AN EXAMINATION OF FACTORS INFLUENCING DIFFERENCES IN ACADEMIC PERFORMANCE AMONG ACTIVE DUTY MILITARY STUDENTS AND NAVAL RESERVE OFFICER TRAINING CORPS SCHOLARSHIP STUDENTS IN A UNIVERSITY SETTING

Except where reference is made to the work of others, the work described in this dissertation is my own or was done in the collaboration with my advisory committee. This dissertation does not include proprietary or classified information.

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Robert Jameson Griffith

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VITA

Robert Jameson Griffith, son of Franklin E. Griffith, Jr. and Cindy Evans Key, was born June 30,1972, in Thomson, Georgia. He graduated from Auburn University with a Bachelor of Civil Engineering in 1998. He has served thirteen years in the United Sates Navy. He taught at the Naval Nuclear Prototype Unit in Charleston, South Carolina on two separate occasions totaling three and one half years. He received the Master of Engineering Management from Old Dominion University in Norfolk, Virginia in 2003. In 2004, he began working as an associate professor of Naval Science at Auburn University where he received the Specialist in Adult Education in December 2005. While serving as an associate professor of Naval Science he taught Naval Leadership and Management, Naval Ships Systems I, and Naval Ships Systems II. Additionally, he has served as the sophomore and junior class advisor for the Naval Science Department. He is married to Dana Michele Griffith and they have two children, Jaima and Cody.

DISSERTATION ABSTRACT

AN EXAMINATION OF FACTORS INFLUENCING DIFFERENCES IN ACADEMIC PERFORMANCE AMONG ACTIVE DUTY MILITARY STUDENTS AND NAVAL RESERVE OFFICER TRAINING CORPS SCHOLARSHIP STUDENTS IN A UNIVERSITY SETTING

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Naval Science Departments at universities across the country have two groups of students: Active duty and non-active duty students. These two types of students seem to have parity with regard to requisite academic ability, however often there is a large disparity among actual academic performance. This study investigated

possible relationships between academic achievement, motivation, mental maturity, age, marital status, and military status. The following research questions were investigated: (1) What is the direct affect of autonomous motivation as measured by the Self-Regulated Learning Questionnaire (SRQ-L) on academic achievement?; (2) What is the direct affect of mental maturity as measured by the Basic Achievement Skills Inventory (BASI) survey on academic achievement?; (3) What is the indirect effect of age on academic achievement?; (4) What is the indirect effect of military status on academic achievement?; and (5) What is the indirect effect of marital status on academic achievement?

These research questions were investigated using a path analysis design. Ninety-six undergraduate students in the Naval Reserve Officer Training Corps (NROTC) department were administered the SRQ-L, BASI survey, and a demographic survey. Results from the adjusted path analysis model indicate that military program and BASI scores explains 27% of grade point average. The CFI, NFI, and RMSEA values were 0.982, 0.952, and 0.075 respectively, indicating a good match of the model and the observed data.

ACKNOWLEDGEMENTS

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This dissertation is dedicated to my wife, partner for life and best friend, Michele Griffith. Without your love, encouragement, patience, and support my success would not be possible. To my children, Jaima and Cody, thank you for the all joy that you have given me. To my parents, Franklin Griffith and Cindy Key, thank you for your love, support, and for instilling the values that make me who I am. Lastly, and above all, I thank my Lord and Savior Jesus Christ for the gifts and talents that I have been blessed with.

Style manual or journal used: Publication Manual of the American Psychological Association, 5th Edition.

Computer software used: SPSS 10, AMOS 5.0, Windows XP, and Microsoft Word 2003

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CHAPTER I

Introduction

Bush(2005) alluded to the self-standards, rules of conscience, and integrity that we possess as humans in our present culture and society. These same axioms for living are applicable to learning as well. People at their best are inspired, striving to learn; master new skills; extend themselves; and apply their talents responsibly (Ryan & Deci, 2000).

Adults have a self-concept of being responsible for their own lives and decisions and these adult students need to know why they need to learn something before making the effort to learn (Knowles, 1984). Since Knowles's (1975) prominent work in self-directed learning, the field of Adult Education has been studying multiple offshoots of this topic.

Over the last thirty years a theory addressing motivation and personality has developed called Self-Determination Theory (SDT). SDT is an approach to human motivation and personality that uses traditional

empirical methods while employing an organismic metatheory that highlights the importance of humans' evolved inner resources for personality development and behavioral self-regulation (Ryan, Kuhl, & Deci, 1997).

Naval Science Departments at universities across this country have two groups of students: Active duty (veterans) and non-active duty students. The active-duty military students enrolled in colleges across this country are a subset of non-traditional students. The active duty students have been serving the United States Navy or Marine Corps anywhere from one and one half years to eight years. The non-active duty students are typically traditional college students that have been awarded Naval Reserve Officer Training Corps (NROTC) scholarships following high school completion. Both groups of students have mirrored intellectual capacity as measured by their average Scholastic Aptitude Test (SAT) scores and high school grade point averages (GPA). However, the active duty military student population performs better with regards to academics as measured by college GPA (See Table 1).

Table 1

Means and Standard Deviations for Academic Demographics by Participant Status

Academic Demographics	*M*		*SD*	
	Active (n=34)	Non-Active (n=62)	Active (n=34)	Non-Active (n=62)
SAT Score	1240	1212	161.3	111.7
High School GPA	3.30	3.53	0.57	0.35
College GPA	3.59	3.01	0.10	0.51

N = 96

Statement of the Problem

The factors that cause one group of students to be more academically successful than another group of students are not fully understood. There is scant literature since Frederiksen and Schrader's (1950) study of 10,000 veterans and non-veterans and their respective academic performances. Research linking specific attributes for success of active duty military and non-active duty military students in a college setting is specifically lacking.

Purpose of the Research

The purpose of this study was to investigate possible relationships between academic success, autonomous motivation, age, marriage, and mental maturity. Investigating these relationships can lend itself to a better understanding of the apparent differences in academic performance between these two groups of students. Additionally, this study can assist ROTC programs in identifying different ways to foster these relationships in order to maximize academic performance among both groups. Mezirow (2000) states that adult programs should be designed “to help adults realize their potential for becoming more liberated, socially responsible, and autonomous learners” (p.30).

Instructional strategies designed to prepare learners for a customized, self-directed learning environment and to help maintain learning focus, direction, and momentum may contribute to their success (Ausburn, 2002). This study will add to the body of knowledge in the field of developmental psychology and adult education.

Instruments

The SRQ-L was developed by Williams and Deci (1996) for measuring controlled regulation or autonomous regulation. The questionnaire is designed to determine what motivates students to learn in a particular setting. It has two subscales employing twelve questions on a Likert-type scale.

Achilles Bardos developed the Basic Achievement Skills Inventory (BASI) (Pearson Assessments, n.d.) survey for measuring math, reading, and language skills for children and adults. The BASI survey can be used for a snapshot of overall academic maturity in verbal and math skills, and test groups that are diverse in age and ability (Pearson Assessments, n.d.). The survey has two sections, math and verbal, with scores tabulated in each section and overall.

Research Questions

The following questions were investigated:

1. What is the direct affect of autonomous motivation as measured by the SRQ-L on academic achievement?
2. What is the direct affect of mental maturity as measured by the BASI survey on academic achievement?
3. What is the indirect effect of age on academic achievement?

4. What is the indirect effect of military status on academic achievement?
5. What is the indirect effect of marital status on academic achievement?

Significance of the Study

This study will aid in identifying factors that can increase academic performance in the NROTC program, and help identify demographics for better recruitment and retention. Additionally, understanding these relationships can contribute to the literature in the field of SDT, motivation, and adult education in general.

Assumptions of the Study

This study contained the following assumptions:

1. The survey and questionnaire administrator performed without biasing the study results.
2. The use of volunteer participants within the NROTC department did not distort the findings of the study.
3. The participants were able to adequately evaluate and report their perceptions in regard to the questions asked.
4. The participants answered the instrument questions truthfully.

Limitations of the Study

This study contained the following limitations:

1. The sample was limited to a total of 96 students within the NROTC department.
2. The generalizability of the results is limited due to the sample being taken from one institution.
3. Both instruments used in the study are self-reported measures.

Definition of Terms

For the purpose of this study, the following definitions were used:

1. Active duty military student. Students that are on active obligated service with the U. S. Navy or Marine Corps attached to the NROTC department to attain a college degree and commission into their respective service.
2. Non-Active Duty military student. Students that have received NROTC scholarships and are attached to the NROTC department to attain a college degree and commission into the U.S. Navy or Marine Corps.
3. Learning Self-Regulation Questionnaire (SRQ-L). Instrument used to measure controlled or autonomous motivation in an academic setting.

4. Basic Achievement Skills Inventory (BASI). Instrument used to determine academic achievement or mental maturity for adults in the area of math and verbal skills.
5. Self-Determination Theory (SDT). SDT is an approach to human motivation and personality that uses traditional empirical methods while employing an organismic metatheory that highlights the importance of humans' evolved inner resources for personality development and behavioral self-regulation (Ryan, Kuhl, & Deci, 1997).
6. Traditional Student. Term used to describe undergraduate students attending the university that are between the ages of 18-22.
7. Non-traditional student. Term used to describe undergraduate students attending the university that are 23 years of age or older.

8. Self-Directed Learning. “A process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating outcomes” (Knowles, 1975, p.18).

Organization of the Study

Chapter I introduces the problem to be studied. This chapter specifically addresses the statement of the problem, purpose of the research, research question, significance of the study, assumptions of the study, limitations of the study, and definition of terms. Chapter II provides a review of related literature of this study including self-determination theory, intrinsic and extrinsic motivation, and self-directed learning. Chapter III presents the procedural details of this study. This includes the design of research, research questions, sample, instrumentation, data collection, and data analysis. Chapter IV presents the findings of the study and an interpretation of the data. The participant’s demographic characteristics are described and the analytical and statistical procedures are also documented.

Chapter V presents a summary discussion, findings, conclusions, implications, and recommendations for practice and future research.

CHAPTER II

Literature Review

The purpose of this study was to investigate possible relationships between academic success, motivation, mental maturity, age, marital status, and military status. Investigating these relationships can lend itself to a better understanding of the apparent differences in academic performance between active duty and non-active duty military students. Additionally, understanding these relationships can assist the NROTC program in identifying different ways to foster these relationships in order to maximize academic performance among both groups. The following research questions were investigated:

1. What is the direct affect of autonomous motivation as measured by the SRQ-L on academic achievement?
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4. What is the indirect effect of military status on academic achievement?
5. What is the indirect effect of marital status on academic achievement?

This chapter has six sections: self-directed learning, self-regulated learning, self-determination theory, motivation, academic persistence, and non-traditional students. This examination is an attempt to understand the variability in the academic performances among adults today. Knowing who is in the class, why they are in the class, and the barriers inherent in the learning situation is essential to facilitate learning in the classroom (Merriam & Brockett, 1997).

Self-Directed Learning

Malcolm S. Knowles is known as the father of andragogy. Andragogy is a concept that has evolved over the last century that refers to an integrated framework of adult learning (Knowles, Holton III, & Swanson, 2005). The true definition from its Greek base is the art of teaching or helping adults learn. Dusan Savicevic first introduced the term into American society in 1967(Knowles, Holton III, & Swanson, 2005). Knowles (1980) originally developed four principles for andragogy, but later added two additional

principles to bring the total to six (Knowles, 1990). These six principles make up what is known as the Andragogical Model, and are:

1. Learner's need to know. Adults need to know why they need to learn something before undertaking to learn it.
2. Self-concept of the learner. Adults have a self-concept of being responsible for their own decisions, for their own lives.
3. Prior experience of the learner. Adults come into an educational setting with a greater volume and quality of experience than youths.
4. Readiness to learn. Adults become ready to learn those things they need to know and be able to do in order to cope with their real-life situations.
5. Orientation to learning. Adults are life-centered in their orientation to learning. Adults are motivated to learn to the extent that they perceive that learning will help them perform tasks within their life situations.
6. Motivation to learn. Adults are responsive to some external motivators, but the most influential motivators are internal.

This model did not satisfy some, who believed these assumptions would not hold up under close scrutiny (MacKeracher, 2004).

Andragogy is the most widely known and used model for adult learning, but it is continually evolving. Merriam and Cafferella (1999) stated:

> We see andragogy as an enduring model for understanding certain aspects of adult learning. It does not give us the total picture, nor is it a panacea for fixing adult learning practices. Rather, it constitutes one piece of the rich mosaic of adult learning. (p.278)

Knowles (1989) reiterated the basis of andragogy by stating:

> I prefer to think of it as a model of assumptions about adult learning or a conceptual framework that serves as a basis for emerging theory. (p.112)

The term Andragogy fundamentally implies that one has to be an adult before this model can be applied. The question of when do individuals become adults has been a topic of debate for decades, and will continue to be debated as long as humanity exists. Psychologically, individuals become adults when they arrive at a

self-concept of being responsible for their own lives, of being self-directed (Knowles, Holton III, & Swanson, 2005).

