FACTORS INFLUENCING INTENT TO PERSIST IN HIGHER EDUCATION OF PARTICIPANTS IN U.S. ARMY RESERVE OFFICER TRAINING CORPS (ROTC) PROGRAMS

DISSERTATION

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By

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* * * * *

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ABSTRACT

The preponderance of research examining college student retention has focused on the influence of academic and social integration factors (Bean, 2005; Braxton, Hirschy, & McClendon, 2004; Pascarella & Terenzini, 1980; Tinto, 1993). Recent research suggested that psychosocial factors may be significantly related to student departure decisions (Bean, 2005). In addition, the psychological construct of hardiness has been positively correlated to retention of students in higher education (Lifton, Seay, McCarly, Olive-Taylor, Seeger, & Bigbee, 2006). The attributes associated with Communities of Practice (CoPs) may include many of the factors that might be considered psychosocial variables (Lave & Wenger, 1991; Stein, 1998; Wenger, 1998a). The function of CoPs is the promotion of individual and group learning that offered meaning and united members (Wenger, 1998a).

The U.S. Army ROTC program offered a community of practice that encouraged learning through both formal and informal learning experiences and provided the social and psychological development variables that may contribute to retention. This study examines the extent to which the social and psychological variables, including hardiness, influenced the retention of participants in U.S. Army
ROTC in higher education. Assessments measuring the variables were administered to participants in U.S. Army ROTC programs, and the results were analyzed using a logistic regression model to determine the probability of persistence in higher education.
Dedication

This document is dedicated to my family.
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CHAPTER 1

INTRODUCTION

Introduction

The rapid rate of global economic and cultural change is influencing the workforce in the United States, and as economic and technological trends accelerate the rate of change, the importance of postsecondary education has taken on greater significance in determining workplace outcomes (ACT, 2004). As a result, the institutional and individual investment in education has made retention of students in higher education an issue of greater significance (Braxton, Hirschy, & McClendon, 2004). Research addressing retention in higher education has explored the importance of student integration on retention in higher education (Tinto, 1987, 1993). Numerous studies have examined Tinto’s model (Bean, 1982; Braxton et al., 2004; Knight, 2002; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1980; Terenzini, Lorang, & Pascarella, 1981; Terenzini & Pascarella, 1980; Tinto, 1982), resulting in findings that have informed the development of models emerging from Tinto’s foundational work (Astin, 1993; Bean, 1983, 2005; Braxton et al., 2004; Pascarella, 1985) and have contributed to a greater understanding of student attrition.
Moreover, recent studies have focused on the effect of psychosocial indicators on retention (Bean, 2005; Braxton et al., 2004; Lifton et al., 2006), suggesting social interaction and psychological responses—in particular psychological hardiness—may have a positive influence on persistence in higher education. Studies examining the efficacy of retention strategies (Potts, Schultz, & Foust, 2004; Smith, MacGregor, Matthews, & Gabelnick, 2004; Wang & Grimes, 2001) have found positive correlations between social interaction interventions that contribute to social integration and retention. Specific programming that contributes to students’ integration into university communities (Johnson, 2001; Mangold, Bean, Adams, Schwab, & Lynch, 2003; Smith et al., 2004; Zepke & Leach, 2005) in turn offers approaches that contribute to persistence in higher education. In addition, Giaquinto (2009) suggested that participation in learning communities in which active learning is used to construct new knowledge supports first-year retention.

Student participation in a learning community has been identified as a model for encouraging persistence (Johnson, 2001; Smith et al., 2004). A type of learning community in higher education offering a model that explored the responses of student participants regarding departure decisions was presented in the U.S. Army’s Reserve Officer Training Corps (ROTC) program (U.S. Army, 2009). This study examined the Army ROTC participants’ perceptions of the psychosocial factors and the influence of those factors on persistence in higher education.
**Background of the Problem**

The impact of technology and global economic change has influenced the nature of contemporary life by emphasizing the need for more fully developed technical skills and higher-order critical thinking skills (ACT, 2004). This has created a greater emphasis on the value of post-secondary education (ACT, 2004; Dewey, 1938; Osterman, Kochan, Locke, & Piore, 2001), particularly post-secondary education that engages learners in active learning communities (Braxton, Brier, & Steele, 2008; Giaquinto, 2009). The nature of the contemporary workplace operates from a model of multiple projects, through multiple networks and multiple phases (von Bertalanffy, 1968). The ability to compete globally requires a workforce trained in higher-order skills associated with training beyond the secondary school level (ACT, 2004). The ability to retain students in higher education is increasingly important to the nation’s ability to function economically, politically, and culturally (Capelli et al., 1997). In addition, individuals with better educations are able to engage in more secure employment opportunities with improved wages, benefits, and possibilities for greater advancement than are individuals with less education (Barfield & Beaulieu, 1999; U.S. Department of Labor, 2008).

Student attrition has been the focus of extensive research for the past century (Summerskill, 1962). Between 1913 and 1962, the median rate of student attrition during a 4-year period was a 50%, with an attrition rate of 41.5% in Astin’s (1972) study of a national sample of students in 1966. More recent findings indicated that 1 out of 4 students in 4-year institutions left within the first year (ACT, 2008), and the
national graduation rate within a 5-year period for students seeking bachelor’s degrees was 52.5% (ACT, 2008).

Efforts to understand student attrition have resulted in a significant amount of research devoted to retention at the 4-year level. Tinto’s (1975) model was founded on Durkheim’s (1951) theoretical work in the study of suicide, which suggested that decisions to commit suicide were less likely if individuals shared values and relationships with a group. Spady (1970) identified the longitudinal nature of retention tracing the significance of prior experiences and the relationship with the institution as contributing to the decision to persist. Pascarella’s (1980) model emphasized student interaction with faculty and academic outcomes as influencing student attrition.

Bean’s (1982) model of student attrition was founded in Ajzen and Fishbein’s (1975) model of causal decision-making influencing turnover in organizations. Bean’s (1982) model identified ten factors that were considered influential on variances in student attrition—intent to leave, practical value, certainty of choice, loyalty, grades, courses, educational goals, major and job certainty, opportunity to transfer, and family approval of the institution. Bean’s (1982) work confirmed the significance of intent to leave in relation to persistence toward graduation and retention in higher education.

Further, the factors related to retention in higher education in Tinto’s interactionalist model were associated with two areas—academic integration and social integration (Tinto, 1993). Factors identified with academic integration included
socioeconomic status and academic performance measures (GPA, college grades, and standardized test scores) (ACT, 2004). Factors identified with social integration included institutional commitment, social support, social involvement, and academic self-confidence (ACT, 2004).

More recently, the influence of social integration and institutional commitment have become recognized as positively related to persistence (Braxton et al., 2004; Kennedy & Sheckley, 2000; Mangold et al., 2003) even in the event of poor academic performance. As suggested by Braxton (2003), academic integration factors failed to exert significant influence on student departure decisions. Factors recognized as most influential in student departure decisions were related to social integration (Braxton, 2003; Braxton et al., 2008). The result has been an effort on the part of universities to provide programming that responded to student social integration issues and offered means to develop communities fostering institutional commitment (ACT, 2004). These efforts took the form of first-year interventions featuring mentoring (Mangold et al., 2003), faculty interaction with students (Astin, 1972, 1977; Pascarella & Terenzini, 1979), and the formation of learning communities through the use of clustered class cohorts (Baker & Pomerantz, 2001; Johnson, 2001). Braxton et al. (2008) identified the potential that existed in fostering membership in affinity groups that encouraged social integration and positively influences retention.

The construct of psychological hardiness has been studied (Lifton et al., 2006) as an influence on retention with results indicating a positive relationship between measures of hardiness and persistence to graduation. Hardiness is defined as those
behaviors and attitudes founded in an existential perspective embracing the view that individuals shape their own experience of the world (Frankl, 1997). Hardiness was operationalized as a perception of the unfamiliar as a path to growth (Maddi, 2004). The subcomponents of hardiness were commitment, control, and challenge. Individuals who measured high in hardiness demonstrated an audacity in confronting uncertainty. As stated by Maddi (2006):

If you are strong in commitment, you believe it is important to remain involved with events and people around you, no matter how stressful things become. It seems like a waste of time to withdraw into alienation and isolation. If you are strong in control, you want to continue to have an influence on the outcomes going on around you, no matter how difficult this becomes. It seems like a mistake to let yourself slip into powerlessness and passivity. If you are strong in challenge, you see stresses as a normal part of living and an opportunity to learn, develop and grow in wisdom. You do not believe that easy comfort and security is a birthright. (p. 160)

Research supports the relationship between hardiness and retention in high-stakes, high-stress settings (Bartone, 1999; Judkins & Ingram, 2002; Judkins, Reid, & Furlow, 2006; Law, 2005). Hardiness and retention in higher education have been found to be positively correlated (Lifton et al., 2006).

Finally, a social learning model of education as theorized by Bandura (1977) suggested an approach to retention issues. The modeling associated with social learning within a community of practice may provide approaches to support the social integration factors that are positively correlated to persistence (Bean, 1982; Kennedy & Sheckley, 2000; Mangold et al., 2003; Tinto, 1993). The influence of learning communities has proven to be an effective approach to retention (Baker & Pomerantz,
2001; Johnson, 2001). The influence of communities of practice within a higher education setting has not been examined to determine the significance of the relationship between community of practice models (Wenger, 1998b), modeling (Bandura, 1977), and situated cognition (Lave & Wenger, 1991) on retention in higher education. Unique communities that provide participants with common interests with opportunities to interact through learning activities that create meaning and identity may contribute to retention. One type of learning community that was the focus of the present study provided an environment that drew participants interested in possible U.S. military service and, as such, represented an affinity group as described by Braxton et al. (2008).

Military training that takes place in civilian academic settings represents a community of practice model. U.S. Army Reserve Officer Training Corps (ROTC) participants engage in multiple competing demands associated with multiple roles as they transition from adolescence to young adulthood. The goal of the Army ROTC is to recruit and develop the next generation of officer leaders. Accordingly, it is charged with selecting appropriate candidates for leadership roles and maintaining their participation through graduation from college to commissioning as officers in the Army (U.S. Army, 2009).

Typically, candidate retention declines as participants proceed through academic training. In the past, rate of attrition among ROTC participants exceeded that of the general student population (Hawkins, 2006). The greatest loss occurred after the freshman year (either sophomore or junior year) when contracts for
commitment to service subsequent to graduation were signed. Further, accession rates continued to trend downward, resulting in a projected shortfall in the number of participants accepting a commission (Coumbe, 2008; Henning, 2006; U.S. Government Accountability Office, 2007). Further, continuation rates among the U.S. Army Officer Corps continued to trend downward (Wardynski, Lyle, & Colarusso, 2009). Little is known concerning the decision to continue as a member of Army ROTC training. The incentive to continue as a participant based solely on the value of scholarship benefits would argue for continuation of the commitment. The factors influencing completion to commission would suggest circumstances beyond strict economic or career advancement considerations.

**Statement of the Problem**

Researchers studying the issue of retention in higher education generally recognized the influence of two areas related to persistence to graduation—academic integration and social integration (Bean, 1982; Tinto, 1993). Recent research provided significant evidence that the factors identified by Tinto (1993) were not substantiated by empirical research (Braxton & Lien, 2000). Indeed, while the factors related to retention in higher education as identified by Tinto have been examined, the most significant combination of factors accounted for only 17% of the variance in retention (ACT, 2004). Braxton et al. (2004) suggested that the significance of institutional factors leading to social integration were critical to student retention. Additionally, Eaton and Bean (1995) emphasized the role of psychological factors on
retention, suggesting these factors accounted for 37% of variance in departure decisions. Further, psychological hardiness was found to be positively related to retention in higher education (Lifton et al., 2006).

Research has found that (a) social and academic integration factors accounted for only 17% of variance in student attrition, (b) psychosocial engagement was positively related to persistence, and (c) hardiness was a positive influence on retention. Therefore, to better understand those aspects of retention related to participation in a community of practice, this study examined the influence of social and psychological factors influencing student attrition.

**Statement of the Purpose**

The purpose of this study was to examine how a learning community influenced persistence in higher education. Specifically, this study investigated the perceptions of U.S. Army ROTC cadets enrolled at three Midwestern universities regarding social integration variables (French & Oakes, 2004; Pascarella & Terenzini, 1980). Those variables were peer-group interaction, institutional and goal commitment, and academic and intellectual development (Pascarella & Terenzini, 1980). The variables associated with psychological hardiness (commitment, control, and challenge) were assessed (Bartone, 1995). The subjects of the present study were freshmen and sophomore cadets who had not signed contracts to accept scholarships in exchange for commissions as U.S. Army officers. Three universities participated in the study: (a) a large public university (enrollment of 50,000+ students), designated
as a research university with a very high research activity classification, primarily residential; (b) a mid-size (enrollment of 10,000+ students) private university with religious affiliation designated as a research university with a high research activity classification, primarily residential; and (c) a mid-size (enrollment of 15,000+ students) public commuter university designated as a research university with a high research activity classification, primarily nonresidential (Carnegie Foundation for the Advancement of Teaching, 2009). The dependent variable—intent to persist in higher education to commissioning as an officer in the U.S. Army—was measured through a regression analysis that assessed the influence of the independent variables on Army ROTC participants’ self-reported intent to persist to graduation (Bean, 1982; Cabrera, Nora, & Casteñeda, 1992).

**Conceptual Framework**

This study was based in Tinto’s (1993) and Bean’s (1982) theories of higher education retention, Braxton et al.’s (2004) revisions to Tinto, and Maddi and Kobasa’s (1984) theory of psychological hardiness. These factors were explored within the framework of a type of learning community, i.e., the community practice model (Lave & Wenger, 1991; Wenger, 1998b) suggesting that members who were transitioning into new and unfamiliar experiences would be introduced to the group through a process of legitimate peripheral participation. Legitimate peripheral participation exposed new members of a community of practice to the body of knowledge, lexicon, rituals, and role expectations of individuals who shared a domain
of interest. These individuals comprised a community that was involved in practices and activities that brought them together in shared experiences and provided a social framework for learning. New members were provided with opportunities to become practitioners through engagement in progressively more demanding tasks or responsibilities. The exposure to learning in a context of situated cognition involved the learner in social learning through modeling (Bandura, 1977) and in training through Vygotsky’s (1978) zone of proximal development. This process allowed senior members of the group to provide new members with examples of functioning within the context of the group and encouraged new members to practice skills under the guidance of a more skilled member. The progressive nature of the learning experience allowed new members to internalize the roles and behaviors of the group. The initiate was invited to identify with the group in modes that influenced the identity of the person as a group member.

The influence of the factors as experienced through this community of practice model was measured through scales that assessed the social integration variables as adapted through Pascarella and Terenzini’s (1980) Institutional Integration Scale (IIS), as revised by French and Oakes (2004). The social integration variables relevant to retention that were assessed through the IIS were peer-group interaction, institutional and goal commitment, and academic and intellectual development, found to relate to retention (French & Oakes, 2004; Pascarella & Terenzini, 1980). Psychological hardiness was assessed through the use of the Dispositional Resilience Scale-15 (Bartone, 1995) and related to retention as identified by Bean and Eaton (2002) in
their examination of the psychological processes influencing social integration. The “year in college” was included to assess possible differences between freshmen and sophomores. The dependent variable was determined through self-report of intent to persist that had been found to be strongly correlated with actual persistence (Bean, 1982; Cabrera, Castañeda, Nora, & Hengstler, 1992; Cabrera, Nora et al., 1992; Nelson, Scott, & Bryan, 1984; Okun, Benin, & Brandt-Williams, 1996; Porter & Swing, 2006). The model for the conceptual framework is presented in Figure 1.

Figure 1. Model for the U.S. Army ROTC Study

Research has shown that retention in higher education was related to institutional and social integration factors (Braxton et al., 2004). In addition, psychological hardiness has been found to be positively correlated with retention in
college (Lifton et al., 2006). Despite extensive study, however, the influence of academic and social integration factors accounted for only 17% of variance in retention. Eaton and Bean (1995), who examined the relationship of these factors in conjunction with hardiness, found that psychological factors such as attitudes and beliefs, coping skills, locus of control, and self-efficacy accounted for 37% of variance in retention. Little research has examined the relationship between these indicators as experienced in a community of practice model that provides a social learning experience in a higher education setting.

**Research Questions**

The following research questions, focused on the subscales measuring variables related to retention, were examined in this research study:

1. What are the mean scores for the psychosocial factors of intellectual and academic development, peer-group interaction, institutional and goal commitment, and psychological hardiness (commitment, control, and challenge) and the dependent variable of intent to persist of participants in U.S. Army ROTC programs at the universities studied?

2. What is the correlation between the study variable (intent to persist) and the psychosocial variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) for participants in U.S. Army ROTC programs at universities studied?
3. What is the likelihood of intent to persist to commissioning as an officer in the U.S. Army based on the variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) of participants in U.S. Army ROTC programs at the universities studied?

4. Which of the independent variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) influence the likelihood of intent to persist to commissioning of participants in U.S. Army ROTC programs at the universities studied?

Significance of the Study

The increasingly competitive nature of the global economy and the rapidity of change in the workplace produced a greater need for post-secondary education (ACT, 2004). Further, individuals who were able to engage in higher education enjoyed greater opportunities for higher-paying employment with options for advancement and improved benefits (Barfield & Beaulieu, 1999). The ability to persist in higher education provided benefits to individuals and to the nation as a whole (ACT, 2004).

