship exist between self-efficacy, the other psychological variables contained on the survey instrument, and other cadet data?

RQ3: How did cadets perceive their own self-efficacy and how it affected their progression through the ROTC program?

RQ4: Do cadets believe that their self-efficacy helped them positively navigate their AFROTC experience?

The quantitative data generated by the survey instrument was used to answer research questions 1 and 2, and also helped to shape the semi-structured interviews. The data generated from the interviews with the senior cadets was used to answer research questions 3 and 4.Quantitative

For the quantitative portion of this research, participants were recruited from the entire cadet corps. The total cadet population at the time of the survey was 129 cadets. Of the 129 cadets 119 chose to participate in the survey. This resulted in a 93% survey response rate across the entire corps. For the study 51 of 55 AS100 cadets, 28 of 29 AS200 cadets, 21 of 25 AS300 cadets, and 20 of 20 AS400 cadets participated in the study. A full demographic breakdown can be found in Table 3.

Table 3

Demographics of Participant Population

Year Group	Gender	Race							
		Black or African American	Asian American	White or Caucasian	Native American	Pacific Islander or Hawaiian Native	Self-Describe	Hispanic	Prefer not to Answer
AS100									
Male	36	0	0	34	0	0	2	0	0
Female	14	1	0	12	0	0	1	0	1
AS200									
Male	18	0	1	16	0	0	0	1	0
Female	10	1	2	7	0	0	0	0	0
AS300									
Male	16	0	0	15	0	0	1	0	0
Female	5	0	0	5	0	0	0	0	0
AS400									
Male	10	0	0	10	0	0	0	0	0
Female	5	0	0	5	0	0	0	0	0
Total									
Male	85	1	1	75	0	0	3	1	0
Female	34	1	2	29	0	0	1	0	1

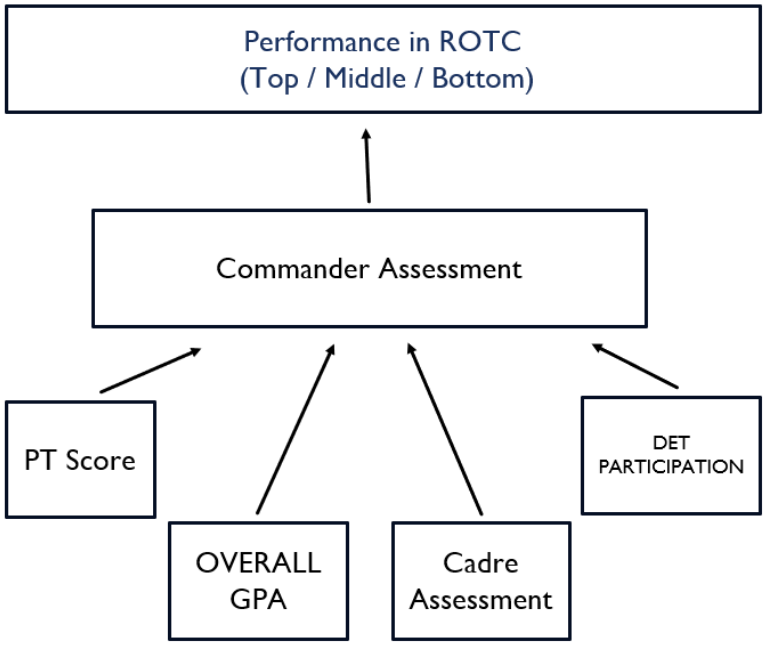
Design

Current Evaluation and Measurement Criteria

The current manner in which the cadets are assessed by, and which results in their order of merit, is not standardized across ROTC units nationwide. This is done deliberately in order to allow each detachment commander the flexibility to lead their units and determine who their top personnel are. This is not to say there are no standards, but rather an overall commander's intent from the HQAFROTC to help guide each commander as they discharge their duties. For this detachment, the cadre use each cadet's PT Score, Overall GPA, AS Year Cadre Assessment, and Detachment Participation to help inform the overall Commander's assessment of each cadet before the order of merit is established. A model of this can be found in Figure 1.

Figure 1

Current ROTC Detachment Evaluation Criteria



Research Design

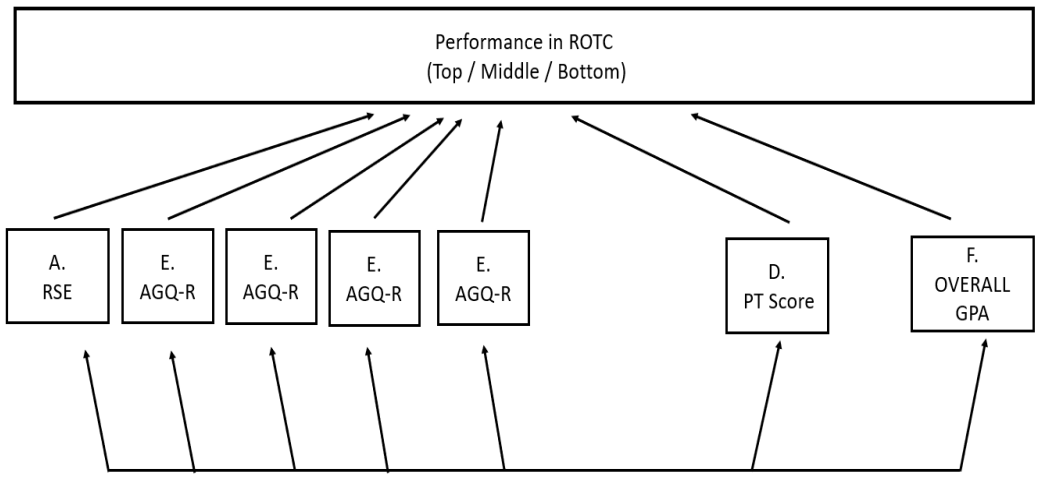
The design of this study builds upon and expands a previous study by Gilson et al. (2017) that looked at what psychological variables best predicted success for Army ROTC students during a mandatory summer program for Army ROTC cadets. In the Gilson et al. (2017) study, the team used the Grit-S scale (Duckworth & Quinn, 2009), along with a self-efficacy scale, and a scale measuring psychological flexibility to determine the relationship between these variables and being rated an effective leader during program activities. This study found that self-efficacy was the only variable that predicted success in the Army ROTC environment. The results that showed grit and psychological flexibility were not statistically significant predictors led to the

decision to use an updated protocol that looked at self-efficacy and the four achievement goal orientation constructs measured by the AGQ-R (Elliot & Murayama, 2008).

The design for the quantitative portion of this study borrowed from the Gilson et al. (2017) study by assessing the affects and interactions that various psychological variables as well as other predictors have on the performance of ROTC cadets. Much like the Gilson et al. (2017) study, this study used ordinal cadet ranking as its dependent variable. Like the final measurements of Needs Improvement, Satisfies the Standard, and Exceeds the Standard, this study's dependent variable measured success ordinally with the categories of Top, Middle, and Bottom Third. This study sought to build upon and expand the knowledge in the areas of psychological variables in a military setting with the goal of further informing design of educational practices aimed at increasing the overall quality of the commissioning cadet.

Figure 2

Research Design for Current Study



The Instrument

Data Collection

Quantitative

The population for the study was the Air Force ROTC cadets of the local AFROTC detachment. The make-up of the participants was more heavily weighted towards the freshmen and sophomore class as they had not met their first round of boards and therefore have not had their numbers attritted. The number of cadets is reduced following the sophomore year for several reasons. Not all cadets choose to remain in the program, not all cadets are chosen to go to field training and become upperclassmen, and not all cadets are able to finish the field training program. For these reasons the majority of responses will be from the freshmen and sophomore classes. This approach represents a purposeful sampling technique as the research will be limited to only AFROTC cadets.

To try and achieve maximum participation of the survey, the researcher presented the opportunity to participate in the survey following an ROTC class. The benefit of an in-person approach conducted during their class time is that it will allow for maximum contact with all of the detachment's students (approx. 130). Additionally, the researcher believed the students were more likely to answer the questionnaire if it directly followed a class and not something they must remember to do outside of normal hours or times.

Instrument Validity and Reliability for Quantitative Instruments

GSE

The GSE scale (Chen et al., 2001) is an eight-item instrument that was developed from exploratory research conducted by the researchers. It initially contained 14 items of which six were removed due to them being found nearly linearly redundant with other items on the test.

Also, the researchers looked to make sure the NGSE was distinct from self-esteem. Findings from this analysis showed the NGSE to be distinct from, but highly related to self-esteem. The researchers also confirmed that GSE as measured by the NGSE more closely aligned with motivation constructs than with self-esteem. By utilizing the NGSE to measure GSE along with other constructs in this research, this will build on literature to determine if GSE is generalizable with other samples and settings (Chen et al., 2001).

AGQ-R

The AGQ-R (Elliot & Murayama, 2008) is a revision of the former scale that also measured achievement goal orientation (AGO). The AGQ-R measures the 2 x 2 model of AGO and deals with shortcomings of the original survey instrument. The new 12 item scale was developed and validated through a survey of 229 undergraduates (Elliot & Murayama, 2008). It is measured on a 5 item Likert scale and was assessed using confirmatory factor analysis. The results from this analysis underpinned the support for the 2 x 2 model and displayed a good fit χ^2 (48, $N = 229$) = 78.32, $p < .01$, CFI = .99. Additionally, the researchers tested the AGQ-R against six alternative models and found this model to display the best fit. Lastly, each of the subscales also displayed high levels of internal consistency with mastery-approach goals ($\alpha = .84$), mastery-avoidance goals ($\alpha = .88$), performance-approach goals ($\alpha = .92$), and performance-avoidance goals ($\alpha = .94$) (Elliot & Murayama, 2008), and allows for the measurement of the specific sub-constructs of the larger Achievement Goal Orientation construct.

RSE

The RSE scale is an adapted self-efficacy scale that sought to assess an AFROTC cadet's self-efficacy in the context of the AFROTC program. In order to ensure reliability and validity of the RSE scale, the researchers conducted analysis of the scale to ensure it met acceptable levels

on key identifiers such Cronbach's alpha and dimensionality. Additionally, it was developed using guidelines outlined by Bandura (2006). The instrument contained eight items related to cadet self-efficacy situated in the context of the ROTC environment.

Data Analysis

Quantitative Analysis

Quantitative data was collected using a paper self-report questionnaire. Following data collection and entrance into an excel spreadsheet, data was analyzed using IBM's SPSS version 29. SPSS was used for all measurements of quantitative data gathered during the study. All data was analyzed for descriptive statistics, to include means and standard deviations of both the population data as well as data generated from the RSE and AGQ-R. The first 9 questions on the instrument were used to gather demographic data on the participants, while the following portions of the survey gathered info on GSE, RSE, Grit-S, and AGQ-R respectively.

In addition to descriptive statistics, SPSS was used to perform ordinal linear regression to assess if there was any relationship between performance by the AFROTC cadets and any independent psychological variables and independent cadet performance variables, GPA or PFT score, and dependent variable of cadet ranking by members of the cadre. Along with ordinal regression, Chi Square tests were performed due to the non-parametric nature of the data due to the level of measurement being ordinal and that sample sizes based on demographic data were not always equal (McHugh, 2013).

Qualitative

For the qualitative interview portion of the data, the decision was made to sample up to 12 members of the AS400 class. This was done for several reasons, but mainly to enable the researcher to gather as much data as possible from the participants. By interviewing the AS400

class this study will be able to provide a holistic and retrospective look at their AFROTC experience and the role that any of the independent variables could have played in their ability to complete the program. Along with the need to gather sufficient interviews, by sampling six cadets out of a class of 20 there was a better chance that the researcher would gather qualitative data from a range of cadets and not only one segment of the class. The demographics for the interview participants can be found in Table 4.

