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INFLUENCE OF EARLY INTERVENTION CAREER EXPLORATION ON
STUDENT PERSISTENCE

by

Ben Littlepage

A Dissertation

Submitted in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Education

Major: Higher and Adult Education

The University of Memphis

May 2012

Dedication

I would like to dedicate this dissertation to my Lord Jesus Christ, Jennifer Littlepage, wife of four wonderful years, Sandler Grace, daughter, and Dr. and Mrs. Randy Littlepage, mother and father. This life enriching journey would not have been made possible without you.

Acknowledgements

There are a number of people I would like to acknowledge as being instrumental in helping me attain this accomplishment. First and foremost is my Father in Heaven. I vowed to you, upon the completion of this degree, to serve in whatever way you desired for my life. I have held true to the verse Psalm 37:4 and in every way you delivered the desires on my heart. My focus has remained on you over the last four-and-a-half years. Thank you for giving me the strength and perseverance to attain this credential. I promise to serve you by exemplifying my faith to those around me.

I would like to thank my family. To my wife Jennifer Littlepage, you left a comfortable, stable environment four years ago to follow me to Jackson, TN. You motivate me each day to be the best husband and father possible. I realize it was not always easy to endure the sacrifices of time and money necessary to reach this point. To my mother and father, your love and discipline has molded my character into a man I hope makes you proud. I am blessed to have parents capable of providing me with such wise counsel. I promise to raise Sandler (Sadie) Grace with the same love and support you showed me. Florence Rudd, Neil and Pam Helton, Jonathan and Kendra Helton, Brittany Helton and James (Bubba) Lear were also champions for the cause.

I would like to thank the two college presidents and supervising colleagues who made this possible. Dr. James (Jim) Selbe of Hopkinsville Community and Technical College encouraged me to apply to the University of Memphis. Dr. Karen Bowyer of Dyersburg State Community College understood the importance and impact this degree would have on my professional career. Dr. Jason Warren, Deloria Scott, Dr. Mary Ann Sellars and JDan Gullett served as my supervising colleagues over the last four-and-a-

half years. You were sympathetic to my goal and encouraged me at every turn. There were many times I approached you with questions and requests for annual leave. Not once did you ever turn me away. Thank you.

I would like to thank the members of my dissertation committee, Dr. Katrina Meyer, Dr. Barbara Mullins Nelson, Dr. Linn Stranak and Dr. Jeffery Wilson. The relationship I have developed with you over the last four-and-a-half years extends far beyond your service on this committee. Dr. Katrina Meyers, you saw potential in me at times I did not know existed. Your professional drive has inspired me more than you may realize. I could not imagine going through this process without you.

Lastly, I would like to thank Doug Hodge at Dyersburg State Community College. Doug came to me in April 2010 with the idea for this study. Doug and I discussed on multiple occasions our belief of how career decisiveness influenced student persistence and academic achievement. Doug helped me develop the methodology of this study and deserves credit for this contribution to my success.

Abstract

Littlepage, Benjamin Rudd Louis. Ed.D. The University of Memphis. May 2012. Influence of Early Intervention Career Exploration on Student Persistence. Major Professor: Dr. Katrina Meyer.

The study examined whether 181 academically underprepared, first-time freshmen were found to increase persistence and academic achievement due to the early intervention of a career exploration assessment. Persistence was defined as continuous, active enrollment from Fall 2010 to Fall 2011. Academic achievement was defined as grade point average. The study site was a rural community college located in northwest Tennessee where household poverty was high, educational attainment was low and 70% of first-time freshmen had a remedial education need in 2010. Pre-existing characteristics and the level of academic preparedness for each participant were collected. Participants were purposefully sampled by using a college transitions course required of students who test into one or more remedial subject areas. Nine independent variables were collected: gender, race, parent's education level, enrollment status, age, Holland personality types and the number of prescribed developmental studies courses in mathematics, reading and writing. The sample largely consisted of participants who were enrolled full time and between the ages of 18 and 24. Six hypotheses were proposed. Data were analyzed using one sample *t*-tests, multiple linear regression, binary logistical regression, eta coefficient, and two-way chi square. Statistically significant increases in persistence and academic achievement were found in the sample when compared to the population of academically underprepared, first-time freshmen from Fall 2009. Gender, race, primary personality type and the number of prescribed developmental studies reading courses were statistically significant variables in predicting persistence. Female Caucasians with a

Social primary personality type and no prescribed developmental studies reading courses were most likely to persist from Fall 2010 to Fall 2011. Age, enrollment status, race, gender, and the number of prescribed developmental studies reading courses were statistically significant variables in predicting academic achievement (grade point average). Traditional aged, full-time enrolled, Caucasian, female participants with no prescribed developmental studies reading courses were most likely to demonstrate academic achievement from Fall 2010 to Fall 2011. A statistically significant relationship between Holland personality types and academic achievement was not found. Persisters and non-persisters were not related in a comparison of Holland personality types. Recommendations to increase student exposure to career exploration and for future research were made.

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Chapter 1: Introduction

“It will be interesting to see how many of these students are still enrolled next year,” thought the college administrator as he stood in front of a large, diverse group of new students. As the administrator introduced himself to the group, he followed up his introduction with the question, “What brought you to our community college?” Some students responded by stating the occupation they were pursuing or that they just had finished high school. Other students mentioned they had lost their job recently and wanted to re-enter the workforce in a more sustainable career.

Motivations to enter college like those mentioned in the first paragraph have brought enrollment growth to the community college sector. The community college sector has experienced unprecedented enrollment growth over the last 5 years. In Fall 2006, 6.2 million students were enrolled at a community college (National Center for Education Statistics [NCES], 2008). In Fall 2008, 12.4 million students were enrolled in a community college (American Association of Community Colleges [AACCC], 2011b). Although enrollment has grown, the likelihood students in the community college sector will receive a credential has not grown at a similar pace. Community colleges award credentials in the form of certificates, diplomas and degrees. A longitudinal study (Berkner, 1996) found only 36.7 % of community college students enrolled from 1989 to 1994 left with a credential. A more recent attrition study found 45 % of community college students enrolled from Fall 2003 to Spring 2006 had left without receiving a credential (NCES, 2008).

This study focuses on retention of community college students. This chapter includes a brief review of the two theories that support the framework and need for this

study. Terms used throughout the study like *at risk students* and *career assessment* are defined in this chapter. The chapter closes with the mention of expected assumptions, limitations and organization of the study.

Purpose and Significance of the Study

The purpose of the study is to determine if the early intervention of a career exploration assessment can aid in the retention of new, at-risk students at a community college. The results of this study will be beneficial to administrators, faculty and staff as they develop strategies to improve persistence rates and graduation rates and assist this academically underprepared population to set academic and vocational goals. The development of those strategies is significant because a performance-based funding formula for state-assisted institutions in Tennessee is being phased in between now and June 30, 2013. A performance-based funding model was the product of the Complete College Tennessee Act of 2010. Benchmarks for credit hours earned, academic program completion and college student transfer placement are forcing community colleges in the state to rethink strategic planning initiatives. The new funding formula must now focus on student persistence, not full-time equivalent enrollments for state subsidies.

Theoretical Framework

Two theories provided the framework for the study: Bean and Metzner's (1985) *Model of Non-traditional Undergraduate Student Attrition* and Holland's (1997) *Theory of Vocational Personalities and Work Environments*. Bean and Metzner's (1985) *Model of Non-traditional Undergraduate Student Attrition* was used because its focus on non-traditional student attrition resembles characteristics of study site's population: community college students. Holland's (1997) *Theory of Vocational Personalities and*

Work Environments was chosen for two reasons. First, Holland's theory filled a void left by Bean and Metzner's model. The model did not account for the influence career aptitude has on student persistence. Second, research on the application of Holland's theory in a community college setting was not found. This study will fit into the existing body of research because the setting and sample population will add to the findings of studies that applied Holland's theory.

Definition of Terms

Key terms like *early intervention*, *career assessment*, *first-time students*, *persistence*, *retention*, *academic achievement*, *personality types*, *at-risk students*, *academically underprepared*, *remedial studies* and *developmental studies* need to be defined so the reader better understands the purpose of the study, parameters of the research design and those who have chosen to participate.

1. *Early intervention* or intrusion is approaching a student with help at the first sign of trouble (Stuart, 2010)
2. *Career assessment* is a tool used to identify personal traits that match up with skills and competencies for various fields of work (WorldWideLearn, 2011). Talents, abilities, values, likes and dislikes are all measured to narrow down occupational choices that fit an individual's lifestyle interests.
3. *First-time students* are defined as those individuals who began coursework with no prior academic history at a particular post-secondary institution (NCES, 2011c).
4. *Persistence* is a student's continuous, active enrollment until academic program completion (Tinto, 1993).

5. *Retention* is a student's continued enrollment in classes throughout one semester (Crawford, 1999).
6. *Academic achievement* is excellence or accomplishment in an academic environment and often measured by a student's standardized test scores, grade point average and/or subject specific grades (Fan, 2001). Grade point average was elected to measure academic achievement in this study.
7. *At-risk students* are those students who self-identify as an ethnic minority, are academically disadvantaged, have a disability, are of low socioeconomic status and/or are probationary students (Heisserer & Parette, 2002).
8. *Academically underprepared* students have demonstrated a lack of basic skills in at least one of three developmental subject areas: reading, writing or mathematics (Tritelli, 2003).
9. *Remedial studies* and *developmental studies* are intended to correct or improve deficient skills in a specific subject area (Bahr, 2008; Wright, Wright & Lamb, 2002). The terms are used interchangeably throughout the study.

Assumptions

This study was based on certain assumptions. The research assumed the study's participants were truthful. It is impossible for the researcher to know whether participants were honest when they answer the study's questions. The truthful response of subjects was important to answering the research question and testing each hypothesis.

Limitations

The study had several limitations that affected its generalization to a larger population. Because of the particular nature of the community college where data was

collected, results may be generalized only to rural Tennessee community colleges with little racial diversity, high poverty levels and the majority of its students being first generation. The generalization of results was limited due to the number of participants. Because purposeful sampling was used, this limits generalization of results to a larger population. A limitation of any persistence study is the intention of its participants. Community college students attend college for a variety of reasons, including graduating with a degree, improving workplace skills, or seeking monetary aid through Title IV funds. While society may focus on the granting of the credential (and states fund degree acquisition), students may prefer to seek only a few courses to satisfy their particular needs.

Organization of the Study

Chapter 2 discussed the two theories providing the framework for the study and provided a literature review of the nine variables used in the multiple and logistical regression models for hypotheses 2 and 4. The purpose of the literature review was to justify the inclusion of the prominent theories and nine variables used in the study.

Chapter 3 discussed the setting, sample, research question and hypotheses, instruments, variable definitions, data collection, data analysis and research design.

Chapter 4 presented the study's findings and answers the research questions and six individual hypotheses using the statistical methods described in Chapter 3. The chapter also offered any noticeable themes found in the analysis.

Chapter 5 provided the researcher's conclusion of the analysis and how the findings were relevant to the literature review in Chapter 2. Recommendations for the

setting and other community colleges like it were made. Finally, suggestions for future research were offered.

Chapter 2: Literature Review

Introduction

The community college sector offers millions of Americans the opportunity to obtain a post-secondary education credential. In 2008, 12.4 million of the 19.1 million post-secondary education students were enrolled in a community college (American Association of Community Colleges [AACC], 2011b; National Center for Education Statistics [NCES], 2011a). The sector's vision for greater accessibility and affordability to the general public has resulted in a diverse student body enrolled in community colleges. Forty-five percent of community college students identified with a racial minority in Fall 2010 (AACC, 2011b). Sixty percent were above the age of 22 with an average age of 28 (AACC, 2011b).

Community colleges offer accessibility to millions of Americans through lower admissions standards and open enrollment practices. Affordability is the product of lower tuition rates and other costs of community colleges, which are less expensive than other state-assisted postsecondary institutions. Community college students paid on average of \$2,713 a year or 35.7 % of the annual tuition at a public-assisted state university or college in the 2010-2011 academic year (AACC, 2011b).

Critics have identified open admissions policies as one influence elevating attrition rates at community colleges (Bahr, 2007; Kozeracki, 2002; Markus & Zeitlin, 1992). Summers (2003) defined attrition as a student's failure to enroll from one semester to the next that occurs prior to an educational goal being achieved. Open admissions policies were widely adopted at community colleges beginning in the 1960s to support the sector's goal for greater accessibility to higher education for the general public. An

open admissions policy means a student entering college with inadequate academic preparation as demonstrated through a placement exam can be accepted, conditionally or fully depending on the institution.

Four-year and two-year public institutions that chose to provide greater accessibility through open admissions policies experienced greater annual attrition in 2008 compared to institutions with selective admissions criteria (NCES, 2009b). Two-year institutions with an open admissions policy retained 61% of their full-time students. Four-year institutions with an open admissions policy retained 57% of their full-time students. In contrast, four-year institutions that accepted less than a fourth of their applicants retained 95% of their full-time students in 2008.

The lack of academic preparation among first-time freshmen may also influence the greater annual attrition among institutions that offer open admissions policies. In 2000, 42% of first-time freshmen at two-year institutions were placed into one or more remedial courses. Twenty percent of first-time freshmen at four-year institutions were placed into one or more remedial courses in the same year (NCES, 2001b). Only 12% of four-year institutions with selective admissions criteria were placed into one or more remedial courses in 2000.

Student attrition has improved over the last 25 years, but continues to be problematic for community colleges. In 1986, only 29.5% of community college students persisted for two years or more (Tinto, 1987). The National Center for Education Statistics (2008a) reported 55% of community college students persisted two years from 2004 to 2006.

Unfortunately, graduation rates have not experienced similar gains at community colleges. The National Center for Education Statistics (2011b) reported on graduation rates for two community college cohort groups. A six-year longitudinal study from 1999 to 2005 yielded a 29% graduation rate. Another six-year longitudinal study from 2005 to 2011 yielded a 27% graduation rate.

Studying student persistence, the opposite of attrition, remains difficult and complex. Many influences can directly and indirectly influence a student's decision to persist. Researchers have used popular models developed by Bean and Metzner (1985) and Tinto (1975) to measure the impact of various influences on student attrition at community colleges (Bers & Smith, 1991; Clagett, 1996; Feldman, 1993; Voorhees, 1993; Windham, 1995a). These studies have revealed similarities like external obligations associated with age, enrollment status, minority status, educational goal decisiveness and weekly work hours as potentially damaging to student persistence. External obligations associated with age were defined as those who assumed the role of financial provider and/or caretaker for a household. Community colleges have historically enrolled students with these characteristics. In 2008, 60% of the 12.4 million community college students were older than 22 years of age, 45% were students of color, and 61% were employed while they attended college (AACCC, 2011b). Community college faculty and staff have limited control over these influences, but continue to explore ways to increase persistence and academic achievement while adhering to policies that promote accessibility.

Extensive research has been conducted on attrition and persistence in higher education; however, this research has been primarily conducted at four-year colleges and

universities rather than community colleges (Hoyt, 1999). Early attrition models developed at four-year institutions offer insight into causes for attrition, but were developed by focusing on traditional student populations. Traditional student populations in early attrition studies were defined as those who attended a four-year college or university, did not delay college enrollment after high school, were financially dependent upon parents, carried a full-time college credit load and were not employed full time. Tinto's (1975) model for college student attrition continues to be arguably the most widely recognized and tested in higher education. Tinto believed student persistence was related to the degree in which the student felt integrated into the life of the college, academically and socially. Studies have indicated that non-traditional commuter students, commonly served by community colleges, are more influenced by academic integration into college and pre-existing variables such as gender, commitment to goals, socioeconomic status and external relationships than the student's social integration into college life (Pascarella & Chapman, 1983; Pascarella & Wolfe, 1985).

Model of Non-traditional Undergraduate Student Attrition

Bean and Metzner (1985) developed a conceptual model of the attrition process for non-traditional undergraduate students called the *Model of Non-traditional Undergraduate Student Attrition*. Although the model does not claim to represent a specific higher education sector, non-traditional students are commonly associated with those enrolled at community colleges. The lack of research contributing to understanding influences of non-traditional student attrition served as the motivator for Bean and Metzner.