Thus Andragogy has popularized the concept of self-directed learning (SDL). SDL describes a process where individuals take the initiative, with or without the help of others, in diagnosing their learning needs, developing learning goals, identifying human and material resources, postulating and implementing learning strategies, and evaluating learning outcomes (Knowles, 1975). According to Piskurick (1993):

> The reality is no matter how SDL is dressed up with technology or touted by 'true believers', it is simply another design methodology. SDL is a training design. SDL is a training design in which trainees master packages of pre-determined material, at their own pace, without the aid of any instructor. This is not the only definition of SDL, nor is it all-inclusive for any one learning environment. (p.4)

Brockett & Hiemstra (1991) view self-directed learning as an instructional process centering on such activities as assessing needs, securing learning resources, implementing learning activities, and evaluating learning. Hiemstra and Sisco (1990) refer to self-directed learning as

individualizing instruction, a process focusing on characteristics of the teaching-learning transaction. Self-directed learning is a dynamic interplay between behavior, information, motivation, and emotion under the experienced control of the learning person (Academy of Human Resource Development, 2002).

Allen Tough, a contemporary of Knowles, authored several works on the concept of self-directedness (Tough, 1966, 1971, 1979). Tough (1971) was more concerned about distinguishing between formal education and informal learning. He was interested in how adults learn naturally, when they are not being formally taught. Tough (1971) introduced a concept of self-directed learning projects. Tough (1979) concluded that most adults engage in an average of eight major learning projects each year, and only ten percent of them were associated with educational settings. The majority of the projects were self-directed in nature. His work clearly shows that adults engage in a wide variety of learning activities in response to their daily needs and problems (MacKeracher, 2004).

Another prominent research effort to develop an instrument to measure self-directedness was undertaken by Guglielmino (1977). She developed the Self-Directed

Learning Readiness Scale (SDLRS) that is used to measure self-directed readiness or to compare various self-directed learning aspects with numerous characteristics. Guglielmino's SDLRS has been criticized as being difficult to use with certain groups, without validation, and conceptually and methodologically flawed (Field, 1989). Baveye (2003) stated:

> Unfortunately, SDLRS and other similar tests focused from the onset and have since remained centered on the easily measured perceptions of SDL readiness rather than on actual, observed SDL endeavors. In so doing, they may have provided a misleading and distorted view of SDL. (p.445)

Many labels have been put on self-directed learning throughout the literature in the field of Adult Education such as "self-regulated learning", "self-planned learning", "independent learning", "self-education", "self-instruction", "self-study", "self-teaching", "independent study", "self-determined learning", and "autonomous learning".

Straka (1997) stated:

> Even though self-directed learning is apparently under discussion world-wide, this does not in any way mean that a unanimous understanding of self-directed learning underlies this discussion, one indicator being the large number of terms for this phenomenon. (p.1)

Many of these terms are used interchangeably. Writers in the field often use different words to describe a single concept; however these words convey more value to some than others (MacKeracher, 2004). Carré (1994) identified over twenty different terms for self-directed learning.

Self-Regulated Learning

Students are self-regulated to the degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process (Zimmermann, 1986). These students self-generate thoughts, feelings, and actions through purposive use of specific processes, strategies, or responses to improve their academic achievement (Zimmerman & Schunk, 2001). Students are aware of the usefulness of self-regulation processes in enhancing their academic success. Self-regulatory processes include attending to and concentrating on

instruction; organizing, coding, and rehearsing information to be remembered; establishing a productive work environment; using resources effectively; holding positive beliefs about one's capabilities, the value of learning, the factors influencing learning, and the anticipated outcomes of actions; and experiencing pride and satisfaction with one's efforts (Schunk, 1994).

Zimmerman & Schunk (2001) suggest that students do not self-regulate during all learning experiences. They suggest that self-regulation is an initiated proactive response to a learning stimulus; it is not merely an inherent cognitive ability. Thus, students often do not self-regulate during their learning when they could. Zimmerman, Bonner, and Kovach (1996) indicate that self-regulation learning strategies manifest an increase in learning efficiency in content and methods, self-efficacy, and increased academic test performance. Zimmerman developed a self-regulatory model that emphasized specific processes. This model requires a continuous self-assessmented approach to learning, such that strategies or processes can be altered to ensure success.

Zimmerman's (1986) self-regulatory model has four phases:

1. Baseline self-monitoring. Students collect initial data about the activity in question.
2. Structured self-monitoring. Students self-observe according to a structured protocol provided by the instructor.
3. Independent self-monitoring. Students adapt the protocol to their own individual needs.
4. Self-regulated self-monitoring. Students develop monitoring protocols for other academic activities on their own.

Researchers (Bandura, 1986; Kanfer & Gaelick, 1986) view self-regulation as comprising three processes: self-observation, self-judgment, and self-reaction. Self-observation is deliberate attention to aspects of one's behavior (Schunk, 1996). Self-judgment refers to comparing present performance with one's goals (Schunk, 1996). Self-reactions to goal progress may be evaluative or tangible (Schunk, 1996). Schunk (1996) contends that effective self-regulated learning requires that students engage in self-evaluation periodically. Self-evaluation is a process comprising self-judgments of present performance and

self-reactions to these judgments (Schunk, 1996). Kasworm and Yao (1992) stated:

> Adult learning and instructional theory suggest that the student should be an active participant in the design and execution of the learning process. The adult student should engage in the development of meaningful and relevant learning with in-depth information processing and autonomous self learning. In particular, learning by adults should be an interactive constructive process of meaning; learning strategies should reflect global, interactive, and meta-cognitive actions. (p.2)

Self-Determination Theory

Self-determination theory (SDT) has been initiated and prominently developed by Edward Deci and Richard Ryan (Deci & Ryan, 1985b: Ryan & Deci, 2000). SDT evolved over the last thirty years in the form of four mini-theories, each of which relate to specific phenomena (Deci & Ryan, 2002). These four mini-theories are: cognitive evaluation theory, organismic integration theory, causality orientations theory, and basic needs theory (Deci & Ryan, 2002). The primary agenda of SDT has been to provide an account of the discrepant viewpoints characterized by humanistic and

developmental theories that employ an organismic metatheory and, that of behavioral, cognitive, and post-modern theories that do not (Deci & Ryan, 2002). SDT assumes that all individuals have natural, innate, and constructive tendencies to develop an ever more elaborated and unified sense of self (Deci & Ryan, 2002). SDT takes the approach that these innate tendencies can either be fostered and supported or be hindered and suffocated. Self-determination has important motivating properties and being denied the opportunity for self-determination results in the loss of organismic well-being (Deci, 1980). Deci (1980) stated “Few human concerns are more universally central than that of self-determination”. (p.3)

SDT posits three needs that provide the basis for categorizing aspects of the environment as supportive versus antagonistic to integrated and vital human functioning (Deci & Ryan, 2002). These needs are:

1. Competence. Competence refers to feeling effective in one’s ongoing interactions with the social environment and experiencing opportunities to exercise and express one’s capacities (Deci, 1975; Harter, 1983; White, 1959). Competence is not an attained skill or capability, but rather is a felt

sense of confidence and effectance in action (Deci & Ryan, 2002). According to Haworth (1986) competence has two aspects: (a) it is an awareness of agency, that one is an effective producer of intended effects and (b) it is an awareness of how well one performs, an awareness that involves a sense of confidence or lack of confidence in oneself.

2. Relatedness. Refers to feeling connected to others, to caring for and being cared for by others, to having a sense of belongingness both with other individuals and with one's community (Baumeister & Leary, 1995; Bowlby, 1979; Harlow, 1958; Ryan, 1995). Deci and Ryan (2002) state:

> The need to feel oneself as being in relation to others is thus not concerned with the attainment of a certain outcome or a formal status, but instead concerns the psychological sense of being with others in secure communion or unity. (p.7)

3. Autonomy. Refers to being the perceived origin of one's own behavior (deCharms, 1968; Deci & Ryan, 1985b; Ryan & Connell, 1989). Haworth (1986)

divides autonomy into two levels: minimal autonomy and normal autonomy. Minimal autonomy refers to the individual with independence, self-control, self-sufficiency, and self-rule (Haworth, 1986). Normal autonomy refers to an individual with critical reflection, deliberation, and critical competence (Haworth, 1986).

The usefulness of applying SDT to the educational setting has become apparent. According to Reeve (2002), two decades of empirical work support two conclusions: autonomously motivated students thrive in educational settings and students benefit when teachers support their autonomy. Table 2 depicts the educational benefits shown by autonomously motivated students and the supportive study references.

Table 2

Educational Benefits Shown By Autonomously-Motivated Students, Compared to Control-Motivated Students

Educational Benefit	Supportive Reference
Higher Academic Achievement	Miserandino, 1996 Flink et al., 1992
Higher Perceived Competence	Ryan & Grolnick, 1986
More Positive Emotionality	Ryan & Connell, 1989 Garbarino, 1975 Ryan, 1982
Higher Self-Worth	Ryan & Grolnick, 1986
Preference for Optimal Challenge	Shapira, 1976 Boggiano et al., 1988 Pittman et al., 1982
Pleasure from Optimal Challenge	Harter, 1974, 1978
Stronger Perceptions of Control	Boggiano & Barrett, 1985
Greater Creativity	Amabile, 1985
Higher Rates of Retention	Vallerand & Bissonette, 1992

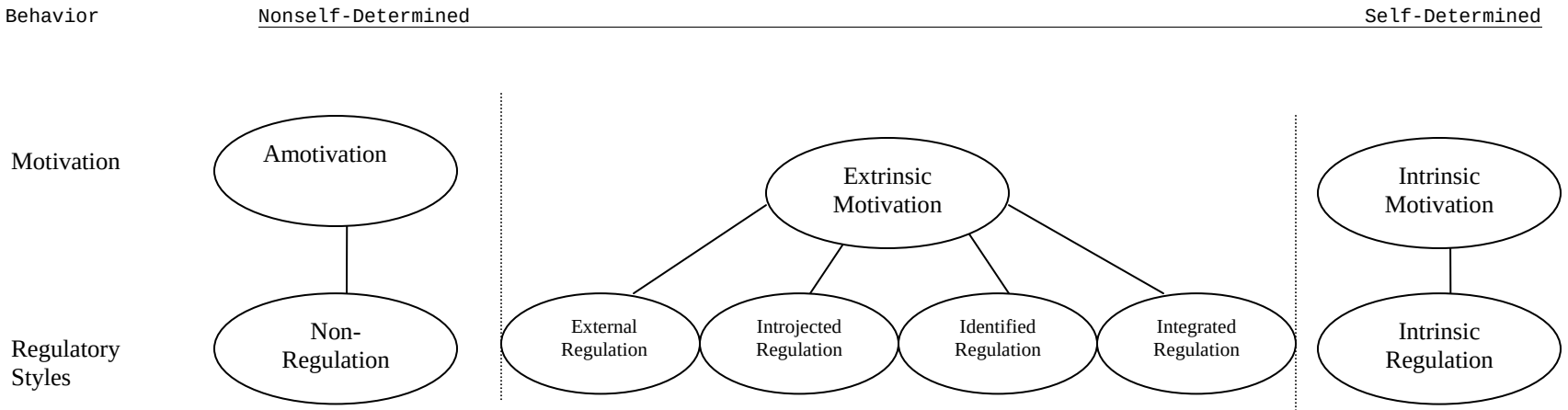
Adapted from “Self-Determination Theory Applied to Educational Settings,” by J. Reeve, 2002, In L. Deci & R. Ryan (Eds.), *Handbook of Self-Determination Research* (p. 184). New York: University of Rochester Press.

Motivation

For the last thirty years there has been primarily two types of motivation that interest social science researchers: intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to the behaviors performed out of interest and enjoyment (Vallerand & Ratelle, 2002). Extrinsic motivation pertains to behaviors carried out to attain contingent outcomes (Deci, 1971). Confirmatory factor analysis on the different motivational scales that have been validated provide support for the existence of intrinsic motivation, extrinsic motivation, and amotivation (Vallerand, 1997). Figure 1 shows the types of motivation on a self determination continuum.

Intrinsic Motivation

Intrinsic motivation implies engaging in an activity for the pleasure and satisfaction of it (Deci, 1975). Vallerand, Pelletier, Blais, et al. (1992) suggests a three part taxonomy of intrinsic motivation. First, intrinsic motivation to know implies engaging in activities because of the pleasure and satisfaction obtained from learning, exploring, and understanding new things. Second, intrinsic motivation to accomplish things refers to engaging in activities because



Perceived Locus of Causality	Impersonal	External	Somewhat External	Somewhat Internal	Internal	Internal
Relevant Regulatory Processes	Nonintentional, Nonvaluing, Incompetence, Lack of Control	Compliance, External rewards & punishments	Self-Control, Ego-Involvement, Internal rewards & punishments	Personal Importance, Conscious Valuing	Congruence, Awareness, Synthesis With self	Interest, Enjoyment, Inherent Satisfaction

Figure 1. The Self-Determination Continuum Showing Types of Motivation With Their Regulatory Styles, Loci of Causality, and Corresponding Processes.

From "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being," by R.M. Ryan and E.L. Deci, 2000, American Psychologists, 55, p.72. Copyright 2000 by the American Psychological Association. Reprinted with permission of the author.

of the pleasure and satisfaction obtained from trying to surpass oneself, creating, or accomplishing something. And third, intrinsic motivation to experience stimulation operates when one is engaged in an activity because of the stimulating sensations associated with it.