Table 4

Interview Participant Demographics

Pseudonym	Sex	Race	GPA	PFT	RSE	MAp	MAv	PAp	PAv	Cadet Ranking
Cadet Red	Male	White	3.21	87.00	4.00	4.0	4.00	3.33	3.33	Middle Third
Cadet Yellow	Male	White	3.26	95.50	3.63	3.33	3.00	4.67	5.00	Bottom Third
Cadet Orange	Male	White	3.11	93.50	4.75	5.00	2.00	5.00	3.67	Middle Third
Cadet Green	Male	White	3.33	94.50	4.38	4.00	4.00	4.67	4.00	Top Third
Cadet Blue	Male	White	3.43	94.10	4.38	3.33	3.33	4.00	4.00	Middle Third
Cadet Black	Female	White	3.53	96.00	4.50	4.67	3.33	4.00	3.00	Top Third

Qualitative data was gathered over the course of interviews with 6 cadets. The cadets were purposefully selected from the 20 members of the 2024 commissioning class. By choosing to sample only from the AS400, or senior class, the researcher was able to gain a more holistic perspective of these cadets' ROTC experience over the past four years (Creswell, 2009). All senior cadets were provided the opportunity to interview and the 6 chosen were all volunteers. All 6 cadets participated in one semi-structured interview with the researcher. If further information or clarification was needed after the researcher conducted the initial interview, the researcher would reach out to the cadet in order to conduct another interview related to the

follow up questions. The use of a semi-structured interview format was deemed the most suitable as it would allow the researcher to delve deeper into how the interviewee viewed and expressed their lived experiences (Hancock & Algozzine, 2017; Tracy, 2019). The use of the semi-structured interview technique allowed the researcher the flexibility to navigate the complexity of the various experiences of the ROTC cadets and how those emerge in the individual interviews.

Qualitative Analysis, Reliability, and Validity

Interview transcripts were generated from the audio recordings of the interviews and were crosschecked to ensure no mistakes occurred during transcription to help ensure reliability of generated data (Creswell, 2009). Once all transcripts were gathered, the researcher conducted several types of analysis to determine what if any themes and patterns emerged from the interviews using ATLAS.ti software version 5.22.1 (Creswell, 2009). All transcripts were coded and any codes that appeared less frequently were recoded into broader categories. Additionally, the researcher used the multiple interviews to triangulate data generated from the participants (Hancock & Algozzine, 2017). Additionally, earlier in this section the researcher highlighted their positionality in order to highlight any bias and help the reader understand how and why the researcher came to specific conclusions (Creswell, 2009). Lastly, to increase dependability and trustworthiness the researcher kept a detailed audit trail of all of their actions related to qualitative research and data analysis.

Summary

The research in this study sought to investigate the effects of self-efficacy on ROTC students at a large southeastern public university. However, rather than looking simply at quantitative or qualitative measures, it sought to build a more holistic picture by using a sequential mixed methods case study approach. This was done to try and better understand the contextual conditions in which the students exist while navigating the demands of both college and ROTC, rather than separating the participants from their contextual landscape. This was carried out by utilizing the sequential mixed method strategy and first conducting the quantitative assessment and then analyzing the results of the self-report instrument to help guide the semi-structured interview of the senior cadets. The sequential nature of the study allowed the researcher to better understand the macro-level view of the ROTC detachment before beginning the interview portion of the study. Through the interviews it was hoped to gain a better contextual understanding of the quantitative data and how the cadet's experienced the motivational construct of self-efficacy in both their ROTC and everyday lives over their years in the program.

Findings

The purpose of this research was to better understand ROTC cadets' self-perceptions of their own internal motivations in relation to their time in AFROTC and how those may have shaped their performance as they moved through the program. The research design utilized a sequential mixed-methods design whereby it might be possible to adjust the qualitative portion of the study based on the findings derived from the quantitative portion of the study. By using the results from the study, educational leaders in the Air Force ROTC program will be able to use better course design methods aimed at improving the ROTC experience both in educational and practical outcomes. To better understand the findings, it is first necessary to understand the population of the study in both the macro and micro-sense. To do this we will first examine the population of the detachment and then of each class. Following the examination of the population is an examination of the scales used to assess the ROTC cadets. Next the paper will examine the correlations between the independent variables. Lastly, the development and testing of the model will be discussed as well as the results.

Descriptives

The Corps and the Classes

The entire 130-member cadet corps was invited to participate in the survey. Of the total population of 118 cadets who took part in the survey, not all of them fully completed specific items on the survey and had all GPA and PFT information available for the purpose of this study. This led to small differences in the populations for each of the variables, but a total population of 105 cadets who completed all items on the survey instrument and had complete information for both GPA and PFT scores. In some instances, a GPA may not have been available due to a cadet entering the cadet corps this semester and a GPA having not been recorded at the time the

information was gathered from the cadre. In regard to the PFT scores, some cadets (AS100s) have not yet taken the PFT due to either joining the detachment this semester or having an injury that prevented them from participating in the PFT during the fall semester. Additionally, a very small number of cadets missed a question or chose not to answer a specific question on different portions of the survey. The average cadet has a mean GPA of 3.35 and PFT score of 93.51. Their answers on the surveys also indicated a GSE score of 4.33, a RSE score of 4.37, a Grit score of 3.29, and Achievement Goal Orientation scores of 4.32 for MAP, 3.98 for MAV, 4.25 for PAP, and 4.27 for PAV. A full table of descriptives for the ROTC Corps and each AS year can be found in Table 5.

Table 5

Descriptives of Variables for AFROTC

AS Year		GPA	PFT	RSE	Performance Approach	Performance Avoidance	Mastery Approach	Mastery Avoidance
AS100	Mean	3.32	92.42	4.297	4.472	4.403	4.493	4.163
	N	44	43	48	48	48	48	47
	Std Dev	0.530	5.975	0.437	0.562	0.704	0.528	0.798
AS200	Mean	3.48	94.33	4.344	4.226	4.452	4.345	4.103
	N	27	27	28	28	28	28	26
	Std Dev	0.389	5.228	0.398	0.522	0.727	0.577	0.717
AS300	Mean	3.24	95.44	4.369	3.873	3.917	4.079	3.762
	N	21	21	21	21	20	21	21
	Std Dev	0.498	4.401	0.388	0.734	0.884	0.640	0.817
AS400	Mean	3.40	93.01	4.413	4.183	3.983	4.150	3.717
	N	20	20	20	20	20	20	20
	Std Dev	0.366	5.008	0.365	0.597	0.848	0.546	0.907
All Classes	Mean	3.36	93.57	4.341	4.256	4.259	4.325	3.997
	N	112	111	117	117	116	117	114
	Std Dev	0.468	5.415	0.405	0.624	0.791	0.581	0.817

In examining the descriptives of the ROTC classes it is worth noting the AS100 class has the lowest GPA, PFT, and RSE when compared to the rest of the classes. The GPA and PFT scores being the lowest should not be a surprise as this is the largest class and includes some cadets who will decide to drop out of ROTC before the start of their AS 200 year. Also, this is

likely the first time many of these cadets have spent significant time away from their parents and are learning how to manage their daily schedules amidst the competing priorities of both school and ROTC. This makes the fact that their RSE is the lowest of the four year groups understandable. Especially, given that the survey was given in the spring semester of their first year. They have had a full fall semester of college and ROTC events to inform their own self-efficacy. In looking at the total population of the AS200s, 28, it is not unreasonable to assume that at least 10 cadets will drop out of the AS100 class and this could have a positive effect on all three areas as it is reasonable to assume that the cadets that leave the program would be the ones who were struggling.

In looking at the various descriptives related to Achievement Goal Orientation, it is most interesting to note that the AS200 class exhibits the highest score related to the Performance Avoidance construct. During the AS200 year, cadets are directly competing nationwide for coveted slots to attend Field Training and along with wanting to do well, also do not want to do anything that would cost them one of these slots. These results on the survey agree with the findings of Elliot (2006) that those who practice avoidance behaviors are attempting to limit negative impacts to oneself. In the case of the AS200s, they are worried about not only performing well, but also doing something that could harm their chances. Coincidentally, there is an increase in the Performance Avoidance score from the AS300 to the AS400 year. Like the AS200 year this may be attributed to the cadets not wanting to do anything that would cost them their commission in the Air Force and as such exhibiting avoidance behaviors aimed at limiting possible negative side effects. Also, it is worth noting that among both Mastery and Performance Avoidance, the scores decrease as a cadet goes through the program.

Lastly, in examining the results of the RSE scores of the cadets it is worth noting that the longer a cadet stays in the program the higher the score, which indicates an increase in the average self-efficacy of the cadets. This rise in self-efficacy corresponds with several events, the rise in the average GPA, the rise in the average PFT scores, and in the case of the POC cadets, the successful selection for and graduation from field training. These indicators all serve to provide positive feedback to the cadets regarding their efforts and their ability, which is shown in the rising RSE scores. These results also make sense when compared to the overall rising approach scores and declining avoidance scores.

The Instrument

The goal was to validate a new cadet self-efficacy scale that was adapted from the general self-efficacy (GSE) scale (Chen et al., 2001), that focused more specifically on the self-efficacy of AFROTC cadets related to their unique experiences. Along with looking at the cadets ROTC self-efficacy (RSE), the instrument included the 12 item Achievement Goal Questionnaire – Revised (AGQ-R) to assess a participant's Achievement Goal Orientation. Along with the scales there was a page of 10 demographic questions to help capture pertinent information related to the demographics of the participants. The blended instrument that assesses more than one type of psychological variable, was built using the instrument and design used by Gilson et al. (2017) as a model. In their study on self-efficacy as a predictor of success among Army ROTC students, they utilized a self-report survey instrument, which measured self-efficacy, psychological flexibility, and grit, with evaluations from ROTC leadership.

The survey instrument collected demographic data to include age, gender, program year, ethnicity, study habits, scholarship status, number of courses taken per semester and whether or not a cadet worked. Along with demographics, the study used self-report surveys to assess each

cadet's general ROTC self-efficacy and achievement goal orientation. The results of the survey were then used along with cadet GPA and PFT scores to investigate any relationship between the psychological variables, GPA and PFT scores, and overall cadet ranking by the cadre. The total population of the study was 118 out of a possible 129 cadets for a return of 91%.

AGQ-R

The AGQ-R (Elliot & Murayama, 2008) is a revision of the former scale that also measured achievement goal orientation (AGO). The AGQ-R measures the 2 x 2 model of AGO and deals with shortcomings of the original survey instrument. The new 12 item scale was developed and validated through a survey of 229 undergraduates (Elliot & Murayama, 2008). It is measured on a 5 item Likert scale and was assessed using confirmatory factor analysis. The results from this analysis underpinned the support for the 2 x 2 model and displayed a good fit $\chi^{2(}48, N = 229) = 78.32, p < .01$, CFI = .99. Additionally, the researchers tested the AGQ-R against six alternative models and found this model to display the best fit. Lastly, each of the subscales also displayed high levels of internal consistency with mastery-approach goals (α = .84), mastery-avoidance goals (α = .88), performance-approach goals (α = .92), and performance-avoidance goals (α = .94) (Elliot & Murayama, 2008). The use of this item to measure the cadets' AGO allowed the researcher to understand the nuances of this construct as they relate to the participants who completed the survey.

RSE Scale

The RSE scale is an adapted self-efficacy scale that sought to assess an AFROTC cadet's self-efficacy in the context of the AFROTC program. In order to ensure reliability and validity of the RSE scale, the researchers conducted analysis of the scale to ensure it met acceptable levels on key identifiers such as Cronbach's alpha and dimensionality. It was adapted from the GSE

scale that was created by Chen et al. (2001) and their work on a more generalized form of self-efficacy. The reliability and stability of the NGSE was measured and found to be high (α = .86 and .90) and (*r* = .67 and .74) respectively and was found to be unidimensional. Additionally, it was developed using guidelines outlined by Bandura (2006). The instrument contained eight items related to cadet self-efficacy situated in the context of the ROTC environment.

The introduction of the new ROTC Self-Efficacy scale was done to evaluate self-efficacy when situated within the cadet experience. Though Chen et al. (2001) showed that self-efficacy can be thought of in more general terms it is also important to recognize that it can be state specific as laid out by Bandura (1997) and Pintrich (1991). As such a self-efficacy scale borrowing from Chen et al. (2001), but situated within the context of ROTC experiences for cadets was developed and used in the survey. There is precedence for developing a scale in an ROTC or military environment as Gilson et al. (2017) developed a self-efficacy scale that was used in the measurement of that specific psychological variable in a similarly designed study centered around Army ROTC cadets. Though the development of this scale was done in a manner similar to other scales, its reliability needed to be thoroughly tested before a full analysis of the survey results could occur.

The eight-item scale utilized a 5-point Likert scale rating for the cadets to self-assess their own self-efficacy. Overall, the 8-item scale yielded a Cronbach's α = .831 unstandardized and .834 when standardized, representing a high level of internal consistency greater than the recommended value of .7 (Cronbach, 1951). These values were calculated with a sample of 117. Almost all of the items shared a mean above 4, except question 7, which asked cadets to compare their ability against that of other cadets, had a mean of 3.81. Thus, most of the cadet's answers fell into the Agree column Items 3, 4, and 5. When assessing the other scale statistics, it is worth

noting that all of the values in the Corrected Item Total Correlation column in Table 6 are above .538, except item 6, which is at .319. This along with the information presented that if item 6 were deleted the Cronbach's α would raise to .845 suggest that the scale could be changed to a 7 item survey. However, the decision was made to keep item 6 until further testing rather than make changes with results from only one study population.