The model is as relevant today as ever before. The model defines non-traditional students as different from traditional students on the basis of age, residency, and enrollment status. Residency for a traditional student is one who lives on campus. A non-traditional student is defined in the model as someone who is older than age 24, does not live on campus, is a part-time student, or displays some combination of these three factors. The definition goes on to recognize non-traditional students are not greatly influenced by the social environment of the institution and are chiefly concerned with the institution's academic offerings.

Bean and Metzner (1985) realized the definition was not completely satisfactory, but its applicability to community college students was the reason for choosing this theoretical model for this study. Based on the definition, community college students are often considered nontraditional. In Fall 2009, 41% of community college students were 25 years of age and up (NCES, 2010a), 60% attended part time (AACC, 2011a) and only 21% had on-campus housing (AACC, 2011b). Community college students do not typically live on campus and therefore, they commute regularly to campus for classes.

Bean and Metzner's (1985) *Model of Non-traditional Undergraduate Student Attrition* posits four fundamental sets of variables believed to provide the basis for dropout decisions: Background and Defining Variables, Academic Variables, Environmental Variables and Psychological Outcomes. The complete model and four variable sets can be seen in Figure 1 (Bean & Metzner, 1985, p. 491).

The model illustrates how the variable sets have an effect on student attrition. The four variable sets mentioned in the previous paragraph have a direct effect on attrition. A student is expected to leave school if he or she is deficient in one of the four variable sets.

However, compensatory interaction between variables can influence attrition, especially if the nontraditional student is deficient in one of the variable sets. For example, Environmental variables have a direct effect on a student dropping out. Students unable to make childcare arrangements, maintain financial demands or find outside encouragement are expected to drop out of school. Academic variables also have a direct effect on student attrition. Students who lack strong study habits, receive poor academic advice, miss class regularly and remain undecided about a major are expected to drop out as well. The model proposes a compensatory interaction between the two variable sets. A student with a poor academic performance, but strong environmental support is expected to remain enrolled.

The model also provides a compensatory interaction between a direct effect variable and indirect effect variable: Social Interaction Variables and Background and Defining Variables. As stated earlier in this section, social integration is less important to nontraditional student retention compared to the other variables in the model. Social integration can compensate for deficiencies identified in the Background and Defining Variables set. For example an older nontraditional student who may perceive themselves as out of place could become socially integrated and reduce this stress, further minimizing his or her intent to leave.

In Figure 1, the Background and Defining Variables set contains seven predictor variables and is the most pertinent of the variable sets to the purpose of this study (Bean & Metzner, 1985, p. 491). Four of the seven variables in the set will be used in this study. These variables are recognized by Bean and Metzner as influences on non-traditional student attrition and include age, enrollment status, race and gender. The influence these

four variables have on student persistence will be described in greater detail individually later in the literature review.

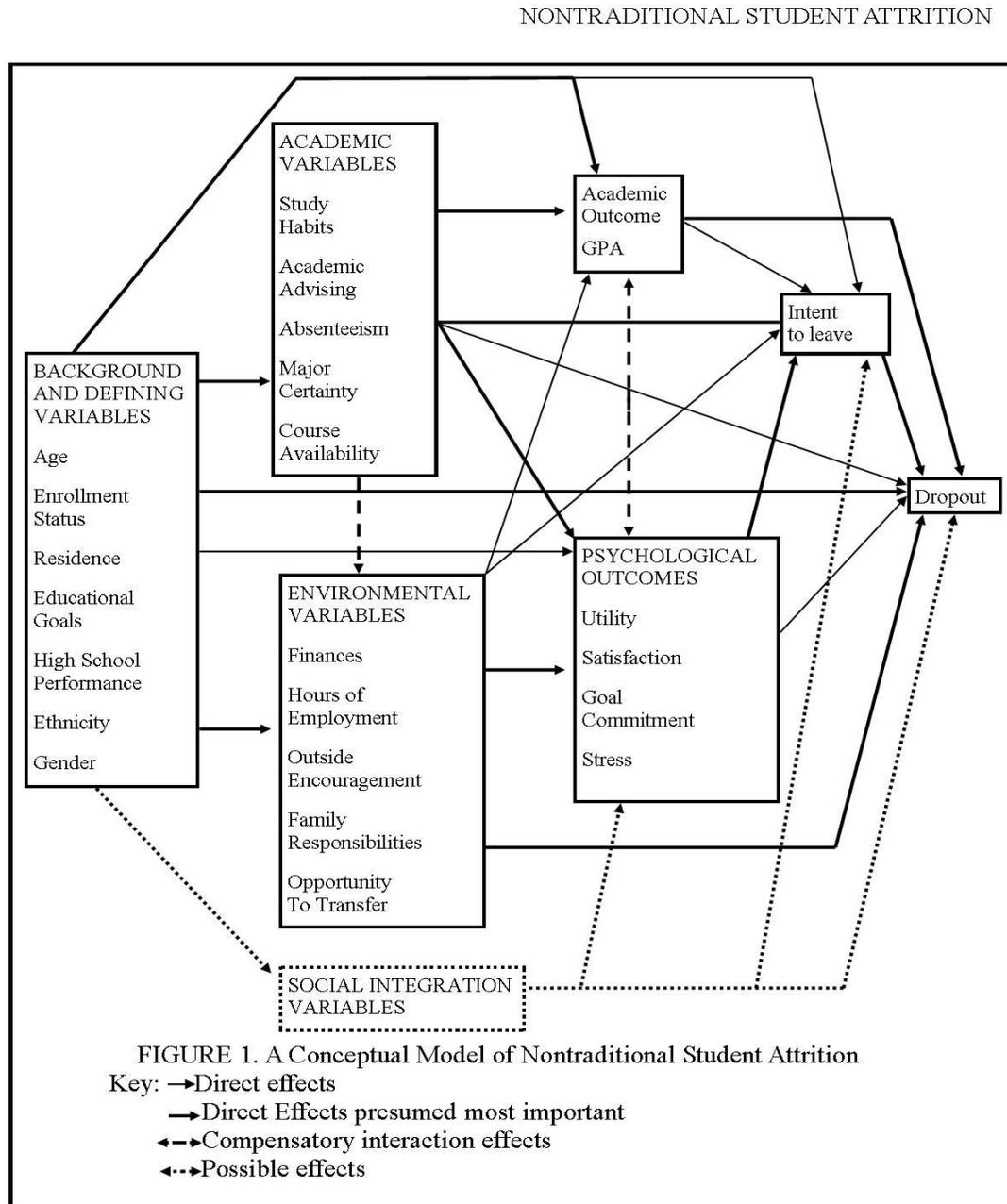


Figure 1. Model of Nontraditional Undergraduate Student Attrition (Bean & Metzner, 1985, p. 491).

Theory of Vocational Personalities and Work Environments

John Holland's (1997) *Theory of Vocational Personalities and Work Environments* was designed to explain the vocational behavior of people. It is used commonly by career counseling professionals to conceptualize various occupational clusters and suggest practical avenues for people looking to attain vocational satisfaction based on individual personal interests. Van Vianen, DePater & Preenen (2009) found Holland's theory was useful in helping students make career decisions by narrowing, funneling or focusing their attention on potential occupational choices, often following a strategy of matching students' abilities, attitudes, values or personality traits with specific occupations or professions. The theory has four fundamental assumptions. The assumptions are

1. Most people can be categorized as one of six personality types,
2. There are six model environments,
3. People search for environments that will exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles, and
4. Behavior is determined by an interaction between personality and environment.

The six personality types and model environments share the same names: *Realistic, Investigative, Artistic, Social, Enterprising* and *Conventional*. Each personality type will be given a thorough explanation in the next section of this chapter. Individuals who identify with characteristics in one of the six personality types, for example *Realistic*, will in turn associate with characteristics in the *Realistic* model environment.

The pairing of people to environments leads to predictable outcomes. These outcomes include vocational choice, vocational stability and achievement, educational choice and achievement, personal competence, social behavior and susceptibility to influence. This study will focus on how the exposure to vocational choice impacts the outcome of educational achievement for first-time, academically underprepared community college students.

Attrition models have emphasized the importance of person-environment congruence for student persistence and academic achievement (Kahn, Nauta, Gailbreath, Tipps & Chartrand, 2002). Holland's theory (1997) promotes the assumption that each personality type is likely to flourish in a congruent environment (Smart, Feldman, & Ethington, 2000). Two studies (Reutefors, Schneider & Overtone, 1979; Spokane, 1985) reported a low to moderate positive relationship of .15 to .54 with a mean correlation of .21 in students whose personality types were congruent with their academic area of emphasis. The college freshmen studied achieved higher grade point averages than those without congruent personality-environment types. However, Frantz and Walsh (1972) showed no relationship between congruence and students' academic achievement in a similar study. More research is needed in the area of personality type congruence, especially among non-traditional student populations. No research has been found where Holland's Theory was applied to a non-traditional student population.

One assumption Holland (1997) makes for an individual with personality-environment type congruence is academic or vocational satisfaction can be expected. Smart (1987) found a moderate positive relationship between congruence and academic satisfaction. He studied 3,929 graduate students and found those with personality-

environment type congruence were significantly more satisfied with faculty-student relations and relations with peer students. Elton and Smart (1988) explored the relationship between type congruence and vocational satisfaction among 1,869 college graduates who were five years removed from their baccalaureate degree. Participant satisfaction was assessed on income, fringe benefits, opportunities for promotion and job security. Congruence was found to have a moderate positive relationship to satisfaction with income, fringe benefits and opportunities for promotion. Congruence was not related to satisfaction with job security.

Holland (1997) explains a congruent personality type and environment is one in which a person's preferred activities and interests are required by the environment in order for a person's disposition to be reinforced. For example, a student with an Investigative type interest would feel more comfortable reenacting a crime scene to find possible clues than creating written self expressions in the form of a poem for an English composition class. Holland explains that a particular disposition develops because different people have different biological capacities and life histories. The developmental outcomes between a person's biological capacities and life history are characterized as personality types and tend to become well defined between the ages of 18 and 30. The characteristics and values of the six personality types will be explained further in the next section.

Holland does not identify one assessment technique over another as being more advantageous for assessing a person's personality type (Holland, 1997, p. 29). He explains the best assessment is the one with the most consistent results. Consistency is determined by how an individual's personality type patterns are aligned on the Theory's

hexagonal model used to illustrate how the six personality types interact. The hexagonal model can be seen in Figure 2 (Smart, Feldman & Ethington, 2000, p. 40). The less distance between any two personality types, the greater the psychological resemblance. Patterns composed of adjacent personality types on the hexagon are most consistent (p. 35). For example, a person with a *Realistic-Investigative* (R-I) personality pattern is consistent because both types share common traits like unsociable, preference toward things and not people, and self-deprecation. Patterns composed of opposite types on the hexagon are least consistent. For example, a person with an *Artistic-Conventional* (A-I) personality pattern would find difficulty in a work environment where traits from both types would be utilized. *Artistic* types enjoy self-expression, while *Conventional* types enjoy rules and details with little left to the imagination. Patterns composed of every other type on the hexagon form an intermediate level of consistency. An example of intermediate consistency would be *Artistic* and *Enterprising* or *Investigative* and *Social*.

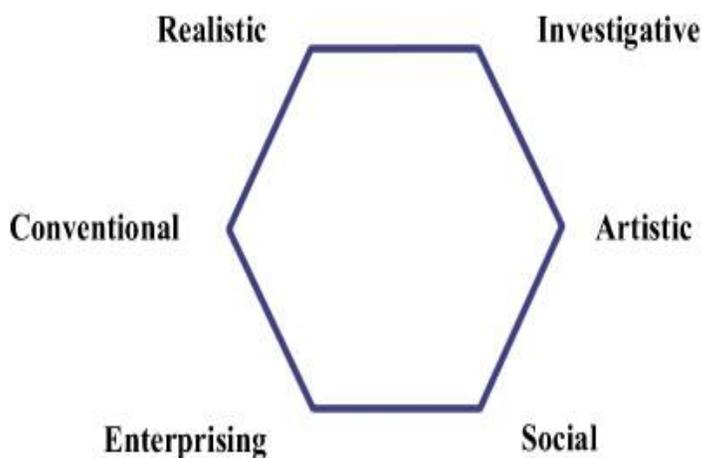


Figure 2 Hexagon Model for Defining Psychological Resemblances Psychological Resemblances Among Personality Types and Academic Environments (Smart, Feldman & Ethington, 2000, p. 40)

Personality Types

The purpose of this section is to explain the development of personality types in individuals and define each type so a better understanding for the uniqueness of each participant in the study can be acquired. Holland's (1997) *Theory of Vocational Personalities and Work Environments* introduces six personality types which were mentioned earlier: *Realistic, Investigative, Artistic, Social, Enterprising* and *Conventional*. Holland (1997) explains that "types produce types" (p. 17). This means that a person with a particular personality type is naturally attracted to an environment type of similar characteristics.

Holland also explains how a parent can influence a child's personality type. Parental attitudes play a complex role in the development of a child's personality type (Roe, 1956; Roe & Siegelman, 1964). Holland's assumption is that each parent's core belief system provides both a large cluster of environmental opportunities and limitations. For example, a parent with a Realistic personality type promotes values and engages in activities inside and outside the home characteristic of this personality type. A Realistic parent would also select other Realistic personalities to be around and share in life's occurrences. The parent will likely reject or ignore activities and people who possess Social or Artistic personality types. The personality type(s) of parents influence the values, exposure and environments of their children.

Realistic personality types prefer activities that involve the explicit, ordered and systematic manipulation of objects, tools, machines, and animals (Strong, Feldman & Ethington, 2000). They avoid educational and interpersonal activities. These behavioral tendencies lead to the acquisition of manual, mechanical, agricultural, electrical, and

technical competencies. Realistic personality types perceive themselves as practical and conservative, but lack social skills. They value material and monetary rewards for tangible accomplishments. This personality type prefers occupations or situations that have a narrow range of interests (Holland, 1997). Words used to describe Realistic personality types are dogmatic, hardheaded and persistent.

Investigative personality types prefer activities that involve the observations, symbols, systems, and creative investigations of physical, biological, and cultural phenomena in order to understand and control such phenomena (Smart, Feldman & Ethington, 2000). They avoid persuasive, social and repetitive activities; Enterprising and Conventional environments do not generate pleasure for this type. Scientific and scholarly activities are valued, while family, security, cheerfulness and having true friendships are less important (Holland, 1997). These behavioral tendencies lead to the acquisition of scientific and mathematical competencies and to a deficiency in persuasive and leadership abilities. Investigative personality types perceive themselves as cautious, complex, curious, independent, precise, rational, and scholarly. Other personality types describe Investigative personality types as analytical, critical, curious, pessimistic, and unassuming.

Artistic personality types prefer ambiguous, free, and unsystematic activities that involve the manipulation of physical, verbal or human materials to create art forms or products (Smart, Feldman & Ethington, et al., 2000). They avoid routine activities like elaborate record keeping, clerical or secretarial work, business systems and conformity to established rules; Conventional environments bore this personality type. They do not value obedience, logical or responsible behavior. Instead, this personality type values

expression and introspection of oneself. This personality has the most open, liberal belief system of all the types. The acquisition of artistic competencies in language, art, music, drama, culinary and writing excites this personality type. They perceive themselves as original, intuitive, sensitive, and value the creative expression of ideas, emotions, and sentiments (Holland, 1997). Words used to describe this personality type by others are complicated, disorderly, impractical, impulsive and nonconforming.

Social personalities prefer activities that entail the manipulation of others to inform, train, develop, cure or enlighten. Realistic occupations and situations are commonly avoided among Social personalities. This aversion includes systematic activities that involve materials, tools and machines. Activities that require patience and precision also frustrate this group. These behavioral tendencies lead to the acquisition of human relations competencies, both interpersonal and educational, and to a deficit in manual and technical competencies. Social personality types want to serve others in the context of medical support and institutional service (Strong, Feldman & Ethington, 2000). A belief in equality for all and a desire to be helpful and forgiving is common. They value fostering the welfare of others and social service. Logical and intellectual behaviors are not seen as essential to have an exciting life. Their belief system is moderately open, but traditional values are the norm. Terms commonly used to describe Social personality types are agreeable, generous, helpful, idealistic, persuasive, understanding and warm.