The variables related to retention in higher education were examined by several scholars, and the preponderance of evidence suggested that the strongest combination of variables accounted for only 17% of the variance in retention in higher education (ACT, 2004). The variables accounting for the most variance included academic integration variables (high school GPA, ACT/SAT scores, socioeconomic status) and social integration variables (institutional commitment, academic goals,
social support, academic self-confidence, and social involvement) (Bean, 1982; Cabrera, Castañeda et al., 1992; Kennedy & Sheckley, 2000; Tinto, 1993). Further, research explored the influence of attitudes and beliefs, coping skills, self-efficacy, and locus of control, indicating that these variables influenced social integration, explaining 37% of the variance in retention (Bean & Eaton, 2002). Psychological hardiness was found to be positively correlated to retention in higher education (Lifton et al., 2006). Research indicated that first-year retention intervention may have positively influenced retention (Schnell, Seashore, & Doetkott, 2003).

The positive influence of social integration factors on retention suggested the value of social interaction in persistence (Kennedy & Sheckley, 2000). Activities that fostered interaction and encouraged the development of learning communities contributed to persistence (Mangold et al., 2003). On the other hand, there was little research about factors as experienced in a unique learning community represented by the community of practice model that provided the type of social integration experiences contributing to retention.

This study provides a better understanding of those social learning experiences associated with communities of practice that lead to increased student retention in higher education and, in this model, increased likelihood of graduation. This suggests the continued exploration of the development of similar social learning communities that would influence student attrition.
**Definition of Terms**

Below are conceptual and operational definitions of terminology as they were used throughout this study.

**Community of Practice.**

Conceptual definition: A learning community that was engaged in social learning practices inviting new members who shared the interests of the community into the group’s knowledge, behaviors, rituals, and role expectations via legitimate peripheral participation (Lave & Wenger, 1991).

Operational definition: The U.S. Army ROTC battalions at three 4-year universities in the Midwest.

**Hardiness.**

Conceptual definition: The construct of psychological hardiness was defined as an attitude and belief system founded in the existential perspective comprised of commitment (a belief that the activities of life had meaning and value), control (a belief that the individual had the greatest control over the decisions that influenced outcomes in life), and challenge (a belief that life was characterized by change that made it interesting and a source of growth) (Maddi, 2006).

Operational definition: The value of the results of the Dispositional Resilience Scale-15 (Bartone, 1995) was used as a measure of hardiness and the subscales of commitment, control, and challenges as related to retention (Lifton et al., 2006).
Higher Education.

Conceptual definition: Any institution providing postsecondary education (Astin, 1993).

Operational definition: This study examined retention in higher education in 4-year university education institutions only.

Intent to Persist.

Conceptual definition: The expressed intention to continue engagement in a particular endeavor to completion (Bean, 1982; Cabrera, Castañeda et al., 1992; Cabrera, Nora et al., 1992).

Operational definition: The expressed intention to continue in the Army ROTC program leading to commissioning as an officer in the U.S. Army.

Retention.

Conceptual definition: The return to university or the stated intention to return to the university in which the student is currently enrolled (Bean, 1982; Cabrera, Castañeda et al., 1992).

Operational definition: The stated intention to persist to commissioning as an officer in the U.S. Army (Bean, 1982; Cabrera, Castañeda et al., 1992; Porter & Swing, 2006).

Social Integration.

Conceptual definition: Peer group interaction, academic, and intellectual development and institutional and goal commitment (Braxton, McKinney, & Reynolds, 2006; Pascarella, 1980).
Conceptual definition: Peer group interaction, academic and intellectual development and institutional and goal commitment (Braxton et al., 2006; Pascarella, 1980) as measured by the revised Institutional Integration Scale (IIS) (French & Oakes, 2004; Pascarella & Terenzini, 1980).

Assumptions

1. The U.S. Army ROTC community of practice model offered a meaningful framework through which the variables related to retention could be assessed. Scales used in previous studies (Bartone, 1991; French & Oakes, 2004; Pascarella & Terenzini, 1980) provided meaningful measures of the variables and suggested that the self-report information was reasonably accurate. This required students to participate freely and without coercion.

2. The expressed intent to persist was representative of actual persistence to graduation and commissioning (Bean, 1980; Cabrera, Castañeda et al., 1992; Porter & Swing, 2006). This presumed that the goal of the students involved in the Army ROTC community of practice was graduation, leading to commissioning in the U.S. Army in a leadership position.

Scope and Delimitations

This study included university students who were participating in U.S. Army ROTC programming. Because retention was defined as intent to persist—signing contracts to graduate and accepting commissions in the U.S. Army, which generally
takes place after either freshman or sophomore year—the students participating were freshmen and sophomores. The number of participants from the three institutions was 133 students, of which data from 79 participants was found to meet the requirements of the study. Specifically, the population of the study was U.S. Army ROTC participants who had not yet signed contracts requiring graduation and commissioning as officers in the U.S. Army. The study’s focus on the relationship of variables associated with social integration and psychological hardiness on retention suggested that participants who had signed contracts were likely to be influenced in favor of retention, thereby ameliorating the influence of retention variables. It was beyond the scope of this study to determine causality in the relationship among the variables and retention. Data used in the analysis were collected in one event at each university in the fall 2009 term.

**Limitations**

The following limitations to this study were identified:

1. The design of this study used a multivariate logistic regression model. Logistic regression analyses fit the theoretical framework of the research emphasizing persistence at the freshman and sophomore level, limiting the generalizability of the study findings to students enrolled in higher education at 4-year institutions. The model limited the number of variables based on the theoretical foundation that recognized the influence of social integration factors (peer-group interaction, institutional and goal commitment, and academic and intellectual development) and
psychological hardiness subcomponents (commitment, control, and challenge), and the sample size of 133 participants, 81 of whom provided data that met the study criteria. Of the 81 participants who provided data, two provided incomplete data, resulting in data analysis being conducted on complete data provided by 79 participants.

2. The study population consisted of the accessible population from U.S. Army ROTC battalions at three 4-year universities and was not randomly selected. The results of the study are not generalizable to participants in U.S. Army ROTC programs beyond the study population but are useful in exploring the relationship between psychosocial factors and intent to persist in college to graduation and commissioning. Utilizing inferential statistics was acceptable because the accessible population in this study was a sample in time, and it was assumed that this study’s accessible population was similar to other accessible populations from U.S. Army ROTC programs.

3. The study population was enrolled at three universities—a large public university (residential campus), a mid-size private university, and a mid-size public commuter university (limited residential option). Braxton et al. (2004) identified issues regarding retention in commuter universities in which academic integration assumed greater significance based on the limited option for social integration and the varying demands commuter students encounter. Bean’s (1990) research suggested that institutional environments and responses were specific and not generalizable. Further, attempting to draw inferences from data on intent to persist from differing
institutions without taking into consideration student goals, which may include short-
term educational objectives, may not permit meaningful measurement (Bean, 1990).
The use of U.S. Army ROTC programs as a model for examining persistence issues
offered a framework for minimizing the differences among institutions and student
goals. The U.S. Army ROTC program stipulated specific requirements of coursework
related to ROTC, extracurricular involvement, and 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
commissions in the U.S. Army as officers and financial support contingent on the
achievement of academic performance requirements and monitored participation in
the program. These characteristics of enrollment in ROTC responded to the
institutional and goal issues articulated by Bean (1990) as affecting departure
decisions.

4. The information gathered was based on the perceptions of the participants
through self-report, also possibly limiting the generalizability of the study. Further,
the influence of current economic factors may have affected the perceptions of the
participants regarding alternative pathways available outside of those offered by
participation in higher education, thereby increasing retention based on the factors that
might have encouraged departure.

5. This study was designed to examine the psychological and social factors
and intent to persist in U.S. Army ROTC, so control or comparison groups were not
utilized. This is because of the very specific nature of the purpose of this study that focused on persistence in learning communities. Although future research may address the differences among participants in U.S. Army ROTC and nonparticipants in student departure decisions, this is outside the scope of this study.

**Organization of the Study**

This study is organized into five chapters. Chapter 1 provides an introduction to the study, a statement of the research problem, and the significance of the study. Chapter 2 reviews the literature related to the research problem, specifically theory and empirical research on retention in higher education and in U.S. ROTC programs, psychological hardiness, community of practice models, and the importance of retention in higher education individually and to the society. Chapter 3 discusses the research design and methodology. Chapter 4 presents the results, and Chapter 5 provides a discussion of the conclusions and implications of the study and offers suggested areas for future research.
CHAPTER 2

REVIEW OF LITERATURE

Introduction

This chapter offers an extensive review of the literature concerning factors influencing retention in higher education. The first section presents an overview of retention literature examining persistence in higher education, including an examination of the literature surrounding the psychological construct of hardiness. Hardiness is a quality that has been positively correlated to retention in higher education (Lifton, Seay, & Bushko, 2000; Lifton et al., 2006). The second section examines retention strategies in higher education, particularly learning communities as an approach to retention. The third section offers theories of social learning, particularly those related to the areas of situated cognition and communities of practice. The fourth section provides background related to the U.S. ROTC program as a community of practice and retention issues of ROTC.

Retention in Higher Education

The value of postsecondary education has been recognized as a significant influence on economic and occupational outcomes for both individuals and society as
a whole (ACT, 2004; Occupational Outlook Quarterly, 2004;). Individuals with greater levels of education experienced both lower unemployment and higher pay (U.S. Department of Labor, 2008; Occupational Outlook Quarterly, 2004). Data provided by the Bureau of Labor Statistics (U.S. Department of Labor, 2008) shows that unemployment for 2006 college graduates was 2% while the jobless rate for individuals without high school credentials was 9%. The most recent data confirmed the comparative value of a higher education with the unemployment rate for high school graduates more than twice (10.8%) that of college graduates (4.9%) (U.S. Department of Labor, 2008). Median weekly earnings for people with less than a high school diploma were reported as $396 compared to $978 for individuals with a bachelor’s degree (U.S. Department of Labor, 2008).

The value to society lies in the higher capability levels available to employers seeking skilled employees. The need for highly training individuals has become more critical to viability in international economic competition (ACT, 2004). Currently, six in ten positions demand training beyond high school (Occupational Projections and Training Data, 2008), with the number of jobs requiring postsecondary training predicted to increase at a faster rate than positions requiring lesser training (Sommers, 2007).

Data indicated the level of retention in higher education. The national average for graduation with a bachelor’s degree within six years as reported in 2007 was 56.1% (National Center for Higher Education Management Systems, 2009). Globally, access to postsecondary education and participation had increased. Data comparing
enrollment in college of 18- to 24-year-olds from 29 countries in 2008 ranked the United States at seventh with enrollment at 34 per 100 as compared to 53 per 100 in Korea, 50 per 100 in Greece, 30 per 100 in Poland, and 37 per 100 in Ireland (Wagner, 2008). The number of credentials awarded per 100 students in the 29 countries represented in the study placed the United States tied for 15th place with Korea and the Netherlands with 18 per 100 students, and with Australia tied at #1 with Japan and Switzerland with 26 per 100 students (Wagner, 2008). The increasingly competitive nature of the global economy emphasized the need for improved retention in higher education (ACT, 2004).

The loss of students through attrition created threats to the economic viability of the United States and squandered valuable assets (ACT, 2004). Tinto (1993) showed that attrition represented a sunk cost that would not easily be recovered through enrollment based on increases in population. Demographics indicated a decrease in the age cohort of traditional students (age 18-24), which increased the significance of retention of students who would enroll (Tinto, 1993).

The reasons for student departure were varied and related to several possible factors. Some students attended college to update skills and may have decided to leave after accomplishing that task or transfer to another institution (Tinto, 1993). Withdrawal from college related to personal issues, including family or health reasons, and program changes (Braxton, 2003). Most examinations of student attrition operated from the assumption that students enrolled in higher education to earn
degrees (Braxton, 2003), making student persistence a subject of scrutiny on the part of educational researchers.

The theories of student attrition offered several perspectives in which decisions to leave college were grounded (Tinto, 1987). A brief discussion of the four perspectives represented in Tinto’s (1987) model of student retention is presented below—economic, organizational, psychological, and sociological.

**Economic Perspective**

The issue of financing continued participation in higher education exerted an influence on the decision to persist (Tinto, 1986). The economic perspective was founded in the principles of human capital theory as articulated by Becker (1964). Human capital theory viewed training and skill development as an investment that yielded return. The investment must be perceived to offer a justifiable return to maintain the commitment to the endeavor.

While acknowledging the importance of finances in the pursuit of college education, Tinto (1993) disputed the notion that finances were a central factor in student departure decisions. The economic reasons for attrition were not primary influences. The initial feasibility of attendance may have been determined by the availability of finances, but, while finances may have cited as the reason for leaving college, the choice to leave was founded in more complex issues (Tinto, 1993). In describing students’ reasons for leaving, Tinto (1993) posited:
Their citing of financial reasons for leaving is simply another way of stating their view that the benefits of continued attendance do not outweigh the costs of doing so. Conversely, when students are satisfied with their institutional experience, they often are willing to accept considerable economic hardships in order to continue. For them, the benefits of attendance more than justify costs. (p. 88)

**Organizational Perspective**

Tinto’s (1986) model addressed the influence of the institution—its organizational structure and behavior—on student attrition decisions. The size of the institution, its selectivity in admissions, the ratio of faculty-to-students, and the administrative structure were dimensions of organizational structure that may have affected student integration (Braxton, 2003; Tinto, 1986). The organizational approach to functioning as an institution of higher education also may have influenced student retention (Berger, 2000). Student adjustment and satisfaction were influenced by whether an institution’s bureaucratic processes and interaction were perceived as fair (ACT, 2004; Astin & Scherrei, 1980; Bean, 1983; Berger & Braxton, 1998). If students perceived the institution as acting with integrity, committed to the welfare of its students, offering opportunities to engage students in a community, facilitating the student social interaction and psychosocial engagement, the students’ commitment to the institution was reinforced, thereby acting as a possible influence affecting departure decisions (Braxton et al., 2006; Braxton, Sullivan, & Johnson, 1997).

Braxton et al. (2004) examined the differences between the retention of students at four-year residential universities and four-year commuter universities and community colleges. The psychosocial factors that contributed to retention could be
influenced directly by four-year residential universities through interventions that elicited student engagement through the living and social interactions of the university. Four-year college commuter and community college students, however, were not available to participate in social and residential activities that might have engaged them more fully. The opportunities to engage students to influence institutional commitment needed to be provided through academic activities (Braxton et al., 2004). Moreover, commuter and community college students frequently were confronted by competing demands attributable to the multiple roles associated with their lives (Braxton et al., 2004). These roles – as employees, parents, or partners in the relationship – may have acted to draw attention away from the demands of college and compromise students’ commitment to persistence in college (Braxton et al., 2004). These factors may have influenced differences in retention and the intervention strategies that institutions use to encourage persistence (Braxton et al., 2004; Zepke & Leach, 2005).

Recent emphasis on institutional responses to student integration and adjustment focused on the importance of institutional commitment as a component in social integration of students to an institution of higher education (Braxton et al., 2006) and more attention to the development of programming that encouraged academic and social approach behaviors (Eaton & Bean, 1995).
Psychological Perspective

Tinto’s (1986) model considered the individual and environmental influences on the psychological perspective of student retention as affecting students’ perceptions and experiences. These perceptions then may have influenced retention decisions. Bean and Eaton (2000) developed a model of student attrition based in the psychological perspective, positing the following theories: (a) attitude-behavior theory, (b) coping behavioral theory, (c) self-efficacy theory, and (d) attribution theory. The primary orientation of these theories was that responses were based in choices influenced by prior experiences and the perspectives that were the result of those experiences (Bean & Eaton, 2000). The ability to cope with the demands of the unfamiliar settings of a college environment would be influenced by the student’s self-efficacy (Bandura, 1986). Bean and Eaton (2000) posited that retention was founded in the students’ belief in their ability to engage in activities successfully, a belief that they were able to make decisions that affected outcomes in their lives, and their ability to deal with the stresses inherent in adapting to a new environment. In a study of 262 first- and second-year students, Eaton and Bean (1995) found that 37% of student attrition was explained by psychological and sociological indicators and suggested interventions that would train students in ways to increase approach behaviors in place of avoidance behaviors, thereby encouraging the adaptive coping behaviors influencing social integration.

Baird (2000) offered the position that Pace’s (1984) environmental scales offered a framework for understanding the psychological impact evoked through
environment. The significance of a climate that provided a supportive, helpful, and friendly atmosphere combined with intellectual satisfaction contributed to satisfaction that may have fostered retention (Baird, 2000). There was a lack of integrated understanding of how these various aspects of the psychological perspective interacted to influence student persistence (Braxton, 2003).

Furthermore, results of research examining the relationship between the psychological construct of hardiness and students’ persistence to graduation indicated a positive correlation (Lifton, Seay, & Bushko, 2000; Lifton et al., 2006). The construct of hardiness encompassed several of the features of Bean and Eaton’s (2000) psychological model specifically related to the factors identified in attitudes and beliefs, coping skills, self-efficacy, and locus of control. Kobasa (1979) identified hardiness as a perspective that influenced individuals to respond to the world in ways that supported growth rather than avoidance, especially when experiencing stress. The subcomponents of hardiness—commitment, control, and challenge—as theorized by Maddi and Kobasa (1984) were reflective of the theories incorporated by Bean and Eaton (2000). The commitment subcomponent of hardiness indicated a view of life that offered a sense of value, meaning, and purpose. The subcomponent of control reflected a belief in autonomy and the ability to affect outcomes. The subcomponent of challenge suggested an attitude of openness to new situations as opportunities to learn and grow. A hardy perspective may have contributed to managing the stress of dealing with new and unfamiliar situations (Maddi, 2006) as experienced in transitions
to a new setting and support adaptation and persistence. A detailed examination of hardiness is considered in the third section of this literature review.