Intrinsic motivation is regarded as an important determinant of learning. Emergent motivation theory suggests that intrinsic motivation emerges from the interaction of individuals with their environment (Csikszentmihalyi & Rathunde, 1993). A basic assumption of most authors is that intrinsically motivated learners tend to employ sophisticated elaborative and metacognitive learning strategies, that foster the acquisition of well-structured knowledge that constitutes “deep understanding” (Renkl, 1997). Studies testing this assumption usually show that intrinsic motivation is actually associated with elaborate and metacognitive strategies, but these types of learning strategies are not always related to achievement measures such as grades (Pintrich, 1989; Pintrich & DeGroot, 1990). It can be argued that typical examinations test primarily low level learning goals.

Extrinsic Motivation

Extrinsic motivation deals with a broader array of behaviors used to attain an end state that is separate from the behavior. Deci & Ryan (1985b) have suggested a typology consisting of four types of extrinsically motivated acts that involve self-determination and choice.

1. External Regulation. Someone who is externally regulated, performs to attain a positive end state or to avoid a negative end state which are separate from the activity itself (Vallerand & Ratelle, 2002). This type of regulation is typically how extrinsic motivation is portrayed in the literature (Vallerand & Ratelle, 2002).
2. Introjected Regulation. With this stage of motivation, individuals start to internalize the reasons for their behaviors, but motivation is still not self-determined because this type of regulation deals with past external contingencies (Vallerand & Ratelle, 2002). This person acts out of obligation to avoid shame and internal pressure (Vallerand & Ratelle, 2002).
3. Identified Regulation. When the reasons to engage in an activity are internalized and the activity is

judged to be valuable, then the activity will be performed with a sense of choice (Vallerand & Ratelle, 2002). A person acting out of identified reasons is said to be self-determined.

4. Integrated Regulation. When choices to engage in some activities become coherent with other self-structures, the choice underlying behavior is in harmony with other structures within the self (Vallerand & Ratelle, 2002).

Amotivation

Deci & Ryan (1985b) state that a third motivational factor should be considered when trying to understand human behavior. Amotivation refers to behavior that exhibits apparent motivational absence. Most amotivated individuals feel incompetent and act like they have little or no control (Vallerand & Ratelle, 2002). A probable consequence of this behavior is to quit the activity (Vallerand & Ratelle, 2002). Within the academic setting this leads to failure, disenrollment, or dropping out of school.

Baker (2004) performed a study to assess the predictive value of motivational orientations in determining subsequent academic performance. The study

indicated that motivational orientations were not significant predictors of students' academic achievement at a university. This is contrary to other research (Deci & Ryan, 1985b; Vallerand, Fortier, and Guay, 1997) that suggests that self-determined types of motivation lead to successful academic performance, while non self-determined types of motivation lead to negative outcomes. Another study by Lin and McKeachie (1999) indicated that a moderate level of extrinsic motivation is better than a high level, while higher levels of intrinsic motivation are positively related to grades. This diversity in the results of studies performed suggests an importance of considering curvilinear relationships and interactions when generalizing about the effects of different goals or motives on performance (Lin & McKeachie, 1999).

Academic Persistence

It is important to look at in context of this study the literature regarding persistence. After all, academic persistence is nothing more than a "line in the sand"; Did the student meet the minimum academic requirements to continue in school? However, there is no clear definition of persistence within the body of literature. Some studies define persistence by academic dismissal; others define it

by voluntary withdrawal or “dropouts” (Tinto, 1982). For the purpose of this study, persistence in the area of dropouts will not be examined.

There are many factors related to a student’s persistence in college such as high school achievements, ethnicity, gender, marital status, socio-economic status, academic major, employment status, size of college, and involvement with faculty and peers (Bank, Biddle, & Slavings, 1992; Porter, 1990). Table 3 list some studies of academic persistence performed in recent years and the associated factors examined.

Astin (1993) suggests that demographic factors such as sex, ethnicity, transfer status, and employment status are important in predicting undergraduate grades. This study examines the demographic variables of program status, age, and marital status and their affect on academic performance.

Table 3

Some Recent Studies and Associated Factors on Academic Persistence

Name	Date	Factor(s)
Coppola	1999	High School GPA, Parents' Education level, & Family Origin
Day	1999	Locus of Control, Attributional Style, Depression, Anxiety, & Self-esteem
Woolford-Hunt	1999	Environmental Factors of College Size, Residential Status of College, & Organizational Structure Ratio
Freeze	2000	Non-cognitive Factors
Freer-Weiss	2000	Student Characteristics
McDaniel	2000	Predicted College GPA
Langin-Ealy	2001	Institutional Integration
Cheslock	2001	Transfer Student Status
Bowers	2002	Gender, High School GPA, Parental Characteristics, Academic Achievement, Well-being, & Adjustment
Duggan	2003	Transfer GPA, Gender, Race, & Age
Townsley	2004	Communication Satisfaction
Peart-Forbes	2004	Social Support, University Climate
Helbig	2004	Academic Achievement, Financial Assistance, & Social Integration
Samuel	2005	Family Support, Faculty Support, Institutional Policy, & Classroom Environment
Jumpeter	2005	Student Academic Behaviors

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Demographic Factors

This study examined the indirect effect of age, marital status, and program status on academic achievement. Program status was segregated into active duty students or veterans, and non-active duty students. Veterans fall into the non-traditional category of college students, whereas the non-active duty students in this study are traditional college students in the NROTC program. Many of the veteran students are considered transfer students, because of completed college credits prior to or during active duty service. However, some have no previous college experience.

Astin (1986) and Lenning (1982) indicate that marriage is an important variable in persistence. Marital status is important to consider because of the significant support structure it can provide. Additionally, marriage can provide additional motivational factors than those who are not married. Positive social support is reciprocated in interpersonal relationships defined in six basic forms: money, status, love, information, goods, and services. When any of these fall below a certain level, functioning is impaired (Dollahite, 1991; Foa, 1993). Veteran students in the NROTC program are employed, they have status, and

many are married. These differences often bring stronger social support structures than that of a traditional college student. Goplerud (1980) found that students who have no established social supports indicate greater stress levels than students with already established social networks. Astin (1986) states that marriage tends to decrease women's chances of persisting, while it increases men's chances of persisting. The NROTC program is largely made up of male students. Astin (1986) also reports that spousal support highly increases the student's chances and ability to persist.

Academic Factors

Porter (1990) indicates that students' high school academic factors such as aptitude scores and grade point average are related to college persistence. Additionally, Astin (1975), Fetters (1977), Pantages and Creedon (1978), and Ramist (1981), indicate that grade point average and class standing are significant predictors of persistence. Astin (1993) stated that "GPA, despite its limitations, appears to reflect the student's actual learning and growth during the undergraduate years" (p.242), thus making it an appropriate variable for measuring academic success.

As previously indicated in Table I of Chapter I, the two groups examined in this study have great high school grade point averages and SAT scores, and there is essentially parity across the groups. Schunk (1989) suggests that performance is not synonymous with learning. He describes that learning cannot be directly measured, but rather inferred on the basis of learning behaviors. Students who do not perform well may be unmotivated, anxious, sick, or feel performance is not important. Ramist (1981) found that SAT or ACT scores do not always predict academic persistence, that there are other mediating variables. Early preparation and success in high school indicates a higher interest and motivation to complete college (Astin, 1986; Porter, 1990). There is a large amount of literature that indicates students' academic goals and desires affect their academic performance and persistence (Bean, 1983; Jumpeter, 2005; Lenning, 1982; Spady, 1971; Terenzini & Pascarella, 1978; Tinto, 1982).

Motivational Factors

Several researchers (Summerskill, 1962; Ramist, 1981; Astin, 1973; Fetters, 1977) have documented the effects of student motivation on academic persistence. Astin (1973)

states that students who anticipate completing a degree are more likely to persist. According to Tinto (1975) and Pantages and Creedon (1978), the parental expectations and influence have a strong influence on persistence. Lack (1997) found a significant relationship between parent participation and student persistence. Motivational factors have shown to be a predictor of academic success, and can further be subdivided into intrinsic and extrinsic factors. Parental expectations and influence is an example of an extrinsic motivational factor.

Parental education can be grouped into parental influences, an extrinsic motivational factor. According to Astin (1975), Fetters (1977), and Lenning (1982), persistence is highly correlated with the educational level of the parents. Conversely, Pantages and Creedon (1978) and Ramists (1981) conclude that parental education is not a major factor in persistence. The literature is mixed and inconclusive on the exact effect parental education has on academic success.

A Persistence Model

The most widely tested and well known model for student persistence and attrition is Tinto's (1975) theoretical model of student departure (Pascarella, 1980).

This study was a longitudinal, explanatory model of student attrition based on the degree of fit between the student and college environment (Pascarella, Smart, & Ethington, 1986). Tinto's (1975) model concludes that persistence and attrition are:

> A longitudinal process of interaction between the individual and the academic and social systems of the college during which a person's experiences in those systems (as measured by his normative and structural integration) continually modify his goal and institutional commitments in ways which lead to persistence and/or varying forms of dropout. (p.94)

Tinto's model indicates that a student's level of persistence will be dependent on a series of interactions among the student and the academic and social systems of the institution. The constituents that make up this longitudinal process are:

1. The pre-enrollment student characteristics. (e.g., family history, family expectations, pre-college educational background, ethnicity, gender, age, & motivation)
2. The level of the student's commitment and goal orientations upon entering the institution.

3. The institution’s academic and social system.
4. The extent of social and academic integration within the institution.
5. Changes in the student’s goal orientations and commitment, influenced by the institutional academic and social systems.
6. The dynamics of these factors interacting, resulting in a decision to persist.

Many studies have tested Tinto’s model of student departure (Munro, 1981; Pascarella, 1982; Pascarella & Chapman, 1983; Pascarella, Smart, & Ethington, 1986; Stoecker, Pascarella, & Wolfle, 1988; Williamson & Creamer, 1988). These studies have established predictive validity to the model. Figure 2 illustrates Tinto’s model of student attrition.

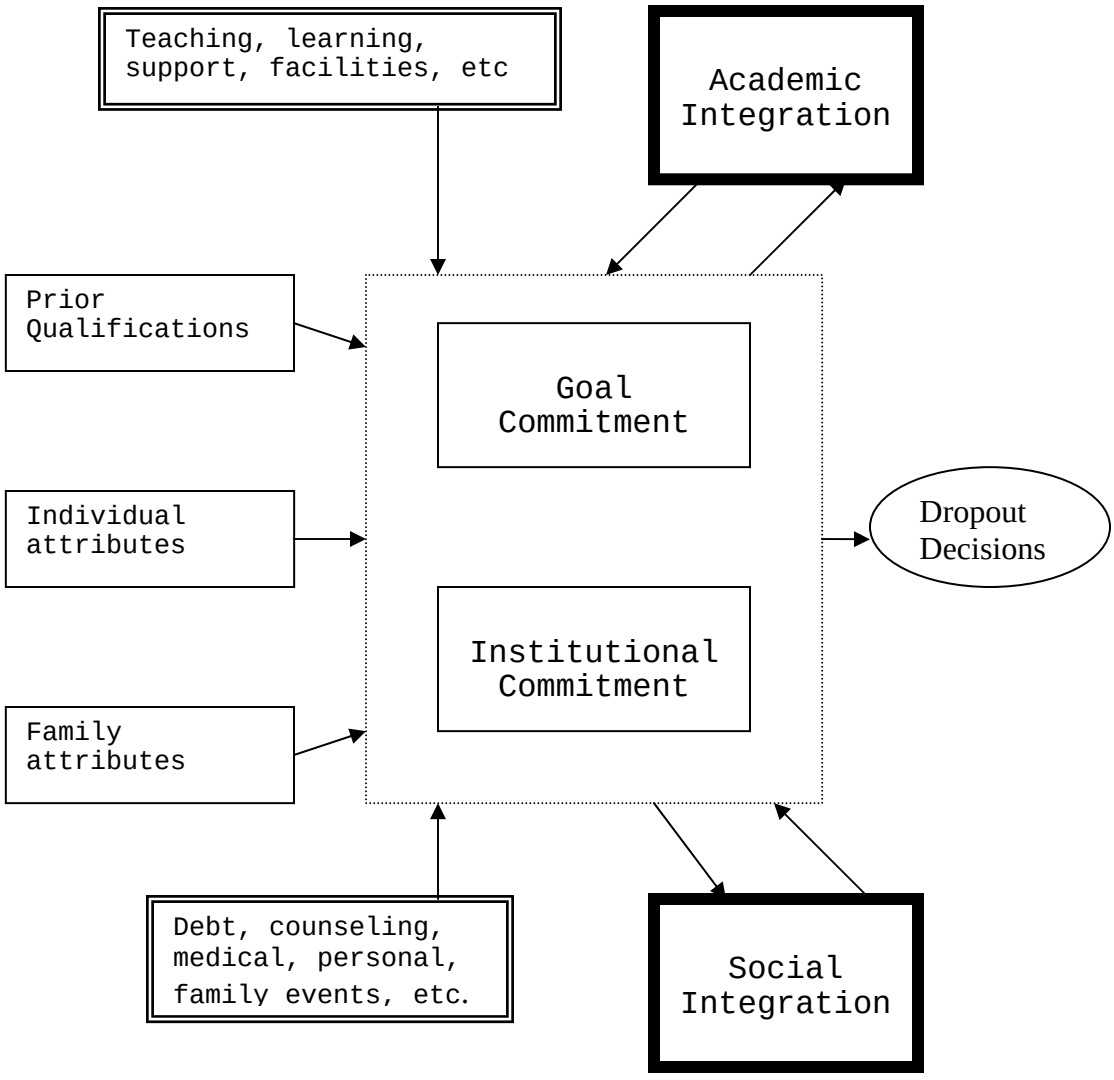


Figure 2. Illustration of Tinto's Model of Student Persistence

From "Tinto's model of student retention," by Draper, S. W. (2002, May 14) Retrieved March 2, 2006, from http://www.psy.gla. ac.uk/~steve/localed/tinto.html

Adapted with permission of the author.