Enterprising personality types prefer activities that involve the manipulation of others to attain organizational goals or economic gains (Strong, Feldman & Ethington, 2000). They avoid Investigative environments that include scientific, intellectual and

abstruse activities where observational and systematic behaviors are needed. Instead, vocational preferences include controlling others and becoming a leader in commerce, community and in public affairs. Positions of little influence are frustrating to this personality type. These behavioral tendencies lead to an acquisition of leadership, interpersonal, speaking and persuasive competencies. They possess high self-esteem and a closed belief system. Problems are often viewed in social influence terms by this group. Enterprising people see themselves as aggressive, ambitious, energetic, extroverted, optimistic, popular, self-confident, and value material accomplishments and social status (Holland, 1997). Words used by others to describe Enterprising personality types are acquisitive, assertive, domineering, energetic and self-confident.

Conventional personality types prefer activities that involve the explicit, ordered, and systematic manipulation of data (Strong, Feldman & Ethington, 2000). Examples would include keeping records, filing, reproducing materials and organizing written and numerical data according to a prescribed plan. They avoid ambiguous and unstructured undertakings and feel uncomfortable in Artistic environments. It frustrates Conventional personalities to be creative and have to persuade people. They follow established rules, practices and procedures and look to authorities for advice and counsel. These behavioral tendencies lead to the acquisition of clerical, computational and business system competencies (Holland, 1997). Traditional values are represented among this personality type. Conventional personality types believe it is desirable to be ambitious, polite and obedient. Conventional people perceive themselves as careful, conforming, orderly and having a numerical ability. Words used to describe this personality type are conscientious, efficient, inflexible, methodical and thorough.

A student's resemblance to one or more of these types should predict his or her behaviors (Strong, Feldman, & Ethington, 2000). For example, high educational aspirations go with the following personality types in rank order from highest to lowest: *Investigative, Social, Artistic, Conventional, Enterprising* and *Realistic*. Educational achievement follows the same rank ordering. Personality type determines how someone will respond to instructors, teaching methods and styles according to the congruence between the two individuals or the individual and subject. For example, a *Social* person should prefer and benefit more from a *Social* teacher or a *Social* subject using teaching methods conducive to their personality type like group discussions and projects. This study will include the Holland personality types of participants to see if they predict academic achievement and persistence.

Enrollment Status

Enrollment status is defined as the number of academic credit hours in which a student is registered at the beginning of the semester. It can also be defined as full-time or part-time attendance (Wolfe, 1998). Of the 12.4 million community college students enrolled in 2008, 60% were enrolled part time (AACC, 2011b).

Bean and Metzner (1985) found non-traditional students enrolled less than full time because of external responsibilities like work and family obligations. Non-traditional students are recognized as being financially independent (Forbus, Mehta & Newbold, 2010). The financial independence of non-traditional students requires many to work more hours than traditional students in order to cover the costs of tuition and other monetary needs. Hudson and Hurst (2002) found in 2001 that 48% of community college

students worked to support their education. Eighty percent of community college students 25 years of age and up worked while attending college also in 2001 (NCES, 2001a).

Hoyt (1999), in a study at Utah Valley State College, found students who worked full time and were from lower income groups had significantly higher attrition rates. Students who work full time generally take fewer courses. Participants in the study who took a larger number of credit hours during their first term and did not work full time had a higher rate of persistence. As a result, students who attend college full time were recognized as having a greater commitment to credential attainment or more financial support to pursue their studies. The Department of Education found students who worked fewer than 35 hours per week were more likely than those who worked 35 hours or more per week to earn an associate's degree; the comparison was 20% to 8% over eight years (NCES, 2003). The Forbus et al. (2010) study also had similar findings. Only 11.3% of traditional students took five or more years to obtain an undergraduate degree, while 67.8% of non-traditional students took five or more years to obtain a degree. A characteristic of traditional students is full-time enrollment status, while non-traditional students are more likely to work full time and attend class part time (Berker et al., 2003).

Several studies at two-year colleges found strong evidence that students enrolled less than full time were more likely to leave college early (Alfred, 1973; Behrendt, 1974; Knoell, 1976; Smith, 1980). More recent data released by the U.S. Department of Education identified part-time enrollment as a characteristic known to adversely affect persistence (NCES, 2003). The Department of Education tracked college enrollment of high school graduates from the class of 1992 from Fall 1992 through Spring 2000. Thirty-nine percent enrolled part time at their first institution (p.34). The study found

students enrolled full time were more likely to obtain an associate degree than those enrolled part time; the comparison was 20% to 12%, respectively. Wyman (1997,) studied institutional differences in the persistence rates at two-year colleges and found institutions enrolling more full-time students also had lower attrition rates (p.32).

Gender

The majority of full-time and part-time students in the community college sector are women. Of the 12.4 million community college students enrolled in 2008, 7.2 million or 58% of students were women (AACC, 2011b). Men and women possess different learning preferences (Wehrwein, Lujan, & DiCarlo, 2007) as well as varying vocational interests (Holland, 1997). Gender is included as another predictor variable in this persistence study for these reasons.

Since the inception of community colleges in the 1960s, society's perceptions of women's capabilities, vocationally and academically, have evolved. As a result of this social evolution, women have been drawn to educational programs of study once exclusively filled with men like business, science, technology and mathematics. Georgetown University (2011) examined 15 undergraduate major clusters to identify earnings and demographic information for each cluster. The report revealed two themes relevant to the evolution of gender roles. First, undergraduate major clusters like business, science, technology and mathematics once dominated by males are graduating greater numbers of females. Biology and Life Sciences has a concentration of 55% female. Business is 45% female. Mathematics and Computers is 31% female. The second theme of the report was that discrepancy still exists between the median annual earnings for males and females in those clusters formerly dominated by men. Women made

\$12,000 less in Biology and Life Sciences, \$16,000 less in Business, and \$13,000 in Mathematics and Computers.

Women also continue to choose occupational areas historically associated with the female gender. Georgetown University (2011) found undergraduate major clusters like Arts, Education, Health and Psychology, and Social Work had high concentrations of women. The concentration of women in these areas may be an example of social role evolution. It may also demonstrate the different motivations men and women apply to making career decisions. Holland (1997) found women have a tendency to view themselves in the context of relationships with others and make decisions to optimize and maintain relationships. Occupations offering opportunities to help others or the freedom to maximize other personal relationships continue to guide career choices of women. He found women associate most closely with the Social and Artistic personality-environment types, while men associate more consistently with the Realistic and Investigative types. Holland found no significant difference in Conventional or Enterprising types for either gender.

Farmer (1987), another relational personality theorist like Holland, found women have a dual pull or set of obligations for home and work. Women feel the need to balance time between developing a professional identity and fulfilling perceived duties with their families. The dual pull creates greater challenges for vocational decision making and increases with age. Farmer assessed career and achievement motivation among 1,863 ninth and 12th graders as well as 212 adults. She found females possess greater career and achievement motivation at a younger age than males, but motivation between the genders changed as they transition into adulthood. Farmer assumed the transition into adulthood

diminished women's long-term career commitment because the pull to be involved at home had strong allure. Women in young adulthood begin to think about relationships and family as being part of their long term plans. Career and achievement motivations are not solely occupation-based any longer. For males, variables found to be significant at the .05 alpha level in relation to career motivation were independence, competition and intrinsic value. The same variables found to be significant for adult males did not show significance for adolescent males.

Murray and Hall (2001) tested Holland's belief. They looked at the gender differences of 216 undergraduate students at a regional comprehensive institution as it pertained to vocational interests and co-curricular activities. Holland's personality type codes were assigned to participants. Women scored significantly higher than men in Social and Enterprising vocational interests. Men scored significantly higher than women in Realistic vocational interests. Men scored higher than women in Realistic and Investigative co-curricular interests. Women scored higher than men in Social and Artistic co-curricular interests. The researchers concluded men had a good person-environment fit for Realistic type interests and women had a good fit for Social interests. The significance of both inventories was set at 99% or .01 alpha level.

Gender is a predictor variable commonly studied in persistence and attrition studies (Cohen & Brawer, 2009). The ease of capturing this information as well as the different motivations for degree attainment between men and women makes gender a popular predictor variable. Women have demonstrated greater levels of student success than men over the last decade. The University of Hawaii Community College System (2003) published a three-year longitudinal study of student success from 1998 to 2001.

Student success was defined as continuous enrollment and graduation. The study looked at 2,932 first-time freshmen at all seven community colleges in the system. Women demonstrated a 42% success rate after three years, and 16% graduated. Men demonstrated a 37% success rate after three years, and 12% graduated. A similar study of the Maryland Community College System found women had greater student success than men in a four-year longitudinal study (Maryland State Higher Education Commission, 2003). Student success was defined as graduation and transfer rate to a bachelor degree-granting institution. The study looked at 11,770 students from 15 different community colleges. The four-year graduation and transfer rate for women was 32% and 29% for men. Although student success in either study did not reveal a large discrepancy between women and men, the results were consistent with the 2010 Digest of Education Statistics (NCES, 2010b). In 2009, 19,740 associate degrees were awarded. Fifty-eight percent of associate degree recipients were female. It is still unclear why women demonstrate greater rates of persistence in terms of continuous enrollment, graduation and transfer rates than men.

Age

Thirty-nine percent of the 12.4 million community college students enrolled in Fall 2008 are younger than 22 years of age (AACCC, 2011b) which means that community colleges rely heavily on older, part-time commuter students (Riesman, 1981). The decline in employment among the blue-collar sector of the economy has had a profound effect on college enrollments (Bean & Metzner, 1985). A large number of workers entering and re-entering the labor force must choose between low-paying jobs with questionable

longevity or jobs with higher earning potential that require specialized training from post-secondary institutions.

The number of older working adults attending college has increased substantially over the last 15 years. Enrollment between 1995 and 2006 grew 13% among college students 25 years of age and older (NCES, 2009b). The National Center for Education Statistics projects a rise of 19% from 2006 to 2017 for this same age population. Eighty-five percent of community college students are employed; 53.8% are employed full time (Education Commission of the States, 2004). Older adults often return to college for a second career or to update their knowledge and skills for the changing work environment (Hoyt, 1999). Older students work for two primary reasons: to pay for some or all of college and personal expenses and to support themselves and/or a family (NASPA, 2008). These students are older than the traditional 18- to 24-year-old college student, as defined by Bean and Metzner (1985), who are preparing to enter the workforce possibly for the first time.

Richardson (1994) asserted it is a misconception that older adults generally lack academic skills and abilities. He performed a literature review on cognition characteristics of older adults to support his argument. Bean and Metzner (1985) found that age *per se* was not a major influence on attrition; rather the factors associated with age such as greater family responsibilities, full-time employment and higher levels of absenteeism contributed to attrition. Other studies support Bean and Metzner's claim regarding the relationship between persistence and the factors associated with age (Bers & Smith, 1991; Greer, 1980; Hunter & Sheldon, 1980; Lanni, 1997). Age is simply used

as a collective composite variable for factors associated with it in many persistence and academic achievement studies.

Six studies conducted at two-year colleges reported a positive association between students' age and attrition (Brooks-Leonard, 1991; Gorter, 1978; Greer, 1980; Hunter & Sheldon, 1980; Johnson, 1980; Windham, 1995b). These studies found older students have a greater likelihood for attrition than younger students. Other research at two-year colleges failed to note a significant association between age and persistence (DeVecchio, 1972; Mohammadi, 1994; Pascarella & Chapman, 1983; White, 1972). Age is used as a predictor variable in this study because of its relationship to persistence and academic achievement among non-traditional students.

Parent's Education Level

The guidance of a parent or grandparent who has attended college is beneficial for non-traditional students and positively affects student retention (Metzner, 1984; Staman, 1980). A parent who has attended college is able to provide emotional support for the student and meaning to the postsecondary environment. First-generation college students are less likely to have the same support at home. Scenarios where first-generation college students would likely struggle include uncertainty about academic strategies for success, how to handle administrative processes and who to ask for help with unique issues and emotional support.

Locke (1976) said the evaluation of past experiences gives rise to an individual's attitude. For example, a parent who has benefited from educational attainment possesses a positive attitude about the opportunities that college affords. Children accept this attitude because it is from their parents and is seen as a means to attain a similar lifestyle.

The value placed on education serves as a motivator for students to achieve educational attainment. Locke's statement is similar to the one credited to Holland in the Personality Types section of the chapter: a parent's attitude about his or her child's education influences that child's decision to attend and persist in college.

Somers, Cofer, Hall & Vander Putten (1999) used a sample of 1,472 African Americans and 11,292 Caucasians to measure how pre-college characteristics like parent's education level influence retention. Parent's education level was significant for Caucasians, but not African Americans. Caucasians were two percentage points more likely to persist if their mothers had a college degree and 2.5 percentage points more likely to persist if the father had a college degree. Parent's education had a significant indirect effect on student persistence among Caucasians. Parent's education was also found to have a significant direct effect on a student's desire to finish college.

Hoyt (1999) monitored three freshmen cohort classes from 1993 through 1995 at a regional college of 18,174 students. The study found students with a parent who had earned a bachelor's degree were more likely to persist, whereas first-generation students had higher attrition rates. A negative correlation of .187 was reported for first-generation college students and persistence.

Sociologists view the perpetual cycle of educational persistence and attainment by those who have parents with postsecondary experience as Structuration Theory. Giddens (1984) believed his theory had two structures. One structure is constructed of actors who are knowledgeable of activities in various situations. The other structure is composed of the rules, resources and relationships produced and reproduced through social interaction in those activities and various situations. Skaling (1971) found parents' level of formal

education was the most powerful predictor of traditional student persistence in college among the various indicators of parental socioeconomic status. Socioeconomic status indicators include annual income, housing arrangement, crime and educational attainment. Skaling (1971), Spady (1970) and Tinto (1975) reported a positive relationship between parents' educational level and student persistence. Furthermore, Gerardi (1996) found that parents' educational background was a contributor to graduation along with other factors. In contrast, Rossman and Kirk (1970) and Pascarella and Terenzini (1980) found no significant difference in traditional students between dropouts and persisters according to the educational level of either parent. Jaffe and Adams (1970) discovered no significant relationship between parents' educational level and the persistence of students at multiple two-year colleges. The emphasis placed on the parental education level for a college student as well as the inconsistent findings so far about its impact on persistence justifies it as a predictor variable for this study.

Race

Like the other variables mentioned thus far, race has been the focus of persistence research for years. Postsecondary education has become more racially diverse since 2000 (NCES, 2010c). Thirty-two percent of all undergraduate students identified with a racial minority in 2000. In 2008, the percentage of students who identified with a racial minority increased 5%, while total undergraduate enrollment grew from 13.1 million in 2000 to 16.3 million in 2008. The increase of 3.2 million students over eight years was largely driven by new African American and Hispanic enrollments. The percentage of total undergraduate enrollment for African Americans increased from 12 to 23% or 1.5 million to 2.2 million students. Hispanic undergraduate enrollment grew from 10 to 24%

or 1.3 million to 2.1 million students. The percentage of total undergraduate enrollment for Caucasians declined from 68 to 63%..

The community college sector has also seen enrollment growth among racial minorities over the last decade (NCES, 2002). In 2000, 33% of student enrollment in the community college identified with a racial minority. In 2008, 45% of students identified with a racial minority: 13% African American, 16% Hispanic, 9% other, 6% Asian and 1% Native American (AACC, 2010a).

The definition of race is synonymous with the term Ethnicity in Bean and Metzner's (1985) *Model of Non-traditional Undergraduate Student Attrition*. Earlier studies that have focused on the relationship between race, persistence and academic achievement at predominantly white institutions categorize self-identifiable groups like African American as black and Caucasian as white (Astin, 1972; Bennett & Bean, 1984).

