

## ABSTRACT

Amy Theresa Shannon, ACADEMIC AND PSYCHOSOCIAL FACTORS INFLUENCING FEMALE CADETS' INTENT TO PERSIST IN RESERVE OFFICER TRAINING CORPS (ROTC) AND COMMISSION IN THE UNITED STATES AIR FORCE OR ARMY (Under the direction of Dr. Cheryl McFadden). Department of Educational Leadership, June 2013.

In spite of representation in enlisted ranks, women are underrepresented among top leadership positions within the military. As the largest commissioning source, ROTC plays a vital role in increasing the number of female military officers. There is substantial evidence that female cadets are retained at lower levels than male cadets during their first two years in the program. Therefore, the purpose of this study was to examine the influence of academic and psychosocial factors on female cadets' intent to persist in ROTC and commission in the United States Air Force or Army.

The study was predicated on Tinto's student integration theory and Maddi and Kobasa's theory of psychological hardiness. The Institutional Integration Scale and the Dispositional Resilience Scale-15 (version 3) were used to assess the effect of the predictor variables on cadets' intent to persist in ROTC towards commissioning. The research participants were freshmen and sophomore Army and Air Force ROTC cadets who had not accepted scholarships from the United States military in exchange for commissioning as officers after graduation or had a pre-existing service agreement with the military. Data were gathered from 280 ROTC cadets (89 of whom were female) enrolled at five public universities in spring 2013.

After controlling for gender, the *institutional and goal commitment* variable had a statistically significant effect on cadets' intent to persist in ROTC towards commissioning. When cadets were separated by gender, male cadets' intentions to persist in ROTC towards commissioning were influenced by their academic and intellectual development, while female cadets were influenced by their institutional and goal commitments. Results indicated that

cadets' gender did not influence their intent to persist in ROTC towards commissioning.

However, cadets' chosen military branch was found to influence their intent to persist in ROTC towards commissioning.

The study included various implications for ROTC personnel and college administrators. Some recommendations included assisting female cadets with the identification of academic and career goals, publicizing and encouraging male cadets to use academic services, and fostering partnerships between ROTC personnel and college administrators to promote student development and success. The study concluded with recommendations for future research.

ACADEMIC AND PSYCHOSOCIAL FACTORS INFLUENCING FEMALE CADETS'  
INTENT TO PERSIST IN RESERVE OFFICER TRAINING CORPS (ROTC) AND  
COMMISSION IN THE UNITED STATES AIR FORCE OR ARMY

A Dissertation

Presented to

The Faculty of the Department of Educational Leadership

East Carolina University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

by

Amy Theresa Shannon

June, 2013

ACADEMIC AND PSYCHOSOCIAL FACTORS INFLUENCING FEMALE CADETS'  
INTENT TO PERSIST IN RESERVE OFFICER TRAINING CORPS (ROTC) AND  
COMMISSION IN THE UNITED STATES AIR FORCE OR ARMY

by

Amy Theresa Shannon

APPROVED BY:

DIRECTOR OF DISSERTATION: \_\_\_\_\_  
Cheryl McFadden

COMMITTEE MEMBER: \_\_\_\_\_  
Michael Brown

COMMITTEE MEMBER: \_\_\_\_\_  
C. Steve Duncan

COMMITTEE MEMBER: \_\_\_\_\_  
David Siegel

INTERIM CHAIR OF THE DEPARTMENT OF EDUCATIONAL LEADERSHIP:

\_\_\_\_\_  
William Rouse, Jr.

DEAN OF THE GRADUATE SCHOOL:

\_\_\_\_\_  
Paul Gemperline

©Copyright 2013  
Amy Theresa Shannon

## **DEDICATION**

To Evan Joseph Shannon, who's been making the world a better, brighter, and funnier place since 2010.

## ACKNOWLEDGEMENTS

I would like to thank Dr. Cheryl McFadden for her unwavering support, encouragement, guidance, and feedback. Thank you for sharing my passion for my research topic--that had a profound effect on my confidence and motivation. I absolutely, unequivocally, and thankfully picked the right person as my dissertation chair! I would like to thank Dr. Brown for always having an open-door policy, ample patience, and honest feedback. Thank you for not giving me the answers, but challenging me to find the right path on my own. I would also like to extend my gratitude to Dr. Duncan for his insightful comments and expertise about the United States military. I admire your strength of character and thank you for your service to our country. Lastly, I would like to express thanks to Dr. Siegel for his attention to details, for asking probing questions, and for being a walking encyclopedia on higher education. You are the committee member who never failed to stump me on a question--but made me a better researcher by asking. To my entire committee, thank you for tolerating my nervousness during my dissertation proposal, believing in me, and making this entire process so rewarding.

I would like to thank Dr. Andrada Ivanescu for meeting with me several times and providing guidance through the difficult world of statistics. Your expertise and help was invaluable. I would also like to extend my thanks to Ms. Joyce Joines Newman who proofread my dissertation and caught so many mistakes that I overlooked. If any typos remain, I undoubtedly wrote them after Joyce's final edits.

I would like to thank my family for their love, encouragement, and support. To my parents, Wayne and Marty Miller, thank you for instilling in me the value of education at a young age and for challenging me always to do my best. I love you very much. To my in-laws,

Gene and Ann Shannon, thank you for loving me like one of your own children and for always being so gracious.

I would also like to express my gratitude to the Ronald E. McNair Postbaccalaureate Achievement Program. I was fortunate to be a part of the program in 1996, and through the McNair program I realized my academic potential and set my sights on one day obtaining my doctorate degree. Thank you McNair for helping me realize that before I could make a dream come true, I must first have one.

To all of the cadets who participated in my study, thank you for your honest feedback and consummate professionalism. I wish you all the best in your future endeavors.

I would like to thank my best friend and husband, Brian, for being my biggest supporter. I could not have done this without his encouragement, support, love, patience, and faith. He believed in me when I didn't believe in myself.

I would like to thank my son, Evan, for his love and for helping me realize what is important in life. Also, thank you for keeping me awake in statistics by kicking me when *in utero*. I dedicate this all to you.

Lastly, I would like to thank God for the many blessings in my life. Through Him all things are possible.



## TABLE OF CONTENTS

LIST OF TABLES .....	xiii
LIST OF FIGURES .....	xiv
CHAPTER ONE: INTRODUCTION.....	1
Background of Problem .....	5
Statement of Problem.....	9
Purpose of Study .....	12
Conceptual Framework.....	14
Research Questions.....	16
Significance of Study .....	19
Definition of Terms.....	19
Assumptions.....	21
Scope and Delimitations .....	22
Limitations .....	22
Organization of Study .....	23
CHAPTER TWO: REVIEW OF THE LITERATURE.....	24
Student Persistence in Higher Education.....	24
Academic Performance.....	25
Student Engagement .....	28
Interactions with Faculty Members and Peers .....	29
Student Motivation and Commitment.....	31
Psychological Hardiness .....	33

Retention of Women in Higher Education.....	36
Self-Beliefs .....	38
Social Support.....	39
University Comfort.....	40
History of Women in the United States Military .....	41
Retention of Women in the United States Military .....	45
Retention of Women in ROTC .....	49
Summary .....	51
CHAPTER THREE: METHODS .....	52
Research Design.....	52
Research Questions.....	53
Threats to Validity .....	55
Maturation.....	56
Testing/Response Bias.....	56
Nonrandom Sample Selection.....	56
Sample Size.....	57
Generalizability.....	57
Participants.....	58
Instrumentation .....	61
Instrument Validity .....	62
Data Preparation.....	67
Assumptions.....	67
Data Analysis .....	69

Summary .....	73
CHAPTER FOUR: RESULTS .....	75
Demographic Profile of Respondents .....	75
Data Analysis .....	75
Summary .....	100
CHAPTER FIVE: DISCUSSION.....	101
Findings of the Study .....	101
Research Questions #1 and #5 .....	101
Research Questions #2 and #6 .....	103
Research Question #3 .....	104
Research Question #4 .....	105
Research Question #7 .....	105
Research Question #8 .....	107
Theoretical Framework.....	108
Implications for ROTC Personnel and College Administrators .....	110
Recommendations for Future Research .....	113
Summary .....	116
Conclusion .....	118
REFERENCES .....	120
APPENDIX A: FREEDOM OF INFORMATION ACT AFROTC REQUEST (CASE 2012-03089-F).....	145
APPENDIX B: REQUEST FOR ARMY ROTC RETENTION STATISTICS .....	148
APPENDIX C: UNITED STATES ARMY CADET COMMAND UNCLASSIFIED RETENTION RATES .....	149

APPENDIX D: PERMISSION LETTER .....	159
APPENDIX E: EMAIL TO SCHEDULE CAMPUS VISIT.....	160
APPENDIX F: SCHEDULE OF CAMPUS VISITS.....	161
APPENDIX G: PARTICIPANT RECRUITMENT/DATA COLLECTION SCRIPT .....	163
APPENDIX H: INFORMED CONSENT TO PARTICIPATE IN RESEARCH .....	165
APPENDIX I: U.S. AIR FORCE RESEARCH INSTITUTE EXEMPTION .....	168
APPENDIX J: DEPARTMENT OF THE AIR FORCE MEMORANDUM FOR DETACHMENTS.....	171
APPENDIX K: U.S. ARMY RESEARCH INSTITUTE EXEMPTION .....	172
APPENDIX L: NOTIFICATION OF EXEMPT RESEARCH CERTIFICATIONS .....	174

## LIST OF TABLES

1. Actual and Projected Numbers for Bachelor’s Degrees Conferred by Postsecondary Degree-Granting Institutions, by Sex of Recipient: 2009-2021 .....	37
2. Classification of Outcome and Predictor Variables in Study .....	54
3. Number of Female Freshmen/Sophomore ROTC Cadets in North Carolina State Institutions as of October 2012.....	60
4. Maximum and Minimum Measures for Study Instruments .....	68
5. Demographic Profile of Study Participants .....	76
6. Bivariate Relationships between Cadets’ Intent to Persist and Explanatory Variables.....	78
7. Summary Statistics for Explanatory Variables.....	79
8. Bivariate Associations between Quantitative Study Variables.....	81
9. Multivariate Logistic Regression: Odds Ratios and Confidence Intervals.....	82
10. Logistic Regression Model Summary.....	84
11. Results of Analysis of Variance (ANOVA).....	86
12. Crosstabulations of Cadets’ Intent to Persist Based on Gender.....	87
13. Bivariate Relationships between Male/Female Cadets’ Intent to Persist and Explanatory Variables .....	89
14. Summary Statistics for Explanatory Variables by Gender .....	91
15. Bivariate Associations between Quantitative Variables in Study by Gender.....	92
16. Multivariate Logistic Regressions by Gender: Odds Ratios and Confidence Intervals.....	94
17. Logistic Regression Model Summary by Gender .....	96
18. Results of Analysis of Variance (ANOVA) by Gender.....	98
19. Crosstabulations of Cadets’ Intent to Persist Based on Military Branch.....	99

## **LIST OF FIGURES**

1. Female Shares of Enlisted Personnel and Officers, by Service and Rank, September 2008.....	3
2. Theoretical Model for Factors Influencing Female Cadets' Intent to Persist in ROTC.....	17

## CHAPTER ONE: INTRODUCTION

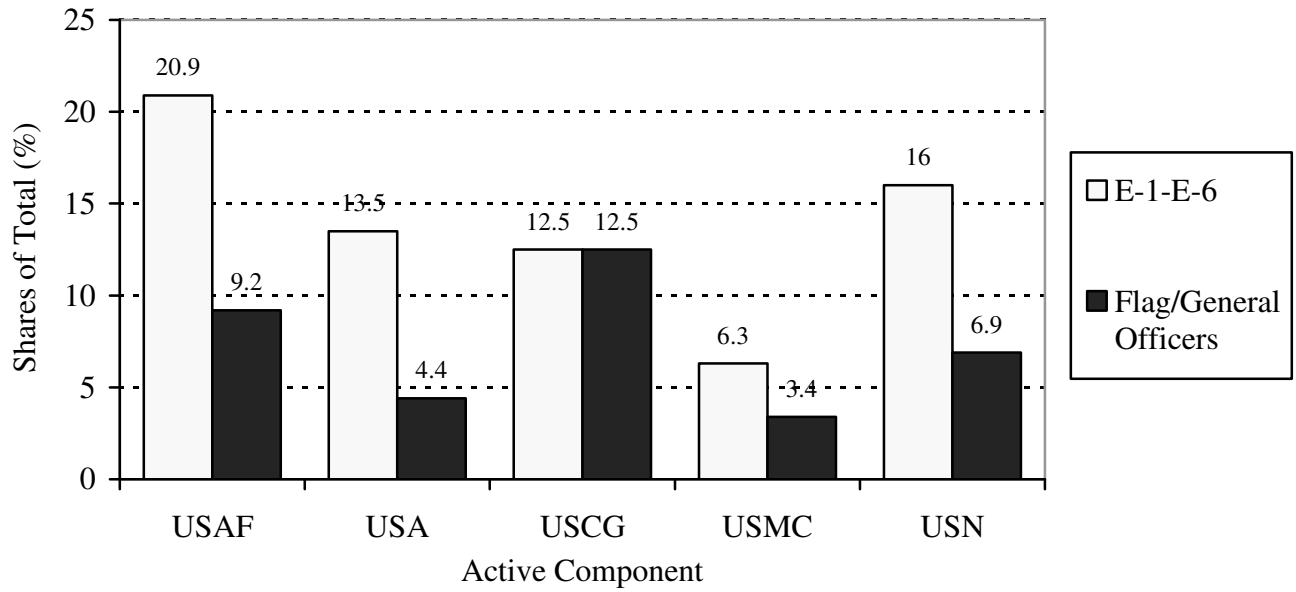
Throughout history, structural impediments made on the basis of gender have generally excluded women from the military and specifically from battle (Monahan & Neidel-Greenlee, 2010; Skaine, 2011). Nevertheless, authors Monahan and Neidel-Greenlee (2010) state, “feelings of patriotism have never been an exclusive attribute of the male heart” (p. xv). In spite of common societal values that limited females to domestic roles and tasks, women have fought their enemies in defense of their country and joined in combat, sometimes as leaders, at other times as political dignitaries, and often as ground soldiers (Monahan & Neidel-Greenlee, 2010; Skaine, 2011). One does not have to look far in American history to discover women who have volunteered to serve their nation during times of war. A study of conflicts from the Revolutionary War to the present reveals women who served the military as nurses, laundresses, manufacturers, cooks, and even soldiers (Evans, 1997; Greenwald, 1980; Kerber, 1976; Monahan & Neidel-Greenlee, 2010; Norton, 1980).

As the United States evolved and witnessed economic, political, social, and moral reform, an increased number of women began participating in domains previously defined as male (Herbert, 1998; McGovern, 1968; Schneider & Schneider, 1993). The shift in norms, combined with societal needs and the disruptive impact of war, resulted in women redefining their role in society (Greenwald, 1980). Subsequently, significant court and legislative action was taken after World War II to grant women permanent status in the United States military (Monahan & Neidel-Greenlee, 2010). In 1948, the Women’s Armed Services Integration Act granted women permanent status in the regular and reserve forces of all branches of the military, and in 1976 women were allowed to join the Reserve Officer Training Corps (ROTC) where they currently comprise twenty percent of all cadets (“Army ROTC,” 2011).

While many obstacles to admitting women to branches of the United States military have been removed by court proceedings and legislative actions, a complementary shift in the creation of military leadership in which women are well represented has been delayed (Military Leadership Diversity Commission [MLDC], 2011). The Armed Forces seeks to develop a continuous stream of leaders who are as diverse as the United States and reflect the demographics of the enlisted troops they lead (MLDC, 2011). In spite of representation in enlisted ranks (women represent approximately 13% of E1-E6 personnel within all branches of the Armed Forces), women are underrepresented among top leadership positions within the military and on average represent less than 8% of flag/general officers (O7 and higher) within all branches of the military (MLDC, 2011; Skaine, 2011) (see Figure 1).

The United States military needs effective and diverse leaders in order to direct the power of the troops successfully, protect national security, and instill pride among service members. According to the MLDC (2011), service members' vision for their career is largely shaped by whether they see officers with similar backgrounds excelling in the Armed Forces and being recognized for their dedication and service. Further, the performance of the military is influenced by service members' beliefs that they are provided equal opportunities and are treated fairly regardless of their gender or ethnicity (MLDC, 2011). An example of the military's dedication to having and maintaining a diverse officer corps can be found in the consolidated brief from Lt. Gen. Julius W. Becton, Jr. et al. (2003) as *amicus curiae* to the Supreme Court of the United States in support of the respondents in *Grutter v. Bollinger* (2003) and *Gratz v. Bollinger* (2003) regarding the University of Michigan Law School and undergraduate affirmative action admissions policies. The *amici curiae* submitted a legal opinion that the court of appeals' decisions in *Grutter v. Bollinger* and *Gratz v. Bollinger* must be affirmed because





*Figure 1.* Female Shares of Enlisted Personnel and Officers, by Service and Rank, September 2008. Adapted from MLDC (2001).

racial diversity in higher education is a compelling interest. Furthermore, the *amici curiae* posited:

The government's compelling interest in promoting racial diversity in higher education is buttressed by its compelling national security interest in a cohesive military. That requires both a diverse officer corps and substantial numbers of officers educated and trained in diverse educational settings, including the military academies and ROTC programs. (p. 8)

The *amici curiae* provided justification for the race and gender-conscious recruiting, preparatory, and admissions policies in ROTC programs and at the service academies. In addition, the brief illustrated the Armed Forces' compelling interest in promoting diversity in the general officer corps.

As the largest commissioning source in the United States military, ROTC plays a vital role in increasing the number of female military officers (Johnson, 2002; U.S. Army, 2011). The mission of the organization is to provide military and leadership training at schools and institutions of higher education (Leal, 2007; Mahan, 1976). In 1916, President Woodrow Wilson signed the National Defense Act creating the Army ROTC ("Army ROTC," 2011; Leal, 2007). Although successful as a recruitment tool for the Armed Forces, the program has experienced fluctuating enrollment throughout the years. Enrollment in the program at its inception was strong due to ROTC becoming a required part of the curriculum for all male students in land-grant institutions (Leal, 2007; Mahan, 1976). During World War II, ROTC was suspended in favor of short-term training programs for military officers. However, after Pearl Harbor the availability of ROTC-trained officers was credited with the swift mobilization of the military, and the program was reinstated (Leal, 2007). In the early 1960s conditions changed again when

many institutions of higher education removed compulsory ROTC involvement, and enrollment numbers declined (Leal, 2007; Mahan, 1976). In spite of this, the onset of the Vietnam War increased enrollment in the program as college men chose ROTC as an alternative to enlisted service (Mahan, 1976). After the All-Volunteer Force was implemented in 1973, the military again faced the challenge of attracting and retaining students in the program. The success of ROTC after this time period can be attributed to several factors as such as loosened uniform, haircut, and drill regulations. In addition, a recruitment campaign was launched that centered on opportunities and scholarships, minority students, and women (Leal, 2007).

The United States military seeks to develop a general officer corps that is representative of the enlisted troops they lead (see Figure 1). Despite ROTC's noteworthy record of producing officers, there is substantial evidence that female cadets are retained at lower levels than male cadets during their first two years in the program (Department of the Air Force, 2012; Department of the Army, 2012) (see Appendices A, B, and C). The purpose of this study was to examine the influence of academic and psychosocial factors on female cadets' intent to persist in ROTC and commission in the United States Air Force or Army and to consider how retention of female cadets could be improved.

### **Background of Problem**

Throughout history societies have existed only with the protection of a military (Andrews, 1918). Military service is a vital component of a democracy because the liberties of the people must be defended and protected (Bergman, 1996). Military personnel serve the country by winning the nation's wars, mediating peacekeeping endeavors, and providing disaster relief in times of need (Bassett, 2004; Horner, 1995; Yeakey, 2002). The cornerstone of the military's success is highly effective leaders who can direct and control the power of the troops.

These highly specialized leaders must understand the goals of the organization and be able to articulate a strategic vision to the soldiers they lead (Andrews, 1918; Bergman, 1996; Ulmer, 1998). Effective military leaders increase individual and group productivity, effectiveness, and efficiency (Pritchard, 1999). They develop trust among the troops, build teams, inspire confidence, and rationalize sacrifice (Ulmer, 1998; Yeakey, 2002). Ultimately, the United States military needs effective leadership in order to continue to develop and improve (Kohn, 1998; Kucharek, 2007; Moilanen & Craig, 2000).

In order to conduct more disparate missions in the future, the United States military needs diverse leaders with a wide range of knowledge, skills, and backgrounds (Baldwin & Rothwell, 1993; Eagly & Chin, 2010; Kohn, 1998; Vecchio & Brazil, 2007). For example, the military possesses complex cyber systems that require intricate utilization and defense. These systems obscure the line between combat and noncombat situations, and military leaders must work collaboratively with critical stakeholders and international partners to ensure the security and proper utilization of these systems (MLDC, 2011). These collaborations require top military leaders to have greater cultural, regional, and foreign-language skills (MLDC, 2011). To address these challenges, ethnic divisions among officers must be embraced and gender diversity must be supported (MLDC, 2011). In fact, the Department of Defense (DoD) and members of Congress have made diversity in officer ranks a priority (Lim, Cho, & Curry, 2008; Lubold, 2006; MLDC, 2011).

However, military representation is an old issue (Armor, 1996; Kohn, 1998; Lim, Marquis, Hall, Schulker, & Zhuo, 2009; MLDC, 2011). Throughout history the general populace has possessed legitimate trepidation about the motivations and allegiances of a military that is homogenous. A broadly representative military in a democracy is believed to represent

the legitimate concerns of all citizens (Kohn, 1998; Lim et al., 2009; MLDC, 2011). Diverse military personnel are judged to uphold national values and to be loyal to the government, while perceptions of a non-inclusive military leadership can estrange the military from the general populace (Armor, 1996). In addition, studies have shown that developing and maintaining qualified and demographically diverse leadership within the military are critical to the effectiveness of missions (Lim et al., 2008; MLDC, 2011). Military leadership that reflects the service members being led instills pride among the troops and increases military agility and responsiveness (Kark & Eagly, 2010). From a practical standpoint, increasing gender representation within the officer corps provides the military with an expanded pool of candidates from which to recruit. There must be a continuous replacement of departing service members, and a lack of aspiring officers can pose a threat to national security (Card & Farrell, 1983; Meese, 2008; McIlwaine, 2009; MLDC, 2011).

One impetus for the increase in female representation among senior military officers occurred in May 2005 when Secretary of Defense Donald Rumsfeld issued a directive to all branches of the United States military to improve the representation of minorities and women among senior military leadership to reflect the demographics of enlisted personnel (Lim et al., 2009; Lubold, 2006). According to Lim et al. (2009):

The government has historically argued that representation of minority groups is important because it demonstrates that the public policy realm is open to and representative of all people. In addition, DoD is concerned that no particular group should bear the costs and sacrifices of military service unequally. (p. 1)

Members of Congress and the DoD responded to the directive and made diversity among senior leaders a political priority. The precedence of Rumsfeld's directive led to questions regarding

why the number of women among the officer corps should be increased. Proponents of increased gender representation state that having more women as senior officers helps the Armed Forces avoid the negative consequences that accompany a lack of equal opportunity (real or perceived). The country has witnessed a growing acceptance of women serving as leaders within the greater society as well as within the military (Moore & Webb, 2000; Segal & Segal, 2004). However, women are currently underrepresented among top leadership positions within all branches of the military, and increasing these numbers will reflect equity of opportunity for female soldiers (Baldwin & Rothwell, 1993; Burrelli, 2012; MLDC, 2011). Advocates of increased female representation within the general officer corps also state that diversity among the leadership widens the range of views during decision making (Baldwin & Rothwell, 1993). Female representation among leaders will ensure that the military's decisions reflect the broader interests of the country, including underrepresented groups. Despite opponents' cautions, the integration of women within military units has not had a major effect on unit readiness, cohesion, or morale (Harrell & Miller, 1997). In addition, the replacement of the draft with an all-volunteer force has exacerbated the personnel needs of the United States military (Card & Farrell, 1983; McIlwaine, 2009; Meese, 2008; MLDC, 2011). Women represent a large and important pool of candidates for the recruitment of future military officers.

In order to meet the needs of the ever-changing military, fulfill former Secretary of Defense Donald Rumsfeld's directive to increase gender representation among the military's senior leadership, and develop a general officer corps that is reflective of the enlisted troops, the Armed Forces must focus on the recruitment, training, and retention of individuals who can become future senior leaders (MLDC, 2011). Commissioned officers in the Armed Forces are employed in leadership roles or in highly specialized fields that require professional degrees. An

interested individual must choose among four options to become an officer: attend a military college or senior military academy, enroll at a four-year college or university and participate in ROTC, attend Officer Candidate School after completing a four-year degree, or receive a direct commission from the military after earning a professional degree (“Army ROTC,” 2011).

Among these four options, ROTC has emerged as the top commissioning source for the United States military (Johnson, 2002; U.S. Army, 2011). The organization provides the military with a large number of well-educated officers who have received a diverse, self-disciplined civilian education along with centralized leadership development training (Johnson, 2002; Leal, 2007; Neiberg, 2000; U.S. Army, 2011; Wilson, 2009). ROTC enrolls both male and female cadets who are racially and ethnically diverse, and graduates of the program have possessed great efficacy for leadership and proven themselves in times of war and peace (Johnson, 2002; Leal, 2007; Wiedemann, 2005; Wilson, 2009). Although ROTC is successful in producing officers for the United States military, the organization experiences a high level of attrition of female cadets during their first two years in the program. A high attrition level of female cadets hinders the Armed Forces’ ability to produce a female general officer corps that is representative of the enlisted troops.

### **Statement of the Problem**

Women are currently underrepresented among top leadership positions within all branches of the United States military, accounting for only 4.4% of the Army’s general officer corps, 9.2% of Air Force general officers, 12.5% of Coast Guard general officers, 6.9% of Navy general officers, and 3.4% of Marine Corp general officers (MLDC, 2011; Skaine, 2011; U.S. Army, 2011; U.S. Air Force, 2011; U.S. Navy, 2012). Former Secretary of Defense Donald Rumsfeld, the DoD, members of Congress, and sectors of the general population have expressed

concern about the scarcity of women in top military leadership positions and have advocated for the general officer corps to be representative of the enlisted troops they lead (MLDC, 2011) (see Figure 1). All branches of the military have been charged with evaluating and assessing policies that provide opportunities for the advancement and promotion of female members in the Armed Forces (Lim et al., 2008; Lubold, 2006; MLDC, 2011).

The military promotes leaders from within the organization; therefore, the leaders of the future are developed and selected from today's recruits (Meese, 2008; MLDC, 2011). As the largest commissioning source of officers for the United States military, ROTC plays a vital role in meeting the directives set forth by the military's prominent stakeholders (Johnson, 2002; U.S. Army, 2011). Although ROTC has a noteworthy record of producing well-educated, highly effective, and socially responsible leaders, female cadets discontinue involvement in ROTC at higher levels than their male counterparts. Subsequently, the attrition of female ROTC cadets hinders the Armed Forces' directive to increase representation of women among general officers and to produce a general officer corps that is representative of the enlisted troops.

The low retention rates of females in Air Force and Army ROTC are exacerbated by the fact that enrollment numbers of female cadets are lower than male cadets (Department of the Air Force, 2012; Department of the Army, 2012). In 2011, 2,909 females were enrolled in Air Force ROTC and constituted 23.7% of all cadets. That same year, 461 female lieutenants were commissioned from Air Force ROTC, compared to 1,481 male lieutenants (Department of the Air Force, 2012). In addition to lower enrollment and graduation numbers, the average attrition rate of female cadets in the program by their second year was 48% (see Appendix A). Similarly, statistics from Army ROTC show lower enrollment numbers and lower retention rates of female cadets compared to male cadets (see Appendices B and C). Army ROTC has more than 20,000



members, and women constitute 20% of all cadets (“Go Army,” 2012). The average retention rate of female cadets in Army ROTC during their first year is 40.73% compared to 49.36% for male cadets. Furthermore, the average retention rate of second-year female cadets is 58.23%, compared to 64.05% for male cadets (Department of the Army, 2012).

In an attempt to understand why women refrain from, join, or fail to persist in the Armed Forces, past researchers have explored the experiences of women who enter male-dominated areas such as the military (Acker, 1990; Card & Farrell, 1983; Cheatham, 1984; Herbert, 1998; Larwood, Glasser, & McDonald, 1980; Robinson Kurpius & Lucart, 2000; Zeigler & Gunderson, 2005). Societal constructs of gender, sex discrimination, differences in promotions and incomes between men and women, as well as familial ties and responsibilities have been studied to explain high attrition rates among female soldiers (Cheatham, 1984; Herbert, 1998; Monahan & Neidel-Greenlee, 2010; Robinson Kurpius & Lucart, 2000; Skaine, 2011). However, limited research has addressed the factors that influence female cadets’ intent to persist in ROTC and commission in the military. The study completed by Johnston (2010) is the most applicable research to the present study. Johnston examined the influence of the psychosocial factors of peer-group interaction, institutional and goal commitment, academic/intellectual development, and the psychological factor of hardiness on ROTC cadets’ intent to persist in higher education. However, her study did not specifically focus on psychosocial factors that influence cadets’ intent to persist in ROTC or include comparisons between male and female cadets. Additionally, her study did not examine the influence of the cadets’ interactions with their ROTC faculty or ROTC faculty concern for student development and teaching on the students’ intent to persist in ROTC. Therefore, further research needed to be conducted to understand why retention rates

differed between male and female ROTC cadets by studying the academic and psychosocial factors that influenced cadets' intent to persist in ROTC and commission in the military.

### **Purpose of Study**

In recent decades, the United States military has endeavored to become an inclusive organization by increasing representation of racial/ethnic minorities and women among senior leadership (MLDC, 2011). Despite the organization's successes, "the Armed Forces have not yet succeeded in developing a continuing stream of leaders who are as diverse as the Nation they serve" (MLDC, 2011, p. vii). In terms of representative percentages of senior military leadership positions, women are underrepresented as compared to their representation within the enlisted ranks (MLDC, 2011; Skaine, 2011; U.S. Air Force, 2011; U.S. Army, 2011) (see Figure 1). ROTC plays a pivotal role in helping the Armed Forces increase representation of women among top military leaders (Johnson, 2002; U.S. Army, 2011). However, statistics show that female ROTC cadets are less likely than their male counterparts to continue involvement in the organization (Department of the Air Force, 2012; Department of the Army, 2012) (see Appendices A, B, and C).

In response to the limited amount of research conducted on factors influencing female cadets' intent to persist in ROTC, the purpose of this study was to examine the influence of the social and academic factors of intellectual/academic development, peer group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, goal/institution commitment, and the psychological factor of hardiness on female cadets' intent to persist in ROTC and commission in the United States Air Force or Army. The study included United States Army and Air Force ROTC cadets enrolled at five southeastern universities. The students' perceptions regarding academic integration factors, social integration factors, and

psychological hardiness were assessed as they related to the students' intent to persist in ROTC. The research participants were freshmen and sophomore cadets who had not accepted scholarships from the United States military in exchange for commissioning as officers after graduation and who did not have a pre-existing service agreement with the Armed Forces. The universities that participated in the study consisted of: (a) a large public university (enrollment of approximately 27,000 students) which was primarily nonresidential and designated a doctoral/research university; (b) a medium-sized public university (enrollment of approximately 6,000 students) which was primarily residential and designated a master's university; (c) a large public university (enrollment of approximately 33,000 students) which was a land-grant institution, primarily residential, and designated a research university with very high research activity; (d) a large public university (enrollment of approximately 28,000 students) which was primarily residential and designated a research university with very high research activity; and (e) a large public university (enrollment of approximately 24,000 students) which was primarily residential and designated a doctoral/research university (Carnegie Foundation for the Advancement of Teaching, 2010). The influence of the predictor variables on the outcome variable (cadets' intent to persist in ROTC and commission as officers in the United States Air Force or Army) was analyzed through odds ratios, crosstabulations, and logistic regressions. The predictor variables within the study included peer group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic/intellectual development, goal/institution commitment, and the psychological factor of hardiness (which included the subscales of commitment, control, and challenge).