Non-Traditional Students

The need to look at the research on non-traditional students is important for this study. One of the two groups of students examined is classified as non-traditional. This group of students is veterans, currently serving in the U.S. Navy or Marine Corps. These veterans are older with a variety of life skills that positively affect their academic performance in college. Frederiksen and Schrader's (1950) study of 10,000 veterans and non-veterans statistically showed that veterans do excel non-veterans of equal ability with respect to achievement in college. Frederikson and Schrader (1950) found that veterans were distinctive from traditional students in at least three ways:

1. They bring a background of experiences which often have no counterpart in the backgrounds of civilian students.
2. The age of the veterans students significantly changed the general appearance of the student body.
3. Because of the educational provisions of the GI Bill of Rights, their decision to attend college, and choice of college, is undoubtedly less affected by the economic status of their family.

Many things have changed in this country since this study in 1950 such as the GI Bill benefits, the current military force is all voluntary vice drafted, and women play a vital role in today's military force. Frederiken and Schrader's (1950) study only examined male students. There is little to no literature since this study that compares specifically veterans to non-veterans and their respective academic performances. Current literature only examines and generalizes about traditional verses non-traditional students.

Graham and Donaldson (1999) stated that non-traditional students do as well as traditional students because they "approach their college experiences with a clearer purpose in mind, take advice of instructors more seriously, are more intent on learning, and expect to gain something they can apply in the workforce" (p.5). The clear age difference between traditional students and veterans, coupled with their life experiences and engrained work ethic, provide them with increased effort, understanding, expectations, and more purposeful goals in the classroom. Tice (1997) stated that adults are more self-directed and their learning becomes more meaningful

and profound due to the integration of experience with knowledge.

There is an extensive amount of literature about differences in traditional and non-traditional students. Bean and Metzer (1985) concluded that non-traditional students generally are less interested in social integration and participate less in campus social activities. Staman (1979) concluded the number of work hours per week had a strong negative effect on persistence in traditional students, but had no significant effect on non-traditional students. Morales' (2000) study concluded that transfer students were older, had a general idea of what they needed to be successful, and that they had specific needs and concerns, which are not often expressed by new students. Maline and others (1980) concluded from a study of adults that: (1) students rated job preparation or career advancement as the most important college goal, (2) the major GPA predictor was the students' satisfaction with their own academic performance, (3) the major predictor of college satisfaction was external life variables and satisfaction with college facilities, and (4) the major predictors of affective changes were student goals and the achievement of these goals. These are only a few of the

studies concluding differences between traditional and non-traditional student cohorts. However, Cross (1980) explains that when generalizing about non-traditional students, the difficulty is that:

> Almost any group of adults is more heterogeneous than a comparable group of 18-year-olds….No single profile can be regarded as representative of the adult learner, even when one looks at the small group of adults who choose to pursue academic credit. (p.77)

Summary

This review of literature looked at 6 specific areas of focus underlying this examination: self-directed learning, self-regulated learning, self-determination theory, motivation, academic persistence, and non-traditional students. This examination is an attempt to learn about possible relationships between academic success, motivation, mental maturity, age, marital status, and military status. The variability of performances among the two categories of students studied in this examination creates a need to understand these relationships, and through management, promotion, and development the NROTC department can affect academic success. This review of literature is structured in an attempt to understand the

differences in the two categories of students, to understand the reasons of variance in observed performances, and to present some similar research and findings of similar students.

CHAPTER III

Methods

The purpose of this study was to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Investigating these relationships can lend itself to a better understanding of the apparent differences in academic performance between active duty and non-active duty military students. Additionally, understanding these relationships can assist ROTC programs in identifying different ways to foster these relationships in order to maximize academic performance among both groups. The following research questions were investigated:

1. What is the direct affect of autonomous motivation as measured by the SRQ-L on academic achievement?
2. What is the direct affect of mental maturity as measured by the BASI survey on academic achievement?
3. What is the indirect effect of age on academic achievement?

4. What is the indirect effect of military status on academic achievement?
5. What is the indirect effect of marital status on academic achievement?

This chapter contains four sections. The first section describes the design of the study. The second section describes the sample selection of the study. The third section describes the instruments and procedures that were utilized. The fourth and final section provides specific information about data collection and method by which data is analyzed.

Design of Study

This study employs the use of an analytical method called path analysis. Path analysis, sometimes referred to as causal structuring, is a specific regression technique that yields information about both the direct and indirect influence of antecedents on outcomes. The endogenous variables for this analysis are grade point average (GPA), autonomous motivation (RAI), and mental maturity (MM). The exogenous variables for this study are age, marital status, and military status.

Military status is defined in this study as either an active duty military student or a non-active duty military student. Figure 3 delineates the initial path analysis model used in this study.

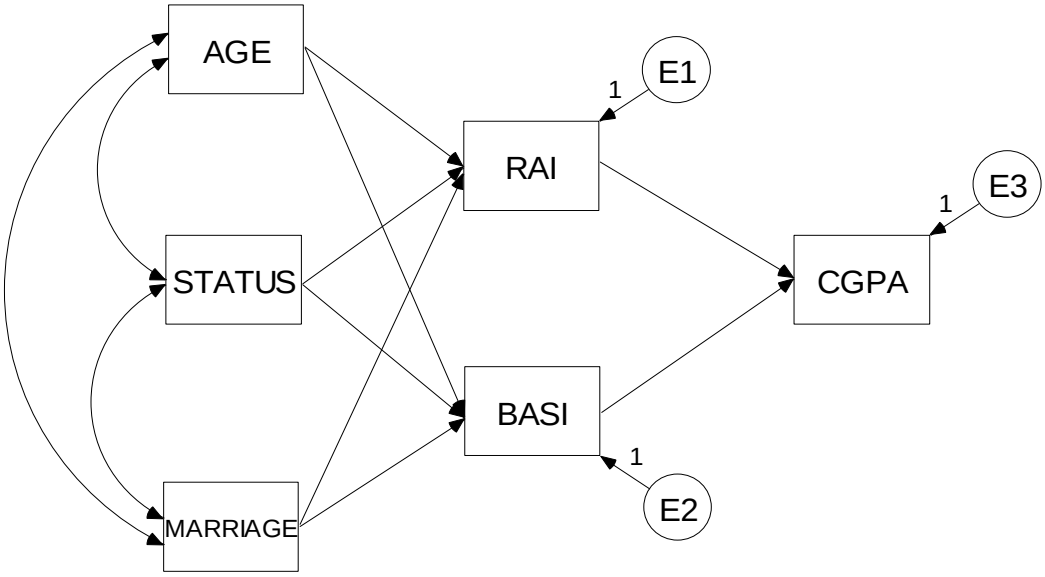


Figure 3. Initial path analysis model: Influence of Military status, marital status, age, mental maturity, and autonomous motivation on academic achievement.

Sample

The participants in this study consisted of 96 undergraduate students currently attending a land grant state university in the southeastern part of the United States. This university has an approximate enrollment of 26,000 students. The participants were enrolled in NROTC courses at the state university, ranging from freshman to seniors. This study provided an information sheet (Appendix A) and obtained demographic information from the sample using a demographic survey designed by the researcher (Appendix C). The age of the participants ranged from 19 to 33, with a mean age of 22.4 (N=96). The group was comprised of 84 males and 12 females. Most participants in the study were not married with 75 being single and 21 married. The group was comprised of 62 non-active duty military students and 34 active duty military students. Permission was obtained to conduct this study (See Appendix B).

Instrumentation

Two instruments and a demographic survey were utilized in this study. The SRQ-L survey developed by Williams and Deci (1996) was used to measure autonomous motivation within the sample, and the BASI survey developed by Bardos

(Pearson Assessments, n.d.) was used to measure mental maturity within the sample. The demographic survey (Appendix C) used was designed by the researcher.

Validity is used to define the accuracy of the instrument. Stated differently, did the instrument measure what it claims to measure? Content validity is the degree to which the instrument covers the material the instrument is supposed to cover. Concurrent validity is a type of criterion-related validity where the test is administered at or about the same time that data are collected on the criterion variable (Huck, 2004).

Self-Regulated Learning Questionnaire

The SRQ-L was developed by Williams and Deci (1996) for measuring autonomous motivation. The questionnaire is designed to determine what motivates students to learn in a particular setting. It has two subscales employing twelve questions on a 7-point Likert-type scale. The subscales are controlled regulation and autonomous regulation. Each subscale score is calculated by averaging the items on that subscale. The subscale questions are as follows:

Autonomous regulation: 1,4,8,9, & 10.

Controlled regulation: 2,3,5,6,7,11,& 12.

The alpha reliabilities for these two subscales are 0.75 for controlled regulation and 0.80 for autonomous regulation (Self-Determination Theory; An Approach to Human Motivation & Personality, n.d.). A Relative Autonomy Index (RAI) is formed by subtracting the controlled regulation subscale from the autonomous regulation subscale. Higher scores, meaning more autonomous, on the RAI in the academic domain have been shown to predict students' conceptual learning (Grolnick & Ryan, 1987). The SRQ-L demonstrates construct validity due to the high correlations to the General Causality Orientations Scale (GCOS) (Deci & Ryan, 1985a; Williams & Deci, 1996).

Basic Achievements Skills Inventory

The BASI survey was developed by Bardos (Pearson Assessments, n.d.) to be a brief but accurate assessment of overall academic achievement. The survey consists of two tests: verbal skills and math skills. Verbal skills are assessed using vocabulary, language mechanics, and reading comprehension questions, and math skills are assessed using math computation and math application questions. Each section has a 25-minute time limit. The BASI survey has been standardized for children and adults ranging in age from 8 to 80 (see Tables 4, 5, & 6).

Table 4

Demographic Characteristics of the School-Age and Adult Standardization Samples

Demographic Variable	Subgroup	US%	School-Age Sample N=2,518 n	%	Adult Sample N=2,452 n	%
Gender	Male	48.4	1,237	49.1	1,223	49.9[a]
	Female	51.6	1,281	50.9	1,228	50.1[a]
Race/Ethnicity	White	69.1	1,746	69.3	1,667	68.0
	African American	12.1	278	11.0	335	13.7
	Hispanic/Latino	12.5	322	12.8	304	12.4
	Asian American	3.6	80	3.2	52	2.1
	American Indian	0.7	46	1.8	37	1.5
	Pacific Islander	0.1	11	0.4	18	0.7
	Other	1.8	35	1.4	39	1.6
Education(parental education for the school-age sample)	Less than 12th grade	14.8	334	13.3	368	15.1[b]
	High School grad/GED	32.5	766	30.4	735	30.1[b]
	1-3 years of college	28.3	720	28.6	692	28.3[b]
	4+ years of college	24.4	698	27.7	649	26.6[b]
Region	Northeast	19.1	416	16.5	393	16.0
	South	35.7	901	35.8	749	30.5
	Midwest	22.9	625	24.8	566	23.1
	West	22.3	576	22.9	744	30.3

Note. [a] Percentages were calculated by dividing by 2,451 because gender was not reported for 1 subject. [b] Percentages were calculated by dividing by 2,444 because education was not reported for 8 subjects. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005.

Table 5

Age Breakdown of the School-Age Standardization Sample

Age	n
8	238
9	293
10	251
11	326
12	379
13	333
14	156
15	161
16	144
17	167
18	70
Total	2,518

Adapted from A.N. Bardos with permission from personal communication, July 12, 2005.

Table 6

Normative Age Groupings by Test for the Adult Standardization Sample

Verbal Skills Norm Groups	n
19-25 years	871
26-46 years	1,135
47-80 years	446
Total	2,452

Math Skills Norm Groups	n
19 years	220
20-21 years	313
22-25 years	338
26-35 years	588
36-50 years	708
51-80 years	285
Total	2,518

Adapted from A.N. Bardos with permission from personal communication, July 12, 2005.

The BASI survey has established content validity from national standards, item writers with expertise in respective subject areas, and numerous cycles of item reviews (A. N. Bardos, personal communication, July 12, 2005). The BASI survey demonstrates concurrent validity with other group achievement tests such as the Iowa Test of Educational Development (ITED) and the Test of Adult Basic Education (TABE) as indicated by the high correlations in Tables 7 and 8.