High attrition rates have been found in certain races. Nora and Cabrera (1996) found racial minority undergraduate students at a doctoral-granting institution were somewhat less prepared for their college studies than white students. The researchers reported that parental support, social integration, perception of discrimination and academic and intellectual development were indirectly related to student persistence for minority students.

Astin (1972) looked at attrition rates of Caucasian and African American students at a two-year college. He found attrition rates among African American students to be higher even with past academic achievement, aspiration and socioeconomic status controlled. African American students were found to be less likely to persist as Caucasian students in other studies as well (Mohammadi, 1994; Zhao, 1999). Other studies at two-

year colleges did not reveal a relationship between race and attrition (Aquino, 1990; Brunner et al., 1978; Rice, 1983; Wall, 1996).

Adelman (1996) found remediation rates at four-year institutions, especially in reading, were substantially higher among minority students, particularly for African Americans. Remediation rates were defined as the number of students placed into a remedial or college preparatory course. Hoyt (1999) found similar results in a study of remediation and persistence at Utah Valley State College. Minority students were at much greater risk of requiring remedial education in several areas and dropping out of college. Remedial education is the next predictor variable to be discussed.

Remedial Education

Postsecondary remediation plays an important role in higher education by providing opportunities to rectify race, class and gender disparities generated in primary and secondary schools (Bahr, 2008). Open admissions policies that originated in the 1960s meant inadequate academic preparation was no longer a barrier to college access (Markus & Zeitlin, 1992, p. 17). Individuals with little money and inadequate academic preparation were unable to attend a four-year college and university. Therefore, community colleges were the choice for these individuals. As a result of open admissions, remedial education became a necessity at community colleges across the country.

A 1995 National Center of Education Statistics report indicated 100% of community colleges offered at least one remedial reading, writing and mathematics course (Lewis & Farris, 1996). Fifty-five percent of community colleges reported the number of students enrolled in developmental courses had increased from 1990 to 1995.

The same report revealed 41% of first-time community college freshmen enrolled in one or more remedial or college preparatory course. A report issued by the Institute of Higher Education Policy found a quarter of those enrolled in remedial courses were over the age of 30 (Woodhams, 1998). These reports clearly indicate remedial education makes up a significant portion of the curriculum at community colleges and affects a substantial number of its students.

National Center for Education Statistics (2004) tracked 1,992 12th-graders who enrolled in postsecondary education institutions between 1992 and 2000. Over 60% of students who first attended a public two-year community college and 25% who first attended a four-year institution completed at least one remedial course at the postsecondary level. The students who first attended public two-year community colleges were more likely to enroll in a remedial reading and in one or more remedial mathematics courses.

Age has been found to have a direct relationship with remedial placement as well as the completion of remediation (Windham, 1996). In Fall 1992, first-time freshmen in the Florida community college system were enrolled in a cohort to learn more about pre-college variables and the relationship they have with remediation. Older age groups, 25 years old and older, failed at least one section of the remedial placement exam more often than those 24 years of age and under. Students 25 years of age and older had an average failure rate of 81% compared to 55.7% for students 24 years of age and under. Failure rate was defined as failing one of three remedial subject areas on the remedial placement exam. The longer a first-time student was out of high school, the greater likelihood he or she would fail reading, writing and/or the mathematics portion of the exam. The

mathematics portion of the exam was the most commonly failed by all age groups. The study monitored the cohort for two years. After two years, remedial completion rates were analyzed. Students 24 years of age and older had a slightly higher completion rate at 63.26% compared to younger students at 63.18%. After four years, students in the older age group had a slightly better graduation rate at 20.77% compared to younger students with a graduation rate of 20.05%.

The breadth or number of remedial subject areas in which a student is placed has been found to predict persistence. Studies conducted at two- and four-year institutions have consistently found a relationship between persistence and college readiness (Zhao, 1999). College readiness was defined as a student's ability to perform college-level coursework based on placement test results. Students unprepared for college-level work, regardless of the post-secondary sector, were more likely to leave school prematurely (Boughan, 1998; Clagett, 1996; Lanni, 1997; Vorhees, 1993).

Adelman's (1996) examination of 2.5 million student transcripts revealed a student's need for remediation is inversely related to his or her likelihood of degree completion (p. 56). Fifty-five percent of those who took no remedial courses and 47% of students who took one remedial course earned a bachelor degree. Only 24% of those who took three or more remedial courses earned a bachelor degree.

Hoyt (1999) investigated the relationship between remedial education and student persistence rates as well. Data were collected from Utah Valley State College's freshman students in 1993, 1994, and 1995. The total student enrollment for these cohorts was tracked to determine how many dropped out by fall 1998. Results indicated that students' academic performance in the first term had a strong relationship with their persistence.

Twenty-one percent of the total cohort enrollment or 2,517 students required remedial education in two areas, and 11% required remedial education in three areas. The areas of remediation available to students at Utah Valley State College were reading, writing and mathematics. Of those who needed remediation, 44% were placed into remedial math courses, 34% needed remedial English and 12% needed remedial reading courses. Students taking remedial reading courses needed remediation in all three areas. Seventy-two percent of students who required remedial education in three areas eventually dropped out of the college. In other words, a positive relationship was found between students who needed remedial courses and academic achievement and persistence.

Utah Valley State College (UVSC), now known as Utah Valley University, was an urban community college that enrolled 18,174 students in Fall 1998. Historical data maintained by the college indicated that over half of the students dropped out of college and failed to earn a degree or transfer, and about half the entering freshmen required remedial education. Although many differences exist between Utah Valley University and the setting for the proposed research, Dyersburg State Community College, the remedial subject areas and course sequences are the same. Both colleges support an open admissions policy, utilize the ACT, SAT and ACT COMPASS Test to assign remedial courses to incoming students, and offer a remedial math, English, and reading sequence of courses to prepare students for college level coursework.

Racial minorities in Hoyt's study had high remedial placement rates at Utah Valley State. Sixty-two percent tested into remedial education, with 57% requiring remedial math, 51% needing remedial English and 26% needing remedial reading. Twenty-three percent of minorities needed remedial education in all three areas. When

the first-term GPA was weighted and remedial placement rates and other variables were controlled, minority status still significantly increased a student's chances of dropping out of college. For the cohorts from 1993 to 1995, 73 to 77% of minority students at Utah Valley State dropped out of college before completing their studies. Although these students had higher remedial education needs, Hoyt recognized other influences may have contributed to their early departure from college.

The subject area(s) where remediation is needed impacts student persistence as well. The National Center for Educational Statistics (2004) found the need for remedial reading is the most serious barrier to degree completion. The need for remedial reading was associated with more total remedial coursework and with lower rates of degree attainment than other remedial course patterns. Fifty-one percent of students who took a remedial reading course enrolled in four or more remedial courses compared with 31% of students who took a remedial mathematics courses. Adelman (1996) also found students required to take remedial reading were at high risk of needing remedial education in all three areas: English, mathematics and reading. Remediation needs for reading were higher among minorities, particularly for African Americans. Adelman argues the need for remedial assistance in reading is due to comprehensive literacy problems.

Remedial reading courses are the most detrimental to a student's college success, but more students are prescribed remedial mathematics assistance than any other subject area (Parsad, Lewis, & Greene, 2003). In Fall 2000, 22% of all first-time freshmen enrolled in both two- and four-year institutions were required to take a remedial mathematics course compared to 14% for writing and 11% for reading. The Community College Research Center conducted a large scale study in 2001 (Grubb & Gardner, 2001)

and found only 25% of students in community colleges who begin in a remedial math sequence successfully completed a college-level math course.

Bahr (2010) found the depth and breadth of a student's remedial needs was negatively correlated with persistence. Depth was defined as the number of courses in a subject area's remedial course sequence. For example, an institution may offer a three-course sequence in its remedial mathematics subject area. A student with a severe deficiency in mathematics may be required to take all three courses in the sequence. The depth of this student's remedial need would be greater than a peer required to take only one course in the mathematics sequence. Breadth was defined as the number of remedial subject areas a student is placed based on his or her ability to do college level coursework. Institutions like Utah Valley State offer remedial courses in three subject areas: mathematics, reading and writing. A student with remedial needs in three subject areas has a greater breadth of college preparatory demands than a student only placed into one subject area. Those who needed remediation the most are the least likely to persist, while those who require the least remediation are the most likely to persist.

Three years earlier, Bahr (2007) found poor English skills, especially reading skills, hampered the acquisition of other basic skills like mathematics. He monitored the academic progress of 55,530 remedial math students from 107 community colleges for a period of 6 years. The remedial math sequence included six courses. Students who placed into college-level English and had a remedial math course were placed in a group. Students placed in a remedial writing and math course, but had no remedial reading course, were placed in a group. Students who had a remedial reading, writing and math course were placed in a group. The study revealed the literacy gap narrowed at the high

end on the remedial math sequence and widened at the low end. This means students who tested in a remedial math course where demonstrated math skill was just below college-level mathematics had English or writing placement scores at a similar level. Only 4% of the remedial math students who tested at the high end of the math sequence were required to take a reading course. Students in this remedial math course who were also placed in college English had a .571 probability of reaching college mathematics. Students who placed at the lower end of the remedial mathematics and were also required to take a remedial writing and reading had a much lower probability of reaching college level math. A student enrolled in the lowest level of the mathematics sequence as well as remedial writing and reading had a .080 probability of reaching college-level mathematics. Twenty-six percent of the students in the study who tested into a remedial writing course also tested into the lowest mathematics course of the developmental sequence. Thirty-eight percent of the students in the study who tested in a remedial reading course also tested in the lowest mathematics course on the developmental sequence. Although English skills are important to persisting in developmental mathematics, a student who has poor math skills is still unlikely to reach college-level mathematics. For example, a student who tested into college English but placed in the lowest level of remedial math only had a 3.9% chance of reach college math.

Other studies found the more subject areas where remediation was needed, the greater likelihood of attrition. Weissman, Silk, and Bulakowski (1997) found that 69% of degree-seeking students who need remedial assistance only in math and 66% of those who only need remedial assistance only in writing successfully complete remediation requirements in two years. Fifty-three percent of students who needed both math and

writing assistance remediate in two years and only 33% who needed remediation in all three subject areas remediated. McCabe (2000) found 20% of community college students who require assistance in all three subject areas remediated in a six-year longitudinal study.

Bahr (2008) found students who effectively remediate mathematics exhibit long-term academic attainment comparable to those who did not need remedial assistance. Bahr looked at 85,894 first-time college freshmen enrolled in 107 community colleges. Students who completed a remedial math course and later a college-level math course had a .66 predicted probability of transferring from a community college to a four-year institution. Students who did not take a remedial math course and completed a college-level math course had a .65 predicted probability of transferring. The study also found disheartening news regarding students who failed to complete their prescribed math remediation. Students who failed to complete a remedial math course(s) had a .83 predicted probability of leaving college without a credential and not transferring. Students who were not required to take remedial math and failed to complete college level mathematics had a .73 predicted probability they would leave college without a credential and not transferring.

Studies on Persistence Using Career Counseling Tools

Wolfe and Johnson (1995) recognized that much variance on attrition was left unaccounted for by academic ability deficiencies. They then investigated other potential indicators of premature departure, particularly those witnessed by career counselors when providing academic and/or career interventions. Career counselors use a variety of instruments individually as well as in a group setting to provide college students an

opportunity for self-discovery. Past studies have used these instruments, like the Strong Interest Inventory and Myers Briggs Type Indicator, to understand personality types and ultimately predictors of attrition outside academic ability deficiencies.

Kahn, Nauta, Gailbreath, Tipps & Chartrand, (2002) performed a study utilizing four career instruments with the purpose of predicting important outcomes like academic achievement and persistence into the sophomore year after controlling established constructs of academic ability like grade point average and prescribed remedial courses. The participants of the study attended a southeastern university where first-time freshmen were enrolled in a transitions course that was commonly reserved for those placed into developmental studies courses. Two positive relationships with persistence were found that could be applicable to a non-traditional, community college student population. First, students who preferred working with others exhibited behaviors of persistence in college. For example, students would seek assistance from instructors and students when they encountered difficulties and initiate collaborative study efforts. These students were credited as being Social on the Strong Interest Inventory, an assessment with similar interpretations to Holland's (1997) *Theory of Vocational Personalities and Work Environments*. Second, students skilled in the interpretation of others' verbal communication may find the college environment a better fit because of the variety of lecture styles found among professors.

Two personality preferences could be a cause of concern for student attrition. Students who preferred practical learning environments and were less likely to work or deal with others may leave college earlier (Kahn et al., 2002). Second, students highly anxious about making career decisions were reluctant to commit to an academic major.

Such reluctance may limit the commitment students feel to college in general. The study's researchers commented that once attrition-prone students have been identified, career interventions may ease this group's transition into college and enhance their first-year experience. Bishop and Brenneman (1986) also found that students who were identified as attrition prone chose to continue in college after receiving career counseling. Kahn et al. (2002) went on to suggest it may be helpful to provide workshops to help students understand the limitations of a personality type and develop strategies for compensating that limitation.

Summary

The literature review provided information on student persistence and how a variety of influences can impact it. An attrition model commonly associated with community college students, a personality-vocation choice theory and research on college student persistence, especially in the community college sector, was reviewed for the chapter. The literature reviewed for this chapter helped the researcher select the quantitative analysis model and variables for the study. The methodology for the study will be explained in the next chapter.

The literature review has identified uncharted territory where research founded on theoretical literature is needed. The purpose of the study is to determine if the early intervention of a career exploration assessment can aid in the persistence of new, at-risk students at a community college. The results of this study will be beneficial to college personnel as they develop strategies to improve student persistence and graduation rates as well as assist the academically underprepared set academic and vocational goals.

Two theories prominent to the study are Bean and Metzner's (1985) *Model of Non-traditional Undergraduate Student Attrition* and John Holland's (1997) *Theory of Vocational Personalities and Work Environments*. Bean and Metzner's (1985) theory provides a definition for a nontraditional student closely resembling characteristics of community college students. The theory also introduces a series of variables influencing nontraditional student attrition. Four of the nine predictor variables used in the study are supported by this theory. Since the theory and definition were introduced 26 years ago, research on persistence is needed at the community college level to evaluate whether theory and definition are still relevant today.

John Holland's (1997) *Theory of Vocational Personalities and Work Environments* provides a conceptual understanding to the differences of academic and vocational interests among individual college students. Six personality types exist in the theory. Primary and secondary personality types derived from the theory were predictor variables. The theory justifies the use of the primary and secondary personality types as predictor variables. The application of this theory and its assignment of personality types to community college students have seen limited exposure in academic research. The study helped to bridge this gap.

Chapter 3: Methodology

This chapter outlines the specific procedures used to answer the question: “Do academically underprepared, first-time freshmen experience increased persistence and academic achievement due to the early intervention of a career exploration assessment?” The chapter also discusses the definitions, participants, setting, sampling research design, data collection and analysis procedures used to conduct this study.

Setting and Background

Dyersburg State Community College is an open admission, learning-centered institution that serves seven counties in west Tennessee and is the site selected for this study. The President of Dyersburg State Community College granted the researcher permission to use the name on the study site throughout the dissertation. Founded in 1969, Dyersburg State’s vision is to enhance the quality of life in west Tennessee by elevating the region’s educational attainment. The home campus is in Dyersburg, Tennessee and centers are located in Covington and Trenton.

Dyersburg State is accredited through the Southern Association of Colleges and Schools Commission on Colleges, Inc. (SACS COC) and permitted to award associate degrees. The College awards the Associate of Arts, Associate of Applied Science, and Associate of Science degrees as well as certificates. Students can choose from 23 academic concentrations for the Associate of Arts and Associate of Science degrees. There are 14 career program tracks for the Associate of Applied Science. Students can also choose from eight certificate options.

Enrollment for Dyersburg State in Fall 2010 was 3,749 students (DSCC, 2010). Nine-hundred and two were first-time, degree-seeking students. The median age for a

Dyersburg State student was 27 years old, and 39% of all students were 25 years of age and older. The racial demographics were as follows: African American 22.3%, American Indian 3.3%, Asian .5%, Caucasian 71.2%, Hispanic 1.6% and other 1.1%. Fifty-seven percent of students were first-generation. Females made up 70% of the student body and males 30%. Full-time and part-time student enrollment was almost evenly split at 49.7% for full time and 50.3% for part time. Based on American College Testing (ACT) or ACT Compass Placement Test scores, 70% of students were placed into one or more developmental studies subject areas: 65.5% into mathematics, 44.5% into reading and 45.5% into writing. Seventy percent of students were Pell Grant eligible.

