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# EARLY PREDICTORS OF PROGRESSION

Predicting Purpose: An Examination of Early Predictors of Progression and Career  
Choice among First-Year Nursing Students

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University of Missouri-St. Louis in partial fulfillment of the requirements  
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## Abstract

The importance of socializing upper level nursing students into the nursing profession is well established in the literature, but less is known about the early predictors of progression and career choice among first-year nursing students using a career development framework. Understanding early predictors of progression, particularly for first generation and underrepresented minority college students, have important implications for diversifying the baccalaureate-prepared nursing pipeline, as well as for developing future career and educational interventions for program completion and student retention. This study utilized a cross-sectional, correlational design to examine predictive factors of progression and career choice among freshmen nursing students. While the need to diversify the nursing workforce is ongoing, nursing schools must have an informed understanding of early progression barriers, their student demographics, and the career decision-making process in order to reduce nursing school and new nurse attrition.

*Keywords:* nursing school, predictors, progression, first generation, career choice

I dedicate this dissertation to my husband, Jon, and my son, Meyer, whose unconditional love and support continues to inspire me. I also dedicate this dissertation to one of my dearest friends, Renata Sledge. Your personal strength and professional drive continually amaze me. I love and adore you all.

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## CHAPTER ONE

Cognitive, non-cognitive, and demographic factors can predict early progression of first-year nursing students (Alden, 2008). Awareness and understanding of the predictive strength of these factors can inform the types of resources, services, and programs that are in place during the college transition. This is especially important since admissions criteria and student demographics can vary per nursing school. Student development programs, such as a First Year Experience (FYE) course, can enhance early progression of college students (Higgins, 2004; Lockie & Burke, 1999; Symes, Tart, & Travis, 2005). The FYE course in this study aimed to assist first-year nursing students by fostering campus connections to people, resources, and services for student success and retention.

In collaboration with institutional leadership from the College of Nursing, the College of Arts and Sciences, and the Office of New Student Programs, a First Year Experience course was developed for Fall 2014 at the University of Missouri-St. Louis for first-year nursing students. While there was already a FYE program in place at the University, each academic unit was responsible for deciding how to incorporate the course into their first-year curriculum. Previously, only nursing students who had earned a clinical space prior to starting nursing school were required to take an introduction to nursing course (UMSL, College of Nursing, 2014). However, that course focused primarily on socialization into the nursing profession. First-year nursing students without an earned clinical space prior to admission were not in the course. At the time, these students were not claimed by the College of Nursing nor the College of Arts and Sciences, who advises the majority of undeclared students at the institution. This was

mainly the result of the uncertainty surrounding whether these students would eventually be competitive for a clinical space. In turn, these students were without a FYE and many were failing their introductory courses. Ultimately, they left the institution after their first year with low GPAs and no formal career guidance.

Meanwhile, many first-year students with an earned clinical space were also experiencing difficulties meeting the academic expectations for performance among nursing students. Others were uncertain about their major selection. In Fall 2014, the researcher began teaching a FYE course that focused on career choice exploration, academic skill building, and institutional and peer engagement for first-year nursing students. After two years, the course was required for all first-year nursing students at the institution due to a campus movement to ensure that all incoming freshmen had a formalized transition experience. Thus, this study examined early predictors of progression and career choice among first-year nursing students using a career development framework. All of the participants completed a FYE for nursing students taught by the researcher. Little nursing research considers the college transition process of first-year nursing students, and how their career choice has either been confirmed or altered, as a result of their early college experiences (Brodie, G. Andrews, J. Andrews, Thomas, Wong, & Rixon, 2004)

### **Background of the Problem**

Selecting a major and career exploration is not a straightforward process for many college students (Tirpak, 2011). Fouad, Guillen, Harris-Hodge, Henry, Novakovic, Terry, & Kantamneni, (2006) report that over half of the 694 participants in their study were

unaware of campus career resources and services and only 6% reported utilizing the services. Rather, their participants reported use of career related services such as campus career fairs, job posting websites, and the career center website. Their sample consisted of freshmen, sophomores, juniors, and seniors, with approximately 25% of each group represented at a large Midwestern university. The majority of participants identified as Caucasian. As college students become increasingly technology-oriented for conducting research, entertainment, and decision-making (Tirpak, 2011; Robinson, Meyer, Prince, McLean, & Low, 2000), technology must be integrated into career and student development programs in order to meet the generational needs of college students.

Computer-assisted career guidance (CACG) systems can provide useful career development assistance to college students (Tirpak, 2011). In terms of cost-effectiveness and efficiency, CACG systems are popular career interventions in higher education. An example of a CACG system is FOCUS-2 (Career Dimensions, Inc., 2014). According to Tirpak (2011), few outcome studies exist regarding FOCUS-2's effectiveness with college students. Tirpak's (2011) study supports use of FOCUS-2 with college students who may be less inclined to seek formal career assistance through a university career center. Students who use FOCUS-2 report higher levels of in career decision-making self-efficacy and career planning during their first year of college (Tirpak, 2011).

### **Statement of Purpose**

The aim of this study was to examine early predictors of progression and career choice among first-year, nursing students using a career development framework. Little nursing literature exists regarding first-year nursing students' transition to college, and

how the career decision-making process is either confirmed or altered, due to early college experiences (Brodie, G. Andrews, J. Andrews, Thomas, Wong, & Rixon, 2004).

### **Significance of the Study**

Understanding who enters nursing schools and why they choose nursing as a major is important for recruiting, supporting, and retaining future nurses (Cho, Jung, & Jang, 2010). According to the U.S. Census Bureau (2011), the number of diverse students attending college significantly increased from 1976 to 2012, with a 5.3% increase in African American students, a 11.4% increase in Latino/Hispanic students, and a 4.5% increase in Asian/Pacific Islander students (National Center for Education Statistics, 2013; Joslyn, 2014). A number of national studies suggest deficiencies in STEM (science, technology, engineering, and math) preparation in high school and college, particularly for women, racial and ethnic minorities, and FGCS (Choy, 2002; Fillman, 2015; Joslyn, 2014; United States Department of Education, 2007; Wright, Jenkins-Guarnieri, & Murdock, 2013). In St. Louis, MO, racial disparity in educational attainment among African Americans is particularly high. According to the Census Bureau (2013), 15.6 % of African Americans in St. Louis do not have a high school diploma compared to 7.3 % of their White counterparts. Only 17% of African Americans possess at least a Bachelor's degree compared to 35.1% for White adults.

While career decision making has been widely studied since the early 20th century in organizational and vocational psychology (Holland, 1959; Strong, 1927), career choice in nursing education research has primarily focused on professional socialization and career transition and satisfaction (Price, Hall, Angus, & Peter, 2013).

Guiding factors in career choice in nursing include: gender (Boughn, 2001), culture (Gregg & Magilvy, 2001), experiential knowledge (Kohler & Edwards, 1990), and the desire to help others (Law & Arthur, 2003). Nursing has historically been associated as a ‘calling’ (Gordon & Nelson, 2005). To minimize nursing school and new nurse attrition, it is important to understand the career decision-making process of Millennial nursing students since they currently represent the largest new nurse demographic (Beecroft, Dorey, & Wenten, 2008). Millennials are described as technologically-oriented with high expectations of themselves and others, desire feedback, and seek recognition for their performance (Boychuk-Duchscher & Cowin, 2004). As generational cohorts and values change and career perceptions and expectations are revealed, examining nursing as a career choice during in the college transition can prevent career disillusionment, nursing school attrition, and promote interest in the profession (Fillman, 2015; Turner, 2011).

For first generation college students (FGCS), the literature has primarily focused on their academic success, particularly in STEM fields, with little focus on career exploration (Chen, 2005; Engle & Tinto, 2008; Joslyn, 2014; Mamiseishvili & Rosser, 2010; McCarron & Inkelas, 2006; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Warburton, Bugarin, Nunez, & Carroll, 2001) or changes in college self-efficacy after experiencing the first year (Gore et al., 2005; Joslyn, 2014; Wright, Jenkins-Guarnieri, & Murdock, 2012). Given the national concerns for increasing diversity in the nursing workforce (Lockie, Van Lanen, & McGannon, 2013; Simon, McGinniss, & Krauss, 2013) as well as institutional strategic priorities for retaining a diverse student body (UMSL, Office of Admissions, 2015), early career development programs are essential

for recruiting, supporting, and retaining future nurses (Fillman, 2015) as well as diverse college students.

### **Research Question**

For purpose of this study and to address the gaps in the literature, the following research question was posed:

What is the predictive value of selected cognitive (first year cumulative GPA and ACT composite scores), noncognitive (Holland scores), and demographic (first generation college status, ethnicity, and Pell eligibility) factors on progression among first-year nursing students?

### **Research Hypothesis**

The hypothesis was developed in response to the research question above and informed by the literature review:

A combination of the selected cognitive, noncognitive, and demographic variables will predict early progression and career fit among first-year nursing students.

### **Research Design**

This study employed a cross-sectional, correlational design. Data were collected from several institutional databases containing cognitive, non-cognitive, and demographic data of first-year nursing students who were enrolled in University Studies 1003 for nursing majors at the University of Missouri-St. Louis in Fall 2014 and Fall 2015. Data were extracted from databases belonging to: Office of Admissions, Office of Financial Aid, Office of Institutional Research, Office of Career Services, and UMSL



College of Nursing Office of Student Services. The designated timeframe of the study reflected when the researcher was responsible for teaching the course. The instrument was a career self-assessment, FOCUS-2 (2015-present) or Strong Interest Inventory (2014). Students completed the either career assessment while enrolled in University Studies 1003 for nursing majors. Both career assessments provided students with a Holland code for this study.

### **Theoretical Framework**

The nursing education literature has reflected research of nursing student retention for several decades. The most widely used model is *The Nursing Undergraduate Retention and Success* (NURS) model (Jeffreys, 2004). The model describes common cognitive and noncognitive factors that affect progression in the nursing major such as academics, financial support, and familial support, ultimately with a focus on professional development in the nursing profession. While Jeffries's (2004) model recognizes the significance of interactions between the student and the environment on progression, there is an inherent assumption in the model that the student is pursuing a major that is matched with their interests, values, and competencies.

This study drew from two theoretical perspectives in the field of career development to examine first-year nursing student progression. First, there is social cognitive career theory (SCCT; Betz & Hackett, 1981; Lent, 2013), which originated from Bandura's (1977) social cognitive theory. The focus acknowledges how environments and context affect career decision making. The theory focuses on three cognitive variables: personal goals, self-efficacy beliefs, and outcome expectations (Lent,

2013). SCCT is important to this study since first generation college students (FGCS) represented approximately 33% of the population. FGCS often face more contextual challenges in higher education such as more financial dependents (Inman & Mayes, 1999), less parental involvement (Hertel, 2002), and less academic preparedness for college rigor (Chen & Carroll, 2005). According to SCCT, context can influence self-efficacy beliefs (Bandura, 1977) and ultimately goal attainment (Lent, Brown, & Hackett, 1994).

Second, Holland's theory of career choice (Holland, 1997) describes the interactions between individuals and their environments on career choice (Holland, 1997). Through Holland's six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Creators (RIASEC), individuals and work settings can be organized, grouped, and matched (Holland, 1997; Joslyn, 2014). FOCUS-2 (Career Comparisons, Inc., 2014) and the Strong Interest Inventory (CPP, 2014), web-based career development tools, were utilized to operationalize Holland's theory in this study. While several outcome studies have tested FOCUS-2 with adult learners to "find statistically significant relationships between individual interests, values, skills and abilities, personality type, leisure time interests, and career planning readiness" (Career Comparisons, Inc., 2014), none have focused specifically on nursing students.

### **Limitations and Delimitations**

Several limitations and delimitations in this study are noted. One limitation was the timeframe. The first two semesters of college may not be an ideal time for identifying predictors of progression since freshmen can experience many other immediate emotions,

such as living away from home for the first time that can affect their academic performance or major selection. Attrition was a consideration due to students leaving the institution during the first year or not completing the career tool. Students with missing or incomplete data were not included in the study. History was a factor because the study examined the first two semesters of college. During this time, students had access to additional campus supports and services that may have affected their progression or career choice.

Additionally, this study utilized secondary educational and achievement data for predicting progression. Using secondary data may not holistically account for the degree of academic rigor in high school or the amount of previous exposure to role models in healthcare. Another limitation was the use of a career choice self-report tool as homework. While online administration offers convenience and accessibility, it also has the potential to reduce engagement and completion rates (Gati & Asulin-Peretz, 2011; Osborn, Dikel, & Sampson, 2011). Computer-based interventions without follow-up guidance can be problematic. According to Joslyn (2014), the standardized nature can fail to address complex social issues or lack direction for seeking additional support. Individuals may misinterpret their results and thus make poor decisions that affect their academic or career outcomes (Gati & Asulin-Peretz, 2011; Osborn, Dikel, & Sampson, 2011). FOCUS-2 and the Strong Interest Inventory were utilized in this study partially because the tools provide students with additional career related resources and websites. A representative from the Office of Career Services visited the students during the FYE course to provide further guidance for interpreting individual results.

Another limitation of a career tool is the level of self-awareness of the participant. Using self-report instruments assumes that participants respond honestly and are actively engaged. The career tool is required for all freshmen during the FYE. Requiring students to complete the survey as a course assignment may have affected the honesty of the responses. Further, two career self-reports were utilized in this study since the Office of Career Services changed licenses during the study's data collection period. In 2014, the Strong Interest Inventory (SII; CPP, Inc., 2004) was administered to students. Beginning in 2015, FOCUS-2 (Career Comparisons, Inc., 2014) was administered to students. Both career development tools provide Holland's RAISEC codes as previously described.

A delimitation of the study was that the population was comprised of only students who identified nursing as their major prior to beginning college. Thus, generalizability may be limited to other first-year nursing students. The population was selected because of the researcher's place of employment during the study's timeframe. As a result, the population may be inherently limited due to a single site. This was noted in the Chapter 5.

### **Definition of Terms**

**Traditional Baccalaureate Nursing Degree (BSN).** The four-year undergraduate degree requires a minimum of 120 credit hours and prepares students for the professional licensure examination to practice nursing.

**Clinical Track Space.** Spaces are competitive for each admissions period. Applicants must meet the minimum criteria for consideration for clinical admission. Meeting the minimum criteria does not guaranteed that a student will earn a clinical space.