**Sociological Perspective**

The significance of social interaction and structure on student retention was the basis for the sociological perspective (Braxton et al., 2004; Tinto, 1986). The impact of cultural capital (Berger, 2000), in which the culture of the institution matched the culture from which the student came, argued for improved retention outcomes. Additionally, the nature of peer interaction constituted the student culture that affected the emerging values, behaviors, and norms of student peer groups (Kuh, 1995; Kuh & Whitt, 1988). Kuh and Love (2000) suggested that the student culture created a framework through which students made meaning. In this way, cultural capital exerted a powerful influence on the experience of students entering a higher education setting (Kuh & Love, 2000; Zepke & Leach, 2005).

Tinto’s (1986) Interactional Theory was founded in the sociological perspective that viewed the interaction between the student and the institution as influencing the student’s decision to persist in the relationship with the organization. The relationship was a result of the prior experiences and student background as influences on the commitment and experiences at the university (Tinto, 1986). Academic integration as described by Tinto (1986) was a measure of structural integration into the university while social integration was reflective of the “fit” or congruency experiences by the student with the university. In this model, the
commitment of the student to the goal of graduation may have compensated for institution commitment, and social integration may have compensated for academic compensation (Tinto, 1986).

No single perspective explained or clarified student departure decisions (Braxton, 2003). Each may have contributed to a holistic view of student attrition, but the model was complex, supporting the notion, in Braxton and Mundy’s words, that the problem of student retention was “ill-structured” (Braxton & Mundy, 2001). As research continues to emerge, the models that followed have contributed to a deeper understanding of student departure decisions. Those models (Astin, 1984; Bean, 1980; Bean & Eaton, 2000; Braxton, 2003; Pascarella, 1985) are discussed briefly.

**Student Retention Models**

The models of student retention that emerged following Tinto’s (1993) model are addressed below.

**Bean’s Model of Student Departure**

Bean’s (1980) model was founded in a paradigm of organization turnover as a psychological process model. Interactions between the student and the university influenced the student’s satisfaction, which thereby affected the student’s institutional commitment. The level of commitment was related to the possibility of student’s decision to leave the institution (Bean, 1980). Because the model has been the subject of continuing study (Bean, 1985; Bean & Eaton, 2000), an increased recognition of
the significance of social interaction with peers and internal psychological development as factors that affected retention decisions has emerged. In particular, Bean and Eaton’s (2002) model focuses on the combination of student psychological responses as aspects which have material effect on retention. In application, the Bean and Eaton (2002) model suggested interventions that brought entering freshmen together in interest groups, learning communities, and orientation and mentoring activities as a means to increasing institutional commitment.

**Astin’s Developmental Theory of Student Involvement**

Astin’s (1984) theory was focused on linking academic approaches with student learning outcomes. Further study yielded results that emphasized the impact of student peer groups as the most critical factor in development of students in higher education (Astin, 1993). While recognizing the importance of the resources that institutions had at their disposal to affect retention, Astin’s (1994) work reinforced the need for institutions to seek new organizational structures and new approaches to engaging students in the learning community of the university.

**Pascarella’s General Causal Model of Retention**

The general causal model emerged from the application of Tinto’s (1993) theory to a methodological investigation of the two categories of variables—social integration and academic integration (Pascarella, 1985; Pascarella & Terenzini, 1980). Scales measuring the outcomes of social and academic integration were
assessed through the development of the Institutional Integration Scale (IIS). The five scales measured Peer-Group Interactions, Interactions with Faculty, Faculty Concern for Student Development and Teaching, Academic and Intellectual Development, and Institutional and Goal Commitment. These were representative of the factors influencing social integration, thereby affecting retention decisions. While the scale generally supported the Tinto (1993) model, results reinforced the social and peer-group interaction as influential on academic development (Pascarella & Terenzini, 1980). Further analysis of the use of the Institutional Integration Scale in retention confirmed its value in assessing retention (Caison, 2007). Most recently, French and Oakes (2004) performed confirmatory factor analysis on a revised Institutional Integration Scale, finding improved reliability and validity for the revised version, particularly the peer-group interaction, institutional and goal commitment, and academic and intellectual development as influencing social integration and retention.

**Braxton’s Revision to Tinto’s Model**

Braxton (2000) assessed Tinto’s (1986) Interactionalist Theory as exerting a dominant influence on research in retention and attrition. While Tinto’s (1975) work provided a foundation for studying student departure decisions, the influence of the academic integration factors of Tinto’s (1993) model were found to exert modest influence on commitment to graduate (Braxton et al., 1997), institutional commitment, and persistence (Braxton & Lien, 2000). Braxton and Hirschy (2005) found the effect of social integration to have a greater influence on decisions related to retention and
attrition. In a study of 62 tests of factors influencing social integration, Braxton and Hirschy (2005) identified three factors affecting social integration—commitment of the institution to student welfare, institutional integrity, and communal potential. Ability to pay was identified as an influencing factor (Cabrera, Stampen, & Hansen, 1990). Two other factors—proactive social adjustment and psychosocial engagement—were recognized as contributing to social integration in 4-year residential institutions (Braxton & Hirschy, 2005). These six factors were posited by Braxton and Hirschy (2005) as constituting a revision to Tinto’s (1986) theory that offered a deepened understanding of the issues surrounding student attrition. Each of the factors is synopsized below.

Commitment of the Institution to Student Welfare. Perceptions of an institution’s commitment to student welfare convey the institution’s ideal of valuing the student as an individual and as part of a group (Braxton et al., 2004). Fairness in administering rules and inviting students to participate in policy-making decisions (Berger & Braxton, 1998), orientation programs (Pascarella, Terenzini, & Wolfle, 1986), active learning and encouraging the development of skills in organization, preparation, and clarity (Braxton, Bray, & Berger, 2000) contributed to students’ perceptions of the institution’s commitment to the welfare of its students.

Communal Potential. Membership in communities within the university contributed to students’ feelings of belonging and social integration (Braxton & Hirschy, 2005). Classrooms (Tinto, 1997), residential halls (Berger, 2002), and student groups (Newcomb, 1966) were sources of student communities. Social
integration also was found to be influenced by the social approach or social avoidance behaviors adopted by the students in coping with unfamiliar and stressful circumstances (Eaton & Bean, 1995).

**Institutional Integrity.** Exhibiting fairness in administering policies (Berger & Braxton, 1998) and meeting expectations as formulated by articulated mission and goals of the institution (Helland, Stallings, & Braxton, 2002) were found to encourage social integration.

**Ability to Pay.** Concerns related to finances may have affected students’ abilities to participate fully in the college environment (Cabrera et al., 1990). Further, student persistence was influenced by the level of satisfaction expressed by the student (Cabrera et al., 1990).

**Proactive Social Adjustment.** Students who anticipated the social demands of the transition to higher education and actively sought opportunities for engagement with peers experienced higher levels of social integration (Braxton & Hirschy, 2005). The ability to adapt to the challenges of a new social milieu while coping with needs and exploring and expanding talents (Heath, 1980) was characteristic of psychological maturity contributing to social integration. As new members sought inclusion in groups, they engaged in what Merton (1968) referred to as anticipatory socialization, a process of adopting the behaviors, attitudes, and values of the group in which they pursued membership. Programs offering orientation that introduced new members to the expectations of the group encouraged the adoption of anticipatory socialization behaviors as a means to social integration (Pascarella et al., 1986).
Further, coping skills that provided students with strategies for managing adjustment influenced social integration (Bean & Eaton, 2002; Braxton et al., 2004; Eaton & Bean, 1995). Avoidance strategies such as denial (a refusal to acknowledge the reality of the situation) diminished the possibility of successful social integration while positive coping strategies that embraced growth (Bean & Eaton, 2002; Carver, Scheier, & Weintraub, 1989; Eaton & Bean, 1995) contributed to social integration.

**Psychosocial Engagement.** Successful social integration required a substantial commitment of time and energy on the part of students (Braxton et al., 2004). The level of social engagement that drew students into extracurricular activities, peer interaction, and informal participation in cooperative endeavors required psychological energy. As articulated by Braxton et al. (2004), social integration was positively correlated with the psychological energy invested in social interaction. Based on Astin’s (1984) theory of involvement, the greater the involvement in the experience of higher education, the greater the level of social integration realized by the student. Eaton and Bean (1995) explored the approach and avoidance behaviors of students and their influence on social integration. Approach and avoidance were responses used to cope with stress, with approach behaviors promoting social integration and avoidance behaviors diminishing social integration (Eaton & Bean, 1995). Coping responses that facilitated the successful management of transition to unfamiliar or stressful situations have been found to be associated with the psychological construct of hardiness (Kobasa, 1979). A detailed examination of the literature related to hardiness and its relation to retention follows.
**Psychological Construct of Hardiness**

While hardiness was not specifically referenced in Braxton and Hirschy’s (2005) revision of Tinto’s (1986) model, behaviors influencing student persistence identified by Eaton and Bean (1995) were associated with attributes of psychological hardiness (Maddi & Kobasa, 1984). Coping skills, including approach and avoidance behaviors, were associated with the construct of psychological hardiness (Maddi, 2004). The personality style associated with hardiness was positively correlated to retention in higher education (Lifton et al., 2004) in a longitudinal study of student persistence to graduation. Results revealed a disproportionately high representation of students with low hardiness measures among students who dropped out (Lifton et al., 2004).

Psychological hardiness has offered an area for examining the experiences of individuals who were confronted by stressful circumstances (Kobasa, 1979). The examination of hardiness yielded a body of research that addressed its function in outcomes such as improved performance decision-making (Sheard & Golby, 2007), resistance to burnout (Garrosa, Moreno-Jimenez, Liang, & Gonzalez, 2008), and reactions to stressors that may have influenced the ability to function or thrive during periods of change and stress (Allred & Smith, 1989; Westman, 1990; Wiebe, 1991). Further, the construct of hardiness presented a model for increasing transformational coping skills (Maddi, 1991; Maddi & Kobasa, 1984).
The theory of psychological hardiness represented a model composed of three factors identified as attitudes toward life: (a) commitment—the belief that life had meaning and value, (b) control—the belief that choices offered opportunities to influence individual outcomes, and (c) challenge—the belief that change was inherent to adult life, making it interesting and engaging (Maddi & Kobasa, 1984; Witmer & Young, 1985). These factors were theorized by Maddi and Kobasa (1984) to contribute to individual ability to cope with stress, adapt performance to the demands of a new environment, and engage in growth associated with critical reflection.

Research suggested two possible mechanisms that may have accounted for the influence of hardiness on responses: (a) events were appraised from an optimistic frame of reference (Allred & Smith, 1989; Florian, Mikulincer, & Taubman, 1995; Wiebe, 1991), and (b) transformational coping strategies were focused on problem-solving and planning (Maddi, Brow, Khoshaba, & Vaitkus, 2006; Westman, 1990).

Allred and Smith (1989) assessed the hardiness of 84 undergraduate students in relation to an evaluative threat, finding that high hardiness positively correlated with higher levels of positive self-statements than among students measuring low hardiness. In a study of 276 Israeli military recruits, Florian et al. (1995) found that appraisal of stressors was influenced by hardiness, resulting in a reduction of stress based in perceptions of stressful circumstances from an optimistic frame of reference contributing to a self-assured response. A study of 820 undergraduates compared the influence of hardiness on participants measuring in high and low triads in hardiness,
determining from results that hardiness played a moderating role on the influence of stress through the effect of appraisal (Wiebe, 1991).

Maddi et al. (2006) assessed the hardiness and religiousness of 60 military officers in resisting depression, finding hardiness to be more effective in responding to depression based in transformational coping skills and socially supportive relationships. Westman (1990) examined hardiness in a study of 326 military cadets, finding that hardiness was negatively related to the experience of stress and positively related to performance both during and following training.

Sheard and Golby (2007) related successful academic performance positively with the commitment component of hardiness, while Lifton et al. (2006) presented the correlation of hardiness of 1,432 college students to persistence in higher education and graduation. The study confirmed the correlation between hardiness and persistence as stated by the authors, contributing to the notion that hardiness represented a perspective associated with an intrepid spirit and “can do” strength of character.

**Braxton’s Revised Model in Practice**

Braxton (2003) revised Tinto’s (1986) model and found that the overriding influence on persistence in higher education was social integration. Social integration was influenced by the student’s perception of the institution’s commitment to the welfare of all students, its institutional integrity, communal potential available to the student, and the student’s ability to engage socially through the auspices of the
institution and level of psychosocial involvement (Braxton et al., 2004). These factors contributed to social integration that influenced institutional commitment, thereby encouraging persistence (Braxton et al., 2004).

While the significance of social integration was related to persistence, the approaches adopted by universities to encourage social integration varied in method and efficacy. The following section examines the various interventions developed to encourage retention and persistence in higher education.

**Retention Strategies in Higher Education**

As a result of examining variables that influenced retention, universities developed a range of strategies that have been adopted to increase student retention. The interventions were focused on programming that facilitated the transition of students to the rigors of higher education (ACT, 2004; Braxton, Milem, & Sullivan, 2000; Mangold et al., 2003; National Resource Center for the First-Year Experience and Students in Transition, 2006; Porter & Swing, 2006; Tinto, 1993; Wang & Grimes, 2001; Zepke & Leach, 2005). Retention programming could be categorized as drawing from two approaches—interventions that facilitated students fitting into the institution and adapting institutional culture to respond to the needs of student populations of increasing diversity (Zepke & Leach, 2005).

The retention of freshmen college students typically has been reported in the 70% range for 4-year institutions with lower rates for 2-year institutions (ACT, 2008). The retention rate for first-year college students in 2008 was reported at 66, the lowest
level since 1989 (ACT, 2008). For this reason, the emphasis for intervention focused on the first-year experience. The National Resource Center on the First-Year Experience and Students in Transition (2006) reported that, of the 968 institutions participating, 821 (84.8%) offered a first seminar. Interventions responded to a range of issues related to persistence, based on research (Braxton et al., 2004; Tinto, 1993;). Seminars for first-year students may have addressed academic requirements and study skills, orientation to the institution, engagement, peer support, career decision-making, and faculty-student interaction among others (National Resource Center for the First-Year Experience and Students in Transition, 2008). Among those interventions, the formation and development of learning communities has been recognized as an effective approach to retention in higher education (Baker & Pomerantz, 2001; Hlyva & Schuh, 2004; Jaffe, Carle, Phillips, & Paltoo, 2008; Johnson, 2001; McQueen, 2009; Tinto, 1997; Zepke & Leach, 2005). The following sections examine the types of interventions and the outcomes related to retention.

**First-Year Seminars**

First-year seminars were developed to provide students in transition to higher education with experiences that facilitated the integration, both academic and social, into the university (Tinto, 1993). As represented by the model known as University 101 (Barefoot & Gardner, 1993; Higbee, Dwinell, & Thomas, 2002; Lifton, Cohen, & Schlesinger, 2000), a combination of services and subjects were included in the seminar (Lifton et al., 2000). Introduction to the university’s services, contact with
peers, academic advising and registration, student success strategies, and self-assessment may have been included in the experiences (Barefoot & Gardner, 1993; Lifton et al., 2000).

Research concerning the effectiveness of the seminars confirmed the effectiveness of these first-year introductions to higher education (McQueen, 2009). In a study of a comprehensive first-year system known as Access Plus used at Missouri Western State College, researchers found a positive relationship between the use of the program and retention at the college (Wang & Grimes, 2001):

Included in Access Plus are numerous programs: a Student Success/Freshman Year Experience Office; an intrusive freshman advising program; an expanded Freshman Seminar course; redesigned Introduction to Professional Studies courses; enhanced orientation programs; creation of Freshman Interest Groups; added faculty for Developmental English and Mathematics; expansion of the programs of the Center for Academic Support; the creation of a Unity Services Office; and a Center for Excellence in Teaching. (p. 61)

In assessing the success of Access Plus during its initial years, the program produced a 10% increase in freshman-to-sophomore retention, a 21% increase in retention of at-risk students, with corresponding decreases in freshmen on academic probation and suspension (Wang & Grimes, 2001).

The use of freshmen orientation models, although less comprehensive than the Access Plus model, offered similar increases in retention (Porter & Swing, 2006). In their study of the influence of first-year seminars on retention, Porter and Swing (2006) surveyed approximately 20,000 first-year students at 45 four-year institutions to understand the effectiveness of the first-year experience. The results of the survey
indicated a positive relationship between the seminar and persistence with students perceiving learning skills and health education components having the most significant impact on intent to persist, a measure closely associated with persistence (Porter & Swing, 2006).

The influence of active learning strategies in retention with first-year students was explored in a study in which 718 freshman were surveyed to examine the effect of various active learning approaches on retention (Braxton et al., 2000). Active learning pedagogical tools such as class discussion, higher order thinking activities, and group work were assessed in relation to retention, with findings indicating that active learning contributed to retention through its effect on social integration (Braxton et al., 2000).