## Conceptual Framework

Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness provided the conceptual framework for this study. A substantial amount of research on college student retention has found that academic integration, social integration, institutional factors, and the psychological construct of hardiness affect students' retention in higher education (ACT, 2004; Bean, 2005; Braxton, Hirschy, & McClendon, 2004; Braxton & Lien, 2000; Eaton & Bean, 1995; Hausmann, Scholfield, & Woods, 2007; Johnston, 2010; Lifton et al., 2006; Pascarella & Terenzini, 1980, 2005; Tinto, 1986, 1993). Amid all this research, Tinto's student integration theory has emerged as a valid predictive model of student persistence in higher education and suggests that academic integration, social integration, institutional commitment, and goal commitment exert the highest effects on a student's persistence in higher education (Cabrera, Nora, & Castañeda, 1993; Knight, 2002; Pascarella & Chapman, 1983; Terenzini, Lorange, & Pascarella, 1981). Tinto recognizes that students attend college with different goals, as well as a range of characteristics such as sex, race, and academic ability. The theory postulates that all of these factors influence how the student will perform in college, interact and integrate into the college's social and academic systems, formulate commitment to the institution, and pursue goals associated with graduation (Tinto, 1993). According to Pascarella and Terenzini (1980), "as [a student's] level of institutional and goal commitment increases there is a corresponding increase in the likelihood of persisting at the institution" (p. 62). The Institutional Integration Scale (IIS) designed by Pascarella and Terenzini and revised by French and Oakes (2004) was used to measure the predictive validity of Tinto's model of academic and social integration. The integration variables relevant to students' intent to persist in ROTC and commission in the United States military, which were assessed through IIS,

included peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic/intellectual development, and institutional/goal commitment (Pascarella & Terenzini, 1980).

Maddi and Kobasa's (1984) theory of psychological hardiness was the second component of the conceptual framework for this study. Their theory postulates that people with hardy personalities possess a high level of commitment to life and work, feel a greater sense of control over their circumstances, and are more open to change and challenges (Bartone, 1995).

Individuals with hardy personalities also view stressful and painful experiences as a normal part of life (Maddi & Kobasa, 1984). Bean and Eaton (2000) studied psychological characteristics that relate to students' intent to persist in higher education and found that successful students interacted within the institutional environment. These interactions resulted in positive self-efficacy, reduced stress, and an internal locus of control (psychological hardiness). The results of Bean and Eaton's research, along with research conducted by Lifton et al. (2006) and Lifton, Seay, and Bushko (2004), show positive correlations between students' psychological hardiness and their persistence to graduation from institutions of higher education. The Dispositional Resilience Scale-15 DRS15-R (version 3) created by Bartone (2007) was used to assess the research participants' psychological hardiness. This scale has demonstrated validity with several different samples and has proved to be a reliable measure of hardiness (Bartone, 2007; Funk, 1992).

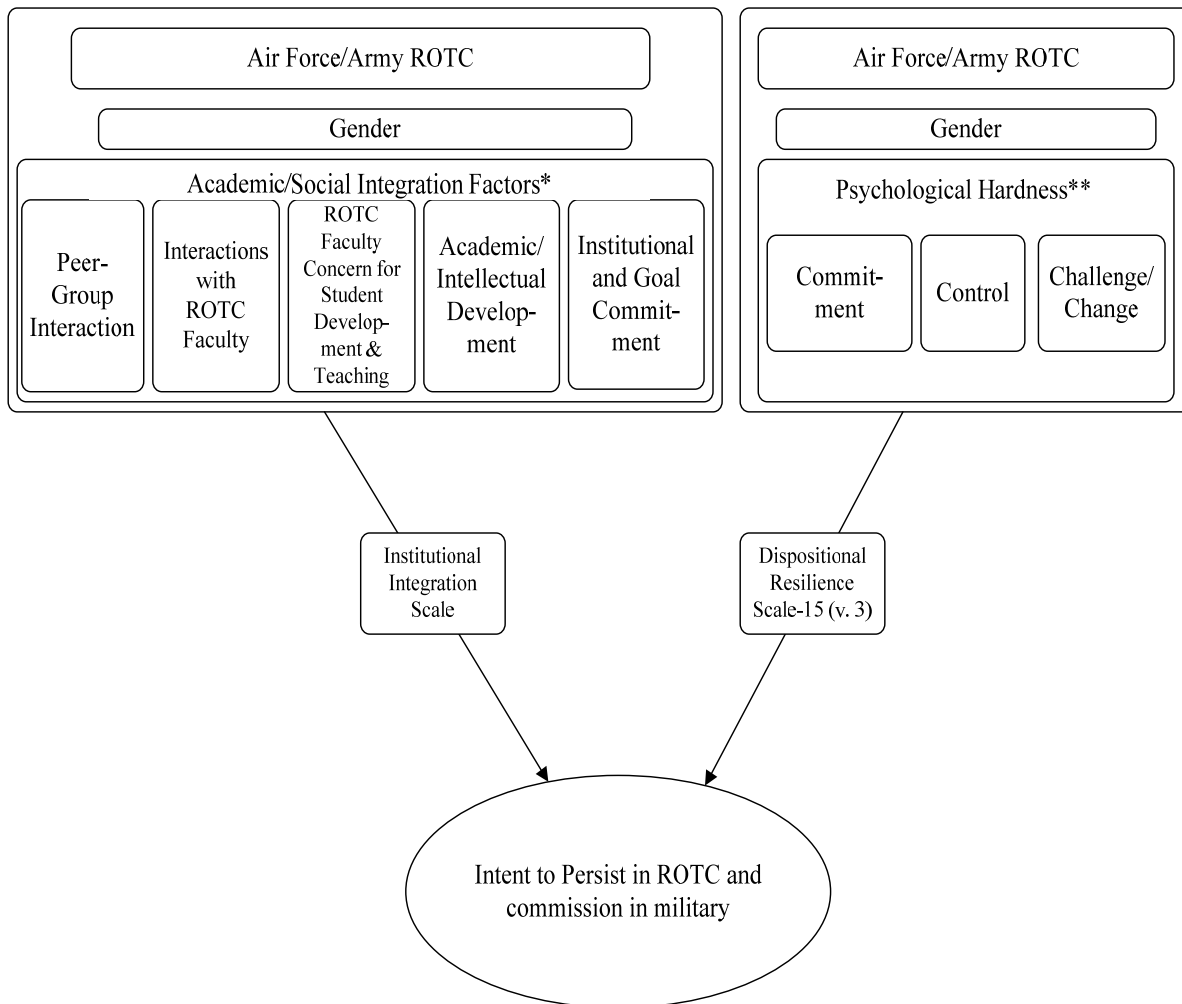
Given that ROTC cadets are simultaneously enrolled in higher education, the factors identified by Tinto (1986) and Maddi and Kobasa (1984) as influential to students' persistence were therefore applicable to this unique group of students. Involvement in ROTC provides cadets with avenues for both academic and social integration at their institution, tests their

psychological hardiness, and exposes them to institutional factors which have been deemed to affect student retention. Cadets can become academically integrated within the institution through interactions with their ROTC faculty and enrollment in weekly, required ROTC courses. ROTC cadets can also become socially integrated through involvement in ROTC-sponsored activities such as required physical training (PT) and weekly leadership labs. Lastly, the psychological hardiness of each cadet is challenged through the strenuous academic and physical requirements of ROTC. Cadets are constantly tested to assess their leadership skills, potential, physical capabilities, and intellectual aptitude because ROTC scholarships are awarded only to cadets who excel in all of these areas.

The model for the conceptual framework used for the study is presented in Figure 2. The outcome variable for the study was the students' disclosed intent to persist in ROTC (which also required persistence in higher education) and commission as an officer in the United States Air Force or Army. Intent to persist in higher education has been found to be strongly correlated with actual persistence to graduation (Okun, Benin, & Brandt-Williams, 1996; Porter & Swing, 2006; Savage & Smith, 2008). The factor "Army/Air Force ROTC" was included to determine if there were any differences between cadets in these two military branches. The factor "gender" was also included to assess if there were any differences between male and female cadets involved in the study.

### **Research Questions**

This study examined the following research questions which were focused on Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness:



*Figure 2. Theoretical Model for Factors Influencing Female Cadets' Intent to Persist in ROTC and Commission in the United States military.*

*Note.* \* = Tinto's student integration theory (1986); \*\* = Theory of Psychological Hardiness (Maddi & Kobasa, 1984). Adapted from Johnston, S. M. (2010). *Factors influencing intent to persist in higher education of participants in U.S. Army reserve officer training corps (ROTC) programs* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 758436316).

1. What is the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and each of the predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, and psychological hardiness [which includes the subscales of commitment, control, and challenge])?
2. What are the associations between the study's predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, psychological hardiness [which includes the subscales of commitment, control, and challenge])?
3. Which of the predictor variables influence the likelihood of cadets' intent to persist in ROTC and commission in the United States military?
4. Is there a significant relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and gender?
5. What is the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and each of the predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, and psychological hardiness [which includes the subscales of commitment, control, and challenge]) by gender?
6. What are the associations between the study's predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student



- development and teaching, academic and intellectual development, institutional and goal commitment, and psychological hardiness [which includes the subscales of commitment, control, and challenge]) by gender?
7. Which of the predictor variables influence the likelihood of male/female cadets' intent to persist in ROTC and commission in the United States military?
  8. Is there a significant relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and the cadets' military branch (Army or Air Force)?

### **Significance of Study**

This study provided a better understanding of the academic and psychosocial factors that influenced female ROTC cadets' intent to persist in ROTC and commission as an officer. The results of the study can be used by ROTC to design retention interventions targeted specifically to freshmen and sophomore who have not accepted a commission as an officer in the United States military. By engaging in retention interventions, ROTC may positively influence students' retention in the organization. If more females are retained within ROTC, more female officers can be commissioned in the United States military upon graduation, and in the future the general officer corps can be more representative of the enlisted troops (see Figure 1).

### **Definition of Terms**

1. *Academic development*: The development of academic skills such as gaining critical thinking ability, gaining factual knowledge, learning fundamental principles, generalizations, and theories, and applying abstract principles (commonly referred to as intellectual development) (Terenzini & Wright, 1987).

2. *Attrition*: Reduction in student population at an institution due to voluntary withdrawal or academic dismissal (Ishitani, 2006).
3. *Cadet*: An individual training for a commissioned position in the military (Merriam-Webster, 2012).
4. *Commission*: An official government document conferring the rank of an officer in the United States military on the recipient (“Go Army,” 2012).
5. *Faculty concern for student development*: Interest on the part of faculty members in providing quality instruction, helping students progress towards their intellectual goals, and helping students grow in more than just academic areas (Endo & Harpel, 1982; Pascarella & Terenzini, 1980).
6. *Hardiness*: A psychological measure of an individual’s commitment to life and work, sense of control, and openness to challenges in life and change (Maddi & Kobasa, 1984).
7. *Higher education*: Education beyond the secondary level provided by a university or college (Astin, 1993; Merriam-Webster, 2012).
8. *Integration*: The extent to which a student shares the attitudes and values of peers and faculty in college and conforms to the formal and informal requirements for membership (Pascarella & Terenzini, 2005).
9. *Intellectual development*: The development of intellectual skills such as gaining critical thinking ability, gaining factual knowledge, learning fundamental principles, generalizations, theories, and applying abstract principles (commonly referred to as academic development) (Terenzini & Wright, 1987).

10. *Intent to persist*: Conveyed intention to remain committed to a specific activity until completed (Cabrera, Castañeda, Nora, & Hengstler, 1992; Johnston, 2010).
11. *Student-faculty interactions*: Both formal and informal interactions between faculty members and students. Informal interactions consist of those in which faculty members and students exhibit friendly relationships and faculty have a personal concern with the students' cognitive and emotional growth. Formal student-faculty interactions are those which are professional in nature, where discussions are limited to academic, vocational, and advising topics (Endo & Harpel, 1982).
12. *Peer-group interaction*: Student to student interactions including items such as working together on group projects for classes, discussing course content, tutoring, participating in student organizations, and informal socializing (Astin, 1993).
13. *Persistence*: Progressive reenrollment in college until graduation (Lufi, Parish-Plass, & Cohen, 2003).
14. *Retention*: A return, or stated intention to return, to the institution of higher education which the individual is currently attending (Cabrera et al., 1992; Johnston, 2010).

### **Assumptions**

Several assumptions underlie this study. The first assumption was that students who participated in the study did so freely and without coercion. Secondly, the researcher assumed that the goals of students involved in ROTC were graduation and commissioning in the United States military. Another assumption was that the cadets involved in the study were eligible to continue in ROTC by meeting all of the organization's standards and requirements. For example, to remain in ROTC cadets must meet physical training (PT) testing standards, body mass index (BMI) measures, and medical standards. In addition, cadets' civil involvements,

degree choices, and scores on officer qualifying tests can affect their intentions to persist in ROTC. My research focused on the influence of academic and psychosocial factors on the cadets' intent to persist in ROTC and commission in the military; therefore, factors such as BMI, PT scores, et cetera were held as constants. The fourth assumption of the study was that the self-reported information gathered from students involved in the study was accurate and that students' expressed intention to persist in ROTC and commission in the United States military would lead to actual persistence. Lastly, the Institutional Integration Scale and Dispositional Resilience Scale-15 (version 3) were assumed to provide meaningful measures of the study variables.

### **Scope and Delimitations**

The research participants were freshmen and sophomore cadets who had not accepted scholarships from the United States military in exchange for commissioning as officers after graduation or had a pre-existing service agreement with the Armed Forces (ROTC cadets who were within Reserve units). Therefore, the retention of the participants in ROTC should not have been influenced by a signed contract or financial assistance from the United States military; this was viewed as a delimitation for the study.

### **Limitations**

The following four limitations were identified for this study. Cadets from Army ROTC and Air Force ROTC were involved in the study. Therefore, the data gathered may not be applicable to other ROTC branches. Second, the data gathered were based on the perceptions of the research participants through self-reporting. Therefore, the applicability of the study is limited (Johnston, 2010). Third, the data were collected during the spring term, and cadets involved were in their second semester of the academic year. As a result, cadets who

discontinued enrollment in ROTC after the fall semester were not a part of the surveyed cohort, and the factors that influenced their decision will not be known. Lastly, the focus of the study was on the research participants' intent to persist in ROTC and commission in the United States military (versus actual persistence). Although research has shown intent to persist in higher education is strongly correlated with actual persistence to graduation, a longitudinal study of the research participants would yield results on actual persistence and graduation (Okun, Benin, & Brandt-Williams, 1996; Porter & Swing, 2006).

### **Organization of the Study**

This study consists of five chapters. Chapter One includes an introduction to the study, the background of the problem, a statement of the problem, a statement of the purpose of the dissertation, a brief description of the study's conceptual framework, research questions, a description of the significance of the study, definitions of terms, assumptions, the scope and delimitations of the study, and limitations of the research. Within Chapter Two the literature related to the research problem is reviewed. In addition, it addressed theories and research conducted on the retention of students in higher education and ROTC programs. Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness are discussed specifically, along with the importance of female officers within the United States military. The research design and methodology are discussed in Chapter Three, and Chapter Four presents the results of the study. Lastly, Chapter Five includes a discussion of the results, implications of the study, and areas for future research.

## **CHAPTER TWO: REVIEW OF LITERATURE**

Chapter two provides a review of literature related to college conditions and student experiences that influence students' intent to persist in higher education and ROTC and commission in the United States military. To begin, an overview of literature related to student persistence in higher education is provided, along with Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness. Next, research specifically related to the retention of women in higher education is reviewed, along with a brief history of women's involvement in the United States military. In conclusion, a synthesis of literature associated with women's retention in the military and ROTC is examined. Throughout the chapter, references are made to the negligible amount of scholarly literature related to factors that affect female cadets' persistence in ROTC. These references are significant, as they substantiate the purpose and significance of this study.

### **Student Persistence in Higher Education**

Costs are imposed on individuals, institutions, and societies when students choose to leave college before completing a degree (Ishitani, 2006). According to Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) “. . . some of the most creative, highly able students leave [college] before earning a degree” (p. 557). This phenomenon is troubling because educational research has shown that societies experience reduced economic output and public revenue since college graduates have been found to earn more money and to be more productive than individuals without college degrees (Pascarella & Terenzini, 2005; Weissmann, 2012). In addition, college graduates have lower unemployment rates (U.S. Department of Labor, 2012), are less likely to need welfare (Pascarella & Terenzini, 2005), and have lower rates of incarceration compared to non-college graduates (Lochner & Moretti, 2004). Postsecondary institutions are also affected

by high levels of student attrition. Many colleges receive governmental funding based on their enrollment rates. Thus, if student retention rates decrease, public funding to the institution may also decrease (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). DesJardins, Ahlburg, and McCall (1999) stated that “given the recent accountability movement in higher education, high dropout rates are considered by oversight agencies and the general public as a sign of institutional failure” (p. 375). Furthermore, Morisano et al. (2010) suggested that retention rates are used by many organizations to rank institutions, and lower rankings affect institutions’ ability to attract high caliber students.

Due to the individual, institutional, and societal costs associated with student attrition, there has been a wealth of literature focused on student persistence in higher education (Braxton, 2000). As a result of this staggering volume of literature (Astin, 1993; Bean, 1990; Braxton, 2000; Braxton, Hirschy, & McClendon, 2004; Cabrera, Nora, & Castañeda, 1993; Pascarella & Terenzini, 2005; Seidman, 2005; Tinto, 1993) the structure of this section focuses specifically on the variables of academic performance, academic-related experiences, interactions with faculty and peers, students’ motivation, and students’ psychological hardiness as they relate to students’ persistence in higher education. These variables were chosen because they are significant components of Tinto’s (1986) student integration theory and of Maddi and Kobasa’s (1984) theory of psychological hardiness, which provide the conceptual framework for this study.

### **Academic Performance**

The academic performance of a student during college is a powerful source of influence on the student’s persistence and degree completion (ACT, 2004; Pascarella & Terenzini, 2005). Academic performance is often measured by a student’s grade point average (GPA), standardized test scores, and class rank (Bean, 2005). According to Pascarella and Terenzini

(2005) “no other variable’s relation to persistence or degree completion has attracted more attention than grade performance” (p. 396). Indeed, numerous studies have focused on the relationship between students’ grade performances and persistence in higher education. Allen, Robbins, Casillas, and Oh (2008) studied the direct and indirect effects of first-year students’ academic performance on their persistence through their third year. They found a positive correlation between students’ first-year academic performance (grade point average) and their persistence through their third year. Mills, Heyworth, Rosenwax, Carr, and Rosenberg (2008) found similar results in their study of factors associated with first-year health science students’ academic performance and persistence. Retention into students’ second year in college was found to be most influenced by the grades they received during their freshman year. Likewise, Morisano et al. (2010) stated that poor academic progress is a cause of students’ early departure from college. Furthermore, they postulated that students who experience difficulty adjusting to the university setting may face academic underachievement. This condition is characterized by inconsistency between students’ potential and their academic achievements in college. Herzog (2005) studied variables that influence college students’ intent to return to their original institution, transfer to another college, or withdraw from school completely. He found that students who obtained better grades and passed a first-year math course were more likely to persist in college than students who received lower grades and failed math. Bean (1982) found that the grades students achieve during college influenced their decision to persist in higher education. However, he stated that the role of grade point averages in students’ retention decisions is not as straightforward as one might think. Bean asserted that students with the highest intelligence quotients (IQ) do not always have the highest grade point averages. Students’ emotional intelligence, social intelligence, need for achievement, and motivation affect



grade point averages. Thus, a student might be classified as failing to persist due to low grades when, in fact, the student left for other reasons. Bean (1982) stated that “low grades [can be] . . . the mechanism for departure, not the cause” (p. 224) and stressed that the effect of grade point averages on student retention in higher education should not be underestimated or overestimated. Similar to Bean, Pascarella and Terenzini (2005) acknowledged that grades are confounded measures reflecting students’ motivation, intellectual abilities, and academic skills. However, they asserted that, even with the limitations associated with grade point averages, the grades that students receive in college may be the best predictor of persistence. Grades have proved to be consistent predictors of students’ persistence in higher education in both single-institution studies and large, nationally-representative studies.

The academic performance of cadets during college affects both their persistence in school and their ability to persist in ROTC. Students who participate in ROTC must maintain a minimum cumulative GPA, which varies by branch, to continue in the program. Furthermore, to receive a scholarship, Army and Air Force ROTC cadets must maintain at least a 2.5 GPA (Leal, 2007; U.S. Air Force, 2011; U.S. Army, 2011). However, Putka (2009) cautioned that the acceptance of an ROTC scholarship does not consistently equate with persistence in the program. Analyses have indicated that four-year scholarship cadets, compared to non-scholarship cadets, are less likely to complete the program and become commissioned officers. According to Putka (2009) “data collected for the current project showed that approximately 10.3% of four-year scholarship freshmen in 2007 disenrolled [*sic*] between their freshman and sophomore years” (p. v). For this reason, Putka argued that factors other than financial assistance affect cadets’ persistence, and he lobbied for the creation of a reliable and valid instrument to measure and predict the continuance of four-year ROTC scholarship recipients.

## **Student Engagement**

Research has also been conducted on the relationship between students' engagement in educationally purposeful activities and their persistence in higher education (Braxton et al., 2004; Kuh, 2003; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007; Pascarella & Terenzini, 2005). Students' engagement in academic-related activities represents the involvement and quality of effort students devote to educationally purposeful activities as well as the institution's investment in resources to enhance learning outcomes and student development (Kuh, 2001; Trowler, 2010). Astin's (1970a, 1970b, 1985, 1999) theory of student involvement is one of the first and most influential models created to explain the impact of college on students (Pascarella & Terenzini, 2005). Astin emphasized the active participation of students in the learning process and postulated that there is a higher likelihood of student persistence the more involved the student is within the institution. Kuh et al. (2008) concurred with Astin's assessment and stated that student engagement in academic-related activities is positively correlated with first-year student grades and with persistence between the freshman and sophomore years. Furthermore, research conducted by Hughes and Pace (2003) showed that students who were less engaged in academic-related activities were less likely to persist in higher education. Data from the National Survey of Student Engagement for four-year institutions and from the Community College Survey of Student Engagement for community colleges illustrated that student engagement is correlated positively with students' persistence in college (McGlynn, 2008). Krause (2005) echoed these findings and stated "we should be concerned about the inertia apparent in some of the first year students . . . because it is closely aligned with student dissatisfaction and potential withdrawal from study" (p. 8). Trowler (2010) concurred with Krause's assessment and proposed that students' investment of time and effort in educationally related activities results in favorable

outcomes such as persistence, satisfaction, and increased academic performance. Johnston (2010) found similar results in her study of factors that influenced Army ROTC cadets' intent to persist in higher education. Her study indicated that “participation as a member of ROTC allowed members to recognize their interests and goals as similar to those of other members and reinforced the engagement and connectedness of the new member . . .” (p. 105). Thus, Johnston found that students’ engagement in ROTC influenced their intent to persist in college.

### **Interactions with Faculty Members and Peers**

The interactions students have with faculty members and peers, as well as students’ ability to integrate into the formal and informal academic and social systems of the institution, are powerful influences on student persistence in college (Pascarella & Terenzini, 2005). One noteworthy theory which gives an explicit, longitudinal, and interactional view of the impact of these academic and social interactions and integration was created by Tinto (1975, 1987, 1993). Tinto’s student integration theory incorporates principles similar to Astin’s (1970a, 1970b, 1985, 1999) theory of student involvement; however, Tinto’s theory seeks specifically to understand and explain the student withdrawal process (Pascarella & Terenzini, 2005). At the core of Tinto’s theory are the concepts of academic and social integration in the institution. Tinto recognized that students go to college with a range of background characteristics (sex, race, academic ability, et cetera) and goals (graduation, degree sought, et cetera). He postulated that these characteristics and goals influence how students will perform in college and how they will interact and integrate into the college social and academic systems. Tinto stated that persistence in college is the result of students’ interactions with these systems. Bean (1980) agreed with Tinto about the necessity of student integration as it relates to student persistence and is the author of another prominent student attrition model. Bean’s model is based on Price’s (1977)

model of employee turnover and stresses a correlation between students' integration into the college social and academic systems and their levels of satisfaction with the institution. Bean (1980) asserted that students' level of satisfaction is expected to increase their level of commitment to their institution and "institutional commitment is seen as leading to a degree in [*sic*] the likelihood that a student will drop out of school" (p. 160). However, Bean deviated from Tinto's model by stressing that students' beliefs shape their attitudes, and that their attitudes are the predictor of their persistence in college (Hagedorn, 2005).

While Tinto (1975, 1987, 1993) and Bean (1980) remain early pioneers in the student retention research and theory arena, recent scholarly research has explored the relationship between students' interactions with faculty members and peers and their persistence in college. Guiffrida's (2005) research focused on the support that African American students need in college in order to persist. He found that, in addition to the interactions they had with their peers and faculty, African American students perceived members of their family and members of their home community as providing essential cultural connections. These cultural connections played a significant role in the students' persistence in college. Hausmann and Scholfield (2007) also conducted research on African American students and found that first-year students who felt a sense of belonging to the institution and/or peer group were more likely to persist in college to their second year. Allen et al. (2008) studied the effects of students' interactions with faculty members and peers on their persistence through their third year. Consistent with the researchers' expectations, they found that students' social connectedness had a direct effect on their persistence at the institution through their third year. Putka (2009) studied factors that influence Army cadets' persistence in ROTC. Results of his study suggested that some cadets left the program due to hostility towards the ROTC faculty. Instead of engaging in meaningful

interactions with their ROTC faculty, the cadets demonstrated hostility to authority, which Putka (2009) defined as “being suspicious of the motives and actions of legitimate authority figures” (p. 6). Despite the specific student population being examined, Kuh et al. (2008) reminded readers “. . . it seems that all students attending institutions that employ a comprehensive system of complementary initiatives based on effective educational practices are more likely to perform better academically, to be more satisfied, and to persist and graduate” (p. 556).

Researchers have also focused on ways in which institutions can cultivate students’ social connectedness. Zhao and Kuh (2004) found that institutions can provide avenues for students to interact with faculty members and peers through programmatic interventions such as living-learning communities, first-year seminars, and service-learning courses. These programmatic interventions were found to have a positive effect on students’ persistence from their first year to their second year at the same institution. Cruce, Wolniak, Seifer, and Pascarella (2006) also found that institutions can influence the persistence of lower ability students, first-generation college students, or students from low socioeconomic backgrounds by providing educationally related activities through which students can interact with faculty members and other students. They asserted that colleges should identify ways to integrate and involve these students in academic-related activities to support student success and promote student persistence (Kuh et al., 2008).

### **Student Motivation and Commitment**

The direct and indirect effects of students’ motivation on their persistence in college have emerged within psychological and educational literature (Allen et al., 2008; Robbins et al., 2004). In psychology, motivation is defined as the arousal, direction, and persistence of behavior

(Franken, 2006). Depending on the perspective of the research being performed, the researcher may view motivation as a trait (Dykman, 1998) or fixed personality characteristic, or as a state (Bandura, 1986) or temporary response to a particular task. In the educational literature realm, motivation is viewed as one of the factors influencing students' approach to and completion of a specific, academic task (Ross, 2008). Within this context, academic motivation consists of students' choices regarding how to approach a particular task, their persistence at the task despite challenges, and the amount of effort they expend on the task (Ross, 2008).

Pascarella and Terenzini (2005) emphasized that students' academic motivations must be integrated with other variables such as social engagement and academic performance to understand and predict students' long-term persistence in college. In fact, two of the earliest researchers of student retention (Bean, 1980; Tinto, 1975, 1987, 1993) recognized students' motivation as an antecedent of persistence. Tinto (1975, 1987, 1993) and Bean (1980) viewed students' commitments to their academic-related goals, as well as to their institution, as forms of motivation. The researchers utilized this motivation as a predictor of students' persistence in college. Robbins et al. (2004) studied the relationship between various psychosocial factors, including motivation, and students' persistence and performance in college. They found that students' achievement motivation and self-efficacy were the strongest predictors of their academic performance. In turn, the researchers found that students' academic performance was a predictor of their persistence in college. Allen et al. (2008) studied the effects of motivation, academic performance, and social connectedness on third-year students' retention at their original institution, likelihood to transfer to another institution, or drop-out behavior by using the students' first-year academic performance as a mediator. Results of their study indicated that "once in the first year of college, academic performance appears almost tantamount to long-term

persistence, and motivation and social connectedness have much smaller effects on likelihood of persisting” (Allen et al., 2008, p. 662). Weissberg and Owen (2005) questioned the generalizability of Allen et al.’s study and suggested that the findings were “compromised because they underestimate the impact of the distinction between commuter and residential institutions and of demographic differences among students” (p. 408). Despite Weissberg and Owen’s skepticism of Allen et al.’s study, Braxton et al. (2004) found that students’ motivation to graduate influenced their persistence in community college and four-year commuter universities. In her study of Army ROTC cadets, Johnston (2010) found that the cadets’ institutional and goal commitments were the most influential variables affecting their intent to persist in college.

Of note, Reason (2009) asserted that not all students attend college with the intent of graduating with a degree. Increasingly complex student attendance patterns have become a recent trend within higher education (McCormick, 2003). The concept that students’ college experiences take place at one school is no longer viable. Nearly half of all undergraduate students (regardless of gender) attend more than one college (McCormick, 2003). Thus, researchers must redefine college outcomes in order to match students’ motivations and reasons for attending college.

### **Psychological Hardiness**

Personality hardiness has emerged as an area of interest for researchers studying the attitudes and skills that individuals need to demonstrate resilience under pressure (Bartone, 1999; Judkins & Ingram, 2002; Judkins, Reid, & Furlow, 2006; Kobasa, Maddi, & Kahn, 1982; Law, 2005; Maddi, 1999, 2002; Maddi & Kobasa, 1984). Maddi and Kobasa (1984) studied psychological hardiness and postulated that the three factors contributing to an individual’s

personality hardiness are commitment, control, and challenge (Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2009). Individuals who have strong commitment attitudes stay involved in activities no matter how stressful the experience may be. Those who have strong control attitudes believe they can influence what is going on around them and have a greater sense of control over their lives. Individuals with challenge attitudes are more open to change and challenges and interpret stressful and painful experiences as a normal part of life (Bartone, 1999; Maddi et al., 2009). Several studies have tested the relationship between individuals' hardiness and stress-related breakdowns, effective coping strategies, academic success, and persistence in college (Bartone, 1999; Bartone & Snook, 1999; Giatras, 2000; James, 2005; Maddi, 1999, 2002). Although older, the research conducted by Maddi and Hightower (1999) is significant because it explored the influence of hardiness and optimism on undergraduate students' ability to cope with stress. The results of their study showed that hardiness, as compared to optimism, was a more powerful source of influence on students' ability to cope effectively with stress. For many college students, going to school represents an exciting and happy experience; however, for other students the transition to college may prove extremely stressful and result in deteriorations in physical and psychological health (Bouteyre, Maurel, & Bernaud, 2007; Misra & McKean, 2000), poor academic performance (Misra & McKean, 2000), or departure from college (Daugherty & Lane, 1999). Thus, researchers have sought to determine if students' psychological hardiness can serve as an indicator of their academic performance and persistence to graduation. Sheard and Golby (2007) conducted a study to identify psychological hardiness components that could explain the academic performance of undergraduate students. The results of their study indicated that students' psychological hardiness, in particular their commitment to their academic goals, was positively correlated with their academic success. Evidence to support



the correlation between hardiness and students' persistence in higher education comes from studies by Lifton et al. (2006) and Lifton, Seay, and Bushko (2000). Through their longitudinal studies the researchers found that hardiness measures collected from students when they entered college were positively correlated with their persistence and graduation four years later. Hystad, Eid, Lanberg, Johnsen, and Bartone (2009) summarized Lifton and colleagues' studies by concluding:

Among the dropouts, a disproportional number were found to score low on hardiness.