**Early Predictors.** The predictor variables in this study included: demographic data (first generation college status, ethnicity, and Pell eligibility), cognitive (ACT composite scores and first-year cumulative GPA), and non-cognitive (Holland codes).

**First Generation College Student (FGCS).** For this study, a FGCS is a student whose parent(s) has not completed a bachelor's degree.

**First Year Experience (FYE).** A national movement in higher education designed to assist freshmen students in their college transition. FYE courses and programs foster campus connections to people, resources, and services for personal and professional development.

**Guaranteed Clinical Student (GCS).** First-time freshmen may qualify for a guaranteed clinical space in UMSL's full-time traditional BSN program if they are admissible to the institution, possess a core high school GPA of 3.0 or higher on a 4.0 scale, and earn an ACT score of 24 or higher.

**First-Year Nursing Student.** First time freshmen who are in the process of taking their general educational coursework may be eligible to apply for a clinical track space in the nursing program.

**Clinical Nursing Student.** A student who earns a clinical space in the nursing program after completing all general education coursework with a minimum cumulative 3.0 GPA and meets the required nursing science GPA.

**Science GPA.** Science GPA consists of the following courses: Chemistry 1052, Biology 1131 (Anatomy and Physiology I) and Biology 1141 (Anatomy & Physiology II), and

Biology 1162 (Microbiology). A minimum grade of B- is required in all of these courses to be admissible for a clinical space.

**Pell eligibility.** The federal grant for college completion is based on expected family contributions, enrollment status, and attendance for the academic year. Expected family contributions are measured and calculated according to a formula established by federal law. Family income, including taxed and untaxed income, assets, and benefits are all included in the formula (UMSL, Office of Financial Aid, 2016).

### **Summary**

Limited research exists on the career decision-making process of first-year nursing students, particularly how cognitive, non-cognitive, and demographic factors affect early academic success and progression within or out of the nursing major. A FYE course in this study provided a unique educational setting for early career choice exploration, academic skill building, and institutional engagement among diverse nursing students. Next, Chapter Two provides a review of the literature and theoretical framework for this study.

## **CHAPTER TWO**

### **Literature Review**

This study examined early predictors of progression and career choice of first-year nursing students using a career development framework. In order to fill this gap of knowledge, it was important to examine the student demographic as well as retention studies informing significant patterns of academic success and progression. Next, the theoretical framework is reviewed to provide a foundation for further examination of the career decision-making process among diverse college student groups. Finally, a First Year Experience (FYE) course for educational and career development is discussed in relation to student success and progression.

#### **Demographics**

Of the population in this study, approximately 33% of the students self-classified as a first generation college student (FGCS) on their admissions application. In general, the University serves a high rate of FGCS (approximately 50%), and particularly in the College of Nursing (approximately 56%) (UMSL, Office of Admissions and Office of Institutional Research, 2016). The demographic is discussed in more detail below due to the diversity that exists among this college population.

#### **First Generation College Students (FGCS)**

For this study, a FGCS was a student who did not have at a parent who completed a bachelor's degree. Since FGCS at four-year universities often have low retention and graduation rates (Chen, 2005; Engle & Tinto, 2008; Joslyn, 2014; Tate, Caperton, Kaiser,

et al., 2015), the importance of having a parent who completed a bachelor's degree was particularly relevant to this study. FGCS represent a diverse student demographic. FGCS are more likely to be from lower socioeconomic status (Bui, 2002; Chen & Carroll, 2005; Engle and Tinto, 2008; Inman & Mayes, 1999; Joslyn, 2014) and not attend college immediately after high school (59%), compared to students with parents who had completed at least some college coursework (93%) (Boyett, 2010; Choy, 2001; Joslyn, 2014). In this study, all participants came to the University directly from high school.

In addition to demographic distinctions, FGCS face more acculturation challenges (Nepper Fiebig, Braid, Ross, Tom, & Prinzo, 2010). Chen and Carroll (2005) found that compared to students whose parents had completed at least some college coursework, FGCS have statistically significant lower scores on cognitive measures before and during college, as well as lower rates of completing advanced math and science courses during high school (Joslyn, 2014). Arathuzik & Aber (1998) report that nursing students who do not speak English as the primary language at home more often fail the NCLEX-RN, the national licensure exam to practice nursing. Similarly, Arathuzik & Aber (1998) reported significant correlations between NCLEX-RN scores and a lack of family responsibilities and emotional stress. Chen & Carroll (2005) reported from a national sample of 7,400 four-year college students and Boyett (2010) found in a sample of 694 community college students, that FGCS who completed remedial coursework prior to starting college, often earned less college credits, had lower college GPAs, and experienced more course withdrawals and failures.

Clearly, FGCS struggle more academically. Bui (2002) reported that they had lower college self-efficacy and thus feared failure more than students with a parent who



had completed college. FGCS's expectations for college success seem to be an important predictor of student learning outcomes. Ramos-Sanchez & Nichols (2007) reported findings from sample of 192 freshmen (33% were FGCS) that students with higher college self-efficacy beginning college significantly predicted higher college adjustment by the end of their first year. Social experiences of FGCS seem to be different as well. Hertel (2002) found among 130 freshmen that FGCS report lower levels of perceived support from college peers. These findings may shed light on some of the noncognitive experiences that contribute to early nursing student progression since nursing programs are highly competitive due to limited clinical spaces. Combined with less perceived support from FGCS by their college peers, this poses some serious transition concerns for higher education practitioners. Since nursing faculty and first-year nursing student interactions are limited, higher education practitioners must be intentional about the types of resources and supports that are in place prior to students' arrival on campus, in order to implement timely and effective career and student development programs.

### **Studies of Student Retention**

The First Year Experience course in this study stemmed from Tinto's model of student departure (1975) to explain early college attrition. According to the model, student retention stems from pre-entry characteristics as well as important academic and social interactions. Pre-entry characteristics can include: family, age, sex, academic and social competencies, ACT scores, and high school GPA. Pre-entry characteristics can directly influence student departure, student engagement, and outcome expectations. Academic variables consist of academic performance and faculty-student connections. Social variables include peer connections and extracurricular activities. According to

Tinto (1975), the stronger the academic and social connections are to the institution, the higher the persistence to graduation. According to Alden (2008), chances for withdrawal for nursing students increased with limited campus engagement, even when academic performance was not an issue. First-year nursing students at the current institution complete their foundational coursework on a separate campus from the College of Nursing. Thus, there is limited social interaction with nursing faculty and clinical nursing students during their first two years of college. Such limited interaction puts them at greater risk for becoming disillusioned with the nursing major or ultimately leaving the institution. The FYE course in this study included visits from nursing faculty and clinical students in order to foster early faculty-student connections.

Tinto (1987, 1993, 2001) developed the student departure model by including: adjustment difficulties, individual-institution fit, marginalization, finances, and external responsibilities as variables. He recognized that different types of students (e.g. at-risk, nontraditional vs. traditional, first generation, etc.) and various types of postsecondary institutions (commuter vs. non-commuter, four-year vs. two-year, urban vs. rural, large vs. small, and public vs. private) required different retention programs (Alden, 2008). Similarly, Pascarella (1980, 1985) developed a retention model for college student development that proposed student persistence is multifaceted and includes: student demographics, organizational structure and setting, social connections, and student effort (Alden, 2008).

### **Academic Success as a Program Outcome**

Nursing literature has traditionally measured academic outcomes in four primary ways: program completion, grades, semester or science GPA, and cumulative GPA (Alden, 2008). Schafer (2002) utilized multiple regression analysis to identify the predictive strength of pre-nursing GPA on progression for age, ethnicity, high school GPA and ACT social science mean. Hayes (2005) conducted multivariate correlational statistics to predict attrition for pre-nursing GPA, number of institutions attended, ACT scores, and pre-nursing courses, particularly Anatomy and Physiology I, College Chemistry, and Microbiology. The greatest predictor of GPA was pre-nursing coursework.

Byrd, Garza, & Nieswiadomy (1999) examined demographic, pre-entry, and progression criteria on BSN graduation at a large southern university. Data collection consisted of 285 student records. Using logistic regression to predict progression during the first semester, they reported that age, ethnicity, science GPA, and pre-nursing GPA predicted graduation in 77% of all participants and in 87.8% of all participants when drop-outs were not included. A second semester model included: age, ethnicity, social science GPA, and Adult Health I scores, predicted graduation for 90.9% of the students. The only variable that was insignificant was ethnicity (Alden, 2008). Wong and Wong (1999) examined grades from general science courses from high school and college on nursing program completion and NCLEX score. With a sample of 258 nursing students, they found that pre-nursing GPA for anatomy and physiology, chemistry, and microbiology significantly correlated with nursing science GPA. All the independent

variables were significant: high school and biology grades, pre-nursing and nursing GPAs, and age.

This study selected early predictors of progression for analysis in consideration of the studies discussed above, especially FGCS status, ACT scores, ethnicity, and first-year cumulative GPA. Age was controlled for since all of the participants were 18 years old at the time of admission. This was due to the five-semester BSN program format that offers first-year nursing students an incentive (called a guaranteed clinical space) for choosing the institution. The notion of the guaranteed clinical space will be discussed in Chapter Three.

### **Career Decision-Making**

Understanding who enters nursing school and why they choose to pursue the profession is essential for recruiting, supporting, and retaining diverse nursing students (Cho, Jung, & Jang, 2010). Changes in generational cohorts bring different values, career perceptions, and expectations (Mimura et al., 2007; Price, 2008). In a sample of 1,127 undergraduate students, FCGS (39%) had significantly lower educational aspirations than their counterparts, which was connected to lower campus engagement levels (Pike & Kuh, 2005). Choy (2001) reported that 55% of incoming FGCS expect to earn at least a bachelor's degree compared to 91% of students whose parent(s) completed college. Boyett (2010) reported that FGCS have lower educational expectations for obtaining a bachelor's degree and thus are less likely to consider graduate school.

At the current institution, many students cite their families as being particularly influential in their major selection. This is often without consideration of the student's

interests or academic competencies. Career choice exploration through computerized assessments, as previously discussed, was an important tool in this study for students to explore their career purpose. The tool provides a range of occupational salaries per career choice in light of internal and external factors potentially influencing major selection. According to general findings of FOCUS-2 (discussed in more detail below), students who complete one or several parts of the career assessment report experiencing greater self-efficacy and career planning readiness for continuing their education beyond an undergraduate degree.

### **Theoretical Framework**

Due to a combination of cognitive, non-cognitive, and demographic factors that affect early academic success and progression, Social Cognitive Career Theory (SCCT; Betz & Hackett, 1981; Lent, Brown, & Hackett, 1994), offers a theoretical lens in which to examine the varying impact of these factors among diverse nursing student. The framework considers environmental and psychological factors that can affect the career decision-making process.

#### **Social Cognitive Career Theory (SCCT)**

SCCT (Betz & Hackett, 1981; Lent, Brown, & Hackett, 1994) provides a lens for understanding the internal and external factors that can impact career choice and satisfaction. SCCT focuses on the relationships and experiences between environments and individuals, especially outcome expectations, self-efficacy beliefs, and personal goals (Lent, 2013). SCCT stems from Bandura's (1977) social cognitive theory (Joslyn, 2014; Lent, 2013). SCCT posits that internal and external factors can affect individual thoughts,

attitudes, and behaviors, which can ultimately impact career choice. Outcome expectancy refers to expectations for particular outcomes based on certain behaviors. Efficacy expectations (or outcome beliefs in SCCT) refers to one's beliefs about their ability to successfully perform certain tasks or activities, which are then assumed to lead to particular outcomes. Self-efficacy changes because it is context specific and fluid (Lent, 2013). Self-efficacy greatly determines the amount of time and energy dedicated to the task or issue at hand. Low self-efficacy expectations can lead to task and/or performance avoidance (Bandura, 1977). For example, many first-year nursing students at the University avoid seeking assistance after a first test failure, even after receiving an academic alert notification, due to a lack of prior experience with poor performance. Their lack of coping skills for working through feelings of inadequacy associated with a test failure often interfere with their ability to move forward in seeking critical assistance. Finally, SCCT highlights personal goals in relation to self-efficacy and outcome expectations. Personal goals are the decision to complete a certain activity or task for an expected outcome (Bandura, 1986).

### **Self-Efficacy and Grit**

Consideration of how self-efficacy develops is important for creating early career and educational student development programs. Bandura (1977) argued self-efficacy beliefs rely on: vicarious learning, personal accomplishments, physiological states, and social persuasion. Vicarious experiences refer to watching others' successful performances without negative consequences. One is then encouraged to perform a similar task or activity. Personal performances rely on the individual doing the task correctly and are particularly powerful for building self-efficacy (Bandura, 1977).

Physiological states include emotional arousal, such as anxiety. Personal performances and physiological states affect self-efficacy, positively or negatively. For instance, many nursing students at the institution experience test anxiety due to high stakes exams. Those who have difficulty coping with the anxiety often lose focus in the testing environment and underperform on the exam. Finally, social persuasion is when an individual is convinced that he or she can perform a task successfully without having done it in the past (Bandura, 1977). Individual perceptions of these four sources of information are connected to self-efficacy levels. For example, two first-year nursing students, enrolled in the same chemistry course with the same instructor, can both participate in class and do well on the exam. Their high exam grade should increase their self-efficacy skills for learning chemistry. However, each student can take away different meaning from this experience, based on previously held beliefs and experiences (Joslyn, 2014). For example, if the course was taught by a famous chemist, this might cause some students to feel intimidated and alter their self-efficacy belief development (Bandura, 1977).

Similarly, positive psychology research (Duckworth & Gross, 2014; Peterson & Seligman, 2004) has shown that what affects students in goal attainment depends on the student's perceptions of the likelihood of reaching their goals. Specifically, the notions of grit and mindset play a role. "Grit" is continued interest and investment toward long-term goals (Duckworth, Peterson, Matthews, & Kelly, 2007). Grit is related to self-control, which involves self-regulation in the face of immediate gratification (Duckworth & Gross, 2014). Typically, students who are "gritty" possess more self-control, but this is not always the case (Duckworth & Gross, 2014). According to Dweck (2006) and Yaeger & Dweck (2012), individuals who believe that their intelligence is limited and

unchangeable have a fixed mindset. In contrast, individuals with a growth mindset believe that their abilities can develop, even after experiencing failure. Growth-minded students are more likely to persevere and enjoy learning. Self-awareness is crucial to a growth mindset. Since many first-year nursing students at the institution are overconfident in their academic abilities from high school, promoting early opportunities for self-awareness, such as through a FYE course, can assist students in modifying their academic abilities as necessary for early academic success and progression.