Table 6

Item Total Statistics for ROTC Self-Efficacy Scale

	Scale Mean if Item Deleted	***Scale Variance if Item Deleted***	***Corrected Item-Total Correlation***	***Squared Multiple Correlation***	***Cronbach's Alpha if Item Deleted***
Question 1	30.36	8.215	0.598	0.379	0.807
Question 2	30.33	8.190	0.542	0.360	0.814
Question 3	30.23	8.248	0.608	0.435	0.806
Question 4	30.21	8.302	0.612	0.466	0.805
Question 5	30.20	8.452	0.538	0.327	0.814
Question 6	30.28	8.825	0.319	0.214	0.845
Question 7	30.91	7.734	0.634	0.447	0.801
Question 8	30.56	7.748	0.647	0.462	0.799

Also, when assessing the inter-item correlations, found in table 7 the inter-correlations for item 6 are lower than all the others, with only one inter-correlation, question 5, rising above .3. Overall, the scale displays good internal consistency and shows the ability to reliably measure self-efficacy.

Table 7 Inter-Item Correlation Matrix for RSE Scale

Questions	1	2	3	4	5	6	7	8
1	1.000							
2	0.423**	1.000						
3	0.488**	0.437**	1.000					
4	0.443**	0.472**	0.578**	1.000				
5	0.365**	0.372**	0.320**	0.342**	1.000			
6	0.232*	0.098	0.246**	0.121	0.397**	1.000		
7	0.490**	0.377**	0.427**	0.479**	0.374**	0.279**	1.000	
8	0.427**	0.469**	0.428**	0.504**	0.413**	0.239**	0.585**	1.000

**Correlation is significant at the .01 level(2-tailed)
* Correlation is significant at the .05 level(2-tailed)

Correlation of Independent Variables

To investigate possible relationships a Spearman rank-order correlation was used to determine both the strength and direction of the association between the continuous independent variables. In order to conduct a spearman's correlation, data must pass three assumptions. The first assumption is that your variables are appropriate for this test. As all variables are continuous, they will be appropriate and assumption one is passed. The second assumption is that the observations are paired variables, or that each score reflects a variable for a single participant. The study design ensures that paired observations of the variables were captured. The third assumption is that the relationship between variables is monotonic in nature. Analysis of the variables indicated a monotonic relationship between variables.

The first analysis was conducted on GPA and PFT as they are the only variables for which there were concrete measurements. GPA was shown to have positively and statistically significantly correlated relationships with PFT $r_s = .286$, $p = .002$ and Mastery Avoidance $r_s = .291$, $p = .002$. The correlations for PFT other than GPA, were RSE and Performance Approach

both of which were positive relationships. The correlation with RSE was $r_s = .265$, $p = .005$, and Performance Approach was $r_s = .213$, $p = .024$. Both RSE and Performance approach were positively correlated with 5 of the independent variables, and both of them were not positively correlated with the same variable, GPA. RSE's strongest correlation was with Mastery Approach $r_s = .398$, $p < .001$, followed closely by Performance Approach $r_s = .371$, $p < .001$. Performance Approach was most strongly correlated with Performance Avoidance $r_s = .613$, $p < .001$. The high correlation of the Performance Avoidance and Performance Approach constructs demonstrates the need for the 2 x 2 construct in order to delineate the approach and avoidance constructs of performance. The performance avoidance construct was correlated with RSE, Mastery Approach, Mastery Avoidance and Performance Approach. The full correlational tables for the independent variables can be found in table 8.

Table 8

Correlations of Independent variables

	GPA	PFT	*RSE*	*Mastery Approach*	*Mastery Avoidance*	*Performance Approach*	*Performance Avoidance*
GPA	1.000						
Sig.(2-Tailed							
N	112						
PFT	.286**	1.000					
Sig.(2-Tailed	0.002						
N	111	111					
RSE	0.180	.265**	1.000				
Sig.(2-Tailed	0.057	0.005					
N	112	111	117				
Mastery Approach	0.047	0.018	.398**	1.000			
Sig.(2-Tailed	0.623	0.850	<.001				
N	112	111	117	117			
Mastery Avoidance	.291**	0.167	.194*	.480**	1.000		
Sig.(2-Tailed	0.002	0.084	0.039	<.001			
N	109	108	114	114	114		
Performance Approach	0.132	.213*	.371**	.435**	.306**	1.000	
Sig.(2-Tailed	0.166	0.024	<.001	<.001	<.001		
N	112	111	117	117	114	117	
Performance Avoidance	0.034	0.132	.252**	.324**	.383**	.613**	1.000
Sig.(2-Tailed	0.725	0.170	0.006	<.001	<.001	<.001	
N	111	110	116	116	113	116	116

**. Correlation is significant at the .01 level(2 tailed)

*. Correlation is significant at the .05 level(2 tailed)

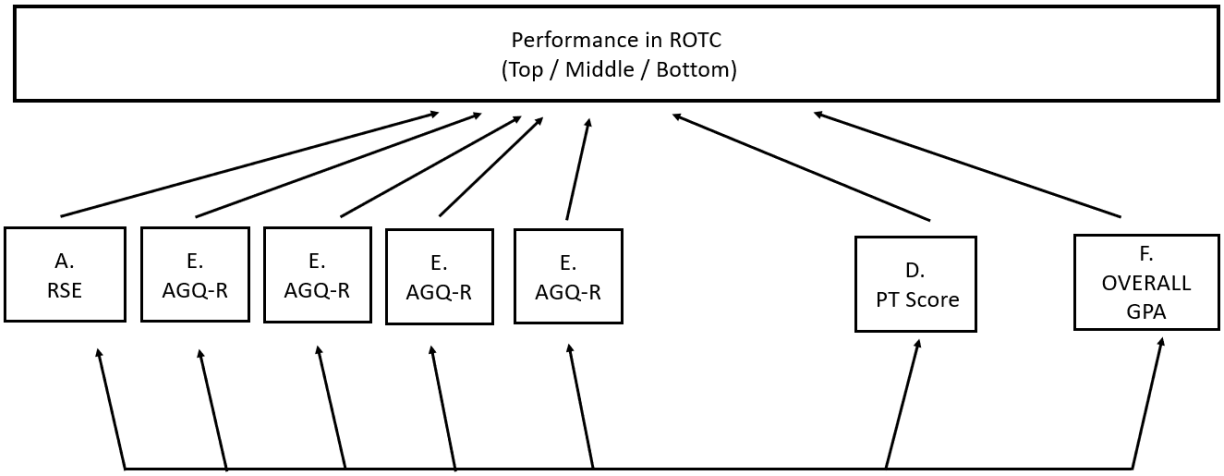
The Model

The model was constructed to measure various psychological constructs and their impact on the success of ROTC cadets during their time in program. In order to be able to measure success, it was decided that for the study it would be defined as the overall ranking of the cadets by the cadre. The cadre do not have a formula, but instead meet each semester to rank each cadet from the best to the worst. They use a combination of available data, GPA and PFT, as well as direct observations to help them in their ranking. This model also uses cadet GPA and PFT scores, but instead of direct observations seeks to see if any single, or combination of, psychological variables might be predictive of class finishing. Though class ranking is done from top to bottom, in a continuous fashion, this study measured it in an ordinal manner similar to the Gilson et al. (2017) Army ROTC study. As the dependent variable in this study, class ranking, was ordinal and an ordinal logistics regression was used to assess it.

The survey was initially constructed to also measure GSE and Grit, however after a review of the literature, and based on the number of responses, 105, they were omitted from the study. GSE was omitted from the quantitative portion of the study as the RSE scale proved to have adequate reliability in measuring self-efficacy and was better contextually situated given that it focused specifically on that construct and its relation to ROTC. Grit was not used in the quantitative analysis as it has been shown not to be predictive of success, but rather in the ability to complete a pursued endeavor (Credé et al., 2017; Duckworth, 2019; Muenks et al., 2017). Figure 3 displays the proposed theoretical model for this study.

Figure 3

Theoretical Model



Assumptions

In order to use an Ordinal Linear Regression to analyze the data, it first needed to meet four assumptions. The first assumption of needing one dependent variable measured at the ordinal variable was met by the research design. The only dependent variable was Cadet Ranking which was measured ordinally by separating the continuous cadet ranking into Top, Middle, and Bottom Thirds. The second assumption that needed to be met was that the model contained at least one independent variable and it was either continuous, ordinal, or categorical. This assumption was met by all the independent variables being measured continuously. Assumption 3 of the study was met by testing for multicollinearity. To test for multicollinearity a linear regression was run in SPSS and indicated no multicollinearity. Table 9 contains the full table of coefficients used to test Assumption 3.

Table 9

Model Coefficients

	Unstandardized Coefficients		*Standardized Coefficients*			*Collinearity Statistics*	
	B	***Std Error***	***Beta***	***t***	***Sig.***	***Tolerance***	***VIF***
Constant	5.943	1.438		4.131	<.001		
GPA	-0.423	0.172	-0.238	-2.462	0.016	0.832	1.202
PFT	-0.021	0.014	-0.14	-1.468	0.145	0.857	1.167
RSE	-0.101	0.229	-0.046	-0.442	0.659	0.706	1.416
Mastery Approach	0.181	0.154	0.129	1.179	0.241	0.649	1.541
Mastery Avoidance	-0.12	0.109	-0.12	-1.1	0.274	0.657	1.523
Performance Approach	-0.409	0.157	-0.316	-2.6	0.011	0.528	1.894
Performance Avoidance	0.281	0.125	0.262	2.25	0.027	0.573	1.745

a. Dependent Variable: Cadet Ranking

Assumption 4 that must be met is that of the test of proportional odds. This test ensures each independent variable has an equal effect at separation points of the dependent variable. This assumption was tested using a full-likelihood ratio test and comparing the test of parallel lines. The test of Parallel lines indicated proportional odds as the differences between the two models was small and did not meet statistical significance as shown in Table 10.

Table 10

Test of Parallel Lines

	-2 Log Likelihood	***Chi-Square***	***df***	***Sig***
Null Hypothesis	204.030			
General	203.153	.877	7	.997

The null hypothesis states that the location of the parameters(slope coefficients) are the same across response categories

As the model met all four assumptions of the ordinal logistics regression, the model was assessed using the ordinal logistics regression to determine model fit.

Covariate Patterns and Model Fit

In order to properly assess any covariate patterns and overall model fit, a polytomous universal model (PLUM) ordinal regression was run in SPSS. This highlighted that there were

214 (66.7%) cells with zero frequencies. This occurred because of the number of continuous independent variables which led to many missing covariate patterns in the data. Due to the high number of cells with zero frequencies, the overall goodness of fit statistics should be treated with some trepidation. The overall goodness-of-fit test showed that both the Pearson and Deviance tests indicated the model fit, but as previously indicated the high number of cells with zero frequencies means these results should be treated cautiously. The Pearson tests resulted in a χ^2 = 224.162, df = 205, p = .171 and the Deviance test resulted in a χ^2 = 204.030, df = 205, p = .506.

An additional and better method of assessing model fit than the previous measurements is to assess the full model against the intercept-only model utilizing the model fitting table provided by SPSS. A -2 Log Likelihood of 204.030, χ^2 = 28.105, df = 7, p < .001 indicated that at least some of the independent variables were statistically significant additions to the model. Along with the goodness-of-fit information pseudo R^2 were also analyzed to assess how much variance might be explained. In determining which one to use, it was decided to use McFadden's measurement as it is the most conservative and would therefore lead to underestimating rather than overestimating the variance explained. The pseudo-R^2 measures can be found in Table 11.

Table 11

Pseudo R^2 measures

Pseudo R^2	
Cox and Snell	.231
Nagelkerke	.261
McFadden	.121

However, due to the fact that 66.7% of the cells had zero frequencies, the Likelihood ratio test was also used to determine model fit. This displayed that the final model statistically significantly predicted the dependent variable, Ordinal Ranking of cadets, better than the intercept-only model, $\chi^2(7) = 28.105$, $p < .001$. The full model fitting information table can be found in Table 12.