Another first-year approach was engaging students through block registration so students were engaged in a cohort (Mangold et al., 2003; Lifton et al., 2000; Tinto, 1997). Mangold et al. (2003) found a positive effect in the retention rates of students engaged in such programs primarily founded in the social integration component that encouraged persistence despite difficulty in academic performance.

Tinto (1997) examined the persistence of students involved in a shared curriculum program known as the Coordinated Studies Programs (CSP). A total of 517 students participated, 210 from a CSP cohort and 307 from a comparison group of students not engaged in a shared learning program. Follow-up produced 121 CSP participants and 166 comparison group participants. Results indicated a significantly higher persistence for CSP participants for the following quarters and even greater
persistence for students transferring to four-year institutions than for that of the comparison group (Tinto, 1997).

The results of the examination of first-year experience seminars suggested that the efficacy of retention interventions was strongly related to social integration, with success most clearly associated with approaches that introduced students to the learning communities model.

**Learning Communities**

Among the interventions that have influenced retention, the impact of learning communities exhibited significant influence on retention of students in higher education (Smith et al., 2004). The diversity of student population, the complexity of higher education infrastructure, and the barriers to education created an increase in student departure decisions (ACT, 2008; Smith et al., 2004). In assessing the significance of learning communities, Smith et al. (2004) posited:

In response to these challenges, learning communities have arisen as one of many reform efforts in undergraduate education. Now offered at more than five hundred colleges and universities, learning communities have become a far-reaching and ambitious movement. Learning communities restructure the curriculum by linking or clustering two or more courses and enrolling a common cohort of students. We believe they are one of the most powerful interventions on the educational landscape because they provide a comprehensive cost-effective framework for enhancing student learning that is applicable in many different types of institutions. Furthermore, a growing body of research demonstrates their effectiveness in addressing a variety of issues from student retention [emphasis added] to curricular coherence to faculty revitalization. (p. 4)
The value of learning communities lay in the communal potential offered that contributed to social integration (Braxton et al., 2004). The ability to engage with students in academic activities that facilitated social interaction reduced feelings of isolation and low solidarity (Mangold et al., 2003; McQueen, 2009; Tinto, 1997). Several studies specifically have addressed the effectiveness of learning communities on retention (Baker & Pomerantz, 2001; Hlyva & Schuh, 2004; Jaffee et al., 2008; Johnson, 2001; Potts et al., 2004).

Johnson (2001) compared retention rates from two learning community models against non-learning community programs. The four programs—a conditional contract student program, Project 100, First-Year Alternative Experience (FYAE), and Russell Scholars Program (RSP)—were intervention programs at one university in the Northeast. After two years, a retention rate of 78.1% was associated with the Russell Scholars Program with retention of 57.4% for the First-Year Alternative Experience. Both programs were structured as learning communities and yielded higher retention rates than did the contract program or the Project 100 program that had retention rates of 49.5% and 49.4%, respectively, both of which were lower than the retention rate of 50.8% for the university general population. As described by Johnson (2001):

Both RSP and FYAE are learning communities which actually seem to do something more than just try to retain students. They attempt to do what Tinto claims retention efforts in general do not do, “change the essential quality of the academic experience” [1996, p. 1] for students. They also appear to address the problem of isolation which is related to dropout. Due to the inclusiveness, the collaborative nature, and the community environment which these two programs deliver, students are less apt to feel alone and isolated. (p. 233)
Baker and Pomerantz (2001) studied the retention of students involved in a learning community model at a four-year metropolitan university that enrolled students in cluster courses. Student retention was improved by membership in the learning community model and improved students’ initial experience of higher education. Students’ comments concerning their learning community membership were (Baker & Pomerantz, 2001):

My Learning Community made making friends easier.... It made college fun.... It helped me make the transition from high school to college easier.... I was more comfortable in my Learning Communities classes.... It made a big institution feel smaller. (p. 124)

Furthermore, faculty comments suggested that students in learning communities were more relaxed with fellow learning community students, engaged in social interaction, and sought fellow students for academic support (Baker & Pomerantz, 2001). Faculty expressed some concern related to students seeking academic information from other students rather than from instructors (Baker & Pomerantz, 2001).

The relationship correlation between both retention and student learning and participation in a cross-cultural learning community was examined by Hlyva and Schuh (2004). In this qualitative study, both observation and focus group interviews with participants in a cross cultural learning community (CCLC) (n=10) and nonparticipants (n=11) were examined (Hlyva & Schuh, 2004). The members of the CCLC were from a variety of backgrounds throughout the United States and international students. Results of the focus group interviews suggested that
participation in the CCLC eased transition of higher education, thereby facilitating
retention and providing an experience that enriched the college experience (Hlyva &
Schuh, 2004).

In a study of first-year learning communities (FLCs), data were gathered from
three first-year classrooms—Residential Freshman Learning Communities (RFLC),
Non-Residential Freshman Learning Communities (NRFLC), and Conventional
Freshman Courses (CFC)—to determine the efficacy of learning communities in
facilitating transition. The results of the study confirmed the efficacy of the FLC
model in facilitating transition; however, the researchers suggested that unintended
outcomes (peer social pressure, “groupthink,” and the formation of social cliques
reminiscent of secondary school social networks) may have emerged as a result of
FLC (Jaffee et al., 2008).

The influence of a cohort-based learning community that focused on common
course registration studied 308 freshmen grouped in business courses as cohorts. The
authors compared academic performance and retention of the cohorts with a
psychology cohort, a non-major cohort, and a comparison group, finding that block
registration in courses of common interest had no influence on performance or
retention (Potts et al., 2004).

The value of learning communities in facilitating transition and promoting
student retention has been demonstrated. The possibility of enriching the experience
of students by providing a more comprehensive community model was suggested by
the research as one that, while promoting retention, addressed development that goes
to the issues of changing the academic experience for students. A unique learning community model that encompasses learning in a contextual manner through a community of practice is examined in the next section.

**Community of Practice Models**

Communities of practice were founded in the theory of situated cognition or situated learning (Lave & Wenger, 1991). Situated learning was an approach that identified learning as a social and cultural experience grounded in the contextual environment of real world activities (Stein, 1998). Situated learning emerged from the research in social learning pioneered by Bandura (1977), focusing on the psychological aspects of development and recognizing the influence of observation and modeling on development and learning. Lave (1997) referred to this as “way in,” a process by which a learner observed the skill being performed by a master. Lave (1997) went beyond Bandura’s (1977) modeling theory by including initial attempts at problem solving in the “way in” phase. The second stage of Lave’s (1997) theory of knowledge acquisition, “practice,” allowed the learner to continue to mastery of the new skill.

Vygotsky’s (1978) activity theory specifically articulated the process by which learners were introduced to skill development through the social interaction with those with greater experience or skill. This gap between the learner’s ability and the more experienced “mentor” was referred to as the zone of proximal development and represents the space in which learning took place (Vygotsky, 1978).
The components (Stein, 1998) of situated learning—content, context, community of practice, participation—were found in a constructivist philosophy of education (Dewey, 1938) in which meaning was negotiated among members of the community. The meaning was realized through interaction experienced in the life-experiences of the learners as they functioned in community together (Lave, 1997). Stein (1998) proposed that content in situated learning was found in the experiences of the learners as they worked with others in problem solving, incorporated meaning into their activities, and applied what was learned in practice. Context was the real-world situation in which knowledge was constructed through practice and reflection. Community of practice referred to learners interacting together to interpret and make meaning from experiences through practice. Participation was the manner and means of interaction through which ideas, reactions, reflection and the use of the real-world material of the group was engaged to create meaning (Stein, 1998). One of the values of operating within a community of practice was realized through “reification,” the manner by which the abstract became tangible through the real-world experience (Wenger, 1998b).

Wenger (1998b) identified meaning, practice, and community as essential components of the community of practice with the additional component of identity as a construct that was influenced by membership in a community of practice. The identity of the learner in a community of practice was affected by the experiences within the community, negotiated through the membership process (Wenger, 1998b). Wenger (1998b) introduced the notion of a “learning trajectory” within identity as the
learners’ means of defining themselves through the continuum of learning. Identity was made more complex by the multiplicity of groups that learners inhabited and that encompassed both local and global communities (Wenger, 1998b). In effect, Wenger (1998b) posited:

An identity, then, is a layering of events of participation and reification by which our experience and its social interpretation inform relations with others, these layers build upon each other to produce our identity as a very complex interweaving of participative experience and reificative projections. Bringing the two together through the negotiation of meaning, we construct who we are. (p. 151)

A new member in a community of practice was introduced to knowledge through what Lave and Wenger (1991) termed “legitimate peripheral participation,” a process by which the learner was introduced to structured exposure the group’s body of knowledge, the rituals, the role expectations, beliefs, and behaviors via appropriate inclusion in practice. The learner was engaged in activities of the community through interaction that scaffolded the new learning appropriately to facilitate the learner’s mastery (Stein, 1998). As suggested by Wenger (1998b):

To open up a practice, peripheral participation must provide access to all three dimensions of practice: to mutual engagement with other members, to their actions and their negotiation of the enterprise, and to the repertoire in use. No matter how the peripherality of initial participation is achieved, it must engage newcomers and provide a sense of how the community operates. Note that the curriculum is then the community of practice itself. Teachers, masters, and specific role models can be important, but it is by virtue of their membership in the community as a whole that they can play their roles. (p. 100)
Wenger (1998b) emphasized that the peripheral role must offer new members the respect associated with potential full membership in the community. Wenger (1998b) continued:

Granting the newcomers legitimacy is important because they are likely to come short of what the community regards as competent engagement. Only with enough legitimacy can all their inevitable stumblings and violations become opportunities for learning rather than cause for dismissal, neglect, or exclusion. (p. 101)

Wenger (1998a) identified communities of practice as emerging from mutual interest, frequently self-organizing and informal. The existence of communities of practice that operated within organizations may be facilitated and sustained by the larger organization as a means to engage learners in knowledge sharing and creation (Wenger, 1998a).

Studies of communities of practice have largely focused on understanding the model through qualitative examinations. Merriam, Courtenay, and Baumgartner (2003) explored the communities of practice that were available to new learners of a marginalized group, that of witches. They (2003) explored the trajectory of learning from the periphery to the center of the community as members were invited into deeper levels of practice. Critical to the trajectory was the identity development of members as they realized greater mastery by balancing the various components of their lives into a coherent identity, including taking a Wiccan name, advancing through levels of expertise, and referring to the growth of their persona through their participation in the community of witches (Merriam et al., 2003).
O’Donnell and Tobbell (2007) examined the experience of a group of adult students transitioning to higher education through legitimate peripheral participation in a higher education community of practice. Adult students were engaged in adult entry courses that facilitated the transition of adult learners to the higher education setting through clustered classes. Through semi-structured interviews, 17 participants were encouraged to share their view of the transition experience as informed by the communities of practice theory in terms of learning, practice, and identity. O’Donnell’s and Tobbell’s (2007) findings suggested that communities of practice that existed on the periphery of a larger organization may have inhibited participation in the larger community by denying the members of the community the opportunity for full membership. Under this model, adult learners adopted the behaviors of students but did not internalize the role of student in a way that influenced an expanded identification with the role, suggesting the marginal nature of the community by which they were introduced to the institution (O’Donnell & Tobbell, 2007).

In a study of the community of practice that supported the scuba diving community, Lagache (1993) used several methods of ethnographic study to examine the practice and learning trajectory of the members of the community. Peripheral participation introduced new members of the community to the practice of diving. New divers and active sightseer status offered means to peripheral entry to the practice. From that position, the members could advance to a more central role in the community of either a professional diver or specialty diver. The final level of participation in practice was the “old timer” role in the community that was populated
by professional divers or specialty divers who may have been engaged in the practice but continued as members of the community. The number of members of the community were highest in the earliest phase of participation (two years) with the number of members diminishing with fewer active members in the community in all other time frames combined. Lagache (1993) suggested that members of the community of practice devoted to scuba diving were driven by the social interaction that facilitated early engagement—learners seeking membership that was not necessarily maintained once the diver’s learning trajectory took him or her to more advanced mastery.

The challenge of sharing knowledge that may otherwise be lost but might benefit members of a community of practice was examined by Snyder, Wenger, and de Sousa Briggs (2004) in an assessment of the CompanyCommand.com online community. The online forum was established by former U.S. Army company commanders who recognized the value of their experiences in forward areas to new members of combat command billets (Dixon, 2007; Snyder et al., 2004). As a mode to share knowledge that might not be available when seasoned officers were separated from the military, it became a viable means for new members of the community to gain valuable insight (Dixon, 2007). Although the initial launch was a result of self-sponsorship, the community of practice became sponsored by the U.S. Military Academy (Snyder et al., 2004).

Some research examined the influence of learning communities on retention in higher education and the form and process of communities of practice in informal
groups and groups that operated within organizations. Little research examined community of practice models and their influence on retention in higher education. The models identified as learning communities in higher education that included clustered classes and cohort scheduling were limited by social interaction grounded in academic integration. U.S. ROTC programs represented a model for examination that included components of common goals and institutional commitment within a community of practice framework.

**U.S. Army Reserve Officer Training Corps Programming**

This section describes the U.S. Army Reserve Officer Training Corps (ROTC) program in detail: (a) history and numbers of ROTC and projections for officer requirements, (b) the structure of ROTC through the framework of a community of practice model, (c) the aspects of the community of practice represented by ROTC that were related to peripheral participation and social integration, (d) the variables in Braxton’s (2000) revision to Tinto’s (1986) model of retention that were represented in the ROTC model.

**History, Numbers, and Projected Officer Requirements**

The ROTC was established in 1916 through the National Defense Act as a response to the needs for U.S. Army officers to prepare for involvement in World War I (U.S. Army, 2009). At the time of this writing, it was the largest provider of officers for a branch of the military, producing more than 500,000 officers since its
establishment. It was one of three possible points of entry to the professional officer corps of the U.S. Army, along with access through the U.S. Military Academy at West Point or through graduation from college and successful completion of Army Officer Candidate School (Coumbe, 2008). As of February 2009, the total number of cadets enrolled nationally in the U.S. Military Academy preparing for commissioning was 4,409 (U.S. Department of the Army, 2009). The average number of officers commissioned as a result of the ROTC program was approximately 4,000 annually (Coumbe, 2008). The projected number of officers available from ROTC programs would not allow the U.S. Cadet Command to meet the anticipated need for officers (Coumbe, 2008).

The participation in U.S. Army ROTC in recent years has indicated an attrition rate that may have exceeded that of the general cohort of college students (Hawkins, 2006) with the decision to leave taking place at the point when cadets were asked to sign a contract that would commit them to service as a U.S. Army officer after graduation, typically between the freshman and junior years. Further, the accession rates for commissioning lieutenants projected a shortfall in the number of ROTC cadets persisting to commissioning (Coumbe, 2008; Henning, 2006; U.S. Government Accountability Office, 2007).

Structure of ROTC as a Community of Practice

The community of practice as represented by U.S. Army ROTC was structured as a comprehensive model for introducing new members to a learning community
(U.S. Army, 2009; Wenger, 1998b). U.S. Army ROTC fostered the development of meaning through legitimate peripheral participation leading to full membership in the larger institutions, i.e., the institution of higher education and the U.S. Army (U.S. Army, 2009). The program was organized to span the four years of university education from freshmen to seniors by inviting students who shared a mutual interest in a military career to engage in pre-service training in a civilian academic setting (U.S. Army, 2009). Two phases constituted engagement in the ROTC program—the U.S. Army ROTC Basic Course of freshmen and sophomores and the U.S. Army ROTC Advanced Course (U.S. Army, 2009). The students in the first two years of ROTC may have their education financed by a full four-year scholarship or may be recipients of a three-year scholarship based on academic performance during the freshman year. On completion of the first-two year basic course, members of the ROTC battalion were required to commit to graduation and commissioning as an officer in the U.S. Army with an obligation of five years active duty (Goldman et al., 1999).

On completion of the Basic Course and executing the contract, U.S. Army ROTC cadets proceeded to the Advanced Course and full membership in the U.S. Army ROTC cohort (U.S. Army, 2009). Any cadet who could honor the contract would be eligible for activation to the regular U.S. Army as an enlisted member. Between the junior and senior years, cadets engaged in a five-week summer course—Leader Development and Assessment Course (LDAC)—at Fort Lewis, Washington (U.S. Army, 2009). The resulting evaluation of cadets determined the military
occupational specialty (MOS) (infantry, armor, aviation, logistics, motor transport, etc.) in which the cadets would be trained as professional officers (U.S. Army, 2009). On completion of LDAC and evaluation, cadets returned to their respective universities to complete academic programs, graduate, and be commissioned as officers in the U.S. Army (2009).

**ROTC Community of Practice**

Members of ROTC engaged in a range of activities that offered opportunities to make meaning and support mutual shared interest and goals (Wenger, 1998b). The community that formed around these shared activities engaged in practice related to the learning taking place in the communities, and it contributed to the identity formation that influenced members’ beliefs about themselves and their learning trajectory within the community (Wenger, 1998b). The activities in which members of ROTC participated are offered below.