### **Career Decision Making Self-Efficacy (CDMSE)**

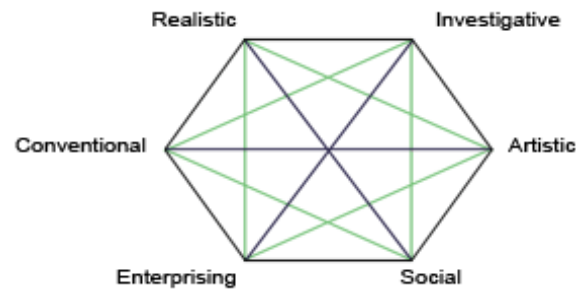
Betz (2000) relates Bandura's (1977) social cognitive theory to career development by considering content and process. Self-efficacy beliefs determine if an individual can perform the reflective behaviors necessary for informed decision-making. Such self-reflection is connected to career readiness and maturity. Both are important for measuring career decision-making self-efficacy (CDMSE). CDMSE focuses on one's confidence levels for completing career decision-making activities (Joslyn, 2014). Five competencies are involved in career decision-making (Betz & Taylor, 1994): goal setting, problem-solving, planning, accurate self-awareness, and career information. Taylor & Betz (1983) found that in a sample of 346 participants with low levels of CDMSE skills, they also had low levels of career decision making. Similarly, Guay, Ratelle, Senecal, Larose, & Deschenes (2006) found a relationship between CDMSE and career decidedness after comparing 243 college students. Gloria & Hird (1999) found in a sample of 687 college students, those with declared majors have significantly higher levels of career decision-making self-efficacy, regardless of ethnicity. Additionally, Caucasian students have statistically higher levels of career decision-making self-



efficacy. These findings are particularly interesting to this study since while all the participants declared nursing as their major upon entrance to the institution, not everyone progressed in the nursing major. CDMSE is linked to self-awareness, personal interests, competency, professional identity, and career decisiveness (Betz & Voyten, 1997; Taylor & Popma, 1990). Many of these factors were explored through this study's career development instrument.

### **Holland's Theory of Career Choice**

Holland's theory of career choice (Holland, 1997) describes the interactions between individuals and their environments on career choice (Holland, 1997). Holland (1997) posited that most people can be categorized into six personality types: Realistic, Investigative, Artistic, Social, Enterprising or Conventional (RAISEC). Late adolescence is when individuals start to develop a RAISEC type. Using Holland's six RAISEC personality types, students and work settings can be grouped and matched (Holland, 1997; Joslyn, 2014). Figure 1 below shows the interaction of the RAISEC themes on the individual and the environment in relation to career choice.

Figure 1. *Holland's Hexagon of RAISEC Themes for Career Choice*

*Figure 1.* Holland's hexagon explains the interactions between the individual and environment on career choice. RAISEC = Realistic, Artistic, Investigative, Social, Enterprising, and Conventional. The theory is most powerful when the individual and the environment are closely matched. Holland, J. L. (1959). A theory of vocational choice. *Journal of counseling psychology*, 6(1), 35.

RAISEC types are informed by experiences, setting, and heredity (Joslyn, 2014). Each type consists of personal and professional preferences, values, goals, beliefs, and coping behaviors. The six RAISEC types exist in six model environments in the shape of a hexagon (see Figure 1 above). The hexagon model represents degrees of congruence or alignment between the environment and the individual. A major component of Holland's (1997) theory is to apply occupational theory in a tangible way (Spokane & Cruza-Guet, 2005). The theory assumes that people look for environments where their skills and abilities are most aligned. Alignment is most powerful when the individual's environment matches their personality (Holland, 1997; Joslyn, 2014). Congruence is ultimately reached when the degree to which an environment or individual align with the six types. An individual's RAISEC code is not fixed; if the person or environment changes, so can the code (Holland, 1997; Joslyn, 2014).

### **Online Career Interventions**

Research suggests that online career interventions improve career development, especially since technology allows the intervention to be self-paced, individualized, and accessible (Gati & Asulin-Petertz, 2011; Joslyn, 2014; Oliver & Whiston, 2000).

Additionally, online and computerized interventions provide increased anonymity to those who would otherwise avoid seeking career counseling (Sampson & Lumsden, 2000).

### **FOCUS-2**

A primary tool used to operationalize Holland's theory in this study was FOCUS-2 (Career Dimensions, Inc., 2014). FOCUS-2 is a web-based tool that guides students through career and educational decision making for major selection. FOCUS-2 combines self-assessment, career and major exploration, decision-making, and action planning. FOCUS-2 is fully certified by the Association for Computer Based Career Information Systems, the National Career Development Association, as well as the United States Department of Labor. FOCUS-2 permits students to do the following: assess career readiness, broaden career horizons, analyze different occupations, make decisions about major areas of study offered at the institution, build a career portfolio, and learn about career tools/websites (Career Dimensions, Inc., 2014). Users can search the occupational database for different majors and compare occupations by salary, skills, and educational requirements (Career Dimensions, Inc., 2014). Student records and results are stored in the system's confidential and secure database, which can only be accessed by the student and designated campus representatives.

While FOCUS-2 aligns students' skills, interests, and values for informing career development programs, it is also an intervention (Dozier et al., 2014; Joslyn, 2014; Reardon & Lentz, 1998; Spokane & Holland, 1995). Use of FOCUS-2 as an intervention among a sample of 420 first-year college students at a private university in the Northeast led to significant differences in career decision-making self-efficacy and changes in career decision making (Tirpak, 2011). In particular, African Americans (11.9%) report more confidence in their ability to make career decisions and are more optimistic than their Asian American counterparts (11%). Students with a declared major report higher career decision making self-efficacy than their undecided peers. These findings are important to this study since all participants declared nursing as their major prior to starting college, thus shedding light on some of the noncognitive factors that affect early academic progression and career choice.

Finally, the delivery and implementation of FOCUS-2 is standardized and allows students to review their information and retake certain portions (Career Dimensions, Inc., 2014). The retake option is particularly useful for students whose responses are influenced by their environment, such as feedback from family members or peers during the assessment (Joslyn, 2014; Sampson, 2000). FOCUS-2 utilizes the Holland RAISEC types in the scales. The scales measure aptitude and proficiencies and promote occupations that are relevant and interesting to the user. As a result, FOCUS-2 meets the standards and guidelines of the National Career Development Association (Career Dimensions, Inc., 2014). In this study, students completed the career tool during the FYE course. Historically, the career interest inventory is the focus point of the career planning process. The inventory reflects an individual's attraction to specific occupational areas

using the RAISEC types. FOCUS-2 is unique compared to other career interest assessments because it includes a device for filtering the results using level of education to provide a more holistic picture for students (Career Dimensions, Inc., 2014).

**FOCUS-2 Effectiveness.** Studies that evaluated the effectiveness of FOCUS-2 reported that students who utilized the career tool experience the following benefits (Career Dimensions, Inc., 2014): 1) They set more specific career and post college education goals; 2) They are more engaged in behaviors supporting their career development, such as enrolling in volunteer activities and internships and elective courses that support their goals; 3) They are more confident in their decisions about the future; and 4) They report more satisfaction with their chosen major. Additionally, surveys of college counselors and publications by the University of Michigan and The American Psychological Association (APA) concluded that FOCUS-2 is the most preferred and widely used career planning system because of its user-friendliness and cost-effectiveness (Career Dimensions, Inc., 2014).

### **Multicultural Components**

A major assumption in discussing SCCT's (Betz, 2000) applicability to diverse college student groups is its relevancy because it considers environmental influences (Joslyn, 2014). While self-efficacy has been explored in relation to diverse populations, it is heavily focused on the individual (Joslyn, 2014; Lindey, 2006). According to Betz (2000), self-efficacy is beneficial for understanding career development of diverse college student groups, particularly for persistence. Similarly, Tang et al. (1999) posited that out of 187 college students, Asian Americans are more likely to be influenced by

family, culture, and career self-efficacy during the career decision-making process.

Hackett, et al. (1992) reported that self-efficacy effectively predicted academic success in a sample of 197 undergraduate STEM students.

Spokane and Cruza-Guet (2005) argued that Holland's (1997) theory of career choice is supported by the literature for its use with diverse populations. Fouad (2002) tested the validity of the RAISEC types (Holland, 1997) among 3,637 people, including Caucasians, Asian Americans, African Americans, Latinos, and Native Americans. He used a randomization test to compare the sample's RAISEC score relationships to the ideal score relationships (Holland, 1997). Holland's theoretical assumptions were confirmed by the sample all ethnic groups, except American Indian professional women. The RAISEC type analyses was supported by another study with a sample of 805 African Americans, 795 Asian Americans, 36,632 Caucasians, and 686 Latinos employed in the United States (Fouad, Harmon, and Borgen, 1997).

Further, Day, Rounds, and Swaney (1998) assessed the RAISEC types validity in a sample of 11,610 secondary students. Their analyses support Holland's model for each ethnic group. Tang, Fouad, and Sith (1999) tested the RAISEC congruence hypothesis with 187 Asian American undergraduate students to determine whether participants' work interests predicted career choice. They considered the following variables: acculturation, family, socioeconomic status, interests, and career self-efficacy. Their results suggest that family, culture, and self-efficacy influence career choice, while interests are not a major predictor. These results are relevant to this study since many nursing students at the institution cite their families as influencing their initial decision to pursue nursing. Determining the significance of the influence can inform the types of educational and

careers programs provided by higher education practitioners for meeting the needs of diverse nursing students.

Tang, Fouad, and Sith's (1999) results do not support Holland's congruence hypothesis in their population. However, the results support the study's hypothesis that Asian American students choose occupations that are more socially acceptable in their culture rather than occupations aligned with their personal interests (Joslyn, 2014). Finally, Magerkorth (2000) studied Holland's (1997) RAISEC types among 441 undergraduate students. They compared congruence scores and career choice and interests scores among the participants. Caucasians had significantly higher levels of congruence than their minority counterparts who comprised 21% of the sample. This may suggest that Holland's (1997) key assumptions are not generalizable to other populations besides Caucasians (Joslyn, 2014).

Additional research is necessary to determine whether Holland's (1997) theory is useful for diverse college student populations (Joslyn, 2014). One way to test the validity of a theory is through the validity of instruments derived from the theory (Joslyn, 2014). For example, Fouad and Mohler (2004) measured the Strong Interest Inventory's (SII; Strong, Donnay, Morris, Schaubhut, & Thompson, R. C. (2004) validity among five cultural and ethnic groups, including American Indians, African Americans, Latinos, Asian/Pacific Islanders, and Caucasians. Their sample consisted of 3,750 participants. Ethnicity was significant for General Occupational Themes. Asian Americans and African Americans scored higher than Native Americans on the Investigative General Occupational Themes and the Enterprising General Occupational Themes, respectively. In Hansen and Lee's (2007) SII study with 319 college students, they found that white

males (81%) have statistically higher hit rates compared to African American women and men and Caucasian women (54-58%) (Joslyn, 2014). Finally, Holland's (1997) theory consists of several assumptions, which have not been tested for validity across all diverse contexts. Thus, the above discussion and its generalizability is inherently limited (Joslyn, 2014). Studies have found that RAISEC types either fit well across different ethnic groups or show consistent misfit. Caucasian participants seem to support the congruence hypothesis more than any other ethnic group (Joslyn, 2014). Since nursing is currently still a predominately Caucasian and female driven profession, the significance of the research findings above are noted in Chapter Five in more detail.

Literature on diverse college student groups and SCCT support applying the concept of self-efficacy to career development (Gushue, Scanlan, Pantzer, & Clarke, 2006; Hackett, Betz, Casas, & Rocha-Singh, 1992; Joslyn, 2014; Lent, Lopez, Sheu, & Lopez, 2011; Tang, Fouad, & Smith, 1999). Acculturation and cultural identity seem to be key aspects of career development for diverse college student groups (Gloria, & Hird, 1999; Patel et al., 2008; Rollins & Valdez, 2006). This is important for higher education practitioners who might not understand why certain students are remaining in a major that they are clearly not enjoying nor demonstrating sufficient competency, such as nursing. Second, CDMSE helps to predict professional identity and career search activity levels with diverse college student groups. In a study using path analysis with 116 engineering students at predominantly White and historically Black universities (Lent, Sheu, Gloster, & Wilkins, 2010), their findings suggest that changes in outcome expectations, goals, and interests are significant predictors of self-efficacy levels. Further, variance for wanting to persist in engineering after the second semester is significantly



influenced by environmental supports. Interests and outcome expectations do not have predictive power for wanting to persist in engineering (Lent, Sheu, Gloster, & Wilkins, 2010; Joslyn, 2014). The current study also considered perceived supports and barriers on progression, discussed in more detail below.

The SCCT model identifies the importance of context for predicting learning experiences (Garriott, Flores, & Martens, 2013). For FCGS, socioeconomic status can predict the extent and quality of learning experiences that shape career interests. Additionally, students who enter the institution from educationally underprepared high schools often do not have the same level of access or exposure to career and educational resources compared to their counterparts. For example, taking advanced placement math and science courses in high school or having limited access to role models in the sciences can impact career choice (Bloom, 2007; Engle & Tinto, 2008; Garriott, Flores, & Martens, 2013). College students who perceive less support from their parents with lower education levels also perceive less access to household educational resources such as less technology access. As a result, this perception restricts pursuit of educational and career opportunities (Garriott, Flores, & Martens, 2013; Gibbons & Shoffner, 2013). In this study, where approximately 33% of the students were FGCS, consideration of contextual factors was important for analyzing predictors of early progression and career choice.

### **Perceived Barriers and Supports**

Lent et al. (2000) defined perceived barriers as negative outcome expectation that affect one's perception of the environment. The career development literature supports the existence of more perceived career barriers among FGCS due to limited networking

opportunities and academic preparation (Fouad & Kantamneni, 2013; Joslyn, 2014).