All seven rural counties in the college's service area have a poverty level above the national average of 13.2%t in 2008 (United States Census Bureau [USCB], 2009b). The seven rural counties served in northwest Tennessee are Crockett, Dyer, Gibson, Lake, Lauderdale, Obion and Tipton. Six of the seven counties have a poverty level of about 17%; two of the six counties have a poverty level of 25% or greater (USCB, 2009a). Only an average of 14.6% of individuals in the service area have obtained an associate degree or higher. Degree attainment of an associate degree or higher in the region is below the 31.8% for Tennessee and 38.1% for the nation (National Center for Higher Education Management Systems [NCHEMS], 2009). Educational attainment has never been more important to the school's mission than it is now.

The Tennessee Higher Education Commission charged Dyersburg State Community College in its *Complete College Tennessee Act of 2010* to increase its fall-to-fall retention rate from 55.3% to 63.3% by 2015. This is doubly important because the state has created an outcomes-based funding formula that includes 11 variables with

varying weights equal to 100%. Six of the 11 variables and weights are pertinent to persistence: students accumulating 12 credit hours is weighted at 6%, students accumulating 24 credit hours is weighted at 7%, students accumulating 36 credit hours is weighted at 7%, associate degrees awarded is weighted at 10%, certificates awarded is weighted at 10% and remedial and developmental completion per student is weighted at 20%. Presently, the Tennessee Higher Education Commission (THEC) is phasing in the new funding formula as the basis of state support for its higher education institutions. State assistance will be exclusively determined by the formula beginning June 30, 2013. The population of academically underprepared students entering Dyersburg State and the urgency to increase persistence due to the new state funding formula justifies the focus for this study.

Population and Sample

A purposeful sampling technique was used in the study. The course, *ORN 1010 Orientation: Learning to Succeed*, is promoted to and typically enrolled in by first-time, academically underprepared freshmen at Dyersburg State Community College. Students who must enroll in two or more developmental studies subject areas are required to take *ORN 1010 Orientation: Learning to Succeed*. Students placed into *ORN 1010 Orientation: Learning to Succeed* are asked to take it their first semester of college. Since the study was designed to predict the persistence and academic achievement of first-year, academically underprepared students, the course provided an excellent source for purposeful sampling. Ten sections of *ORN 1010 Orientation: Learning to Succeed* in Fall 2010 were chosen as the sample for this study. All sections of *ORN 1010 Orientation: Learning to Succeed* from Fall 2009 were used as the study's population.

The participants in the study's sample shared nine similarities with one another. First, all were first-time students of Dyersburg State Community College in the Fall 2010 semester. Second, they declared the college's Dyersburg Campus as their primary site for instruction. Third, all were enrolled in the *ORN 1010 Orientation: Learning to Succeed* course during the Fall 2010 semester. Fourth, none took a career exploration assessment at Dyersburg State Community College. Fifth, all consented to participate in the study and completed a questionnaire. Sixth, all were degree-seeking students and an academic area of emphasis has been declared before the career exploration assessment was administered. Seventh, all took the career exploration assessment in the same controlled environment, which is a computer lab located on the Dyersburg Campus. Eighth, participants in the sample took the assessment during the first week of November 2010. The ninth and final similarity of participants was that all had a permanent residency in the same geographic service area of the college, which is considered rural and below the national poverty level (USCB, 2009a).

The participants of the study differ from one another based on pre-existing characteristics. Participants of the study ranged in age from 18 years of age to older. Given the age discrepancy, some participants have been out of a structured educational setting longer than others. Both males and females participated in the study. The self-described races of participants were African American, Caucasian, or Other. The racial category of Other was used because little representation from races outside African American and Caucasian existed at Dyersburg State as was referenced in the Setting and Background section. Participants represented 35 different programs of study or academic concentrations offered at Dyersburg State Community College. Each participant was

assigned a unique primary and secondary personality type after the career exploration assessment had been completed. The breadth and depth of prescribed developmental studies courses varied for each participant. Some had not completed or were not required to take development studies courses, while others were required to take developmental studies writing, mathematics and/or reading courses. A student's placement in a developmental studies course was determined by the score they received on the ACT or ACT Placement Test. The ACT was taken by participants younger than 21 years of age, while others completed the ACT Compass Placement Test as part of the admissions process. Some participants had parents or grandparents with prior post-secondary education experience. Other participants were first-generation college students.

The Institutional Review Board for the Protection of Human Subjects at the University of Memphis approved an exemption request to conduct this study on May 31, 2010 (approval form can be found in Appendix A). The study was also approved by the President and Vice President for the College at Dyersburg State Community College. The dissemination and collection of the consent form used for this sample is discussed in the Data Collection Procedures section in greater detail. A copy of the consent form is included in Appendix A.

Orientation: Learning to Succeed

ORN 1010 Orientation: Learning to Succeed is a course recommended to all Dyersburg State Community College students and is designed to orient those enrolled to a variety of strategies and techniques necessary to learn and succeed in the college setting. Topics covered include note-taking, studying, reading textbooks, test-taking, memory techniques, learning styles, goal setting, stress and time management, campus

resources, communication skills, critical thinking skills, and career choices. Students who place into two or more developmental studies subject areas are required to take the learning strategies course. The learning strategies course was developed so students could acquire and develop study skills. The primary purpose of *ORN 1010 Orientation: Learning to Succeed* is to produce college graduates by retaining at-risk students. The course also counts as three hours of college credit elective. This course served as a means of locating students for the sample and provided the setting for data collection.

Research Questions and Hypotheses

The study seeks to answer one primary research question:

1. Do academically underprepared, first-time freshmen experience increased persistence and academic achievement due to the early intervention of a career exploration assessment?

Six null hypotheses were identified to support the study's research question. The six null hypotheses are:

HO1: The early intervention of a career exploration assessment will have no impact on first-year student persistence in a study of fall-to-fall semester enrollment at Dyersburg State Community College.

HO2: A student's pre-existing characteristics (gender, race, parent's education level, enrollment status, age and personality types) and level of academic preparedness (number of prescribed developmental studies courses in mathematics, reading and writing) will have no impact on first-year student persistence in a study of fall-to-fall semester enrollment at Dyersburg State Community College.

HO3: The early intervention of a career exploration assessment will have no impact on first-year student academic achievement (grade point average) in a study of fall-to-fall semester enrollment at Dyersburg State Community College.

HO4: A student's pre-existing characteristics (gender, race, parent's education level, enrollment status, age and personality types) and level of academic preparedness (number of prescribed developmental studies courses in mathematics, reading and writing) will have no impact on first-year student academic achievement (grade point average) in a study of fall-to-fall semester enrollment at Dyersburg State Community College.

HO5: Students at Dyersburg State Community College with continuous, active enrollment status from fall-to-fall demonstrate no relationship between Holland personality types and academic achievement (grade point average).

HO6: The frequency of occurrence for the six Holland personality types is the same for students at Dyersburg State Community College with continuous, active enrollment status from fall-to-fall compared to those no longer enrolled.

Instruments

Three instruments were used to collect data for the study: the questionnaire, an Internet-based career assessment called *The Career Key* and Sungard's Banner data system.

The questionnaire was used to collect the initial data for each participant. It consists of eight items designed to identify the pre-existing characteristics of study participants. A copy of the questionnaire is included in Appendix B. The pre-existing characteristics retrieved from each participant were gender, race, parent's education level,

enrollment status, age and personality type. These characteristics were selected because of the abundance of research supporting their use in a study on student persistence.

Definitions and coding details for all variables are provided in the next section.

Six post-secondary education professionals, five internal and one external, established construct validity for the questionnaire: Assistant Vice President of Academic and Student Affairs, Coordinator for Orientation: Learning to Succeed, Director of Financial Aid, Computer Programmer/Analyst, President of Student Government Association and a Professor of Educational Psychology from an external four-year regional university. Construct validity refers to the degree to which inferences can legitimately be made from the operations in the study to the theoretical constructs on which those operations were based (Trochim, 2006). Each of the individuals were selected because of his or her specific affiliation to the population and how that affiliation applied to the information each question was designed to extract. It was important to receive approval from each individual so inferences made on the questionnaire are interpreted appropriately by the participants. To ensure reliability, data checks were made by cross-referencing responses to the questionnaire items with the college's Enterprise Resource Planning software Sungard Banner. The principal investigator had access to the Banner system where data checks were made. The participant's name and Student ID number were entered into the Banner system. A web link in the system provided the investigator access to participant information where cross referencing was done. Data in the system found to be accurate with the questionnaire responses was deemed reliable and used for analysis. More information on the Banner system will be discussed later in this section.

Participants completed a career exploration assessment called *The Career Key* in a reserved computer lab on the Dyersburg Campus. The assessment was administered by the researcher. The product of *The Career Key* was a primary and secondary personality type. The personality types generated from the assessment were used to answer question eight on the questionnaire and serve as predictor variables for the multiple regression equation. *The Career Key* is based on John Holland's *Theory of Vocational Personalities and Work Environments* (Jones, 2011). The same person-environment codes found in Holland's theory are used in *The Career Key*. *The Career Key* was first published in 1987 and became web based in 1997. The career assessment is advertised to take 10 to 15 minutes to complete and has 31 multiple choice questions on seven different web pages. The Internet-based career assessment has been found to be statistically reliable and valid (Levinson, Zeman, & Ohler, 2002). Test-retest reliability ranged between .75 and .84. All concurrent validity coefficients were at or above .65. Jones, Gorman, and Schroeder (1989) compared the validity of *The Career Key* with Holland's *Self Directed Search* (SDS); no differences were found.

The third instrument used in the study is Dyersburg State Community College's Enterprise Resource Planning software, Sungard Banner. Banner was used to cross reference the accuracy of questionnaire responses and track the predictor variables throughout the life of the study. The data in Banner are collected and recorded by a centralized unit, the Office of Admissions and Records. Procedures designed to minimize data entry errors in Banner add reliability to the instrument. For example, all admissions applications and change of information forms are entered into the Banner system by three specialists. This is the primary duty of the three specialists. Each was trained by the

Assistant Director of Admissions and Records and received continuous Banner training from Sungard and the Assistant Director of Admissions and Records. The format and fields in which data were entered and viewed in Banner is restricted to add accuracy and consistency to information housed in the Banner system.

Variables Considered

A regression equation consisting of nine variables (Xs) tried to predict two criterion variables (Ys) in the second and fourth hypotheses. The nine predictor variables were gender, race, age, primary and secondary personality types, number of prescribed developmental math courses, number of prescribed developmental English courses, number of prescribed developmental reading courses and parent's educational experience. The two criterion or dependent variables were persistence and academic achievement. Persistence was defined as fall-to-fall continuous, active enrollment. Academic achievement was defined as the cumulative grade point average.

Gender was defined as male or female and each participant identified the gender they associate with on the questionnaire. Males were coded as 0 and females coded as 1.

Enrollment status was defined by the number of academic credit hours a student takes at the beginning of the semester. Based on the number of credit hours taken in Fall 2010, the principal investigator divided participants into two discrete groups: full-time or less-than-full-time status. Full-time students were those enrolled in 12 credit hours or more in the Fall 2010 term. Those students were coded with a 0. Less-than-full-time students were those enrolled in fewer than 12 credit hours. Students with less-than-full-time status were coded with a 1.

For age, the study coded and defined participants who were between the ages of 18 to 24 with a 0. Participants 25 years of age and older were defined and coded with a 1. The previously stated age ranges for these two groups differ from the definitions used in Dyersburg State Community College's *Fall 2010 Enrollment Report*. *The Fall 2010 Enrollment Report* classifies traditional-aged students as being 18 to 20 years of age. The Report classifies non-traditional-aged students as being 21 years of age and older. The College's definition was not chosen because non-traditional aged students were widely defined as being 25 years of age and older in post-secondary education. The non-traditional-aged student was defined in this way by Bean and Metzger (1985).

Race for each participant was self-identified on the questionnaire. The study used African Americans and Caucasian, but combined all other races into an Others category. The percentage of students who are not African American or Caucasian was quite small at Dyersburg State Community College based on the institution's *Fall 2010 Enrollment Report* (DSCC, 2010). The student population at Dyersburg State Community College had a racial representation of 22.35% African American and 71.2% Caucasian. The remaining 6.5% were mixed between Asian, Hispanic and Native American with no particular race significantly greater than the others. Few students participated in the study from races other than African American and Caucasian and therefore were grouped into an Others category. African Americans were coded with a 0, Others as 1 and Caucasians as 2.

Personality Types were defined by John Holland's (1997) *Theory of Vocational Personalities and Work Environments* and a product of *The Career Key* assessment. The six personality types are *Realistic, Investigative, Artistic, Social, Enterprising,* and

Conventional. Once the assessment was completed, the primary and secondary personality type for each participant was revealed. The personality types were the product of the career exploration assessment. *Realistic* was coded as 1; *Investigative* was coded as 2; *Artistic* was coded as 3; *Social* was coded as 4; *Enterprising* was coded as 5; and *Conventional* was coded as 6.

Academically underprepared students must take a developmental studies mathematics course(s) to equip them with the cognitive knowledge necessary to be successful in college-level mathematics courses. Dyersburg State Community College offers three development studies mathematics courses: Pre-algebra, Basic Algebra and Intermediate Algebra, in that order. Students placed in Pre-algebra are required to take three developmental studies mathematics courses. Students placed in Basic Algebra are required to take two developmental studies mathematics courses. Students placed in Intermediate Algebra are required to take one developmental studies mathematics courses. The coding for developmental studies mathematics courses was based on the number of courses required. For example, a participant required to take three developmental studies mathematics courses or begin with Pre-algebra was coded with a 3. A participant required to take two developmental studies mathematics courses or begin with Basic Algebra was coded with a 2. A participant required to take one developmental studies mathematics course or begin with Intermediate Algebra was coded with a 1. A participant not required to take any developmental studies mathematics courses was coded with a 0.

Academically underprepared students are required to take developmental studies writing course(s) to equip them with the cognitive knowledge necessary to be successful

in college-level English courses. Dyersburg State Community College offers two development studies writing courses: Basic Writing and Developmental Writing. Students placed in Basic Writing are required to take two developmental studies writing courses. Students placed in Developmental Writing are required to take one developmental studies English course. The coding for developmental studies English courses was based on the number of courses required. For example, a participant required to take two developmental studies writing courses or begin with Basic Writing was coded with a 2. A participant required to take one developmental studies writing course or begin with Developmental Writing was coded with a 1. A participant not required to take any developmental studies writing courses was coded with a 0.

Academically underprepared students are required to take a developmental studies reading course(s) to equip them with the cognitive knowledge necessary to be successful in college-level general education courses. A student's test score on the ACT or ACT Compass Placement Test determines whether a student begins his or her collegiate career in developmental studies courses. Dyersburg State Community College offers two development studies reading courses: Reading and Learning and Developmental Reading Improvement. Students placed in Reading and Learning are required to take two developmental studies reading courses. Students placed in Developmental Reading Improvement are required to take one developmental studies reading course. The coding for developmental studies reading courses was based on the number of courses required. For example, a participant who is required to take two developmental studies reading courses or begin with Reading and Learning was coded with a 2. A participant required to take one developmental studies reading course or begin with Development Reading

Improvement was coded with a 1. A participant not required to take any developmental studies reading courses was coded with a 0.

Parent's level of education was defined as the level of educational experience of the parent(s). The term was self-identified by the participant on the questionnaire.

Dyersburg State Community College's application for admissions does not request this information from its applicants, therefore the questionnaire was essential in coding this variable properly for each participant. A participant whose parent(s) or grandparent(s) attended a post-secondary institution prior to the Fall 2010 semester is considered a second-generation college student. A participant is a first-generation college student if he/she did not have a parent or grandparent who attended a post-secondary institution prior to the Fall 2010 semester. Attendance at a post-secondary institution is considered anything past a high school education such as a technical or trade school, college or university. Parent's level of education was divided and coded in two categories: first-generation and second-generation college students. A first-generation participant was coded as 0. A participant whom had a parent or grandparent who attended a post-secondary institution prior to the Fall 2010 semester was coded as 1.