Table 7

Correlations Between the BASI Survey and the ITED (High School Sample)

	BASI Survey						
ITED	VST	VO	LM	RC	MST	MC	MA
Reading Vocabulary	.50**	.56**	.35**	.41**	.26**	.18	.29**
Reading-Literature Materials	.53**	.57**	.32**	.47**	.25*	.16	.29**
Iowa Reading Total	.56**	.61**	.36**	.48**	.28**	.18	.32**
Expression Advanced Skills	.56**	.59**	.48**	.43**	.39**	.34**	.35**
Expression Total	.58**	.60**	.49**	.43**	.43**	.38**	.38**
Quantitative Thinking Advanced Skills	.41**	.48**	.33**	.28**	.38**	.30**	.36**
Quantitative Thinking Advanced Skills Total	.45**	.51**	.37**	.33**	.41**	.32**	.37**

Note. N=101. ITED = Iowa Tests of Educational Development, VST = Verbal Skills Total, VO = Vocabulary, LM = Language Mechanics, RC = Reading Comprehension, MST = Math Skills Total, MC = Math Comprehension, MA = Math Application. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

Table 8

Correlations Between the BASI Survey and the TABE (High School Sample)

	BASI Survey						
TABE	VST	VO	LM	RC	MST	MC	MA
Reading Comprehension	.62**	.58**	.48**	.57**	.61**	.47**	.63**
Math Computation	.47**	.41**	.45**	.42**	.64**	.62**	.51**
Math Application	.53**	.46**	.45**	.48**	.54**	.60**	.38*
Language	.60**	.53**	.49**	.55**	.62**	.58**	.54**
Spelling	.30	.26	.13	.37*	.31*	.33*	.25
Total Math	.53**	.46**	.48**	.48**	.63**	.65**	.48**
Total Battery	.64**	.58**	.54**	.59**	.69**	.63**	.61**

Note. N=40. TABE = Tests of Adult Basic Education 7/8 Complete Battery. VST = Verbal Skills Total, VO = Vocabulary, LM = Language Mechanics, RC = Reading Comprehension, MST = Math Skills Total, MC = Math Comprehension, MA = Math Application. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

Additionally, the BASI survey demonstrates concurrent validity with other achievement tests such as the Wide Range Achievement –3rd edition (WRAT3), Mini Battery of Achievement (MBA), and the Reading and Arithmetic Index (RAI) as indicated by the high correlations in Tables 9,10, and 11.

Table 9

Adult Sample's Performance on the BASI Survey and the WRAT3

BASI Survey	Mean	SD
Verbal Skills Total	112.5	10.3
Vocabulary	13.8	1.8
Language Mechanics	14.0	1.8
Reading Comprehension	12.2	3.0
Math Skills Total	105.8	10.5
Math Computation	10.6	2.3
Math Application	11.0	2.2
WRAT3		
Reading	109.6	6.3
Spelling	108.4	5.8
Arithmetic	105.1	9.3

Note. N=52. WRAT3 = Wide Range Achievement Test-3rd Edition. SD= standard deviation

Correlations between the BASI Survey and the WRAT3 (Adult Sample)

	BASI Survey						
WRAT3	VST	VO	LM	RC	MST	MC	MA
Reading	.31*/.75**	.47**/.90**	-.11/-.40**	.29*/.59**	.08*/.27	.04/.11	.11/.34*
Spelling	.26/.70**	.08/.31*	.23/.70**	.22/.50**	.09/.32*	.12/.36**	.04/.15
Arithmetic	.32*/.62**	.21/.50**	.13/.33*	.31*/.47**	.53**/.83**	.49**/.76**	.48**/.77**

Note. N=52. WRAT3 = Wide Range Achievement Test-3rd Edition. VST = Verbal Skills Total, VO = Vocabulary, LM = Language Mechanics, RC = Reading Comprehension, MST = Math Skills Total, MC = Math Comprehension, MA = Math Application. The correlation on the left in each cell is uncorrected; the correlation on the right is corrected for restriction of range in both test scores. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

Table 10

Adult Sample's Performance on the BASI Survey and the MBA

BASI Survey	Mean	SD
Verbal Skills Total	107.7	9.8
Vocabulary	12.8	2.4
Language Mechanics	13.0	2.4
Reading Comprehension	11.8	2.6
Math Skills Total	107.2	12.3
Math Computation	10.8	2.9
Math Application	11.4	2.3
MBA		
Basic Skills	109.4	10.4
Reading	118.8	13.6
Writing	106.2	12.8
Mathematics	112.3	12.6
Factual Knowledge	102.2	14.9

Note. N=45. MBA = Mini-Battery of Achievement. SD= standard deviation

Correlations between the BASI Survey and the MBA (Adult Sample)

	BASI Survey						
MBA	VST	VO	LM	RC	MST	MC	MA
Basic Skills	.36*/.65**	.08/.15	.47**/.68**	21/.34*	.41**/.62**	.47**/.63**	.28/.49**
Reading	.33*/.51**	.24/.32*	.29/.38**	18/.24	.22/.29	.23/.27	.18/.26
Writing	.18/.31*	-.10/-.15	.46**/.60**	.00/.00	.24/.33*	.32*/.38*	.12/.19
Mathematics	.18/.32*	-.02/-.02	.22/.31*	.22/.29	49**/.63**	.56**/.64**	.35*/.50**
FK	.42**/.58**	.08/.09	.28/.33*	.57**/.63**	.20/.24	.21/.22	.17/.22

Note. N=45. FK = Factual Knowledge. MBA = Mini-Battery of Achievement. VST = Verbal Skills Total, VO = Vocabulary, LM = Language Mechanics, RC = Reading Comprehension, MST = Math Skills Total, MC = Math Comprehension, MA = Math Application. The correlation on the left in each cell is uncorrected; the correlation on the right is corrected for restriction of range in both test scores. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

Table 11

Adult Sample's Performance on the BASI Survey and the RAI

BASI Survey	Mean	SD
Verbal Skills Total	114.4	10.8
Vocabulary	13.1	2.8
Language Mechanics	13.5	2.1
Reading Comprehension	12.4	2.9
Math Skills Total	104.6	10.3
Math Computation	11.1	2.2
Math Application	11.6	2.6
RAI		
Reading Index	103.2	12.2
Arithmetic Index	104.8	10.3

Note. N=44. RAI = Reading and Arithmetic Indexes. SD= standard deviation

Correlations between the BASI Survey and the RAI (College Sample)

	BASI Survey						
RAI	VST	VO	LM	RC	MST	MC	MA
RI	.45**/.65**	.15/.24	.58**/.84**	.41**/.56**	.10/.18	.06/.12	.12/.20
AI	.27/.50**	.18/.28	.37*/.65**	.17/.24	.16/.32*	.06/.12	.19/.31*

Note. N=44. RI = Reading Index. AI = Arithmetic Index. RAI = Reading and Arithmetic Indexes. VST = Verbal Skills Total, VO = Vocabulary, LM = Language Mechanics, RC = Reading Comprehension, MST = Math Skills Total, MC = Math Comprehension, MA = Math Application. The correlation on the left in each cell is uncorrected; the correlation on the right is corrected for restriction of range in both test scores. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

The BASI survey demonstrates concurrent validity with other intelligence tests such as the General Ability Adults (GAMA), Wonderlic, and Weschler Adult Intelligence Scale-Third Edition (WAIS-III) as indicated by the high correlations in Tables 12, 13, and 14.

Table 12

BASI Survey Means, Standard Deviations, and Correlations With GAMA IQ (Adult Sample)

Skill Area or Total Score	Mean	SD	r With GAMA IQ[a]
Verbal Skills Total	108.9	9.9	.25**/.48**
Vocabulary	13.2	2.3	.13/.22*
Language Mechanics	13.1	2.4	.15/.26**
Reading Comprehension	11.9	2.6	.27**/.40**
Math Skills Total	106.6	11.2	.32**/.52**
Math Computation	10.7	2.6	.31**/.45**
Math Application	11.2	2.1	.28**/.48**

Note. N=112. GAMA = General Ability Measure for Adults. [a]The correlation on the left is uncorrected; the correlation on the right is corrected for restriction of range in both test scores. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

Table 13

BASI Survey Means, Standard Deviations, and Correlations With the Wonderlic (Adult Sample)

Skill Area or Total Score	Mean	SD	r With Wonderlic[a]
Verbal Skills Total	116.0	8.6	.64/.82
Vocabulary	13.8	1.8	.38/.56
Language Mechanics	14.0	1.8	.39/.57
Reading Comprehension	12.1	3.0	.60/.60
Math Skills Total	101.5	10.8	.62/.74
Math Computation	10.7	2.4	.52/.60
Math Application	10.7	2.5	.60/.66

Note. N=49. Wonderlic = Wonderlic Personnel Test. [a]The correlation on the left is uncorrected; the correlation on the right is corrected for restriction of range in BASI Survey scores. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. All correlations are statistically significant at p <.01.

Table 14

Correlations between the BASI Survey and the WAIS-III (Adult Sample)

	BASI Survey						
WAIS-III	VST	VO	LM	RC	MST	MC	MA
VIQ	.62**/.88**	.29*/.52**	.54**/.70**	.45**/.69**	.50**/.75**	.52**/.69**	.37**/.68**
PIQ	.41**/.72**	.21/.41**	.39**/.56**	.26/.46**	.52**/.78**	.58**/.75**	.34*/.65**
FSIQ	.59**/.86**	.32*/.56**	.51**/.68**	.41**/.65**	.58**/.82**	.63**/.78**	.40**/.72**
VC	.67**/.88**	.35*/.57**	.52**/.65**	.51**/.71**	.29*/.48**	.34*/.46**	.15/.31*
PO	.33*/.60**	.19/.34*	.32*/.43**	.21/.35*	.33*/.54**	.38**/.51**	.21/.42**
WM	.17/.34*	.10/.18	.18/.25	.06/.11	.58**/.79**	.51**/.64**	.57**/.83**
PS	.22/.39**	.14/.22	.16/.20	.18/.26	.49**/.67**	.54**/.63**	.32*/.54**

Note. N=49. WAIS-III = Wechler Adult Intelligence Scale-Third Edition, VIQ = Verbal IQ, PIQ = Performance IQ, FSIQ = Full Scale IQ, VC = Verbal Comprehension, PO = Perceptual Organization, WM = Working Memory, PS = Processing Speed, VST = Verbal Skills Total, VO = Vocabulary, LM = Language Mechanics, RC = Reading Comprehension, MST = Math Skills Total, MC = Math Comprehension, MA = Math Application. The correlation on the left in each cell is uncorrected; the correlation on the right is corrected for restriction of range in both test scores. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

To establish reliability, Cronbach's alpha coefficients for both math and verbal tests and standard errors of measurement were determined (see Table 15 & 16). Additionally, test-retest reliability coefficients are reported in Table 17.

Table 15

Cronbach's Alpha Internal Consistency Reliability Coefficients and Standard Errors of Measurement for the Verbal Skills Test

		Verbal Skills Total		Vocabulary		Language Mechanics		Reading Comprehension	
Age	N	r_{xx}	SEM	r_{xx}	SEM	r_{xx}	SEM	r_{xx}	SEM
School-Age Norm Groups									
8	238	.75	5.7	.42	2.1	.50	2.0	.60	1.8
9	293	.86	5.2	.69	1.8	.71	1.9	.67	1.6
10	251	.89	5.1	.74	1.9	.73	1.7	.73	1.7
11	326	.89	4.7	.74	1.7	.74	1.6	.79	1.4
12	379	.90	4.4	.79	1.6	.73	1.6	.82	1.3
13	333	.90	4.4	.78	1.6	.75	1.6	.82	1.2
14	156	.94	4.1	.84	1.6	.80	1.4	.87	1.3
15	161	.94	4.2	.83	1.6	.81	1.4	.88	1.3
16	144	.94	4.2	.86	1.6	.81	1.4	.88	1.2
17	167	.94	4.0	.85	1.6	.79	1.3	.88	1.2
18	70	.92	4.0	.85	1.5	.76	1.3	.83	1.3
Adult Norm Groups									
19-25	871	.92	3.9	.81	1.5	.73	1.6	.88	1.1
26-46	1135	.95	3.6	.86	1.5	.81	1.6	.91	0.9
47-80	446	.94	3.5	.87	1.2	.81	1.5	.90	0.9

Note. R_{xx} = internal consistency reliability coefficient, SEM = standard error of measurement. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005.

Table 16

Cronbach's Alpha Internal Consistency Reliability Coefficients and Standard Errors of Measurement for the Math Skills Test

		Math Skills Total		Math Computation		Math Application	
Age	N	r_{xx}	SEM	r_{xx}	SEM	r_{xx}	SEM
School-Age Norm Groups							
8	238	.73	6.6	.56	1.9	.61	1.9
9	293	.79	6.1	.66	1.8	.72	1.7
10	251	.80	6.4	.59	1.9	.74	1.8
11	326	.80	5.9	.66	1.7	.72	1.7
12	379	.87	5.6	.77	1.5	.80	1.6
13	333	.87	5.2	.82	1.4	.76	1.6
14	156	.84	5.8	.76	1.3	.76	1.9
15	161	.89	5.7	.83	1.4	.79	1.8
16	144	.89	5.2	.85	1.4	.76	1.7
17	167	.91	5.6	.87	1.4	.81	1.8
18	70	.89	5.7	.83	1.4	.80	1.8
Adult Norm Groups							
19	220	.89	4.7	.81	1.4	.83	1.2
20-21	313	.91	4.6	.84	1.2	.85	1.2
22-25	338	.92	4.4	.84	1.2	.88	1.1
26-35	588	.93	3.9	.87	1.1	.89	1.0
36-50	708	.92	4.2	.85	1.2	.88	1.0
51-80	285	.93	4.1	.88	1.1	.87	1.2

Note. R_{xx} = internal consistency reliability coefficient, SEM = standard error of measurement. Adapted from A.N. Bardos with permission from personal communication, July 12, 2005.