Fouad & Byars-Winston (2005) reported in a meta-study of 19,611 participants that while minority participants did not show differences on career aspirations, they perceive greater career barriers and fewer opportunities than their counterparts. Similarly, Nepper Fiebig et al. (2010) found in a sample of 219 Latino community college students, that FGCS have significantly higher perceived academic barriers and lower expectations for college success. FGCS also reported avoiding participation in career-oriented activities. Coupled with the highly stressful nature of nursing school, nursing students reported higher anxiety scores than the national norms for other college students (Silvestri, Clark, & Moonie, 2013). The academic rigor and required time investment contributes to higher levels of anxiety, worry and depression. A maladaptive result to stress for many nursing students includes feelings of rejection and inadequacy, which can ultimately lead to task avoidance and thus poor academic performance (Nepper Fiebig et al., 2010). These findings shed light on several noncognitive factors that affect progression of early nursing students. For example, if first generation nursing students perceive greater career barriers than their peers for networking and shadowing opportunities, than nursing schools have an important role to play in hosting career and networking fairs to alleviate some of these perceived barriers.

### **Goal Orientation, Motivation, and Student Demographics**

Goal orientation refers to the affective and cognitive dispositions that shape why one engages in an academic task or activity (Ames, 1992) and explains mechanisms that influence career choice and academic performance. Goal orientation stems from research conducted by Dweck (1986) and consists of two dimensions: learning orientation and

performance orientation. Similar to the notion of a fixed versus growth mindset, nursing students with a learning orientation strive to develop their skills, knowledge, and expertise for personal and professional growth. In contrast, nursing students who are performance oriented focus on outperforming their peers (Ames, 1992). Due to the rigorous and competitive nature of nursing school to earn or maintain a clinical space, many nursing students are performance oriented. Like mindset and grit, goal orientation affects individual abilities to withstand obstacles and adjust to change. For Lent et al. (2000), goal orientation is critical to career development because it connects interests to actions.

Similarly, intrinsic motivation is one's degree of engagement based on the task or activity's inherent interest to the individual (Conti, 2000; Klinger, 2006; Ryan & Deci, 2000). Extrinsic motivation refers to whether the task or activity is completed for primarily external reasons such as money for grades, awards, praise or criticism from an instructor, etc. (Klinger, 2006; Ryan & Deci, 2000). Individuals can have extrinsic and intrinsic reasons for completing a task or activity. However, intrinsic motivation is significantly related to higher cognitive engagement, SAT scores, and academic performance (Conti, 2000). While extrinsic motivation has been positively linked with academic performance, it has also been connected to surface level academic engagement and low self-direction (Conti, 2006; Walker, Green, and Mansell, 2006). Many of the tasks that contribute to learning are considered tedious by college students, and thus call on intrinsic motivation (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011; Yeager, Henderson, Paunesku, Walton, D'Mello, Spitzer, & Duckeworth, 2014). For example, first-year nursing students at the University take chemistry, college math, and

human biology during their first two semesters of college. These rigorous math and science courses are primarily lecture driven, with minimal general science lab experiences. The lack of early experiential learning opportunities makes it difficult for many nursing students to stay motivated, especially since they tend to prefer more hands-on and social learning experiences.

Scant research has focused on motivational differences among diverse college students (D'Lima, Winsler, & Kitsantas, 2014). According to Bui (2002), motivators for attending college vary among FGCS. To provide family financial assistance, family honor, or to gain status and respect are commonly cited reasons for attending college by FGCS. Students with parents who have at least a bachelor's degree state their main reasons for going to college as having relatives who went to college and to move out of their parent's house (Bui, 2002). In a survey of 221 first generation Latino college students across five institutions, they cited their mothers for motivating them to receive a college education, more than their fathers, friends, or teachers (Meza Discua, 2011). The ability to obtain financial aid, live at or near home, quickly complete courses, and be employed during school were key characteristics of FGCS for choosing a particular college (Joslyn, 2014). African American college students, in particular, face stigma associated with academic success. The stigma is confounded by a lack of peer support, professional identity concerns, and a lack of African American mentors in the field. African Americans and other minority student groups who are reminded of these stereotypes display higher academic anxiety and lower intrinsic motivation compared to their Caucasian counterparts (Chavous et al., 2003; Fugligni, 2001; Gillen-O'Neel, Ruble, & Fuglini, 2011; Reyna, 2000).

Family support and student engagement are related to motivation and academic persistence for Latino college students (Gloria et al., 2005). The desire to be academically successful and high self-efficacy are the most influential factors of college success for a sample of Latino students (Gloria et al., 2005). College self-efficacy and academic motivation are strongly correlated to college GPA and retention for Latino students (Edman & Brazil, 2007; Lotkowski, Robbins, & Noeth, 2004). Rivera-Mosquera, Phillips, Castelino, Martin, and Mowry Dobran (2007) conducted a study with 30 Latino students between the ages of 12 and 21. Similar to the FYE course in this study, the program focused on career exploration, college readiness, and academic skill building. The main goal of the program was to increase self-efficacy across all three areas by administering a culturally relevant program. While their study did not provide adequate outcome data, since only half of the 30 participants completed the pre-tests, descriptive statistics showed that career development knowledge and self-efficacy increased with the program. Since encouraging nursing students to seek necessary resources and services is a constant challenge at the current institution, the FYE in this study provided an opportunity to focus on career exploration, college preparedness, and academic skill building.

### **Self-Regulation and Metacognition**

Critical findings from the National Research Council (Bransford, Brown, & Cocking, 2000) shed light on differences between how experts and novices process information: 1) Experts notice meaningful patterns of information that novices overlook. 2) Experts organize their knowledge. 3) Experts reflect on the context and conditions surrounding knowledge. 4) Experts flexibly retrieve important components of knowledge.

According to Brydges & Butler (2012), becoming an expert involves self-regulated learning (SRL), which is guided by metacognition, strategic action, and intrinsic motivation. The SRL stages include planning, goal setting, understanding expectations, flexibility and emotional intelligence, interpreting feedback, self-monitoring, and self-assessment. SRL requires learners to be active participants in the learning process and utilizes prior knowledge. For example, students bring history and experiences, strengths and challenges, and personal interests and beliefs that interact with their learning environment (Brydges & Butler, 2012).

A primary component of SRL is metacognition, which includes retrieval practice, spacing, and interleaving (Brown, Roediger, & McDaniel, 2014). Retrieval practice involves memory recall. Flashcards are a common example of retrieval to strengthen memory and interrupt forgetting. When students space out practice across two or more subjects, retrieval is harder and feels less purposeful. However, the effort produces deeper learning and enables transfer in different contexts (Brown, Roediger, & McDaniel, 2014). Pattern recognition and active self-regulation also promote successful retrieval (Jensen, McDaniel & Bugg, 2012; McDaniel, Dimperio, Griego, & Busemeyer, 2009; McDaniel, Fadler, & Pashler, 2013; McDaniel, Howard, & Einstein, 2009; Rawson & Dunlosky, 2011; McDaniel, Wildman, Anderson, 2012; McDaniel, Woodard, Kummer, 2014). During the learning process, learners need prompt feedback for when and how to use the new knowledge or skill for effective transfer (Jensen, McDaniel & Bugg, 2012; McDaniel, Dimperio, Griego, & Busemeyer, 2009; McDaniel, Fadler, & Pashler, 2013; McDaniel, Howard, & Einstein, 2009; Rawson & Dunlosky, 2011; McDaniel, Wildman, Anderson, 2012; McDaniel, Woodard, Kummer, 2014). For example, Chemistry for the

Health Professionals (Chemistry 1052) is a required course for nursing students during their first semester. The course necessitates that students have high levels of metacognition and self-regulation to be successful in the course. Moreover, chemistry is a strong predictor of progression in nursing at the institution, with a 30% failure rate and 7% withdrawal rate between Fall 2013-Fall 2015 (UMSL, Office of Institutional Research) as well as a strong predictor of NCLEX pass rate success (Lockie, Van Lanen, & McGannon, 2013; Simon, McGinniss, & Krauss, 2013).

### **First Year Experience**

How cognitive, non-cognitive, and demographic factors relate to progression and career choice among first-year nursing students is important for understanding this study's importance within the literature. At the current institution, which traditionally welcomes 500 new freshmen each Fall semester, approximately 66% of these students do return after their freshmen year. For freshmen who earn less than a 2.0 GPA, only 50% return to the university after their first year (UMSL Office of Admissions, 2016).

Since most introductory science courses do not address individual starting points (Tanner, 2011), many early nursing students confront their first significant academic challenge in these courses, often referred to as "weed out" courses (Anderson & Kim, 2006; Barr et al., 2008; Barr et al., 2010; Drane et al., 2005; Hurtado, et al., 2008). Limited clinical nursing spaces and high academic performance requirements in nursing school often foster a "survival of the fittest" mentality (Hurtado et al., 2008; Shulman, 1987). Additionally, the fast-paced, high stakes nature of the coursework limit opportunities for students to self-assess and modify their learning strategies. Negative

experiences in these early courses reduce the number of undergraduates who show interest in the sciences by half within the first two years of college (Drane et al., 2005; Anderson & Kim, 2006; Hurtado et al., 2008; Barr et al., 2008; Barr et al., 2010). An unexpected source of stress for many early nursing students at the current institution is the constant demand to earn or keep a clinical space in the program. In turn, many students become overwhelmed and delay seeking help, resulting in the need for several remediation attempts, leaving the major, or even the institution (Bloom & Krathwohl, 1956; Gardner et al., 2011; Pascarella & Terenzini, 2005; Tinto, 1993; Upcraft & Gardner, 2003).

Tailoring learning conditions for specific student groups, such as in a FYE course, can provide an early opportunity to intentionally support early academic performance and progression (Agarwala, D'Antonio, Roediger, McDermott, & McDaniel, 2014; Brydges & Butler, 2012; Butler, 2010, Little & McDaniel, 2014; McDaniel, Fadler, & Pashler, 2013; Rawson & Dunlosky, 2011; Roediger & Butler, 2011). The earliest FYE course was developed at the University of South Carolina (USC) in 1970 during campus political protests. USC President Jones aimed to connect students to the institution and transform undergraduate teaching through the creation of a FYE. Two years later, all USC freshmen were enrolled in the FYE. Eventually, The National Resource Center for the First Year Experience and Students in Transition at the USC was created. Through the Center, the FYE course became “part of a larger movement to advance and support efforts to improve student learning and transitions into higher education” (<http://www.sc.edu/fye/center/history.html>).



The FYE course in this study was modeled after Vygotsky's (1978) "zone of proximal development." The zone is what a person can do with assistance versus alone. Anderson, Goodman, & Schlossberg (2011) argue that people cope with transition in different ways using four essential resources: self, situation, strategies, and support. Self includes personal characteristics such as socioeconomic status, gender, age, ethnicity, values, and self-efficacy. Situation includes triggers, timing, role change, duration, previous experiences, and concurrent stress. Strategies involve help seeking and feedback seeking. Support focused on social relations such as family, friends, peers, and the institution. Identifying courses that highlight these four essential resources, such as a FYE course, have been shown to be an effective career development program (Francescato, Solimeno, Mebane, & Tomai, 2009; Joslyn, 2014) and for increasing college self-efficacy (Joslyn, 2014; Sidle & McReynolds, 2009). Folger, Careter, and Chase (2004) conducted a FYE intervention with 50 FGCS regarding social and academic motivation and general coping skills in a six-week intervention. The intervention consisted of weekly class meetings on topics including academics, college resources and services, building relationships, and other common student transition issues. Compared with a control group of 44 participants, the FGCS intervention group reported higher first-year GPAs and retention rates (Joslyn, 2014).

### **Early Academic Success**

While most research on college preparedness and academic skill building of educationally underprepared students has been conducted at the community college level, about one-fifth of students at four-year institutions are taking remedial coursework (Adams, et al., 2012). These students are more likely to be minority students, have low

SES, and be first generation (Radford et al., 2010). All students at the University are required to take a FYE course. Thus, the FYE course for nursing students is not viewed as remedial, thus avoiding stigma and supporting timely degree completion (Attewell, Lavin, Domina, & Levey, 2006). The following assumptions about adult learners as conceptualized through the lens of andragogy were used to inform the FYE course in this study (Merriam & Bierema, 2013): 1) Adult learners are self-directed; 2) Adult learners possess a readiness to learn; and 3) Adult learners are intrinsically motivated and genuinely interested in learning. No nursing student begins college thinking "I want to fail." However, many nursing students are unaware that they are academically underprepared and are thus unrealistic with their academic and career goals (Deil-Amen & Rosenbaum, 2002). Moreover, there is often an "illusion of comprehension" or competence (Svinicki, 2004) that exists. This illusion is common among low- and high-performing college students (Brown, Roediger, & McDaniel, 2014). The illusion is the student's belief that they have mastered some skill or knowledge only to discover that they are not demonstrating mastery in a learning task that requires the skill and/or knowledge. It is the "I understood when you explained it in class" phenomenon (Svinicki, 2004, p.120). These students often rely on short-term learning strategies such as incomplete note-taking, organizing information linearly in the form of lists and outlines, isolating facts, and rereading and recopying their notes (Aharaony, 2006; Brown, Roediger, & McDaniel, 2014; Brydges & Butler, 2012; Kiewra, 2002; Lynch, 2007). The reliance on short-term learning strategies was addressed in the study through formal introduction and instruction of long-term learning strategies during the FYE.

### **Metacognitive Learning**

As previously discussed, the FYE in this study originated as a student development course for at-risk, freshmen nursing students. A focus of the course includes applying metacognitive learning strategies for effective reading and note-taking, conceptual thinking, and self-testing. While a popular reading method is Robinson's (1941, 1946) Survey, Question, Read, Recite, and Review (SQ3R), research suggests that this method is ineffective for long-term learning (Jairam & Kiewra, 2009). Tang, Fouad, & Smith (1999) reported no academic improvement due to using the SQ3R method, despite students completing 10 or more hours of SQ3R instruction. Another study found that using the SQ3R system is similar to just reading the textbook (McCormick & Cooper, 1991).