Data Collection Procedures

The data collection process began on Monday, November 1, 2010 and ended Friday, November 5, 2010. The study concluded the 14th day of the Fall 2011 term or September 14, 2011. The Director of Advising Centers and Career Services for Dyersburg State Community College served as the principal investigator for this study. The principal investigator collaborated with the Coordinator of *ORN 1010 Orientation: Learning to Succeed* to speak with 10 different sections of *ORN 1010 Orientation:*

Learning to Succeed. The sections were chosen because they were offered during the normal business hours of the college and located on the Dyersburg Campus. The Director reserved a computer lab on the Dyersburg Campus of Dyersburg State Community College to meet with students in all 10 sections.

The Director met with students in 10 sections of *ORN 1010 Orientation: Learning to Succeed* during the Fall 2010 semester. The purpose of the Director's meeting with students in these 10 sections was to speak about the importance of academic and career planning to academically underprepared, first-time students. He discussed with students the importance of establishing sound academic and vocational goals early in college and basing those goals on personal interests and occupational sustainability. The Director introduced a career exploration assessment called *The Career Key* as part of his presentation to students. The assessment aids students in identifying their vocational options based on their personality types. The consent form and questionnaire disbursement followed the Director's opening remarks about the importance of establishing academic and career goals.

The purpose of the consent form and study was verbally explained to each class thoroughly. The academic abilities of students who enrolled in *ORN 1010 Orientation: Learning to Succeed* varied. Students who participated in the study were asked to read the consent form carefully. The investigator informed students in each section that although he would have access to personally identifiable information, it would only be used to coordinate data across sources and then would be eliminated, thereby assuring the anonymity for each participant. Consent forms required a participant's signature, date of participation and a mark indicating their willingness or unwillingness to participate. A

student who felt uncomfortable participating in the study for whatever reason was encouraged to not sign the consent form. Students were given up to 10 minutes. A copy of the consent form is included in Appendix A.

The questionnaire was given to those who chose to proceed with the study. A questionnaire was not given to those who refused to participate. The opportunity to take the career exploration assessment was made available regardless of whether a student chose to participate in the study. The principal investigator verbally explained the instructions and purpose of the questionnaire to the study's participants. Participants were asked to complete the first seven questions. The first seven questions were designed to collect pre-existing predictor variables: gender, race, parent's education level, enrollment status, age. Once the first seven items of the questionnaire were answered, participants were asked to temporarily put away the questionnaire until the career exploration assessment had been completed. The investigator encouraged participants to raise their hands if uncertain about the meaning or appropriate response to a question. The principal investigator took a direct, thorough approach to collecting questionnaire data because the academic abilities of participants enrolled in the *ORN 1010 Orientation: Learning to Succeed* sections vary. The investigator did not assume everyone understood how to complete a questionnaire. A copy of the questionnaire is included in Appendix B.

Students were asked to boot up and log into the computer facing them once the first seven questions of the questionnaire were answered. The career exploration assessment is completely computerized and online. The website <http://www.collegefortn.org> offers a career assessment based on Holland's theory called

The Career Key. Jones (2011) *The Career Key* is explained more thoroughly in the Instruments section.

The Director used a computer and projector to guide the class to the website where the assessment is housed. Each participant was required to create an electronic account with the website before the assessment could be taken. The account creation took 10 minutes from computer boot up to a username and password being assigned to the student. The assessment took 20-30 minutes for participants to complete. The assessment contained 31 items total. Each participant was asked to mark the best response for each statement. The questions were multiple choice, with no right or wrong answers. At the conclusion of the assessment, a primary and secondary personality type pattern were produced by the program for each participant. The personality types were based on the responses that participants indicated for each item on the assessment.

Once personality types were assigned to each participant, each participant wrote the appropriate response on question eight of the questionnaire and passed all questionnaires, row-by-row, to the right of the computer lab. The entire process of explaining the consent form and questionnaire, proctoring the career exploration assessment and collecting the forms took 45 minutes. The consent forms and questionnaires were stored in a lockable filing cabinet, each in separate doors of the filing cabinet. The principal investigator was the only person with access to the file cabinet. Once the forms and questionnaires from all 10 sections were collected, the researcher recorded the collected data into a Microsoft Excel spreadsheet.

The Microsoft Excel spreadsheet included the questionnaire responses for each participant. The responses for each participant were recorded in the order they appeared

on the questionnaire. Twenty-two columns ran from left to right on top of the spreadsheet. The spreadsheet had 187 rows: one row for the column headings and 186 rows for each participant of the study. The first column contained the Dyersburg State student identification number for each participant. This column was the only one that contained information not taken from the questionnaire responses. The second column contained the first and last name of each participant. Although student identification numbers and names were personally identifiable information, this information will not be shared or used in the data analysis and findings of this study. It was used for two reasons: to validate the data entered for each participant and track each participant's activity for the life of the study.

The remaining columns of the spreadsheet included, from left to right, each participant's response to the questionnaire items. The third column included the gender for each participant. The fourth column contained the racial category for each participant. The fifth column contained the level of college experience for each participant's parents. The sixth column contained the enrollment status for each participant. The seventh column contained the age for each participant. The eighth and ninth columns contained the primary and secondary personality type patterns for each participant. Column 10 contained the grade point average for each participant in the Fall 2010 term. Column 11 contained the grade earned for each participant in *ORN 1010 Orientation: Learning to Succeed* class where the assessment was given. Column 12 contained the hours attempted in the Fall 2010 term for each participant. Column 13 contained the hours completed in the Fall 2010 term for each participant. Column 14 contained the enrollment status for the Spring 2011 term for each participant. Column

15 contained the grade point average for each participant in the Spring 2011 term. Column 16 contained the hours attempted in the Spring 2011 term for each participant. Column 17 contained the hours completed in the Spring 2011 term for each participant. Column 18 contained the enrollment status for the Summer 2011 term for each participant. Column 19 contained the grade point average for each participant in the Summer 2011 term. Column 20 contained the hours attempted in the Summer 2011 term for each participant. Column 21 contained the hours completed in the Summer 2011 term for each participant. Column 22 contained the enrollment status for the Fall 2011 term for each participant.

Data Analysis and Research Design

A descriptive, correlation design was chosen for this study. The design was chosen because the study sought to identify characteristics for a particular group, first-time, and at-risk students. The design helped determine whether a current practice or treatment is capable of predicting persistence and academic achievement.

A one-sample *t*-test was used to analyze the first and third hypotheses. A one sample *t*-test was chosen because it compares the sample mean to the previous year's population mean. The previous year's population mean was considered the standard or normal mean. The means for academic achievement and persistence for students enrolled in the 10 participating sections were compared to the previous year's mean. Goodness-of-fit test was to be used to test normal distribution. The test measures the discrepancy of the observed values and the expected values.

A binary logistic regression model with a backward stepwise design was used to test hypothesis two of the study. Logistic regression was chosen to learn more about the

relationship between the ordinal and categorical independent variables and the dichotomous criterion variable. Logistic regression makes no assumption about the normal distribution, linear relationship and equal variance of variables. Variables were placed into the regression model using an enter method. A backward stepwise design was chosen because it is uncertain which predictor variables have a relationship with the criterion variables. Backward stepwise design includes all variables and removes those that contribute least from the regression equation.

A multiple linear regression model with a backward stepwise design was used to test hypothesis four of the study. Multiple regression was chosen to learn more about the relationship between independent variables and the criterion variable. A backward stepwise design was also chosen for hypothesis four. Normal distribution is commonly tested in regression analysis by using R^2 or the coefficient of determination. The coefficient of determination tests whether shared variance on the regression line fits the data.

Nine predictor variables (Xs) and two criterion variables (Ys) comprised the regression equations to find if the career exploration assessment impacted participant persistence and academic achievement. The predictor variables were gender, race, age, primary and secondary personality types, number of prescribed developmental studies math courses, number of prescribed developmental studies writing courses, number of prescribed developmental studies reading courses and parent's education level. The dependent or criterion variables were persistence and academic achievement.

Eta coefficient was used to analyze hypothesis five. Eta was chosen to test the relationship between the primary personality types among fall-to-fall persisters and the

academic achievement (grade point average) of those persisters. The primary personality types were categorical data types and served as the independent variable. Grade point averages were interval data type and served as the dependent variable. The calculated Eta gave the strength of relationship between the variables. Eta^2 gave the percent of variance in the dependent variable explained by the independent variable. A strong relationship has an Eta value closer to 1 and a weaker association has a value closer to 0.

A two-way chi-square distribution was used to test the sixth hypothesis. A two-way chi-square was chosen because the hypothesis compared two categorical data predictor variables: persisters and those who failed to enroll in Fall 2011. This type of analysis allowed the principal investigator to analyze the expected frequency of occurrence for the six Holland personality types among the two groups and test the null hypothesis. Five degrees of freedom were associated with the test by multiplying the number of rows (persisters and those who failed to persist) minus one by the number of columns (six Holland personality types) minus one. It is unknown if any of the personality types occur more frequently in the persisters compared to those who failed to enroll in Fall 2011.

Summary

This chapter identified the research question and hypotheses to be tested, variables considered, participants, setting, sampling procedure research design, data collection and analysis procedures used to conduct this study. The study sought to find if academically underprepared, first-time freshmen experienced increased persistence and academic achievement due to the early intervention of a career exploration assessment. The identification of six hypotheses helped to answer that question. The setting was

Dyersburg State Community College. Purposeful sampling of first-time, at-risk students were found in the transitions course *ORN 1010 Orientation: Learning to Succeed*. Nine variables were used to create a multiple and logistic regression equation used for hypotheses two and four. A one-sample t-test was used to answer hypotheses one and three. Eta coefficient was the analysis technique used to test hypothesis 5. Two-way chi-square was utilized to analyze hypothesis six. The six personality types of Holland's *Theory of Vocational Personalities and Work Environments* (1997) were the variables used for the equation. Exempt status to conduct this study was received from the Institutional Review Board at the University of Memphis.

Chapter 4: Results

Introduction

This chapter presents the results of the statistical analyses for the study. A presentation of descriptive statistics, reliability coefficients, correlations and regression analysis are found in the chapter. The study examined the influence on persistence and academic achievement (grade point average) from Fall 2010 to Fall 2011 by nine independent variables for first-time, academically underprepared students. The first section introduces the sample and population. Descriptive statistics profile the sample. The next sections interpret the statistical findings for the six hypotheses used to support the study's research question. Tables accompany the interpretations to provide reference. A summary of the findings concludes the chapter.

Participants

The descriptive statistics for the sample and population are found in Table 1. Data for the population and institution are compared to the study sample. Comparisons can be made in seven of the nine independent variables found in the study. The population was not assessed on parent's level of education and the Holland personality types.

The sample contained a greater percentage of males (42.5%) compared to the population (32.8%) and the college (30%). African Americans had greater representation in the sample, 36.5%, and population, 38.9%, than at the college, 22.3%. First-generation students made up 71.9% of the sample. Parent's education level was not assessed for the population, but the college's first-generation student enrollment was 57%. Enrollment status was the most consistent characteristic of the sample. Over 86% of the sample carried 12 credit hours or greater in Fall 2010. The population was slightly lower with

76.6%. Both the sample and population were higher than the college's 49.7%. Non-traditional-aged students enrolled at the college, 39%, was higher than the sample, 21%, and population, 31.5%.

Table 1 also provides frequency data on the other variables included in the study. Table 2 offers the variable codes, mean and standard deviation for the sample once the variables were coded for each participant and analysis was run.

Table 1
Frequency of Distribution Variables for Sample and Population

	Sample N=181	ORN 1010 Population N=542
Variable	Frequency (Percentage)	Frequency (Percentage)
Gender		
Males	77 (42.5)	178 (32.8)
Females	104 (57.5)	364 (67.2)
Total	181 (100)	542 (100)
Race		
African American	66 (36.5)	211 (38.9)
Others	10 (5.5)	38 (7)
Caucasian	105 (58)	293 (54.1)
Total	181 (100)	542 (100)
Parent's Education Level		
First Generation	130 (71.9)	N.A.
Table 4.1 Frequency of Distribution Variables for Sample and Population (continued)		
≥ Second Generation	51 (28.1)	N.A.
Total	181 (100)	N.A.
Enrollment Status		
Full time	156 (86.2)	415 (76.6)
Less than full time	25 (13.8)	127 (23.4)
Total	181 (100)	100
Age		
18-24 years of age	143 (79)	371 (68.5)
25 years of age or older	38 (21)	171 (31.5)
Total	181 (100)	100

Table 1 (Continued)		
Variable	Frequency (Percentage)	Frequency (Percentage)
Primary Personality Type		
Realistic	43 (23.8)	N.A.
Investigative	16 (8.8)	N.A.
Artistic	15 (8.3)	N.A.
Social	58 (32)	N.A.
Enterprising	30 (16.6)	N.A.
Conventional	19 (10.5)	N.A.
Total	181 (100)	N.A.
Secondary Personality Type		
Realistic	38 (21)	N.A.
Investigative	22 (12.2)	N.A.
Artistic	16 (8.8)	N.A.
Social	44 (24.3)	N.A.
Enterprising	26 (14.4)	N.A.
Conventional	35 (19.3)	N.A.
Total	181 (100)	N.A.
Developmental Studies Math		
Placed in three courses	37 (20.4)	109 (20.1)
Placed in two courses	76 (42)	237 (43.7)
Placed in one course	48 (26.5)	102 (18.9)
Placed in no course	20 (11.1)	94 (17.3)
Total	181 (100)	542 (100)
Developmental Studies Reading		
Placed in two courses	8 (4.5)	20 (3.7)
Placed in one course	100 (55.2)	278 (51.3)
Placed in no course	73 (40.3)	244 (45)
Total	181 (100)	542 (100)
Developmental Studies Writing		
Placed in two courses	58 (32)	150 (27.7)
Placed in one course	76 (42)	245 (45.2)
Placed in no course	47 (26)	147 (27.1)
Total	181 (100)	542 (100)
Persistence _ Fall-to-Fall		
Yes	110 (60.7)	260 (48)
No	71 (39.3)	282 (52)
Total	181 (100)	542

Table 1 (continued)		
Variable	Frequency (Percentage)	Frequency (Percentage)
Grade Point Average		
0.0 – 0.59	13 (7.1)	58 (10.7)
0.6 – 1.09	8 (4.5)	34 (6.3)
1.1 – 1.59	15 (8.3)	70 (12.9)
1.6 – 2.09	23 (12.7)	80 (14.8)
2.1 – 2.59	40 (22.1)	109 (20.1)
2.6 – 3.09	38 (21)	102 (18.8)
3.1 – 3.59	30 (16.6)	60 (11)
3.6 – 4.0	14 (7.7)	29 (5.4)
Total	181 (100)	542 (100)

Table 2
Descriptive Statistics for Sample: Codes Applied

Variable	Codes	Mean	Standard Deviation
Gender	Male = 0 Female = 1	.57	.49
Race	African America = 0 Other = 1 Caucasian = 2	1.21	.95
Parent's Education Level	First generation = 0 Parent/Grandparent attended in past = 1	.28	.45
Enrollment Status	Full time = 0 Less than full time = 1	.13	.34
Age	Traditional = 0 Non-traditional = 1	.20	.40
Primary Personality Type	Realistic = 0 Investigative = 1 Artistic = 2 Social = 3 Enterprising = 4 Conventional = 5	2.40	1.67
Secondary Personality Type	Realistic = 0 Investigative = 1 Artistic = 2 Social = 3 Enterprising = 4 Conventional = 5	2.56	1.79

Table 2 (Continued)			
Variable	Codes	Mean	Standard Deviation
Developmental Studies Math	Three required courses = 3 Two required courses = 2 One required course = 1 No required course = 0	1.71	.91
Developmental Studies Reading	Two required courses = 2 One required course = 1 No required course = 0	.64	.56
Developmental Studies Writing	Two required courses = 2 One required course = 1 No required course = 0	1.06	.76
Persistence Fall-to-Fall		.60	.48
Grade Point Average		2.37	.96

Results from Hypothesis 1

Hypothesis 1 stated the early intervention of a career exploration assessment will have no impact on first-year student persistence in a study of fall-to-fall semester enrollment at Dyersburg State Community College. Table 3 provides the descriptive statistics for the sample and population means. Table 4 provides the inferential statistics for the one-sample *t*-test.