Table 12

Model Fitting Information

	-2 Log Likelihood	*Chi-Square*	*df*	*Sig*
Intercept Only	232.135			
Final	204.030	28.105	7	< .001

Parameter Estimates

The odds ratios were calculated using the GenLin procedures in SPSS. In this portion of the analysis GPA, Performance Approach, and Performance Avoidance independent variables were shown to be statistically significant, with GPA being the most powerful of the three statistically significant predictors. The GPA and Performance approach variables indicated a positive relationship when calculating odds. An increase in GPA, expressed on a 4.0 scale, was associated with an increase in the odds of a higher cadet ranking with an odds ratio of 3.363, 95% CI [8.282, 1.366], Wald $\chi^2(1) = 6.956$, $p = .008$. Additionally, when a cadet's Performance Approach score increased, their odds of receiving a higher ranking increased with an odds ratio of 2.879, 95% CI [6.153, 1.248], Wald $\chi^2(1) = 6.153$, $p = .013$. However, the statistically significant result for the Performance Avoidance construct was negative and indicated an inverse relationship with cadet ranking. When a cadet's Performance Avoidance score decreased their

odds of receiving a higher ranking increased with an odds ratio of .458, 95% CI [.924, .227], Wald $\chi^2(1) = 4.761$, $p = .029$. The complete parameter estimates can be found in Table 13.

Table 13

Parameter Estimates

			95% Wald Confidence Interval		*Hypothesis Test*				*95% Wald Confidence Interval for Exp(B)*	
	B	***Std Error***	***Lower***	***Upper***	***Wald Chi-Square***	***df***	***Sig***	***Exp(B)***	***Lower***	***Upper***
Threshold Rank = 3	10.367	3.8364	2.847	17.886	7.302	1	.007	31780.359	17.241	58580180.718
Rank = 2	11.978	3.8873	4.359	19.597	9.495	1	.002	159229.775	78.194	324244894.707
GPA	1.213	.4598	.312	2.114	6.956	1	.008	3.363	1.366	8.282
PFT	.065	.0379	-.009	.139	2.955	1	.086	1.067	.991	1.150
RSE	.222	.5940	-.942	1.386	.140	1	.708	1.249	.390	4.000
Mastery Approach	-.452	.4128	-1.261	.357	1.197	1	.274	.637	.283	1.430
Mastery Avoidance	.300	.2812	-.251	.851	1.140	1	.286	1.350	.778	2.343
Performance Approach	1.058	.4263	.222	1.893	6.153	1	.013	2.879	1.248	6.640
Performance Avoidance	-.782	.3583	-1.484	-.080	4.761	1	.029	.458	.227	.924

Dependent Value: Ordinal Ranking

Model:(Threshold) GPA, PFT, RSE, Mastery Approach, Mastery Avoidance, Performance Approach, Performance Avoidance

a. Fixed at the display value

The formulas generated from the analysis can be found below and would be useful in predicting probabilities for given values.

ORD RANK 3 = 10.367 – ((1.213 x GPA) + (1.058 x Performance Approach Score) + (-.782 x Performance Avoidance Score)

ORD RANK 2 = 11.978 – ((1.213 x GPA) + (1.058 x Performance Approach Score) + (-.782 x Performance Avoidance Score))

Predictions and Model Fit

Along with covariate patterns it was also important to assess overall model fit and ability to predict a cadet's ranking versus their actual standing. To do this a confusion table was generated to assess how reliable the model was at determining where a cadet would be placed. Overall, the model often correctly predicted the correct class rank based on inputs. It correctly predicted cadets in the top third 74.4% of the time, cadets in the middle third 24.2% of the time and cadets in the bottom third 58.6% of the time. When assessing how well the model classified Top Third cadets, it incorrectly classified 8 cadets, 18.6%, and 3 cadets, 7.0% in the middle and bottom third respectively. When predicting the middle third cadets, the model displayed the lowest accuracy with only 24.2% of predictions being correct and 48.5% of predictions incorrectly predicting a top third ranking for cadets. When predicting the bottom third of cadets, the model correctly predicted 58.6% of cadets, and incorrectly predicted 17.2 % of cadets to the top third and 24.1% of cadets into the middle third. Overall, the model was much better at predicting the top and bottom thirds than the middle third. The full confusion table can be found below in Table 14.

Table 14

Confusion Table

RANK	*Top Third*	*Middle Third*	*Bottom Third*	*Total*
Top Third	32	8	3	43
	74.4%	18.6%	7.0%	100%
Middle Third	16	8	9	33
	48.5%	24.2%	27.3%	100%
Bottom Third	5	7	17	29
	17.2%	24.1%	58.6%	100%
Total	53	23	29	105
	50.5%	21.9%	27.6%	100%

Summary of Quantitative Analysis

This quantitative analysis was done to determine if any of the cadet performance metrics or psychological variables had any impact on final cadet ranking by ROTC cadre. The first analysis that was performed was on the newly adapted 8-item RSE scale. The scale demonstrated a high level of internal consistency as demonstrated by a Cronbach's alpha of .831.

A Spearman's rank order correlation was run to assess correlation and relationship between variables. This analysis demonstrated there to be positive and statistically significant relationship between GPA, Mastery Avoidance, and PFT score. PFT was shown to have statistically significant relationships with RSE and Performance Approach. RSE and Performance Approach were shown to have statistically significant relationships with all the variables except GPA. Lastly Performance Avoidance was shown to have a statistically significant relationship with RSE, Mastery Approach, Mastery Avoidance, and Performance Approach.

An ordinal logistic regression with proportional odds was run to analyze if GPA, PFT, RSE, Mastery Approach, Mastery Avoidance, Performance Approach, and Performance Avoidance have any effect on final cadet ranking by the ROTC cadre. An assessment of

proportional odds was done by conducting a full likelihood ratio test which compared varying location parameters, $\chi^2 = .877$, $df = 7$, $p = .997$. Additionally, the deviance goodness-of-fit test indicated a good fit with gathered data, $\chi^2 = 204.030$, $df = 205$, $p = .506$, and the Pearson tests resulted in a $\chi^2 = 224.162$, $df = 205$, $p = .171$. However, it was noted that 66.7% of the cells had zero frequencies. The final model demonstrated statistical significance in predicting the dependent variable more than the intercept-only model, 204.030, $\chi^2 = 28.105$, $df = 7$, $p < .001$. Of the independent variables considered Cadet GPA, Performance Approach, and Performance Avoidance scores were shown to be statistically significant predictors of their final ranking. When GPA increased an increase in the odds of a cadets receiving a higher ranking, with an odds ratio of 3.363, 95% CI [8.282, 1.366], Wald $\chi^2(1) = 6.956$, $p = .008$. When a cadets Performance Approach score increased, their odds of receiving a higher class ranking increased with an odds ratio of 2.879, 95% CI [6.153, 1.248], Wald $\chi^2(1) = 6.153$, $p = .013$. Lastly, when a cadet's Performance Avoidance score decreased their odds of receiving a lower class ranking increased with an odds a ratio of .458, 95% CI [.924, .227], Wald $\chi^2(1) = 4.761$, $p = .029$. Overall, the model correctly predicted cadets in the top third 74.4% of the time, cadets in the middle third 24.2% of the time and cadets in the bottom third 58.6% of the time.

These results demonstrated first that the adapted RSE scale is an accurate measure of self-efficacy in the context of ROTC. Its Cronbach's alpha of .831 shows that the scale demonstrates a high degree of internal consistency and is therefore useful in measuring the self-efficacy of cadets in this context. Secondly, though RSE did not demonstrate statistical significance inside the ordinal logistics regression, it did demonstrate correlations between many of the other psychological variables and PFT scores. This demonstrates its importance as a motivational construct by showing its direct relationship to PFT and its relationship to all of the

Achievement Goal Orientation constructs that were measured using the AGQ-R (Elliot & Murayama, 2008). The ordinal logistics regression results indicated that the most important predictors of ordinal ranking for the cadets were GPA, Performance Approach, and Performance Avoidance. However, in these results it is important to note the negative or inverse relationship that Performance Avoidance displayed to the rankings. Lastly, the model demonstrated an ability to correctly predict the Top Third Cadets 74% of the time, the Middle Third 24% of the time, and the Bottom Third, 58% of the time.

Qualitative Results

The qualitative design of this study and the semi-structured interview protocol were informed by the results of the quantitative portion of this study. As detailed above, GPA and the Performance-Approach and Performance Avoidance constructs of Achievement Goal Orientation were directly related to overall Cadet Performance. However, when assessing correlations between the independent variables the relationship between all of them, and their effect on the GPA and the Performance-Approach and Performance-Avoidance constructs. This information did not change the interview questions, rather it helped inform areas where the researcher could probe to uncover the stories that informed the answers of some of the cadets. By looking at the quantitative analysis results, more developed follow up questions were used in order to better uncover what events had transpired over the four years the cadets had been a part of the corps.

Coding

Data were coded in a hybrid manner to help identify specific constructs related to the quantitative surveys, while also working to identify key aspects of experiences and how they interacted with individual cadets and the ROTC as a whole. A priori coding was decided on initially to help the researcher better codify and group the experiences and meanings described

by the participants. However, as the researcher moved through the data codes, began to emerge that were central to the participants' stories and experiences. The a priori codes that were used by the researcher were related to motivational constructs like self-efficacy, achievement goal orientation, performance approach, performance avoidance, and grit. The in vivo codes that emerged during the coding process were closely related to the constructs and often bridged the constructs and became central to understanding the participants' experiences. Examples of the in vivo codes are challenges, lack of control, mentored, mentoring, organically, relationships and worry. A full table of codes as well as their use frequency can be found below in Table 15. When coding the decision was made to use proper nomenclature of psychological constructs to help with identification and to help the researcher to ask probing follow up questions related to the cadets interview responses.

The code with the highest number of occurrences was that of Challenges, followed closely by Agency, AGO, Approach, Growth, Self-Efficacy and Performance. When attempting to group the codes into themes, the major thematic titles were decided on as they helped more clearly bound and describe the cadets' experiences. Additionally, they showed how the cadets perceived the interplay of their experiences, their approach, and their outcomes. The major themes which all individual codes were sorted into were Challenges, Outlook, Motivation and Relationships. The theme of Challenges saw 160 codings over the 6 interviews. This code grouping included certainty, challenges, consequences, setbacks, uncertainty, worry and growth. The theme of Outlook saw 167 codings over the 6 interviews. This code grouping included Achievement Goal Orientation, Approach, Avoidance, Mastery, and Goal Oriented. The theme of Motivation saw 220 codings over the 6 interviews and included the codes of Agency, Self-Efficacy, General, Specific, Loss of Self-Efficacy, Grit, Passion, Perseverance, Resiliency, Self-

Regulation, and Vicarious. The theme of Relationships saw 109 codings over the 6 interviews and included the codes Mentored, Mentoring, Power, Relationships, Trust and Organically. The decision of how-to group was made through a systematic review of both the codes and the contexts in which they occurred with the specific cadets. Though Achievement Goal orientation is viewed as a motivational construct it was specifically broken out into the Outlook category after the survey results showed it as a statistically significant predictor for cadet success. Also, throughout the interviews the theme of Challenges came to the forefront of interviews with cadets as well as how they approached both those challenges and any goals.

Table 15

Qualitative Coding

Code Words	Frequency	# of interviews appeared in
Agency	51	6
AGO	45	6
Approach	41	6
Avoidance	12	6
Challenges	61	6
Lack of Control	24	4
Consequences	5	1
General	14	4
Goal Oriented	13	5
Grit	28	5
Growth	43	6
Loss of SE	11	4
Mastery	18	4
Mentored	28	5
Mentoring	32	4
Negative Exp. Builder	8	3
Organically	6	3
Passion	20	4
Performance	38	6
Perseverance	26	5
Relationships	28	6
Resiliency	19	5
Self-Efficacy	44	6
Setbacks	8	5
Trust	17	3
Vicarious	5	3
Worry or Anxiety	12	12

Note: Only codes with at least 5 occurrences were displayed

Challenges

Throughout the interviews the cadets described the challenges they faced throughout their time in ROTC, and how those had shaped, motivated, and helped them grown in pursuit of their goals of becoming officers in the Air Force. In the first interview Cadet Red opened his interview characterizing his experience as having "lots of highs and lots of lows… like the highest of highs and the lowest of lows within ROTC". Cadet Black spoke of having to not only encounter, but also overcome challenges at an earlier stage in life and how those not only shaped her, but also her outlook as a future officer. Cadet Yellow and Orange spoke not only of the challenges presented by the ROTC program but also of the need to navigate traditional challenges associated with getting acquainted with college life and classes. He related his experiences of navigating demanding engineering classes, while also dealing with the demands of being a new ROTC Cadet. However, for Cadet Yellow the ROTC challenges did not go away with time, they only seemed to morph as in his AS200 year cadets were confronted with having to complete for scarce appointments to field training and an initial expected acceptance rate of around 50%. For most of the cadets, it was experiences like this, the ones they had no control over, that seemed to be the most stressful and challenging to navigate.