As a result, the SOAR method (Kiewra, 2004; 2009) was selected for use in this study's FYE due to having its theoretical roots in the information processing model. The model represents three components for how humans process information: sensory memory, short-term memory, and long-term memory (Kiewra, 2004; 2009). SOAR, which stands for, Select, Organize, Associate, and Regulate, is comprised of learning strategies that activate cognitive processes such as attention, encoding, storage, and retrieval (Jairam & Kiewra, 2009; Kiewra, 2005). Each SOAR component focuses on common learning errors by students. During the Selection component, the focus is on developing effective note-taking skills since note-taking is strongly related to course outcomes (Kiewra, 1983; Kiewra & Benton, 1988). During the Organization component, the focus is on utilizing strategies to organize information. Since many college students organize information linearly, the emphasis is on creating graphic organizers such as

concept maps and charts in order to demonstrate relationships among key ideas (Kiewra, 2009). During the Association component, the focus is on building associations among ideas. Association activities include: summarizing, elaboration (Pressley, McDaniel, McTurnure, Wood, & Ahmad, 1987), linking to prior knowledge (Bransford, Brown, & Cocking, 2000), and using mnemonics (Atkinson, Levin, Kiewra, Meyers, Kim, Atkinson, & Hwang, 1999). During the Regulation component, the focus is on self-testing for effective self-regulation (Zimmerman et al., 1996). Students in this study utilized the SOAR method to create Chemistry 1052 flashcards and to reconstruct their lecture notes.

### **Summary**

Limited research exists on first-year predictors of progression and career decision making among first-year nursing students using career development theory. A review of the literature considered the roles of cognitive, non-cognitive, and demographic factors of progression and career choice through the theoretical lenses of Social Cognitive Career Theory (Betz, 2000) and Holland's (1997) theory of career choice. Since FGCS are an academically at-risk student population with less guidance for navigating college life and expectations, this study reviewed the current state of interventions in career development for diverse college students. A FYE course provides a unique opportunity for early career exploration, community building, and academic skill building, especially for institutions who serve a high rate of FGCS or underrepresented minority students (URM). Next, the focus will be on the research design and methodology that was used to address this study's primary research question.

## CHAPTER 3

### Research Design and Methodology

The purpose of this study was to examine cognitive, non-cognitive, and demographic data as predictors of progression of first-year nursing students using a career development framework. Few nursing studies have considered the impact of early nursing socialization experiences on career decision-making (Brodie et al., 2004). Thus, this study contributes to existing knowledge by informing future career and educational interventions (such as a FYE course) for first-year nursing students. The career development tool that was utilized in this study is discussed in this chapter in addition to the institutional databases used to collect cognitive achievement, career scores, and demographic data. The outcomes of this study may be generalizable to other nursing student populations. Since at least 33% of the population in this study were first generation college students (FGCS) from diverse backgrounds (UMSL, Office of Institutional Research), the results of this study may also shed light on unique career development needs of underrepresented minority nursing student populations.

#### Research Design

The researcher used correlational prediction study design as the primary framework for conducting the study. The prediction study identified variables that forecasted the academic success of first-year nursing students (Gall, Borg, & Gall, 2007). Specifically, the outcomes of the prediction study design provided the degree to which the dependent variable (progression) could be predicted using demographic data (first generation college student status, ethnicity, and Pell eligibility), educational and

achievement data (ACT scores and first-year cumulative GPA) and non-cognitive data (Holland career scores). Bivariate correlations were computed between the criterion (progression) variable, demographic variables (ethnicity, Pell eligibility, and first generation college student status), the cognitive predictor (ACT scores, first-year cumulative GPA) and non-cognitive predictor (Holland career scores) variables. For this study, the predictor variables were measured before the criterion behavior occurred.

The focus of a prediction study is to maximize the correlation between the predictor variables and the criterion (Borg et al., 2007). This cross-sectional survey research design describes the trends and prevalence of behavior for variables (progression and career choice) in a population of nursing students. Data was collected from the Fall and Spring semesters of 2014 and 2015. More details regarding the independent and dependent variables are in the procedure section. In addition to the primary research design, the study used survey research design to describe trends for the independent and dependent variables in the population of study. Survey research in this study included use of an electronic career development tool distributed via the Office of Career Services. All students at the University have free access to the tool through their student username and password. Once logged in, students completed the survey on a public or personal computer as homework.

### **Research Question**

The literature reviewed, the study's purpose, and social significance of the study, led to the development of the research question: What is the predictive value of selected cognitive (first year cumulative GPA and ACT composite scores), noncognitive (Holland

scores), and demographic (first generation college status, ethnicity, and Pell eligibility) factors on progression among first-year nursing students?

### **Research Hypothesis**

The following hypothesis was developed in response to the research question above and informed by the literature review:

A combination of the selected cognitive, noncognitive, and demographic variables will predict early progression and career fit among first-year nursing students.

### **Population**

The target population for this study consisted of a total of 115 first-year nursing students at the University of Missouri-St. Louis a large Midwestern four-year public land grant university in Fall 2014-Spring 2015 and Fall 2015-Spring 2016. The population completed the course titled University Studies 1003 for nursing majors taught by the researcher and completed a career self-assessment tool (FOCUS-2 (2015) or Strong Interest Inventory (2014)) during the course. The freshmen nursing students were between 18-19 years old and enrolled in a five semester, 120 credit hours prelicensure baccalaureate of science in nursing program. The students completed the (FOCUS-2 (2015-present) or Strong Interest Inventory (2014)) during the course.

### **Sampling**

This study employed non-random probability sampling (Sample I) and random probability sampling (Sample II) among two aggregate samples of 61 first-year nursing students enrolled in University Studies 1003 in 2014 and 2015. A power analysis

determined adequate sample sizes for both samples prior to analysis. Sample I employed non-random probability sampling since the researcher already had access to the educational setting as the instructor for the FYE course and as a staff member in the College of Nursing. Additionally, Sample I demographic data were coded by the Office of Institutional Research before being released to the researcher since it was considered sensitive information. In Fall 2014, only students who had not been formally admitted to the College of Nursing were enrolled in this University Studies 1003 course. The course consisted of 29 students, of which 18 students (or 62%) were first generation college students. In Fall 2015, 86 pre-nursing students were enrolled in the course when a FYE became a one-credit hour requirement for all first-year students, as a result of a campus-wide movement to retain more freshmen. Of the 86 students, 48 students (or 55.8%) self-classified as first generation. Of the 115 total students who completed the course in Fall 2014 and Fall 2015, 61 students were non-randomly selected for the study after data cleaning for a diverse sample size. Students with missing or incomplete data (n=54) were not included in the sample.

Sample II employed random probability sampling. The 61-student sample was generated from 91 students who completed the FOCUS-2 using a random sampling calculator for multiple regression statistics. The noncognitive independent variable was Holland scores, produced by FOCUS-2 or the Strong Interest Inventory. Holland codes are calculated from RAISEC scores that stand for Realistic, Artistic, Investigative, Social, Enterprising, and Conventional. The maximum Holland RAISEC code score is three letters. The letters (or themes) are ranked in order of strength. Themes were coded numerically and chronologically from 1 = Realistic to 6 = Conventional. Holland data



were extracted from the assessment's database via the Office of Career Services, which did not provide student demographic data for gender, ethnicity, age, first generation status, or Pell eligibility. Inferring from the descriptive statistics of Sample I, Sample II consisted of primarily female nursing students who were between 18-19 years old.

A common limitation of non-probability sampling includes the degree of generalizability. To generalize the validity of findings from a sample to a particular population means the sample must be drawn from that population. To address how representative the samples were of the surveyed and non-surveyed population, the researcher utilized a probability of inclusion. All probability samples involve random sampling at some point (Shavelson, 1988). The majority from both samples were female from local public schools, and from middle to low socioeconomic status (UMSL, Office of Admissions, 2016).

Sampling was important to this study for several reasons: 1) Sampling is critical for validity, or the degree to which the interpretations of the study's results are generalizable to the study itself or to other situations and populations (Shavelson, 1988). 2) Sampling is critical for internal validity, or the degree to which the outcomes of a study result from the variables that were treated rather than from non-treated variables. Without probability sampling, error estimates cannot be constructed (Shavelson, 1988). 3) Sampling is critical for external validity, or the degree to which a study's findings are generalizable to people or situations other than the study participants. Sampling for the career instrument was randomly selected to ensure a representative sample and generalizability. Random selection means that the sample was randomly selected from the same population of approximately 90 first-year nursing students (Shavelson, 1988).

### **Study Site**

This study took place at the University of Missouri-St. Louis (UMSL) in St. Louis, Missouri, USA. The land grant institution is the only four-year public nursing school in St. Louis and is part of a four-campus state university system: University of Missouri-Columbia, University of Missouri-Kansas City, and Missouri University of Science and Technology. The majority of undergraduate students (75%) commute to campus and work at least part-time (or 26 hours per week) while attending the institution (UMSL, Office of Admissions). The majority of students come from the St. Louis area public schools.

Over 50% of the general undergraduate student population (12,161 students) at UMSL come from low socioeconomic backgrounds and are Pell eligible (UMSL, Office of Institutional Research, 2016). Pell eligibility derives from the average annual household income, which for families with a student attending UMSL is approximately \$30,000 (Institute for Research on Higher Education, 2016). Essentially, 92% of family income is necessary to pay for UMSL tuition. Racial disparity in postsecondary attainment among African Americans in St. Louis is particularly high. According to the *College Affordability Diagnosis* (Institute for Research on Higher Education, 2016), 39% percent of Whites have an associate's degree or higher, compared to only 26% of African Americans and Latinos. Approximately 30% of freshmen students at the institution are Pell eligible. Over 38% of the total undergraduate population at the institution is Pell eligible (UMSL, Office of Admissions, 2016).

## Methods and Procedures

This study utilized a cross-sectional, correlational design to examine predictors of progression and career choice among first-year nursing students. The research variables are discussed below.

### Research Variables

The independent or predictor variables in this study were student profile characteristics categorized as cognitive, non-cognitive, and demographic variables. The cognitive dependent variable was academic progression determined by first-year cumulative GPA and ACT scores. Progression was analyzed as: 1) progressed within the major, 2) progressed, but in a different major, or 3) left the university. The non-cognitive independent variable included career scores. The demographic variables included first generation college student status, Pell eligibility and ethnicity. Age was controlled for since all participants were between 18-19 years old (UMSL, Office of Institutional Research). Age as continuous demographic variable was self-reported data obtained from the University admission application form.

### Dependent Variables

**Progression.** The dependent or outcome variable in this study was Fall GPA, Spring GPA, and cumulative GPA on progression as determined by student performance in their foundational courses during the first two semesters of the six semester pre-licensure BSN program. It was operationalized as a dichotomous variable with students categorized as 1=successful or 0=unsuccessful. Students were categorized as successful had progressed with at least a 2.0 GPA within or out of the nursing major at the institution. Students who

withdrew from the university during the first two semesters were considered unsuccessful. Students were taking clinical nursing courses during the first two semesters.

### **Cognitive Dependent Variables**

**First-Year Cumulative Grade Point Average (GPA).** Cumulative GPA, on a scale of 0 to 4, was calculated on grades in courses that were completed by the students after high school. At the institution, of freshmen who earn less than a cumulative 2.0 GPA or less, only 50% return to the university after their first year (UMSL Office of Admissions).

**ACT composite scores.** ACT composite scores were based on scores received by the Office of Admissions from official transcripts. Composite scores consisted of each test score (English, mathematics, reading, science) with a range from 1 (low) to 36 (high). The composite score is the average of the four test scores, rounded to the nearest whole number.

### **Noncognitive Independent Variables**

**Career Scores.** This variable was operationalized by student scores on FOCUS-2 or Strong Interest Inventory instruments. Scores were three-letter Holland codes discussed in more detail below.

### **Demographic Independent Variables**

**First Generation College Student.** The categorical variable was determined from the student's self-identified response on the admission application. Students with at least one parent who completed a bachelor's degree were coded as 1=not first generation. Students

with neither parent who had completed a bachelor's degree were coded as 2=first generation.

**Ethnicity.** This demographic variable was determined from the student's self-selected response on the admission application. Each student was coded as 1=Caucasian, 2=African American, 3=Bosnian, 4=Other (Hispanic, Asian, American-Indian).

**Pell Eligibility.** Pell eligibility was based on expected family contributions, enrollment status, and attendance for the academic year. Expected family contributions were measured and calculated according to a formula established by federal law. Family income, including taxed and untaxed income, assets, and benefits were included in the formula (UMSL, Office of Financial Aid).

### **Baccalaureate of Science Nursing (BSN) Program**

Nursing students complete two years of general education coursework and two and a half years of nursing courses before graduation. Clinical placement is an integral part of the nursing curriculum, and is highly competitive due to limited clinical spaces. Nursing freshmen may qualify for a guaranteed clinical space prior to entering college if they meet the following minimum criteria: 1) They are admissible to the institution's admission criteria; 2) They earn a minimum core high school GPA of 3.0; 3) They are a minimum ACT score of 22; 4) They maintain full-time enrollment at the institution during the Fall and Spring semesters; 5) They earn a minimum cumulative college GPA of 2.75 on all first attempts and; 6) They earn a minimum science GPA of 2.75 on first attempts of Chemistry, A&P I and II, and Microbiology, excluding plus and minus grades. Students who maintain these criteria are admitted to the clinical track of the

traditional nursing program after the successful completion of the general education coursework (UMSL, College of Nursing, 2016). Nursing freshmen who do not qualify for a guaranteed clinical space before entering college or transfer students with fewer than 24 hours of transferable college credit hours, can apply for admission to the preclinical track. Admission does not guarantee enrollment in the clinical track. These students must meet the following admission criteria: 1) They must be admissible to the institution based on the University's admission criteria for freshmen or transfer students and 2) They must earn a minimum 2.5 cumulative GPA calculated on all first attempts of all transferable undergraduate courses, excluding pluses and minuses (UMSL, College of Nursing, 2016).

All freshmen at the institution are required to complete a one-credit hour FYE, listed as University Studies 1003 in the Bulletin, during their first semester. The FYE courses are categorized by academic unit. The FYE course in this study consisted of only nursing majors. The course is only offered during the Fall semester for nursing students, since few first-time nursing students enter the University in the Spring. All students at the institution receive a letter grade for the course that counts towards their total required credit hours for graduation. Each Fall semester, first-year nursing students are enrolled in Chemistry 1052 and general education requirements, totaling 16 credit hours. Some first-year nursing students transfer their college chemistry requirement from another institution. These students are enrolled in Biology 1131. Each Spring semester, students are enrolled in Biology 1131 or Biology 1141 depending on transferred credits in addition to their general education requirements, totally 16 credit hours.