Annual persistence of the sample was 60.7%. Annual persistence for the population was 47.8%. The positive mean difference shows the sample persisted at a rate of 12.9% more than the population. The first null hypothesis was rejected at a .05 alpha

level. The test produced the following statistical test result: $t(180) = 3.546$, $p = .000$.

Skewness, which measures symmetry of the normal curve, and kurtosis, which measures the peak of the normal curve, were used to define the parameters of normal distribution in Table 4.3. Bulmer (1979) said skewness between $-.5$ and $+.5$ is approximately symmetric. The skewness for the sample was $-.44$ and there were slightly more data points left of the normal curve. The kurtosis shape was platykurtic at -1.82 . Cohen's d was used to measure the effect size. The effect size measures the magnitude of the relationship as it pertains to the population. The effect size according to Hinkle et al. (2003) was small at $.263$.

Table 3

Hypothesis 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Sample	181	.00	1.00	.6077	.48961	-.445	.181	-1.822	.359
Population	541	.00	1.00	.4787	.50001	.085	.105	-2.000	.210

Table 4

Hypothesis 1: One-Sample Test

	Test Value = .4787					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Sample	3.546	180	.000	.12903	.0572	.2008

Results from Hypothesis 2

Hypothesis 2 stated that students pre-existing characteristics (gender, race, parent's education level, enrollment status, age and personality types) and level of academic preparedness (number of prescribed developmental studies courses in mathematics, reading and writing) will have no impact on first-year student persistence in a study of fall-to-fall semester enrollment at Dyersburg State Community College. Tables 5 through 8 provide statistical output for the hypothesis. The omnibus test of model coefficients is located in Table 5. The model summary table is located in Table 6. The classification table is located in Table 7. The variables in the equation table are located in Table 8.

The Omnibus test in Table 5 shows the regression model was statistically significant at .000, which means it was able to predict those who persisted versus those who failed to persist. The Classification Table found in Table 7 evaluates the predictive accuracy of the logistic regression model. Of the 71 students who failed to persist in Fall 2011, the model correctly classified 43 students as not likely to have persisted. Similarly, of the 110 that persisted to the Fall 2011 semester, the model correctly classified 90 students as likely to persist. Overall, the model correctly classified 73.5% of participants belonging to the appropriate group, persisters or those who failed to persist. In Table 6, the Nagelkerke R Square was used to measure the amount of variability in the dependent variable that can be accounted for by the independent variables in the regression equation. The Nagelkerke R Square found that 38.1% of the dependent variable's variance can be attributed to the independent variables, which is small according to Hinkle et al. (2003). In Table 8, four independent variables had statistically significant

predictability of persistence once the backward stepwise regression was completed: gender (1) was .012, race (1) was .000, primary personality type (4) was .015 and developmental studies reading placement was .032. Females Caucasians with a Social primary personality type and no developmental studies reading course needs were more likely to persist from Fall 2010 to Fall 2011. The regression equation for hypothesis 6 is $z = -0.99 (\text{Gender } 1) - 1.51 (\text{Race } 1) + 1.64 (\text{Primary Personality Type } 4) - 0.72 (\text{Developmental Studies Reading})$. Based on the four statistically significant variables in Table 8, the second null hypothesis was rejected.

Table 5
Hypothesis 2: Omnibus Tests of Model Coefficients

	Chi-square	Df	Sig.
Step	.712	1	.399
Block	49.522	11	.000
Model	49.522	11	.000

Table 6
Hypothesis 2: Model Summary

Nagelkerke R Square
.381

Table 7
Hypothesis 2: Classification Table

	Observed	Predicted		
		Persist		Percentage Correct
		No	Yes	
Persist	No	43	28	60.6
	Yes	20	90	81.8
Overall Percentage				73.5

Table 8
Hypothesis 2: Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp(B)
Gender(1)	-.999	.396	6.352	1	.012	.368
Race(1)	-1.519	.426	12.705	1	.000	.219
Race(2)	-1.161	.776	2.240	1	.134	.313
EnrollmentStatus(1)	.911	.537	2.876	1	.090	2.487
Age(1)	-.868	.492	3.117	1	.077	.420
PrimaryPersonality Type(1)	.241	.686	.123	1	.726	1.272
PrimaryPersonality Type(2)	1.389	.819	2.878	1	.090	4.012
PrimaryPersonality Type(3)	1.305	.902	2.094	1	.148	3.687
PrimaryPersonality Type(4)	1.641	.672	5.960	1	.015	5.162
PrimaryPersonality Type(5)	1.042	.721	2.089	1	.148	2.835
Developmental Studies Reading	-.721	.336	4.610	1	.032	.486
Constant	1.006	.756	1.771	1	.183	2.734

Results from Hypothesis 3

Hypothesis 3 stated the early intervention of a career exploration assessment will have no impact on first-year student academic achievement (grade point average) in a study of fall-to-fall semester enrollment at Dyersburg State Community College. Table 9 provides the descriptive statistics for the sample and population means. Table 10 provides the inferential statistics one-sample *t*-test.

In Table 9, the academic achievement (grade point average) mean for the sample was 2.37. The academic achievement (grade point average) mean for the population was 2.08. The positive mean difference shows the academic achievement for the sample increased .29 GPA points more than the population. The test produced the following statistical test result: $t(180) = 4.162, p = .000$. Skewness, which measures symmetry of the normal curve, and kurtosis, which measures the peak of the normal curve, was used to define the parameters of normal distribution in Table 9. Bulmer (1979) said skewness between -1.0 and -.5 was moderately skewed. The skewness for the sample was -.678 and more data points were to the left of the normal curve. The kurtosis shape was platykurtic at -.053. Cohen's d was used to measure the effect size. The effect size measures the magnitude of the relationship as it pertains to the population. The effect size according to Hinkle et al. (2003) was small at .30. The third null hypothesis was rejected at a .05 alpha level.

Table 9
Hypothesis 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Sample	181	.00	4.00	2.3775	.96153	-.678	.181	-.053	.359
Population	541	.00	4.00	2.0808	1.03480	-.463	.105	-.512	.210

Table 10

Hypothesis 3: One-Sample Test

	Test Value = 2.080					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Sample	4.162	180	.000	.29746	.1564	.4385

Results from Hypothesis 4

Hypothesis 4 stated a student’s pre-existing characteristics (gender, race, parent’s education level, enrollment status, age and personality types) and level of academic preparedness (number of prescribed developmental studies courses in mathematics, reading and writing) will have no impact on first-year student academic achievement (grade point average) in a study of fall-to-fall semester enrollment at Dyersburg State Community College. Tables 11 to 14 provide statistical output for the hypothesis. The regression model summary is located in Table 11. The analysis of variance table is located in Table 12. The coefficients table is located in Table 13. The excluded variables table is located in Table 14.

In Table 13, it is clear that five independent variables had statistically significant predictability of academic achievement once the backward stepwise regression was complete: age, race, gender, developmental studies reading placement and enrollment status had a statistical significance of .000. Female Caucasians between the ages of 18 to 24 who were enrolled full time with no required developmental studies reading courses demonstrated greater academic achievement from Fall 2010 to Fall 2011. Collinearity statistics measure whether there is a near perfect linear relationship among some or all of the independent variables in a regression model. Multicollinearity does not appear to be a

problem in the analysis based on the collinearity statistics of tolerance (TOL) and variance inflation factor (VIF) in Table 13 according to O'Brien (2007). The TOL values are .897, .900, .924, .927, .966 and the VIF values are 1.035, 1.079, 1.082, 1.112 and 1.114. Table 14 contains the variables with no statistical significance in predicting academic achievement from Fall 2010 to Fall 2011. The proportion of variance for academic achievement explained was 28.6% for the five variables with significance using R^2 (see Table 11). A positive moderate relationship of .535 was found between academic achievement and the five independent variables shown to have significance (Table 11). The standard error of the estimate showed a positive high fit at .82 (Table 11). The y-intercept was found at 1.96, which is where the regression line crosses the y-axis. A participant's gender, .429, race, .282, and age, .565, were found to have a positive low to moderate influence on academic achievement. A participant's developmental studies reading placement, -.356, and enrollment status, -.487, had a negative low to moderate influence on academic achievement. These estimates are located in Table 13. Table 12 shows the test produced a significance value of .00 when tested at the .05 alpha level. The fourth null hypothesis was rejected.

Table 11
Hypothesis 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
	.535	.286	.266	.82379	-.009	2.264	1	174	.134

Table 12

Hypothesis 4: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	47.656	5	9.531	14.045	.000
Residual	118.760	175	.679		
Total	166.416	180			

Table 13

Hypothesis 4: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.965	.160		12.297	.000		
Gender	.429	.126	.221	3.403	.001	.966	1.035
Race	.282	.068	.279	4.140	.000	.897	1.114
Enrollment Status	-.487	.184	-.175	-2.641	.009	.927	1.079
Age	.565	.156	.240	3.610	.000	.924	1.082
DSPReading	-.356	.114	-.210	-3.114	.002	.900	1.112

Table 14

Hypothesis 4: Excluded Variables

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
DSPMath	.003	.040	.968	.003	.781	1.280	.781
Parent Education	.047	.710	.479	.054	.938	1.066	.879
Primary Personality Type	.085	1.228	.221	.093	.846	1.183	.835
DSPWriting	.099	1.399	.164	.105	.806	1.241	.806
Secondary Personality Type	-.098	1.505	.134	-.113	.951	1.051	.887

Results from Hypothesis 5

Hypothesis 5 stated students at Dyersburg State Community College with continuous, active enrollment status from fall-to-fall would demonstrate no relationship between Holland personality type and academic achievement (grade point average). Table 15 provides the Eta values for the independent variable, Holland personality type, and the dependent value, grade point average, for the fall-to-fall persisters.

The Eta value for the chosen dependent variable, academic achievement, was .32. The Eta value demonstrates a relationship, albeit weak, between the independent and dependent variables. Eta² value was calculated at .10. Eta² indicates that 10.5% of the variability in the dependent variable is explained by the independent variable. Eta² was tested against its critical value of .195 at the .05 alpha level to measure significance of the relationship. The relationship was not found to be statistically significant. Although a weak relationship between Holland personality types and academic achievement was found, it did not meet the 5% level of significance. Therefore null hypothesis 5 cannot be rejected.

Table 15
Hypothesis 5: Measures of Association

	Eta	Eta Squared
GPA * Primary Personality Type	.325	.105

Results from Hypothesis 6

Hypothesis 6 stated the frequency of occurrence for the six Holland personality types is the same for students at Dyersburg State Community College with continuous, active enrollment status from fall-to-fall compared to those no longer enrolled. Table 16

provides the persistence and personality type crosstabulation. Table 17 provides the chi-square tests output for persisters and non-persisters.

Table 16 provides the observed and expected frequencies of occurrence for persisters and non-persisters among the six Holland personality types. Forty-four or 40% of persisters had a Social personality type. Twenty-two or 31% of non-persisters had a Realistic personality type. The personality types for persisters in rank order were Social with 44, Realistic with 21, Enterprising with 16, Investigative and Artistic with 10 each and Conventional with 9. The personality types for non-persisters in rank order were Realistic with 22, Social and Enterprising with 14 each, Conventional with 10, Investigative with 6 and Artistic with 5.

The critical value for 5 degrees of freedom at the .05 alpha level for persisters and non-persisters was 11.07. The Pearson chi square value for persisters and non-persisters was 10.476 as indicated in Table 17. To test hypothesis 6, the observed chi-square value was compared to the critical value. Since the critical value of 11.07 was greater than the observed chi square, hypothesis 6 cannot be rejected. Therefore the frequency of occurrence for the six Holland personality types among persisters and non-persisters was not statistically significant at .063. The two factors, persisters and non-persisters, were not related.

Table 16

Hypothesis 6: Persistence and Personality Type Crosstabulation

		PersonalityType						Total	
		1.00	2.00	3.00	4.00	5.00	6.00		
Persistence	1.00	Count	21	10	10	44	16	9	110
		Expected Count	26.1	9.7	9.1	35.2	18.2	11.5	110.0
	2.00	Count	22	6	5	14	14	10	71
		Expected Count	16.9	6.3	5.9	22.8	11.8	7.5	71.0
Total		Count	43	16	15	58	30	19	181
		Expected Count	43.0	16.0	15.0	58.0	30.0	19.0	181.0

Table 17

Hypothesis 6: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.476	5	.063
Likelihood Ratio	10.745	5	.057
Linear-by-Linear Association	.362	1	.547
N of Valid Cases	181		

Summary

Academically underprepared, first-time freshmen were found to increase persistence and academic achievement due to the early intervention of a career exploration assessment. The persistence and academic achievement of the sample from Fall 2010 was significantly better than the population from Fall 2009 although the effect size was small. Nine variables were regressed to see which contributed to an increase in persistence and academic achievement. Gender (female), race (African American), primary personality type (Social), and developmental studies reading placement were found to be significant predictors of persistence in Hypotheses 2. Gender (female), race (African American), developmental studies reading placement, age (traditional age) and

enrollment status (full-time enrollment) were found to be significant predictors of academic achievement in Hypothesis 4. A weak, statistically insignificant relationship was found between the Holland personality types of persisters and academic achievement in Hypothesis 5. The two predictors, persisters and non-persisters were not related in Hypothesis 6.

Chapter 5: Conclusion

Introduction

Chapter 5 summarizes the statistical findings from Chapter 4 and compares the findings to the literature reviewed in Chapter 2. Recommendations are made as to how the study site, Dyersburg State Community College, can use the findings to improve persistence and academic achievement of academically underprepared, first-time freshmen. Suggestions for future research targeted at the same student population are made. The chapter concludes with a summary of the study.

Results and Prior Literature

Academically underprepared, first-time freshmen were found to increase persistence and academic achievement due to the early intervention of a career exploration assessment. Fall-to-fall persistence and academic achievement as defined by grade point average were significantly better than the population for both outcome measures. Nine variables were collected from the sample and regressed to detect their contributions to an increase in persistence and academic achievement. Gender, race, primary personality type and developmental studies reading placement were found to be significant in predicting persistence in Hypothesis 2. Participants who were female, Caucasian and had a Social primary personality type with no developmental studies reading course requirements demonstrated greater persistence from Fall 2010 to Fall 2011. Gender, race, developmental studies reading placement, age and enrollment status were found to be statistically significant in predicting academic achievement in Hypothesis 4. Participants who were female, Caucasian, had no developmental studies

reading course requirements, between the ages of 18 and 24 and enrolled full time demonstrated greater academic achievement from Fall 2010 to Fall 2011.

Comparisons between the sample and institutional statistics produced interesting observations. The frequencies of males and African Americans in the sample were higher than the institution as a whole. Perhaps first-time freshmen males and African Americans in Fall 2010 were more likely to be academically underprepared. Males made up 42.5 % of the original sample and 53.3% were not retained. African Americans made up 36.5% of the sample and 57.5% were not retained. Both males and African Americans had difficulty persisting and achieving academically based on the significance of relationship in Hypothesis 2 and Hypothesis 4.

In contrast to the proportion of part-time, non-traditional-aged students in the population and at the institution, the frequencies for those traditional aged and enrolled full time were greater in the sample. Perhaps the higher frequencies for traditional aged and full time enrolled participants in the sample occurred because the 10 sections of ORN 1010 included in the study met during normal business hours. Part-time students likely work full time, therefore would enroll in course sections outside of normal business hours (Berker et al., 2003). A characteristic of traditional students is full-time enrollment status, while non-traditional students are more likely to attend class part time. The frequency of traditionally aged and full-time enrolled students in the sample contradicts two of three fundamental characteristics used to define a non-traditional student in Bean and Metzner's attrition model (1985). The model defines non-traditional students on the basis of age, residency, and enrollment status. A non-traditional student is defined as someone who is older than age 24, does not live on campus, is a part-time student, or displays

some combination of these three factors. Although Bean and Metzner's (1985) definition of a non-traditional student was not a good fit for the sample used in this study, their understanding for how age and enrollment status influence persistence was accurate.