**Academic Classes.** A shared military curriculum exposed new members to military science and continued the growth of the returning members. Freshmen were required to register for classes in U.S. Army leadership, U.S. Army customs and traditions, military operations and tactics, goal setting and accomplishment, and health and physical fitness. Sophomore curricula included applied leadership theory, communication, principles of war, and military operations and tactics. Juniors enrolled in command and staff functions, law of war, weapons, team dynamics and peer leadership, and military operations and tactics. Seniors enrolled in training the
force, military justice, ethical decision making, personnel management, cultural
awareness, post and installation support, and military operations and tactics (U.S.
Army, 2009). Further, each member of the unit was assigned a faculty adviser within
the ROTC cadre who was required to meet a minimum of once each term to review
the member’s academic progress and monitor engagement in the program. Academic
performance was monitored, and deficiencies were remediated through mandatory
study hall attendance (U.S. Army, 2009).

**Extracurricular Activities.** All members of the cohort were required to select
an extracurricular activity related to military professional training, including but not
limited to marksmanship, Army Ranger challenge, drill team, Color Guard, and band,
etc., with competitions among other ROTC units as a part of the involvement.
Members also could be required to participate in formations and inspections and be
available as representatives of the unit at official functions (U.S. Army, 2009).

**Leadership.** Options for leadership within ROTC were available by accepting
responsibilities of Officer of the Day, Battalion Commander, etc., and other official
roles that supported battalion operations (U.S. Army, 2009). All new members were
introduced to U.S. Army ROTC through an orientation program that was managed and
operated by senior members of the cohort. Mentoring of new members was provided
through a network of senior members of the cohort who were matched to new
members based on major of study (U.S. Army, 2009).
Physical Training. Unless physically unable, all members of the cohort were required to participate in physical training before classes on prescribed mornings during the academic year (U.S. Army, 2009).

Social Functions. Members of the unit were encouraged to participate in leisure activities sponsored by the unit, such as tailgating at collegiate athletic competitions and formal military balls. (U.S. Army, 2009).

As represented by the community of practice model (Wenger, 1998b), ROTC offered a form of peripheral participation that drew new members who shared the community’s interests and goals. Members’ activities supported the realization of learning through lived experience and negotiated meaning (Wenger, 1998b). Figure 2 represents a model of peripheral participation in U.S. Army ROTC, adapted from Lagache (1993) and depicting the increasing learning trajectory the ROTC community of practice represents.
Figure 2. Levels of Peripheral Participation: U.S. Army ROTC
Adapted from Lagache (1993).
Braxton’s Revision of Tinto’s Model as Related to ROTC CoP Variables

Tinto’s (1993) model as revised by Braxton et al. (2004) identified factors that may have been positively related to retention, possibly represented in the ROTC Communities of Practice (CoP) model. The members’ perceptions of the institutional commitment to their welfare, the integrity of the institution, and the communal potential of the community were represented in the structural facets of ROTC (mentoring, faculty involvement, financial commitment, shared interests) (Braxton et al., 2004). The other two factors in Braxton’s model, proactive social adjustment and psychosocial engagement, may have been associated with the extracurricular, leadership, and social activities of ROTC. These factors were positively related to social integration that was a more significant influence on persistence than were academic factors (Braxton et al., 2004). In addition, psychological factors identified by Eaton and Bean (1995) as related to retention in higher education may be understood as relating to psychological hardiness (Maddi & Kobasa, 1984).

We know that retention in higher education was positively related to factors of social integration and that those factors were influenced most significantly by those aspects of learning communities that promoted social integration. The factors that influenced social integration were identified as peer-group interaction, institutional and goal commitment, and academic and intellectual development. We also know that communities of practice were a type of learning community and ROTC may have exhibited many of the qualities of a community of practice (Braxton et al., 2006; Wenger, 1998b).
We also know that psychological hardiness was positively related to retention in higher education. There was no research on the influence of the U.S. Army ROTC community of practice model about social integration variables that contributed to intent to persist in higher education. There was a dearth of research examining the influence of hardiness on intent to persist in a community of practice model in higher education. Chapter 3 focuses on the research methods guiding this study.
CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to examine the relationship between the social and psychological variables associated with social integration in higher education to the intent to persist of participants in a higher education community of practice. The examined community of practice was the U.S. Army Reserve Officer Training Corps (ROTC) program. This chapter presents the methodology for the study: the context of the study, the research design, the process for data collection, and the procedures used for measurement and data analysis in investigating each of the research questions.

Research Context

In determining the relationship between the social integration and psychological variables as experienced within a community of practice and retention in higher education, the researcher examined the intent to persist that has been found to be highly correlated to student persistence (Bean, 1983, 2005; Bean & Eaton, 2002; Porter & Swing, 2006; Savage & Smith, 2008). Data assessing the variables related
to social integration as presented by Braxton et al. (2004) were measured using the revised Institutional Integration Scale (IIS) (French & Oakes, 2004; Pascarella & Terenzini, 1980). Subscales for the variables of peer-group interactions, academic and intellectual development, and institutional and goal commitments were assessed. Psychological hardiness of commitment, control, and challenge was assessed through the administration of the Dispositional Resilience Scale-15 (DRS-15) (Bartone, 1995, 2007).

The target population for this research study was students enrolled in four-year higher education institutions who were participating in U.S. Army ROTC programs but not contracted to graduate and accept a commission as an officer in the U.S. Army. The participants were enrolled at three four-year universities—one public residential university, one private residential university, and one public commuter university—who were members of the U.S. Army ROTC battalion. Thus, the study population consisted of the accessible population and was not randomly selected. Data were gathered from participants in the U.S. Army Reserve Officer Training Corps (ROTC) program during the fall term of the 2009-2010 academic year. The projected study size was 133 participants, 81 of whom provided data that met study criteria. Data analysis was conducted on the 79 cases that provided complete data. The results were regressed against the dichotomous dependent variable of intent to persist that has been found to be highly positively correlated with student retention (Bean, 1980; Porter & Swing, 2006; Savage & Smith, 2008). Results of the data collection were analyzed
Research Design

This research study used descriptive and inferential statistics. Specifically, a 6-factor logistic regression model was used to examine the influence of the social integration and psychological variables concerning decisions to persist to graduation within a community of practice model. The type of research used for this study may be categorized as an associational research study to determine the contribution on the likelihood of intent to persist of the various factors – those related to social integration (peer-group interaction, institutional and goal commitment, and academic and intellectual development) and those related to psychological hardiness (commitment, control, and challenge) – as measured with participants of the U.S. Army ROTC at three institutions of higher education. This research differed from experimental research in that the researcher did not provide treatment or intervention between groups to compare results on a dependent variable(s) so the differing effect of the intervention might be observed. Because the independent variables of this study operated in relationship to the dependent variable, associational research seeking an understanding of the level of relationship with a dependent dichotomous variable was determined to be the most appropriate method for evaluating the research questions in this study. The use of a dichotomous dependent variable addressed the influence of the independent variables concerning the likelihood of intent to persist and followed
established protocols for examining issues related to intent to persist. Further, based on the size of the accessible population and the distribution of the data, the use of a logistic regression model with a dichotomous dependent variable was determined to be most appropriate for data analysis.

An *a priori* analysis of power recognized the possible limitation related to sample size that would risk loss of power, thereby affecting the ability to detect subtle deviations in differences between the variables and the possibility of high correlation between the independent variables (Hosmer & Lemeshow, 2000; Menard, 2002). The study population of 133 with 79 participants providing acceptable data exceeded the recommended size of 10 cases for each variable, a rule of thumb cited by Keith (2006). Power analysis using a logistic regression z-test model with an odds ratio of 1.3, two-tailed test with normal distribution, recommended a sample size of 81 to achieve 0.15 power (Faul, 2008).

Based on these considerations, the use of logistic regression as a method for analysis of the data was deemed to be appropriate, given the use of a dichotomized continuous dependent variable, the distribution of the data, and sample size. Logistic regression operates on a natural logarithm of the odds ratio of belonging to either one group (in this case, participants in U.S. Army ROTC intending to persist to commissioning, i.e., strong persisters) or another (those not intending to persist to commissioning as an officer in the U.S. Army, i.e., weak persisters). A forced entry or simultaneous regression method was used in conducting the regression because the study was founded on a theory testing approach to data analysis that may be used to
explore and examine the specific effect of each variable on outcomes (Keith, 2006). Additionally, based on the distribution of the data, conversion of the continuous dependent variable to the dichotomous variable necessary for logistic regression would examine the influence of each variable and/or combinations of variables on the dichotomous dependent variable, intent to persist.

**Threats to Validity**

One possible threat to the validity of the study was location, occurring when data are collected under differing conditions by different researchers. Data were collected in conjunction with classes associated with the study of military science at three universities by the same researcher using a recruitment script to minimize the risk of differences in location and recruitment. The universities were (a) one large public university (enrollment of 50,000+ students) designated as a research university with a very high research activity classification, primarily residential; (b) one mid-size (enrollment of 10,000+ students) private university with religious affiliation designated as a research university with a high research activity classification, primarily residential; and (c) one mid-size (enrollment of 15,000+ students) public commuter university designated as a research university with a high research activity classification, primarily a nonresidential or commuter university (Carnegie Foundation for the Advancement of Teaching, 2009).

The differences among the retention of students at four-year residential universities and four-year commuter universities and community colleges were
founded in the limited social interaction available to students attending a commuter university. The psychosocial factors that contributed to retention could have been influenced directly by four-year residential universities through interventions that engaged students through the living and social interactions of the university.

Four-year college commuter and community college students, however, were not available to participate in social and residential activities that might have engaged them more fully. Braxton et al. (2004) found that the opportunities to engage students to influence institutional commitment must be provided through academic activities. Moreover, commuter and community college students frequently were confronted by competing demands attributable to the multiple roles associated with their lives (Braxton et al., 2004). These roles—as employees, parents, or partners in relationship—may act to draw attention away from the demands of college, thereby compromising students’ commitment to persistence in college (Braxton et al., 2004). These factors may have influenced differences in retention and the intervention strategies that institutions use to encourage persistence (Braxton et al., 2004; Zepke & Leach, 2005).

Because research suggested that institutional environments and responses were specific and not generalizable (Bean, 1990) and because inferences about retention from differing institutions without considering student goals may not provide meaningful measurement, the U.S. Army ROTC learning-community model offered a population engaged in programming that minimized the differences among institutions and student goals. The U.S. Army 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 as an officer, financial support contingent on the achievement of academic performance requirements, and monitored participation in the program. These characteristics of enrollment in ROTC responded to the institutional and goal issues articulated by Bean (1990) as affecting departure decisions.

**Research Questions**

The following research questions, focused on the subscales measuring variables related to retention, were examined in this research study:

1. What are the mean scores for the psychosocial factors of intellectual and academic development, peer-group interaction, institutional and goal commitment, and psychological hardiness (commitment, control, and challenge) and the dependent variable of intent to persist of participants in U.S. Army ROTC programs at the universities studied?

2. What is the correlation between the study variable (intent to persist) and the psychosocial variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) of participants in U.S. Army ROTC programs at the universities studied?
3. What is the likelihood of intent to persist to commissioning as an officer in the U.S. Army based on the variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) of participants in U.S. Army ROTC programs at the universities studied?

4. Which of the independent variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) influence the likelihood of intent to persist to commissioning of participants in U.S. Army ROTC programs at the universities studied?

**Sampling**

The target population for this research study was students enrolled in four-year higher education institutions participating in U.S. Army ROTC programming who had not signed contracts obligating acceptance of a commission in the Army. The total number of participants was 133 students, but of that number, 81 students met the criteria of not having signed contracts for commissioning after graduation. The number of participants exceeded the recommended level of 10 cases for each independent variable (Hosmer & Lemeshow, 2000).

Data were collected at two public universities and one private university with U.S. Army ROTC battalions. The population was the accessible participants in U.S. Army ROTC. It was limited in size and not randomly selected. The responses of the participants were assessed in the aggregate. The Institutional Review Boards of the three universities approved the recruitment scripts and the consent forms and granted a
1-year extension to ensure adequate time for follow-up. The responses were coded with an alphanumeric code of the students’ choice with only the aggregate information provided to representatives of the educational institutions, U.S. Army ROTC, and the U.S. Army.

**Instrumentation**

The instrument consisted of two assessments compiled in booklet form for ease of completion and collection. The assessment booklet provided instructions on each page for completion of the instrument, including scales. The variables were related to social integration and psychological hardiness. Those variables were based on Tinto’s (1993) theory of retention as revised by Braxton et al. (2004) and Bean and Eaton’s (2002) more recent research that focused on the significance of psychosocial variables. The subscales were peer-group interaction, intellectual and academic development, and institutional and goal commitment that assessed institutional, social, and psychological factors. The variables were measured through the use of the revised Institutional Integration Scale (IIS) (French & Oakes, 2004; Pascarella & Terenzini, 1980), adapted for use with this population. The reliability associated with the peer-group interaction subscale was reported at .84, for the academic and intellectual development subscale at .74, and for the institutional and goal commitments subscale at .71 (Pascarella & Terenzini, 1980). The results of a cross-validation sample reported validity at 78.9% of persisters and 75.8% of non-persisters in the sample (Pascarella & Terenzini, 1980). An examination of the reliability and
validity of the IIS conducted by French and Oakes (2004) offered improved coefficient alphas of .84, .82, and .76, respectively, for peer-group interaction, academic and intellectual development, and institutional and goal commitment based on item revision. A confirmatory factor analysis reported adequate fit to data (French & Oakes, 2004). Appendix A presents the IIS as revised by French and Oakes (2004) and adapted for this population.

In addition, psychological hardiness, shown to correlate positively with retention (Lifton et al., 2006) and to reflect the factors identified by Bean and Eaton (2002) as related to influence on social integration and retention, was assessed through measurement of the subscales of commitment, control, and challenge. The assessment instrument was the Dispositional Resilience Scale-15 (DRS-15) (Bartone, 1995, 2007). The scale offers high reliability with a Cronbach’s alpha for total hardiness of .83 and subscale measures of .77 for commitment, .71 for control and, .70 for challenge subscales. As Bartone (1995) cited, “This scale has demonstrated appropriate criterion-related and predictive validity in several samples, with respect both to health and performance under high-stress conditions (p. 3).

A longer version of the DRS-15, the Dispositional Resilience Scale-30 (DRS-30) (Bartone, 1991), was used by Lifton et al. (2006) to examine the influence of hardiness as an independent variable on retention of college students. Reliability coefficients for the subscales presented low reliability, suggesting the total hardiness score (offering a reliability of .70 to .85, depending on the sample) as the only
measure available (Bartone, 1991). For that reason, the DRS-15 was determined to be the preferred scale for assessing hardiness (Appendix B).

The IIS was adapted for the special population represented by U.S. Army ROTC participants. The DRS-15 was administered in its original form. Cronbach’s Alpha for the study reported reliability of .733.

**Procedure**

Data were gathered at each of the three institutions in a single event at which recruitment and data collection took place. The researcher used a script to recruit participants from members of the U.S. Army ROTC battalions attending military science classes. The researcher obtained consent and then collected data at the beginning of class. The researcher provided all materials necessary for participation.

**Data Preparation**

Data were assessed for completeness, and the researcher took steps to minimize the possibility of omissions or skipped items. Cases with missing values were eliminated from consideration in the final data analysis. Reverse scored items (3, 4, 9, 11 and 14) were adjusted in the SPSS software application (Statistical Package for the Social Sciences, 2008). Subscale measures were computed and regressed against the responses to the dichotomized dependent variable response of intent to persist. The maximum measure for the variables associated with the Institutional Integration Scale (IIS) were 50 for intellectual and academic
development, 50 for peer-group interaction, and 25 for institutional and goal commitment. The maximum values for each of the hardiness subscales of commitment, control, and challenge were 15 each. The dependent variable of intent to persist had a maximum value of 15.

The dependent variable of intent to persist was developed from data collected as a continuous variable. The participants were given a five-point Likert-type scale for response to the three questions that collectively represented the dependent variable of intent to persist. The responses ranged from 1 (strongly disagree) to 5 (strongly agree) with a range of 3 to 15. An initial review suggested a bimodal distribution with levels of intent to persist. A multinomial regression was conducted with levels identified as strong persisters (measures of 13 and above), neutral on persistence (a measure of 12), and weak persisters (measures less than 12). The result of the multinomial regression indicated that there was not sufficient distinction between the neutral and strong persister response. As a result, the dependent variable was more appropriately dichotomized as strong persisters (measures of 12 and above) and weak persisters (measures less than 12). The final model was run as a logistic regression with a dichotomized single variable. Based on the distribution of the data, the responses were collapsed to two categories, with participants whose values were 12 to 15 for the composite score as strong persisters and those with values less than 12 categorized as weak persisters.
Assumptions

Data was assessed for missing cases. Preliminary assessment indicated that 81 cases were available, but two cases provided incomplete data, resulting in 79 cases being included in the analysis. Further assessment of the data indicated that the assumptions associated with logistic regression were met. The assumptions of logistic regression addressed in this study are that (1) the dependent variable was dichotomous, (2) the independent variables included in the study were relevant, (3) the cell counts for the categorical variable were adequate to indicate sample size requirements were met, (4) the independent variables did not exhibit excessive collinearity, and (5) there were no outliers represented among the cases.

The assumption that the dependent variable was dichotomous was met through the process addressed by dichotomizing the continuous variable into two categories—weak persisters and strong persisters. The inclusion of relevant variables was met because the independent variables included in the study were based on theoretical considerations founded in the literature associated with persistence within higher education. Variables that were not relevant or were outside the scope of the study were not included in the model.