Also worth noting is that hardiness was not associated with entrance examination scores or intellectual ability. Clearly the effect of hardiness is not simply due to superior academic skills, but rather reflects a more global attitude or manner to approach life's challenges. (p. 423)

Very little scholarly research is available on the relationship between ROTC cadets' psychological hardiness and their intent to persist in higher education. Johnston (2010) recognized this void in the literature and subsequently studied the relationship between Army ROTC cadets' psychological hardiness and their intent to persist in college and commission in the United States military. The results of Johnston's study indicated a negligible influence of psychological hardiness on the cadets' intent to persist. According to Johnston (2010) this result "may have indicated that the psychological perspectives represented by hardiness did not play a role in intent to persist until and if commitment to the goal waivered" (p. 105). No scholarly research on the relationship between female cadets' psychological hardiness and intent to persist in ROTC and commission in the United States Air Force or Army has been completed.

## **Retention of Women in Higher Education**

The enrollment of women in higher education has increased significantly within the last few decades, and women have gone from the minority to the majority of the country's undergraduate population (Freeman, 2004; Peter & Horn, 2005). Research conducted by Freeman (2004) found that between 1970 and 2001, female representation in higher education rose from 42% to 56%. The National Center for Education Statistics (NCES) (2011) provided undergraduate enrollment projections to 2021 and postulated that women will represent 58% of the undergraduate population (see Table 1). These enrollment projections indicate that women will continue to surpass men in the completion of associate and bachelor degrees into the next decade (Peter & Horn, 2005). The change in enrollment trends between men and women has generated research focused on student background characteristics such as gender to explain college student attrition (Dixon Rayle, Robinson Kurpius, & Arredondo, 2006; Pascarella, Duby, & Iverson, 1983; Pascarella & Terenzini, 1978, 1980, 1983; Stage & Hossler, 1989).

Despite the gains women have made in enrollment on college campuses, they continue to face psychosocial disadvantages and external pressures that negatively influence their persistence in college or their persistence in specific academic programs (Dixon Rayle et al., 2006; Landry, 2002; Tinto, 1993). Dixon Rayle et al. (2006) recommended that university personnel understand the role that female students' self-beliefs, social support, and university comfort have on their persistence in college. Self-beliefs are conceptualized as students' self-esteem, self-efficacy, and personal valuing of education (Dixon Rayle et al., 2006). Students' social support is defined as family, peer, and friend support as well as mentoring from faculty and staff. Lastly, students' comfort with the university includes their perceptions of the university's culture and environment as well as academic stress.

Table 1

*Actual and Projected Numbers for Bachelor's Degrees Conferred by Postsecondary**Degree-Granting Institutions, by Sex of Recipient: 2009-2021*

Year	Total	Men	Women
<i>Actual</i>			
2009–10	1,673,000	717,000	956,000
2010–11	1,715,000	735,000	980,000
2011–12	1,781,000	765,000	1,016,000
<i>Projected</i>			
2012–13	1,791,000	766,000	1,025,000
2013–14	1,805,000	769,000	1,036,000
2014–15	1,817,000	771,000	1,046,000
2015–16	1,835,000	775,000	1,060,000
2016–17	1,858,000	782,000	1,076,000
2017–18	1,879,000	787,000	1,092,000
2018–19	1,901,000	794,000	1,107,000
2019–20	1,923,000	801,000	1,123,000
2020–21	1,945,000	808,000	1,137,000

*Note.* Details may not sum to totals because of rounding.

SOURCE: United States Department of Education, National Center for Education

Statistics

## **Self-Beliefs**

In regards to the psychosocial construct of self-belief, research has found that women tend to have lower self-esteem, lower educational self-efficacy, and fewer beliefs that they can excel in college as compared to their male peers (Dixon Rayle et al., 2006; Schlossberg, Lynch, & Chickering, 1989). Studies have found that women's negative self-beliefs often result in their discontinuation of their college education (Gloria & Ho, 2003; Gloria & Robinson Kurpius, 2001). These findings are supported in research examining the low persistence rates of women enrolled in science, technology, engineering, and mathematics (STEM) programs in college (Blickenstaff, 2006; Bystydzienski & Bird, 2006; Landry, 2002). Studies have found that the academic performance level of women and men in STEM programs is not significantly different (Bystydzienski & Bird, 2006; Landry, 2002). Blickenstaff (2006) and Burke and Mattis (2007) concurred with this finding and stated that there is very little difference in the scientific or mathematical ability of women and men in STEM programs. However, Hutchison, Follman, Sumpter, and Bodner (2006) discovered that many women who leave STEM programs have low levels of confidence in their academic abilities despite earning similar grades to women who persist. Jacobs (2005) echoed these findings and stated that the gender of students is not a contributing factor to their competence in engineering majors or to their desire to pursue a STEM degree. Instead, Jacobs determined that students' self-efficacy, the social support they receive from others, and the value they place on succeeding in engineering are more predictive of their probability of pursuing a STEM degree.

Students' personal valuing of education represents another prong of the self-belief construct. Research has shown that this self-belief is related to students' persistence within higher education (Dixon Rayle et al., 2006; Dixon Rayle, Tovar-Gamero, & Johnson, 2004).

This correlation is outlined by Tinto (1993), who postulated that students' commitment to obtaining a degree is positively correlated with their persistence in college. Further, Dixon Rayle et al. (2006) concluded:

Based on Tinto's theory, it is reasonable to predict that if college students are experiencing lower self-beliefs (defined as self-esteem, educational self-efficacy, and personal valuing of education), their positive decisions related to academic persistence may suffer. Given that women often report poorer self-beliefs than do men, these beliefs can serve as barriers to educational success and persistence . . ." (p. 327)

### **Social Support**

The amount of social support students receive has been shown to be related to persistence in higher education (Tinto, 1993). Tinto (1993) referred to the concept of social support as college integration and stated that students' integration is dependent on the frequency and type of interactions they have with family, friends, faculty, and staff. In their review of Tinto's model, Foley Nicpon et al. (2006) noted that "he [Tinto] stressed that students who develop satisfying relationships with peers tend to earn better grades and are more inclined to remain in college than are students who fail to develop these significant ties" (p. 346). In their study of the factors that influence college students' persistence decisions, Dixon Rayle et al. (2004) found that female students reported more social support from friends than male students. This finding is significant because Dixon Rayle et al. (2004) determined that female students' interaction with faculty, both inside and outside of the classroom as teachers and mentors, was a critical component of their persistence in college. This conclusion was echoed in a study by Dixon Rayle et al. (2006) which determined that female students' persistence in college is influenced by the level of social support they receive. In addition, Dixon Rayle et al. (2006) concluded that parental support and

encouragement, especially from mothers, fostered female students' positive decisions about persisting in college. Foley Nicpon et al. (2006) studied the relationship between college students' loneliness, social support, and persistence. The results of their study found that students who experienced less loneliness and had more social support were more likely to persist in college. In addition, more women than men in their study received social support from family and friends.

### **University Comfort**

Students' persistence in college is also influenced by the amount of comfort they feel at the university (Dixon Rayle et al., 2006). University comfort is the overriding term used to explain students' perceptions of the receptivity of the institution's environment, the college's culture, and their academic-related stress. Tinto's (1993) student persistence model proposed that student attrition is related to the lack of fit between the student and the college environment. Therefore, students are more likely to discontinue enrollment in college if they possess values significantly different from the university or if they do not have adequate social support (Foley Nicpon et al., 2006). Wilcoxson (2010) examined the relationship between first, second, and third-year college students' intent to persist and their college experiences. She found that third-year students' departure decisions were largely related to the students' perceptions that the institution lacked sensitivity to their individual needs. Dixon Rayle et al. (2006) agreed that women who do not perceive their college as inviting or supportive are more likely to discontinue enrollment and asserted:

On average, college women report...higher academic stress such as higher anxiety about coursework than do college men (Michie, Glachan, & Bray, 2001). Being in an environment that results in stress can increase discomfort in that setting . . . . women may

find themselves in an environment where their personal values, such as taking time to get to know their professors and fellow students and relationship-oriented learning, are not supported (Liang et al., 2002; Schlossberg, 1989). This sense of not fitting in or feeling culturally incongruent in the university setting (Gloria & Robinson Kurpius, 1996) can result in less university comfort and often is related to increased academic non-persistence decisions (Gloria, 1993; Gloria et al., 1999, Gloria & Ho, 2003; Gloria & Robinson Kurpius, 2001). (p. 328)

### **History of Women in the United States Military**

The social constructs of gender have historically limited the involvement of women in the United States military (Monahan & Neidel-Greenlee, 2010; Skaine, 2011). Lorber (1994) stated that throughout history gender has been socially constructed because human society depends on a predictable division of labor. One way of allocating people to specific work is to base decisions on gender and common societal values (Lorber, 1994). During the 18<sup>th</sup> century, society viewed women as embodying the values of piety, purity, submission, and domesticity (Kelley, 2001; Welter, 1966). According to Norton (1980), many Americans during this time period had very clear ideas of which tasks and behaviors were appropriate for women and what function each gender was expected to perform. Women were limited to the domestic or private sphere while men were allocated to the public sphere. Coincidentally, Kerber (1976) suggested that the American Revolutionary War was the impetus for women to serve outside of their domestic scope. During this time, women supported the war effort by boycotting imported goods and working as laundresses, cooks, and nurses for the military (Evans, 1997; Norton, 1980).

According to Kerber (1976), post-revolutionary republican ideology resulted in women redefining their role in society. The concept of republican motherhood replaced long-established views of gender, and women were allowed to be educated in order to promote values in children and raise moral, republican sons (Amott & Matthaei, 1996; Kerber, 1976; Nash, 1997; Norton, 1980). Republican motherhood was viewed by Nash (1997) “as a solution to the dilemma of the incompatibility of women’s revolutionary politicization with post-revolutionary theories relegating women to the home” (p. 172). According to Nash, republican motherhood offered women a means of combining domesticity with civic, public, and political interests. Kerber agreed, stating that the visibility of women in the public sphere was heightened in the post-revolutionary period. Thus, by the beginning of the Civil War women’s involvement evolved beyond their traditional roles as nurses, cooks, laundresses, and clerks to encouraging and supporting the war effort publicly (Kerber, 1976).

During the Progressive Era (1890s-1920s), the United States witnessed economic, political, social, and moral reform (McGovern, 1968; Schneider & Schneider, 1993). According to Herbert (1998), an increased number of women began participating in domains previously defined as male. McGovern (1968) concurred, stating that during this era women made a decided shift in their sex role towards more masculine norms. The shift in norms, combined with the country’s needs during World War I, resulted in women constituting a significant percentage of workers in the wartime manufacturing of machinery, airplanes, artillery, and food (Greenwald, 1980). Formerly masculine jobs such as typists, telephone operators, and stenographers were filled by women, and more than 35,000 women occupied noncombat military positions. However, at the close of World War I, the military unceremoniously ended women’s positions



and did not grant them official discharges by stating that they were never officially in the service (Monahan & Neidel-Greenlee, 2010).

The inclusion of women in the military increased exponentially during World War II (Monahan & Neidel-Greenlee, 2010). The Women's Army Corps, Navy Women's Reserve, Marine Corps Women's Reserve, Women Air Force Service Pilots, and Coast Guard Women's Reserve were established during this time period. More than 400,000 women served in the United States military at home and overseas in primarily non-combat positions (Monahan & Neidel-Greenlee, 2010). However, as the United States demobilized after the war, most of the women serving were removed from their military positions and returned to more traditional roles for females. As previously discussed in chapter one, significant court and legislative action was taken after World War II to grant women permanent status in the United States military (Monahan & Neidel-Greenlee, 2010). The Women's Armed Services Integration Act granted women permanent status in the regular and reserve forces of all branches of the military in 1948. However, the legislation limited the proportion of women in the military to 2% of the enlisted force and 10% of officers (Burrelli, 2012). In 1967 the legislation was repealed, and the limit on women as enlisted personnel and officers was removed.

According to Burrelli (2012), two major factors led to the expansion of the role of women in the military after the repeal of the Women's Armed Services Integration Act. The end of the draft and the beginning of the All-Volunteer Force in 1973 constituted one impetus for the increasing number of women in the Armed Forces. The recruitment and retention of qualified males in the military proved to be difficult; therefore, efforts turned to the recruitment of women. Second, the equal rights movement in the 1960s and 1970s was a driving force behind the expansion of women's roles in the military. During this time societal demands increased for

equal opportunities for women in the workplace, including the military. The following chronology reflects noteworthy changes and events in servicewomen's status from the equal rights movement to the present:

- In 1975, Public Law 94-106 was signed which allowed women to be admitted into the military service academies (Burrelli, 2012).
- In 1976, women were allowed to join ROTC ("Army ROTC," 2011).
- In 1977, the Secretary of Defense submitted to Congress a definition of the term "combat" as well as recommendations for increasing job classifications for women (Burrelli, 2012).
- In 1988, the DoD adopted a "risk rule" that excluded women from noncombat units or missions if the risks of exposure to direct combat, capture, or hostile fire were equal to or greater than the risks in the combat units they supported (Burrelli, 2012; Skaine, 2011).
- Operation Desert Shield in 1990 and Desert Storm in 1991 exposed 41,000 servicewomen to hostile fire and capture as the line was blurred between combat and noncombat. Thirteen servicewomen were killed and two were captured (Skaine). Women's involvement in the Gulf War resulted in a repeal of the ban on women serving aboard both combat aircraft (10 USCS § 8549) and combat ships (10 USCS § 6015) (Skaine, 2011).
- In 1994, DoD rescinded the 1988 "risk rule." The new policy opened many positions for women in units for which they were qualified; however, units below the brigade level were not opened to women due to their primary mission of direct ground combat

(Skaine, 2011). Skaine (2011) outlined additional exceptions to the rescinded “risk rule”:

Services may close positions to women if (1) they are required to physically collocate and remain with direct ground combat units, (2) the cost of providing appropriate living arrangements for women is prohibitive, (3) the units are engaged in special operations forces’ missions or long-range reconnaissance, or (4) job related physical requirements would exclude the majority of women. (p. 8)

- In 1996, Carol Mutter from the Marine Corps and Patricia Tracey from the Navy were the first women in history to be promoted to three-star ranks (Skaine, 2011).
- In 1998, women flew combat aircraft on combat missions in Operation Desert Fox (Skaine, 2011).
- In 2000, Capt. Kathleen McGrath was the first woman the Navy assigned to command a warship in the Persian Gulf (Skaine, 2011).
- In 2004, Col. Linda McTague was the first women assigned by the Air Force to command a fighter squadron (Skaine, 2011).
- In 2008, Lt. Gen. Ann E. Dunwoody from the Army was the first female military officer to be appointed to four-star general (Skaine, 2011).
- In 2009, women were allowed to serve on Naval submarines (Skaine, 2011).

### **Retention of Women in the United States Military**

Due to the increased reliance on women in the United States military, it is essential to understand factors that affect their retention in the Armed Forces. The military subscribes to an “up or out” promotion system which sets limits on how long service members can stay in their

ranks without being promoted (Tice, 2011). Officer promotion in the Armed Forces is a competitive process. The seniority of a service member is a consideration in the “up or out” system only in that it makes one eligible for promotion but does not guarantee it. Service members’ past performance and leadership potential are main considerations in the system, and failure to earn a promotion leads to discharge from the Armed Forces (Tice, 2011). Statistics show that as rank increases, fewer women are available for promotion considerations in the “up or out” system (Harris, 2009; Skaine, 2011). Therefore, researchers have sought to understand factors such as stereotyping, job promotion opportunities, sex discrimination, deployment, and women’s family commitments in regards to how they influence women’s decisions to stay or leave the military.

The gender stereotyping women may encounter when entering male-dominated areas such as the military has been explored to determine if it influences servicewomen’s attrition rates from the military (Acker, 1990; Cheatham, 1984; Herbert, 1998; Larwood, Glasser, & McDonald, 1980; Robinson Kurpius & Lucart, 2000; Zeigler & Gunderson, 2005). Cheatham (1984) attributed gender stereotyping within the military to the gender-role socialization within American society. He emphasized that American society adheres to traditional cultural models which describe women as sensitive, emotional, and sociable, while men are described as logical, tough, and realistic. Interestingly, the characteristics society has assigned to men are parallel to the characteristics valued in leaders within the military (Cheatham, 1984). Herbert (1998) explored society’s historical views of women who joined the military and concluded that these women were often labeled as sexually promiscuous, homosexual, or as joining the military simply to find a husband. According to Herbert, these labels are the result of societal expectations of what constitutes femininity and masculinity; thus, servicewomen learn how to

redefine and manage their gender. Striking a balance between femininity and masculinity is important because a female soldier who is too feminine may be perceived as incompetent, whereas one who is too masculine may be perceived as homosexual (Herbert, 1998). Ridgeway and Correll (2004) supported the concept that gender is an institutionalized system of social practices. A society holds cultural beliefs that define the characteristics of men and women and how they are expected to behave. As a result, the authors asserted that society's culture imposes inequalities and stereotypes on the basis of gender. Robinson Kurpius and Lucart (2000) investigated gender role attitudes in civilian and military environments. Although the military adopted zero-tolerance for sexual harassment and discrimination, the authors found that the integration and retention of women was a continuous problem. Robinson Kurpius and Lucart related these problems to gender role attitudes adopted by the overall culture which shape behaviors deemed appropriate for a specific sex. Similarly, Zeigler and Gunderson (2005) cited cultural and gendered expectations of men and women as the central problem of integrating and retaining women into the military.

Sex differences in promotions within the military have also been cited as a cause of servicewomen's attrition. Card and Farrell (1983) found that the retention rates for female soldiers were not as high as for male soldiers due to several reasons, including sex differences in promotion and income as well as the number of positions available to women (which thereby affects promotion opportunities). Matthews, Ender, Laurence, and Rohall (2009) reiterated Card and Farrell's finding that sex differences in promotion affect the attrition of women in the military and pointed out:

Despite the fact that women have played increasingly important and expanded roles in both the enlisted and officer ranks (Herek, 1993), barriers remain especially regarding

attainment of top leadership positions (Hosek et al., 2001). Access to and successful career progression within the officer corps is important for women and for the military.

(p. 242)

Evertson and Nesbitt (2004) and Baldwin (1996) agreed that the unrepresentative hierarchy and glass ceiling of the military are the cause of servicewomen's attrition. According to the researchers, women choose to leave the military due to shortcomings in recruitment, selection inequities, training disparities, occupational segregation (also known as dead-end jobs), retention failures, and promotion inequities. Baldwin affirmed that achieving equitable representation in the officer ranks will take time. To combat the unrepresentative number of female officers, Baldwin recommended the recruitment of women from high school Junior Reserve Officer Training Corps (JROTC) programs and ROTC, the expansion of scholarships, work-study programs, and summer internships. Harris (2009) contended that female officers may face isolation in their position which, in turn, can affect their persistence in the Armed Forces. Harris noted that the isolation servicewomen encounter can prohibit them from certain advantages given to male officers, such as informal social networks and career-building assignments (Harris, 2009).

Researchers have also studied the effect of the inherent nature and demands of the military (i.e., deployments, multiple moves) on servicewomen's attrition rates. The Defense Advisory Committee on Women in the Services [DACOWITS] (2003) found that many female officers left the Armed Forces in order to devote more time to their families. Additionally, DACOWITS found that frequent and multiple deployments made the task of managing family issues especially challenging for servicewomen. Issues of family, child care, pregnancy, and personal time were cited by DACOWITS as notable causes of attrition of servicewomen. Kelley

et al. (2001) studied Naval servicewomen's intent to persist in the military. Many of the women within the study cited work-family concerns as a rationale for leaving the military. Missing milestones in their children's lives, maintaining a strong parent-child bond, and the reintegration of the deployed parent back into the family were concerns of many servicewomen. This finding is parallel to an earlier study by Pierce (1998), who found that active-duty Air Force women who were mothers were twice as likely to leave the Armed Forces compared to women without children. Harris (2009) echoed these findings and emphasized that the "up or out" promotion system of the military "discounts those issues that uniquely affect women and the family [and] are . . . unsympathetic to women's quest for success . . ." (p. 394). Harris described the military as a greedy institution which makes total claims on servicewomen's attention and time. Therefore, Harris concluded that servicewomen often forsake their aspirations for a family in order to pursue their military career.

### **Retention of Women in ROTC**

Research has been conducted on the reasons women join ROTC (Greer, 2006; Mahan, 1976; Williams, 1989) as well as on their experiences as cadets (Cheatham, 1984; Larwood, Glasser, & McDonald, 1980; Robinson Kurpius & Lucart, 2000; Silva, 2008; Zeigler & Gunderson, 2005). However, minimal research has been conducted on the factors that influence female cadets' persistence in ROTC. Johnston (2010) studied factors that influence male and female Army ROTC cadets' intent to persist in higher education. Johnston's research showed correlations between the cadets' intent to persist in higher education and the predictor variables of peer-group interaction, academic development, and institutional and goal commitments. Furthermore, results of the study indicated that the cadets' institutional and goal commitments were the most influential variables affecting intent to persist. Johnston did not find a correlation

between the cadets' intent to persist in higher education and their psychological hardiness. The results of Johnston's study are significant; however, her sample population was small, consisting of only 14 females. Johnston indicated that further studies should be conducted and the number of participants should be increased to provide a more varied sample for examination. Edwards (2012) studied African American cadets and the impact of ROTC on their retention in historically black colleges and universities (HBCUs), and found a positive correlation between the students' retention in college and the amount of support they were provided through their institution, family, and ROTC peers. Edwards' phenomenological study is notable in that it showed that African American cadets' retention in college was affected by their interactions with their ROTC peers. However, the target population of his research (i.e., African Americans) is different from the specific population used for this study. Putka (2009) studied the persistence rates of four-year scholarship recipients in ROTC. In 2007, 10.3% of four-year scholarship freshmen discontinued involvement in ROTC between their freshman and sophomore years. Subsequently, Putka summarized the results of a new measurement tool called the Cadet Background and Experiences Form (CBEF), which was used by the United States Army Research Institute (ARI) to predict ROTC continuance for four-year scholarship recipients. The CBEF showed that cadets' persistence in ROTC was significantly related to their achievement orientation, fitness motivation, hostility toward authority, self-efficacy, personal identification with the Army, and propensity for commitment. Although the purpose of the study was not to compare differences between male and female cadets, Putka summarized gender comparisons within the results of the CBEF. Fitness motivation, stress tolerance, and personal identification with the Army were higher indicators of persistence for male cadets, while achievement and educational identification were higher indicators for female cadets. However, based on Cohen's



(1988) guidelines for the number of participants needed to achieve significant results, the only variable within the CBEF deemed as having a large effect on the persistence of male versus female cadets was fitness motivation. Putka's research was informative; yet, his focus was on four-year scholarship recipients and differs from the present study, which consisted of freshman and sophomore female cadets who had not received ROTC scholarships or had a current service agreement with the military.

### **Summary**

The research reviewed in the previous sections illustrates the impact of specific college experiences on students' persistence and educational attainment. In addition, academic development and degree of students' integration into institutional social systems, as well as students' psychological hardiness, show positive effects on persistence. Furthermore, the literature confirms that the retention of servicewomen within the military is an area of concern and is affected by numerous factors. A review of the literature yielded negligible amounts of research on the factors influencing female cadets' persistence in ROTC. Johnston's (2010) study was determined to be the most relevant research related to the present study. However, due to the small number of female participants within her study the results must be tested for validity and reliability. Taken as a whole, the literature review substantiates the significance of the present study. My research incorporated academic and psychosocial factors identified in the literature review as influential to students' persistence in college. In addition, my study contributes to the literature by studying factors that influence female cadets' intent to persist in ROTC and commission in the United States Air Force or Army.

## **CHAPTER THREE: METHODS**

The purpose of this study was to examine the influence that selected psychosocial and academic factors had on female cadets' intent to persist in the United States Army and Air Force ROTC programs and commission in the United States military. This chapter will explain the methodology adopted for the study. It will describe the research design and clarify the process for data collection. In addition, details will be provided regarding the procedures and measurements used to analyze the collected data.

### **Research Design**

The research questions for this study were answered through non-experimental research methods. According to Field (2009), non-experimental research methods are “a form of research in which you observe what naturally goes on in the world without directly interfering with it” (p. 783). To begin, a binary logistic regression between each of the predictor variables and the outcome variable was calculated to produce odds ratios. These odds ratios served as indicators of the change in odds resulting from unit changes in the predictor variables. Bivariate relationships that yielded an odds ratio less than 1 were excluded from further analyses, because these indicated a negative correlation to cadets' intent to persist. Next, predictor variables with odds ratios greater than 1 were entered into a multivariate logistic regression. Descriptive statistics of each of the predictor variables were processed during this analysis, and the correlation matrix of the bivariate associations aided in identifying the presence of multicollinearity. The resulting odds ratios and confidence intervals served as indicators of significant relationships between the outcome variable and each predictor variable. In addition, the multivariate logistic regression model summary indicated how much of the variance in the outcome (cadets' intent to persist in ROTC and commission in the United States military) was

accounted for by the study's predictor variables (represented by  $R^2$ ). An ANOVA test was also run to test whether the study's model (see Figure 2) significantly predicted the outcome variable. Lastly, in order to determine the relationship between the outcome variable and gender (or military branch), crosstabulations were calculated and represented in percentages. The use of odds ratios, Pearson's correlations, confidence intervals, logistic regression analyses, ANOVA tests, and crosstabulations was determined to be most appropriate for the data analyses based on the classification of the variables used within the study (see Table 2) and the research questions.

### **Research Questions**

The following research questions were examined in this study and were focused on Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness:

1. What is the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and each of the predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, and psychological hardiness [which includes the subscales of commitment, control, and challenge])?
2. What are the associations between the study's predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, and psychological hardiness [which includes the subscales of commitment, control, and challenge])?

Table 2

*Classification of Outcome and Predictor Variables in Study*

Variable	Classification
Outcome	
Intent to Persist in ROTC and Commission in United States military	Categorical
Predictor	
Gender (male or female)	Categorical
ROTC branch (Air Force or Army)	Categorical
Peer-group interaction	Continuous
Interactions with ROTC Faculty	Continuous
ROTC faculty concern for student development and teaching	Continuous
Academic/intellectual development	Continuous
Goal/institution commitment	Continuous
Psychological hardiness	Continuous

3. Which of the predictor variables influence the likelihood of cadets' intent to persist in ROTC and commission in the United States military?
4. Is there a significant relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and gender?
5. What is the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and each of the predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, and psychological hardiness [which includes the subscales of commitment, control, and challenge]) by gender?
6. What are the associations between the study's predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, psychological hardiness [which includes the subscales of commitment, control, and challenge]) by gender?
7. Which of the predictor variables influence the likelihood of male/female cadets' intent to persist in ROTC and commission in the United States military?
8. Is there a significant relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and the cadets' military branch (Army or Air Force)?

### **Threats to Validity**

The adequacy of a research study's design is primarily determined by its validity (Trochim, 2000). Common threats to the validity of non-experimental research include

maturation, testing/response bias, nonrandom sample selection, sample size, and the generalizability of the study's findings to the overall population (Trochim, 2000). The steps taken in response to each of these common threats are outlined below.

### **Maturation**

Maturation poses a threat to the validity of a study if research participants change during the course of the study or between points of measurement (Trochim, 2000). To ensure maturation did not occur during the study, the research participants were surveyed only once during the course of the study.

### **Testing/Response Bias**

In order to formulate meaningful conclusions, research participants must provide truthful responses to questionnaires and in interviews (van de Mortel, 2008). Participants may present a favorable image of themselves by responding to questions in what they perceive to be a socially desirable manner. In addition, research participants may experience self-deception in which they believe the information they report, or falsify their responses in order to avoid criticism, gain approval, or conform to socially acceptable values and beliefs (van de Mortel, 2008).

To eliminate testing/response bias, the study participants were informed that all responses would be anonymous and kept confidential by the principal researcher. In addition, ROTC Commanding Officers were not present during the data collection to ensure the study participants' comfort.

### **Nonrandom Sample Selection**

The institutions chosen for the study were selected in a nonrandom manner. The research participants were from five public, four-year universities in North Carolina. The state of North Carolina was chosen because it has the third largest active duty, National Guard, and Reserve

presence in the country (UNC Systemwide Evaluation & Recommendation for Veterans Education & Services [UNC SERVES], 2011). In addition, on a per capita basis, North Carolina has the highest percentage of military personnel in the country (UNC SERVES, 2011). In order to have a large enough study population, the North Carolina institutions were selected based on the number of cadets enrolled in their programs.

The validity of a study can also be compromised when data are collected from different locations by different researchers. In order to minimize this threat, I individually collected data in conjunction with classes and/or labs associated with the study of military science/aerospace studies. A script was utilized when gathering participants' consent to participate in the study and when explaining the instructions and procedures used for data collection.

### **Sample Size**

Study participants and nonparticipants may have different views. In order to have adequate external validity that can be generalized to the population being sampled, an adequate survey response rate is required (Armstrong & Ashworth, 2000; Parashos, Moran, & Messer, 2005). Hosmer and Lemeshow (2000) recommend 10 cases for each predictor variable. Therefore, the goal was to survey 100 female participants to eliminate this threat to the study's validity.

### **Generalizability**

Bean (1990) suggested that institutional environments are specific, and therefore students' responses cannot be generalizable to the overall population. In addition, Bean postulated that any deductions about persistence of students from different institutions will not provide meaningful measurement unless students' goals are taken into account (Johnston, 2010).

The requirements for enrollment in ROTC refuted the institutional and goal concerns of Bean because:

The U.S. Army ROTC [and U.S. Air Force ROTC] . . . model offered a population engaged in programming that minimized the differences among institutions and student goals. The U.S. Army ROTC [and U.S. Air Force ROTC] program stipulated specific requirements of course work related to ROTC, extracurricular involvement, engagement with faculty, and leadership training that provided limited standardization among institutions. Second, student goals as required by involvement in ROTC would be attenuated to requirements for participation that included stated intent to graduate and accept a commission in the U.S. Army [or U.S. Air Force] as an officer, financial support contingent on the achievement of academic performance requirements, and monitored participation in the program. (Johnston, 2010, pp. 69-70)

### **Participants**

The research participants were freshmen and sophomore cadets who had not accepted scholarships from the United States military in exchange for commissioning as officers after graduation or had a pre-existing service agreement with the Armed Forces (i.e., Reservists or members of the National Guard). Institutions from the state of North Carolina were chosen for the study because it has the third largest active duty, National Guard, and Reserve presence in the country (UNC SERVES, 2011). In addition, on a per capita basis, North Carolina has the highest percentage of military personnel in the country (UNC SERVES, 2011). The universities that participated in the study were: (a) a large public university (enrollment of approximately 27,000 students) which was primarily nonresidential and designated a doctoral/research university; (b) a medium-sized public university (enrollment of approximately 6,000 students) which was



primarily residential and designated a master's university; (c) a large public university (enrollment of approximately 33,000 students) which was a land-grant institution, primarily residential, and designated a research university with very high research activity; (d) a large public university (enrollment of approximately 28,000 students) which was primarily residential and designated a research university with very high research activity; and (e) a large public university (enrollment of approximately 24,000 students) which was primarily residential and designated a doctoral/research university (Carnegie Foundation for the Advancement of Teaching, 2010). Hosmer and Lemeshow (2000) recommend 10 cases for each predictor variable, and the goal was to recruit at least 100 female participants for the study.