### **Selection of Research Participants**

Selection of research participants included non-random and randomized sampling using probability theory. Without probability sampling, error estimates cannot be created (Shavelon, 1988). Both samples consisted of 61 participants. Power analyses were conducted for both samples before data collection.

### **Instrumentation**

FOCUS-2 and the Strong Interest Inventory were utilized in this study to produce the noncognitive variable (Holland scores). The University no longer utilizes the Strong Interest Inventory. While the reliability and validity of each instrument is discussed below, moving forward, the researcher will only reference FOCUS-2. However, the Strong Interest Inventory Holland data is included in the analysis.

### **FOCUS-2**

According to Career Dimensions, Inc. (2014), FOCUS-2 measures interests, values, skills, abilities, personality type, leisure interests, and career planning readiness. The measure has been tested on several different demographics, including high school students, college students, and adults in transition. The categories include (Realistic (doers), Investigative (thinkers), Artistic (creators), Social (helpers), Enterprising (persuaders), and Conventional (organizers)). They provide an ordering of a person's closeness to each of the six types, allowing for the possibility of 720 personality patterns. A three-letter RAISEC code is constructed due to the user's responses to the career interest scale (Career Dimensions, Inc., 2014).

To access FOCUS-2, students click on the hyperlink located on the institution's Office of Career Services homepage and register for a free student account. Participants only completed the career interest and values scales for the FYE course. Students are able to match their Holland code to their interests with different occupations and combined the results of up to five assessments to identify occupations that overlapped the selected career dimensions. For interpretation of a person's three-letter Holland code, the first letter is his/her highest field of interest, the second letter is his/her next to the highest field of interest, and the third letter is next on down from the second. Only the first three letters are used in Holland codes (Career Comparisons, Inc., 2014). An example of a three-letter Holland code that was common for nursing students in this study was SIE (Social, Investigative, and Enterprising) and SIA (Social, Investigative, and Artistic), which is discussed in more detail below. Students were encouraged to explore their results and revisit FOCUS-2 during the FYE and throughout their undergraduate experience. A representative from the Office of Career Services visited the course after students completed the assessment to provide additional assistance for interpreting individual Holland scores. Table 1 below defines the Holland themes that create the three letter Holland codes.



Table 1

*Definition of Holland RAISEC Codes*

<b>Theme</b>	<b>Code</b>	<b>Interests</b>	<b>Work Activities</b>	<b>Potential Skills</b>	<b>Values</b>
Realistic	R	Machines, computer networks	Operating equipment, using tools	Mechanical ingenuity and dexterity	Tradition, practicality
Artistic	A	Self-expression, art appreciation, communication,	Composing music, art	Creativity, artistic expression	Beauty, originality, imagination
Investigative	I	Science, medicine, mathematics, research	Performing lab work, solving	Mathematical ability, researching, writing	Independence, curiosity, learning
Social	S	People, team work, helping, community service	Teaching, caring for people, counseling	People skills, verbal ability, listening	Cooperation, generosity, service to others
Enterprising	E	Business, politics, leadership, entrepreneurship	Selling, managing, persuading, marketing	Verbal ability, ability to motivate and direct others	Risk-taking, status, competition, influence
Conventional	C	Organization, data management, accounting, investing	Setting up procedures and systems, organizing,	Ability to work with numbers, data analysis, finances	Accuracy, stability, efficiency

*Note.* Holland codes are created through a combination of three themes that comprise personality types based on interests, values, work activities, and skills. Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources, Inc.

### **Reliability and Validity of the Career Instrument**

Since 2015, FOCUS-2 is administered to all first-year students at the institution. FOCUS-2's reliability and validity was based on samples from college students at two and four year colleges and universities (n=2,788) and working adults (n=2,469). Item-scale correlations and item-factor analyses were used for all samples. Two measures of reliability were computed, one for internal reliability (alpha coefficient) and one for stability (test-retest). The validity measures consisted of content validity and construct validity for all sets of items. Content validity was established by: 1) examining the face validity of items; 2) reviewing the theory and methods to develop the items; and 3) item-scale correlations. Content validity analysis showed that the factors were equivalent to the Holland RAISEC type factors.

For the Strong Interest Inventory, construct validity was determined by comparing the results of the factor analysis across the different samples. For the interest inventory items, all items had factor analysis loadings that reached or exceeded .67 on their respective factors. The reliability coefficients for all items reached or exceeded .85 (Career Dimensions, Inc., 2014). Internal consistency reliabilities of all scales are high, with General Occupation Interests ranging from .90 to .95, Basic Interest Scales from .80 to .92, and Personal Style Scales ranging from .82 to .87. Internal consistency reliability was not calculated for the Occupational Scales since the scales contain items with heterogeneous content. Several studies have validated the reliability of SII (Donnay & Borgen, 1996; Rottinghaus, Lindley, Green, & Borgen, 2002; Strong, 1935, 1955). Internal consistency reliabilities of all SII scales are high, with General Occupation Interests range from .90 to .95, Basic Interest Scales from .80 to .92, and Personal Style

Scales from .82 to .87. Internal consistency reliability was not calculated for the Occupational Scales since the scales contain items with heterogeneous content. Several studies have validated SII (Donnay & Borgen, 1996; Rottinghaus, Lindley, Green, & Borgen, 2002; Strong, 1935, 1955).

### **Data Collection**

This cross-sectional, correlational study involved analysis of data from a student databases belonging to UMSL Offices of Institutional Research, Admissions, Financial Aid, and Career Services as well as UMSL College of Nursing Office of Student Services. Admission and academic records of students admitted to the five semester prelicensure BSN program at the University of Missouri-St. Louis in Fall 2014 and 2015 provided the source of data for this study. Data were extracted admission applications and student transcripts by personnel in the Offices of Admissions and Financial Aid. The database included student profile characteristics such as demographics and pre-entry cognitive achievement data. The researcher created electronic folders for data collection before gathering data.

### **Data Analysis**

For the correlational prediction study, the SPSS 23.0 Bivariate Correlation Procedure (IBM, 2014) was used to correlate the scores for the predictor (educational and achievement data) variables with the scores for the criterion (progression) variable. As a follow-up to the prediction of first-year, nursing students which utilized bivariate correlations, multiple regression of SPSS Linear Regression Procedures was used to maximize the predictions of the performance of these students using two or more

predictor variables (Gall et al., 2007). Multiple regression was a powerful statistical procedure that estimated the collective and individual contributions of the predictor variables (Gall, et al., 2007). Multiple regression enabled the researcher to compute and evaluate the strength, direction, and significance of multiple correlation coefficients; the contribution of each independent variable to the prediction of the dependent variable; regression coefficient for each predictor variable; and the prediction regression equation (Gall et al., 2007). The SPSS 23.0 Descriptive Procedure (IBM, 2014) was utilized to compute the descriptive statistics and regression statistics of the first-year nursing students' survey scores, including means and standard deviations, minimum and maximum, correlations, frequencies, and ANOVA.

#### **Research Study Timeline for Completion of Dissertation and Defense**

The research study timeline for completion of the dissertation and defense began in May 2016 when the researcher met with the committee for proposal approval. Next, the researcher submitted the study for IRB review. After receiving IRB approval, data collection and analysis began. The timeframe for data collection was critical since the first two semesters of nursing school often determine progression into clinical portion of the major at the current institution. Not only does the timeframe matter for nursing school progression, but it also is important for students to successfully transition into college life and expectations for student retention. Chapters Four and Five were completed in early September 2016 for a full draft submission review by the dissertation committee. In October 2016, the researcher completed a pre-defense and that November the researcher successfully defended this dissertation.

### **Research Permissions and Ethical Considerations**

This IRB approved study received the appropriate permissions to conduct human subjects research. Several ethical considerations occurred to preserve the integrity of the human subjects and the data.

### **Ethics and Human Relations**

Ethical issues were addressed at each phase in the study. In compliance with the regulations of the University of Missouri Institutional Review Board (Institutional Review Board, 2016), the permission of conducting the research was obtained prior to beginning the research study. The exempt application provided information about the principal investigator, description of the project, methods, procedures, participants, and confidentiality. Categories of exempt research were stipulated in Federal regulations at 45 CFR46.101(b)(1-6) as follows

<http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html#46.101>:

(ii.) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

(iii.) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph(b)(2) of this section, if: (i) The human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

(iv.) Research, involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

All participants were coded when reporting results. No identifying data for participants were disseminated. All study data, including survey electronic files, were kept in locked metal file cabinets in the researcher's locked office. In accordance with UMSL IRB guidelines and timeframes, all study data were stored and deleted. The final IRB Annual Report was submitted according the UMSL Institutional Review Board guidelines.

### **The Role of the Researcher**

Prior to the beginning of the study, the researcher obtained permission from the UMSL Institutional Review Board. The researcher organized the secondary and survey

data, monitored the data, analyzed results, and prepared the written dissertation for the final defense. To begin, the researcher created spreadsheets with all the cognitive, non-cognitive, and demographic variables of study. The researcher was familiar with the participants in the study as a result of working in the educational setting. The career tool was administered electronically during the First Year Experience. Additionally, through regular meetings and communication, the researcher's dissertation advisory committee monitored all research procedures and data analyses. The researcher conducted all aspects of the study according to guidelines provided by the University of Missouri Institutional Review Board, the University of Missouri-St. Louis Graduate School, UMSL Office of Institutional Research, UMSL College of Nursing, and UMSL College of Education.

### **Summary**

This chapter described the research purpose, research question and hypothesis, institutional demographics where the study took place, the target population, study variables, participant selection, data collection, validity and reliability of the instruments, data analysis and procedures, research timeline, research permissions and ethical considerations, and the role of the researcher. A non-experimental, cross-sectional predictive study was utilized to examine secondary and survey data in relation to progression and career choice. The next chapter will provide the results and analyses of the results for the research question.

## **CHAPTER FOUR**

### **Results and Analysis**

Chapter Four presents the results of the research study, findings, and analyses for the research question. Specifically, the results of the statistical analyses consisted of: 1) the reliability and validity of the career instruments, 2) descriptive statistics for the research question, and 3) the inferential statistical outcomes. The purpose of this study was to examine early predictors of academic success and progression of first-year nursing students in relation to career choice. The research question and hypothesis was:

#### **Research Question**

What is the predictive value of selected cognitive (first year cumulative GPA and ACT composite scores), noncognitive (Holland scores), and demographic (first generation college status, ethnicity, and Pell eligibility) factors on progression among first-year nursing students?

#### **Research Hypothesis**

A combination of the selected cognitive, noncognitive, and demographic variables will predict early progression and career fit among first-year nursing students.

#### **Brief Description of the Samples**

The study consisted of two samples (Sample I and Sample II) among an aggregate first-year nursing student population. Each sample consisted of sixty-one (n=61) undergraduate freshmen pre-nursing students aged 18-19 years old enrolled in a five semester, 120 credit hours prelicensure baccalaureate of science in nursing program at the University of Missouri-St. Louis in Fall-Spring 2014 and Fall-Spring 2015. Sample I data



was analyzed to determine the predictive value of ACT composite scores, first-year GPA, first generation status, and retained in nursing on progression. Sample I employed non-random probability sampling. Sample II was analyzed to determine the predictive value of progression and first-year cumulative GPA in relation to Holland scores. Random probability sampling was employed for Sample II.

### **Sample I**

Sample I data was analyzed to predict the impact of ACT composite scores, first-year GPA, first generation status, and stayed in nursing on progression. Sample I employed non-random probability sampling. This type of sampling was employed since the researcher already had access to the educational setting as the instructor for the titled University Studies 1003 and as a student affairs staff member in the College of Nursing. In Fall 2014, only students who had not been formally admitted to the College of Nursing were enrolled in this University Studies 1003 course. The course consisted of 29 students, of which 18 students (or 62%) were first generation college students. In Fall 2015, 86 pre-nursing students were enrolled in the course when a FYE became a one-credit hour requirement for all first-year students, as a result of a campus-wide movement to retain more freshmen. Of the 86 students, 48 students (or 55.8%) self-classified as first generation. Of the 115 total students who completed the course in Fall 2014 and Fall 2015, 61 students were non-randomly selected for the study. Students with missing or incomplete data (n=30) were not included in the sample.

**Power Analysis.** For Sample I, a 61-student sample size was determined to be adequate after using a power calculator for multiple regression statistics. Power of .80 or

greater is recommended by Cohen (1965) to detect a medium effective size with an alpha level of .05. The recommendation was based on the probability of committing a Type I error to the probability of committing a Type II error. To determine the needed sample size, the following was used in the calculation: alpha level (.05), power (.80), and effect size ( $d=.50$ ). The minimum required sample size for this study was calculated to be 39 students (<http://www.danielsoper.com/statcalc/calculator.aspx?id=1>). The sample size was selected by the researcher after data cleaning in order to maintain a diverse sample size for analysis.

### **Descriptive Statistics for Sample I**

Before testing the study's hypothesis, descriptive statistics was calculated for each demographic variable to ensure the integrity of the data. The following variables were included: gender, ethnicity, first generation college status, and Pell eligibility. The descriptive statistics are displayed in Table 2.

Table 2

*Gender, Ethnicity, First Generation, and Pell Eligible Frequency and Percent (Sample 1)*

Variable	Freq.	%
Gender		
Female	54	88.5
Male	7	11.5
Ethnicity		
Caucasian	29	47.5
URM	21	34.4
Asian	6	9.8
Multiple race/ethnicity	3	4.9
Non-resident/international	1	1.6
First generation	40	65.6
Pell eligible	41	67.2

*Note.* Freq. = frequency; % = percent. n=61.

Analysis of the student demographics in Table 2 revealed that there were 54 females (88.5%) and seven males (11.5%). According to the most recent American Association of Colleges of Nursing national survey of enrollment in schools of nursing (AACN, 2014), while males represent 7.0% of the nursing workforce, males account for 11.7% of students in pre-licensure baccalaureate programs in the United States. The number of males in the sample was 11.5%, which is aligned with the national average. The number of males admitted to the College of Nursing from 2014-2015 has remained consistent with the current national average.