One categorical variable in the study, year in college, was included as a factor. Based on Hosmer and Lemeshow (2000), the cell counts for “year in college” violated the cell count assumption by producing cells with zero counts. This factor was removed from the data analysis. Further analysis of the data considered the responses of all participants as a single group and the variable “year in college” was not
included. Further, as addressed previously, the cases included in the data analysis provided an adequate sample for this study.

Examination of the standard errors of the data output indicated that multicollinearity was not an issue in the analysis, confirming the assumption of lack of interactions among the independent variables. The assumption was further assessed through an examination of correlations among independent variables. Based on Menard (2002), the threshold of .80 for correlations was not represented among the independent variables, suggesting that multicollinearity was not an issue.

The distribution of the data as represented in Figure 3 was negatively skewed, further confirming the use of logistic regression for data analysis. The dichotomized continuous variable was created based on the distribution of the data with responses collapsed to two categories. Scores ranged from 3 to 15 on the dependent variable of intent to persist. As shown in the histogram in Figure 3, approximately 25% of the participants responded with a score of 13 or less, with 75% responding with a score of 14 or 15. Participants who selected 12 and above for the composite score were categorized as strong persisters, and those whose composite score was less than 12 were categorized as weak persisters. This met the assumption associated with logistic regression that the dependent variable be dichotomous.

The final assumption related to outliers was based on an examination of the standardized residuals. Based on an analysis of the data, two cases fell beyond the -2 and +2 level. Because less than 5% of the cases were found to be beyond the accepted
level, the assumption related to outliers was determined to be met (Afifi, Clark, & May, 2003).

![Figure 3. Distribution of Scores on Dependent Variable, Intent to Persist](image)

**Data Analysis**

The SPSS 17.0 statistical analysis software (Statistical Package for the Social Sciences, 2008) was used to compute both descriptive and inferential statistics. The results of the assessment instruments were regressed in a simultaneous entry logistic regression model. The chi-square test and the Hosmer-Lemeshow Test (2000) were determined to be the appropriate measures for addressing goodness-of-fit (Berman,
The equation used for logistic regression in this study, as presented in O’Connell (2006), was:

\[
\pi(x) = \frac{\exp(\alpha + \beta_1 x_{yc} + \beta_2 x_{pc} + \beta_3 x_{ia} + \beta_4 x_{ig} + \beta_5 x_{co} + \beta_6 x_{cn} + \beta_7 x_{ch})}{1 + \exp(\alpha + \beta_1 x_{yc} + \beta_2 x_{pc} + \beta_3 x_{ia} + \beta_4 x_{ig} + \beta_5 x_{co} + \beta_6 x_{cn} + \beta_7 x_{ch})}
\]

\(\pi(x)\) represents the log odds of the dependent variable or outcome of interest, the probability of persisting as expressed by intent to persist, or of not persisting as expressed by not intending to persist.

\(\alpha\) represents the constant

\(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7\) represent the logistic regression coefficients for each independent variable

\(X_{yc}, X_{pc}, X_{ia}, X_{ig}, X_{co}, X_{cn}, X_{ch}\) represent the independent variables (O’Connell, 2006).

The independent variables are:

- \(X_{yc}\) represents the psychosocial variable “year in college” (freshman or sophomore) (freshman = 0; sophomore = 1).
- \(X_{pc}\) represents the independent variable “peer-group interaction.”
- \(X_{ia}\) represents the independent variable “intellectual and academic development.”
- \(X_{ig}\) represents the independent variable “institutional and goal commitment.”
- \(X_{co}\) represents the independent variable of “commitment,” a subcomponent of the psychological construct “hardiness.”
- \(X_{cn}\) represents the independent variable of “control,” a subcomponent of the psychological construct “hardiness.”
- \(X_{ch}\) represents the independent variable of “challenge,” a subcomponent of the psychological construct “hardiness.”

The results were examined to determine the influence of each predictor variable on the dependent variable of intent to persist or intent not to persist using a
simultaneous or forced entry logistic regression procedure. The measures helped determine the influence of each variable on the intent to persist to commissioning or intent not to persist to commissioning. Table 1 presents the type of variable and statistical test found to be appropriate, based on the distribution of the data, sample size, method and type of variables being assessed, and the associated research question.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Type of Variable</th>
<th>Statistical Test</th>
</tr>
</thead>
</table>
| 1                 | Peer-group interaction, intellectual and academic development, institutional and goal commitment; commitment, control, and challenge: latent, interval. Year of college: nominal monochotomous. | Descriptive Statistics:  
- Frequencies  
- Mean  
- Standard deviations  
- Cross-tabs  
- Cell counts |
| 2                 | Peer-group interaction, intellectual and academic development, institutional and goal commitment; commitment, control, and challenge: latent, interval. Year of college: nominal monochotomous. | Descriptive Statistics:  
- Frequencies  
- Correlation  
- Pearson’s R |
| 3                 | Peer-group interaction, intellectual and academic development, institutional and goal commitment; commitment, control, and challenge: latent, interval. Intent to persist to graduation and commissioning: dichotomous variable. | Multivariate Logistic Regression:  
- Full model forced entry  
- Chi-square  
- Goodness of fit  
- Hosmer-Lemeshow Test  
- Goodness of fit |
| 4                 | Peer-group interaction, intellectual and academic development, institutional and goal commitment; commitment, control, and challenge: latent, interval. Intent to persist to graduation and commissioning: dichotomous variable. | Multivariate Logistic Regression:  
- Parameter estimate  
- Coefficient estimate analysis  
[Exp(β)]  
- Wald statistic |

Table 1. Variables and Statistical Tests Used to Address Research Questions
CHAPTER 4

ANALYSIS OF THE DATA

Introduction

The purpose of this study was to investigate the factors associated with retention within a particular community of practice in higher education. Participants in this study were members of Army ROTC battalions at three universities who completed two instruments that assessed factors associated with retention in higher education, i.e., academic and intellectual development, peer-group interaction, institutional and goal commitment, and the subcomponents of psychological hardiness (commitment, control, and challenge).

The major research question examined in this study was, “What is the influence of the above variables on the intent to persist to commissioning as an officer in the U.S. Army of members of Army Reserve Officer Training Corps (ROTC) programs?” This chapter presents the findings of the research study and describes the data used to address the research questions. It is divided into three sections: (a) demographics, (b) results of the inferential statistics for the research questions, and (c) a summary of the research findings.
Demographics

Recruiting participants took place during the first quarter of the 2009-2010 academic year. Participants in this study were 67 males (82.7%) and 14 females (17.2%). There were 50 freshmen (61.7%), 29 sophomores (35.8%), and 2 juniors (2.46%). Because there were only two participants identified as juniors, those two cases were included with the sophomores for the rest of the data analysis. None of the participants had signed contracts for scholarships requiring commissioning as an officer in the U.S. Army following graduation from college. Although 81 individuals participated in the study, two participants (one male freshman at the private medium-sized university and one male freshman at the large public university) failed to provide complete data, so the data analysis was conducted with 79 cases for which complete data was provided. Table 2 shows the participation based on demographics.

<table>
<thead>
<tr>
<th>Midwest University</th>
<th>Year of College</th>
<th>Sex (N=81)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>A large public university</td>
<td>Freshmen</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Sophomores</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Juniors</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>A mid-size private university</td>
<td>Freshmen</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Sophomores</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Juniors</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>A mid-size public commuter university</td>
<td>Freshmen</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Sophomores</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Juniors</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>67</strong></td>
<td><strong>14</strong></td>
</tr>
<tr>
<td>Percent of Total</td>
<td></td>
<td><strong>82.7</strong></td>
<td><strong>17.2</strong></td>
</tr>
</tbody>
</table>

Table 2. Participant Demographics
Results

Participants in Army ROTC provided a population to test the influence of variables within a community of practice model in higher education. Research questions concerned information representing measures for each of the factors, separately and in combination, and their relationship to the dependent variable of intent to persist to commissioning.

A simultaneous multivariate logistic regression analysis was conducted to address the purpose of this study and to predict intention to persist from the participants’ levels of response on the variables of intellectual and academic development, peer-group interaction, institutional and goal commitment, and hardiness subcomponents (commitment, control, and challenge). Further, “year of college” (freshman = 1; sophomore/junior = 2) was included to address whether increase in time within the ROTC program influenced predicted response level for the intent to persist variable. The following sections examine the results of data collection and analysis as represented by the research questions.

Research Question #1

1. What are the mean scores for the psychosocial factors of intellectual and academic development, peer-group interaction, institutional and goal commitment, and psychological hardiness (commitment, control, and challenge) and the dependent
variable of intent to persist of participants in U.S. Army ROTC programs at the universities studied?

Results of data collection provided the descriptive statistics associated with the assessment of the variables. The total in the population being examined was $n = 81$ with 79 participants providing complete data. Participants were members of Army ROTC who had not yet signed contracts committing them to mandatory commissioning as an officer in the U.S. Army after graduation. The initial examination of the data for the scores on the variables was based on year in college. Only two participants were identified as juniors, so those cases were included with the sophomores. Mean scores and standard deviations for the variables for freshmen, sophomores/juniors, and the entire group of non-contracted participants are provided in Table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Freshmen</th>
<th>Sophomores &amp; Juniors</th>
<th>Total</th>
<th>t-test*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
</tr>
<tr>
<td>Intellectual, Academic</td>
<td>49</td>
<td>38.0</td>
<td>5.0</td>
<td>30</td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer-Group Interaction</td>
<td>49</td>
<td>41.0</td>
<td>5.1</td>
<td>30</td>
</tr>
<tr>
<td>Institutional, Goal</td>
<td>49</td>
<td>23.4</td>
<td>2.5</td>
<td>30</td>
</tr>
<tr>
<td>Commitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardiness, Commitment</td>
<td>49</td>
<td>11.5</td>
<td>1.7</td>
<td>30</td>
</tr>
<tr>
<td>Hardiness, Control</td>
<td>49</td>
<td>11.6</td>
<td>1.9</td>
<td>30</td>
</tr>
<tr>
<td>Hardiness, Challenge</td>
<td>49</td>
<td>8.2</td>
<td>2.6</td>
<td>30</td>
</tr>
</tbody>
</table>

*p ≤ .05

Table 3. Statistics for Freshmen and Sophomores/Juniors
The analysis of the data from the freshmen and the sophomores/juniors shows comparable results on responses to the assessments in all categories, with sophomores/juniors showing slightly higher mean scores for all independent variables than freshmen. As shown in Table 3, t-tests failed to reveal a statistically significant difference between the mean scores for freshmen and sophomore/junior groups for the variables examined in the study. Further, analysis of descriptive data from the 65 male participants and 14 female participants provided similar outcomes. Table 4 presents the data for the males and female participants.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men</th>
<th>Women</th>
<th>t-test*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Intellectual, Academic</td>
<td>65</td>
<td>38.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer-Group Interaction</td>
<td>65</td>
<td>41.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Institutional, Goal Commitment</td>
<td>65</td>
<td>24.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Hardiness-Commitment</td>
<td>65</td>
<td>11.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Hardiness-Control</td>
<td>65</td>
<td>11.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Hardiness-Challenge</td>
<td>65</td>
<td>8.5</td>
<td>2.6</td>
</tr>
</tbody>
</table>

*p ≤ .05

Table 4. Statistics for Men and Women

Although there are slight increases in mean scores for sophomores/juniors over freshmen and for females over males, t-tests failed to reveal statistically significant differences between the mean scores for the males and females for any of the variables, as shown in Table 4. Differences in mean scores may be attributable to
factors outside the scope of this study, i.e., developmental maturity. Accordingly, the study focused on the responses of the entire group of participants.

**Research Question #2**

2. What is the correlation between the study variable (intent to persist) and the psychosocial variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) for participants in U.S. Army ROTC programs at the universities studied?

The results of Research Question #2 examined the relationship among the psychosocial variables associated with intent to persist, hardiness, and year in college and are presented in Table 5. Based on Cohen’s (1992) guidelines on strength of correlation, the point biserial correlations between the dependent dichotomous variable and the continuous independent variables indicated that there were moderate correlations between the dependent variable of “intent to persist to commissioning” and “institutional and goal commitment” (.513), “peer-group interaction” (.374), and “intellectual and academic development” (.354). No correlations were found between the dependent variable and the hardiness subcomponents “control” (.127), “challenge” (-.174) and “commitment” (.080).
<table>
<thead>
<tr>
<th>Intent to Persist to Commissioning</th>
<th>Intellectual and Academic Development</th>
<th>Peer-Group Interaction</th>
<th>Institutional and Goal Commitment</th>
<th>Hardiness – Commitment</th>
<th>Hardiness – Control</th>
<th>Hardiness – Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intent to Persist to Commissioning</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Intellectual and Academic Development</td>
<td>.354**</td>
<td>1</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Peer-Group Interaction</td>
<td>.499**</td>
<td>.671**</td>
<td>1</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Institutional and Goal Commitment</td>
<td>.513**</td>
<td>.505**</td>
<td>.441**</td>
<td>1</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Hardiness – Commitment</td>
<td>.080</td>
<td>.503**</td>
<td>.533**</td>
<td>.229*</td>
<td>1</td>
<td>79</td>
</tr>
<tr>
<td>Hardiness – Control</td>
<td>.127</td>
<td>.291**</td>
<td>.332**</td>
<td>.123</td>
<td>.345**</td>
<td>1</td>
</tr>
<tr>
<td>Hardiness – Challenge</td>
<td>-.174</td>
<td>.032</td>
<td>.158</td>
<td>-.144</td>
<td>.248*</td>
<td>-.002</td>
</tr>
</tbody>
</table>

*p ≤ .05; **p ≤ .01

Table 5. Correlation Matrix
In addition, strong to moderate correlations were reported between a number of independent variables as presented in Table 5. The strongest correlations were between those independent variables that are associated with the psychosocial factors related to retention in higher education. Moderate to weak correlations were found among the commitment and control subcomponents of hardiness. Hardiness-challenge exhibited a weak correlation with the independent variable hardiness-commitment and no correlation with independent variable hardiness-control. Table 5 shows moderate levels of correlation, confirming the assumption that multicollinearity was not an issue in this analysis.

As indicated in Table 5, there was co-variance between the variables “institutional and goal commitment,” “peer-group interaction,” and “academic and goal commitment” and the dependent variable. Correlations among the independent variables were below the .80 level (Menard, 1995), indicating multicollinearity was not an issue in this study.

**Research Question #3**

3. What is the likelihood of intent to persist to commissioning as an officer in the U.S. Army based on the variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) of participants in U.S. Army ROTC programs at the universities studied?
Based on the examination of the data addressing assumptions, the use of a logistic regression model was determined to be most appropriate for exploring the influence of these variables on the intent to persist to commissioning as an officer in the U.S. Army. Overall, 87% of respondents were classified as strong persisters. An assessment of the overall fit of the model examined the initial log-likelihood statistic (-2LL) to determine whether the inclusion of the variables improved the predictive capability. As shown in Table 6, the results of the analysis compared the difference between the model with only the constant included against the model with all of the variables. A reduction in the -2 log likelihood from the first model to the second confirmed the predictive value of the variables included in the study. The variables added were institutional and goal commitment, peer-group interaction, intellectual and academic development, and the hardiness variables (commitment, control, and commitment).

The Block 1 model provides the deviance statistic associated with including the variables. The first model with only the constant yielded an initial deviance value of 60.0 with a decrease to 36.7 with the six variables included, producing a model chi-square difference statistic of 23.3, indicating the overall fit as good.
A second test of goodness-of-fit for this analysis was the Hosmer-Lemeshow Test (2000) that represented a more robust measure of goodness-of-fit, particularly for models with continuous covariates. The results of the Hosmer-Lemeshow Test were based on a comparison of the observed to predicted values with the goodness-of-fit determined through lack of significant difference between them. For this model, the Hosmer-Lemeshow Test yielded a chi-square goodness-of-fit statistic of 5.49 with a significance level of .704 based on 8 degrees of freedom. This suggested the fitted model well represented the actual data.

The analysis used simultaneous forced entry logistic regression. The results of the regression are shown in Table 7.

### Table 6. Logistic Regression Model Summary at Block 1

<table>
<thead>
<tr>
<th>Constant only</th>
<th>Variables added: Institutional &amp; Goal Commitment, Peer-Group Interaction, Intellectual &amp; Academic Development, &amp; Hardiness (Commitment, Control, &amp; Challenge)</th>
<th>Difference between Initial -2LL and Block 1 -2LL model improvement with addition of six variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial -2 Log Likelihood</td>
<td>Model Chi-Square</td>
<td>df</td>
</tr>
<tr>
<td>60.0</td>
<td>36.7</td>
<td>23.3</td>
</tr>
</tbody>
</table>

### Table 7. Model Summary: Pseudo R-Square Indicators

<table>
<thead>
<tr>
<th>Step</th>
<th>-2 Log Likelihood</th>
<th>Cox &amp; Snell R-Square</th>
<th>Nagelkerke R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36.7</td>
<td>.255</td>
<td>.480</td>
</tr>
</tbody>
</table>
In an assessment of the pseudo R-Square indicators, in particular the Nagelkerke R-Square (1991), the proportion of deviance accounted for by the variables included in the study (i.e., institutional and goal commitment; peer-group interaction; intellectual and academic development; and hardiness-commitment, hardiness-control, and hardiness-commitment) was approximately 48%. It is necessary to note that the Nagelkerke statistic was considered a proxy for the R-Square obtained through ordinary least squares (OLS) regression as a continuous outcome. Thus, it was informative for comparing competing models, but there was no statistic test for its strength in logistic regression. Finally, the omnibus tests of model coefficients are shown in Table 8.