In order to have a large enough study population, the institutions were selected based on the number of cadets enrolled in their programs (see Table 3). I collected the participants' responses in conjunction with their classes and/or labs associated with the study of military science or aerospace studies. The Commanding Officers of each ROTC battalion were contacted by email requesting permission to survey the cadets during their military science or aerospace studies class (see Appendices D and E). Campus visits began the week of February 4, 2013, and ended the week of March 18, 2013 (see Appendix F). A script was utilized when gathering cadets' consent to participate in the study and when explaining the instructions and procedures used for data collection (see Appendices G and H). The Institutional Review Board from my home institution approved recruitment scripts, participant consent forms, and survey instruments. One of the universities involved in the study required additional approval from their Institutional Review Board. This additional Institutional Review Board approved my study prior to my visit to the campus. Approval from the United States Army and Air Force Research Institutes was not needed as the cadets involved in the study were not receiving scholarships from the military in

Table 3

*Number of Female Freshman/Sophomore ROTC Cadets in North Carolina State Institutions as of October 2012*

Institution	Air Force ROTC	Army ROTC
East Carolina University	28	8
Fayetteville State University	29	20
North Carolina State University	9	12
University of North Carolina at Chapel Hill	12	5
University of North Carolina at Charlotte	12	35
Total	90	80

exchange for commissioning as officers after graduation and therefore were not considered members of the United States Department of the Air Force or Army (see Appendices I, J, K, and L).

### **Instrumentation**

I traveled to each of the five institutions to recruit research participants and gather data. The recruitment of participants and data collection occurred simultaneously at each institution. I used a script to recruit the study participants during their military science/aerospace studies class and/or lab. The participants' consent was collected at the beginning of the class/lab. Once consent forms were collected, each participant was given a booklet containing the two assessments (IIS and DRS15-R, version 3) as well as instructions on how to complete the instruments. The instructions carefully explained the Likert-scales being used within the instruments in order to avoid confusion among the participants. The academic and social variables measured were based on Tinto's (1986) student integration theory. The IIS designed by Pascarella and Terenzini (1980) and revised by French and Oakes (2004) was used to measure the predictive validity of Tinto's model of academic and social integration. The predictor variables relevant to students' intent to persist in ROTC and commission in the United States military, which were assessed through IIS, included academic/intellectual development, peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, and institutional/goal commitments (Pascarella & Terenzini, 1980). Minor adaptations were made to the IIS to fit the specific ROTC population being studied. The outcome variable, intent to persist in ROTC and commission in the United States military, was represented by three questions utilizing a four-point Likert-scale. The three questions were added to the end of the IIS instrument (35, 36, and 37). The psychological hardiness variable

being measured was based on Maddi and Kobasa's (1984) theory of psychological hardiness. The DRS15-R (version 3) created by Bartone (2007) was used to assess the research participants' psychological hardiness. The content of the instrument was presented in its original form to the research participants.

### **Instrument Validity**

An instrument is considered valid if it accurately measures what it intends to measure (French & Oakes, 2004; van de Mortel, 2008). It is important to gather evidence illustrating item level measurement invariance across student subgroups (e.g., men versus women) when modeling student success and predicting student outcomes (Breidenbach & French, 2010). For example, if the IIS is used by researchers to formulate intervention strategies for specific subgroups of students or to predict students' success and/or persistence:

Evidence is needed to support that a lack of measurement invariance across groups is not influencing prediction. Without such evidence, it is difficult, if not impossible, to determine if group score differences could be a result of a lack of measurement invariance (e.g. differential item functioning (DIF)) or a true group difference on the construction. (Breidenbach & French, 2010, p. 343)

It is also important to investigate the gender invariance of any instrument. Research has shown that differences in male and female students' performance and personality are related to their persistence and success in college (Breidenbach & French, 2010).

Studies using the IIS as an indicator of students' persistence can affect policy decisions within higher education. As a result, it is imperative that outcomes from the IIS are not the result of any variance in measurements between groups (Breidenbach & French, 2010). The original IIS was designed by Pascarella and Terenzini (1980) and based on the elements of Tinto's

model. In order to determine the validity of the IIS in predicting students' persistence, the researchers conducted a longitudinal study and administered the instrument to students beginning their freshman year in college. In order to determine the predictive validity of the IIS, a multivariate analysis of covariance was used. The results of the multivariate analysis of covariance  $F$  of the IIS was 27.51 ( $p < .001$ ) and deemed significant. The scales within the IIS were found to significantly differentiate students who persisted in college versus those who left voluntarily which increased the identification of student persistence from 58.2% to 81.4%. However, the results of the study showed that female and male students differed in their perception of the importance of peer-group interactions and institutional and goal commitment. Withdrawal decisions for female students were closely associated with peer-group interactions, while goal commitments were closely associated with the withdrawal of males. Within Pascarella and Terenzini's study, the internal consistency reliability (coefficient alpha) associated with the peer-group interaction subscale was .84, interaction with faculty was .83, faculty concern for student development and teaching was .82, the academic and intellectual development subscale was .74, and the institutional/goal commitment subscale was .71. However, the results of a follow-up study by Terenzini, Lorange, and Pascarella (1981) did not find any differences in the predictive validity of the IIS subscales between females and males. The contradictory findings warranted further investigation. Subsequently, French and Oakes (2004) revised Pascarella and Terenzini's IIS. The revised IIS has been shown to have satisfactory internal consistency, reliability, and intercorrelations (French & Oakes, 2004). In addition, the reliability of the revised IIS is an improvement over the original scale. French and Oakes found the coefficient alphas for peer-group interaction to be .84, interactions with faculty was .89, faculty concern for student development and teaching was .88, academic and

intellectual development was .82, and the institutional/goal commitment coefficient was .76. Baker, Caison, and Meade (2007) conducted research which examined gender-related predictive validity of the five subscales of the IIS (peer-group interaction, interactions with faculty, faculty concern for student development and teaching, academic/intellectual development, and institutional/goal commitment) with regard to student withdrawal. A logistic regression was used within the study to determine the validity of each subscale of the IIS and whether there was differing predictive validity between male and female students. Results of the logistic regression model found that the respondent scores on the IIS appear to be valid indicators influencing student persistence ( $\chi^2 = 97.1693$ ,  $df = 11$ ,  $p < .0001$ ). In addition, the subscales in the IIS did not have different predictive validity between male and female students. Breidenbach and French (2010) found similar results in their assessment of the IIS. They concluded that the subscales of the IIS measured institutional integration equivalently between male and female students.

Although there is a substantial amount of research on psychological hardiness, one of the fundamental issues within the literature is that several hardiness scales have been utilized (Funk, 1992). Research on psychological hardiness requires reliable and valid measures to ensure data quality (Funk, 1992; Windle, Bennet, & Noyes, 2011). The DRS was developed with a theoretical background derived from the hardiness literature. One of the advantages of the DRS is that the scale provides separate estimates for commitment, control, and challenge (Funk, 1992). Composite hardiness scores can be produced by adding scores from the three dimensions. In addition, the DRS does not rely exclusively on negatively-keyed indicators, uses equal numbers of items to measure commitment, control, and challenge, and it has higher levels of internal consistency compared to previous hardiness scales (Funk, 1992). The DSR-15 has

demonstrated reliability with a Cronbach's alpha coefficient of .83 for the total hardiness measure (Bartone, 1995). The coefficient alpha for the commitment subscale is .77, for control is .71, and for challenge is .70 (Bartone, 1995). In a test-retest reliability study of the DRS-15, Bartone (2007) computed Pearson correlation coefficients for the total hardiness scores and subscales of commitment, control, and challenge. The three-week test-retest reliability coefficient was .78. The test-retest coefficient for commitment was .75, for control was .58, and for challenge was .81. According to Bartone (2007):

Cronbach coefficient alpha is by far the most commonly used index of reliability for self-report scales. But Cronbach alpha reflects the internal consistency of scale items and can underestimate reliability when a complex construct is measured with relatively few items. In such cases, test-retest reliability is the preferred approach (Anastasi & Urbina, 1997).

The 3-wk. [*sic*] test-retest coefficient of .78 reported here indicates high reliability for the DRS-15 short hardiness scale. (pp. 943-944)

Bartone (1995) created the DRS-15 and tested the validity of the instrument by surveying 125 Army medical workers deployed to Croatia. In order to test the overall validity of the DRS-15, a stepwise regression was used. Using hardiness as the predictor variable, and depression as the outcome variable,  $R^2 = 0.17$  and  $\beta = -0.35$  ( $p < 0.0000$ ). Interpretation of these results indicated that hardiness shared 17% of the variability in predicting depression and that as participants' hardiness increased, the likelihood of their developing depression decreased. The F-ratio of the data was  $F = 14.88$  with  $df = 2, 123$  ( $p < 0.0000$ ) which demonstrated appropriate construct validity. In 1999, Bartone administered the DRS-15 to 787 Army National Guard and Reservists in medical units after the Gulf War. To test the mediating roles of hardiness and stress on psychiatric symptoms, a multiple regression was utilized,  $R^2 = 0.38$  and  $\beta = -0.17$  ( $p < 0.01$ ).

Interpretation of these results indicated that hardiness represented 38% of the variability in predicting psychiatric symptoms in the participants and that as the participants' hardiness increased, the likelihood of their developing psychiatric symptoms decreased. The F-ratio of the data was  $F = 77.42$  with  $df = 6, 767$  ( $p < 0.001$ ) which demonstrated appropriate validity.

The DRS15-R (version 3) is the most recent version of the 15-item DRS. The updated version of the DRS is designed to be better balanced between negatively and positively keyed items and is more culturally sensitive (Bartone, 2007). Each of the hardiness subscales (commitment, control, and challenge) is measured through five items. Within the instrument, six items are negatively-keyed, which provides a more well-balanced instrument for negative and positive items (Bartone, 2007).

Lifton et al. (2006) utilized a longer version of the DRS-15, the Dispositional Resilience Scale-30 (DRS-30), during their study of the influence of students' psychological hardiness on their persistence in higher education. However, Bartone (1991) found the reliability coefficients for the subscales (commitment, control, challenge) in the DRS-30 to have low reliability. The Cronbach alpha for the total hardiness scale ranged from .70 to .85, depending on the sample. In addition, the internal consistency for the challenge subscale was low (.35 to .62). Thus, Bartone suggested that it is best to use only the comprehensive hardiness score of the DRS-30. Due to (1) the low internal consistency for the challenge subscale in the DRS-30, (2) the high reliability of both the comprehensive hardiness scale and subscales of the DRS-15, (3) the construct validity of the DRS-15, and (4) the balance of negative and positive items and culturally sensitive design of the DRS15-R, the DRS15-R (version 3) was chosen for this study.



## **Data Preparation**

After data were collected an assessed for completeness was conducted by the researcher. Any instruments that contained omissions or skipped items were removed from the data analysis. For the DRS15-R (v. 3), scores were reversed for the negatively-keyed items (3, 4, 9, 11, and 14). After reversing the scoring for the negatively-keyed items, the responses for all 15 items were summed to obtain a total hardiness score. Subscales scores for commitment, control, and challenge were created by summing the relevant five items for each facet. Using SPSS, the subscale measures were regressed against the responses to the outcome variable, intent to persist in ROTC towards commissioning. The maximum and minimum scores that could be obtained through the IIS, DRS15-R (version 3) and on the three questions measuring students' intent to persist can be found in Table 4. Lastly, any outlying scores that were detected were corrected by changing the outlying score to be one unit above the next highest score in the data set (Field, 2009).

## **Assumptions**

Generalizing the results of a logistic regression to a population outside the study's sample is possible only if underlying assumptions are met (Field, 2009). The first two assumptions for the study's logistic regression were that the outcome variable was quantitative and categorical and that the predictor variables were quantitative, continuous, and relevant (Field, 2009). Non-zero variance in the predictor variables was the next assumption that had to be met within the regression analysis. The predictor variables had to have variance in value. The fourth assumption of the logistic regression was linearity. There was a linear relationship between the

Table 4

*Maximum and Minimum Measures for Study Instruments*

Scale/Variable	Maximum Score	Minimum Score
Institutional Integration Scale	170	34
Academic/Intellectual Development	50	10
Peer-group Interaction	50	10
Interactions with ROTC Faculty	30	6
ROTC Faculty Concern for Student Development and Teaching	20	4
Institutional and Goal Commitments	20	4
Intent to Persist	15	3
Importance of Commissioning as an Officer in U.S. Military	5	1
Confidence in Choosing to Participate in ROTC	5	1
Intent to Continue in ROTC Next Fall	5	1
Dispositional Resilience Scale 15-R	45	0
Commitment	15	0
Control	15	0
Challenge	15	0

continuous predictor variables and the logit of the outcome variable (Field, 2009). To test this assumption, the interactions between the outcome and predictor variables were reviewed for significance (Field, 2009). The fifth assumption of the logistic regression was that the predictor variables were uncorrelated with external variables (Field, 2009). If external variables are correlated with the predictor variables, then the conclusions drawn from the logistic regression are unreliable. Homoscedasticity was the sixth assumption of the logistic regression. The predictor variables in logistic regressions can take any form, and therefore the logistic regression made no assumption about the distribution of the predictor variables. The variables did not have to be normally distributed, have a linear relationship, or be of equal variance within each group. In a logistic regression, the relationship between the outcome and predictor variable is not a linear function (thus the logit of the outcome variable was used). The absence of perfect multicollinearity was the seventh assumption for the logistic regression. Multicollinearity exists when there is a strong correlation (or perfect linear relationship) between two or more predictor variables (Field, 2009). According to Field (2009), “if there is perfect collinearity between predictors it becomes impossible to obtain unique estimates of the regression coefficients because there are an infinite number of combinations of coefficients that would work equally well” (p. 223). Multicollinearity was identified by reviewing correlations of all of the predictor variables to see if any were highly correlated. Correlations above .80 or .90 were considered very high (Field, 2009).

### **Data Analysis**

Descriptive and associational statistics were computed with the statistical software Statistical Package for the Social Sciences (SPSS) (2011), version 20. To answer the first research question, a binary logistic regression between each of the predictor variables and the

outcome variable was calculated to produce odds ratios. These odds ratios served as indicators of the change in odds resulting from unit changes in the predictor variables. If the resulting value was greater than 1, then the odds ratio indicated that as the predictor variable increased the odds of the outcome (cadets' intent to persist) occurring increased. Values less than 1 indicated that as the predictor variable increased, the odds of the outcome occurring decreased (Field, 2009). Subsequently, bivariate relationships that yielded an odds ratio less than 1 were excluded from further analyses because this indicated a negative correlation to cadets' intent to persist in ROTC and commission in the United States military.

For the second research question, predictor variables with odds ratios greater than 1 were all entered into a multivariate logistic regression. The forced entry method was chosen because the predictor variables were based on Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness. According to Field (2009):

This method relies on good theoretical reasons for including the chosen predictors, but unlike hierarchical [regression predictors] the experimenter makes no decision about the order in which variables are entered. Some researchers believe that this method is the only appropriate theory for theory testing (Studenmund & Cassidy, 1987) because stepwise techniques are influenced by random variation in the data and so seldom give replicable results if the model is retested. (p. 212)

The equation used for the logistic regression, as presented in Field (2009), was:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1X_{1i} + b_2X_{2i} + b_3X_{3i} + b_4X_{4i} + b_5X_{5i} + b_6X_{6i} + b_7X_{7i} + b_8X_{8i} + b_9X_{9i} + b_{10}X_{10i})}}$$

In the equation, P(Y) represented the probability of the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) occurring, *e* was the base of natural

logarithms,  $b_0$  represented the constant,  $b_1$  was the coefficient of the first predictor variable ( $X_{1i}$ ),  $b_2$  was the coefficient of the second predictor variable ( $X_{2i}$ ), and  $b_n$  was the coefficient of the  $n$ th predictor variable ( $X_{ni}$ ) (Field). The predictor variables included:

$X_1$  represented the categorical variable “gender” (male=0; female=1)

$X_2$  represented the categorical variable “ROTC branch” (AFROTC=0; Army ROTC=1)

$X_3$  represented the predictor variable “peer-group interaction”

$X_4$  represented the predictor variable “interactions with ROTC faculty”

$X_5$  represented the predictor variable “ROTC faculty concern for student development and teaching”

$X_6$  represented the predictor variable “academic/intellectual development”

$X_7$  represented the predictor variable “goal/institution commitment”

$X_8$  represented the predictor variable “commitment,” which was a subcategory of the psychological construct of hardiness

$X_9$  represented the predictor variable “control,” which was a subcategory of the psychological construct of hardiness

$X_{10}$  represented the predictor variable “challenge,” which was a subcategory of the psychological construct of hardiness

A correlation matrix including Pearson’s correlations and the results of two-tailed tests aided in identifying significant bivariate associations between predictor study variables. Pearson’s correlation coefficients are a standardized measure of the strength of the relationship between two variables (Field, 2009). Pearson’s correlation coefficients should range between -1 and +1; and a coefficient of -1 indicated a negative relationship between the variables while a +1 coefficient indicated that the variables were positively correlated (Field, 2009). Two-tailed tests

were used due to the study having non-directional hypotheses. In addition, Pearson's correlations and the results of the two-tailed tests aided in identifying the presence of multicollinearity. Multicollinearity occurs when two or more predictor variables in a regression model have a strong correlation (Field, 2009). This condition poses a problem because, according to Field (2009), "it becomes impossible to obtain unique estimates of the regression coefficients because there are an infinite number of combinations of coefficients that would work equally well" (p. 223).

In order to answer the third research question, the odds ratios and confidence intervals in the multivariate logistic regression were utilized to identify significant relationships between the outcome variable and each predictor variable. The confidence interval provided a range within which the true value of the mean was expected to fall with certain probability (e.g., 95%) (Field, 2009). In addition, the multivariate logistic regression model summary addressed how well the model fit the outcome by indicating how much of the variance in the outcome (cadets' intent to persist in ROTC and commission in the United States military) was accounted for by the predictor variables (represented by  $R^2$ ). An ANOVA test was also run to address the fit of the study's model (see Figure 2) in significantly predicting the outcome variable. Crosstabulations were calculated and represented in percentages to address the fourth research question and determined the relationship between the outcome variable and gender.

In order to answer research questions 5-8, the data were split by gender. After this was completed the sixth research question was analyzed though the odds ratios produced in binary logistic regressions. Bivariate relationships that yielded odds ratios less than 1 were excluded from further analyses. For the sixth research question, a multivariate logistic regression was run for all predictor variables with  $\text{Exp}(B) < 1$ . Pearson's correlations and the results of two-tailed

tests were used to identify multicollinearity. The seventh research question was answered by analyzing the odds ratios and confidence intervals in the multivariate logistic regression, and an ANOVA test and the  $R^2$  were used to determine the model's fit to the outcome variable. Lastly, the eighth research question was addressed through the use of crosstabulations between cadets' intent to persist and military branch.

### **Summary**

Research has found that students' stated intent to persist in higher education is strongly correlated with actual persistence (Bean, 2005; Bean & Eaton, 2002; Okun, Benin, & Brandt-Williams, 1996; Porter & Swing, 2006; Savage & Smith, 2008). Consequently, I sought to determine the influence specific academic and psychosocial factors had on female ROTC cadets' intent to persist in ROTC and commission in the United States military. For this study Tinto's (1986) student integration theory was adopted due to its emergence as a valid predictive model of student persistence in higher education (Cabrera, Nora, & Castañeda, 1993; Knight, 2002; Pascarella & Chapman, 1983; Terenzini, Lorange, & Pascarella, 1981). The Institutional Integration Scale (IIS) designed by Pascarella and Terenzini (1980) and revised by French and Oakes (2004) was used to measure the data related to Tinto's model. The variables relevant to students' intent to persist in ROTC and commission in the United States military, which were assessed through the IIS, included peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic/intellectual development, and institutional/goal commitment (Pascarella & Terenzini, 1980). Maddi and Kobasa's (1984) theory of psychological hardiness was the second theory adopted in this study. This theory was chosen because researchers have discovered positive correlations between college students' psychological hardiness and their persistence to graduation (Lifton et al., 2004,

2006). The Dispositional Resilience Scale-15 (version 3) (DRS15-R) created by Bartone (2007) was used to assess the research participants' psychological hardiness in the areas of commitment, control, and challenge.

The research participants were freshman and sophomore United States Army and Air Force ROTC cadets who had not accepted scholarships from the United States military in exchange for commissioning as officers after graduation and those who did not have a pre-existing service agreement with the Armed Forces. The research participants were from five public, four-year universities in North Carolina. The state of North Carolina was chosen because it has the third largest active duty, National Guard, and Reserve presence in the country (UNC SERVES, 2011). In addition, on a per capita basis, North Carolina has the highest percentage of military personnel in the country (UNC SERVES, 2011). The North Carolina universities from which the study population was drawn were chosen due to the number of cadets enrolled in their programs. Therefore, the study participants were not randomly selected. Data were gathered from research participants during the spring term of the 2012-2013 academic year. Intent to persist in ROTC and commission in the United States military served as the categorical outcome variable within the study, and the collected data were analyzed through the use of odds ratios, Pearson's correlations, confidence intervals, binary and multivariate logistic regression analyses, ANOVA tests, and crosstabulations with the statistical software, Statistical Package for the Social Sciences (SPSS) (2011), version 20.



## **CHAPTER FOUR: RESULTS**

This chapter provides a summary of the collected surveys and presents the results of the data analyses in three sections. The first section of the chapter provides a summary of the demographic profile of the respondents. Within the second section, the results of the data analyses are reported and the research questions are addressed. The last section of the chapter includes a summary of the research findings.

### **Demographic Profile of Respondents**

A total of 282 ROTC cadets participated in the study. Two male, Air Force cadets failed to provide complete data; therefore, their responses were excluded and the data analyses were conducted with 280 cases. There were 191 male cadets (68% of total participants) and 89 female cadets (32% of total participants). One hundred forty-three participants were Air Force cadets (51%) and 137 were Army cadets (49%). Ninety-one of the 143 Air Force cadets were male (64%) and 52 were female (36%). One hundred of the Army cadets (73%) were male and 37 (27%) were female. Table 5 includes the demographic profile of the participants.

### **Data Analysis**

The first research question sought to define the relationship between the outcome variable (intent to persist in ROTC and commission in the United States military) and the predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic/intellectual development, institutional and goal commitment, and psychological hardiness [which includes three subcomponents]). Outliers in the data were identified in order to reduce the impact of these values. These outliers represented data very different from the rest and could bias the statistics such as the mean. Four outlying scores for the variable *institutional and goal commitment* were identified through the use of

Table 5

*Demographic Profile of Study Participants*

Participants	N	%
Male	191	68%
Female	89	32%
Total	280	100%
<b>ROTC Military Branch</b>		
Air Force (Total=143)		
Male	91	64%
Female	52	36%
Army (Total=137)		
Male	100	73%
Female	37	27%

boxplots in SPSS. These outlying scores were transformed by changing the outlying score to be one unit above the next highest score in the data set (see Field, 2009). After outlying data were transformed, the data were analyzed using a binary logistic regression between each of the predictor variables and the outcome variable.

The value of the odds ratio [Exp(B) in the SPSS output] was utilized to interpret the logistic regression, since odds ratios serve as indicators of the change in odds resulting from unit changes in the predictor variables (Field). Exp(B) values greater than 1 indicated that as the predictor variable increased, the odds of the outcome variable occurring also increased. Table 6 includes a summary of the odds ratios calculated for the bivariate relationships between cadets' intent to persist in ROTC towards commissioning and each predictor variable. Odds ratios greater than 1 were calculated for the predictor variables of peer-group interaction [Exp(B) = 1.18], interactions with ROTC faculty [Exp(B) = 1.18], ROTC faculty concern for student development and teaching [Exp(B) = 1.30], academic/intellectual development [Exp(B) = 1.23], institutional and goal commitments [Exp(B) = 1.47], psychological hardiness [Exp(B) = 1.09], as well as for the commitment [Exp(B) = 1.33] and control [Exp(B) = 1.22] subcomponents of psychological hardiness. The challenge subcomponent of psychological hardiness yielded an odds ratio less than 1 [Exp(B) = 0.90] indicating that as this predictor variable increased, the odds of the cadets' intent to persist in ROTC and commission in the United States military decreased. Subsequently, the predictor variable *challenge* was excluded from further analyses since it indicated a negative correlation to the outcome variable.

All of the predictor variables with odds ratios greater than 1 were force entered into a multivariate logistic regression. Descriptive statistics for the predictor variables were processed during the analysis and can be found in Table 7. Large standard deviations were found for the

Table 6

*Bivariate Relationships between Cadets' Intent to Persist and Explanatory Variables*

Explanatory Variable	Exp(B)	95% C.I. for Exp(B)	
		Lower	Upper
Peer-Group Interaction	1.18*	1.09	1.27
Interactions with ROTC Faculty	1.18*	1.07	1.29
ROTC Faculty Concern for Student Development	1.30*	1.11	1.52
Academic/Intellectual Development	1.23*	1.12	1.36
Institutional and Goal Commitment	1.47*	1.27	1.72
Psychological Hardiness	1.09*	1.00	1.18
Commitment	1.33*	1.12	1.59
Control	1.22*	1.03	1.44
Challenge	0.90	0.76	1.06

*Note.* \*  $p < 0.05$ .

Table 7

*Summary Statistics for Explanatory Variables*

Explanatory Variable	Range of		
	Possible Values	Mean	SD
Peer-Group Interaction	10-50	41.29	5.70
Interactions with ROTC Faculty	6-30	23.19	4.18
ROTC Faculty Concern for Student Development	4-20	17.40	2.47
Academic/Intellectual Development	10-50	40.16	4.98
Institutional and Goal Commitment	4-20	18.68	2.11
Psychological Hardiness	0-45	32.58	4.93
Commitment	0-15	11.36	2.23
Control	0-15	12.81	2.19

variables of *peer-group interaction* (SD = 5.70), *academic/intellectual development* (SD = 4.98) and *psychological hardiness* (SD = 4.93). High mean scores (within the upper 80th percentile) were calculated for the variables of *peer-group interaction* ( $\bar{X} = 41.29$ ), *ROTC faculty concern for student development and teaching* ( $\bar{X} = 17.40$ ), *academic and intellectual development* ( $\bar{X} = 40.16$ ), *institutional and goal commitment* ( $\bar{X} = 18.68$ ), and the *control* subscale of psychological hardiness ( $\bar{X} = 12.81$ ).

The second research question sought to determine the associations between the study's predictor variables. Table 8 includes a correlation matrix of these bivariate associations which were examined for multicollinearity. No substantial correlations ( $r > 0.80$ ) between predictor variables were present, and therefore multicollinearity in the data was not present (Field, 2009). The table also includes Pearson's correlation coefficient between every pair of variables. Significant bivariate associations ( $p < 0.01$ ) were found between all of the predictor variables except for *institutional/goal commitment* and *psychological hardiness* as well as *institutional/goal commitment* and the *control* subscale of psychological hardiness.

The third research question sought to determine which of the predictor variables influenced the likelihood of ROTC cadets' intent to persist in ROTC and commission in the United States military. The odds ratios and confidence intervals for the predictor variables included in the study's model can be found in Table 9. Odds ratios [Exp(B)] values greater than 1 were calculated for all of the predictor variables except *ROTC faculty concern for student development and teaching* [Exp(B) = 0.99] and *psychological hardiness* [Exp(B) = 0.87]. These low odds ratios indicated that as the magnitude of the variables, *ROTC faculty concern for student development and teaching* and *psychological hardiness* increased, the odds of the outcome (cadets' intent to persist in ROTC and commission in the United States military)

Table 8

*Bivariate Associations between Quantitative Study Variables*

	Peer-Group	Interact w/ ROTC Faculty	Faculty Concern	Acad/Intellect Dev.	Institutional/Goal Commit.	Total Hardiness	Commitment Subscale	Control Subscale
Pearson Correlation								
Peer-Group	1.00	0.53*	0.52*	0.56*	0.29*	0.35*	0.38*	0.24*
Interact w/ ROTC Faculty		1.00	0.56*	0.51*	0.16*	0.27*	0.33*	0.24*
Faculty Concern			1.00	0.52*	0.17*	0.33*	0.34*	0.33*
Acad/Intellect Development				1.00	0.27*	0.41*	0.41*	0.30*
Institutional/Goal Commit.					1.00	0.09	0.21*	0.05
Total Hardiness						1.00	0.76*	0.70*
Commitment subscale							1.00	0.48*
Control subscale								1.00
Sig. (2-tailed)								
Peer-Group	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interact w/ ROTC Faculty		-	0.00	0.00	0.01	0.00	0.00	0.00
Faculty Concern			-	0.00	0.01	0.00	0.00	0.00
Acad/Intellect Development				-	0.00	0.00	0.00	0.00
Institutional/Goal Commit.					-	0.14	0.00	0.43
Total Hardiness						-	0.00	0.00
Commitment subscale							-	0.00
Control subscale								-

Note. \* = Significant correlations at the 0.01 level (2-tailed).

Table 9

*Multivariate Logistic Regression: Odds Ratios and Confidence Intervals*

Explanatory Variable	Sig.	Exp(B)	95% C.I. for Exp(B)	
			Lower	Upper
Peer-Group Interaction	0.22	1.07	0.96	1.19
Interactions with ROTC Faculty	0.61	1.03	0.91	1.19
ROTC Faculty Concern for Student Develop	0.97	0.99	0.80	1.24
Academic/Intellectual Development	0.10	1.11	0.98	1.26
Institutional and Goal Commitment	0.01*	1.21	1.08	1.57
Psychological Hardiness	0.19	0.87	0.71	1.07
Commitment	0.15	1.29	0.91	1.82
Control	0.23	1.20	0.89	1.63

*Note.* \* =  $p < 0.05$ .



decreased. The confidence intervals of the variables with odds ratios greater than 1 were next examined. A 95% confidence interval for the odds ratio was selected, and the results can also be found in Table 9. Confidence intervals that did not cross 1 (both values were greater than 1) were important and indicated that as the predictor variable increased, so did the odds of outcome (Field, 2009). Based on the results of the confidence intervals, the only predictor variable deemed significant in increasing the odds of cadets' intent to persist in ROTC and commission in the United States military was *institutional and goal commitment* (when controlling for gender).