Many of the participants' challenges were also co-coded and located in the motivation theme; however, not for reasons that any of the cadets relished. These episodes represented occurrences when cadets felt they had no agency, and therefore described feeling the loss of self-efficacy or the ability to affect any control on the outcome of those challenges. When asked what made those experiences high highs and low lows, Cadet Red stated that they were related to "events going on outside of your control… [and] not [knowing] when some event could pop up and change your course entirely". In the case of Cadet Red, the most challenging moment he

spoke of and reflected on occurred when he was involved in an on-campus scooter accident that resulted in him being transported to the hospital and the loss-of-use of his dominant writing hand in the middle of the semester. He spoke of having to navigate academic challenges like taking classes while writing with his left hand, but the most challenging aspect of this experience related to his experience with ROTC. Because of his accident, he needed to change his graduation and commissioning date, which requires approval through ROTC headquarters as those are contractually obligated. Throughout this process, Cadet Red was forced to undergo many stressful events like changing colleges and majors in order to maintain his original commissioning date, only to be told after swapping colleges and majors that he could move his commissioning date and maintain his original course of study. He related to feeling "on the verge of panic… because of the fact that I was doing all I could do… and the feeling that [no matter what they tried] it wasn't good enough."

Here it is evident that though the initial challenge was the accident that deprived the cadet the use of their dominant hand and required a hospital stay was bad, it was the churn and uncertainty around the secondary challenge that was worse. It is worth noting that Cadets Yellow, Black, Orange, and Blue all had similar experiences where they described challenges in which they had little control over the outcome of events and how that made the event much more stressful, when compared to events where they perceived themselves as having control. It is commonly accepted that students embarking on their collegiate journey will face challenges; however, the layering of challenges that students, in this case cadets, face can seem daunting. Coupled with the effects resulting from the lack of control, and it is easy to understand why the cadets all had some version of this story that they related.

Motivation

Understanding, the motivational concept of self-efficacy from the reference point of the cadets is essential to answering research questions 3 and 4. When looking at whether or not self-efficacy helps a cadet navigate the ROTC program, the interviews began to illuminate that it was necessary to not only focus on the instances that self-efficacy may have helped a cadet navigate a challenging time period, but also the way a cadet's self-efficacy may have been affected by going through those experiences. In conjunction with self-efficacy, the study also looked at grit and its role in a cadet's experience throughout ROTC. Throughout the interviews various instances and themes of self-efficacy were explored by the researcher, but even when probed the cadets seldom specifically mentioned it. Rather, they mentioned specific traits related to and often associated with self-efficacy.

Self-Efficacy

Cadet Black had the most vocal support for the concept of and value of self-efficacy and it's affects throughout the interview, relating how important she believed the concept to be related to being "anti-fragile… and [trusting] your ability to make things happen". Though not specifically stated in the ROTC mission as a concept, it was implicit in its charter. In looking at one of the key tenants of self-efficacy, agency, it became apparent in interviews of the importance of this concept as it was associated with more positive experiences when facing challenges. Cadet Green related how encountering the challenge of being tasked with leading 70 AS100s through their preparation for field training was a rewarding experience through which he learned many things about being a leader that he would take with him throughout his time in ROTC and in the Air Force. As he related this experience, he spoke about learning to lead the cadets and getting to decide not only the steps he would take, but also the manner in which he

would do it. Having this ability to decide things and exercise choice made this demanding experience worthwhile and less of a dread.

As explored in the previous section relating to the theme of challenges, the lack of agency that was central to Cadet Red's experience with his medical challenges is noticeably absent from the medical experience of Cadet Green. In Cadet Green's experience, he was going through his required Air Force flight physical to become a pilot, but was told he did not have sufficient depth perception and would not be able to pursue his dream job. However, he did not simply accept that his dream would stop here, but instead sough an exception to policy that would allow him to continue down the path of becoming a pilot. In looking at Cadet Red and Cadet Green's experiences, there are both similarities and differences. Understanding these is key to realizing the role that agency played in not only their experience but also their perception of those experiences. Cadet Red experienced a complete lack of certainty and flip flopping from the higher up decision makers, resulting in greater amounts of stress and worry. For Cadet Green, even though the decision was out of his hands, he did not describe the dread, panic, or negative experiences that Cadet Red did. Instead, he was able to find areas where he could exert influence and control in order to exhibit some Agency in the process. These two experiences show that even when faced with similar events, experiences can be different, based on the amount of agency one feels they have.

Along with agency, another important aspect of self-efficacy is the ability to not only gain it through self-experiences, but also vicariously through the experiences of others. One of the important aspects of the ROTC program is that not only does it allow cadets to practice leadership, but it places them in close proximity with each other. This allows them to develop relationships with each other and vicariously learn from what their peers are experiencing. This

is important because it is impossible to give every cadet every experience they will one day need to navigate their Air Force career.

Early in the ROTC experience this act of observing and learning is important as it can help fill in the gaps that exist not only in knowledge, but in perceived ability as well. Cadet Blue felt this was extremely important as it helped his year group see what was going to happen to them the following year as they prepared for Field Training. By paying close attention to the AS200 class experience it led the class to band together more closely with a shared goal of ensuring that not only were they prepared for field training, but to demonstrate their belief in their own abilities to their upperclassmen trainers.

Cadet Black described how watching those above her helped to buttress her beliefs that she too could accomplish goals she set for herself. As Cadet Black watched those cadets above her, she used their experiences to inform her self-efficacy related to her own abilities and choices based off the prior performance of other cadets in pursuit of their own goals. She specifically cited instances when she used performance of more senior cadets to help validate her ability to compete and do well at field training between the GMC and POC portions of the ROTC Program. However, it is not only through watching the experiences of other cadets that vicarious self-efficacy happens.

In the case of Cadet Red and his experience following his accident, he spoke about how the cadre sat him down and spoke to him about learning from what he was going through. He spoke about how persistent they were and how that helped him understand what is expected of Air Force officers as they lead and care for Airmen. By going through this event and observing their actions he was able to positively inform his self-efficacy as it relates to his future career in the Air Force. For the cadets interviewed, they felt that self-efficacy was an important part of

their leadership tool kit in that it allowed them to continue on even though they may not be sure of their actions, decisions, or future. Also, they felt that they were able to gain self-efficacy both through their own experiences and from either modeling behaviors of those mentors both above and lateral to them.

Orientation

The central aspect of this study is to assess the effect of self-efficacy on cadets. However, during the quantitative portion of the study, one's orientation towards their experiences was highlighted as important to their success in ROTC. Also, RSE was shown to be correlated with all of the achievement goal orientation constructs. The quantitative results indicated not only that performance approach behaviors were beneficial to cadet success; but that performance avoidance behaviors were inversely related to success for cadets. Therefore, it became paramount to uncover if cadets would describe any instances in which they displayed those avoidance behaviors.

All of the cadets interviewed spoke of exhibiting some type of approach behavior, be it mastery or performance throughout their ROTC career. In the interview with Cadet Green, the topic of competition with other cadets came to the forefront when he acknowledged the fact that most cadets realize that they are in competition with each other; however, in his experience this is not done with a focus on beating the other person out. Rather he looks at the standards, uses prior experiences based on what he saw other cadets receive or achieve with similar results as he focuses on "being the best at whatever I'm doing and I hope I'm able to bring those people with me". This is a demonstration of the performance approach construct as Cadet Green is gauging his success relative to the standards or metrics rather than against other cadets in the corps. However, it is interesting in the fact that he does also gauge his chances and performance against

other cadets, but those are cadets who are more senior to him and with whom he is not in direct competition. This allows him to judge his performance against a standard, or metric, he has seen be successful and therefore is less likely to exhibit the maladaptive patterns associated with the performance avoidance construct. These sentiments were echoed by Cadet Red who stated that he always tries to "meet the standard of excellence and push beyond" whatever the accepted standard is. Along with the Performance Approach construct, the Mastery Approach construct was described by the cadets. Cadet Black espoused this construct by relating the simple but profound question "what can I learn from this" that she often asked herself in various situations, both academic and ROTC related. Cadet Black also recognized that the opportunity to receive feedback allows her to grow and learn from experiences, and that this is an invaluable opportunity for her to learn and get better at that specific event.

In the quantitative analysis it was shown that performance and mastery avoidance were statistically significant predictors of GPA, but none of the cadets ever spoke about any examples that were coded as avoidance related with respect to grades. However, there were instances of Avoidance brought up during cadet interviews. Specifically, Cadet Blue spoke about his time at field training, during the summer between his AS200 and AS300 year, and how his "biggest worry was when it came time to volunteer [he would not be] the first one to stick [his] hand up unless he knew exactly what he was doing". He also noted that due to the uniqueness of field training and not knowing what would happen he had that "mental [framework]". Additionally, Cadet Blue spoke of how he didn't feel he executed as well as he could have when given the opportunity to act as flight commander because he was "nervous of [his] knowledge… [and did he] have the right facilities" to perform as the flight commander. Additionally, in a more writ large version of the avoidance behavior, Cadet Yellow spoke about how his class at the

beginning of his sophomore year learned that the acceptance rate to field training was projected to be very small that year. This coupled with the experience of watching the previous year's AS200 class experience a very low acceptance rate, induced some cadets to drop out of the program because they did not believe they would be competitive. However, the ones that stayed in the program did not experience the low acceptance rate because many other cadets in detachments across the United States did the same thing and dropped out of the program. This resulted in the vast majority of the cadets who stayed in this detachment getting selected to attend field training. Though the cadets who dropped out of ROTC avoided the negative possibility of having to get told no in relation to their opportunity to attend field training, they also missed what became a better than expected opportunity to attend field training and continue in the program towards commissioning and becoming an officer in the Air Force.

As exhibited by the questions related to how they treat their time and activities in ROTC, we can see that cadets exhibit both approach and avoidance traits of performance and mastery orientations. Also, we can see how their perspectives may have affected not only their outlook, but also their possible outcomes in some scenarios. For the cadets, who practiced approach behaviors they increased their chances to have a positive outcome, while the opposite is true for those who practiced the avoidance behaviors.

Relationships

One area that was not initially expected in the research design was that of relationships and their importance to the cadets and their experience. Overall, all of the cadets interviewed spoke about the importance of their relationships with other cadets in their class, more senior cadets, and with the cadre. Relationships could be seen as twofold. First as the glue that held the class together throughout both the good and bad times, and secondly as the system by which fuel

was transferred in order to power the machine. The importance of relationships is central to understanding much of what was mentioned over the interviews by the cadets. Additionally, it is worth noting that almost all of the cadets spoke about how their first semester at college occurred in the fall of 2020 during the COVID-19 pandemic and how that affected their experience. Cadet Blue early on spoke about how ROTC "gave him an immediate family away from home" and noted how important that was. Cadet Green described how ROTC was "one of the only organizations on campus that [met] in person at [that] time" and how that ability to gather with each other really helped them bond together early on in their ROTC experience. It is worth noting that it was not only the AS100s that were meeting, but the entire ROTC detachment was able to meet in order to accomplish their stated training objectives. By belonging to an organization that was allowed to meet during this time, the cadets were able to forge lateral relationships with their own classmates as well as vertical ones with ROTC cadets above them.

Relationships as a path to Mentoring and Mentorship

One of the key aspects of the ROTC program that emerged from the interviews was that of the mentorship that occurred between the cadets. However, while it is worth noting the growth and improvement of cadets, it is also worth noting how much harder it would have been had the cadets not first fostered relationships in and outside of their own AS year groups. The cadets interviewed all spoke about how relationships developed before mentoring occurred. For Cadet Yellow, he would "talk to people [he] was friendly with" and noticed that belonging to clubs like the Special Warfare Workout Club helped introduce him to older cadets in a non-intimidating atmosphere that lowered the perceived power dynamics and allowed him to more easily approach these older cadets. For Cadet Orange, he met one of his mentors at church and began the relationship there. He noted that it developed organically outside of the constraints of the

detachment and ROTC, but definitely helped him to feel comfortable when he approached the cadet and was in need of advice. In the instance of Cadet Orange, he is classified as an AS250 cadet meaning he came into the ROTC program a year later in the fall of 2021 and completed the first two years of the ROTC program in the same academic year. While the other cadets in his class had had a year to build these relationships he had not. He therefore also viewed some of those cadets in his peer group as having more experience based on their 2020 year in the ROTC program. Cadet Black noted that in ROTC some of her friends would be placed in positions of authority based on their job in the corps and this made asking for advice and guidance easier because there was a built-in level of trust. In the case of Cadet Black, a pre-established relationship allowed her to take in information from someone in her field training flight in regard to her performance as flight commander that she says helped her not only their, but also in her everyday ROTC duties. Though Cadet Black stated she "would have taken the advice from anyone at that point", the relationship allowed her to seek him out for guidance on the current situation in the flight. The willingness of a leader to be able to be mentored not only by those above them, but also closest to them is essential to their continued success throughout their Air Force career.