Ethnic representation was predominately Caucasian (n=29, 47.5%). The other largest group of students was underrepresented minority students (URM) (n=21, 34.4%). Students who identified as African American, Latino, Native Hawaiian/Pacific Islander,

and American Indian were grouped into one category as underrepresented minority students (URM) by the Office of Institutional Research. The percentages of other ethnic groups are displayed in Table 2. URM students account for over 30.1% of BSN programs in the United States (AACN, 2014), which is similar to the percentage of minority students (34.4%) in the study's sample. Recent data indicates that minority representation at UMSL College of Nursing remained relatively consistent in 2014 and 2015. All first-year nursing students in the study entered the University directly from high school. Thus, no students had previous college degrees. The majority of students in Sample I, or 40 students (65.6%), self-classified as first generation, while 21 (34.4%) did not self-classify as first generation. Additionally, the majority of students were Pell eligible; 41 students (or 67.2%) had Pell eligibility while 20 students (or 32.8%) were not eligible. Age was controlled for in the study since all the participants were between 18-19 years old (UMSL, Office of Institutional Research, 2016).

### **Description of the Cognitive Independent Variables**

Cognitive independent variables reflective of students' early academic achievements included: first year cumulative GPA and ACT composite scores. ACT composite scores were utilized in the study as a performance predictor. At the time, the nursing program required a minimum 21 ACT score for clinical eligibility.

**First-Year Cumulative GPA.** First-year cumulative GPA consisted of first Fall and First Spring cumulative GPAs. UMSL College of Nursing also has a science GPA requirement that includes scores from Chemistry 1052, Biology 1141, Biology 1142, and Biology 1162.

**First Fall (Semester I) cumulative GPA.** First Fall cumulative GPA consisted of the following coursework: English composition (3 credits), College Algebra (3 credits), Human Biology (3 credits), Chemistry for the Health Professions (4 credits), and one social science elective (3 credits), and University Studies 1003 (1 credit) for 17 total credit hours.

**First Spring (Semester II) cumulative GPA.** First Spring Cumulative GPA consists of the following coursework: Anatomy and Physiology (4 credits), Statistics (3 credits), Economics (3 credits), General Psychology (3 credits), and U.S. History or Government (3 credits), for 16 total credit hours.

### **Pearson Correlations for Sample I**

Strength and direction (or effect size) of the correlations among the study variables was assessed using bivariate Pearson correlations. This type of correlation analysis is appropriate for a scale level of measurement (Cohen, 1965). The strength of the correlations was determined based on the magnitude of the relationship between the independent variables (first year cumulative GPA, ACT composite scores, FGCS) and the dependent variable (retained second Fall). Results for the Pearson Correlations for Sample I are displayed in Table 3.

Table 3

*Summary of Correlation Variables for Progression (Sample I)*

Variable	Correlation Coefficients
ACT composite scores	.056
First-Year cumulative GPA	.401**
First generation	.482**
Retained in nursing 2 <sup>nd</sup> Fall	.000*

*Note.* Retained in nursing only means the student(s) did not switch majors. First-year retention in the nursing major does not always mean the student will earn a clinical space in the nursing program. n=61.

\*p<0.05 \*\*p<0.001.

Results of the bivariate correlational analysis in Table 3 showed a statistically significant positive relationship between progression in the nursing major and remaining at UMSL after the first year of college. First-year cumulative GPA and first generation status showed a lowly correlated relationship with retained in nursing second Fall (progression). Three of the four variables were statistically significant (first-year GPA, first generation status, and progressed in nursing). The strongest correlation was between staying in the nursing major and progression after the first year of college. When staying in the nursing major increased, so did the likelihood of progression. ACT composites scores did not demonstrate a statistically significant relationship with first-year progression.

In Sample I, the sample means were analyzed for the cognitive variables. Sample means represented the distribution of cognitive mean scores, standard deviation, and the minimum and maximum ranges. Results are displayed in Table 4.

Table 4

*Cognitive Variable Sample Means for Progression (Sample I)*

Variable	Mean	SD	Minimum	Maximum
ACT composite scores	21	2.161	16	28
Chemistry 1052 scores	2	1.6486	0	4
Fall GPA	2.50	1.2509	.059	4.0
Spring GPA	3.09	1.3391	.043	4.0
First-Year Cumulative GPA	3.01	1.4544	.05	4.0

*Note.* Chemistry 1052 grade scores were coded by grade scores as follows: A=1, B=2, C=3, D=4, F=5. SD=standard deviation. n=61.

Results in Table 4 above show the cognitive variable means for ACT composite scores were 21 out of 32 total points. Students must earn a minimum of a 21 ACT score as part of the nursing school admissions criteria. Chemistry scores were calculated as grade of A=1, B=2, C=3, D=5 and F=6. The average Chemistry 1052 score was a grade of a B- which is aligned with the science GPA requirements where student must earn a B- or higher in the course to remain in good standing in the nursing major. First Fall GPA (2.50 GPA) was lower than first Spring GPA (3.01). This was most likely because Chemistry 1052 is required during the first semester, which is a historically challenging course for first-year nursing students. A first-year 3.01 GPA aligns with the requirements of the nursing admissions criteria where students must earn a minimum 2.75 GPA to be eligible to apply for a clinical space.

### Multiple Regression Results and Analysis for Sample I

Multiple regression statistics was utilized to predict first-year progression, which was measured cumulatively and included the first fall and first spring semesters of the five-semester BSN program. Students who did not complete both semesters or had missing/incomplete data were not included in the study. The multiple regression equation compared the probability of the dependent variable (progression) with a 2.0 cumulative GPA or higher (successful=1) to the probability of lack of progression (unsuccessful=0). The statistical significance level for this analysis was  $p \leq 0.05$ . Table 5 below displays the results of the multiple regression analysis. Of the 61 students, 39 (or 63.9%) were successful, 22 (or 36.1%) students were unsuccessful. Of the 22 unsuccessful students, three students left the University.

Table 5

#### *Predictor Variables of First-Year Progression (Sample I)*

Variable	B	Std. Error	Beta
ACT composite score	.016	.009	.069
First-Year cumulative GPA	.035	.013	.102
First generation	-.003	.039	-.003
Progressed in nursing 2 <sup>nd</sup> Fall	.506	.020	.958

*Note.* Progression is the dependent variable. Std. Error = standard error. B and Std. Error = unstandardized coefficients. Beta = standardized coefficients. n=61.

\* $p \leq 0.05$ .



Table 5 above shows that the multiple correlation coefficient (R), using all predictors simultaneously is .96 (R-squared=.92 and the adjusted R-squared is .91, meaning that 91% of the variance in progression was predicted from progressed in nursing, FGCS, ACT composite scores, and first year cumulative GPA combined. The adjusted R-squared was lower than the unadjusted r-squared. This was related to the number of dependent variables as well as the magnitude of the effect and sample size.

The ANOVA (not listed in a table)  $F= 165.210$  and was statistically significant ( $p \leq 0.000$ ). A large F ratio meant that the variation among group means was more than expected by chance. The combination of predictors (ACT composite score, first year cumulative GPA, first generation college, and progressed in nursing second fall) significantly predicted the dependent variable (progression).

The bivariate correlations among the independent variables were examined to assess for multicollinearity. The strongest correlation was progressed in nursing and remained at the University ( $p \leq 0.05$ , .000\*), which did not suggest issues with multicollinearity. To rule out the existence of multicollinearity in multiple regression models, a collinearity diagnostics statistics was ran. These statistics include tolerance and variance inflation factors as displayed in Table 6. Low tolerance levels (1-R<sup>2</sup>) and variance inflation factors greater than 10 are indicative of multicollinearity.

Table 6

*Tolerance and Variance Inflation Factors for Independent Variables of Progression (Sample I)*

Variable	Tolerance	VI
First-Year cumulative GPA	.942	1.061
ACT composite scores	.970	1.030
Retained in nursing 2 <sup>nd</sup> Fall	.956	1.032
First generation college students	.969	1.046

*Note.* VI=variable inflation. n=61.

\* $p \leq 0.05$ .

Results in Table 6 show that tolerance for all variables and variance inflation was close to 1, indicating that there were no strong linear dependencies among the predictor variables and that multicollinearity was not an issue.

### **Description of Sample II**

Sample II was analyzed to determine the predictive value of progression and first-year cumulative GPA in relation to Holland scores. Random probability sampling was employed for Sample II among a 61-student sample using a random sampling calculator for multiple regression statistics. The total first-year nursing student population consisted of 91 students enrolled in University Studies 1003 for nursing majors in Fall 2014 or Fall 2015. The noncognitive independent variable was Holland codes, measured by FOCUS-2 or the Strong Interest Inventory career assessment. Holland codes are calculated from RAISEC scores that stand for Realistic, Artistic, Investigative, Social, Enterprising, and

Conventional. The maximum Holland RAISEC code score is three letters. The letters (or themes) are ranked in order of strength. Themes were coded numerically and chronologically from 1 = Realistic to 6 = Conventional. Holland data were extracted from the assessment's database via the Office of Career Services, which did not provide student demographic data for gender, ethnicity, age, first generation status, or Pell eligibility. Inferring from the descriptive statistics of Sample I, Sample II consisted of primarily female nursing students who were between 18-19 years old.

**Power Analysis.** For Sample II, out of a total of 115 students, 91 students completed the career instrument. A 61-student sample size was determined to be adequate after using a power calculator for multiple regression statistics. Power of .80 or greater is recommended by Cohen (1965) to detect a medium effective size with an alpha level of .05. The recommendation was based on the probability of committing a Type I error to the probability of committing a Type II error. To determine the needed sample size, the following was used in the calculation: alpha level (.05), power (.80), and effect size ( $d=.50$ ). The minimum required sample size for this study was calculated to be 29 students (<http://www.danielsoper.com/statcalc/calculator.aspx?id=1>). A sample of 61 students was selected for analysis by the researcher after data cleaning and in order to have a diverse sample size.

### **Descriptive Statistics for Holland Themes**

Table 7 displays a frequency distribution, which was summarized as a grouping of data divided into mutually exclusive themes and the number of occurrences in each theme. Frequency involved the measure of central tendency as well as the means and median scores. The first two strongest themes are displayed.

Table 7

*Frequency and Percent for Holland RAISEC Themes (Sample II)*

Variable	Theme I		Theme II		Cum. %
	Freq.	%	Freq.	%	
Realistic	0	0%	3	4.9%	4.9%
Artistic	5	8.4%	9	14.7%	23.1%
Investigative	12	19.6%	21	34.4%	54%
Social	43	70.4%	11	18.3%	88.7%
Enterprising	1	1.6%	10	16.3%	17.9%
Conventional	0	0 %	7	11.4%	11.4%

*Note.* Freq.= frequency; % = percent; cum % = cumulative percent. n=61.

Table 7 results above show that for the highest strengths (Theme I and Theme II), the Social and Investigative themes were the most frequented. For Theme I, Social was the strongest occupational preference with 43 students (or 70.4%) in relation to career values and personal interests. Investigative was the strongest theme for 12 students (or 19.6%). For Theme II, Investigative as strongest occupational preference in relation to career values and personal interests comprised 21 (or 34.4%). Social as the second strongest theme consisted of 11 students (or 18.3%).

The noncognitive variable samples means for Sample II represented the distribution of the noncognitive variable scores. The mean Holland code for students was SIA (Social, Investigative, and Artistic) or SIE (Social, Investigative, and Enterprising).

Both three-letter codes were tied at seven students. As noted earlier, Social and Investigative themes represented the highest frequencies. The majority of students progressed with a first-year cumulative of 2.83 GPA. The minimum GPA from the sample was a .38 GPA whereas the maximum GPA was a 4.0 on a 4.0 grading scale. Progression was operationalized as whether the student earned a 2.0 GPA or higher to avoid being on academic probation by the University.

The categorical dependent variable, Holland codes, reflected the degree of career fit or congruence with the nursing major and was analyzed in relation to progression. The combination of the Social/Investigative or Investigative/Social themes and groupings were associated with professional and academic success in nursing. The Investigative strength was not analyzed as a separate variable, but rather in combination with the Social theme due to their high frequency in the sample's Holland codes. Nursing education literature has long since established that the profession requires interpersonal communication skills since nursing is a highly social profession. However, while nursing literature has always supported the need for students to develop critical thinking skills, the construct of critical thinking has not been analyzed from a career development perspective using the Investigative theme as a marker.

**Dependent Variables.** Progression, was analyzed as a dependent variable and classified according to Progressed=1, Switched Majors=2, or Left University=3. Progression was defined as earning a 2.0 cumulative GPA or above during the first year of college. Unsuccessful students were those who left the University or earned less than a 2.0 cumulative GPA. The variable was coded as 1=successful and 0=unsuccessful. Table 8 shows the frequency distribution progression data for Sample II.

Table 8

*Frequency and Percent of Progression Variables Analyzed as Successful, Unsuccessful, or Left University (Sample II)*

Variables	Freq.	%	Cum. %
Progression			
Successful (above 2.0 GPA)	44	73.8	73.8
Unsuccessful (below 2.0 GPA)	12	19.7	93.4
Left University	4	6.6	100

*Note.* Freq. = frequency; % = percent; Cum. % = cumulative percent. n=61.

Table 8 results above show that the majority of first-year nursing students 44 (or 73.8%) successfully progressed with a 2.0 GPA or higher. There were 12 (or 19.7%) students who earned less than a 2.0 GPA and were unsuccessful. Additionally, 4 (or 6.6%) students left the University. A total of 16 (26.3%) were unsuccessful.

### **Pearson Correlational Analysis for Sample II**

Table 9 below shows the Holland code correlations in relation to first-year progression and first-year GPA.

Table 9

*Correlation Variables of Progression, GPA, and Holland Scores (Sample II)*

Variables	Correlation Coefficients
Progression	.000*
First-Year GPA	.397

*Note.* Dependent variable=Holland Code. n=61.

\* $p \leq 0.05$ .

Table 9 above shows a strong positive correlation between progression and Holland Code. First-year cumulative GPA was insignificant. Progression was analyzed as a predictor variable. Holland scores were analyzed as a dependent variable. This was intentional in order to determine if one's Holland code predicted successful progression in the nursing major.

To rule out the existence of multicollinearity in regression models, a collinearity diagnostics statistics was run and is displayed below in Table 10. The statistics include tolerance and variance inflation factors. Low tolerance levels (1-R<sup>2</sup>) and variance inflation factors greater than 10 are indicative of multicollinearity.

Table 10

*Tolerance and Variance Inflation Factors for Independent Variables (Sample II)*

Variable	Tolerance	VI
Progression	.964	1.037
First-Year GPA	.938	1.066

*Note.* VI=variable inflation. n=61.