The logistic regression model summary can be found in Table 10 and was useful in determining how well the study's predictor variables, as a whole, fit the outcome variable. The column labeled R represents the measure of the multiple correlations between the predictor variables and outcome variable (0.42), and the column labeled  $R^2$  indicates how much of the variance in the outcome was accounted for by the predictor variables (Field, 2009). The model summary indicated a  $R^2$  value of 0.17, which means that the predictor variables of peer-group interaction, interaction with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, psychological hardiness, and the commitment and control subscales of psychological hardiness accounted for 17% of the variation in cadets' intent to persist in ROTC and commission in the United States military. The adjusted  $R^2$  indicates how well the model could be generalized to the overall ROTC population. The difference between the  $R^2$  and the adjusted  $R^2$  was 0.02 ( $0.17 - 0.15 = 0.02$ ) or approximately 2%. This reduction indicated that if the model were derived from the general population of cadets rather than from a sample of cadets, it would account for approximately 2% less variance in the outcome.

Table 10

*Logistic Regression Model Summary<sup>b</sup>*

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>
1	0.42 <sup>a</sup>	0.17	0.15

*Note.* a = Predictors: (Constant), Peer-Group Interaction, Interaction with ROTC faculty, ROTC Faculty Concern for Student Development and Teaching, Academic/Intellectual development, Institutional and Goal Commitments, Total Psychological Hardiness, Commitment subscale, and Control subscale. b = Outcome variable: Cadet's intent to persist in ROTC and commission in the United States military.

Table 11 contains the results of an ANOVA test which was also used to determine the fit of the study's model. The ANOVA tested whether the study's model could significantly predict the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) (Field, 2009). The sum of squares (3.82) was an estimate of the total variability of the data, and the residual sum of squares (18.13) was a measure of the variability that cannot be explained by the model (Field, 2009). The *F*-ratio (7.13) tested the overall fit of the study's model to the data in the multiple regression. With 8 and 271 degrees of freedom, the critical values of the *F*-distribution were 1.97 ( $p = 0.05$ ) and 2.58 ( $p = 0.01$ ). The observed *F*-ratio (7.13) was therefore significant at the 0.05 and 0.01 levels of significance.

The fourth research question sought to determine the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and gender. In order to analyze the relationships between these categorical variables, crosstabulations were calculated (see Table 12). Twenty-four cadets indicated they did not intend to persist in ROTC and commission in the United States military (8.60% of the total) and of these 17 were male cadets (70.80% of the total who stated they would not persist) and seven were female cadets (29.20% of the total that stated they would not persist). Further, 256 cadets indicated they would persist in ROTC and commission in the United States military (91.40% of the total), and of those who planned to persist, 174 were male cadets (68.00% of the total) and 82 were female cadets (32.00% of the total). Lastly, within the male cadet population 91.10% intended to persist in ROTC and commission in the United States military while 8.90% did not. Similarly, within the female cadet population, 92.10% intended to persist while 7.90% did not. The Pearson chi-square statistic was used to examine whether there was an association between the two categorical variables (gender and intent to persist in ROTC and commission in the

Table 11

*Results of Analysis of Variance (ANOVA<sup>a</sup>)*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.82	8.00	0.48	7.13	0.00 <sup>b</sup>
	Residual	18.13	271.00	0.07		
	Total	21.94	279.00			

*Note.* a = Outcome variable: Cadet's intent to persist in ROTC and commission in the United States military. b = Predictor variables: Peer-Group Interaction, Interaction with ROTC faculty, ROTC Faculty Concern for Student Development and Teaching, Academic/Intellectual development, Institutional and Goal Commitments, Total Psychological Hardiness, Commitment subscale, and Control subscale.

Table 12

*Crosstabulations of Cadets' Intent to Persist Based on Gender<sup>a</sup>*

Gender		Cadet's intent to persist in ROTC		Total
		No	Yes	
Male	Count	17	174	191
	% within male or female	8.90%	91.10%	100.00%
	% within cadets' intent to persist	70.80%	68.00%	68.20%
Female	Count	7	82	89
	% within male or female	7.90%	92.10%	100.00%
	% within cadets' intent to persist	29.20%	32.00%	31.80%
Total	Count	24	256	280
	% within male or female	8.60%	91.40%	100.00%
	% within cadets' intent to persist	100.00%	100.00%	100.00%

*Note.* a = Non-significant correlations detected at the 0.05 level (2-tailed).

United States military). Results of the Pearson's test indicated that the two categorical variables were independent and not related ( $p < 0.05$ ).

The fifth research question sought to determine if there were differences in the influence of the predictor variables on male and female ROTC cadets' intent to persist in ROTC and commission in the United States military. A binary logistic regression between each of the predictor variables and the outcome variable was conducted for both male and female cadets. The value of the odds ratio [Exp(B) in the SPSS output] was utilized to interpret the logistic regression, and values greater than 1 indicated that as the predictor variable increased the odds of the outcome variable occurring also increased. Table 13 includes a summary of the odds ratios calculated for the bivariate relationships between male and female cadets' intent to persist and each predictor variable. For male cadets, odds ratios greater than 1 were calculated for all of the predictor variables excluding the *challenge* subcomponent of psychological hardiness [Exp(B) = 0.89]; as this predictor variable increased, the odds of male cadets' intent to persist in ROTC and commission in the United States military decreased. Likewise, odds ratios greater than 1 were calculated for all of the predictor variables for female cadets excluding the *challenge* subcomponent of psychological hardiness [Exp(B) = 0.89]. This indicated that as the *challenge* predictor variable increased, the odds of female cadets' intent to persist in ROTC and commission in the United States military decreased. Subsequently, the *challenge* predictor variable was excluded from further analyses as it indicated a negative correlation to male or female cadets' intent to persist in ROTC and commission in the United States military.

Keeping the data separated by gender, all of the predictor variables with odds ratios greater than 1 were next entered (forced entry method) into a multivariate logistic regression. Descriptive statistics of each of the predictor variables for males and females were processed

Table 13

*Bivariate Relationships between Male/Female Cadets' Intent to Persist and Explanatory**Variables*

Male	Explanatory Variable	Exp(B)	95% C.I. for Exp(B)	
			Lower	Upper
	Peer-Group Interaction	1.22*	1.10	1.35
	Interactions with ROTC Faculty	1.24*	1.10	1.40
	Faculty Concern for Student Development	1.29*	1.07	1.56
	Academic/Intellectual Development	1.30*	1.15	1.47
	Institutional and Goal Commitment	1.37*	1.15	1.64
	Psychological Hardiness	1.11*	1.01	1.22
	Commitment	1.13*	1.13	1.69
	Control	1.27*	1.05	1.54
	Challenge	0.89	0.73	1.10
Female	Explanatory Variable	Exp(B)	95% C.I. for Exp(B)	
			Lower	Upper
	Peer-Group Interaction	1.23*	1.00	1.23
	Interactions with ROTC Faculty	1.10*	0.92	1.27
	Faculty Concern for Student Development	1.32*	0.99	1.75
	Academic/Intellectual Development	1.10*	0.93	1.29
	Institutional and Goal Commitment	1.85*	1.29	2.67
	Psychological Hardiness	1.02*	0.87	1.20
	Commitment	1.16*	0.78	1.74
	Control	1.07*	0.76	1.50
	Challenge	0.89	0.65	1.23

*Note.* \* =  $p < 0.05$ .

during the logistic regressions and can be found in Table 14. For male cadets, large standard deviations were calculated for the variables of *peer-group interaction* (SD = 5.42), *academic and intellectual development* (SD = 5.08), and *psychological hardiness* (SD = 5.03). High mean scores (within the upper 80th percentile) were processed for the variables of *peer-group interaction* ( $\bar{X} = 41.51$ ), *ROTC faculty concern for student development and teaching* ( $\bar{X} = 17.43$ ), *academic and intellectual development* ( $\bar{X} = 40.23$ ), *institutional and goal commitment* ( $\bar{X} = 18.63$ ), and the psychological hardiness subcomponent of *control* ( $\bar{X} = 12.79$ ). For female cadets, a large standard deviation was calculated for the variable of *peer-group interaction* (SD = 6.25). High mean scores (within the upper 80th percentile) were processed for the variables of *peer-group interaction* ( $\bar{X} = 40.81$ ), *ROTC faculty concern for student development and teaching* ( $\bar{X} = 17.31$ ), *academic and intellectual development* ( $\bar{X} = 40.01$ ), and *institutional and goal commitment* ( $\bar{X} = 18.79$ ).

For both male and female cadets, bivariate associations between the study's predictor variables were calculated (see Table 15). The results in this table were used to address the sixth research question, which sought to determine the bivariate associations between the predictor study variables by gender. No substantial correlations ( $r > 0.80$ ) between predictor variables were present and therefore multicollinearity in the data was not present for males or females (Field, 2009). Pearson's correlation coefficient between every pair of variables can also be found in Table 15. For male cadets, significant bivariate associations ( $p < 0.01$ ) were found for all variables except the associations between *institutional and goal commitment* and *interactions with ROTC faculty*, *institutional and goal commitment* and *ROTC faculty concern for student development and teaching*, *psychological hardiness* and *institutional and goal commitment*, and the *control* subscale of psychological hardiness and *institutional and goal commitment*. For



Table 14

*Summary Statistics for Explanatory Variables by Gender*

Male	Explanatory Variable	Range of	Mean	SD
		Possible Values		
	Peer-Group Interaction	10-50	41.51	5.42
	Interactions with ROTC Faculty	6-30	23.28	4.02
	ROTC Faculty Concern for Student Develop.	4-20	17.43	2.43
	Academic/Intellectual Development	10-50	40.23	5.08
	Institutional and Goal Commitment	4-20	18.63	2.20
	Psychological Hardiness	0-45	32.32	5.03
	Commitment	0-15	11.23	2.39
	Control	0-15	12.79	2.21
Female	Explanatory Variable	Range of	Mean	SD
		Possible Values		
	Peer-Group Interaction	10-50	40.81	6.25
	Interactions with ROTC Faculty	6-30	22.99	4.53
	ROTC Faculty Concern for Student Develop.	4-20	17.31	2.58
	Academic/Intellectual Development	10-50	40.01	4.81
	Institutional and Goal Commitment	4-20	18.79	1.91
	Psychological Hardiness	0-45	33.12	4.71
	Commitment	0-15	11.63	1.82
	Control	0-15	12.85	2.14

Table 15

*Bivariate Associations between Quantitative Variables in Study by Gender*

Gender	Peer-Group	Interact w/ Faculty	Faculty Concern	Acad/Intellect Dev.	Institutional/Goal Commit.	Total Hardiness	Commitment Subscale	Control Subscale
<b>Male</b>								
Pearson Correlation								
Peer-Group	1.00	0.54*	0.50*	0.54*	0.28*	0.33*	0.38*	0.26*
Interact w/ Faculty		1.00	0.53*	0.51*	0.13	0.36*	0.38*	0.30*
Faculty Concern			1.00	0.47*	0.10	0.33*	0.34*	0.29*
Acad/Intellect Dev.				1.00	0.28*	0.42*	0.42*	0.28*
Institut/Goal Commit					1.00	0.08	0.20*	0.08
Total Hardiness						1.00	0.79*	0.70*
Commit. Subscale							1.00	0.49*
Control Subscale								1.00
<b>Female</b>								
Pearson Correlation								
Peer-Group	1.00	0.51*	0.56*	0.60*	0.32*	0.39*	0.43*	0.21
Interact w/ Faculty		1.00	0.62*	0.50*	0.25	0.11	0.23	0.15
Faculty Concern			1.00	0.63*	0.36*	0.36*	0.38*	0.42*
Acad/Intellect Dev.				1.00	0.26	0.39*	0.42*	0.33*
Institut/ Goal Commit					1.00	0.11	0.25	0.12
Total Hardiness						1.00	0.71*	0.68*
Commit. Subscale							1.00	0.48*
Control Subscale								1.00

Note. \* = Significant correlations at the 0.01 level (2-tailed).

female cadets, several non-significant bivariate associations ( $p < 0.01$ ) were found between the variables (see Table 15).

The seventh research question sought to determine which of the predictor variables influenced the likelihood of male/female cadets' intent to persist in ROTC and commission in the United States military. For male cadets, odds ratios [Exp(B)] values greater than 1 were calculated for all of the predictor variables except for *ROTC faculty concern for student development and teaching* [Exp(B) = 0.94] and *psychological hardiness* [Exp(B) = 0.81]. These low odds ratios indicated that as these variables increased, the odds of the outcome (male cadets' intent to persist in ROTC and commission in the United States military) decreased. The confidence intervals of the variables with odds ratios greater than 1 were next examined for male cadets. A 95% confidence interval for the odds ratio was selected and the results can also be found in Table 16. Based on the results of the confidence intervals, the predictor variable deemed significant in increasing the odds of male cadets' intent to persist in ROTC and commission in the United States military was *academic and intellectual development*. For female cadets, odds ratios [Exp(B)] values greater than 1 were calculated for the predictor variables of *peer-group interaction* [Exp(B) = 1.10], *ROTC faculty concern for student development and teaching* [Exp(B) = 1.27], *institutional and goal commitment* [Exp(B) = 1.74], and the psychological hardiness subscale of *control* [Exp(B) = 1.13]. These odds ratios indicated that as these variables increased, the odds of the outcome (female cadets' intent to persist in ROTC and commission in the United States military) increased. However, the confidence intervals were also examined to validate that as these predictor variables increased, so did the odds of the outcome. Based on the results of the confidence intervals, the only predictor variable deemed significant in increasing the odds of female cadets' intent to persist in ROTC and

Table 16

*Multivariate Logistic Regressions by Gender: Odds Ratios and Confidence Intervals*

Gender	Explanatory Variable	Sig.	Exp(B)	95% C.I. for Exp(B)	
				Lower	Upper
Male	Peer-Group Interaction	0.31	1.08	0.93	1.24
	Interactions with ROTC Faculty	0.35	1.08	0.92	1.28
	Faculty Concern for Student Develop	0.67	0.94	0.73	1.23
	Academic/Intellectual Development	0.03*	1.20	1.02	1.41
	Institutional and Goal Commitment	0.19	1.16	0.93	1.45
	Psychological Hardiness	0.10	0.81	0.63	1.04
	Commitment	0.07	1.48	0.97	2.26
Control	0.21	1.25	0.89	1.76	
Female	Peer-Group Interaction	0.42	1.10	0.88	1.38
	Interactions with ROTC Faculty	0.41	0.86	0.60	1.23
	Faculty Concern for Student Develop	0.42	1.27	0.71	2.27
	Academic/Intellectual Development	0.87	0.98	0.75	1.27
	Institutional and Goal Commitment	0.01*	1.74	1.16	2.61
	Psychological Hardiness	0.81	0.95	0.60	1.48
	Commitment	0.67	0.84	0.37	1.90
Control	0.74	1.13	0.55	2.35	

*Note.* a = Outcome variable: Cadet's intent to persist in ROTC and commission in the United

States military. \* =  $p < 0.05$ .

commission in the United States military was *institutional and goal commitment*. Table 16 includes the odds ratios and confidence intervals calculated for the multivariate logistic regression (separated by gender).

The logistic regression model summaries for male and female ROTC cadets can be found in Table 17. The column labeled R represents the measure of the multiple correlations between the predictor variables and outcome variable (0.45 for male cadets, 0.50 for female cadets), and the column labeled  $R^2$  indicates how much of the variance in the outcome is accounted for by the predictor variables (Field, 2009). For male cadets, the model indicated an  $R^2$  value of 0.20, which means that the predictor variables of peer-group interaction, interaction with ROTC faculty, ROTC faculty concern for student development and teaching, academic/intellectual development, institutional and goal commitments, psychological hardiness, commitment subscale, and the control subscale accounted for 20% of the variation in cadets' intent to persist in ROTC and commission in the United States military. The  $R^2$  value for female cadets was 0.25, which indicated the predictor variables accounted for 25% of the variance in the outcome variable. The adjusted  $R^2$  indicates how well the model could be generalized to the overall ROTC population. For male cadets, the difference between the  $R^2$  and the adjusted  $R^2$  was 0.03 ( $0.20 - 0.17 = 0.03$ ) or approximately 3%. This reduction indicated that if the model were derived from the general population of male cadets rather than from a sample of cadets it would account for approximately 3% less variance in the outcome. For female cadets, the difference between the  $R^2$  and the adjusted  $R^2$  was 0.08 ( $0.25 - 0.17 = 0.08$ ), or approximately 8%. This reduction indicated that if the model were derived from the general population of female cadets rather than from a sample of cadets it would account for approximately 8% less variance in the outcome.

Table 17

*Logistic Regression Model Summary<sup>b</sup> by Gender*

Gender	R	R <sup>2</sup>	Adjusted R <sup>2</sup>
Male	0.45 <sup>a</sup>	0.20	0.17
Female	0.50 <sup>c</sup>	0.25	0.17

*Note.* a = Predictors: (Constant), Peer-Group Interaction, Interaction with ROTC faculty, ROTC Faculty Concern for Student Development and Teaching, Academic/Intellectual development, Institutional and Goal Commitments, Total Psychological Hardiness, Commitment subscale, and Control subscale. b = Outcome variable: Cadet's intent to persist in ROTC and commission in the United States military. c = Predictors: (Constant), Peer-Group Interaction, Interaction with ROTC faculty, ROTC Faculty Concern for Student Development and Teaching, Academic/Intellectual development, Institutional and Goal Commitments, Total Psychological Hardiness, Commitment subscale, and Control subscale.

ANOVA statistics indicated whether the study's model was significantly better at predicting the outcome (cadets' intent to persist in ROTC and commission in the United States military) compared to using the mean (Field, 2009). For male cadets, the sum of squares ( $SS_M$ ) was 3.10, while the residual sum of squares was 12.39. The  $F$ -ratio (5.69) tested the overall fit of the model in the multiple regression. With 8 and 182 degrees of freedom, the critical values of the  $F$ -distribution were 1.99 ( $p = 0.05$ ) and 2.61 ( $p = 0.01$ ). Therefore, the observed  $F$ -ratio (5.69) for male cadets was significant at the 0.05 and 0.01 levels of significance. For female cadets, the sum of squares was 1.59, and the residual sum of squares was 4.86. With 8 and 80 degrees of freedom, the critical values of the  $F$ -distribution were 2.06 ( $p = 0.05$ ) and 2.74 ( $p = 0.01$ ). As a result, the observed  $F$ -ratio (3.27) for female cadets was significant at the 0.05 and 0.01 levels of significance (see Table 18).

The eighth research question sought to determine the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and the cadets' military branch (Army/Air Force). In order to analyze the relationships between these categorical variables, crosstabulations were calculated (see Table 19). Twenty-four cadets indicated they did not intend to persist in ROTC and commission in the United States military (8.60% of the total). Of this total, seven were Air Force cadets (29.20% of the total who stated they would not persist) and 17 were Army cadets (70.80% of the total who stated they would not persist). Furthermore, 256 cadets indicated they would persist in ROTC and commission in the United States military (91.40% of the total), and of those who planned to persist, 136 were Air Force cadets (53.10% of the total) and 120 were Army cadets (46.90% of the total). Lastly, within the Air Force cadet population 95.10% intended to persist in ROTC and commission in the United States military while 4.90% did not. Within the Army cadet population, 87.60%

Table 18

*Results of Analysis of Variance (ANOVA<sup>a</sup>) by Gender*

Gender		Sum of Squares	df	Mean Square	F	Sig.
	Regression	3.10	8.00	0.39	5.69	0.00 <sup>b</sup>
Male	Residual	12.39	182.00	0.07		
	Total	15.49	190.00			
	Regression	1.59	8.00	0.20	3.27	0.00 <sup>c</sup>
Female	Residual	4.86	80.00	0.06		
	Total	6.45	88.00			

*Note.* a = Outcome variable: Cadet's intent to persist in ROTC and commission in the United States military. b = Predictor variables: Control subscale of psychological hardiness, Peer-Group Interactions, Interactions with ROTC faculty, Commitment subscale, Academic/Intellectual Development, Goal Commitments, ROTC Faculty Concern for Student Development and Teaching, and Total Psychological Hardiness. c = Predictor variables: Control subscale of psychological hardiness, Peer-Group Interactions, Interactions with ROTC faculty, Commitment subscale, Academic/Intellectual Development, Goal Commitments, ROTC Faculty Concern for Student Development and Teaching, and Total Psychological Hardiness.



Table 19

*Crosstabulations of Cadets' Intent to Persist Based on Military Branch*

Military Branch		Cadet's intent to		Total
		persist in ROTC		
		No	Yes	
Air Force	Count	7	136	143
	% within Air Force or Army	4.90%	95.10%	100.00%
	% within cadets' intent to persist	29.20%*	53.10%	51.1%
Army	Count	17	120	137
	% within Air Force or Army	12.40%	87.60%	100.00%
	% within cadets' intent to persist	70.80%*	46.90%	31.80%
Total	Count	24	256	280
	% within Air Force or Army	8.60%	91.40%	100.00%
	% within cadets' intent to persist	100.00%	100.00%	100.00%

*Note.* \* = Significant correlation at the 0.05 level (2-tailed).

intended to persist while 12.40% did not. The Pearson chi-square statistic was used to examine whether there was an association between the two categorical variables (military branch and intent to persist in ROTC and commission in the United States military). Results of the Pearson's test indicated that the two categorical variables were dependent and related ( $p < 0.05$ ).

### **Summary**

The data analyses resulted in five significant outcomes. First, the *challenge* subcomponent of psychological hardiness was found to have a negative correlation to cadets' intent to persist in ROTC towards commissioning. Second, when controlling for gender, *institutional and goal commitment* was the only predictor variable that had a statistically significant effect on cadets' intent to persist in ROTC towards commissioning. Third, male cadets' intent to persist in ROTC towards commissioning was influenced by their *academic and intellectual development* while female cadets were influenced by their *institutional and goal commitments*. Fourth, the results indicated that cadets' gender did not influence their intent to persist in ROTC towards commissioning. Lastly, cadets' chosen military branch was found to influence their intent to persist in ROTC towards commissioning. Air Force cadets were more likely to indicate intent to persist in ROTC towards commissioning versus Army cadets.

## CHAPTER FIVE: DISCUSSION

This study, predicated on Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness, addressed eight research questions. These research questions were related to academic and psychosocial factors that influenced female ROTC cadets' intent to persist in ROTC and commission as officers in the United States Air Force or Army. This chapter features a review of the findings of the study, information about the theoretical framework, implications for military personnel and college administrators, and recommendations for future research.

### Findings of Study

#### Research Questions #1 and #5

Question #1: What is the relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and each of the predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, psychological hardiness [which includes the subscales of commitment, control, and challenge])?

Question #5: What is the relationship between the outcome variables and each of the predictor variables by gender?

The *challenge* subcomponent of psychological hardiness was negatively related to male and female cadets' intent to persist in ROTC and commission in the United States military. Results of odds ratios and 95% confidence intervals showed that as cadets' openness to change and challenges increased, the odds of the cadets' intent to persist in ROTC and commission in the United States military decreased. These findings were reflected in the scores received on the

DRS-15 (version 3) through which cadets who indicated a dislike of changes in their regular routine (question 3), found changes in their routine uninteresting (question 5), did not enjoy the challenge of having to do more than one thing at a time (question 9), and did not like having a daily schedule that is interrupted or changes very much (questions 11 and 14) received a low *challenge* score. Conversely, the odds of these same cadets intending to persist in ROTC and commission in the United States military were high. These results may be influenced by the military's culture in which service members are a part of a tightly controlled and regimented daily routine related explicitly to the mission of the organization (Hajjar, 2013; Wilson, 2008). The internal structure of the military is subdivided into standardized units through which the flow of information, resources, and personnel is formalized through complex regulations (Burke, 2004; Soeters, Poponete, & Page, 2006; Wilson, 2008). Cadets who prefer flexible schedules and varying responsibilities may be less likely to continue within ROTC and commission in the United States military due to the organization's culture. This is consistent with previous research in which it was found that as the challenge predictor variable increased the result was a decrease in cadets' odds of persisting in ROTC (Johnston, 2010).

*Peer-group interaction, interaction with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, psychological hardiness, and the commitment and control subscales of psychological hardiness* were positively related to male and female cadets' intent to persist in ROTC and commission in the United States military. Results of odds ratios and 95% confidence intervals showed that as these predictor variables increased there was an increase in cadets' intent to persist in ROTC and commission in the United States military. In addition, the logistic regression model summaries indicated that these variables, as a whole, accounted for a

significant percentage of the variation in male and female cadets' intent to persist in ROTC towards commissioning. Likewise, the results of the ANOVA indicated that these variables, as a whole, significantly predicted the outcome variable.

This is consistent with Johnston's (2010) study in which it was found that *institutional and goal commitment, peer-group interaction, and intellectual and academic development* were positively correlated with cadets' intent to persist to commissioning. There was no correlation between cadets' intent to persist to commissioning and the psychological hardiness subcomponents of *control, challenge, and commitment*. Previous research found positive correlations between students' persistence in college and peer-group interactions (Astin, 1970a, 1970b, 1985, 1999; Bean, 1980; Pascarella & Terenzini, 2005; Tinto, 1975, 1987, 1993), interactions with faculty (Allen et al., 2008; Guiffrida, 2005; Hausmann & Scholfield, 2007; Putka, 2009), faculty concern for student development and teaching (Cruce et al., 2006; Zhao & Kuh, 2004), academic and intellectual development (Allen et al., 2008; Herzog, 2005; Mills et al., 2008; Morisano et al., 2010), and psychological hardiness (Lifton et al., 2004; Lifton et al., 2006).

## **Research Questions #2 and #6**

Question #2: What are the associations between the study's predictor variables (peer-group interaction, interactions with ROTC faculty, ROTC faculty concern for student development and teaching, academic and intellectual development, institutional and goal commitment, psychological hardiness [which includes the subscales of commitment, control, and challenge])?

Questions #6: What are the associations between the study's predictor variables by gender?

There were significant correlations between many of the study's predictor variables. These bivariate analyses were helpful in assessing the association and causality among the predictor variables (see Tables 9 and 16). However, the correlational results did not indicate which variable caused a change in the other. The results simply indicated that the variables co-occurred in a certain way (Field, 2009). The co-occurrence of predictor variables is understandable in that many factors were closely related. For example, students who frequently interacted with their ROTC faculty may have felt that their faculty were concerned with their development and teaching. Conversely, students who felt that ROTC faculty were concerned with student development and teaching may have frequently interacted with their faculty. Johnston (2010) found strong correlations between predictor variables associated with the psychosocial factors of *peer-group interaction, academic and intellectual development, institutional and goal commitment*, and the *commitment* and *control* subscales of psychological hardiness. The positive net affects of academic and psychosocial variables on students' persistence in college is supported in the literature (Pascarella & Terenzini, 2005; Tinto, 1975, 1987, 1993).

### **Research Question #3**

Which of the predictor variables influence the likelihood of cadets' intent to persist in ROTC and commission in the United States military?

Controlling for gender, *institutional and goal commitment* was the only predictor variable that had a significant effect on cadets' intent to persist in ROTC and commission in the United States military. Cadets' commitments to graduate from their institution and fulfill their goals had an impact on their intent to persist in ROTC and commission after graduation. This may be influenced by cadets' goals of becoming officers within the military. ROTC has emerged as the

top commissioning source for the United States military (Johnson, 2002; U.S. Army, 2011) because graduates of the program become well-educated officers who have received a diverse, self-disciplined, civilian education along with centralized leadership development training (Johnson; Leal, 2007; Neiberg, 2000; U.S. Army; Wilson, 2009). Johnston's (2010) study found similar results in that the predictor variable of *institutional and goal commitment* was statistically significant in influencing cadets' persistence in ROTC. Additional literature reflects this finding, as many studies have noted that students' commitments to their academic-related goals, as well as their institution, are predictor of students' persistence in college (Bean, 1980; Robbins et al., 2004; Tinto, 1975, 1987, 1993).

#### **Research Question #4**

Is there a significant relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and gender?

There was no significant relationship between cadets' gender and their intent to persist in ROTC and commission in the United States military. Results of the Pearson's chi-square test indicated that these two categorical variables (gender and intent to persist in ROTC towards commissioning) were independent and not related. This indicated that variables other than gender influence cadets' decision to continue in ROTC. The literature reflects this finding since many studies have noted that cadets' persistence in ROTC is influenced by factors other than gender (Edwards, 2012; Johnston, 2010; Putka, 2009).

#### **Research Question #7**

Which of the predictor variables influence the likelihood of male/female cadets' intent to persist in ROTC and commission in the United States military?

For male cadets, *academic and intellectual development* was the only predictor variable that had a significant effect on their intent to persist in ROTC and commission in the United States military. More than any other predictor variable, the academic and intellectual development of male cadets significantly influenced their intent to continue in the program towards commissioning. This finding is understandable given that the literature has indicated that the academic development and performance of students during college is a powerful source of influence on student's persistence and degree completion (ACT, 2004; Pascarella & Terenzini, 2005; Tinto, 1975, 1987, 1993). Furthermore, the academic performance of cadets during college affects both their persistence in school and their ability to persist in ROTC. Students who participate in ROTC must maintain a minimum cumulative GPA to continue in the program and must earn a high GPA to receive a scholarship (Leal, 2007; U.S. Air Force, 2011; U.S. Army, 2011). Therefore, male cadets' academic and intellectual development may play a role in their intent to persist since cadets must meet specific academic standards to remain in the program and receive a scholarship.

For female cadets, *institutional and goal commitment* was the only predictor variable that had a significant effect on their intent to persist in ROTC and commission in the United States military. Female cadets' personal goal of obtaining their college degree and commissioning as an officer in the military influenced their decision to persist in ROTC more than any other variable. The literature supports this finding and states that students' academic motivations must be integrated with other variables (such as the desire to become an officer in the Armed Forces) to understand and predict students' long-term persistence (Pascarella & Terenzini, 2005). Additional literature views students' commitments to their academic-related goals, as well as



their institution, as forms of motivation to persist in college (Bean, 1980; Tinto, 1975, 1987, 1993).

The predictor variable of *psychological hardiness* had a negligible influence on male and female cadets' intent to persist in ROTC and commission in the United States military. Despite a positive correlation between cadets' psychological hardiness and their intent to persist in ROTC towards commissioning, the correlation was not statistically significant. This finding is paralleled in Johnston's (2010) study, who concluded that this result, "may have indicated that the psychological perspectives represented by hardiness did not play a role in intent to persist until and if commitment to the goal waivered" (p. 105). This finding is noteworthy because the study completed by Lifton et al. (2006) showed a statistically significant correlation between students' psychological hardiness and their persistence in college to graduation. The results of this study and Lifton et al.'s study may indicate that psychological hardiness may be significantly correlated to persistence and graduation from college but not significantly correlated to persistence in ROTC towards commissioning.

### **Research Question #8**

Is there a significant relationship between the outcome variable (cadets' intent to persist in ROTC and commission in the United States military) and the cadets' military branch (Army or Air Force)?

There was a significant relationship between cadets' military branch (Air Force/Army) and their intent to persist in ROTC and commission in the United States military. Results of the study indicated that Air Force cadets were more likely to persist in ROTC towards commissioning than Army cadets. Although interesting, the results did not answer the question as to why more Air Force cadets intended to persist compared to Army cadets. The results may

indicate that cadets' experiences differ in Air Force and Army ROTC despite a common goal of commissioning as an officer. These varying experiences in the two branches may influence cadets' decision to persist in the program towards commissioning. Each military branch has its own training program tailored to its role in the military. The mission of the United States Army is to fight and win the country's wars through land-based fighting (Schading, 2007). The Army values loyalty in its soldiers, a sense of duty to fulfill obligations, respect for others, selfless service to the nation, the Army, and subordinates, honor to live to the Army's values, integrity to do the right thing, and personal courage to face fear, danger, or adversity. In order to prepare cadets for commissioning in the Army, topics such as military operations and tactics, principles of war, Army customs and traditions, and health and fitness are covered during the freshman and sophomore years in ROTC (GoArmy, 2013). The mission of the United States Air Force is to fly, fight, and win wars in air, space, and cyberspace (Schading, 2007). The Air Force values integrity in its airmen, service before self, and excellence in tasks undertaken. Air Force ROTC courses cover topics such as military law, communication skills, leadership studies, and international security (Schading, 2007). In addition to differing experiences in Air Force and Army ROTC, the culture of each branch may affect cadets' intent to persist towards commissioning.