Relationships Help the building of General and ROTC Self-Efficacy

While not specifically mentioned in the interviews, another theme that became evident was how relationships allowed the cadets to improve their self-efficacy through not only mentoring, but also through vicarious experiences. Various cadets spoke about how through their relationships they were able to make informed judgements about their own abilities and actions in regard to their current roles and responsibilities in ROTC and their hoped-for future jobs. In the case of Cadet Orange, he was friends with another cadet who also shared the same interests

and is now a Cyber Officer in the USAF. Cadet Orange not only maintains communication with the newly commissioned officer, but also uses him as a reference point when assessing his progress inside the corps and in reference to his goal of becoming a Cyber Officer in the USAF. Cadet Green spoke about how an older cadet served as "inspiration in competing for a slot in the competitive Euro-NATO Joint Pilot Training program". While serving as an inspiration to Cadet Green, he also served as a reference point by which Cadet Green could judge his progress in achieving his goals. Though it was not necessary for Cadet Green to have had a relationship with the older cadet to use him as a reference point, it definitely helped in serving as his inspiration to apply for the program and for him to provide guidance and support to Cadet Green on what he needed to do to make himself more competitive. This story is similar to Cadet Black's experience in the prior section where she used a friend and more senior cadet as a reference point when judging her progress towards their similar goals and her level of performance in the program. Specifically, Cadet Black spoke about how this allows her to know that because she witnessed these exemplars get through challenging situations; and that "as long as [she kept up this mentality or work ethic, [she] should be able to pass or [she] should be able to go through" those situations. Here she speaks about how watching this person will help inform her ability to not only complete challenging tasks but also deal with the hard times that will come in them. Having these reference points are important to other cadets and it is through their social relationships that they first developed.

Summary of Qualitative Analysis

The qualitative analysis of the cadet's interviews developed codes related to their experiences throughout their ROTC career. From there the codes were grouped thematically into like categories that resulted in multiple coded stories and fragments that highlighted the complex

nature of the cadet experience and interactions that occur within that experience. The themes that emerged from the analysis were Challenges, Motivation, Outlook, and Relationships. Though the theme of outlook could also be grouped into motivation, it was broken out based on the results of the quantitative analysis showing that both the Performance Approach and Performance Avoidance constructs within Achievement Goal Orientation to be statistically significant predictors of cadet ranking.

The first theme to be analyzed was that of challenges and a central and unsurprising observation was that all cadets faced a multitude of different challenges during their time in ROTC. All cadets who faced challenges in which they were able to display Agency spoke about the experience in matter of fact and somewhat positive tones. Also, the inverse was true and cadets who felt little to no agency, described how maddening and frustrating this experience was. Achievement Goal Orientation was coded as Outlook and thematically represented how cadets spoke about not only their challenges, but also their goal setting.

Overall, the cadets spoke about how they judged themselves against the standard rather than their peers. Conversely there were instances of Performance Avoidance demonstrated by the cadets. Finally, the last thematic element that was discussed was that of relationships and how those served as the avenues by which development, both laterally and hierarchically occurred. All of the cadets spoke in various ways and scenarios about how relationships shaped their ROTC experience for the positive. When discussing their relationships with other cadets, most of them spoke about how important being able to meet face to face during covid was, as well as how many of those relationships started, and were strengthened in more relaxed atmospheres.

Lastly, in regard to their self-efficacy all cadets felt that they had grown in many ways during their time in the corps and saw the positive benefits in both their professional and

personal lives. Many of them recognized that their self-efficacy was built not only on their own experiences but in how they were able to vicariously experience what the other cadets were doing, achieving, and go through. Overall, the interviews provided much needed context to the quantitative analysis of psychological variables and other cadet performance indicators and highlighted the very complex nature of the ROTC experience.

Chapter V: Discussion

The purpose of this study was to assess the impact of self-efficacy on the performance and success of ROTC cadets to better understand its effects in a military training setting when combined with standard cadet objective performance measures. Additionally, the study sought to adapt established self-efficacy scales and situate them within the context of the ROTC experience. The study also evaluated achievement goal orientation's ability to affect the performance of ROTC cadets. By learning more about what predicted better performance of cadets, this study might inform curriculum and educational practice improvements across a. Following the analysis of the survey, interviews were conducted with six AS400 cadets that explored their experiences related to their ROTC journey, how they have matured and grown during their time in ROTC, and whether or not they felt self-efficacy was important to their journey as a cadet.

To evaluate the reliability of the ROTC Self-Efficacy Scale (RSE) a Cronbach's alpha was calculated using the 8-item scale presented to the ROTC cadets ($\alpha = .831$), which demonstrated its reliability and ability to be included in the study. To assess the effect of self-efficacy on the performance of ROTC students, an ordinal logistics regression was performed on the data due to the nature of the dependent variable, cadet ranking. The cadet ranking was stratified into triads, top, middle, and bottom thirds in each AS year. Separation by AS years is necessary as ROTC cadre do not compare students from different classes to each other. The information provided through the analysis showed that GPA, Performance Approach, and Performance Avoidance were shown to be statistically significant predictors of cadet performance. While GPA and Performance Approach showed positive relationships with performance, Performance Avoidance displayed a negative relationship with cadet performance.

Overall, the model more often than not correctly predicted cadet ranking. It was better at predicting the top, 74.4% accurate, and bottom thirds, 58.6% accurate, than the middle third.

Based on the results showing the Performance Approach and Performance Avoidance constructs as being statistically significant, the interviews delved more deeply into how cadets approach and view both challenges and goals as they relate to ROTC. Additionally, the interviews highlighted the importance of social situations and relationships between cadets and how they affect both general and ROTC specific self-efficacy. Most of the cadets interviewed spoke extensively about the importance of not only their fellow AS year classmates, but also those older cadets they formed significant relationships with and who were important to their growth while in the program. These relationships were the avenue by which the cadets participated in and received mentorship. Also, these relationships allowed cadets to learn vicariously from others and thereby inform their self-efficacy. By performing both quantitative and qualitative research and analysis, the researcher provided a macro level view of the ROTC detachment, while also examining the personal experiences of cadets and came away with real-world examples of why they answered some of the questions the way they did.

Research Questions

RQ1: To what extent did self-efficacy predict an AFROTC students' success in the AFROTC program?

RQ2: Does any relationship exist between self-efficacy, the other psychological variables contained on the survey instrument, and other cadet data?

RQ3: How did cadets perceive their own self-efficacy and how it affected their progression through the ROTC program?

RQ4: Do cadets believe that their self-efficacy helped them positively navigate their AFROTC experience?

Self-Efficacy

Though self-efficacy was the central focus of the study, the quantitative analysis showed it did not have a statistically significant effect on a cadet's overall ranking in this setting. This differed from the findings of the Gilson et al. (2017) study that showed self-efficacy was a statistically significant predictor of success in the study of Army ROTC cadets. This highlights the need for a larger participant population to determine if self-efficacy is not predictive of success in this AFROTC setting. The small sample size, $n = 117$, and the condensed nature of the RSE scores at the top of the scale, 99 out of 117 ranked their RSE as 4.0 or higher, could have resulted in there not being enough variance in the participant population to determine statistical significance. Of the 18 cadets who had RSE scores below 4.0, 17 of them were ranked by the cadre. Of those 17 cadets, 3 were in the top third, 6 were in the middle third, and 8 were in the bottom third. This would anecdotally suggest that lower RSE indicates a higher likelihood of being in the lower two thirds of class ranking; however, additional research with a larger participant pool is needed to determine whether or not a statistically significant relationship exists. Additionally, studying RSE longitudinally at the beginning and end of the academic year would provide a better understanding of where cadet RSE is when cadets enter the ROTC program and how it changes as they progress through the ROTC program. Lastly, this would allow comparison of RSE levels of those who begin the program and choose not to complete it and those who remain in the program.

RSE did show statistically significant correlations with PFT scores, Mastery Approach and Avoidance, and Performance Approach and Avoidance constructs. These correlations show

its relation to and coordinated movements with these variables as they too change. Its strongest correlations were with the Performance and Mastery Approach constructs, which have been shown to have positive effects in multiple studies and could be therefore interpreted as having an indirect effect on the performance of the cadets. As pointed out by almost all the cadets, the belief that they could succeed and had agency, helped them in many areas as they persevered through the challenges that played out in their personal, educational, and cadet lives. A key aspect of self-efficacy theory is that of agency and the belief that one has the ability to exert some form of influence or control over their own actions and the situation they find themselves in. Cadet Red spoke about how the experience of going through a consistently inconsistent challenge where he was not able to exert control and felt like he had little agency was extremely hard and panic inducing. The various aspects of self-efficacy were touched on by the cadets throughout the interview and provided real life examples of the theoretical construct and underpinnings in the real world.

An important, but unplanned area in this study as it relates to self-efficacy was that of role models and how they can affect a person's self-efficacy (Bandura, 1986; Schunk, 1989; Schunk & Dibenedetto, 2016). Many interview participants spoke of how their relationships with other cadets helped inform their belief in themselves and that they were able to accomplish goals they had set for themselves by using these other cadets as models by which to judge their progress and actions. For Cadet Black, who used a more senior female cadet as an exemplar, she was able to judge the worthwhileness of her actions and accomplishments in pursuit of her goals. This not only informed her self-efficacy as it relates to ROTC, but she stated it also informed her general self-efficacy as she felt that "as long as she kept up this mentality or work ethic, I should be able to pass or I should be able to go through pilot training". For Cadet Black, seeing a mentor

and more experienced cadet, with whom she shared much in common go through experiences, persevere through challenges, and achieve their goals allowed her to learn vicariously from these experiences and inform her own self-efficacy related to these events. This example of observations informing one's self-efficacy demonstrates a key tenet put forth by Bandura (1997), and also how positive experiences in one area can inform the person's general self-efficacy across a multitude of scenarios in various domains (Chen et al., 2001).

Grit

Overall, Grit was not included in the quantitative portion of this study, due to it not being known to predict success (Credé et al., 2017; Muenks et al., 2017). However, when interviewing the cadets many of them spoke about traits commonly associated with the Grit concept, including passion and perseverance (Duckworth, 2016; Duckworth et al., 2007; Duckworth & Quinn, 2009), and how they believed these traits were necessary and instrumental to their success as a student and a cadet. In fact, Cadet Red spoke about how he focused on a phrase given to him by his father, "persistence overcomes all resistance", as he dealt with the stress brought on by the shifting sands of his graduation and commissioning date related challenge. Cadet Red's ability to stay focused on the superordinate type goal referenced by Southwick et al. (2019) helped him stay steadfast in the face of trials and challenges that could have prevented him from attaining his commission and becoming an officer in the Air Force. This thought was echoed by Cadet Orange when he spoke about facing challenges and the need to "keep pushing forward and if the way that I've been doing it before has not worked, I try and think of a different way to get around it." In the words of these two cadets, it is easy to see the traits that Duckworth identified when she began her research into Grit and the significance of them to the cadets. However, even though Grit has been linked to positive outcomes, both educational and non-educational (Bowman et al.,

2015), most research has shown it to be focused on the pursuit of those goals that persons value and are willing to pursue in the face of difficulties and trials (Bowman et al., 2015; Duckworth et al., 2007; Duckworth & Quinn, 2009).

While Grit is not shown to be a predictor of success based on cadet rankings, that does not mean it has no place in ROTC, but rather a different place. As outlined in her mega-analysis, Duckworth (2019) noted that the higher the Grit score of a West Point cadet, the higher the likelihood they would complete Beast Barracks. Though Grit has not been shown to predict success, it may be better used to help cadets understand what it takes to complete ROTC and letting them know what their level of grit is. It is worth noting that just because a tool, or instrument in this case, is not useful in one context does not mean it cannot be useful in other scenarios. In practical terms, we do not throw away a hammer when it proves un-useful at helping tighten screws. So rather than saying the construct of Grit is not useful in the context of ROTC, we should work to understand where it is useful and can be implemented to help both the cadets and the cadre. Armed with this information, both cadre and POC Cadets could know what development, in regards to Grit, that specific GMC cadets need in order to increase their chances of completing the program and their four year degree as outlined in the studies by Whipple and Dimitrova-Grajzl (2023) and Hwang and Nam (2021). Through the better development of grit in cadets, it may be possible to help develop and retain more cadets, thereby increasing the available talent pool competing for field training positions and entering the Air Force.