Table 17

Test-Retest Data for the BASI Survey

Skill Area or Total Score	First Test Mean	SD	Retest Mean	SD	Gain	Reliability
Verbal Skills Total	108.1	10.6	108.1	8.6	0.0	.63**
Vocabulary	12.7	2.3	12.4	2.3	-0.3	.36*
Language Mechanics	13.1	2.0	13.4	2.0	0.3	.49**
Reading Comprehension	11.8	3.0	12.0	2.6	0.2	.49**
Math Skills Total	113.0	12.9	105.8	12.9	-7.2	.55**
Math Computation	12.3	2.7	10.3	2.9	-2.0	.23
Math Application	12.2	3.2	11.3	2.6	-0.9	.62**

Note. N = 33. dapted from A.N. Bardos with permission from personal communication, July 12, 2005. *p<.05, **p<.01.

Data Collection and Procedure

The purpose of this study was to investigate possible relationships between academic success, motivation, mental maturity, age, marital status, and military status. Permission was obtained from the Professor of Naval Science to administer the surveys during Naval Science lab. Data was collected the second week of class during the spring and summer semesters. Students choosing to participate in the study were given a packet of information containing a information sheet (Appendix A), a demographic survey (Appendix C), the SRQ-L, and the BASI survey. It was approximated to take 65 minutes to complete all survey forms. The BASI survey contains two parts with each having a 25-minute time limit. The SRQ-L survey and demographic

survey are untimed surveys. The BASI survey was administered first, and the students had the remainder of the lab (approximately 15 minutes) to complete the SRQ-L and demographic surveys.

Summary

This chapter addressed the purpose and design of the study, population and sample, and instrumentation used for the study. The validity and reliability for the SRQ-L questionnaire and BASI survey were addressed. Data was collected in accordance with the research guidelines set by the Auburn University Institutional Review Board and the data collection was discussed. The information sheet and demographic survey used in the study are included in the appendices. The statistical method used to analyze data for this study was path analysis.

CHAPTER IV

Results

Introduction

The purpose of this study was to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Investigating these relationships can lend itself to a better understanding of the apparent differences in academic performance between active duty and non-active duty military students. Additionally, understanding these relationships can assist ROTC programs in identifying different ways to foster these relationships in order to maximize academic performance among both groups. The following research questions were investigated:

1. What is the direct affect of autonomous motivation as measured by the SRQ-L on academic achievement?
2. What is the direct affect of mental maturity as measured by the BASI survey on academic achievement?

3. What is the indirect effect of age on academic achievement?
4. What is the indirect effect of military status on academic achievement?
5. What is the indirect effect of marital status on academic achievement?

The statistical procedures used in this study were Pearson Product Moment Correlation coefficients and path analysis. Descriptive statistics used in this study included means and standard deviations. The analysis of data was performed through the use of the Statistical Package for the Social Sciences (SPSS) and the Amos 5.0 structural equation modeling programs.

Data were gathered from 96 students in the Naval Science department during the fall 2005 and spring 2006 terms. Involvement in the study was voluntary with no incentives or consequences used. Two validated instruments were used in the study: The Self Regulated Learning Questionnaire (SRQ-L) and the Basic Achievement Skills Inventory (BASI) survey.

Self-Regulated Learning Questionnaire (SRQ-L)

The SRQ-L is a questionnaire developed by Williams and Deci (1996) designed to measure autonomous and controlled motivation. It consists of 12 statements that concern the reasons why people learn in particular settings such as college. It has two subscales: controlled regulation and autonomous regulation. The responses to each statement range from ”not at all true” to “very true” on a 7-point likert scale. Each subscale score is determined by averaging the item answers on that subscale. A Relative Autonomy Index (RAI) is formed by subtracting the controlled subscale score from the autonomous subscale score. A higher RAI number is indicative of higher autonomous regulation. The RAI index for 34 active duty participants ranged from -2.6 to 4.4. The mean RAI score for active duty participants was 1.06, with a standard deviation of 1.32. The RAI index of 62 non-active duty participants ranged from -2.0 to 3.9. The mean RAI score for non-active duty participants was 0.81, with a standard deviation of 1.22.

Internal consistency reliability was determined for the two subscales of the SRQ-L by Cronbach’s alpha. Cronbach’s alpha for the autonomous regulation scale and

controlled regulation scale was 0.683 and 0.677 respectively. Discriminate validity is provided by the lack of significant correlation (r=0.056) and a low Cronbach's alpha (0.106) between the two subscales.

Basic Achievement Skills Inventory (BASI)

The BASI survey developed by Bardos (Pearson Assessments, n.d.) was designed to be a brief but accurate assessment of overall academic achievement. It consists of two sections: verbal and math skills. Each section has a 25-minute time limit. The math section has 68 multiple-choice questions. The verbal section has 73 multiple-choice questions. An average BASI score is calculated by averaging the standardized scores on the math and verbal sections. The BASI survey mean standardized score for 34 active duty participants was 117.9. The BASI survey mean standardized score for 62 non-active duty participants was 120.7.

Demographic Profile

The sample for this study consisted of 96 students enrolled in the Naval Science department at a southeastern land grant university: 34 active duty and 62 non-active duty. In addition to completing the two validated instruments, the students completed a short demographic

survey (Appendix C), which provided information about gender, marital status, age, high school GPA, college GPA, and SAT scores.

The participants in this study were predominately male (87.5%) with females comprising 12.5% of the population. This is indicative of the higher percentage of males that are enrolled in NROTC programs. The age of the participants ranged from 19 to 33, with a mean age of 22.4 (*N*=96). The number of participants who were married was 21.9%. The means and standard deviations for high school GPA, college GPA (CGPA), and SAT scores are provided in Table 18.

Table 18

Means and Standard Deviations for Academic Demographics by Participant Status

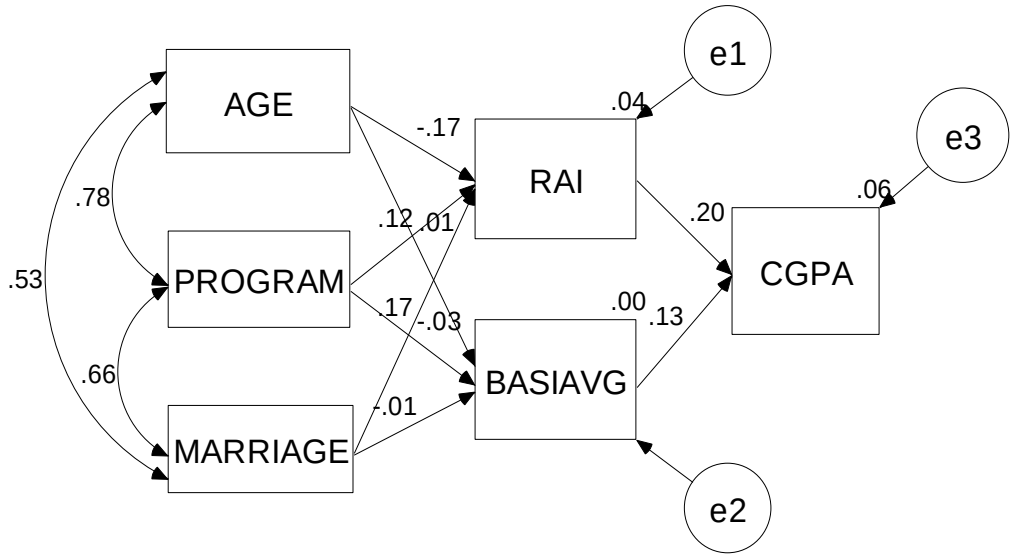
	M		*SD*	
Academic Demographics	Active (n=34)	Non-Active (n=62)	Active (n=34)	Non-Active (n=62)
SAT Score	1240	1212	161.3	111.7
High School GPA	3.30	3.53	0.57	0.35
College GPA	3.59	3.01	0.10	0.51

N = 96

Path Analysis

The path analysis was performed using Amos 5.0 structural equation modeling program. Military program was divided dichotomously with active duty students coded as 1 and non-active duty coded as 0. Marital status was coded with not married as 0 and married as 1. All other

variables used in the regression analysis are continuous variables. Figure 4 illustrates the path coefficients and R^2 values for the endogenous variables. Table 19 depicts the Pearson correlation coefficients (r) for the exogenous variables.



Note: Only path coefficient for RAI to CGPA is significant at $p < .05$(2 tailed), N=96.

Figure 4. Initial model with standardized regression (Beta) coefficients.

Table 19

Pearson correlations for the Exogenous Variables

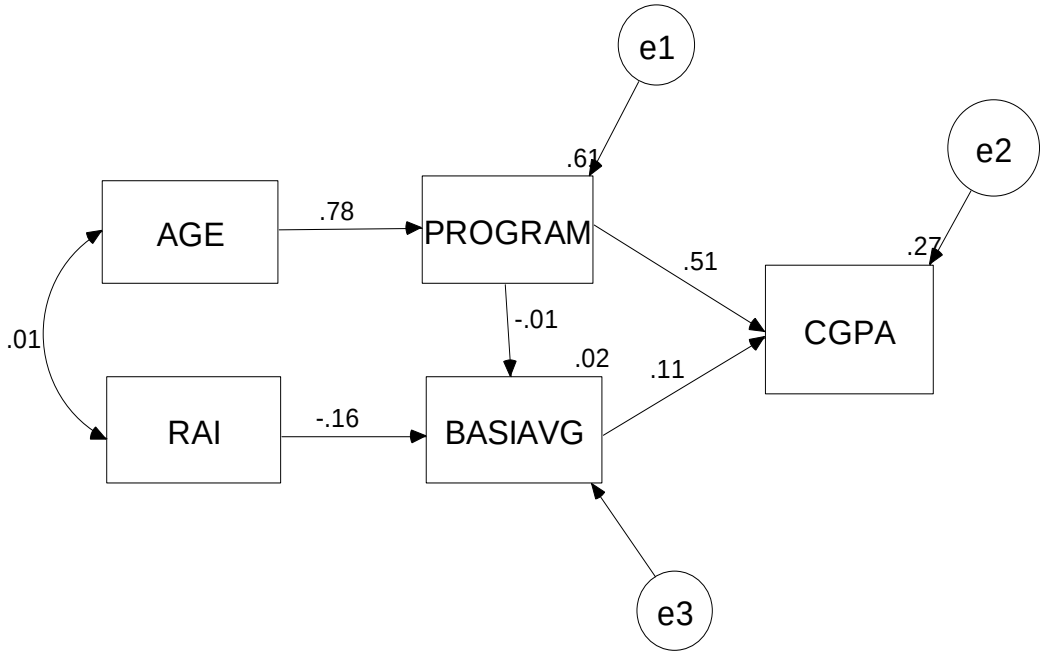
	1	2	3
1. Age	-		
2. Status	0.78**	-	
3. Marriage	0.53**	0.66**	-

***p < 0.01* (2 tailed), *N* = 96

The chi-square value for the initial model was statistically significant, indicating a poor match of the model to the observed data. The CFI and NFI values were .814 and .808 respectively, indicating again a poor match of the model to the observed data. Additionally, the root mean square error of approximation (RMSEA)was .291, indicating a poor fit. As indicated by Table 19, all three of the exogenous variables of the model are highly correlated. Based on the initial path analysis results (see Figure 4), the BASI and SRQ-L surveys explain 6% of the variance in GPA. The exogenous variables explain 4% of the RAI, and 0% of the BASI scores. However, in the initial model the only variables that had any significance on CGPA were the RAI scores. Age, program, and marriage had no significant effect on RAI or BASI scores.

After analyzing the initial model, the model was respecified. Marital status was removed, and age became a predictor for status. Additionally, RAI became a predictor

for BASI. Figure 5 depicts the respecified model, path coefficients, and R^2 values for the endogenous variables.



Note: Only path coefficients AGE to PROGRAM and PROGRAM to CGPA are significant at $p < 0.01$ (2 tailed), N =96.

Figure 5. Respecified model with standardized regression (Beta) coefficients.

With the respecified model, military program and BASI scores explains 27% of college grade point average (CGPA). Age explains 61% of military status. As you get older, you are more likely to be a active duty veteran student than a non-veteran student. RAI and military status explains 2% of the BASI score. The chi-square value for the respecified model is not statistically significant, indicating a good match of the model and the observed data. The CFI and NFI values were 0.982 and 0.952 respectively, indicating again a good match of the model and the observed data. Additionally, the RMSEA was .075, indicating a good fit. The exogenous variables age and RAI are not correlated. The new respecified model fits the data statistically significantly better than the initial model. The analysis results indicate that age and military status were significant predictors of academic achievement.

Research Questions

This study explored five research questions to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status:

1. What is the direct effect of autonomous motivation as measured by the SRQ-L on academic achievement? According to the initial model, RAI index has a statistically significant effect on academic achievement as measured by CGPA, however it is very moderate.

2. What is the direct effect of mental maturity as measured by the BASI survey on academic achievement? This question was answered using the path coefficient from BASI to CGPA (.11) of the respecified path model. The BASI has no statistically significant direct effect on academic achievement.

3. What is the indirect effect of age on academic achievement? This question was answered using the path coefficient from age to program (.78) of the respecified path model. Age has a very high statistically significant indirect effect on academic achievement.