Females comprised 57.5 % of the sample. Seventy-five percent of the females in the sample were traditional aged, between the ages of 18 and 24. Based on the literature, females were expected to be in the majority and demonstrate student success as defined by continuous enrollment. Fifty-eight percent of students enrolled at a community college in Fall 2008 were female (AACC, 2011b). The research presented in the literature review showed females have a greater likelihood of persisting in college (Maryland State Higher Education Commission, 2003; NCES, 2010b; University of Hawaii Community College System, 2003). The combination of high frequencies for females and females of traditional age likely contributed to the sample's increase in persistence and academic achievement. Farmer (1987) found women have a dual pull from home and work, which increases with age. She found females possess greater career and achievement motivation at a younger age than males, but motivation between the genders change as they transition into adulthood. The findings support the literature in that females, especially those of a traditional age, demonstrate greater persistence and academic achievement as well as represent the gender majority among college students.

The National Center for Educational Statistics (2004) found the need for remedial reading the most serious barrier to degree completion. The need for remedial reading was associated with lower rates of degree attainment. Adelman (1996) argues the need for remedial assistance in reading is due to comprehensive literacy problems. In this study, developmental studies reading placement demonstrated a significant relationship in

predicting persistence and academic achievement. The variable's correlation coefficient in Hypothesis 2 and Hypothesis 4 had a negative relationship with both dependent variables: persistence and academic achievement. One-hundred and eight participants or 59.3% of the sample were required to take at least one developmental studies reading course. Literature reviewed in Chapter 2 associated the need for remedial reading with other variables used in the study. Adelman (1996) found remediation rates, especially in reading, were substantially higher among minority students, particularly for African Americans. Seventy-seven percent of African American participants were required to enroll in at least one developmental studies reading course. Six of the eight participants required to enroll in the lowest level of developmental studies, DSPR 0700: Reading and Learning in College, were African American. Age was found to have a direct relationship with remedial reading placement as well as the completion of remediation (Windham, 1996). The longer a first-time student was out of high school, the greater likelihood he or she would fail reading, writing and/or the mathematics portion of the placement exam. Sixty percent of non-traditional aged participants in the sample, those 25 years of age and older, were required to enroll in at least one developmental studies reading course. The study's findings support the literature reviewed in Chapter 2. The need for remedial reading presents a challenge for academically underprepared, first-time freshmen.

One of six Holland personality types demonstrated a statistically significant relationship with persistence in Hypothesis 2. The Social primary personality type was shown to predict fall-to-fall persistence. A significant relationship was not found when Holland personality types were tested in Hypotheses 4, 5, and 6. Although a significant relationship was not shown between personality type and academic achievement,

comparisons between the persisters and non-persisters revealed an interesting observation. Strong et al. (2000) found educational achievement among the personality types followed this rank from highest to lowest: Investigative, Social, Artistic, Conventional, Enterprising and Realistic. Strong's findings were collected at three public-assisted bachelor-degree granting universities. This study's rank of personality types was different from Strong's findings. This study's rank, based on percentage from highest to lowest for persisters, was Social, Realistic, Enterprising, Investigative, Artistic and Conventional. This study's rank, based on percentage from highest to lowest for non-persisters, was Realistic, Social, Enterprising, Conventional, Investigative and Artistic. Although a statistically significant relationship between persisters and non-persisters in Hypothesis 6 was not found, a significance of .06 demonstrated a relationship did exist.

An individual's personality-environment type congruence determines how he or she responds to class content, instructors, teaching methods and assignments. Two implications based on the personality type rank comparisons and Smart's findings may explain why more similarities between personality types and persistence were not found in this study. First, the classroom environment may have been more conducive to some personality types over others. Content delivery, peer collaboration, assignments, classroom setting and instructors may have been more congruent with participants who had a Social personality type. This could explain why Social primary personality type participants were found to be statistically significant in persisting from fall-to-fall at a greater rate than the other five personality types. Participants with a Realistic or Conventional personality type failed to find the same congruency. Second, a participant pursuing an academic program congruent to his or her personality type may have been

unable to take courses within that program's curriculum. For example, a participant with a Conventional personality type interested in accounting or administrative office support would have been unable to take courses toward his or her academic interest the first semester due to first addressing his or her remediation needs. Depending on the breadth and depth of remedial needs, the participant may have been unable to take any courses toward his or her academic interest the first year of college. Given the variation found in the personality type comparisons, it can be concluded personality-environment type congruence was not found for five personality types.

Recommendations

Several of the variables (gender, race, required developmental studies reading courses) included in this study have a statistically significant influence on fall-to-fall persistence and academic achievement (grade point average). The following recommendations are intended to increase persistence and academic achievement among academically underprepared, first-time freshmen.

Although the effect size for Hypothesis 1 and 3 was small, providing academically underprepared students with a career exploration assessment early in their college career was shown to improve persistence and academic achievement when compared to the population. Therefore, all sections of ORN 1010: Learning to Succeed should include the same presentation on career exploration given to the sample for this study. This includes those sections that meet at locations other than the Dyersburg Campus and at times outside normal business hours. The presentation would likely be more effective if offered earlier in the semester than November. It is also recommended that all students meet with a career counseling professional individually later in the

semester. Kahn et al. (2002) found students highly anxious about making career decisions were reluctant to commit to an academic major. Such reluctance may limit the commitment students feel to college in general. Once attrition-prone students have been identified, career interventions may ease this group's transition into college and enhance their first-year experience. Bishop and Brenneman (1986) also found that students who were identified as attrition prone chose to continue in college after receiving career counseling. The recommendation to meet with all students enrolled in ORN 1010: Learning to Succeed individually may prove logistically difficult. Coordination of this effort with ORN 1010: Learning to Succeed instructors would be important. Requiring students enrolled in the course to meet with a career counseling professional as part of a class assignment may aid in the success of this initiative.

A participant's need for developmental studies reading courses negatively influenced persistence and academic achievement in the study. Therefore, it is recommended that students with remedial reading needs would benefit from an intrusive approach to student services support. First, the career presentation given to all ORN 1010: Learning to Succeed sections would likely reach those students with developmental studies reading placement needs. A follow-up reading assignment or presentation later in the semester for students enrolled in a developmental studies reading course is recommended. The presenter could collaborate with the reading instructors on an assignment designed to reinforce prior learning from the original presentation on academic and career planning. Second, students who test into the lowest level developmental studies reading, DSPR 0700: Reading and Learning, should be enrolled in an intensive, cognitive skill development program. Only two of the eight participants who

tested in the lowest level of developmental studies reading in this study persisted from fall-to-fall. Collaboration between the local adult education program or the college's literary council and the college may help prepare those with remedial reading needs for college-level reading expectations. A deficiency in reading found in this group is problematic for individual and institutional persistence rates and academic achievement. The college could require this group to participate in extended reading lab hours and complete a reading preparatory program through adult education before they are permitted degree-seeking status. Two purposes are served by requiring students in a reading preparatory program to enroll as non-degree seeking. First, the institution would become a better steward of financial aid subsidies. Money is only invested in the students who choose to invest in themselves first. Second, the institution would accept degree-seeking students likely to earn a credential without compromising the community college sector's mission of open accessibility. As stated in Chapter 2, the Tennessee Higher Education Commission (THEC) is phasing in an outcomes-based funding formula that includes 11 variables with varying weights equal to 100 %. Six of the 11 variables are pertinent to persistence. State assistance will be exclusively determined by the formula beginning June 30, 2013. Students who possess degree-seeking status and are academically prepared for college-level reading are more likely to earn the institution state assistance.

Future Research

Predicting an academically underprepared, first-time freshmen student's persistence and academic achievement is difficult because so many factors can be influential. Based on the experience with this study, it is recommended that any future

research include greater focus on the sample and the inclusion of additional predictor variables, which will be explained later in this section. Future research along this line may provide greater understanding.

Several flaws with the sample may have yielded different results. The sample size could have been larger by including more than 10 of the 20 sections of ORN 1010: Learning to Succeed. Only one campus location of three was sampled. Institution and population statistics were collected from the college's three locations, not one. The sample may have represented academically underprepared, first-time freshmen at the Dyersburg Campus more than the institution as a whole. Sections chosen for the study met during normal business hours. Traditional-aged, full-time enrolled students have a greater likelihood of attending class during the day. Selecting sections at night or late afternoon may have increased the number of non-traditional participants in the sample. If the 10 sections chosen for the study were selected from the available 20 sections using cluster random sampling, a better sample of academically underprepared, first-time freshmen would have been represented.

Nine independent variables shown to predict persistence and academic achievement in reviewed research were chosen for this study. Many other variables could have accompanied those nine. Persistence is a complicated issue to study because many variables have been shown to influence it. A future study would include additional variables like high school grade point average, source of tuition and fee support (state achievement scholarship, Title IV funds, workforce development assistance, family, etc.), weekly work hours, number of dependents, time lapsed between last educational institution attended, participation in new student orientation, and perceived family

support. The inclusion of additional variables serves three purposes: identify other predictors, identify how those variables interact or modify their influence, and identify at-risk student sub-populations leaving college prematurely. Preventive program support can be justified through research and implemented through the inclusion of additional variables.

Males and African Americans were found to be academically underprepared in the study. A qualitative expansion of the study for future research may include investigating the academic barriers and social causes as to why males and African were less likely to succeed. Cohorts and/or focus groups consisting of males and African Americans would provide an excellent sample to conduct case studies research.

The measures of student success used for the study should be expanded. Ultimately the goal is to award credentials to students depending on their motivation to attend college. Monitoring persistence and grade point averages are important measures to gauge an institution's success in reaching its goal of awarding credentials, but another should be considered. Total credit hours earned by hours attempted should be another measure of student success. If a student enrolled full time takes six years to complete a two-year associate degree, a student's success might be questioned. Stakeholders, internally and externally, are affected by a student who prolongs his or her time. The institution may have lost money through the provision of resources to the student. The student has lost time. Federal subsidies were lost if the student received Title IV funds. The local economy lost the infusion of educated workers.

Future researchers should also consider extending the timeframe for their study. It should not be implied that an academically underprepared, first-time freshmen who

persisted for one academic year will be awarded a credential. Second-year college students encounter trials unique from freshmen. As students increasingly take longer periods of time to complete their education, studies should include student data over two, three and four years.

Summary

Jim Applegate, Vice President for Program Development with the Lumina Foundation (2011), said “Maybe it is true, there are no silver bullets in this economy. But getting a high-quality post-secondary education credential is the closest thing we have.” Persistence until graduation will remain a difficult and complex topic to study because of the unique needs of students and the many factors that influence it. However, this study demonstrates that academically underprepared, first-time freshmen increased persistence and academic achievement due to the early intervention of a career exploration assessment. The support of career exploration opportunities for students, especially the academically underprepared, is a step toward positive measures of student success.

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Appendix A:

Informed Consent Form: Career Exploration Workshop

- Principal Investigator: You are being asked to allow the Director of Advising Centers – Ben Littlepage – to use your participation in the career exploration workshop pilot study and responses to questionnaires in a study student persistence after the exposure to the workshop. This is not an evaluation of you, nor is it an evaluation that affects any grade you might have at Dyersburg State Community College. In fact, any personal connection to your participation in the study will not be made public.
- Duration: I intend to collect data for 18 months, starting with your consent to participate and concluding the date final grades are submitted for Fall 2011 courses.
- Procedures: Reports will be run to measure student persistence from Fall 2010 to Fall 2011. Comparisons between nine variables indicated on the questionnaire will be made regarding student persistence. Names of participants will be coded so no identifying characteristics can be made. The analysis will begin after the 14th day of the Fall 2011 semester.
- Benefits: These data will form the basis of an analysis comparing the relevance of early career exploration intervention for first-time freshmen in the hopes that Dyersburg State Community College can better understand strategies improve student persistence and what populations benefit most.
- Risks: No risks are foreseen. All printed materials will be held in a secure location in a locked file cabinet, held for three years after data analysis is complete, and destroyed upon publication of the article(s) based on the analyses.
- Confidentiality: While your identity cannot be blocked by Banner, your affiliation with the pilot study will only be known by the researcher and pilot facilitator. Your identity is not an element or focus of the study. All information will be kept confidential within the limits allowed by law.
- Contact: If you have questions about this research, please contact Ben Littlepage at 731-288-7514 or littlepage@dsc.edu.

Participants can also contact the Institutional Review Board for the Protection of Human Subjects at irb@memphis.edu.

Voluntary Participation: If you are uncomfortable about your participation in this study, you can request that your contributions to discussions or evaluations not be included in the study. In this case, all contributions to the study will be blackened and will not be included in the analysis.

Discontinued Participation: The participant may request that his/her contributions to discussions or evaluations not be included in future or current analyses at any time during the timeframe of the course or the study.

Costs: There are no costs to the participant anticipated.

Findings: All participants may receive a copy of the research findings once the analysis is complete and a draft article is prepared. Participants wishing to receive a copy must submit the request in writing to the e-mail address previously listed.

Signature of Participant

Date

Check any that apply:

Willing to participate Not willing to participate

Appendix B:

Questionnaire: Career Exploration Workshop

Name (Please Print): _____

Date: _____

Please mark the appropriate response.

1. What is your gender? _____female _____male

2. What racial category do you consider yourself?

- a. _____African American
- b. _____American Indian
- c. _____Asian
- d. _____Caucasian
- e. _____Hispanic/Latino/Spanish
- f. _____Pacific Islander
- g. _____Other

3. Please mark the academic plan of study you intend to pursue at Dyersburg State Community College from the list below.

TRANSFER PROGRAMS

ASSOCIATE OF SCIENCE DEGREE

- | | |
|---|-------------------------------|
| _____Accounting | _____Agricultural Business |
| _____Agriculture – Plant & Soil Science | _____Biology |
| _____Business Administration | _____Chemistry |
| _____Criminal Justice | _____General Studies |
| _____Health, PE & Recreation | _____History |
| _____Information Systems | _____Mathematics |
| _____Music | _____Pre-Health Professions |
| _____Pre-Nursing | _____Pre-Occupational Therapy |
| _____Pre-Physical Therapy | _____Psychology |
| _____Secondary Education | _____Social Work |
| _____Social Sciences | _____Teaching (K-6) |

ASSOCIATE OF ARTS DEGREE

- | | |
|-----------------------|----------------------|
| _____Criminal Justice | _____English |
| _____Foreign Language | _____General Studies |
| _____History | _____Psychology |
| _____Social Work | _____Sociology |

CAREER PROGRAMS

ASSOCIATE OF APPLIED SCIENCE DEGREE

- Accounting Technology
- Business Administration
- Networking & Cyber Security
- Early Childhood Education
- EMT
- Health Information Technology
- Core Nursing (DSCC's RN Program)

- Administrative Office Support Management
- Software Application
- EMT - Paramedic
- General Technology
- Justice Services

CERTIFICATE PROGRAMS

- Agriculture Applications
- Corrections & Law Enforcement
- Electronic Health Record
- Medical Coding

- Computer Operations & Maintenance
- Early Childhood Education
- EMT - Paramedic
- Network Routing & Cyber Security

4. Did either parent or set of grandparents attend college prior to this semester?

- a. Yes
- b. No

5. Please select the semester enrollment status most applicable to you.

- a. Full-time (12 credit hours or more per semester)
- b. Three-quarter Time (9 – 11 credit hours per semester)
- c. Part-time (6 – 8 credit hours per semester)
- d. Less than part time (1 – 5 credit hours per semester)

6. Do you plan to take all classes needed to complete your plan of study at the Dyersburg?

- a. Yes
- b. No

7. What is your current age?

- a. _____

8. What is your primary and secondary personality type

- a. Primary _____
- b. Secondary _____