Results for Table 10 above show that tolerance for all variables and variable inflation was close to 1, indicating that there were no strong linear dependencies among the predictor variables and that multicollinearity was not an issue.

### Multiple Regression Analyses for Sample II

Table 11 below describes the multiple regression correlation coefficients for progression and first-year cumulative GPA.

Table 11

*Predictors of Progression and First-Year Cumulative GPA (Sample II)*

Variable	B	Std. Error	Beta
Progression	-118.557	17.677	-.673
First-Year GPA	-10.341	12.123	-.087

*Note.* Std. Error = standard error. B and Std. Error = unstandardized coefficients. Beta = standardized coefficients. n=61.

\* $p < 0.05$ .

Table 11 above shows that the multiple correlation coefficient (R), using all predictors simultaneously was .66 (R-squared=.44 and the adjusted R-squared is .41, meaning that 41% of the variance in Holland code predicted progression and first-year cumulative GPA. The adjusted R-squared was lower than the unadjusted R-squared. This was related to the number of dependent variables as well as the magnitude of the effect and sample size.

The ANOVA (not displayed in a table) revealed that  $F=15.329$  and was significant. The combination of predictors (Holland Code and First-Year Cumulative GPA) significantly predicted the dependent variable (Progression). A large F ratio meant that the variation among group means was more than what would be expected by chance.



## Summary

Multiple regression statistics was used to examine the predictive value of cognitive, noncognitive, and demographic factors on early progression and career choice of first-year nursing students at the University of Missouri-St. Louis using two samples of 61 students in a five-semester prelicensure baccalaureate nursing program. For Sample I, three independent variables (first year cumulative GPA and retained in the nursing major) were found to be most significant for predicting first-year progression. The cognitive variable ACT composite score was not significant. The demographic variable of first generation college student was moderately significant for progression. For Sample II, one dependent variable (progression in the nursing major) was significant for predicting the independent variable (Holland code) and thus career fit.

The study analyzed one distinct point in the nursing program, at the end of the first-year, which includes the first two semesters of college. The two samples shared the same demographic predictor variables of first generation college student status, age, and gender, ethnicity, and Pell eligibility as well as the same cognitive variables of ACT scores, first-year cumulative GPA, and progressed in the nursing major. Sample I examined chemistry scores and Fall- and Spring GPA separately as well as cumulatively. The single noncognitive variable (Holland code scores) was only analyzed and interpreted for Sample II.

The results of the study provided important data for early identification and implementation of career and student development programs for first-year nursing students. The best predictors of progression and career fit are cognitive and non-cognitive variables that are available early in the nursing program. The study findings are insightful

for student affairs practitioners and career counselors for assisting students to make data-informed career and educational decision-making.

## CHAPTER FIVE

### Summary, Conclusions, and Recommendations

This chapter will discuss the findings of the research study, implications of the findings, conclusions, and recommendations for future research. The purpose of this cross sectional, correlational study was to examine predictors of progression of first-year students in relation to career choice. The study considered cognitive, noncognitive, and demographic factors associated with progression and career decision making.

This study drew from two theoretical perspectives in the field of career development. The first theoretical framework was social cognitive career theory (SCCT; Betz & Hackett, 1981; Lent, 2013), where the focus is on how environments and context affect career decision making. SCCT is important to this study since first generation college students (FGCS) represent approximately 33% of the population. The second theory utilized in this study is Holland's theory of career choice (Holland, 1997). This theory describes the interactions between individuals and their environments on career choice (Holland, 1997) using Holland's six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Creators (RIASEC), (Holland, 1997; Joslyn, 2014). Results of this study found that a combination of cognitive, noncognitive, and demographic variables predicted progression and career choice of the participants. These findings may assist higher education practitioners and nursing schools in identifying resources and services sooner, such as a First Year Experience, to better serve and support diverse first-year nursing students.

### **Research Findings**

These research findings are most relevant to the institutional setting of this study. However, the results have important pragmatic value for nursing faculty, higher education practitioners, and most importantly, the students, at other undergraduate nursing programs.

#### **Sample I**

Sample I data consisted of 61 first-year nursing students who were primarily female (54 or 88.5%), Caucasian (29 or 47.5%) or underrepresented minority students (21 or 34.4%), aged 18-19 years old, first generation college students (40 or 65.6%), and Pell eligible (41 or 67.2%). Bivariate correlations revealed a statistically significant positive relationship between progression in the nursing major and remaining at the University after the first year of college. This was likely due to the majority of our freshmen nursing students choosing the University because of the guaranteed clinical space incentive, which is only available to freshmen nursing students. Students who lose their clinical space or cannot earn the required nursing GPA (2.75), often leave the University if they still wish to pursue nursing elsewhere. First-year cumulative GPA and first generation college status showed a lowly correlated significant relationship on progression. This was most likely because first generation students in the study represented a sizeable portion of the population, or 33% of the students.

Sample I results of the multiple regression statistics for predicting first-year progression showed that when using all the predictors simultaneously, 91% of the variance in first-year progression in the nursing major was predicted by GPA, FGCS,

ACT composite scores, and first year cumulative GPA. An ANOVA revealed that the combination of predictors significantly predicted progression. The strongest correlation was between staying in the nursing major and progression with a 2.0 GPA or higher after the first year of college. ACT composite scores did not demonstrate a statistically significant relationship with first-year progression. This was most likely because students must earn a minimum 21 ACT score for a guaranteed clinical space, and at least a B-grade in their science courses with a minimum 3.0 cumulative GPA, in order to remain eligible for the nursing program. All general education course requirements require a grade of a C- or higher. Students complete Chemistry 1052 during their first year, which has been historically challenging for pre-nursing students with high failure and withdrawal rates

It is difficult to compare this study's measure and assessment of progression with other research studies because there is little consistency in the definitions of progression in the research literature. This is likely due to the variety in nursing curricula and course sequencing. However, this study's findings are consistent with other research studies that measured the predictive value of academic outcomes in four ways: program completion, grades, semester or science GPA, and cumulative GPA (Alden, 2008), and pre-nursing GPA on progression for age, ethnicity, high school GPA and ACT social science mean (Byrd, Garza, & Nieswiadomy, 1999; Hayes, 2005; Schafer 2002). These studies suggest that it is a combination of cognitive and noncognitive factors that predict nursing student success and program completion. The combination varies with consideration to student demographics and institutional resources and supports.

**Sample II (Holland codes)**

Sample II consisted of 61 first-year nursing students who completed FOCUS-2, a career self-assessment tool used to operationalize Holland's theory (Career Dimensions, Inc., 2014). FOCUS-2 combines self-assessment, career and major exploration, decision-making, and action planning. For Sample II, the highest and most common strengths for the Holland scores were the Social and Investigative themes. The Social theme involves liking to do things with people, such as teaching or nursing. Social individuals see themselves as helpful, friendly, and trustworthy. The Investigative theme, however, has not been directly discussed in the nursing education literature. The Investigative theme is associated with liking science and solving math or science problems. The third most common theme was Artistic or Enterprising. The Enterprising theme was particularly interesting to the researcher since preliminary descriptive statistics showed that several students who left the nursing major switched to a business major at the University. The Enterprising theme is associated with liking to lead, and generally avoids activities that require careful observation and scientific, analytical thinking. The Artistic theme is associated with liking to do creative activities such as music, drama, crafts, or creative writing.

The dependent variable, Holland codes, particularly the Social and Investigative themes were analyzed in relation to first-year progression. The majority of students progressed who progressed in the major with a 2.0 GPA or higher had the Social and Investigative themes. Multiple regression statistics showed that when using all the predictors simultaneously, 44% of the variance in the Holland code predicted

progression. Combined, the Holland code data and first-year cumulative GPA scores significantly predicted progression.

### **Implications of the Findings**

This study has shown that first-year nursing students at the University of Missouri-St. Louis benefitted from use of a career development tool. There is little nursing research that considers first-year nursing students' transition to college, and how the career decision-making process is either confirmed or changed, as a result of early college experiences (Brodie, G. Andrews, J. Andrews, Thomas, Wong, & Rixon, 2004). Millennial nursing students currently represent the largest new nurse demographic (Beecroft, Dorey, & Wenten, 2008). As generational cohorts change, early career choice exploration can prevent career disillusionment, nursing school attrition, and promote interest in the profession (Fillman, 2015; Turner, 2011).

A career development tool, such as FOCUS-2, offers colleges students a strengths-based approach to becoming intentional about their career path. Assisting first-year nursing students to reflect on their career choice, such as through a First Year Experience course, is connected to helping them find their career purpose. Gloria and Hird (1999) posited that students with a declared a major are more intentional and have greater self-efficacy. However, the career decision-making process is not simply a single point in time task accomplished after major declaration or based on admissions criteria. Academic performance is what derails many first-year nursing students in their progression in the major. An unexpected source of stress for many nursing students at UMSL is the constant demand to earn or keep a clinical space (Brodie et al., 2004). In turn, students often become overwhelmed with their studies and delay seeking help until

it is too late (Bloom & Krathwohl, 1956; Gardner et al., 2011; Pascarella & Terenzini, 2005; Tinto, 1993; Upcraft & Gardner, 2003). Particularly for higher education and student affairs practitioners, examining cognitive and non-cognitive factors related to career choice in relation to program completion is essential since declaring nursing as a major is not always congruent with actual learning outcomes. Additionally, career development tools can assist practitioners to avoid applying a deficit model thinking of thinking to particular students who are struggling in their major.

Ongoing assessment of students' cognitive and noncognitive needs is necessary for supporting diverse college students. A FYE course provides the opportunity to support early nursing students in their personal and professional development by providing students with ongoing self-reflection opportunities that they would not typically receive in the science courses. These opportunities, such as self-reflection of motivation and self-efficacy, can support students' learning outcomes, especially in their introductory science courses when students often do not feel connected to the nursing major. Higher education practitioners are vital to the process of helping students to align their career and educational goals with their academic performance. This requires suggested several changes in student affairs practice such as: 1) The creation of early touch points for students, such as through a FYE course, to promote ongoing self-reflection of their educational and career goals using self-assessment tools; 2) How early practitioners can connect with students to bridge entry into the academic program through graduation; and 3) How practitioners develop, implement, and evaluate cognitive and noncognitive student data to inform program development and professional practices.



**Conclusion**

This nonexperimental, cross-sectional study is encouraging for the following reasons: First, the significant variables in this study were revealed early in the nursing program, meaning key career and educational resources and services can be in place prior to students officially arriving on campus to increase progression. For example, FOCUS-2 administered during a FYE course can serve as important early touch points for connecting students to campus resources and services, while also promoting student self-awareness and data informed decision-making. Findings from this study provide evidence to assist in the early identification of student subpopulations that may be at greater risk for academic difficulty or career misalignment during their first year of nursing school. Early identification also includes assisting students who are no longer interested in the nursing major by helping to reroute them to a major that better matches their values, interests, and competencies.

**Recommendations for Future Research**

The results of this study were informed by the literature review and led to the following recommendations: One primary recommendation is consideration to the timeframe for engaging nursing students during their first year. A First Year Experience can provide early educational and career development that is beneficial for students as well as inform the faculty and staff who work with them. Since most introductory math and science courses do not address individual starting points (Tanner, 2011), many nursing students confront their first significant academic challenges during the first year of college (Anderson & Kim, 2006; Barr et al., 2008; Barr et al., 2010; Drane et al., 2005; Hurtado, et al., 2008). The fast-paced, high stakes nature of the coursework limits

opportunities for students to self-assess and modify their learning strategies, which can reduce the number of undergraduates who show interest in the sciences by half within the first two years of college (Drane et al., 2005; Anderson & Kim, 2006; Hurtado et al., 2008; Barr et al., 2008; Barr et al., 2010).

Combined with changes in generational cohorts who bring different values, career perceptions, and expectations (Mimura et al., 2007; Price, 2008), a First Year Experience can guide students in their educational and career development, and provide additional touch points for supporting nursing students in their progression (Agarwala, D'Antonio, Roediger, McDermott, & McDaniel, 2014; Brydges. Thus, a longitudinal survey study (several points in time) is recommended to extend this study beyond one year (one point in time). A multi-university study needs to be conducted since this study was limited to one institution. Additional research is needed to determine whether Holland's (1997) theory is beneficial for diverse college student groups (Joslyn, 2014) since Holland's (1997) theory consists of several assumptions, which have not been tested for validity across all diverse contexts. Since the nursing profession in the United States consists of primarily Caucasian females, which is supported by the study's sample, a nursing population may be inherently limited for shedding light on the validity of Holland's theory.

A further recommendation is for career counselors who can use the current study to inform their delivery of career development resources and services for declared and undeclared students as well as for diverse college student groups. An important factor to consider when working with first-year college students is career decision making readiness. While an individual's Holland code alone does not determine progression nor a

finite career path, combined with selected cognitive and demographic factors as well as informed guidance from higher education practitioners, it can provide a rich self-empowerment tool for degree attainment. Further, an emerging pattern at the study's institution for nursing students whose last Holland theme is E for Enterprising is that they are leaving the nursing major to pursue a business major at the institution. Further examination of nursing students who switch majors and their academic progression after leaving the major can inform the types of educational and career resources offered to diverse college student populations.

Career development in higher education, particularly at the current institution, is not immune to the financial concerns that affect the study's student population. FGCS tend to have more dependents at home (Imnan and Mayes, 1999) and work at least part-time. Over 80% of the nursing students at institution work at least part-time while enrolled as a full-time nursing student (UMSL, Office of Admissions). Online career development interventions, like FOCUS-2, can also assist students in meeting their immediate financial needs, such as finding on-campus jobs, managing finances, etc., while assisting them in career planning.

Finally, further study is necessary to examine the predictive value of the selected cognitive, noncognitive, and demographic variables utilized in this research. While not all variables were statistically significant in this study (such as age and ethnicity), there is evidence in the literature that these variables are important (Alden, 2008). More studies are needed to accurately assess the predictive value of demographic and noncognitive factors on progression and career choice, particularly since opportunities for withdrawal increase with limited campus engagement, even when academic performance is not an

issue (Tinto, 1975). Limited interaction can also put students at greater risk for becoming disillusioned with the nursing major or ultimately leaving the institution. A FYE course can provide important cognitive and noncognitive support and resources to support diverse nursing students, while also providing a more holistic nursing school experience.

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