4. What is the indirect effect of military program on academic achievement? This question is answered using the initial model, which fit the data poorly. Military program does not have a statistically significant indirect effect on academic achievement, however according to the respecified model it has a very high statistically significant direct effect (.51) on academic achievement.

5. What is the indirect effect of marital status on academic achievement? This question is answered using the initial path model. Marital status had no significant effect on RAI or BASI, and thus was removed from the path model. Marital status has no statistically significant indirect effect on academic achievement.

Summary

The purpose of this research was to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Based on the analysis of the data from this study, the data suggest that there is a statistically significant direct effect on academic achievement (as measured by GPA in this study) caused by military status. Additionally, there is a statistically significant indirect effect on academic achievement caused by age. In the next chapter, the results from this chapter will be discussed as well as recommendations for future research will be presented.

CHAPTER V

Conclusions, Discussion, and Recommendations

Conclusions

The purpose of this study was to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Chapter I introduced the study. Chapter II reviewed the literature related to self-directed learning, self-regulated learning, self-determination theory, academic persistence, motivation, and non-traditional students. Chapter III presented the method for the study and chapter IV presented the results of the data gathered. The final chapter of this study will offer a summary of the study, major conclusions, and some recommendations for future research.

The statistical procedures used in this study were Pearson Product Moment Correlation coefficients and path analysis. Descriptive statistics used in this study included means and standard deviations. The analysis of data was performed through the use of the Statistical

Package for the Social Sciences (SPSS) and the Amos 5.0 structural equation modeling programs. Data were gathered from 96 students in the Naval Science department during the fall 2005 and spring 2006 terms. Involvement in the study was voluntary with no incentives or consequences used. Two validated instruments were used in the study: The Self Regulated Learning Questionnaire (SRQ-L) and the Basic Achievement Skills Inventory (BASI) survey.

The sample for this study consisted of 96 students enrolled in the Naval Science department at a southeastern land grant university: 34 active duty and 62 non-active duty. In addition to completing the two validated instruments, the students completed a short demographic survey (Appendix C), which provided information about gender, marital status, age, high school GPA, college GPA, and SAT scores.

The participants in this study were predominately male (87.5%) with females comprising 12.5% of the population. This is indicative of the higher percentage of males that are enrolled in NROTC programs. The age of the participants ranged from 19 to 33, with a mean age of 22.4 (N=96). The number of participants who were married was 21.9%.

Discussion

This study found a weak to moderate statistically significant direct effect of autonomous motivation on academic achievement in the initial model. This result is congruent with research from Deci and Ryan (1985b), Flink, Boggiano, Maim, Barrett, and Katz(1992), Miserandino (1996), and Vallerand, Fortier, and Guay(1997) that suggests self-determined types of motivation lead to successful academic performances. Lin and McKeachie's (1999) study also suggests that higher levels of intrinsic motivation are positively related to grades. However, the weakness of the effect also tends to support Baker's (2004) findings that motivational orientations were not significant predictors of students' academic achievement. The motivational research to date mainly posits that some type of motivation to learn is positively related to grades.

The SRQ-L used in this study measured the level of extrinsic and intrinsic motivation of the participants. The data from this study does not indicate one type as being a strong enough predictor over the other. Both types of motivational orientations had similar academic achievement. The RAI index for 34 active duty participants

ranged from -2.6 to 4.4. The mean RAI score for active duty participants was 1.06, with a standard deviation of 1.32. The RAI index of 62 non-active duty participants ranged from -2.0 to 3.9. The mean RAI score for non-active duty participants was 0.81, with a standard deviation of 1.22. There was not a significant difference between the two types of students with regards to motivational orientation. A larger sample size would increase the power of the findings, and could uncover a stronger statistical relationship not seen from this study.

This study found age to be a large statistically significant direct effect on program status, and not to be a significant indirect effect on BASI scores. The relationship of program to age is explained by the nature of the two types of programs in the NROTC department. In order to be an active duty veteran, an individual would have had to join and currently be serving in the U.S. Navy or Marine Corps. This would inherently make them an older group of students than those that join the NROTC program immediately upon graduation from high school. The effect of age on the BASI scores is not coherent with Tice's (1997) statement that adults' learning is more profound due to the integration of experience with knowledge.

This study found a statistically significant direct effect of military status on academic achievement. This supports Frederiksen and Schrader's (1950) findings that veterans do excel non-veterans of equal ability with respect to achievement in college. Frederiksen and Schrader (1950) found that active duty veterans bring a background of experiences that have no counterpart in the backgrounds of civilian students. Due to their experiences and age, perhaps the active duty veteran student has greater mental maturity than the non-active duty student, but was not accurately measured by the BASI survey.

This study found that marital status had no statistically significant affect on academic achievement. Marital status was removed from the initial path analysis model due to its non-significance. This is contrary to Astin (1986) and Lenning's (1982) indication that marriage is an important variable in academic persistence.

Recommendations

The purpose of this research was to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Based on this research, it is apparent that there is a relationship between age, military status,

and academic achievement. Military status has a direct effect on academic achievement. Veteran students coming into the NROTC programs will be academically more superior to their non-veteran counterparts. This has lasting implications for the NROTC programs. Understanding this relationship can help enable military advisors and administrators to look for new tools to equipment non-veterans for success. The administrators of the NROTC programs need to examine the attributes that make veterans successful, and foster those same attributes in the non-veteran students.

Additional studies correlating factors that explain the academic superiority of the veteran students are needed. Some future research should include but is not limited to:

1. Measure the level of commitment of both groups and examine the effect on academic achievement.
2. Examine the different social support factors between the two groups, and their effect on academic achievement.
3. Use more measures of the motivational orientations of both groups to determine precisely which type of motivational orientation is prevalent in each group.

4. Measure the extent to which both groups of students are integrated within the NROTC department and its affect on academic achievement.
5. Replicate this study of veterans on a regional scale in the Southeast United States.
6. Use more measurable variables to explain the latent variables of maturity, motivation, and achievement using a structural equation model.

This study's findings and related literature indicate that no single factor can be found to predict academic achievement in traditional or non-traditional students. Just as Cross (1980) stated:

> No single profile can be regarded as representative of the adult learner, even when one looks at the small group of adults who choose to pursue academic credit. (p.77)

Previously cited literature also supports the idea that academic achievement is impacted as much by personal abilities to effectively cope with social integration into campus life as with academic ability. Tinto (1993) had some insight when he stated successful retention:

> …lies in the willingness of the institutions to involve themselves in the social and intellectual

> development of their students. That involvement and the commitment to students it reflects is the primary source of students' commitment to the institution and their involvement in their own learning. (p.6)

This study suggests that veteran students come to college better equipped for academic success. As an institution, it would be beneficial to develop programs that equip the student body with some of the same skills that these veteran students arrive with. A program could include things such as stress management, developing study skills, test taking skills, financial discipline, and social integration. This program could be developed and required for all new students in their first semester at the institution.

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APPENDICES

APPENDIX A

PARTICIPANT INFORMATION SHEET

AUBURN UNIVERSITY
NAVAL RESERVE OFFICERS TRAINING CORPS UNIT
AUBURN, ALABAMA 36849-5512

INFORMATION SHEET

For Research Study Entitled

An Examination of Observed Differences in Academic Performance between Active Duty Military Students and Non-Active Duty Military Students in a University Setting

You are invited to participate in a research study designed to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Understanding these relationships can assist the NROTC program in identifying different ways to foster these relationships in order to maximize academic performance among both groups. This study is being conducted by LT Robert J. Griffith, Associate Professor of Naval Science, under the supervision of Dr. James Witte, Associate Professor of Adult Education. This study hopes to learn predictors for the apparent differences in academic performance between active duty and non-active duty military students. You were selected as a possible participant because you are enrolled in the Naval Science department and are either an active-duty military student or non-active duty military student. You must be 19 years old or older to participate in this study.

If you decide to participate, I will administer one achievement skills inventory, one motivation questionnaire, and a demographic survey. The achievement skills inventory has two parts; math and verbal skills. Each section will have a 25 minute time limit. The demographic sheet and motivation questionnaire will take about 10 minutes to complete. The total time to complete all surveys is approximately 65 minutes. This will be a one time participation event.

Any information obtained in connection with this study will remain anonymous. Information collected through your participation may be used to fulfill an educational requirement for the degree of Doctor of Education, Education Specialist, published in a professional journal, and/or presented at a professional meeting. Participants may withdraw from participation at any time, without penalty, however, after providing anonymous information you will be unable to withdraw your data after participation, since there will be no way to identify individual information.

HUMAN SUBJECTS
OFFICE OF RESEARCH
PROJECT #05-174 EX 0508
APPROVED 8/9/05 TO 8/18/06

Your decision whether or not to participate will not jeopardize your future relations with Auburn University or the Auburn NROTC department.

If you have any questions I invite you to ask them now. If you have questions later, contact LT Robert J. Griffith at (334) 844-3432, e-mail griffrj@auburn.edu or Dr. James Witte, (334) 844-3054, e-mail wittejc@auburn.edu will be happy to answer them.

For more information regarding your rights as a research participant you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone(334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu .

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

Robert Griffith 8/25/05

Investigator's signature Date

HUMAN SUBJECTS
OFFICE OF RESEARCH
PROJECT # 05-174 EX 0508
APPROVED 8/19/05 TO 8/18/06

APPENDIX B

INSTITUTIONAL REVIEW BOARD (IRB)

Auburn University

Auburn University, Alabama 36849

Office of Human Subjects Research
307 Samford Hall

Telephone: 334-844-5966
Fax: 334-844-4391
hsubjec@auburn.edu

September 1, 2005

MEMORANDUM TO: Robert Griffith
EFLT

PROTOCOL TITLE: "An Examination of Observed Differences in Academic Performance Between Active Duty Military Students and Non-Active Duty Military Students in a University Setting"

IRB File: #05-174 EX 0508

APPROVAL DATE: August 19, 2005
EXPIRATION DATE: August 18, 2006

The referenced protocol was approved "Exempt" from further review under 45 CFR 46.101 (b)(2) by IRB procedure on August 19, 2005. You should retain this letter in your files, along with a copy of the revised protocol and other pertinent information concerning your study. If you should anticipate a change in any of the procedures authorized in this protocol, you must request and receive IRB approval prior to implementation of any revision. Please reference the above IRB File in any correspondence regarding this project.

If you will be unable to file a Final Report on your project before August 18, 2006, you must submit a request for an extension of approval to the IRB no later than August 1, 2006. If your IRB authorization expires and/or you have not received written notice that a request for an extension has been approved prior to August 18, 2006, you must suspend the project immediately and contact the Office of Human Subjects Research for assistance.

A Final Report will be required to close your IRB project file.

If you have any questions concerning this Board action, please contact the Office of Human Subjects Research at 844-5966.

Sincerely,

Niki L. Johnson, JD, MBA, Director
Office of Human Subjects Research
Research Compliance Auburn University

cc: William Spencer
James Witte

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS

RESEARCH PROTOCOL REVIEW FORM

For information or help completing this form, contact: **THE OFFICE OF HUMAN SUBJECTS RESEARCH**, 307 Samford Hall,
Phone: 334-844-5966 **e-mail:** hsubjec@auburn.edu **Web Address:** http://www.auburn.edu/research/vpr/ohs/index.htm

Complete this form using Adobe Acrobat Writer (versions 5.0 and greater).

1. **PROPOSED DATES OF STUDY:** **FROM:** 09/01/2005 **TO:** 09/01/2006

REVIEW TYPE (Check one): ☐ FULL BOARD ☐ EXPEDITED ☑ EXEMPT

2. **PROJECT TITLE:** An Examination of Observed Differences in Academic Performance Between Active Duty Military Students and Non-Active Duty Military Students in a University Setting

3.

Robert J. Griffith	Graduate Student	EFLT	844-3432	griffrj@auburn.edu
PRINCIPAL INVESTIGATOR	TITLE	DEPT	PHONE	E-MAIL

NROTC Department, W. F. Nichols Center, Auburn University, — 334-844-3428
ADDRESS FOR CORRESPONDENCE — FAX

4. **SOURCE OF FUNDING SUPPORT:** ☑ Not Applicable ☐ Internal ☐ External (External Agency): _____

5. **STATUS OF FUNDING SUPPORT:** ☐ Not Applicable ☐ Approved ☐ Pending ☐ Received

6. **GENERAL RESEARCH PROJECT CHARACTERISTICS**

A. Research Content Area

Please check all descriptors that best apply to this proposed research project.

- ☐ Anthropology
- ☐ Anthropometry
- ☐ Biological Sciences
- ☐ Behavioral Sciences
- ☑ Education
- ☐ English
- ☐ History
- ☐ Journalism
- ☐ Medical
- ☐ Physiology
- ☐ Other (Please list:) _____

Please list 3 or 4 keywords to identify this research project: _____

B. Research Methodology

Please check all descriptors that best apply to the research methodology.

Data collection will be: ☐ Prospective ☐ Retrospective ☑ Both

Data will be recorded so that participants can be directly or indirectly identified: ☐ Yes ☑ No

Data collection will involve the use of:

- ☑ Educational Tests (cognitive, diagnostic, aptitude, achievement)
- ☑ Surveys / Questionnaires
- ☐ Private Records / Files
- ☐ Interview / Observation
- ☐ Audiotaping and / or Videotaping
- ☐ Physical / Physiologic Measurements or Specimens

C. Participant Information

Please check all descriptors that apply to the participant population.