### **Theoretical Framework**

This study was predicated on Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness. Tinto's student integration theory has emerged as a valid predictive model of student persistence in higher education. It suggests that academic integration, social integration, institutional commitment, and goal commitment exert the highest effects on a student's persistence in higher education (Cabrera, Nora, & Castañeda,

1993; Knight, 2002; Pascarella & Chapman, 1983; Terenzini, Lorange, & Pascarella, 1981).

Tinto recognizes that students attend college with different goals and students have a range of characteristics such as sex, race, and academic ability. A student's goals and specific characteristics influence how the student will perform in college, interact and integrate into the college's social and academic systems, formulate commitment to the institution, and pursue goals associated with graduation (Tinto, 1993). Maddi and Kobasa's (1984) theory of psychological hardiness postulates that people with hardy personalities possess a high level of commitment to life and work, feel a greater sense of control over their circumstances, and are more open to change and challenges (Bartone, 1995). Stressful and painful experiences are also viewed by individuals with hardy personalities as a normal part of life (Maddi & Kobasa, 1984).

The results of this study are consistent with Tinto's (1986) student integration theory as a predictive model of student persistence in ROTC towards commissioning. Positive correlations were found between cadets' intent to persist in ROTC, intent towards commissioning, and their academic integration, social integration, institutional commitment, and goal commitment. Controlling for gender, the variable of institutional and goal commitment was found to be statistically significant in influencing cadets' persistence. When analyzing male cadets, *academic and intellectual development* was found to be statistically significant in influencing their intent to persist and for female cadets, the variable of *institutional and goal commitment* was found to be statistically significant. The combined variables within Tinto's student integration theory offered greater explanation of the factors that influence cadets' intent to persist in ROTC and commission in the United States military.

Results of the study indicated that cadets' overall psychological hardiness posed a positive, yet statistically non-significant, influence on cadets' intent to persist in ROTC and

commission in the United States military. Furthermore, the *challenge* subcomponent of psychological hardiness proved to be negatively related to male and female cadets' intent to persist in ROTC and commission in the United States military. As cadets' openness to change and challenges increased, the odds of the cadets' intent to persist in ROTC towards commissioning decreased. These results are not consistent with Maddi and Kobasa's (1984) theory of psychological hardiness, although Maddi and Kobasa's psychological hardiness theory represents a perspective which focuses on attitudes and cognitive decisions made in response to stress (Johnston, 2010; Maddi & Kobasa, 1984). Johnston (2010) also found a negligible influence of psychological hardiness on cadets' persistence and postulated that psychological hardiness may not play a role in cadets' intent to persist "until and if commitment to the goal waivered" (p. 105). Thus, psychological hardiness may be more of an influential factor to cadets if their commitment to ROTC and commissioning as an officer waivers in the face of stressors related to achieving their goals (Johnston).

### **Implications for ROTC Personnel and College Administrators**

The results of the study suggested that external motivations such as goal commitment and academic development were more critical to cadets' intent to persist in ROTC towards commissioning versus internal psychological characteristics such as psychological hardiness. Based on the results of this study, several practical implications have been developed for ROTC personnel and college administrators that can assist them in taking actions that may enhance the likelihood of persistence and commissioning of cadets in the respective services.

Institutional and goal commitments had the biggest influence on female cadets' intent to persist. Therefore, ROTC personnel and college administrators can assist these female students with the identification of their academic and career goals early in their college career. There are

many benefits of goal identification and support for the notion that students' commitments to their academic-related goals, as well as their institution, are forms of motivation to persist in college (Bean, 1980; Tinto, 1975, 1987, 1993). Before female cadets can commit and achieve their goals, they must first identify what their goals are. Providing activities that allow female cadets the opportunity to identify their academic and career goals can positively influence their achievement of these goals. Once goals are formed, ROTC personnel and college administrators can help female students use these goals to enhance their persistence. They can also provide advice on the proper avenues to follow to achieve the goal, and support female cadets along their path towards graduation and commissioning.

Female cadets' goal commitments can also act as the conduit through which ROTC personnel and college administrators can connect them with other cadets who share similar ambitions. These cadets can interact with each other through planned programs and activities or through informal interactions. Interactions with other cadets who share common goals can help strengthen female cadets' commitments to their goals and provide peer-interventions if commitment waivers. These peer-group interactions can also provide female cadets with encouragement and support which may increase their intent to persist in ROTC and commission in the United States military.

After female cadets identify their academic and career goals, ROTC personnel and college administrators can pair the cadet with a professional mentor who can provide counsel, guidance, support, and accountability. The professional mentor can help the cadet learn and/or develop specific competencies (Murray, 2001). They can guide the cadet on a project, identify resources, and provide networking opportunities. Mentors may help female cadets persist in ROTC through to commissioning and have long been recognized as an important strategy in

student persistence in higher education (Kahveci, Southerland, & Gilmer, 2006; Mangold, Bean, Adams, Schwab, & Lynch, 2003; Pagan & Edwards-Wilson, 2003; Salinitri, 2005).

Since female cadets' intent to persist in ROTC towards commissioning was most influenced by their institutional and goal commitments, ROTC personnel and college administrators can also help the cadets understand the impact of their performance in ROTC and in school on the achievement of their goals. Cadets with weak performances can be advised on how their performance can negatively impact their goals, encouraged to improve their performance, and/or assisted in redefining their long-term ambitions. Female cadets who are strong performers can be assisted in clarifying their long-term goals, applauded for their achievements, and encouraged to stay committed to their objectives.

Male cadets' academic and intellectual development proved to be the main factor in influencing their intent to persist in ROTC. Subsequently, ROTC personnel and college administrators can publicize and encourage male cadets to utilize academic services designed to support their academic and intellectual development. Many college campuses provide workshops designed to focus on specific issues facing university students and can provide students with helpful information and effective strategies to enhance their academic/intellectual development. ROTC personnel and college administrators can proactively inform male cadets about academic services that can support their success such as tutoring, academic skills workshops, study skills coaching, and academic advising. Throughout the semester male cadets can be reminded to take advantage of these services to avert academic difficulties. Mid-term grades can be reviewed to track students' progress, and peer-mentors can be utilized to provide additional support, encouragement, and accountability. Male cadets can also be informed of the

impact of their academics on their ability to persist in ROTC and achieve their long-term goals in the United States military.

ROTC personnel and college administrators should foster a partnership to promote student development and success. This partnership is important because the military can benefit from a diverse officer corps educated in colleges and trained in ROTC programs (Becton, Jr. et al., 2003). Involvement in ROTC and commissioning in the military requires the completion of a four-year degree so universities can benefit from the effect of ROTC on persistence and graduation of ROTC cadets. In order to foster an effective and successful partnership, college administrators should consider recognizing and accepting ROTC personnel as constituents of higher education. Although military personnel are not the primary constituents of higher education, many ROTC faculty members are invested in helping cadets graduate from college and commission in the military. College administrators can seek to involve and engage ROTC personnel appropriately in college discussions regarding student persistence, academic and intellectual development, and goal commitment. For example, ROTC personnel often have frequent and consistent contact with students throughout their college career and may recognize areas through which the university can strengthen student persistence and success. College administrators can acknowledge the influence, involvement, and insight of many of the ROTC personnel and thus engage ROTC personnel as constituents of higher education.

### **Recommendation for Future Research**

The purpose of this study was to determine the influence of academic and psychosocial factors in female cadets' intent to persist in ROTC towards commissioning. However, there are many other perspectives that can be addressed in future research. The comments below include

recommendations and focus on ways to expand research regarding female cadets' persistence in ROTC towards commissioning in the United States military.

Although research has shown that intent to persist in higher education is strongly correlated with actual persistence to graduation, a longitudinal study of the research participants would yield results on actual persistence and graduation (Okun, Benin, & Brandt-Williams, 1996; Porter & Swing, 2006). Therefore, a longitudinal study utilizing the same predictor variables as this study could determine actual persistence of female cadets from their first semester in ROTC to their graduation from the university. In addition to providing data regarding factors influencing actual persistence of female cadets in ROTC, a longitudinal study could determine if cadets' stated intent to persist in ROTC is correlated with actual persistence. Although the predictor variables of *peer-group interaction*, *interaction with ROTC faculty*, *ROTC faculty concern for student development and teaching*, *psychological hardiness*, and the *commitment* and *control* subscales of psychological hardiness were positively related to male and female cadets' intent to persist in ROTC towards commissioning, they did not influence cadets' intent to persist. Longitudinal studies that assess these variables may identify significant correlations between these variables and cadet persistence due to longer term involvement in the program.

Qualitative research of factors that influence female cadets' intent to persist in ROTC towards commissioning may provide more in-depth information by allowing cadets the opportunity to identify and describe their experiences in ROTC and to discuss how these experiences influence their intent to persist. Due to the quantitative structure of this study, cadets were not asked to share their personal experiences or to provide information regarding



factors that influenced their decision to stay or leave ROTC. Qualitative research can provide this type of information and offer richer data.

The study could also be replicated with different military branches such as the Navy and/or Marine Corps. This study focused on cadets in Air Force and Army ROTC programs. Additional research focusing on other military branches could identify themes, trends, or differences in factors affecting cadets' persistence towards graduation based on military branch.

This study focused on Air Force and Army cadets enrolled in five different institutions within the same state. Therefore, the study could be replicated on multiple campuses, particularly those in different states, of different sizes, and with different affiliations to determine if the results are reliable across institutions.

Although the peer-group interaction variable was positively related to male and female cadets' intent to persist in ROTC towards commissioning, it was not statistically significant in influencing cadets' intent to persist. Future research could be conducted to study the effect of cadets' peer-group interactions in ROTC-focused, living-learning communities on their persistence in ROTC towards commissioning. Living-learning communities are designed to enhance college students' residential experience by supporting students' academic interests and goals. These communities consist of students who share common values, beliefs, and goals and actively engage in learning together and from each other. Although the literature has provided insight on the positive effect of living-learning communities on student persistence in college, academic success, and engagement (Edwards & McKelfresh, 2002; Rocconi, 2011; Stassen, 2003, Tinto, 2003), no such study has been conducted specifically for an ROTC living-learning community. An LLC for ROTC students could allow the cadets to live together, support each other through planned programs and activities, and engage in informal interactions. This

inclusive residential learning experience could help the cadets connect their classroom learning to their residential life. In addition, an LLC designed specifically for ROTC cadets could foster student involvement, leadership, and personal development. As Lardner and Malnarich (2008) state, “the camaraderie of co-enrollment may help students stay in school longer, but learning communities can offer more: curricular coherence; integrative, high-quality learning; collaborative knowledge-construction; and skills and knowledge relevant to living in a complex, messy, diverse world” (para. 3). Thus, a future study focused on LLCs designed specifically for ROTC cadets could provide evidence of the effect of the community and peer-group interactions on cadets’ persistence in ROTC towards commissioning, cadets’ engagement, leadership development, and academic growth.

Lastly, the scope of this study was limited to cadets’ class standing (freshman or sophomore), military branch (Air Force or Army), and gender. The ethnicity of the cadets was not gathered during the study. Edwards (2012) studied African American cadets and the impact of ROTC on their retention in historically black colleges and universities (HBCUs). Besides Edwards’ study, limited scholarly research has been completed on the factors influencing minority students’ persistence in ROTC towards commissioning. Therefore, it is recommended that future research focus on ROTC cadets who are minority students.

### **Summary**

In spite of representation in enlisted ranks, women are underrepresented among top leadership positions within the military (MLDC, 2011; Skaine, 2011). As the largest commissioning source, ROTC plays a vital role in increasing the number of female military officers (Johnson, 2002; U.S. Army, 2011). There is substantial evidence that female cadets are retained at lower levels than male cadets during their first two years in the program (Department

of the Air Force, 2012; Department of the Army, 2012). Therefore, the purpose of this study was to examine the influence of academic and psychosocial factors on female cadets' intent to persist in ROTC and commission in the United States Air Force or Army.

The study was predicated on Tinto's (1986) student integration theory and Maddi and Kobasa's (1984) theory of psychological hardiness. The Institutional Integration Scale and the Dispositional Resilience Scale-15 (version 3) were used to assess the effect of the predictor variables on cadets' intent to persist in ROTC towards commissioning. The research participants were freshman and sophomore Army and Air Force ROTC cadets who had not accepted scholarships from the United States military in exchange for commissioning as officers after graduation or had a pre-existing service agreement with the military. Data were gathered from 280 ROTC cadets (89 of which were female) enrolled at five, public universities in spring 2013.

When controlling for gender, *institutional and goal commitment* was the only predictor variable that had a statistically significant effect on cadets' intent to persist in ROTC towards commissioning. When separating the cadets by gender, male cadets' intentions to persist in ROTC towards commissioning were influenced by their academic and intellectual development while female cadets were influenced by their institutional and goal commitments. Results indicated that cadets' gender did not influence their intent to persist in ROTC towards commissioning. However, cadets' chosen military branch was found to influence their intent to persist in ROTC towards commissioning.

The results of this study supported the validity of Tinto's (1986) student integration theory as a predictive model of student persistence in ROTC towards commissioning. Although the results of the study indicated that cadets' overall psychological hardiness was positively correlated to their intent to persist in ROTC towards commissioning, the correlation was weak.

As a result, Maddi and Kobasa's (1984) theory of psychological hardiness could not be supported as a valid predictive model of students' persistence in ROTC.

The study included various implications for ROTC personnel and college administrators. These recommendations included assisting female cadets with the identification of academic and career goals, developing a professional mentorship program, and explaining to cadets the effect of their performance in ROTC and in school on the achievement of their goals. Additional recommendations included publicizing and encouraging male cadets to use academic services and fostering partnerships between ROTC personnel and college administrators to promote student development and success. The study concluded with recommendations for future research. These recommendations included the completion of a longitudinal study to determine the influence of academic and psychosocial variables on actual student persistence to graduation, qualitative studies which provide cadets the opportunity to identify and explain their experiences in ROTC, and research on other military branches besides the Air Force and Army to identify themes, trends, or differences in factors affecting cadets' persistence in the program. In addition, future research can include multiple campuses in different states and of different sizes to determine reliability of the results across institutions. Additional research can analyze the effect of ROTC-focused, living-learning communities on cadets' persistence in ROTC towards commissioning and examine factors that influence minority cadets' persistence in ROTC.

### **Conclusion**

As legislative actions continue to remove obstacles to admitting women to specific roles in the military, the need for more women among top leadership position intensifies. Significant stakeholders have expressed concern about the scarcity of women in top military leadership positions compared to their representation in enlisted troops (MLDC, 2011). As the largest

commissioning source in the United States military, ROTC plays a vital role in responding to stakeholders' concerns of increasing the number of female military officers (Johnson, 2002; U.S. Army, 2011). Despite ROTC's noteworthy record of producing officers, substantial evidence from the Department of the Air Force (2012) and Department of the Army (2012) indicate that female cadets are retained at lower levels than male cadets during their first two years in the program. Subsequently, the purpose of this study was to identify factors that might influence female cadets' intent to persist in ROTC and commission in the military. The results of the study provide ROTC personnel and college administrators practical implications on how to foster cadet persistence towards commissioning. Future research studying the factors that influence female cadets' persistence in ROTC can only help to strengthen this study's results and provide additional knowledge regarding students' persistence.

The involvement of women in the military will continue to change and grow over the centuries. Since work on this paper began, the United States has witnessed significant political reform which has allowed women to serve in combat roles in the military. In addition, the first female Navy officers began serving aboard large ballistic and guided missile submarines in late 2012. Military women's status has evolved from active supporter to clandestine combatant, to overt warrior, to effective leader (Skaine, 2011). Women's future roles in the military are yet to be determined; however, if the commitment to increasing the number of female officers in top military positions is any indication, women will be front and center on land, on sea, in the air, and around the leadership table.

## REFERENCES

- Acker, J. (1990). Hierarchies, jobs, bodies: A theory of gendered organizations. *Gender & Society, 4*, 139-158.
- ACT, Inc. (2004). The role of academic and non-academic factors in improving college retention. Retrieved from [http://www.act.org/research/policymakers/pdf/college\\_retention.pdf](http://www.act.org/research/policymakers/pdf/college_retention.pdf)
- Allen, J., Robbins, S. B., Casillas, A., & Oh, I-S. (2008). Third-year college retention and transfer: Effects of academic performance, motivation, and social connectedness. *Research in Higher Education, 49*(7), 647-664.
- Amott, T. L., & Matthaei, J. (1996). *Race, gender, and work: A multi-cultural economic history of women in the United States, Revised Edition*. Boston, MA: South End Press.
- Andrews, J. C. (1918). *Leadership and military training*. Philadelphia, PA: J. B. Lippincott Company.
- Armor, D. J. (1996). Race and gender in the U.S. military. *Armed Forces and Society, 23*, 7-28.
- Armstrong, D., & Ashworth, M. (2000). When questionnaire response rates do matter: A survey of general practitioners and their views of NHS changes. *British Journal of General Practitioners, 50*, 479-80.
- Army ROTC. (2011, February 28). Legacy and value: With strength comes responsibility [website]. Retrieved from <http://www.goarmy.com/rotc/legacy-and-value.html>
- Astin, A. (1970a). The methodology of research on college impact, part one. *Sociology of Education, 43*(3), 223-254.
- Astin, A. (1970b). The methodology of research on college impact, part two. *Sociology of Education, 43*(4), 437-450.

- Astin, A. (1985). *Achieving educational excellence: A critical assessment of priorities and practices in higher education*. San Francisco: Jossey-Bass.
- Astin, A. (1993). *What matters in college?* San Francisco: Jossey-Bass.
- Astin, A. (1999). Student involvement: A development theory for higher education. *Journal of College Student Personnel, 40*(5), 518-529.
- Baker, B. A., Caison, A. L., & Meade, A. W. (2007). Assessing gender-related differential item functioning and predictive validity with the institutional integration scale. *Educational and Psychological Measurement, 67*(3), 545-559.
- Baldwin, J. N. (1996). Female promotions in male-dominant organizations: The case of the United States military. *Journal of Politics, 58*(4), 1184–1197.
- Baldwin, J. N., & Rothwell, B. A. (1993). Glass Ceilings in the Military. *Review of Public Personnel Administration, 13*(5), 5–26.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bartone, P. T. (1991). Development and validation of a short hardiness measure. Paper presented at the Third Annual Convention of the American Psychological Society, Washington, DC. Retrieved from <http://www.hardiness-resilience.com>
- Bartone, P. T. (1995). A short hardiness scale. Paper presented at the Seventh Annual Convention of the American Psychological Society, New York, NY. Retrieved from <http://www.hardiness-resilience.com>
- Bartone, P. T. (1999). Hardiness protects against war-related stress in Army reserve forces. *Consulting Psychology Journal, 51*, 72-82.

- Bartone, P. T. (2007). Test-retest reliability of the Dispositional Resilience Scale-15, a brief hardiness scale. *Psychological Reports, 101*, 943-944. Retrieved from <http://www.hardiness-resilience.com>
- Bartone, P. T., & Snook, A. (1999, May). *Cognitive and personality factors predict leader development in U.S. Army cadets*. Paper presented at 35th International Applied Military Psychology Symposium (IAMPS), Florence, Italy.
- Bassett, R. C. (2004). *Growing better leaders for the future: A study in optimizing self-awareness* (Master's thesis). U.S. Army War College, Carlisle Barracks, PA. Retrieved from <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA423368>
- Bean, J. P. (1980). Dropouts and turnover: the synthesis and test of a causal model of student attrition. *Research in Higher Education, 12*(2), 155-187.
- Bean, J. P. (1982). Student attrition, intentions, and confidence: Interaction effects in a path model. *Research in Higher Education, 17*(4), 291-320.
- Bean, J. P. (1990). Why students leave: Insights from research. In D. Hossler & J. Bean (Eds.), *The strategic management of college enrollments* (pp. 147-169). San Francisco: Jossey-Bass.
- Bean, J. P. (2005). Nine themes of college student retention. In A. Seidman (Ed.), *College student retention* (pp. 215-244). Westport, CT: Praeger Publishers.
- Bean, J. P., & Eaton, S. (2000). A psychological model of college student retention. In J. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 48-61). Nashville, TN: Vanderbilt University Press.
- Bean, J., & Eaton, S. (2002). The psychology underlying successful retention practices. *Journal of College Student Retention, 3*(1), 73-89.



- Becton Jr., J. W. (2003). On Writs of Certiorari to the United States Court of Appeals for the Sixth Circuit a consolidated brief of Lt. Gen. Julius W. Becton, Jr. as *Amici Curiae* in support of respondents in Grutter v. Bollinger and Gratz and Hamacher v. Bollinger (No. 02-241, 02-516). Retrieved from [http://www.vpcomm.umich.edu/admissions/legal/gru\\_amicus-ussc/um/MilitaryL-both.pdf](http://www.vpcomm.umich.edu/admissions/legal/gru_amicus-ussc/um/MilitaryL-both.pdf)
- Bergman, C. K. (1996). *Challenge of 21st century leadership: The cornerstone and future building blocks*. Retrieved from Air University website: [http://www.au.af.mil/au/awc/awcgate/awc/bergman\\_ck.pdf](http://www.au.af.mil/au/awc/awcgate/awc/bergman_ck.pdf)
- Blickenstaff, J. C. (2006). Women and science careers: leaky pipeline or gender filter? *Gender and Education, 17*(4), 369-386.
- Bouteyre, E., Maurel, M., & Bernaud, J-L. (2007). Daily hassles and depressive symptoms among first year psychology students in France: The role of coping and social support. *Stress and Health, 23*, 93–99.
- Braxton, J. M. (2000). *Reworking the student departure puzzle*. Vanderbilt University Press: Nashville.
- Braxton, J., Hirschy, A., & McClendon, S. (2004). Understanding and reducing student departure. *ASHE-ERIC Higher Education Report, 30*(3). San Francisco: Jossey-Bass.
- Braxton, J., & Lien, L. (2000). The viability of academic integration as a central construct in Tinto's interactionist theory of college student departure. In J. Braxton (Ed.), *Reworking the student departure puzzle*. Nashville, TN: Vanderbilt University Press.

- Breidenbach, D. H., & French, B. F. (2010). Ordinal logistic regression to detect differential item functioning for gender in the institutional integration scale. *Journal of College Student Retention: Research, Theory and Practice*, 12(3), 339-352.
- Burke, C. (2004). *Camp all-American, Hanoi Jane, and the high-and-tight: Gender, folklore, and changing military culture*. Boston, MA: Beacon Press Books.
- Burke, R. J., & Mattis, M. C. (Eds.). (2007). *Women and minorities in science, technology, engineering and mathematics: Upping the numbers*. Northampton, MA: Edward Elgar Publishing, Inc.
- Burrelli, D. F. (2012). *Women in combat: issues for congress* (Report No. R42075). Retrieved from Congressional Research Service website: [www.crs.gov](http://www.crs.gov) and <http://www.fas.org/sgp/crs/natsec/R42075.pdf>
- Bystydzienski, J. M., & Bird, S. R. (2006). *Removing barriers: Women in academic science, technology, engineering, and mathematics*. Bloomington, IN: Indiana University Press.
- Cabrera, A., Castañeda, M., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *The Journal of Higher Education*, 63(2), 143-164.
- Cabrera, A. F., Nora, A., & Castañeda, M. B. (1993). College persistence: Structural equations modeling test of an integrated model of student retention. *The Journal of Higher Education*, 64(2), 123-139.
- Card, J. J. & Farrell, W. S. (1983). Nontraditional careers for women: a prototypical example, *Sex Roles*, 9(10), 1005-1022.
- Carnegie Foundation for the Advancement of Teaching. (2010). Classifications. Retrieved from Carnegie Foundation website: <http://www.carnegiefoundation.org/>

- Cheatham, H. E. (1984). Integration of women into the U. S. military. *Sex Roles, 11*(1/2), 141-153.
- Cohen (1988). *Statistical power analysis for the behavioral sciences, 2nd edition*. Hillsdale, NJ: Erlbaum.
- Cruce, T., Wolniak, G. C., Seifert, T. A., & Pascarella, E. T. (2006). Impacts of good practices on cognitive development, learning orientations, and graduate degree plans during the first year of college. *Journal of College Student Development, 47*, 365-383.
- Daugherty, T. K., & Lane, R. J. (1999). A longitudinal study of academic and social predictors of college attrition. *Social Behavior and Personality, 27*, 355-361.
- Defense Advisory Committee on Women in the Services. (2003). *Status report*. Washington, DC: Office of the Under Secretary of Defense, Personnel Readiness.
- Department of the Air Force (2012). [FOIA request on retention statistics of female and male AFROTC cadets]. Unpublished raw data.
- Department of the Army (2012). [Request on retention statistics of female and male Army ROTC cadets]. Unpublished raw data.
- DesJardins, S. L., Alhburg, D. A., & McCall, B. P. (1999). An event history model of student departure. *Economics of Education Review, 18*(3), 375-390.
- Dixon Rayle, A., Robinson Kurpius, S. E., & Arredondo, P. (2006). Relationship of self-beliefs, social support, and university comfort with the academic success of freshman college women. *Journal of College Student Retention, 8*(3), 325-343.

- Dixon Rayle, A., Tovar-Gamero, Z., & Johnson, T. (January, 2004). *The validity of self-beliefs as predictors of academic persistence of Latino, Native American, and Euro American undergraduates*. Paper presented at the annual meeting of the Relevance of Assessment and Culture in Evaluation, Tempe, AZ.
- Duranczyk, I. M., Higbee, J. L., & Lundell, D. B. (Eds.). (2004). *Best practices for access and retention in higher education*. Minneapolis, MN: Center for Research on Developmental Education and Urban Literacy (CRDEUL).
- Dykman, B. M. (1998). Integrating cognitive and motivational factors in depression: initial tests of a goal-orientation approach. *Journal of Personality and Social Psychology*, 74, 139-158.
- Eagly, A. H., & Chin, J. L. (2010). Diversity and leadership in a changing world. *American Psychologist*, 65(3), 216-224.
- Eaton, S., & Bean J. (1995). An approach/avoidance behavioral model of college student attrition. *Research in Higher Education*, 36, 617-645.
- Edwards, E. (2012). *African American student retention in the reserve officer training corps (ROTC) leadership program* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses (PQDT).
- Edwards, K. E., & McKelfresh, D. A. (2002). The impact of a living learning center on students' academic success and persistence. *Journal of College Student Development*, 43(3), 395-402.
- Endo, J. J., & Harpel, R. L. (1982). The effect of student-faculty interaction on students' educational outcomes. *Research in Higher Education*, 16(2), 115-138.

- Evans, S. M. (1997). *Born for liberty: A history of women in America*. New York: Free Press Paperbacks.
- Evertson, A., & Nesbitt, A. (2004). *The glass ceiling effect and its impact on mid-level female officer career progression in the United States Marines Corps and Air Force*. Monterey, CA: Naval Postgraduate School.
- Field, A. (2009). *Discovering Statistics using SPSS (3<sup>rd</sup> edition)*. Thousand Oaks, CA: SAGE Publications Inc.
- Foley Nicpon, M., Huser, L., Hull Blanks, E., Sollenberger, S., Befort, C., & Robinson Kurpius, S.E. (2006). The relationship of loneliness and social support with college freshmen's academic performance and persistence. *Journal of College Student Retention*, 8(3), 345-358.
- Franken, R. (2006). *Human motivation* (6th ed.). Florence, KY: Wadsworth.
- Freeman, C. E. (2004). *Trends in Educational Equity of Girls & Women: 2004* (NCES 2005–016). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- French, B., & Oakes, W. (2004). Reliability and validity evidence for the institutional integration scale. *Educational and Psychological Measurement*, 64(1), 88-98.
- Funk, S. C. (1992). Hardiness: a review of theory and research. *Health Psychology*, 11(5), 335-345.
- Giatras, C. (2000). *Personality hardiness: A predictor of occupational stress and job satisfaction among California fire service personnel*. (California State University, Long Beach). *ProQuest Dissertations and Theses*, Retrieved from <http://search.proquest.com/docview/304680191?accountid=10639>. (304680191)

- Gloria, A. M., & Ho, T. A. (2003). Environmental, social, and psychological experiences of Asian American undergraduates: Examining issues of academic persistence. *Journal of Counseling & Development, 81*, 93-105.
- Gloria, A. M., & Robinson Kurpius, S. E. (2001). Influences of self-beliefs, social support, and comfort in the university environment on the academic nonpersistence decisions of American Indian undergraduates. *Cultural Diversity and Ethnic Minority Psychology, 7*, 88-102.
- Go Army. (2012, July 10). Become an officer [website]. Retrieved from <http://www.goarmy.com/careers-and-jobs/become-an-officer.html>
- Gratz v. Bollinger, 539 U.S. 244 (2003).
- Greenwald, M. W. (1980). *Women, war, and work: the impact of World War I on women workers in the United States*. New York: Cornell University Press.
- Greer, S. C. (2006). *Motivation and military science commitment of army reserve officer training corps cadets* (Unpublished master's thesis). University of Georgia, Athens, GA. Retrieved from [http://athenaeum.libs.uga.edu/bitstream/handle/10724/9312/greer\\_stuart\\_c\\_200608\\_ma.pdf?sequence=1](http://athenaeum.libs.uga.edu/bitstream/handle/10724/9312/greer_stuart_c_200608_ma.pdf?sequence=1)
- Grutter v. Bollinger, 539 U.S. 306 (2003).
- Guiffrida, D. A. (2005). To break away or strengthen ties to home: A complex question for African American students attending a predominantly White institution. *Equity and Excellence in Education, 38*(1), 49–60.

- Hagedorn, L. S. (2005). How to define retention: a new look at an old problem. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 89-106). Westport, CT: ACE/Praeger Publishers.
- Hajjar, R. (2013). Emergent postmodern US military culture. *Armed Forces & Society, 00(0)*, 1-28. doi: 10.1177/0095327X12465261
- Harris, G. L. A. (2009). Women, the military, and academe: navigating the family track in an up or out system. *Administration & Society, 41(4)*, 391-422.
- Hausmann, L., Scholfield, J. W., Woods, R. L. (2007). Sense of belonging as a predictor of intentions to persist among African American and white first-year college students. *Research in Higher Education, 48(7)*, 803-839.
- Harrell, M. C., & Miller, L. L. (1997). *New opportunities for military women: Effects upon readiness, cohesion, and morale*. Santa Monica, CA: RAND Corporation.
- Herbert, M. S. (1998). *Camouflage isn't only for combat: Gender, sexuality, and women in the military*. New York, NY: New York University Press.
- Herzog, S. (2005). Measuring determinants of student return vs. dropout/stopout vs. transfer: a first-to-second year analysis of new freshmen. *Research in Higher Education, 46(8)*, 883-928.
- Horner, D. H. (1995). Leader development and why it remains important. *Military Review, 75(4)*, 76-86.
- Hosmer, D., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed.). New York: John Wiley & Sons.
- Hughes, R., & Pace, C. R. (2003). Using NSSE to study student retention and withdrawal. *Assessment Update: Progress, Trends, and Practices in Higher Education, 15(4)*, 1-2, 15.