Achievement Goal Orientation

What was initially thought of as a secondary research item, was shown to be of greater importance by the quantitative analysis of the survey. The findings that the performance approach and avoidance constructs displayed statistical significance and self-efficacy did not

forced the reevaluation of why this might have occurred. In the study of self-efficacy, the term triadic reciprocality is used to describe the interactions between behavior, environment, and person (Bandura, 1986; Schunk & DiBenedetto, 2020). In using that as a lens through which to interpret the results from the analysis one must consider all three, but in this section, I will focus on the behavior and person while the environment will be covered in the section on relationships.

When assessing the cadets and their behavior, one must acknowledge that a majority of the cadets who entered into the program have done so with some type of goal in mind and that they are motivated to perform well in order to increase their chances of achieving those goals, thereby situating this nicely against Nicholls (1984) backdrop of those who display achievement behavior want to exhibit elevated capabilities. Also, the cadets all realized they were in some form of competition with their peers for many of the same opportunities in the program. As such, maybe it should not have been as surprising when the performance approach construct of AGO significantly predicted rank. It is important to acknowledge the work done by Elliot and Church (1997) that restructured AGO into a hierarchical 2 X 2 model integrating performance, mastery, avoidance, and approach which can be seen in Figure 4. Additionally, as previously mentioned Elliot (2006) believes that the approach and avoidance distinction was the best conceptual lens through which to view this motivational construct.

Figure 4

AGO 2 x 2 Model

	Mastery	Performance
Approach	Mastery Approach	Performance Approach
Avoidance	Mastery Avoidance	Performance Avoidance

Note: (Elliot & McGregor, 2001)

Approach

In looking at the quantitative analysis, it is important to note that an increase in a cadet's performance approach score increased their odds of receiving a higher ranking by 2.853, which while lower than the 4.023 displayed by GPA is still significant. These results support the findings by Elliot and McGregor (1999) that showed the performance approach construct positively affected test performance and mediated anxiety. When understanding how and why the approach orientation may have had such a great impact on performance it is central to note that this orientation seeks to learn and improve one's skills (Elliot, 1999; Senko et al., 2011).

The approach orientation helped Cadets Black and Green as they encountered challenges by using other senior cadets as yardsticks by which they judged their performance. Though judging one's performance in relation to another is not a central tenet of the approach orientation, all the cadets interviewed specifically mentioned that they were using older cadets with whom they were not in direct competition. These more senior cadets also held an important distinction pointed out by Schunk (1989) in that their seniority made them appear slightly more competent and accomplished to Cadet Black and Cadet Green, which makes the more senior cadets better for assessing one's own capabilities.

For Cadets Green and Orange even though they were competing for the same opportunities, with other cadets, they did not view it as a winner-take-all scenario. Rather they used competition as a means by which to motivate themselves to get better and help others improve their performance as well. These statements support findings by (Elliot, 1999); Harackiewicz and Elliot (1993); Wolters et al. (1996) that performance-based goals could not only be beneficial but also increase interest in mastery goals.

Additionally, when assessing the findings and reasons why exhibiting a performance approach orientation could be beneficial it is important to recall the example of Cadet Red, who faced tremendous obstacles following his accident, follow on medical treatment, and spoke forthrightly about persistence, grit, and perseverance. Evidence shows that those who display adaptive (approach) behaviors are more likely to display persistence in the face of obstacles (Dweck, 1975; Dweck, 1986). Cadet Red's approach orientation allowed him to maintain a healthy overall mindset while persevering through these challenges, which he and his father believe helped him be successful in remaining in the program and working towards a career in the Air Force.

The approach framework both conceptualizes and demonstrates numerous positive effects for those cadets that use them as their motivational construct. It is worth noting that the Air Force's third core value is "Excellence in All We Do", and that is very much a performance approach-oriented goal structure. As stated in Air Force Instruction 1-1, Air Force Standards (*Air Force Instruction 1-1: Air force culture*, 2023, p. 6) this "does not mean that the Air Force demands perfection in everything from everyone. Instead, it directs Airmen to continuously advance their craft and increase their knowledge as Airmen… [in order to] propel America's Air Force in quantum leaps towards accomplishment and performance." The Air Force Core Values invite high standards and achievement, but in a way that promotes and supports its Airmens' efforts to achieve success.

Avoidance

While approach behaviors have been shown to have positive effects, avoidance behaviors have long been associated with negative outcomes (Dweck, 1975; Dweck, 1986) and in the case of this study cadet ranking. The statistically significant finding from this study that the higher a

cadet's performance avoidance score the more likely they were to be in a lower ranked group demonstrated practical findings in alignment with theory. This will allow ROTC and their cadre members the ability to point to the importance of embracing those adaptive behaviors, and also enable them to show the negative consequences of maladaptive behaviors. Additionally, there were instances during the interviews of cadets describing avoidance behaviors and how those limited their positive outcomes. For example, Cadet Blue spoke about how at field training he did not execute as well as he thought he should have because he did not trust his knowledge level, and this led to his unwillingness to volunteer for opportunities unless he was very sure of what could and would happen. This concrete example of maladaptive (avoidance) behaviors, by a successful cadet who is but weeks away from commissioning and becoming an officer highlight how even learners who are adaptive, and approach oriented, can exhibit avoidance behaviors (Dweck & Leggett, 1988).

This story can serve as a lesson by which future cadets could learn through the vicarious experience of Cadet Blue. It highlights the complex experiences and choices cadets must navigate in ROTC. By highlighting these relevant examples for cadets, ROTC can actively demonstrate to younger cadets concrete examples of avoidance behaviors in action. This could help the ROTC cadets understand the conceptual foundations and how to apply them to their own lives. The lesson that a person does not only inhabit one space on the continuum, but rather can exist in multiple places based on the current situation they may find themselves in is a powerful one. While Cadet Blue may have felt uneasy and displayed avoidance behaviors, these were specifically located to his experience with field training, as he spoke about numerous other events and occurrences that placed him firmly within the approach construct. This underscores both the specific and general nature of constructs and how cadets move through them as they

face various challenges and opportunities. This supports the theory that self-efficacy has been shown to be both specific by Pintrich (1991) through his development of the MSLQ and general by Chen et al. (2001). By finding and highlighting more examples like these, cadets may come to better understand their current place in a broader developmental journey and what actions they could take that would positively affect it.

Relationships and the Cadet Environment

When both the quantitative and qualitative portions of this study were designed, little thought was given to trying to assess the environment in which the cadets operated. In hindsight this was shortsighted and akin to a biologist trying to conduct the study of a wild animal with no thought about the environment in which it lived, or as Bredo (1997) put it "a learning theory that focuses on the 'lone organism' to the exclusion of its participation in social activities is like a theory of learning to make music by oneself" (p. 4). In this chapter's portion on self-efficacy, I spoke about the person and behavior portions of the triadic reciprocality concept, and here I will examine the environment and the interactions between the cadets. The theme of relationships and their positive influence on the interviewed cadets emerged early during the interview and coding process and made it necessary to be included.

Relationships

Early in the qualitative analysis, it became clear that relationships served several purposes, all of them important to the cadets. Relationships were the conduit through which hierarchical and lateral mentoring and mentorship occurred. Second, they were the avenue by which cadets came to know each other and by which vicarious experiences occurred that fed into each cadet's self-efficacy loops. Finally, they helped prepare and maintain the environment in which all cadets experience their college and ROTC lives.

In thinking about the importance of relationships, it is helpful to look again at the Air Force Core Value of "Excellence in All We Do", how it relates to Teamwork, and its vital role as the cadets prepare to become Air Force Officers.

> Essential to triumph at every level. Airmen recognize the interdependency of every Airman's contributions towards the mission and strive for organizational excellence. They not only give their personal best, but also challenge and motivate each other to perform their best. They gain respect through their actions and strong work ethic to build team trust, and they give respect to others for their contributions. Airmen carry their own weight and do whatever is necessary to help our wingmen carry theirs. They embrace the idea that their part of the Air Force meets the Air Force's worldclass standard. (*Air Force Instruction 1-1: Air force culture*, 2023, p. 7)

We can see the importance the Air Force puts on the culture of its force, but also the role Airmen play in helping to mold and build the culture of the service. It is not a one-way transaction, but rather a complex one in which culture and each Airman's actions influence each other. Furthermore, in the same document, the Air Force gives guidance on Airmen Leadership Qualities and how these qualities

> are of paramount importance to the Air Force… [and how important the] development of skills and leadership abilities and in determining who will be selected for advancement through assignments, promotions, and other personnel actions… [and how these will be used] during feedback and evaluation methods for assessing Airmen. (*Air Force Instruction 1-1: Air force culture*, 2023, p. 7)

More specifically in the following section that solely discusses leading people, Air Force members are charged with fostering cohesive teams, using emotional intelligence to care for people while appropriately managing relationships (*Air Force Instruction 1-1: Air force culture*, 2023, p. 8). Central to this discussion of relationships is the word trust and its necessity if there is to be any type of relationship.

Whenever cadets spoke about their experience with either cadre or other cadets an underlying theme of trust permeated the discussion. In the case of Cadet Black and her Field Training experience, she spoke about how the building of "mutual trust" allowed her to accept critical feedback related to her performance and how that feedback helped shape her remaining time in ROTC. Additionally, Cadet Red spoke about how building a relationship allowed you to trust more senior cadets and you would be willing to go to them if you needed help or guidance. Cadet Orange spoke about how the relationships with two other cadets are what allowed him to feel comfortable going to them for advice on many subjects. Without these relationships it is hard to imagine the ROTC program having much success.

Environmental Interaction

The topic of environment was only specifically covered once in the interview, but it is worth examining as it specifically relates to the topic of relationships. The interactive nature of a person, the environment, and learning can be traced back to Dewey (1916) and how he spoke about how it was not merely an adaptation, but a complex interplay where the environment and the learner are both shaped and shape each other like an ever-evolving organism. Cadet Black spoke about how the detachment has changed over the past four years and how it both looks and feels different from her first semester as a cadet in the fall of 2020. She spoke about the overall tone of detachment leadership and how things that were important to prior leaders were not

important to the current detachment leadership and characterized this as a "shift". While much of the tone of an organization is set by the leader, team members often underestimate how much power they have in setting the tone as well. All of the cadets that were interviewed had examples of how they went to other cadets for guidance and advice. Considering the view of Dewey on the interactions between the person and the environment, the activities of the cadets have served to create an environment that has changed. This change has resulted in an environment where cadets of all ranks feel more comfortable in reaching out for help and guidance. This view was supported by Cadet Black who felt like "a lot of [cadets] are getting that one-on-one support that they, a lot of people, would be too afraid to ask for when I was a underclassmen, because it's a little bit more easy to approach". The very act of these senior cadets being willing to and going to others for advice and guidance has shaped the culture of the detachment into one that encourages those relationships that were pivotal for all the cadets who were interviewed.

Implications for ROTC

Based on the findings of the survey and the interviews ROTC could help cadets by implementing the following items.

1. Continue to find classroom lessons, like dress and appearance or customs and courtesies, that can be offloaded to Computer Based Training and after-hours instruction by more senior cadets. This would allow the cadre to focus classroom time on more complex subjects related to motivation, perseverance, and mentoring. Introducing the young cadets to this subject earlier would help to prime the pump and get them to thinking about it earlier. Additionally, it will allow more senior cadets to practice leadership tactics, techniques, and procedures in a low stakes environment. Lastly, by increasing interaction

between POCs and GMCs there is a greater likelihood of beneficial relationships developing between cadets.

2. Identify key cadet leadership positions and work one-on-one to make sure not only were the correct ones selected, but they are provided guided mentorship to make sure they are as ready as they can be to lead their fellow cadets. As we have seen, cadets are powerful models and mentors, so putting more focused effort and emphasis on this has the potential to increase the benefits to younger cadets through cadet driven mentorship.
3. The cadre needs to identify the culture they want in their detachment and work with all of the POCs to ensure they understand what culture the leadership wants, why they want that culture, and what their role is in making it happen. By ensuring the correct cultural environment is in place, the cadre will help to make sure the detachment is a place that will grow the leaders the Air Force needs.