- ☑ Males
- ☑ Females

Vulnerable Populations

- ☐ Pregnant Women
- ☐ Children
- ☐ Prisoners
- ☐ Adolescents
- ☐ Elderly
- ☐ Physically Challenged
- ☐ Economically Challenged
- ☐ Mentally Challenged

Do you plan to recruit Auburn University Students? ☑ Yes ☐ No

Do you plan to compensate your participants? ☐ Yes ☑ No

D. Risks to Participants

Please identify all risks that may reasonably be expected as a result of participating in this research.

- ☐ Breach of Confidentiality
- ☐ Coercion
- ☐ Deception
- ☐ Physical
- ☐ Psychological
- ☐ Social
- ☑ None
- ☐ Other (please list): _____

For OHSR Office Use Only

DATE RECEIVED IN OHSR: _____ **by** _____ **PROTOCOL #** _____

DATE OF OHSR CONTENT REVIEW: _____ **by** _____ **DATE ASSIGNED IRB REVIEW:** _____ **by** _____

DATE OF IRB REVIEW: _____ **by** _____ **DATE IRB APPROVAL:** _____ **by** _____

INTERVAL FOR CONTINUING REVIEW: _____

7. **PROJECT ASSURANCES**

PROJECT TITLE: An Examination of Observed Differences in Academic Performance Between Active Duty Military Students and Non-Active Duty Military Students in a University Setting

A. PRINCIPAL INVESTIGATOR'S ASSSURANCE

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the Auburn University IRB.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with Auburn University policies regarding the collection and analysis of the research data.
4. I agree to comply with all Auburn policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:
   a. Conducting the project by qualified personnel according to the approved protocol
   b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Human Subjects Research (except in an emergency, if necessary to safeguard the well-being of human subjects)
   c. Obtaining the legally effective informed consent from each participant or their legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form
   d. Promptly reporting significant adverse events and/or effects to the Office of Human Subjects Research in writing within 5 working days of the occurrence.
5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise OHSR, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the Auburn University IRB.
7. I will prepare and submit a renewal request and supply all supporting documents to the Office of Human Subjects Research before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the Auburn University IRB.
8. I will prepare and submit a final report upon completion of this research project.

Robert J. Griffith	Robert J. Griffith	8/25/05
Principal Investigator (Please Print)	**Principal Investigator's Signature**	**Date**

B. FACULTY SPONSOR'S ASSSURANCE

1. By my signature as sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol.
2. I certify that the project will be performed by qualified personnel according to the approved protocol using conventional or experimental methodology.
3. I agree to meet with the investigator on a regular basis to monitor study progress.
4. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
5. I assure that the investigator will promptly report significant adverse events and/or effects to the OHSR in writing within 5 working days of the occurrence.
6. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the OHSR by letter of such arrangements.
7. I have read the protocol submitted for this project for content, clarity, and methodology.

Dr. James E. Witte	James E. Witte	8/25/05
Faculty Sponsor (Please Print)	**Faculty Sponsor's Signature**	**Date**

C. DEPARTMENT HEAD'S ASSSURANCE

By my signature as department head, I certify that every member of my department involved with the conduct of this research project will abide by all Auburn University policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants.

Dr. William Spencer	William R Spencer	8/29/05
Department Head (Please Print)	**Department Head's Signature**	**Date**

8. **PROJECT ABSTRACT: Prepare an abstract (400-word maximum) that includes: I.) A summary of relevant research findings leading to this research proposal; II.) A concise purpose statement; III.) A brief description of the methodology; IV.) Expected and/or possible outcomes, and V.) A statement regarding the potential significance of this research project.** ***Please cite relevant sources and include a "Reference List" as Appendix A.***

Naval Science Departments at universities across this country have two groups of students: Active duty and non-active duty students. Both groups of students have mirrored intellectual capacity as measured by their mean Scholastic Aptitude Test (SAT) scores and high school grade point averages (GPA). However, the active duty military student population performs superior with regards to academics and aptitude. Astin (1993) stated that "GPA, despite its limitations, appears to reflect the student's actual learning and growth during the undergraduate years" (p.242), thus making it an appropriate variable for measuring academic success.

The purpose of this study is to investigate possible relationships between academic success, autonomous motivation, age, marriage, and mental maturity. This study will administer two instruments to collect data for analysis: the Self Regulated Learning Questionnaire (SRQ-L) (Williams & Deci, 1996) and the Basic Achievement Skills Inventory (BASI) (Pearson Assessments, n.d.). This study uses path analysis to investigate these effects on academic achievement. Path analysis, sometimes referred to as causal structuring, is a specific regression technique that yields information about both the direct and indirect influence of antecedents on outcomes. The following research questions will be investigated:

1. What is the direct affect of autonomous motivation as measured by the SRQ-L on academic achievement?
2. What is the direct affect of mental maturity as measured by the BASI survey on academic achievement?
3. What is the indirect effect of age on academic achievement?
4. What is the indirect effect of military status on academic achievement?
5. What is the indirect effect of marital status on academic achievement?

Investigating these relationships can lend itself to a better understanding of the apparent differences in academic performance between these two groups of students. Additionally, this study can assist ROTC programs in identifying different ways to foster these relationships in order to maximize academic performance among both groups. The SRQ-L will be administered to measure autonomous motivation and the BASI will be administered to measure mental maturity. Other independent variables will be collected via a demographic survey.

9. **PURPOSE & SIGNIFICANCE.**

   a. **Clearly state all of the objectives, goals, or aims of this project.**

The purpose of this study is to investigate possible relationships between academic success, autonomous motivation, mental maturity, age, marital status, and military status. Investigating these relationships can lend itself to a better understanding of the apparent differences in academic performance between active duty and non-active duty military students. Additionally, understanding these relationships can assist ROTC programs in identifying different ways to foster these relationships in order to maximize academic performance among both groups.

   b. **How will the results of this project be used? (e.g., Presentation? Publication? Thesis? Dissertation?)**

The results will be used in my field project for Education Specialist degree.

10. **KEY PERSONNEL INVOLVED WITH DATA COLLECTION. Identify each individual involved with the conduct of this project and describe his or her roles and responsibilities related to this project. Be as specific as possible.**

Individual: Robert J. Griffith **Title:** Graduate Student **Dept/ Affiliation:** EFLT
Roles / Responsibilities:

Primary Researcher - responsible for administering the surveys and collecting and analyzing the data. Also responsible for maintaining security of the data.

Individual: James E. Witte **Title:** Associate Profess **Dept/ Affiliation:** EFLT
Roles / Responsibilities:

Research Advisor/ Major Professor - responsible for advising the primary researcher on data analysis methods and research material for use in project.

Individual: _____ **Title:** _____ **Dept/ Affiliation:** _____
Roles / Responsibilities:

Individual: _____ **Title:** _____ **Dept/ Affiliation:** _____
Roles / Responsibilities:

Individual: _____ **Title:** _____ **Dept/ Affiliation:** _____
Roles / Responsibilities:

11. **LOCATION OF RESEARCH. List all locations where data collection will take place. Be as specific as possible.**

Naval Science lab during the Fall 2005 and Spring 2006 semesters at Auburn University.

12. PARTICIPANTS.

a. **Describe the participant population you have chosen for this project.**

1) Active duty military students enrolled in the Naval Science Department at Auburn University.

2) Non-Active duty military students enrolled in the Naval Science Department at Auburn University.

There will be no participants under the age of 19 years old, thus parental consent is not required.

What is the minimum number of participants you need to validate the study? 100

What is the maximum number of participants you will include in the study? 100

b. **Describe the criteria established for participant selection. (If the participants can be classified as a "vulnerable" population, please describe additional safeguards that you will use to assure the ethical treatment of these individuals.)**

Subjects will be students within the Naval Science Department who are active duty veterans or NROTC scholarship recipients.

c. **Describe all procedures you will use to recruit participants.** ***Please include a copy of all flyers, advertisements, and scripts and label as Appendix B.***

Each student in Naval Science lab will be given a packet of materials by the primary researcher containing the information and information sheet, a demographic survey, the SRQ-L, and the BASI survey. After receiving the packet of materials, the students will be told to read the information sheet, participation in this study is strictly voluntary, and that there is no harm or risk involved. There are no grades assigned for the Naval Science Lab, so there is no negative impact for choosing not to participate. They will be told if they choose not to participate, then they are free to leave. The students will be told that I will be present in the lab period to answer any questions that may arise. The SRQ-L is not timed and should take less than 5 minutes to complete. The BASI survey is a timed survey with each section taking 25 minutes to complete. The total time to completion of the BASI is approximately 52 minutes. After completing the BASI survey, the students will have the remainder of the lab period (about 15-20 minutes) to complete the SRQ-L and the demographic survey.

What is the maximum number of potential participants you plan to recruit? 100

d. **Describe how you will determine group assignments (e.g., random assignment, independent characteristics, etc.).**

Students are divided into two independent groups: Active duty military and non-active duty military students.

e. **Describe the type and amount and method of compensation for participants.**

None

13. **PROJECT DESIGN & METHODS. Describe the procedures you will plan to use in order to address the aims of this study. (NOTE: Use language that would be understandable to a layperson. Without a complete description of all procedures, the Auburn University IRB will not be able to review protocol. If additional space is needed for #13, part b, save the information as a .pdf file and insert after page 6 of this form.)**

a. **Project overview. (Briefly describe the scientific design.)**

Three surveys (Demographic, SRQ-L, and BASI) are administered in Naval Science lab to collect data for use in a path analysis model.

b. **Describe all procedures and methods used to address the purpose.**

This study employs the use of an analytical method called path analysis. Path analysis, sometimes referred to as causal structuring, is a specific regression technique that yields information about both the direct and indirect influence of antecedents on outcomes. The endogenous variables for this analysis are grade point average (GPA), autonomous motivation (RAI), and mental maturity (MM). The exogenous variables for this study are age, marital status, and military status.

The purpose of the project is to investigate the following research questions:
1. What is the direct affect of autonomous motivation as measured by the SRQ-L on academic achievement?
2. What is the direct affect of mental maturity as measured by the BASI survey on academic achievement?
3. What is the indirect effect of age on academic achievement?
4. What is the indirect effect of military status on academic achievement?
5. What is the indirect effect of marital status on academic achievement?

The procedures for data collection were given in 12c.

c. **List all instruments used in data collection. (e.g., surveys, questionnaires, educational tests, data collection sheets, outline of interviews, scripts, audio and/or video methods etc.)** ***Please include a copy of all data collection instruments that will be used in this project and label as Appendix C.***

SRQ-L - The questionnaire is designed to determine what motivates students to learn in a particular setting.

BASI - The survey is used to estimate overall academic maturity in verbal and math skills.

Demographic Survey

d. **Data Analysis: Explain how the data will be analyzed.**

Path Analysis

14. **RISKS & DISCOMFORTS: List and describe all of the reasonable risks that participants might encounter if they decide to participate in this research.** ***If you are using deception in this study, please justify the use of deception and be sure to attach a copy of the debriefing form you plan to use and label as Appendix D.***

None

15. **PRECAUTIONS. Describe all precautions you have taken to eliminate or reduce risks that were listed in #14.**

Anonymous data collection to reduce risk of identification.

16. **BENEFITS.**

a. List all realistic benefits participants can expect by participating in this study.

None

b. List all realistic benefits for the general population that may be generated from this study.

It is important to study and understand information about why college students perform the way that they do, regardless of program of study. Any relationships uncovered by this study need to be reported to the facilitators and administrators of the NROTC program for use in determining student needs, any program changes, and fostering self-efficacy. This study will aid in identifying factors that can increase academic performance in ROTC programs, and help identify demographics for better recruitment and retention. Additionally, understanding these relationships can contribute to the literature in the field of self-determination theory, motivation, and adult education in general.

17. PROTECTION OF DATA.

a. Will data be collected as anonymous? ☑ Yes ☐ No *If "YES", go to part "g".*

b. Will data be collected as confidential? ☐ Yes ☐ No

c. If data is collected as confidential, how will the participants' data be coded or linked to identifying information?

d. Justify your need to code participants' data or link the data with identifying information.

e. Where will code lists be stored?

f. Will data collected as "confidential" be recorded and analyzed as "anonymous"? ☐ Yes ☐ No

g. Describe how the data will be stored (e.g., hard copy, audio cassette, electronic data, etc.), where the data will be stored, and how the location where data is stored will be secured in your absence.

The paper copies of the surveys and electronic copies of the results will be stored in a locked file cabinet in my office in W.F. Nichols center. I have the only key, and my office is locked when I am not present.

h. Who will have access to participants' data?

The researcher (Robert J. Griffith) and major professor(Dr. James Witte).

i. When is the latest date that the data will be retained?

Summer 2006

j. How will the data be destroyed? (NOTE: Data recorded and analyzed as "anonymous" may be retained indefinitely.)

APPENDIX C

DEMOGRAPHIC INFORMATION SHEET

Demographic Survey

Circle the correct answer or fill in the blank.

Sex: M or F

Married: Y or N

Age _____

Program: NROTC or STA-21/MECP

SAT score: _____

H.S. GPA: _____

Auburn CGPA: _____

Major: _____