- Hutchison, M. A., Follman, D. K., Sumpter, M., & Bodner, G. M. (2006). Factors influencing the self-efficacy beliefs of first-year engineering students. *Journal of Engineering Education, 95*(1), 39-47.
- Hystad, S. W., Eid, J., Laberg, J. C., Johnsen, B. H., & Bartone, P. T. (2009). Academic stress and health: Exploring the moderating role of personality hardiness, *Scandinavian Journal of Educational Research, 53*(5), 421-429
- IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.
- Ishitani, T. T. (2006). Studying attrition and degree completion behavior among first-generation college students in the United States. *The Journal of Higher Education, 77*(5), 861-885.
- Jacobs, J. E. (2005). Twenty-five years of research on gender and ethnic differences in math and science career choices: What have we learned? *New Directions for Child and Adolescent Development, 110*, 85-94.
- James, B. J. (2005). *Existential hardiness as a moderator of stress and anger in police recruits*. (Walden University). *ProQuest Dissertations and Theses*, Retrieved from <http://search.proquest.com/docview/305371139?accountid=10639>
- Johnson, M. H. (2002). *Army ROTC's challenge: Providing lieutenants for the objective force*. Retrieved from the Defense Technical Information Center website: <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA404216>
- Johnston, S. M. (2010). *Factors influencing intent to persist in higher education of participants in U.S. Army reserve officer training corps (ROTC) programs* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 758436316).



- Judkins, S., & Ingram M. (2002). Decreasing stress among nurse managers: A long-term solution. *Journal of Continuing Education in Nursing, 33*(6), 259-264.
- Judkins, S., Reid, B., & Furlow, L. (2006). Hardiness training among nurse managers: building a healthy workplace. *Journal of Continuing Education in Nursing, 37*(5), 202-207.
- Kahveci, A., Southerland, S. A., & Gilmer, P. J. (2006). Retaining undergraduate women in science, mathematics, and engineering. *Journal of College Science Teaching, 36*(3), 34-38.
- Kark, R., & Eagly, A. H. (2010). Gender and leadership: Negotiating the labyrinth. *Handbook of Gender Research in Psychology, 2*, 443-468. Doi: 10.1007/978-1-4419-1467-5\_19
- Kelley, M. (2001). Beyond the boundaries. *Journal of the Early Republic, 21*(1), 73-78.
- Kelley, M. L., Hock, E., Bonney, J. F., Jarvis, M. S., Smith, K. M., & Gaffney, M. A. (2001). Navy mothers experiencing and not experiencing deployment: reasons for staying in or leaving the military. *Military Psychology, 13*(1), 55-71.
- Kerber, L. (1976). The republican mother: Women and the enlightenment-an American perspective. *American Quarterly, 28*(2), 187-205.
- Knight, W. E. (2002). *Toward a comprehensive model of influences upon time to bachelor's degree attainment* (AIR Professional File No. 85). Tallahassee, FL: Association for Institutional Research.
- Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology, 42*, 168-177.
- Kohn, R. H. (1998). An officer corps for the next century. *Joint Forces Quarterly, 18*, 76-80.

- Krause, K. (2005, September). *Understanding and promoting student engagement in university learning communities*. Paper presented at the James Cook University Symposium, Sharing Scholarship in Learning and Teaching: Engaging Students, Townsville/Cairns, Queensland.
- Kucharek, P. (2007). *The senior leader's responsibility for leading military change and transformation* (Unpublished master's thesis). U.S. Army War College, Carlisle Barracks, PA. Retrieved from <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA469664>
- Kuh, G. D. (2001). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change*, 33(3), 10-17.
- Kuh, G. D. (2003). What we're learning about student engagement from NSSE. *Change*, 35(2), 24-32.
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008) Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education*, 79 (5), 540–563.
- Kuh, G. D., Kinzie, J., Buckley, J., Bridges, B., & Hayek, J. C. (2007). *Piecing together the student success puzzle: Research, propositions, and recommendations*. ASHE Higher Education Report, 52(5). San Francisco: Jossey-Bass.
- Landry, C. C. (2002). Retention of women and people of color: Unique challenges and institutional responses. *Journal of College Student Retention: Research, Theory & Practice*, 4(1), 1-13.

- Lardner, E., & Malnarich, G. (2008, July-August). New era in learning-community work: Why the pedagogy of intentional integration matters. *Change: The Magazine of Higher Education*, 40(4). Retrieved from <http://www.changemag.org/Archives/Back%20Issues/July-August%202008/full-new-era.html>
- Larwood, L., Glasser, E., & McDonald, R. (1980). Attitudes of male and female cadets towards military sex integration. *Sex Roles*, 6(3), 381-390.
- Law, D. (2005). Interactive organizational commitment and hardiness in public accountants' turnover. *Managerial Auditing Journal*, 20(4), 383-393.
- Leal, D. L. (2007). Students in Uniform: ROTC, the citizen-soldier, and the civil-military gap. *PS: Political Science and Politics*, 40(3), 479-483.
- Lifton, D., Seay, S., & Bushko, A. (2000). Can student "hardiness" serve as an indicator of likely persistence to graduation? Baseline results from a longitudinal study. *Academic Exchange Quarterly*, 4, 73-81.
- Lifton, D., Seay, S., Bushko, A. (2004). Measuring undergraduate hardiness as an indicator of persistence to graduation within four years. In I. Duranczyk, J. Higbee, & D. Lundell (Eds.), *Best practices for access and retention in higher education*. Minneapolis, MN: Center for Research on Developmental Education and Urban Literacy, General College, University of Minnesota, 103-113.
- Lifton, D., Seay, S., McCarly, N., Olive-Taylor, R., Seeger, R., & Bigbee, D. (2006). Correlating hardiness with graduation persistence. *Academic Exchange Quarterly*, 10(3), 277-283.
- Lim, N., Cho, M., & Curry, K. (2008). *Planning for diversity: Options and recommendations for DoD leaders*. Santa Monica, CA: RAND Corporation.

- Lim, N., Marquis, J., Hall, C., Schulker, D., & Zhuo, X. (2009). *Officer classification and the future of diversity among senior military leaders: A case study of the Army ROTC*. Santa Monica, CA: RAND Corporation.
- Lochner, L., & Moretti, E. (2004). The effect of education on criminal activity: Evidence from prison inmates, arrests and self-reports. *American Economic Review*, 94 (1).
- Lorber, J. (1994). *Paradoxes of gender*. New Haven: Yale University Press.
- Lubold, G. (2006, March 6). More minority officers needed, Rumsfeld says. *Army Times*. Retrieved from <http://www.armytimes.com/legacy/new/0-ARMYPAPER-1558076.php>
- Lufi, D, Parish-Plass, J., & Cohen, A. (2003). Persistence in higher education and its relationship to other personality variables. *College Student Journal*, 37(1), 50-59.
- Maddi, S. R. (1999). The personality construct of hardiness, I: Effects on experiencing, coping, and strain. *Consulting Psychology Journal*, 51, 83–94.
- Maddi, S. R. (2002). The story of hardiness: Twenty years of theorizing, research, and practice. *Consulting Psychology Journal*, 54, 173–185.
- Maddi, S. R., Harvey, R. H., Khoshaba, D. M., Fazel, M., & Resurreccion, N. (2009). The personality construct of hardiness, IV: Expressed in positive cognitions and emotions concerning oneself and developmentally relevant activities. *Journal of Humanistic Psychology*, 49(3), 292-305.
- Maddi, S. R., & Hightower, M. (1999). Hardiness and optimism as expressed in coping patterns. *Consulting Psychology Journal*, 51, 95–105.
- Maddi, S., & Kobasa, S. (1984). *The hardy executive: Health under stress*. Homewood, IL: Dow Jones-Irwin.

- Mahan, B. T. (1976). Career alternative for women: ROTC. *Vocational Guidance Quarterly*, 25(2), 163-169.
- Mangold, W. D., Bean, L. G., Adams, D. J., Schwab, W. A., & Lynch, S. M. (2003). Who goes and who stays: An assessment of the effect of a freshman mentoring and unit registration program on college persistence. *Journal of College Student Retention*, 4(2), 95-122.
- Matthews, M. D., Ender, M. G., Laurence, J. H., & Rohall, D. E. (2009). Role of group affiliation and gender on attitudes toward women in the military. *Military Psychology*, 21(2), 241-251.
- McCormick, A. C. (2003). Swirling and double-dipping: New patterns of student attendance and their implications for higher education. *New Directions for Higher Education*, 2003(121), 13-24.
- McGlynn, A. P. (2008). Millennials in college: How do we motivate them? *Education Digest: Essential Reading Condensed for Quick Review*, 73(6), 19-22.
- McGovern, J. R. (1968). The American women's pre-world war 1 freedom in manners and morals. *The Journal of American History*, 55(2), 315-333.
- McIlwaine, R. J. (2009). *The army officer: Recruit, access, and retain* (Master's thesis). U.S. Army War College, Carlisle Barracks, PA. Retrieved from <http://www.dtic.mil/cgibin/GetTRDoc?AD=ADA499320>
- McNair Achievement Programs (2011). The book and legacy of Ronald McNair. Retrieved from <http://www.ronaldmcnair.org/book.htm>
- Meese, M. J. (2008). The army officer corps in the all-volunteer force. *Contemporary Economic Policy*, 20(2), 101-110.

- Merriam-Webster, Incorporated. (2012, July 10). An encyclopedia Britannica company [website]. Retrieved from <http://www.merriam-webster.com/>
- Military Leadership Diversity Commission (March, 2011). *Final Report: From Representation to Inclusion: Diversity Leadership for the 21<sup>st</sup>-Century Military*. Retrieved from <http://mldc.whs.mil/>
- Mills, C., Heyworth, J., Rosenwax, L., Carr, S., & Rosenberg, M. (2008). Factors associated with the academic success of first year health science students. *Advances in Health Sciences Education, 14*(2), 205-217.
- Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies, 16*, 41-51.
- Moilanen, J. H., & Craig, D. M. (May/June, 2000). Leader development in a transforming army. *Military Review, 80*(3), 12-16.
- Monahan, E. M., & Neidel-Greenlee, R. (2010). *A few good women: America's military women from World War I to the wars in Iraq and Afghanistan*. New York: Alfred A. Knopf.
- Moore, B. L., & Webb, S. C. (2000). Perceptions of equal opportunity among women and minority army personnel. *Sociological Inquiry, 70*(2), 215-239.
- Morisano, D., Hirsh, J. B., Peterson, J. B., Pihl, R. O., & Shore, B. M. (2010). Setting, elaborating, and reflecting on personal goals improves academic performance. *Journal of Applied Psychology, 95*(2), 255-264.
- Murray, M. (2001). *Beyond the myths and magic of mentoring*. San Francisco: Jossey-Bass.
- Nash, M. A. (1997). Rethinking republican motherhood: Benjamin Rush and the young ladies' academy of Philadelphia. *Journal of the Early Republic, 17*(2), 171-191.

- National Center for Education Statistics, Institute of Education Sciences. (2011). *Actual and projected numbers for bachelor's degrees conferred by postsecondary degree-granting institutions, by sex of recipient: 1995-66 through 2020-21*. Retrieved from <http://nces.ed.gov/programs/projections/projections2020/tables.asp>
- Neiberg, M. (2000). *Making citizen-soldiers: ROTC and the ideology of American military service*. Cambridge, MA: Harvard University Press.
- Norton, M. B. (1980). *Liberty's daughters: the revolutionary experience of American women, 1750-1800: With a new preface*. New York: Cornell University Press.
- Okun, M., Benin, M., & Brandt-Williams, A. (1996). Staying in college: Moderators of the relation between intention and institutional departure. *The Journal of Higher Education*, 67, 577-596.
- Pagan, R., & Edwards-Wilson, R. (2003). A mentoring program for remedial students. *Journal of College Student Retention*, 4(3), 207-225.
- Parashos, P., Morgan, M. V., & Messer, H. H. (2005). Response rate and nonresponse bias in a questionnaire survey of dentists. *Community Dentistry and Oral Epidemiology*, 33(1), 9-16.
- Pascarella, E. T., & Chapman, D. (1983). A multi-institutional path analytical validation of Tinto's model of college withdrawal. *American Educational Research Journal*, 20, 87-102.
- Pascarella, E. T., Duby, P., & Iverson, B. (1983). A test and reconceptualization of a theoretical model of college withdrawal in a commuter institution setting. *Sociology of Education*, 56(2), 88-100.

- Pascarella, E. T., & Terenzini, P. (1978). The relation of students' precollege characteristics and freshman year experience to voluntary attrition. *Research in Higher Education, 9*(4), 347–366.
- Pascarella, E., & Terenzini, P. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. *The Journal of Higher Education, 51*(1), 60-75.
- Pascarella, E. T., & Terenzini, P. (1983). Path analytic validation of Tinto's model. *Journal of Educational Psychology, 75*(2), 215–226.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: a third decade of research (Vol. 2)*. San Francisco, CA: Jossey-Bass.
- Peter, K., & Horn, L. (2005). *Gender differences in participation and completion of undergraduate education and how they have changed over time (NCES 2005-169)*. U. S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office. Retrieved from National Center for Education Statistics web site: <http://nces.ed.gov/pubs2005/2005169.pdf>
- Pierce, P. F. (1998). Retention of Air Force women serving during Desert Shield and Desert Storm. *Military Psychology, 10*(3), 195-213.
- Porter, S., & Swing, R. (2006). Understanding how first-year seminars affect persistence. *Research in Higher Education, 47*(1), 89-109.
- Price, J. L. (1977). *The study of turnover*. Ames, IA: Iowa State University Press.
- Pritchard, K. H. (May/June, 1999). Competency-based leadership for the 21st Century. *Military Review, 79*(3), 23-26.



- Putka, D. J. (2009). *Initial development and validation of assessments for predicting disenrollment of four-year scholarship recipients from the reserve officer training corps* (Contract No. DASW01-03-D-005 (Do 0042)). Retrieved from Defense Technical Information Center website: <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA495510>
- Reason, R. D. (2009). Student variables that predict retention: Recent research and new developments. *NASPA Journal*, 46(3), 482-501.
- Ridgeway, C. L., & Correll, S. J. (2004). Unpacking the gender system: A theoretical perspective on gender beliefs and social relations. *Gender & Society*, 18(4), 510-531.
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, 130(2), 261-288.
- Robinson Kurpius, S. E., & Lucart A. L. (2000). Military and civilian undergraduates: Attitudes toward women, masculinity, and authoritarianism. *Sex Roles*, 43(3/4), 255-265.
- Rocconi, L. M. (2011). The impact of learning communities on first year students' growth and development in college. *Research in Higher Education*, 52(2), 178-193.
- Ross, S. (2008). *Motivation correlates of academic achievement: Exploring how motivation influences academic achievement in the PISA 2003 dataset*. University of Victoria (Canada). *ProQuest Dissertations and Theses*, Retrieved from <http://search.proquest.com/docview/3044446364?accountid=10639>. (3044446364).
- Salintri, G. (2005). The effects of formal mentoring on the retention rates for first-year, low-achieving students. *Canadian Journal of Education*, 28(4), 853-873.

- Savage, J., & Smith, S. (2008). General and specific goal orientations as correlates of adult student degree completion: Lessons from the Community College of the Air Force. *Journal of College Student Retention, 9*(4), 461-485.
- Schading, B. (2007). *A civilian's guide to the U.S. military: A comprehensive reference to the customs, language, and structure of the armed forces*. Cincinnati, OH: Writer's Digest Books.
- Schlossberg, N. K., Lynch, A. Q., & Chickering, A. W. (1989). *Improving higher education environments for adults: Responsive programs and services from entry to departure*. San Francisco, CA: Jossey-Bass.
- Schneider, D., & Schneider, C. J. (1993). *American women in the progressive era, 1900-1920*. New York: Facts on File, Inc.
- Segal, D. R., & Segal, M. W. (2004). America's military population. *Population Bulletin, 59*(4), 1-44.
- Seidman, A. (Ed.). (2005). *Student retention: Formula for student success*. Westport, CT: ACE/Praeger Publishers.
- Sheard, M., & Golby, J. (2007). Hardiness and undergraduate academic study: the moderating role of commitment. *Personality and Individual Differences, 43*(3), 579-588.
- Silva, J. M. (2008). A new generation of women? How female ROTC cadets negotiate the tension between masculine military culture and traditional femininity. *Social Forces, (87)*2, 937-960.
- Skaine, R. (2011). *Women in combat: A reference handbook*. Santa Barbara, CA: ABC-CLIO.

- Soeters, J. L., Poponete, C., & Page, J. T. (2006). Culture's consequences in the military. In T. W. Britt, A. B. Adler, & C. A. Castro (Eds.), *Military life: The psychology of serving in peace and combat* (pp. 13–14). Westport, CT: Praeger Security International.
- Stage, F., & Hossler, D. (1989). Differences in family influences on college attendance plans for male and female ninth graders. *Research in Higher Education, 30*(3), 301–315.
- Stassen, M. L. (2003). Student outcomes: The impact of varying living-learning community models. *Research in Higher Education, 44*(5), 581-613.
- Terenzini, P. T., Lorange, W., & Pascarella, E. (1981). Predicting freshman persistence and voluntary dropout decisions: A replication. *Research in Higher Education, 15*, 109-127.
- Terenzini, P. T., & Wright, T. M. (1987). Influences on students' academic growth during four years of college. *Research in Higher Education, 26*(2), 161-179.
- Tice, J. (2011, February 11). Up-or-out rules get refined by Army. *Army Times*. Retrieved from <http://www.armytimes.com/news/2011/02/army-tighter-up-or-out-rules-for-enlisteds-021311w/>
- Tinto, V. (1975). Dropout from higher education: a theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89-125.
- Tinto, V. (1986). Theories of student departure revisited. In J. Smart (Ed.), *Higher education: A handbook of theory and research*. New York: Agathon.
- Tinto, V. (1987). *Leaving college: rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.), Chicago: University of Chicago Press.

- Tinto, V. (2003). Learning better together: The impact of learning communities on student success. *Higher Education monograph series*, 1(8).
- Trochim, W. M. (2000). *The research methods knowledge base*, 2<sup>nd</sup> edition. Cincinnati, OH: Atomic Dog Publishing. .
- Trowler, V. (2010). *Student engagement literature review*. The Higher Education Academy. Department of Educational Research. Lancaster University, UK.
- Ulmer, W. F. (1998). Military leadership into the 21<sup>st</sup> century: Another “bridge too far?” *Parameters*, Spring 1998, 4-25.
- UNC Systemwide Evaluation & Recommendation for Veterans Education & Services. (2011, April). *Report to the President*. Retrieved from <http://www.northcarolina.edu/frc/uncserves/serves.html>
- U. S. Air Force (2011). The book 2011. *Airman: Official Magazine of the U.S. Air Force*, LV(3), 1-48.
- U. S. Army (2011). Women in the U.S. Army: Today’s women soldiers [Army.mil featured website]. Retrieved from <http://www.army.mil/women/today.html>
- U. S. Department of Labor, Labor Force Statistics from the Current Population Survey. (2012). *Employment status of the civilian noninstitutional population 25 years and over by educational attainment, sex, race, and Hispanic or Latino ethnicity*. Retrieved from <http://www.bls.gov/cps/cpsaat07.pdf>
- U. S. Navy (2012). Women in the Navy Fact Sheet. Retrieved from [http://www.public.navy.mil/bupers-npc/organization/bupers/WomensPolicy/Documents/Women%20in%20the%20Navy%20Fact%20Sheet\\_JAN%202012\\_v3.pdf](http://www.public.navy.mil/bupers-npc/organization/bupers/WomensPolicy/Documents/Women%20in%20the%20Navy%20Fact%20Sheet_JAN%202012_v3.pdf)

- van de Mortel, T.F. (2008). Faking it: social desirability response bias in self-report research. *Australian Journal of Advanced Nursing*, 25(4), 40-48.
- Vecchio, R. P., & Brazil, D. M. (2007). Leadership and sex-similarity: A comparison in a military setting. *Personnel Psychology*, 60(2), 303-335.
- Weissberg, N. C., & Owen, D. R. (2005). Do psychosocial and study skill factors predict college outcomes? Comment on Robbins et al. (2004). *Psychological Bulletin*, 131(3), 407-409.
- Weissmann, J. (2012, August). How the great recession proved, beyond a doubt, the value of a college degree. *The Atlantic*. Retrieved from <http://www.theatlantic.com/business/archive/2012/08/how-the-great-recession-proved-beyond-a-doubt-the-value-of-a-college-degree/261225/#.UC2vB9JZTf0.facebook>
- Welter, B. (1966). The cult of true womanhood: 1820-1860. *American Quarterly*, 18(2), 151-174.
- Wiedemann, E. (2005). *The United States army reserve officer's training corps providing the right leader for the transforming force. USAWC Strategy Research Project*. Retrieved from the Defense Technical Information Center website: <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA432309>
- Wilcoxson, L. (2010). Factors affecting intention to leave in the first, second and third year of university studies: a semester-by-semester investigation. *Higher Education Research & Development*, 29(6), 623-639.
- Williams, C. L. (1989). *Gender differences at work: women and men in nontraditional occupations*. Berkeley, CA: University of California Press.
- Wilson, P. H. (2008). Defining military culture. *The Journal of Military History*, 72(1), 11-41.

- Wilson, W. L. (2009). *Examining factors associated with leadership self-efficacy in college student military programs*. (University of Maryland, College Park). *ProQuest Dissertations and Theses*,  
<http://search.proquest.com/docview/304923352?accountid=10639>
- Windle, G., Bennet, K. M., & Noyes, J. (2011). A methodological review of resilience measurement scales. *Health and Quality of Life Outcomes*, 9(8), 1-18.
- Yeakey, G. (2002). Situational leadership. *Military Review*, 82(1), 72-82.
- Zeigler, S. L., & Gunderson, G. G. (2005). *Moving beyond G.I. Jane: Women in the U.S. military*. Lanham, Maryland: University Press of America, Inc.
- Zhao, C-M., & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education*, 45, 115-138.

**APPENDIX A: FREEDOM OF INFORMATION ACT AFROTC REQUEST AND  
RESULTS (CASE 2012-03089-F)**



**DEPARTMENT OF THE AIR FORCE**  
42D AIR BASE WING (AETC)  
MAXWELL AIR FORCE BASE ALABAMA

25 APR 2012

Major Becky M. Beers  
Commander, 42d Communications Squadron  
170 W Selfridge Street  
Maxwell-Gunter AFB AL 36112-6610

Ms. Amy Shannon  
364 Vineyard Circle  
Greenville, North Carolina 27858

Dear Ms. Shannon

We have processed your Freedom of Information Act (FOIA) dated April 5, 2012, for the number of women who join AFROTC; number of men who join AFROTC; the attrition rate of female AFROTC cadets; the attrition rate of male AFROTC cadets; information on the reasons why female AFROTC cadets leave ROTC; and information on the reasons why male AFROTC cadets leave ROTC. We processed your request under both the Freedom of Information Act and the Privacy Act. All of the releasable information responsive to your request is enclosed. The records were retrieved from a Privacy Act system of record FO36 AETC 1.

There is no charge for processing this request since assessable fees are less than \$25.00.

Sincerely

  
BECKY M. BEERS, Major, USAF

Attachments  
Statistical Information

Tab 3

MEMORANDUM FOR Ms. Amy Shannon

April 10, 2012

FROM: Holm Center/CCX

SUBJECT: FOIA Request Shannon (Case 2012-03089-F)

Here are the answers to your questions:

1. Number of women who join AFROTC? Typically about 23.7% of AFROTC enrolled cadets are female and 23.3% of AFROTC graduates are female. The average number of female enrolled cadets over the past 10 years is 3,525. The average number of female AFROTC graduates over the last 10 years is 501. In FY 2011, 461 female lieutenants were commissioned. Currently, there are 2,909 female cadets enrolled (23.9%).
2. Number of men who join AFROTC? On average, about 76.3% of AFROTC enrolled cadets are male and about 76.7% of AFROTC graduates are male. The average number of male enrolled cadets over the last 10 years is 11,290. The average number of male AFROTC graduates over the last 10 years is 1,638. In FY 2011, 1,481 male lieutenants were commissioned. Currently, there are 9,243 male cadets enrolled (76.1%).
3. The attrition rate of female AFROTC cadets? This office does not maintain attrition figures on a routine basis. Because the number of enrolled cadets is unlimited for both freshmen and sophomore years, attrition rates can be difficult to determine. In past calculations, average student attrition by the second year has been about 48% including unlimited non-scholarship students (53%) and limited scholarship students (32%). Cadets who have an obligation to AFROTC and the Air Force are contracted cadets and our response will cover contracted students at two points in their enrollment—AS100 year (Freshman) and AS300 year (Junior) in relation to graduation. For example, by taking enrolled AS100 contracted female cadets from November 2004 and comparing graduation figures using SSNs, 111 of 227 graduated for a 48.9% graduation rate and a 51.1% attrition rate. In contrast, by taking AS300 students (all contracted who competed for and successfully completed AFROTC Field Training between Sophomore and Junior years), we see a slightly different picture. AS300 contracted female cadets from November 2004, using the same comparison method of cross comparing SSNs we find that 430 of 548 graduated for a 78.5% graduation rate and a 21.5% attrition rate.
4. The attrition rate of male AFROTC cadets? This office does not maintain attrition figures on a routine basis. Because the number of enrolled cadets is unlimited for both freshmen and sophomore years, attrition rates can be difficult to determine. In past calculations, average student attrition by the second year has been about 48% including unlimited non-scholarship students (53%) and scholarship students (32%). Cadets who have an obligation to AFROTC and the Air Force are contracted cadets and our response will cover contracted students at two points in their enrollment—AS100 year (Freshman) and AS300 year (Junior) in relation



Tab 3 Shannon Response (continued)

to graduation. By taking enrolled AS100 contracted male cadets from November 2004 and comparing graduation figures using SSNs, 420 of 862 graduated for a 48.7% graduation rate and a 51.3% attrition rate. In contrast, by taking AS300 students (all contracted who competed for and successfully completed AFROTC Field Training between Sophomore and Junior years), we see a slightly different picture. AS300 contracted male cadets from November 2004, using the same comparison method of cross comparing SSNs we find that 1,422 of 1,776 graduated for a 80.1% graduation rate and a 19.9% attrition rate.

5. Information on reasons why female AFROTC cadets leave AFROTC? Individual reasons for each cadet leaving the AFROTC program vary and as they are personal are covered from non-release by the Privacy Act. However, the most likely reasons that cadets leave the program are academic, financial, family matters, career change, civil involvements, moral issues, medical reasons, drugs, weight, physical fitness, non-selection for Field Training, poor time management, lack of leadership skills and/or discipline, among others.
6. Information on reasons why male AFROTC cadets leave AFROTC? See 5 above.

## **APPENDIX B: REQUEST FOR ARMY ROTC RETENTION STATISTICS**

**From:** Hackathorn, Matthew S LTC MIL USA TRADOC USACC  
**Sent:** Wednesday, July 18, 2012 4:28:00 PM  
**To:** Shannon, Amy  
**Subject:** FW: ROTC statistics (UNCLASSIFIED)

Classification: UNCLASSIFIED  
Caveats: FOUO

Hi Amy,

Finally received clearance to send this along. It was simply a matter of getting a senior leader to peruse this data and provide a thumbs-up.

This is our analysis using 5 years of data and a Two-Sample t Test. Male retention is higher as MSL I and II; Female retention is higher as MSL IV. Please let us know if you have any questions.

Best regards,  
Matt

LTC Matt Hackathorn  
Public Affairs Officer  
U.S. Army Cadet Command  
(W) 502-624-5706  
(bb) 502-457-5273  
(email) matthew.hackathorn@us.army.mil

**From:** Shannon, Amy  
**Sent:** Tuesday, April 03, 2012 9:41:01 AM  
**To:** matthew.hackathorn@usacc.army.mil  
**Subject:** ROTC statistics

Mr. Hackathorn,

My name is Amy Shannon. I work at East Carolina University and am a doctoral student in the Educational Leadership program. As part of my dissertation I am trying to find statistics on the retention rates of female ROTC cadets versus male cadets. In addition, I am interested in finding out if there is any data that has been collected on why female cadets choose to leave ROTC.

Any information you could provide would be greatly appreciated. Thank you for your help!

v/r, Amy Shannon

**APPENDIX C: UNITED STATES ARMY CADET COMMAND UNCLASSIFIED**

**RETENTION RATES**

Male/Female Retention Rates

Year	Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
SY0607-SY0708	F	37.76%	54.43%	80.57%	93.08%	88.14%	57.49%
SY0708-SY0809	F	39.86%	58.19%	86.00%	94.59%	93.51%	59.45%
SY0809-SY0910	F	44.08%	60.54%	87.73%	95.19%	94.50%	62.04%
SY0910-SY1011	F	40.28%	58.72%	85.49%	94.80%	93.58%	60.19%
SY1011-SY1112	F	41.67%	59.27%	88.12%	93.65%	96.15%	62.54%
SY0607-SY0708	M	46.46%	61.85%	86.88%	87.90%	91.11%	65.96%
SY0708-SY0809	M	49.32%	63.45%	86.85%	91.34%	94.82%	67.99%
SY0809-SY0910	M	52.65%	65.92%	90.12%	92.68%	96.08%	70.54%
SY0910-SY1011	M	48.94%	66.37%	87.94%	91.76%	93.46%	68.39%
SY1011-SY1112	M	49.43%	62.68%	88.91%	92.42%	94.39%	68.33%

SY0607 through SY1011 Average Retention Rates

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	40.73%	58.23%	85.58%	94.26%	93.18%	60.34%
M	49.36%	64.05%	88.14%	91.22%	93.97%	68.24%
Overall	47.18%	62.75%	87.64%	91.77%	93.83%	66.48%
P value for Hypothesis Test	0.000163	0.001403	0.069418	0.010201	0.315580	0.000089

## Two-Sample $t$ Tests with 5 school-year samples for Male and Female retention in ROTC by Military Science Level

Hypothesis Test (all but MSL IV retention)

Ho: Female Retention – Male Retention = 0

Ha: Female Retention – Male Retention < 0

-There is **significant** evidence that average male retention is higher than female retention for MSLs I and II

-There is **marginal** evidence that average male retention is higher than female retention for MSL IIIs

-There is **no** evidence that average male retention is higher than female retention for MSLs V, VI, C.

Hypothesis Test (MSL IV retention only)

Ho: Female Retention – Male Retention = 0

Ha: Female Retention – Male Retention > 0

-There is **significant** evidence that average male retention is less than female retention for MSL IV.