Limitations

This study was conducted on a predominantly White and predominantly male population of students attending a predominantly White institution in a southeastern rural area. This limits its generalizability across AFROTC because of the varying types of detachments at the different types of universities and how those variables could affect cadet responses and data. This limitation exists for both the quantitative and qualitative data generated for the study. Also, while data was gathered from the entire detachment across all year groups, there is a large swath of data that could not be gathered, that of the cadets in the AS200, AS300, and AS400 years who did not remain in the program. The data gathered only represents those cadets who were currently in the program and their interpretations of those constructs at that time. Had the surveys been given at a different time they may have yielded different results.

In order to capture as much information as possible the survey incorporated many theoretical construct questionnaires which could have led to cadets blindly answering questions and could have affected the results of the study. Additionally, some students may have not fully understood some of the questions which may have caused blind entry. Though an anonymous survey, it is worth noting that as a self-report measure some of the cadets may not have answered truthfully due to social desirability bias.

The current detachment demonstrated abnormally high PFT scores with limited overall variance in scores. Of the 122 cadets with PFT data available, only 25 of the cadets had scores below 90 and of those only 2 cadets had a score below 80, and the average PFT score for a cadet was 93.4. While outstanding as a measure of physical fitness inside the detachment, more data is needed to determine if these results are indicative of the average ROTC detachment and cadet.

Recommendations for Further Studies

This work should be replicated across the varying types of AFROTC detachments in order to determine if there are differences related to detachment size, type, and location, and university size, type, and location. By conducting the survey across the various universities and detachments a more thorough and complete understanding could possibly be developed. Additionally, a longitudinal study at several detachments to better understand if the various types of detachments display differences, the differences between cadets who stay and those who do not, and if there are measurable changes to cadets who complete the ROTC program would increase contextual understanding of the program. A scale related to self-regulation should be added to determine if that construct has an effect on cadet success. Additionally, performing this study at ROTC Field Training each summer would be useful because it would allow quicker access to a wider swath of ROTC cadets as this is mandatory to progress from the GMC to the

POC portion of the program. Also, by conducting the study at Field Training it would be possible to see if there are differences in performance at short highly intense training locations versus more long-term stable training environments found at the detachments. By comparing the two outcomes, researchers might come to better understand how specific psychological variables affect performance in different military training environments, which could shape ROTC training of the GMC cadets in the two years prior to field training. A larger sample of cadet PT scores is needed in order to have a more representative sample of PFT scores and determine if PFT score is a statistically significant predictor of the ranking/success of a cadet. When speaking with Cadre leadership they specifically mentioned PFT score and GPA metrics they use to evaluate cadets which underscores its importance and the need for more data. The lack of variability and top-heavy nature of the PFT scores at this specific detachment may have affected the ability of PFT scores to have an effect on cadet ranking. Lastly, while determining what contributes to success in a training environment is important, linking this with continued success and performance in the Air Force would help determine what attributes and traits contribute to success in the Active-Duty Air Force, and if they are the same as those that predicted success in a training environment.

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Appendix A

Auburn University IRB Approval

From: IRB Administration
Sent: Thursday, February 8, 2024 9:09 AM
To: Andrew Looser
Cc: Paris Strom; Jill Salisbury-glennon
Subject: Looser Approval, Protocol #23-636 EP 2401, "The Effects of Self-Efficacy on Success Among ROTC College Students"
Attachments: Investigators Responsibilities rev 1-2011.docx; Looser 23-636 EP 2401 New Rev 2.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Use IRB Submission Page for protocol-related submissions and IRBadmin@auburn.edu for questions and information.

Dear Mr. Looser,

Your protocol titled "The Effects of Self-Efficacy on Success Among ROTC College Students" has received approval as "EP" under federal regulation 45 CFR 46.110(b)(5,6,7). Please find approval of your protocol attached.

Official notice:
This e-mail serves as official notice the protocol has been approved. By accepting this approval, you also accept your responsibilities associated with this approval. Details of your responsibilities are attached. Retain a copy for your records.

Consent documents:
Attached is a copy of your consent form. You must provide a copy for each participant to keep.

Expiration:
Continuing review of this Expedited protocol is not required; however, all modification/revisions to the approved protocol must be reviewed and approved by the IRB.

When you have completed all research activities, have no plans to collect additional data and have destroyed all identifiable information as approved by the IRB, please submit a final report.

PLEASE NOTE: If any unfunded, IRB-approved study should later receive funding, you must submit a MODIFICATION REQUEST for IRB review. In the request, identify the funding source/sponsor and AU OSP number. Also, revise IRB-stamped consent documents to include the Sponsor at the top of page 1 and the "Who will see study data?" section of consent documents." (see online template consent documents).

Best wishes for success with your research!

IRB Admin
Office of Research Compliance
Auburn University
540 Devall Drive
Auburn, AL 36832

Appendix C

Survey Instrument

DEMOGRAPHIC INFORMATION

1. Gender (circle one). Male Female Prefer not to Answer

2. What year did you graduate from high school? _____

3. Class level (circle one).

   Freshman Sophomore Junior Senior

4. If a Freshman or Sophomore, I am on a ROTC scholarship. Yes / No

5. Race/Ethnicity (circle one).

Black or African American Asian American White or Caucasian Native American or Alaskan Native

Pacific Islander or Hawaiian Native Self-Describe Prefer Not to Answer

6. How many hours per week do you work for pay? _____

7. How ROTC classes have you completed? _____

8. How many classes are you taking this term? _____

9. How many hours a week do you study on average? _____

General Self-Efficacy

1. I will be able to achieve most of the goals that I have set for myself.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

2. When facing difficult tasks, I am certain that I will accomplish them.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

3. I have set goals for my time in ROTC and I feel that I will be able to achieve them

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

4. I believe I can succeed at most any endeavor to which I set my mind.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

5. I will be able to successfully overcome many challenges.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

6. I am confident that I can perform effectively on many different tasks.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

7. Compared to other people, I can do most tasks very well.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

8. Even when things are tough, I can perform quite well.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

ROTC Self-Efficacy Survey

1. I have set goals for my time in ROTC and I feel that I will be able to achieve them

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

2. I am certain that I will accomplish any difficult tasks that come along during my time in the detachment.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

3. I think I can obtain the ROTC related outcomes that are important to me.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

4. I believe I can succeed at the ROTC pursuits that I have set my mind to

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

5. I know that ROTC will present me with many challenges and I will overcome them.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

6. ROTC has helped me to understand that I am able to perform many different tasks well.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

7. Compared to the other cadets, I can do most tasks well

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

8. Even when I encounter tough times during ROTC, I feel that I can perform quite well.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

Short Grit Scale

1. New Ideas and projects sometimes distract me from previous ones.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

2. Setbacks don't discourage me.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

3. I have been obsessed with a certain idea or project for a short time but later lost interest.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

4. I am a hard worker.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

5. I often set a goal but later choose to pursue a different one.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

6. I have difficulty maintaining my focus on projects that take more than a few months to complete.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

7. I finish whatever I begin.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

8. I am diligent.

	Very much like me
	Mostly like me
	Somewhat like me
	Not much like me
	Not like me at all
	Prefer not to Answer

Achievement Goal Questionnaire-Revised

1. My aim is to completely master the material presented in ROTC.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

2. I am striving to do well compared to other cadets.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

3. My goal is to learn as much as possible from my ROTC experience.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

4. My aim is to perform well relative to other cadets.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

5. My aim is to avoid learning less than I possibly could.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

6. My goal is to avoid performing poorly compared to cadets.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		Prefer not to answer
1	2	3	4	5		

7. I am striving to understand the content of my ROTC courses as thoroughly as possible.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

8. My goal is to perform better than the other cadets.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

9. My goal is to avoid learning less than it is possible to learn.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

10. I am striving to avoid performing worse than other cadets.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

11. I am striving to avoid an incomplete understanding of the ROTC material.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

12. My aim is to avoid doing worse than other cadets.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	[redacted]	Prefer not to answer
1	2	3	4	5	[redacted]	

Appendix C

Interview Questions

Interview Questions

1. Tell me about your overall experience with ROTC?
2. Would say it was mostly negative/positive. Could you elaborate more on why?
3. When given or encountering a challenge what would you say your outlook is?
4. Thinking back on your experience can you give two or three examples of when you had to overcome some type of hardship or challenge related to the ROTC experience?
    a. While going through those times, did you feel you had any control over your outcome or did you feel you were just along for the ride?
        i. Why is that?
        ii. Is this outlook something you learned, developed, or always had?
5. Thinking through your ROTC experience did you have any mentors, or older cadets that you looked to as examples of you being able to complete the programs or specific parts of the program?
    a. Tell me about them?
    b. Was this an organic process or were they placed in your life via ROTC related activities?
6. Going back to those times you faced challenges, could you describe your inner monologue or thought process as you encountered and went through the examples.
7. Did you enter ROTC with any specific goals and if so, what were they and did you accomplish them?
    a. If not would you feel comfortable elaborating on why?
8. ROTC put you through many experiences, did you feel you had the opportunity to succeed in all the scenarios?
9. Do you believe a strong sense of self-efficacy is important to be successful in ROTC and why?
10. Do you believe your sense of self-efficacy grew from when you entered the ROTC program to now?
    a. Can you give some examples or expound on that?

Appendix D

Recruitment Materials

Dear Cadet,

I am an Air Force Officer working on his PhD at Auburn University. For that process I am conducting research into the concept of self-efficacy and how it affects cadet performance over their tenure in ROTC. If you would like to participate, I have a short survey (15-20 min) I would like for you to take regarding cadet self-efficacy.

Also, Thank you for deciding to become a part of Det 005. It played an immeasurable role in my development not only as an Air Force officer but also as a person. Whether or not you continue in the program and become an officer in the world's greatest Air Force or decide this isn't the path for you and choose to go some other way in life, I feel confident in saying you will be better for having spent time here.

Again, thank you for your time and your willingness to serve. War Eagle!

Sincerely,

Lt Col Andrew C. Looser, USAF

PhD Student, Auburn University

Dear Cadet,

I am an Air Force Officer working on his PhD at Auburn University. For that process I am conducting research into the concept of self-efficacy and how it affects cadet performance over their tenure in ROTC. If you would like to participate, I have a short survey (15-20 min) I would like for you to take regarding cadet self-efficacy.

Also, Thank you for deciding to become a part of Det 005. It played an immeasurable role in my development not only as an Air Force officer but also as a person. Whether or not you continue in the program and become an officer in the world's greatest Air Force or decide this isn't the path for you and choose to go some other way in life, I feel confident in saying you will be better for having spent time here.

Again, thank you for your time and your willingness to serve. War Eagle!

Sincerely,

Lt Col Andrew C. Looser, USAF

PhD Student, Auburn University

RECRUITMENT SCRIPT (verbal, in person)
(*This should be a brief version of the consent document.*)

My name is Andrew Looser, a Doctoral Student from the Department of Educational Foundations, Leadership, and Technology at Auburn University. I would like to invite you to participate in my research study to look at the effects of self-efficacy on success among ROTC students. You may participate if you are an adult and currently in the ROTC program. Please do not participate if you do not fit both of these categories. This study will have two parts. The first being a survey that will assess self-efficacy, achievement goal orientation, and grit. It is

As a participant, you will be asked to take part in either the survey or both the survey and the interview.

This study will have two parts.

The first being a survey that will assess self-efficacy, achievement goal orientation, and grit. It is a 45 item self-report instrument that will be used to gain a clear understanding of where the detachment rests on those psychological variables. The survey takes approximately 15-20 minutes to complete and there is no minimal to no risk associated with it. For you completion of the survey you will receive $10.

As a part of this study, each individual's GPA and Physical Fitness scores will be used in conjunction with their survey responses for correlational research. However, at no time will the researcher have access to any document with your GPA and or Physical Fitness scores and your name. Also, at no time will any member or the cadre have access to any survey instrument that has your unique numerical identifier on it.

The second portion of the study will seek to interview between 9-12 senior cadets about their ROTC experiences and ask them to reflect back on general and specific experiences during their time in the program. The interview is expected to take about an hour, and for your participation you will receive $20.

Like the first part of the study, there are no risks greater than what you experience in everyday life as a student here at Auburn. The only benefit you may have from participating in the interview portion is that you would gain a greater understanding of motivation and performance related to yourself through the act of thoughtful reflection.

The audio recording will take place in a private place. The recording will be maintained in a secure location until transcribed. Once transcribed it will be permanently deleted. The transcript will be maintained digitally in a secure location in accordance with all Auburn University IRB protocols. Additionally, no data that is identifiable will be shared with Air Force Faculty or personnel.

If you would like to participate in this research study, please see me afterwards or respond to the email that was sent to you earlier this week..

Do you have any questions now? If you have questions later, please contact me at acl0087@auburn.edu or you may contact my advisor, Dr. Strom, at stromps@auburn.edu.