<table>
<thead>
<tr>
<th></th>
<th>Chi-Square</th>
<th>df</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>23.28</td>
<td>6</td>
<td>.001</td>
</tr>
<tr>
<td>Block</td>
<td>23.28</td>
<td>6</td>
<td>.001</td>
</tr>
<tr>
<td>Model</td>
<td>23.28</td>
<td>6</td>
<td>.001</td>
</tr>
</tbody>
</table>

**Table 8. Omnibus Tests of Model Coefficients**

The omnibus tests provide a chi-square measure that was comparable to the omnibus F statistic in the multiple regression analysis. The results of the tests provided a value of 23.28, indicating significance at $\alpha = .05$ level, further confirming the significance of the model. The significance suggested that the data fit the model with at least one of the independent variables being significantly related to the dichotomous dependent variable.
Logistic regression calculated the change in the log odds of the dependent variable as opposed to the changes in the dependent variable itself. Given the results of the logistic regression, there was a significant relationship between intent to persist to commissioning as an officer in the U.S. Army and the variables included in this study. The influence of the individual variables on intent to persist are examined in the next section.

**Research Question #4**

4. Which of the independent variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) influence the likelihood of intent to persist to commissioning of participants in U.S. Army ROTC programs at the universities studied?

The statistics and coefficients associated with the logistic regression model for this study provided information concerning the significance of each variable in the model when controlling for the other variables. Table 9 presents these statistics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>S</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual, Academic Development</td>
<td>.092</td>
<td>.137</td>
<td>.455</td>
<td>1</td>
<td>.500</td>
<td>1.097</td>
</tr>
<tr>
<td>Peer Group Interaction</td>
<td>.245</td>
<td>.131</td>
<td>3.518</td>
<td>1</td>
<td>.061</td>
<td>1.278</td>
</tr>
<tr>
<td>Institutional, Goal Commitment</td>
<td>.320</td>
<td>.160</td>
<td>3.980</td>
<td>1</td>
<td>.046</td>
<td>1.376</td>
</tr>
<tr>
<td>Hardiness-Commitment</td>
<td>-.519</td>
<td>.351</td>
<td>2.185</td>
<td>1</td>
<td>.139</td>
<td>.595</td>
</tr>
<tr>
<td>Hardiness-Control</td>
<td>.200</td>
<td>.300</td>
<td>.445</td>
<td>1</td>
<td>.505</td>
<td>1.221</td>
</tr>
<tr>
<td>Hardiness-Challenge</td>
<td>-.110</td>
<td>.200</td>
<td>.301</td>
<td>1</td>
<td>.583</td>
<td>.896</td>
</tr>
<tr>
<td>Constant</td>
<td>-13.601</td>
<td>5.658</td>
<td>5.778</td>
<td>1</td>
<td>.016</td>
<td>.000</td>
</tr>
</tbody>
</table>

p = .05

**Table 9. Variables in the Logistic Regression Model**
The unstandardized logit coefficient, B, or parameter estimate (assuming other effects constant) represented the expected change in the logit of the dependent variable when the independent variable changed by one unit. The logit of the dependent variable for this study represented the logarithm of the odds of a participant indicating intent to persist. The standard error statistic for B was a measure of the sampling error or degree of precision of measurement of the parameter estimate.

The more meaningful statistic for interpretation of the logistic regression model analysis was the Exp(β) or the odds ratio. The odds ratio suggested the odds of the dependent variable event occurring given a one-unit change in the independent variable. The odds ratio for the variables in this model provided the factor by which the odds of a participant indicating intent to persist would change for each change of one unit in the independent variable holding the other variables constant. Odds ratio was the value founded in the odds of a participant expressing the intent to persist divided by the odds of a participant expressing intent not to persist. When interpreting the odds ratio, values that exceeded 1 indicated the independent variable increase and would result in an increase in the odds of persisting. The Wald statistic was an indicator of the significance of the B coefficient with higher values associated with greater significance of the B.

The statistics in this study as presented in Table 9 indicated that only one variable, institutional and goal commitment, was statistically significant in this model. The unstandardized logit coefficient indicated that institutional and goal commitment
had a positive effect on the log of the odds for intent to persist ($B = .320$). The Wald statistic of 3.980 indicated that the institutional and goal commitment coefficient was statistically different from zero and that it was significant in predicting the likelihood of intent to persist. The $\text{Exp}(B)$ or odds ratio was greater than 1 with a value of 1.376, indicating that, as institutional and goal commitment increased, the odds of intent to persist increased by 37.6% (O’Connell, 2006). No other independent variables showed statistical significance in the regression model.

**Summary of Research Findings**

A review of the intention data presented a distribution that was negatively skewed. Initial review suggested a bimodal distribution for levels of intent to persist. The continuous dependent variable was thus dichotomized to two groups with measures of 14 or 15 categorized as strong persister and 13 or less as weak persister. Before the logistic regression, a multinomial regression was conducted with levels identified as strong persisters (measures of 13 and above), neutral on persistence (a measure of 12), and weak persisters (measures less than 12). However, the results of the multinomial regression indicated that there was not a sufficient distinction between the neutral and strong persister response. As a result, the dependent variable was more appropriately dichotomized as strong persisters (measures of 12 and above) and weak persisters (measures less than 12). The final model was run as a logistic regression with a dichotomized outcome variable. As discussed in Chapter 3, the
review of the data confirmed that the assumptions related to logistic regression were met.

The first question in the research study presented the descriptive data associated with the study. The research questions being explored suggested a logistic regression model as an appropriate approach for data analysis. The group represented in the model was a cohort of participants in U.S. Army ROTC who had not signed contracts committing to accept a commission as an officer in the U.S. Army following graduation. Data from 81 participants were collected for data analysis. The logistic regression model was based on responses from 79 participants because two cases had missing data. The data were analyzed to provide a better understanding of the influence of the variables institutional and goal commitment, peer-group interaction, intellectual and academic development, and hardiness (commitment, control, and challenge) on the intent to persist to commissioning as an officer in the U.S. Army. The data associated with Research Question #1 showed that 45.6% of the participants were from the large public university, 32.0% were from the mid-size private university, and 22.2% were from the mid-size public commuter university. In addition, 82.7% of the participants were male and 17.2% were female.

Research Question #1 further provided descriptive data regarding means and standard deviations for the variables. The data presented a negatively skewed distribution of the data. The mean for the dependent variable of “intent to persist” was 14.0 on a maximum scale of 15 with a standard deviation of 2.2.
Research Question #2 examined the correlations among the dependent and independent variables. Institutional and goal commitment, peer-group interaction, and intellectual and academic development were positively correlated with the dependent variable of intent to persist to commissioning.

Research Question #3 examined the likelihood of intent to persist to commissioning attributable to the variables in the study. The results of a forced simultaneous entry logistic regression model indicated that, as a set, the variables included in the model were related to intention to persist to commissioning as an officer in the U.S. Army.

Research Question #4 examined which variables were most strongly associated with likelihood of intent to persist to commissioning. Analysis suggested that only one of the variables included in the model, institutional and goal commitment, was significant. The findings showed that a one-unit increase in institutional and goal commitment would increase the likelihood of intent to persist by 37.6%.

The data presented in this study indicated that the variables of intellectual and academic development, peer-group interaction, institutional and goal commitment, and hardiness (commitment, control, and challenge) were associated with intent to persist to commissioning. The findings also show that the variable, institutional and goal commitment, was significant in predicting the likelihood of intent to persist to commissioning. Further discussion of the results of the data analysis are provided in the following chapter.
CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This study examined the psychosocial factors associated with retention in a Community of Practice (CoP) operating in a higher education setting, specifically, U.S. Army Reserve Officer Training Corps (ROTC) programs. The overarching research question that guided this study was, “What is the influence of psycho-social variables on the intent to persist to commissioning as an officer in the U.S. Army of members of Army Reserve Officer Training Corps (ROTC) programs?” Research focused on the social integration variables of institutional and goal commitment, peer-group interaction, intellectual and academic development, and the psychological variables associated with hardiness (commitment, control, and challenge). “Year in college” also was included as an predictor variable. This chapter includes (a) summary of research, (b) conclusions, (c) recommendations, (d) areas for further study, and (e) significance of the study.
Summary of the Research

The purpose of this study was to explore variables experienced in a community of practice (CoP) influence retention in higher education. The U.S. Army ROTC was a unique learning community that provided exposure to a wide range of activities (physical, social, educational, and career related) that also were related to a professional goal of becoming an officer in the U.S. Army. This represented a situated learning environment that functioned as a community of practice (CoP). Specifically, this study investigated the influence of social integration variables (institutional and goal commitment, peer-group interaction, and intellectual and academic development) and psychological variables (hardiness-commitment, hardiness-control and hardiness-challenge) on the likelihood of participants in Army ROTC expressing intent to persist to commissioning as an officer in the U.S. Army.

The CoP program provided access to education and training in a career that would begin following graduation. Furthermore, the program engaged members in the practices and behaviors associated with a particular role in the workforce while senior members modeled expected behaviors. An exploration of the participation in the ROTC CoP offered the opportunity to understand the factors that may have influenced intent to persist in higher education. Figure 2 (page 61) represents the ROTC Community of Practice program.

The population studied was comprised of participants in U.S. Army ROTC at three universities who had not signed contracts requiring commitment to accept a commission in the U.S. Army after graduation. The population was drawn from three
universities to obtain a larger group with which to conduct the assessment. The data collected in the study was obtained by administering two instruments at each of the universities at one single event. The specific research questions examined in this study were:

1. What are the mean scores for the psychosocial factors of intellectual and academic development, peer-group interaction, institutional and goal commitment, and psychological hardiness (commitment, control, and challenge) and the dependent variable of intent to persist of participants in U.S. Army ROTC programs at the universities studied?

2. What is the correlation between the study variable (intent to persist) and the psychosocial variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) for participants in U.S. Army ROTC programs at universities studied?

3. What is the likelihood of intent to persist to commissioning as an officer in the U.S. Army based on the variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) of participants in U.S. Army ROTC programs at the universities studied?

4. Which of the independent variables (intellectual and academic development, peer-group interaction, institutional and goal commitment, commitment, control, and challenge) influence the likelihood of intent to persist to commissioning of participants in U.S. Army ROTC programs at the universities studied?
Study Design

Data were collected at three universities in the Midwest: a large public university (49,676 enrolled), a mid-size private university (11,000 enrolled), and a mid-size public commuter university (17,662 enrolled). The instrument used to collect the social integration data was the revised Institutional Integration Scale (French & Oakes, 2004; Pascarella & Terenzini, 1980) adapted for administration with the U.S. Army ROTC programs (Appendix A). The data on psychological hardiness factors was obtained through the administration of the Dispositional Resilience Scale-15 (DRS-15) (Bartone, 1995, 2007) (Appendix B).

Data collection provided 133 cases. Review of the data indicated that, of those cases, 52 participants had signed contracts to accept commissions after graduation. The remaining 81 cases were considered appropriate for inclusion in the analysis. Of the 81 cases, two participants failed to provide complete data, resulting in 79 cases considered appropriate for inclusion in the final data analysis.

A quantitative analysis of the data obtained from the participants was conducted. Multivariate logistic regression was the quantitative method used to analyze the data. The dependent variable was “intent to persist to commissioning as an officer in the U.S. Army,” and the independent variables were social integration variables (intellectual and academic development, peer-group interaction, and institutional and goal commitment) and psychological variables (subcomponents of hardiness—commitment, control, and challenge).
Results

The primary research question for this study examined the influence of variables on Army ROTC participants’ intent to persist to commissioning as an officer in the U.S. Army. A multivariate logistic regression model using simultaneous entry was conducted to assess the relationship between the independent variables and the dependent variable and the association among the independent variables. The results of the data analysis showed significance in the relationship of the independent variables with the dependent variable. The model was a full simultaneous entry logistic regression model that included the six variables – institutional and goal commitment, peer-group interaction, intellectual and academic development, and hardiness (commitment, control, and challenge) – on the dependent variable, intent to persist. The model displayed an initial -2 log likelihood (-2LL) (with constant only) of 60.0. The Block 1 -2LL (including all the independent variables) of 36.7 represented a statistically significant chi-square difference ($p \leq .05$). At least one of the predictor variables was significantly related to the dependent variable. In addition, the results of the Hosmer-Lemeshow Test (2000) based on a comparison of the observed and predicted values offered a chi-square statistic of 5.49 with significance of .704 with 8 degrees of freedom. This further suggested that the model fit the data, because the null hypothesis of correspondence between observed and predicted values was retained.

The pseudo R-Square indicators reporting the proportion of variance explained by the variables in the study—intellectual and goal commitment, peer-group
interaction, institutional and goal commitment, hardiness (commitment, control, and challenge)—was 48% for the Nagelkerke R-Square (1991) and 25% for the Cox & Snell R-Square (1989). These measures are not accurate measures of variance explained, as found in the R-Square statistic obtained through ordinary least squares regression for continuous outcome. It is meaningful in comparing competing models but there is no statistic test for its strength in logistic regression.

When controlling for the other variables, the independent variable, institutional and goal commitment, was found to be the only variable that influenced the dependent variable of intent to persist to commissioning with an \( \text{Exp}(B) \) or odds ratio of 1.376 and a Wald statistic of 3.980 \( (p \leq .05) \). The following section addresses the findings associated with each of the research questions within the context of each question.

Based on the research questions, the results of the study are presented in this section.

Analysis of the descriptive data from the study indicated the means of the responses of participants were generally high. The highest mean of the independent variables was associated with institutional and goal commitment \( (M = 23.6; \ SD = 2.4; \ Max = 25) \). The measures for the factors associated with psychological hardiness were lower than those associated with the social integration factors. This indicates that, in this study, hardiness (commitment, control, and challenge) was not as influential on intent to persist of participants as the social integration variables (institutional and goal commitment, peer-group interaction and intellectual and academic development) examined.
Based on data analysis of the correlations of the variables, three of the six variables were significant ($p \leq .01$) in the correlation with the dependent variable of intent to persist to commissioning in the U.S. Army. The most significant correlation was institutional and goal commitment with a positive correlation of $r = .513$, $p \leq .01$. Other positive correlations between independent variables and the dependent variable at the $p \leq .01$ are intellectual and academic development ($r = .354$), and peer-group interaction ($r = .499$). The independent variables associated with hardiness – commitment, control, challenge – did not exhibit any correlations with the dependent variable.

The results of the multivariate logistic regression analysis found that the logistic regression model was a good model, offering a better understanding of the influence of the variables on likelihood of intent to persist to commissioning as an officer. The model provided outcomes that supported the notion that social integration and psychological variables are related to intent to persist with an outcome of -2LL of 36.7 for the Block 1 model that includes all variables. This represents a decrease of 23.3 from the initial model -2LL of 60.0 indicating the model is a good fit for the data. In addition the pseudo R-Square statistics (Cox & Snell, .26; Naglekerke R-Square, .48) supported the goodness-of-fit of the model that was further indicated by the Hosmer and Lemeshow Test showing a statistic of .704 with 8 degrees of freedom. The result indicated that intention to persist to commissioning as an Army officer was influenced by the variables examined in this study – institutional and goal commitment, peer-group interaction, intellectual and academic development, and
hardiness (commitment, control, and challenge) – and the inclusion of all the variables offered a greater explanatory value of likelihood of intent to persist than did the model with no predictors.

One independent variable, institutional and goal commitment, influenced the intent to persist with an odds ratio of 1.376 ($p \leq .05$). This indicated that, as institutional and goal commitment increased, the odds of intent to persist increased by 37.6%. No other independent variables displayed statistics indicating influence on the dependent variable intent to persist. Institutional and goal commitment was the only variable in the study accounting for the likelihood of intent to persist. The combined influence of all variables in the model offered greater explanatory value of those factors’ influence on likelihood of intent to persist with the social integration variables (institutional and goal commitment, peer-group interaction, intellectual and goal commitment), improving the probability of persistence more than the psychological hardiness variables.

**Conclusions**

As a result of the analysis, it was possible to conclude that the model examined allowed for better prediction of intent to persist than by chance. Second, the influence of institutional and goal commitment may have indicated the participants’ goal identification as central to involvement in U.S. Army ROTC and their intent to persist. As such, it acted as a meaningful factor in influencing continued participation in the ROTC program. Institutional and goal commitment represented a clarity of
commitment to accomplish a goal. It drove the decision-making process that progressed the new member of ROTC from identifying the goal to taking the initial steps to making it a reality. It directed the transition of the individual from someone interested in the possibility of an option as an officer in the Army to new member of an organization that provided a systematic process for achieving that goal (Tinto, 1975).

The literature about retention suggested that institutional and goal commitment was the most influential factor in predicting degree completion in higher education (Bean, 1990; Pascarella & Terenzini, 1980). Further, study of learning communities indicated that individuals sought membership in organizations that matched their needs and mirrored their values and perspectives (Braxton & Lein, 2000). 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, influencing their institutional and goal commitment. Institutional and goal commitment provided the impetus to engage with ROTC.