SY0607-SY0708 Retention Rates

Gender	MSL					Overall
	MSL I	MSL II	MSL III	MSL IV	V,VI,C	
F	37.76%	54.43%	80.57%	93.08%	88.14%	57.49%
M	46.46%	61.85%	86.88%	87.90%	91.11%	65.96%
Overall	44.41%	60.35%	85.70%	88.80%	90.54%	64.21%

SY0708-SY0809 Retention Rates

Gender	MSL					Overall
	MSL I	MSL II	MSL III	MSL IV	V,VI,C	
F	39.86%	58.19%	86.00%	94.59%	93.51%	59.45%
M	49.32%	63.45%	86.85%	91.34%	94.82%	67.99%
Overall	46.90%	62.32%	86.69%	91.90%	94.57%	66.12%

SY0809-SY0910 Retention Rates

Gender	MSL					Overall
	MSL I	MSL II	MSL III	MSL IV	V,VI,C	
F	44.08%	60.54%	87.73%	95.19%	94.50%	62.04%
M	52.65%	65.92%	90.12%	92.68%	96.08%	70.54%
Overall	50.36%	64.69%	89.64%	93.13%	95.77%	68.59%

SY0910-SY1011 Retention Rates

Gender	MSL					Overall
	MSL I	MSL II	MSL III	MSL IV	V,VI,C	
F	40.28%	58.72%	85.49%	94.80%	93.58%	60.19%
M	48.94%	66.37%	87.94%	91.76%	93.46%	68.39%
Overall	46.75%	64.49%	87.44%	92.33%	93.48%	66.49%

SY1011-SY1112 Retention Rates

Gender	MSL					Overall
	MSL I	MSL II	MSL III	MSL IV	V,VI,C	
F	41.67%	59.27%	88.12%	93.65%	96.15%	62.54%
M	49.43%	62.68%	88.91%	92.42%	94.39%	68.33%
Overall	47.46%	61.92%	88.74%	92.67%	94.80%	67.00%

SY0607 through SY1011 Average Retention Rates

Gender	MSL					Overall
	MSL I	MSL II	MSL III	MSL IV	V,VI,C	
F	40.73%	58.23%	85.58%	94.26%	93.18%	60.34%
M	49.36%	64.05%	88.14%	91.22%	93.97%	68.24%
Overall	47.18%	62.75%	87.64%	91.77%	93.83%	66.48%

Retention Rates SY0607-SY0708

**SY0607 Peak Total Cadets**

Gender	1	2	3	4	5	6	C	Total
F	2794	1670	1081	824	43	11	140	6563
M	9085	6574	4710	3892	80	66	664	25071
Total	11879	8244	5791	4716	123	77	804	31634

**SY0607-SY0708 Attrited Cadets**

Gender	1	2	3	4	5	6	C	Total
F	1739	761	210	57	2	2	19	2790
M	4864	2508	618	471	1	7	64	8533
Total	6603	3269	828	528	3	9	83	11323

**SY0607-SY0708 Retained Cadets**

Gender	1	2	3	4	5	6	C	Total
F	1055	909	871	767	41	9	121	3773
M	4221	4066	4092	3421	79	59	600	16538
Total	5276	4975	4963	4188	120	68	721	20311

**SY0607-SY0708 Retention Rates**

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	37.76%	54.43%	80.57%	93.08%	88.14%	57.49%
M	46.46%	61.85%	86.88%	87.90%	91.11%	65.96%
Overall	44.41%	60.35%	85.70%	88.80%	90.54%	64.21%

Retention Rates SY0708-SY0809

SY0708 Peak Total Cadets

Gender	1	2	3	4	5	6	C	Total
F	3314	1916	1150	868	41	18	126	7433
M	9660	7009	4988	4169	144	58	570	26598
Total	12974	8925	6138	5037	185	76	696	34031

SY0708-SY0809 Attrited Cadets

Gender	1	2	3	4	5	6	C	Total
F	1993	801	161	47	0	3	9	3014
M	4896	2562	656	361	0	9	31	8515
Total	6889	3363	817	408	0	12	40	11529

SY0708-SY0809 Retained Cadets

Gender	1	2	3	4	5	6	C	Total
F	1321	1115	989	821	41	15	117	4419
M	4764	4447	4332	3808	144	49	539	18083
Total	6085	5562	5321	4629	185	64	656	22502

SY0708-SY0809 Retention Rates

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	39.86%	58.19%	86.00%	94.59%	93.51%	59.45%
M	49.32%	63.45%	86.85%	91.34%	94.82%	67.99%
Overall	46.90%	62.32%	86.69%	91.90%	94.57%	66.12%



Retention Rates SY0809-SY0910

SY0809 Peak Total Cadets

Gender	1	2	3	4	5	6	C	Total
F	3834	2273	1328	956	55	14	131	8591
M	10486	7722	5333	4426	187	58	572	28784
Total	14320	9995	6661	5382	242	72	703	37375

SY0809-SY0910 Attrited Cadets

Gender	1	2	3	4	5	6	C	Total
F	2144	897	163	46	2	0	9	3261
M	4965	2632	527	324	2	4	26	8480
Total	7109	3529	690	370	4	4	35	11741

SY0809-SY0910 Retained Cadets

Gender	1	2	3	4	5	6	C	Total
F	1690	1376	1165	910	53	14	122	5330
M	5521	5090	4806	4102	185	54	546	20304
Total	7211	6466	5971	5012	238	68	668	25634

SY0809-SY0910 Retention Rates

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	44.08%	60.54%	87.73%	95.19%	94.50%	62.04%
M	52.65%	65.92%	90.12%	92.68%	96.08%	70.54%
Overall	50.36%	64.69%	89.64%	93.13%	95.77%	68.59%

Retention Rates SY0910-SY1011

SY0910 Peak Total Cadets

Gender	1	2	3	4	5	6	C	Total
F	4076	2587	1544	1115	74	15	129	9540
M	12011	7971	5946	4807	211	59	571	31576
Total	16087	10558	7490	5922	285	74	700	41116

SY0910-SY1011 Attrited Cadets

Gender	1	2	3	4	5	6	C	Total
F	2434	1068	224	58	4	2	8	3798
M	6133	2681	717	396	8	5	42	9982
Total	8567	3749	941	454	12	7	50	13780

SY0910-SY1011 Retained Cadets

Gender	1	2	3	4	5	6	C	Total
F	1642	1519	1320	1057	70	13	121	5742
M	5878	5290	5229	4411	203	54	529	21594
Total	7520	6809	6549	5468	273	67	650	27336

SY0910-SY1011 Retention Rates

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	40.28%	58.72%	85.49%	94.80%	93.58%	60.19%
M	48.94%	66.37%	87.94%	91.76%	93.46%	68.39%
Overall	46.75%	64.49%	87.44%	92.33%	93.48%	66.49%

Retention Rates SY1011-SY1112

SY1011 Peak Total Cadets

Gender	1	2	3	4	5	6	C	Total
F	4068	2443	1700	1308	89	30	141	9779
M	12002	8417	6142	5198	253	69	552	32633
Total	16070	10860	7842	6506	342	99	693	42412

SY1011-SY1112 Attrited Cadets

Gender	1	2	3	4	5	6	C	Total
F	2373	995	202	83	1	2	7	3663
M	6070	3141	681	394	8	6	35	10335
Total	8443	4136	883	477	9	8	42	13998

SY1011-SY1112 Retained Cadets

Gender	1	2	3	4	5	6	C	Total
F	1695	1448	1498	1225	88	28	134	6116
M	5932	5276	5461	4804	245	63	517	22298
Total	7627	6724	6959	6029	333	91	651	28414

SY1011-SY1112 Retention Rates

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	41.67%	59.27%	88.12%	93.65%	96.15%	62.54%
M	49.43%	62.68%	88.91%	92.42%	94.39%	68.33%
Overall	47.46%	61.92%	88.74%	92.67%	94.80%	67.00%

Retention Rates SY-SY

SY Peak Total Cadets

Gender	1	2	3	4	5	6	C	Total
F	1	1	1	1	1	1	1	7
M	1	1	1	1	1	1	1	7
Total	2	2	2	2	2	2	2	14

SY-SY Attrited Cadets

Gender	1	2	3	4	5	6	C	Total
F	1	1	1	1	1	1	1	7
M	1	1	1	1	1	1	1	7
Total	2	2	2	2	2	2	2	14

SY-SY Retained Cadets

Gender	1	2	3	4	5	6	C	Total
F	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0

SY-SY Retention Rates

Gender	MSL I	MSL II	MSL III	MSL IV	MSL V,VI,C	Overall
F	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
M	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Overall	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

## APPENDIX D: PERMISSION LETTER



### College of Education Department of Higher, Adult and Counselor Education

East Carolina University 213 Ragsdale Greenville, NC 27858

252-328-6856 office 252-328-5114 fax

<http://www.coe.ecu.edu/hace>

---

**Department Chair**

Dr. Vivian W. Mott

252-328-6856

[mottv@ecu.edu](mailto:mottv@ecu.edu)

**Adult Education Faculty**

Dr. Elizabeth Knott

252-328-6825

[knotte@ecu.edu](mailto:knotte@ecu.edu)

Dr. Vivian W. Mott

252-328-6856

[mottv@ecu.edu](mailto:mottv@ecu.edu)

Dr. Steven W. Schmidt

252-328-1118

[schmidtst@ecu.edu](mailto:schmidtst@ecu.edu)

**Counselor Education Faculty**

Dr. Allison Crowe

252-328-4218

[crowea@ecu.edu](mailto:crowea@ecu.edu)

Dr. Kylie Dotson-Blake

252-328-5277

[blakek@ecu.edu](mailto:blakek@ecu.edu)

Dr. Scott Glass

252-328-5670

[glassj@ecu.edu](mailto:glassj@ecu.edu)

Dr. Mark B. Scholl

252-328-1103

[schollm@ecu.edu](mailto:schollm@ecu.edu)

**Higher Education Faculty**

Dr. Crystal Chambers

252-328-4649

[chambersc@ecu.edu](mailto:chambersc@ecu.edu)

Dr. Cheryl McFadden

252-328-6179

[mcfaddench@ecu.edu](mailto:mcfaddench@ecu.edu)

Dr. Michael Pooch

252-328-5582

[poockm@ecu.edu](mailto:poockm@ecu.edu)

Dr. Sandra Seay

252-328-5313

[seays@ecu.edu](mailto:seays@ecu.edu)

Dr. David Siegel

252-328-2828

[siegeld@ecu.edu](mailto:siegeld@ecu.edu)

Mrs. Michelle Smith

Administrative Support Associate

252-328-6856

[smithmiche@ecu.edu](mailto:smithmiche@ecu.edu)

Date

Dear ,

I am a doctoral student at East Carolina University (ECU) in the Department of Higher, Adult and Counselor Education. I am requesting permission to survey your ROTC cadets for my research study entitled, "Academic and Psychosocial Factors Influencing Female Cadets' Intent to Persist in Reserve Officer Training Corps (ROTC) and Commission in the United States Military". Dr. Cheryl McFadden serves as Chair of my dissertation committee and Dr. Steve Duncan, the Assistant Vice Chancellor for Administration, Finance, and Military Programs at ECU, is a member of my committee.

Statistics indicate that female cadets are less likely than their male counterparts to continue involvement in ROTC (Department of the Air Force, 2012; Department of the Army, 2012). Therefore, the purpose of this research is to understand why retention levels between female and male cadets differ. I hope to learn what factors influence female cadets' intent to continue in ROTC and commission in the military. I am requesting your permission to seek voluntary participation in the study from your students.

Your detachment is being invited to take part in this research because of the number of cadets enrolled in your program. The participants will be cadets who have not accepted scholarships from the United States military in exchange for commissioning as officers after graduation. I would like to administer the survey in your (state name of class) during the spring 2013 semester. The survey takes approximately 45 minutes to complete.

This research is overseen by the ECU Institutional Review Board. The data collected will be anonymous.

If you have questions about your cadets' rights as individuals taking part in research, you may call the UMCIRB Office at 252-744-2914 (M-F, 8:00 a.m.-5:00 p.m.). If you would like to report a complaint or concern about this research study, you may call the Director of the UMCIRB Office at 252-744-1971.

If you are willing to grant your approval to have your cadets surveyed please indicate this approval by emailing me at [shannona@ecu.edu](mailto:shannona@ecu.edu). Please include your official title within your email response. Once I receive confirmation, I will contact you for the coordination of my visit to your detachment.

Very respectfully,

Amy T. Shannon, Principal Investigator

## APPENDIX E: EMAIL TO SCHEDULE CAMPUS VISIT

-----Original Message-----

**From:** Shannon, Amy [<mailto:SHANNONA@ECU.EDU>]

**Sent:** Thursday, January 31, 2013 9:07 AM

**To:**

**Cc:** Shannon, Amy

**Subject:** Campus Visit

Good morning! I am emailing you to coordinate a time to survey your freshmen and sophomore cadets during their ROTC courses. The survey takes approximately 45 minutes to complete and the cadets will only have to take the survey once. *If* the freshmen and sophomore classes are on different days I respectfully ask to schedule my visits to both groups within the same week since I will be traveling from Greenville, N.C.

Please let me if it would be possible for me to visit during the week of Feb. 4<sup>th</sup>. Thank you for your help and I look forward to hearing from you.

v/r, Amy Shannon

**APPENDIX F: SCHEDULE OF CAMPUS VISITS**

**February**

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
					<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b> ARMY (UNC) -3:30 P.M. (LTC STALLINGS) (Directions rec'd)	<b>5</b> AFROTC (UNC) -3:30 P.M. (LTC GREEN) (Directions rec'd)	<b>6</b> ARMY (UNC) -3 P.M. (LTC STALLINGS) (Directions rec'd)	<b>7</b> AFROTC (Charlotte)- 3:30p-4:45p (Capt Moore-meet at 3p) (Directions rec'd)	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b> AFROTC (NCSU)-3 pm (announce); 5:45 pm (gather data)  LTC FROESCHNER (meet LTC at 2:30p) (Directions rec'd)	<b>14</b>	<b>15</b>	<b>16</b>
<b>17</b>	<b>18</b>	<b>19</b> ARMY (FSU)-11 AM (sophomores) (LTC PETHAN) (Directions rec'd)  Taylor Bldg 203 (meet LTC in 109)	<b>20</b> ARMY(FSU)-11 AM (freshmen) (LTC PETHAN) Taylor Bldg 203 (meet LTC in 109)  ECU AFROTC-4:15 p.m. (Capt Boler) Ward 237D	<b>21</b>	<b>22</b>	<b>23</b> ARMY (Charlotte)- 3p (at Davidson College)  (LTC <del>McGINNIS</del> MAJ Walker)
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b> ARMY (ECU)-10 a.m. (frgs) (LTC Heape/MAJ Vaden)- Meet MAJ at 945 a in <del>Christenbury</del> , beforehand  ARMY (ECU)-1 p.m. (soph) (LTC Heape/Mr. Hawley) (104 <del>Christenbury</del> )	<b>28</b>		

**2013**

<b>March</b>						
<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
					<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
←			NCSU/FSU Spr Break	→		
<b>10</b>	<b>11</b>	<b>12</b> NCSU Army (MS1) 11:30a-12:20p (MAJ Albert)  (Directions rec'd)	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
←			ECU Spring Break	→		
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b> Army(NCSU):MAJ Albert (MSII):10:15-11:05a (MSI): 11:30a-12:20p (MSII): 1:30-2:20p  (Directions rec'd)	<b>21</b> AFROTC (FSU) 9 a.m.  Capel Classroom (MAJ Fletcher & C/Col Richardson)	<b>22</b>	<b>23</b>
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>31</b>	<b>April 1</b>					

**2013**



## **APPENDIX G: PARTICIPANT RECRUITMENT/DATA COLLECTION SCRIPT**

Title of Research Project: Academic and Psychosocial Factors Influencing Female Cadets' Intent to Persist in Reserve Officer Training Corps (ROTC) and Commission in the United States Military

Time of Data Collection: tbd

Date of Data Collection: tbd

Place of Data Collection: tbd

Principal Investigator: Amy T. Shannon

Study Participant unique identifier number: No names will be used

---

Purpose of Study (share with ROTC cadets):

*In recent decades, the United States military has made efforts to increase the number of women among senior leadership. In terms of percentages of senior military leadership positions, women are underrepresented as compared to men. ROTC plays a pivotal role in helping the Armed Forces increase representation of women among top military leaders. However, there is a limited amount of research on the factors influencing female cadets' intent to continue in, or leave, ROTC. Therefore, the purpose of this study is to examine the influence of social and academic factors on female cadets' intent to continue in ROTC and commission in the United States military.*

Participants (share with ROTC cadets):

*Students eligible to participate in the study must be freshmen or sophomore cadets who have not accepted scholarships from the United States military. Both female and male cadets from Army ROTC and Air Force ROTC will be included in the study. Five universities within*

*North Carolina are participating in the study and you will be one of approximately 170 cadets involved.*

Method of Data Collection (share with ROTC cadets):

*If you choose to participate, you will be asked to complete two surveys. These surveys will be completed today, will take approximately 45 minutes, and will only have to be completed once during the course of the study. All responses will be anonymous and kept confidential. In addition, ROTC Commanding Officers will not be present during the data collection to ensure your comfort.*

Informed Consent to Participate in Research (share with ROTC cadets):

*Before the surveys can be distributed to those who wish to participate in the study, you must review a consent form, sign, and return it to me. After all consent forms are returned to me I will hand out the surveys along with directions on how to complete the forms.*

Note: The Principal Investigator will hand out the “Informed Consent to Participate in Research” form to each study participant for review prior to the data collection process.

Data Collection (share with ROTC cadets):

*I will now hand out the two surveys for you to complete. Please DO NOT SKIP any questions and circle ONLY ONE response for each question. The surveys use scales so be sure to review which number indicates agreement versus disagreement. Take your time reviewing each statement and base your responses on your experience in ROTC during the last few months. If you have questions please raise your hand and I will assist you. When you are completed with both surveys please return them to me. Thank you!*

## APPENDIX H: INFORMED CONSENT TO PARTICIPATE IN RESEARCH

*East Carolina University*



### **Informed Consent to Participate in Research**

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: Academic and Psychosocial Factors Influencing Female Cadets' Intent to Persist in Reserve Officer Training Corps (ROTC) and Commission in the United States Military

Principal Investigator: Amy T. Shannon

Institution/Department or Division: East Carolina University/Department of Higher, Adult and Counselor Education

Address: East Carolina University; 2 Rawl Annex; Greenville, NC 27858

Telephone #: 252-328-9308

Study Sponsor/Funding Source: Amy T. Shannon, Personal Funding

---

Researchers at East Carolina University (ECU) study problems in society, health problems, environmental problems, behavior problems and the human condition. Our goal is to try to find ways to improve the lives of you and others. To do this, we need the help of volunteers who are willing to take part in research.

#### **Why is this research being done?**

The purpose of this research is to understand why retention levels in ROTC differ between female and male cadets. The decision to take part in this research is yours to make. By doing this research, we hope to learn what factors influence female cadets' intent to continue to ROTC and commission in the military.

#### **Why am I being invited to take part in this research?**

You are being invited to take part in this research because you are a freshman or sophomore ROTC cadet who has not accepted a scholarship from the United States military in exchange for commissioning as an officer after graduation. Both female and male cadets are invited to take part in this study. If you volunteer to take part in this research, you will be one of about 170 cadets from five universities in North Carolina.

#### **Are there reasons I should not take part in this research?**

I understand I should not volunteer for this study if I have received a scholarship from the United States military in exchange for commissioning as an officer after graduation. In addition, I should not participate if I currently have a service commitment with the military.

**What other choices do I have if I do not take part in this research?**

You can choose not to participate.

**Where is the research going to take place and how long will it last?**

The research procedures will be conducted during this class. The total amount of time you will be asked to volunteer for this study is 45 minutes and the surveys will only need to be filled out once.

**What will I be asked to do?**

You are being asked to do the following: Complete the enclosed Institutional Integration Scale (IIS) and Dispositional Resilience Scale-15 (DSR-15). These surveys will only have to be completed once and will take approximately 45 minutes to complete. All responses will be kept confidential.

**What possible harms or discomforts might I experience if I take part in the research?**

It has been determined that the risks associated with this research are no more than what you would experience in everyday life.

**What are the possible benefits I may experience from taking part in this research?**

We do not know if you will get any benefits by taking part in this study. This research might help us learn more about factors that influence female and male cadets' intent to persist in ROTC and commission in the United States military. There may be no personal benefit from your participation but the information gained by doing this research may help others in the future.

**Will I be paid for taking part in this research?**

We will not be able to pay you for the time you volunteer while being in this study.

**What will it cost me to take part in this research?**

It will not cost you any money to be part of the research. The principal investigator will pay the costs of the licenses for the study instruments as well as photocopies for the survey packets.

**Who will know that I took part in this research and learn personal information about me?**

All information collected will be anonymous and therefore will not be connected to you in any way.

**How will you keep the information you collect about me secure? How long will you keep it?**

Data collected will be stored in a locked file cabinet in Rawl Annex, Room 5A at East Carolina University. No identifiable information will be included in the data. Data will be destroyed May 2015. Consent forms will be stored separately so that your identifiable information is not associated with the collected data.

**What if I decide I do not want to continue in this research?**

If you decide you no longer want to be in this research after it has already started, you may stop at any time. You will not be penalized or criticized for stopping. You will not lose any benefits that you should normally receive.

**Who should I contact if I have questions?**

The person conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Amy Shannon, the Principal Investigator at 252-328-9301 (Monday through Friday between 8:00 a.m. to 5:00 p.m.).

If you have questions about your rights as someone taking part in research, you may call the Office for Human Research Integrity (OHRI) at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director of the OHRI, at 252-744-1971

**Is there anything else I should know?**

All information collected today will be anonymous. Therefore, the information you provide will not be linked to you in any way.

**I have decided I want to take part in this research. What should I do now?**

To give your informed consent to proceed with this study, your signature below acknowledges the following:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

---

<b>Participant's Name (PRINT)</b>	<b>Signature</b>	<b>Date</b>
-----------------------------------	------------------	-------------

**Person Obtaining Informed Consent:** I have conducted the initial informed consent process and answered all of the person’s questions about the research.

Amy T. Shannon

---

<b>Person Obtaining Consent (PRINT)</b>	<b>Signature</b>	<b>Date</b>
---	------------------	-------------

## APPENDIX I: U.S. AIR FORCE RESEARCH INSTITUTE EXEMPTION

**From:** CURRIE, KAREN W AD-25 USAF AETC AFRI/RIR [mailto:karen.currie@us.af.mil]  
**Sent:** Tuesday, November 20, 2012 9:13 AM  
**To:** DUNN, JEFFERSON S Col USAF AETC AFROTC/CC; Shannon, Amy  
**Cc:** MCILLECE, ROGER A Maj USAF AETC Holm Center/JA; SHARPE, DONALD G CIV USAF AETC AFRI/RIDM  
**Subject:** RE: ROTC Cadet Survey Permission

For Amy Shannon,

Please see the note from the AFROTC commander below. If you need additional information, please contact his office.

Thanks,

Karen Currie  
AFRI

-----Original Message-----

**From:** DUNN, JEFFERSON S Col USAF AETC AFROTC/CC  
**Sent:** Monday, November 19, 2012 5:32 PM  
**To:** CURRIE, KAREN W AD-25 USAF AETC AFRI/RIR  
**Cc:** MCILLECE, ROGER A Maj USAF AETC Holm Center/JA; SHARPE, DONALD G CIV USAF AETC AFRI/RIDM  
**Subject:** RE: ROTC Cadet Survey Permission

Ms. Currie,

We don't have the authority to approve or disapprove surveys of non-scholarship or non-contracted cadets. Normally, as long as the surveys are voluntary, we support to get useful information with respect to the views and opinions of cadets.

Occasionally we get requests for assistance in ascertaining who to survey or how to contact the intended audience. In those cases, as long as it's voluntary and not disruptive to the cadre or det operations, we can usually assist.

VR,  
Col Dunn

JEFFERSON S. DUNN, Col, USAF  
AFROTC/CC  
Comm: 334-953-9415 DSN: 493

-----Original Message-----

**From:** CURRIE, KAREN W AD-25 USAF AETC AFRI/RIR

**Sent:** Thursday, November 15, 2012 9:17 AM

**To:** DUNN, JEFFERSON S Col USAF AETC AFROTC/CC

**Cc:** MCILLECE, ROGER A Maj USAF AETC Holm Center/JA; SHARPE, DONALD G CIV USAF AETC AFRI/RIDM

**Subject:** ROTC Cadet Survey Permission

Sir,

We request your assistance in answering an inquiry received via our website regarding a survey of ROTC cadets.

V/R,

Karen Currie

Karen W. Currie, Ph.D.

Colonel, USAF (ret)

Faculty Researcher and Defense Analyst

Air Force Research Institute (AFRI/RIR)

155 N. Twining, Bldg 693

Maxwell AFB AL 36112-6026

Office: 334-953-9889; DSN 493-9889; Fax: -4100

email: Karen.Currie@maxwell.af.mil

-----Original Message-----

**From:** SHARPE, DONALD G CIV USAF AETC AFRI/RIDM

**Sent:** Wednesday, November 14, 2012 2:27 PM

**To:** CURRIE, KAREN W AD-25 USAF AETC AFRI/RIR

**Subject:** FW: AFRI Website Contact Form

Karen,

We received a message from the website that is out of our lane. Can you reply back to the person with some advice as to where they can start. See request below.

We appreciate it.

Greg

-----Original Message-----

**From:** AFRI\_Contact\_Form@us.af.mil [mailto:AFRI\_Contact\_Form@us.af.mil]

**Sent:** Wednesday, November 14, 2012 8:37 AM

**To:** BARTH, BILLY J GS-09 USAF AETC AFRI/RID  
**Cc:** shannona@ecu.edu  
**Subject:** AFRI Website Contact Form

**SUBJECT:** AFRI Approval

**EMAIL2:** shannona@ecu.edu

**MESSAGE:** I am a doctoral student at East Carolina University. For my dissertation I will be studying the influence of academic and psychosocial factors on female cadets intent to persist in ROTC. I would like to survey freshmen and sophomore cadets who have not accepted scholarships from the U.S. military in exchange for commissioning. Five universities within North Carolina have been chosen as locations for data collection. I will be securing approval from my university's institutional review board, however, I was curious as to whether or not I need to secure approval from AFRI to survey the cadets. Since the students involved in my study will not be scholarship recipients, and have not accepted commissions from the military, do I need to follow any approval process through AFRI? Please advise and thank you for your help!

v/r, Amy Shannon

**TXTCAPCHA:** SHARKED



**APPENDIX J: DEPARTMENT OF THE AIR FORCE MEMORANDUM FOR  
DETACHMENTS**



**DEPARTMENT OF THE AIR FORCE**  
Air University (AETC)

29 NOV 2012

MEMORANDUM FOR DETACHMENT

FROM: AFROTC/CC

SUBJECT: Ms. Amy Shannon Dissertation Interviews

1. Ms. Amy Shannon, a student at East Carolina University, has my support to survey Air Force Reserve Officer Training Corps (AFROTC) cadets on a voluntary basis as part of her dissertation research. The survey should take 30-45 minutes and will be on a non-interference basis.
2. This study will be conducted on freshman and sophomore cadets who have not accepted scholarships from the United States Air Force in exchange for commissioning as officers after graduation. The purpose of this study is to examine the influence of the social and academic factors on female cadets; intent to persist in ROTC and commission in the United States military.
3. Your cooperation would be appreciated. If you have any questions or concerns, please contact Capt Ingrid Muniz at (334) 953-9420 or [ingrid.muniz.1@us.af.mil](mailto:ingrid.muniz.1@us.af.mil).

  
JEFFERSON S. DUNN, Colonel, USAF  
Commander

## APPENDIX K: U.S. ARMY RESEARCH INSTITUTE EXEMPTION

-----Original Message-----

**From:** Simmons, Robert O CIV (US) [mailto:robert.o.simmons2.civ@mail.mil]

**Sent:** Wednesday, November 14, 2012 2:51 PM

**To:** Shannon, Amy

**Subject:** RE: Request re ROTC cadets (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

Ms. Shannon,

This message is to verify what I stated on the phone: Because the research participants would not be commissioned as officers or otherwise be members of the U.S. Department of the Army, ARI approval is not needed.

Your study is of personal interest to me because I was good friends with three of the first six women ever to be ROTC cadets. This historical footnote occurred at Temple University in the late 1960s because Temple had a requirement that undergraduates take four semesters of physical education, and ROTC could be used to fulfill this requirement. The female cadets made the CBS Evening News.

Best wishes!

Rob

Robert O. Simmons, Ph.D.  
Senior Research Psychologist  
U.S. Army Research Institute (ARI)  
(703) 545-2332  
DSN: 865-2332

-----Original Message-----

**From:** Shannon, Amy [mailto:[SHANNONA@ECU.EDU](mailto:SHANNONA@ECU.EDU)]

**Sent:** Wednesday, November 14, 2012 11:41 AM

**To:** Simmons, Robert O CIV (US)

**Cc:** Shannon, Amy

**Subject:** Request

Mr. Simmons,

Thank you for speaking with me this morning regarding my request to survey Army ROTC cadets. If you could provide an official email to me (including your professional title) indicating I do not need ARI approval for my study I would appreciate it. This documentation will be

shared with commanding officers of ROTC battalions who may have questions regarding ARI's approval.

Below I have included information regarding my study.

v/r, Amy Shannon

Title of Dissertation: Academic and Psychosocial Factors Influencing Female Cadets' Intent to Persist in ROTC and Commission in the U.S. Military

Purpose of Dissertation: ROTC plays a pivotal role in helping the Armed Forces increase representation of women among top military leaders (Johnson, 2002; U.S. Army). However, statistics show that female ROTC cadets are less likely than their male counterparts to continue involvement in the organization (Department of the Army, 2012). The purpose of this study is to examine the influence of the social and academic factors on female cadets' intent to persist in ROTC and commission in the United States military.

Research Participants: The research participants will be freshmen and sophomore cadets who have not accepted scholarships from the United States Army in exchange for commissioning as officers after graduation. The universities that are being considered for data collection include: (a) East Carolina University; (b) Fayetteville State University; (c) North Carolina State University; (d) University of North Carolina at Chapel Hill; and (e) University of North Carolina at Charlotte

Approval Needed: The researcher must secure approval from the commanding officers of each ROTC battalion to survey cadets. The commanding officers will be provided documentation from ARI that official ARI approval is not needed due to the non-commissioned status of the research participants.

## APPENDIX L: NOTIFICATION OF EXEMPT RESEARCH CERTIFICATIONS

### EAST CAROLINA UNIVERSITY

University & Medical Center Institutional Review Board Office

4N-70 Brody Medical Sciences Building · Mail Stop 682

600 Moye Boulevard · Greenville, NC 27834

Office 252-744-2914 · Fax 252-744-2284 · [www.ecu.edu/irb](http://www.ecu.edu/irb)

#### Notification of Exempt Certification

From: Social/Behavioral IRB  
To: Amy Shannon  
CC: Cheryl McFadden  
Date: 1/30/2013  
Re: UMCIRB 12-001918  
Factors Influencing Female ROTC Cadets' Intent to Persist

I am pleased to inform you that your research submission has been certified as exempt on 1/29/2013. This study is eligible for Exempt Certification under category #2.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418

IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418 IRB00004973



February 15, 2013

To: Ms. Amy Shannon  
IRB #: 2013-P-0027  
Study: *"Academic and Psychosocial Factors Influencing Female Cadet's Intent to Persist in Reserve Officers Training Corps and Commission in the US Air Force or Army"*  
Re: Approval  
Submission Type: New Application  
Expiration Date: February 14, 2014  
Co PI: None listed

Your human subject research application, assigned IRB # **2013-P-0027**, has been reviewed and **approved** by the Human Rights in Research Committee (HRRC). Should the approved protocol change in the future, you are obligated to contact the Offices of Sponsored Research and Programs to obtain IRB approval for the change(s) before proceeding with your research. You are also required to contact the Office of Sponsored Research and Programs prior to your approval expiration date if your research has not been completed and your study closed. At that time you will be eligible to apply for approval to continue your study.

Please be reminded that you are **required** to indicate your study number on all documents relating to your study. If you have any questions, please feel free to contact Mrs. Carla Padilla, Compliance Officer at [cpadilla@uncfsu.edu](mailto:cpadilla@uncfsu.edu). Please reference your proposal title and number in all electronic communications.

This study was reviewed in accordance with federal regulations governing human subjects research including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), where applicable.

Sincerely,

A handwritten signature in black ink that reads "Carla Raineri Padilla".

Carla Raineri Padilla  
Human Rights in Research Committee

cc.