Second, the variables associated with psychological hardiness (commitment, control, and challenge) suggested negligible influence on the likelihood of intent to persist. This 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. Eaton and Bean’s (1995) research with psychological constructs focused on approach and avoidance behaviors contributing to intent to persist among a general
cohort of freshmen university students. The variables examined were cognitive behavioral responses characterized by coping behaviors and accounted for 37% of variance in student attrition. Hardiness represented a perspective that framed attitudes and cognitive responses in response to stressors (Maddi & Kobasa, 1984). It was possible that the participants in this study, whose measures in hardiness were strong (M = 32.1; AD = 4.07), may have experienced hardiness as a more influential factor if their commitment waivered in the face of rigors associated with achieving the goal. Hardiness then may have acted as an influence encouraging approach behaviors rather than avoidance behaviors, thereby sustaining goal commitment.

The influence of extrinsic social integration variables may have encouraged greater reliance on the institutional factors in supporting intent to persist than did internal resources like psychological hardiness. It was possible, however, that as participants were influenced by involvement in ROTC, growth and learning may have encouraged members to recognize internal resources and coping skills as influential in their commitment to achieve commissioning. The literature devoted to psychological hardiness indicated that hardiness was a personal quality that was malleable over time (Maddi, 2008). Research in retention in higher education indicated that hardiness was positively related to persistence to graduation (Lifton et al., 2004). As a hypothesis, it may have been possible that hardiness could become an influence on intent to persist as individuals were stressed by the demands of participation in a rigorous endeavor like ROTC. Figure 4 represents the revised conceptual model for the study of the U.S. Army ROTC community of practice.
As shown in Figure 4, institutional and goal commitment was the most influential variable affecting intent to persist. Correlations existed between the independent variables and the dependent variable and between the variables of peer-group interaction, academic development, and institutional and goal commitment. The hardiness variables (commitment, control, and challenge) showed no correlation with the dependent variable or any statistical significance influencing intent to persist to commissioning. The model as a whole provided greater predictive value than mere chance. Figure 4 differs from the model presented before data collection in that the social integration variables were presented as being of equal influence on the
dependent variable, intent to persist. Based on the literature (Maddi, 2006; Maddi & Kobasa, 1984), hardiness subcomponents were shown as factors that might have influenced intent to persist in the original model. This study did not support hardiness factors as contributing to intent to persist.

This model demonstrates the importance of institutional and goal commitment to influencing the intent to persist and the contributing influence of the social integration factors of peer-group interaction and intellectual and academic commitment. The intrinsic factors associated with psychological hardiness offered almost negligible effect on intent to persist. This suggested that participants identified external drivers (i.e., goals, the institution, peers, and academic growth) as more critical to intent to persist than internal psychological perspectives.

**Recommendations**

Recommendations based on the results of this study are presented in this section.

1. Activities that allow individuals to identify and commit to goals and the institution that provides a means to achieve those goals may positively influence participants’ intent to persist to achieving those goals. The influence of institutional and goal commitment may act as a foundation on which administrators may encourage intent to persist. Identifying goals may indicate opportunities to connect participants with others who would share and support intent to persist through peer-group interaction. Further, commitment and pursuit of goals in higher education may
encourage academic and intellectual development in areas of study that may increase intent to persist. Learning communities that address these areas may provide programming that addresses these options. The relationships available to participants in learning communities provide avenues to encourage persistence and intervention if persistence waivers. Programming that tracks members’ participation in group activities could provide additional data as to which participants might benefit from intervention specifically designed to encourage stronger intent to persist. Participants’ level of engagement may indicate a low or diminished intent to persist. As a result of tracking, intervention addressing goal and institutional commitment could take the form of one-on-one counseling to encourage coping behaviors, greater commitment, and more active participation. Engaging the individual in deeper levels of participation may strengthen the participant’s belief that the Army is committed to their progress to commissioning, a factor in retention (Tinto, 1987).

2. Because goal commitment figured prominently in influencing intent to persist, participants’ clear understanding of the impact of performance in Army ROTC on long-term goals in the U.S. Army may offer the possibility of encouraging intent to persist. Early program intervention that would assist participants in clarifying long-term professional goals following graduation and commissioning would offer the possibility of encouraging greater commitment on the part of strong persisters and strengthening commitment on the part of weak persisters.

3. Increasing social integration influences through peer-to-peer interaction that fosters group commitment would offer opportunities to strengthen intent to
Persist. Commitment to Army ROTC and emphasizing identification with this group as defined uniquely through the framework of group membership distinguished it within a larger institution of the university. Peer study groups, shared living arrangements, and involvement in social activities benefiting the larger community are examples of endeavors that would build commitment to both the institution of the U.S. Army and the university.

These recommendations flow from the key influence of social integration variables as foundational factors upon which programming may build to increase levels of intent to persist.

**Areas for Further Study**

Increasing the number of participants would provide a more varied sample for examination. Further, a larger sample would provide for greater power than the sample size of 81 cases that provided a power of 0.15 ($\alpha = .05$), a low level of power for logistic regression. The distribution of the data was negatively skewed for a number of variables. This was largely attributable to a ceiling effect on these variables. The literature addressed the issue of social desirability influencing the responses of military officers on behavioral assessments (Thunholm, 2001). Thunholm found that responses of military officers trended to skew negatively usually associated with the orientation to respond to authority. A larger number of participants may provide a broad enough group from which to gather data, thereby contributing to the possibility of more normal distribution of the data. Further, given
the effect size seen in this study, an addition of several hundred participants may have been sufficient to declare the differences in peer-group interaction and intellectual and academic development significant at the $\alpha = 0.05$ and 80% power. Additionally, a redesign of the assessment instruments with items that required forced choice responses would minimize the ceiling effect on some of the questions.

It is possible that when data were collected (freshmen orientation, early in first term, etc.), involvement in ROTC may not have been long enough to permit participants the interaction with peers or opportunities for academic and intellectual development that the literature suggested may influence likelihood of intent to persist. The population participating in this study was comprised of 49 freshmen, 28 sophomores, and 2 juniors. Although peer-group interaction and academic and intellectual development were correlated significantly with the dependent variable, they were not significant predictors of intent to persist. While they contributed to the overall significance of the model, these variables failed to exhibit significance individually. The inclusion of these social integration variables influenced the likelihood of intent to persist despite the lack of statistical significance exhibited individually. Future research that assesses the variables on a longitudinal basis may indicate possible effect of longer term involvement on these factors and their influence on persistence.

Participants engaged with ROTC are possible recipients of scholarships that will enable them to obtain bachelor’s degrees. This may have an impact on their commitment to the goal of commissioning and the institution. Further exploration of
the influence of economic factors on the intent to persist would offer a better understanding of external influences on persistence to commissioning.

The study examined a cohort of U.S. Army ROTC participants drawn from three universities. The number of participants prevented splitting the groups to conduct comparison of the results of different universities or males/females or differing classes. A larger number of participants may provide an opportunity to compare differences in responses between groups. Further, examinations that would include groups based on race, socioeconomic status, grade point average, or other comparable designations would provide a deeper understanding of the relationship of these factors based on specific group characteristics.

The data obtained examined one group of individuals participating in a the U.S. Army ROTC community of practice. The study would benefit from a model that included examination of the same variables as experienced by groups from the general population of students and from students engaged in different learning communities to obtain a deeper understanding of the differences that groups may exhibit in persistence. A possible area for examination would be the influence of these factors on participants in programming such as cooperative education in which participants are engaged in professional internships and co-op jobs, a framework similar to the U.S. Army ROTC.

Further study of the influence of career goal identification and affiliation with a learning community in which the career goal is shared would provide a deepened understanding of the influence of a career-based learning community on retention.
The literature about retention in higher education suggested the importance of career goals as fundamental to providing students with a contextual understanding of commitment to a goal that provides meaning for students pursuing higher education (Braxton et al., 2008). The decision to pursue a goal that extends beyond the academic realm provides motivation, meaning, and direction. It also may encourage engagement in groups with individuals with similar interests and commitment, thereby increasing commitment to the goal. Bean (1982) emphasized the importance of identifying a career goal as significant in providing a practical value to university study, thereby increasing the likelihood of persistence in higher education.

A longitudinal study that examines the actual retention and persistence to commissioning would provide a better understanding of the variables by providing the metrics for which students actually complete college degrees and become commissioned. Seeking further data that explores the qualities of the persisters also would be beneficial to understanding those qualities that facilitate retention.

**Significance of the Study**

The main contribution of this study is the deeper understanding of the influence of social integration factors, especially institutional and goal commitment, to facilitating engagement with a learning community and the value of affiliation with a learning community to retention in higher education. The learning community examined, U.S. Army ROTC, represented a community of practice that offered a comprehensive structure for membership leading to the realization of a career goal.
The relationships that were developed through the structure of ROTC were driven initially by institutional and goal commitment. The new member was introduced to the group through the process of legitimate peripheral participation, observing the behavior expected in the group through that modeled by senior members. Membership in the group reinforced institutional and goal commitment through a systematic process of progressive engagement and responsibility that was recognized through visible acknowledgement of leadership roles.

Further, the study provides a deeper understanding of the factors that are characteristic of a particular community of practice (CoP) and how those may influence intention to persist. Learning communities have shown promise in providing students with the experience of an inclusive, collaborative environment that promoted social integration and retention (Baker & Pomerantz, 2001; Hlyva & Schuh, 2004), suggesting that engagement in Army ROTC may have increased measures for social integration variables and contributed to continuation to commissioning.

As a unique learning community that functions as a CoP, the U.S. Army ROTC unit introduced the new member to other members who shared their goals to become members of the U.S. Army officer corps. Participation in ROTC provided a context relating academic learning to achieving career goals. The ROTC program replicated the institutional structure of the larger institution (the U.S. Army) in its hierarchical relationships and lines of authority. Growth within the community visibly was acknowledged through advancement in rank and responsibility (Wiedemann,
Further, the social interaction among new members, the officer cadre, and the senior members of the battalion conveyed the institution’s concern for the welfare and success of the individual student, an important component of successful retention (Tinto, 1987). As posited by Kuh and Love (2000), the culture of the learning community as experienced in a higher education setting provided the context in which members made meaning. It reaffirmed the new members’ goals of becoming commissioned officers in the Army through the relationships established in the learning community and reinforced institutional commitment through the acceptance in the group, thereby establishing the member’s identity as a member of the group (Wenger, 1998b). These are factors represented by the social integration variables – institutional and goal commitment, peer-group interaction, and intellectual and academic development – examined in this study and which contributed as a whole to a deeper understanding of those circumstances influencing intent to persist.

As a result of this study, researchers can deepen their understanding of those factors influencing intent to persist, how learning communities might attempt to influence those factors to strengthen intent to persist, and how they may identify approaches for further study. Individuals who are members of learning communities can be engaged in activities and relationships that connect them to those with whom they share goals and a commitment to the institution. Learning communities provide a setting for reaching out to individuals to encourage commitment to the goal and the institution and provide opportunities for peer-group interaction. More importantly, the learning community engages participants in intellectual and academic development
that advances them to the goals to which they are committed. These communities offer transition to a new understanding of each member’s place in the community and provide incentive to continue affiliation. The community conveys its need for each member’s participation, and each member’s commitment is reinforced. This relationship contributes to intent to persist.

The value of structure, clarity, and ritual associated with the traditions of a learning community provides members with a foundation that supports growth and continuity when confronted with the inevitable challenges inherent in pursuit of a meaningful goal. Other models (fraternities, sororities, or professional clubs) may provide similar social support that contributes to retention. Cooperative education may provide relevancy in pursuit of a career goal. This study examined the role of the learning community represented by U.S. Army ROTC. The results suggested that learning communities that offer students opportunities for affiliation with others who were committed to similar goals and institutions may offer a model for encouraging intent to persist to achieving the goal.

Additionally, the ROTC CoP operated as an adjunct for career transition through relevancy to the larger world outside the university. This model exhibited promise as a means to adapt to the rapidly changing career landscape through early identification of career goals, involvement in learning through a community of practice, transformation to a new understanding of identity, and commitment to continuing education to a career goal.
For this reason, participating as a member of a community was suggested as an approach offering individuals encouragement to continue education leading to graduation. It also meant that strategies for retention that begin with the individual (their goals, interests, and place in the community) offered promise for enhanced retention through membership in a community. This connection to a group that encouraged retention may lead to better use of resources and ultimately transition to a meaningful role in the larger world of work through career achievement.

The results of this study indicated that the psychological hardiness factors (commitment, control, and challenge) did not influence persistence. These intrinsic factors were measures of personal variables. The factors identified more readily as influencing likelihood of intention to persist were social integration variables, measures of extrinsic factors. This would indicate that students early in their experience of the institution may have attributed their intent to persist as more heavily dependent on the factors associated with extrinsic variables (goals, institutional qualities, peers, academics) than on their own perceived qualities. A larger sample size and the inclusion of variables that addressed cognitive behavioral psychological factors may have provided a better understanding of the relationship among the variables and intent to persist.

Finally, both institutions, the U.S. Army and the university, represented organizations that offered a framework for achieving the goal that some of the participants expressed, i.e., their intent to persist. The Army provides financial assistance, peer-group affiliation, and psycho-social support. The significant issue of
this study is intending to persist to commissioning as an officer in the U.S. Army through the framework of a unique learning community in higher education. Accordingly, the significant contribution of this study is the result that confirmed the research, suggesting that institutional and goal commitment and social integration variables (peer-group interaction and intellectual and academic development) were a greater influence on the likelihood of intent to persist than the intrinsic psychological variables of hardiness (commitment, control, and challenge). It may be reasonable to conclude that institutions of higher education would experience greater value from engaging in those activities that encourage goal commitment leading to affiliation with learning communities that support the achievement of the goal.
REFERENCES


Knight, W. (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.


APPENDIX A

Institutional Integration Scale (IIS)
Appendix A
Institutional Integration Scale (IIS)

Student Experiences
Following is a list of statements characterizing various aspects of academic and social life at this university. Using the scale to the right of the statements, please indicate the extent of your agreement or disagreement with each statement as it applies to your experience during the past few months by circling the appropriate number. Please circle ONLY ONE number for each statement.

So far in the Army ROTC program:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Not Sure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intellectual and Academic Development Subscale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most of my courses have been intellectually stimulating.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am satisfied with my academic experience in the Army ROTC program.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am more likely to attend a cultural event (e.g., a concert, lecture, or art show) now compared to a few months ago.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am satisfied with the extent of my intellectual development. In addition to required reading assignments, I read many of the recommended books in my courses.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>My interest in ideas and intellectual matters has increased since starting classes.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I have an idea about what I want to major in.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>This year my academic experience has positively influenced my intellectual growth and interest in ideas.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Getting good grades is important to me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I have performed academically as well as I anticipated.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Peer-group Interaction Subscale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My interpersonal relationships with other students and other members of ROTC have positively influenced my intellectual growth and interest in ideas.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I have developed close personal relationships with other students and members of ROTC.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>The student friendships I have developed have been personally satisfying.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>My personal relationships with other students have positively influenced my personal growth, values, and attitudes.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>It has been easy for me to meet and make friends with students.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Statement</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I am satisfied with my dating relationships.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Many students I know would be willing to listen and help me if I had a personal problem.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Most students at in the ROTC battalion have values and attitudes similar to mine.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am satisfied with the opportunities to participate in organized extracurricular activities through the ROTC program.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am happy with my living and/or residence arrangement.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Institutional and Goal Commitment Subscale</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to me to graduate from college.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>It is important to me to graduate from this university.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>It is important to me to be commissioned as an officer in the U.S. Army.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am confident that I made the right decision in choosing to participate in Army ROTC.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I am confident that I made the right decision in choosing to attend this university.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I will most likely continue my participation in Army ROTC next fall.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I will most likely register at this university next fall.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

(French & Oakes, 2004; Pascarella & Terenzini, 1980)
APPENDIX B

Dispositional Resilience Scale (DRS15-R) - Hardiness
Appendix B
Dispositional Resilience Scale (DRS15-R) - Hardiness

Instructions: Below are statements about life that people often feel differently about. Please show how much you think each one is true. Give your own honest opinions. There are no right or wrong answers.

Response options:
0 = not at all true
1 = a little true
2 = quite true
3 = completely true

CM+ _____ 1. Most of my life gets spent doing things that are meaningful.
CO+ _____ 2. Planning ahead can help avoid most future problems.
CH- _____ 3. I don't like to make changes in my regular activities.
CM- _____ 4. I believe that my life is somewhat empty of meaning.
CH+ _____ 5. Changes in routine are interesting to me.

CO+ _____ 6. By working hard you can nearly always achieve your goals.
CM+ _____ 7. I really look forward to my work activities.
CO+ _____ 8. If I'm working on a difficult task, I know when to ask for help.
CO- _____ 9. I don't think there's much I can do to influence my own future.
CM+ _____ 10. Trying your best at work is really worth it in the end.

CH- _____ 11. It bothers me when my daily routine gets interrupted.
CM+ _____ 12. Most days, life is really interesting and exciting for me.
CH+ _____ 13. I enjoy the challenge when I have to do more than one thing at a time.
CH- _____ 14. I like having a daily schedule that doesn't change very much.
CO _____ 15. When I make plans, I'm certain I can make them work.

CM = commitment
CO = control
CH = challenge

Items marked "+" are positively keyed, scored "as is."
Items marked "-" are negatively keyed. Scores are reversed before summing.

Scoring Instructions: After reversing the scoring for the negatively-keyed items (3, 4, 9, 11, 14), sum responses for all 15 items to obtain a total hardiness score. If desired, subscale or facet scores can be created by summing the relevant 5 items for each facet.

* This English revision (DRS15-R) reflects several changes and refinements based upon work conducted in Norway in 2006-07.
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