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AN EXAMINATION OF PRE-ENTRY AND ACADEMIC PERFORMANCE FACTORS THAT PREDICT PERSISTENCE FOR ACADEMICALLY UNDERPREPARED STUDENTS AT A PUBLIC RESEARCH UNIVERSITY

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AN EXAMINATION OF PRE-ENTRY AND ACADEMIC PERFORMANCE FACTORS THAT PREDICT PERSISTENCE FOR ACADEMICALLY UNDERPREPARED STUDENTS AT A PUBLIC RESEARCH UNIVERSITY

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

BY

_____
Dr. Vicki A. Williams, Chair

_____
Dr. Jerome C. Weber, Co-Chair

_____
Dr. Doo H. Lim

_____
Dr. Rebecca R. Barker

_____
Dr. Betty J. Harris

DEDICATION

To my husband Kenneth, thank you for your continued support, encouragement, and understanding while persevering throughout my doctoral program. Although I sacrificed many hours and weekends to accomplish this goal, I appreciate you carrying my load during the most challenging moments throughout this journey. This dissertation could not have been possible without your support. You are my inspiration.

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"I can do all things through Christ which strengthens me"
(Philippians 4:13, King James Version)

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The purpose of this study was to examine student demographic, family characteristics, pre-college, and college academic factors that predict persistence between freshmen students who were placed or not placed in remediation courses. The participants for this study were comprised of 3,213 first-time, full-time and part-time, degree-seeking freshmen students enrolled at the University of Oklahoma during the fall 2006 through the fall 2008 semesters. Tinto's longitudinal model of institutional departure (1993) is widely utilized and focuses on traditional college students at four-year colleges and universities. Therefore, Tinto's model was appropriate for this study for examining demographic, pre-entry, family, and college academic performance variables that predict persistence of first-time entering traditional college students at a four-year public university. Quantitative methodology using an ex post facto design, Factorial Analysis of Variance (ANOVA), Pearson's product-moment correlations, and stepwise multiple regression, was utilized in this study to examine group differences on persistence after the independent variables had occurred. The findings of the study revealed (1) that females accounted for 59.6% of the students placed in remedial courses, while males accounted for 40.4% of the students placed in remedial courses, (2) there were statistically significant mean differences at the .01 percent level obtained for ethnicity, financial aid, and remedial status on persistence, (3) that there was a statistically significant relationship at the .01 percent level between high school GPA, first semester college cumulative GPA, ACT composite scores, and persistence, and (4) academic factors that predict persistence revealed that first semester college cumulative GPA and high school GPA were statistically significant predictors of persistence and together accounted for slightly over 26% of the variance. Implications and recommendations from this study

suggest that a collaboration from higher education stakeholders is needed to develop an academic plan or centralized advising center to assist sophomores with selecting a major, time management, campus resources, and future goals to increase persistence and graduation rates. Administrators and faculty should work to develop programs to address the retention needs of second year students. Further research should be conducted to examine how participation in co-extracurricular activities, living and learning on-campus communities, campus climate, and social integration and institution commitment components contribute to student retention and persistence.

CHAPTER I: INTRODUCTION

Since the early nineteenth century, American colleges and universities have taken note of the deficiencies of students' reading, writing, and mathematics skills. A chronology of developmental education delineates a long history of compensatory assistance in American colleges and universities (Wyatt, 1992). Students who have been disadvantaged by poor high school preparation may improve their academic potential if they are accommodated with compensatory assistance (Wyatt, 1992). Preparatory departments were established to help students lacking basic skills in English, mathematics, and reading succeed in college-level courses during the early nineteenth century (Wyatt, 1992). Providing academic assistance not only helps underprepared students achieve their full potential, but also strengthens American higher education institutions' goals to maintain enrollments, increase financial viability, and meet standards of excellence.

Remedial education remains a controversial but significant topic that relates to issues such as financial and human resource costs to institutions, the extent to which high school students are unprepared for college coursework, and the role of remediation in the curricula of 2-year and 4-year institutions (Ignash, 1997; Hoyt & Sorenson, 2001; Kozeracki, 2002; Roueche & Roueche, 1999). While some blame high schools for not adequately preparing students for college coursework, some policy makers want to shift the financial burden of remediation to the institutions, which ultimately passes these costs along to unprepared college students. Furthermore, higher education institutions are challenged to ensure that taxpayers receive an adequate return on their investment while legislatures are committed to ensuring that taxpayer dollars are well spent.

Nationwide Remediation Trends

Nationwide findings from the National Center for Education Statistics (2003) reported that in the fall of 2000, remediation was more likely offered by public 2-year colleges (98 percent) than any other institutional types. Also, findings revealed that remediation was more likely offered by public 4-year colleges (80 percent) than private 4-year institutions (59 percent). Approximately 76 percent of Title IV degree-granting institutions enrolling freshmen in the fall of 2000 offered at least one remedial reading, writing, or mathematics course (National Center for Education Statistics, 2003). Furthermore, a higher proportion of Title IV degree-granting institutions "offered remedial courses in mathematics (71 percent) and writing (68 percent) than in reading (56 percent)" (National Center for Education Statistics, 2003, p. 7). The most common reasons given by Title IV degree granting institutions as to why remedial courses were not offered are as follows: 59 percent stated that remedial courses were not needed, 29 percent indicated that students who needed remediation completed these courses elsewhere, and 26 percent stated that their institutional policy did not allow remedial courses at their institution (National Center for Education Statistics, 2003). Although students are more likely to graduate from high school on time and take courses that help prepare them for college-level work, many high school graduates are unprepared to succeed in college-level courses and frequently need remediation when they enroll in college (Callan, 2008).

Statewide Remediation Trends

In Oklahoma, the total number of students enrolled in remedial courses (mathematics, English, reading, and science) decreased from 42,051 in 2005-2006 to

39,550 and 38,215 in 2006-2007 and 2007-2008, respectively (OSRHE, 2007a, 2008, 2009). During the 2006-2007 academic year, the percentages of students enrolled in remedial courses were 2.7 percent (1,085 students), 16.8 percent (6,629 students), and 80.5 percent (31,836 students) at research universities, regional colleges, and community colleges, respectively (OSRHE, 2008). The percentage of first-time freshmen enrolled in remedial courses decreased from 37.8 percent in 2005-2006 to 36.5 percent in 2006-2007 and increased slightly to 36.8 percent during the 2007-2008 academic year for the Oklahoma state system (OSRHE, 2008, 2009). Furthermore, the remediation rate for first-time freshmen less than 21 years of age decreased from 35.7 percent in 2005-2006 to 33.6 percent in 2006-2007 and increased slightly to 34.8 percent in 2007-2008, respectively (OSRHE, 2007a, 2008, 2009).

The increase in remediation rates after the 2005-2006 academic year can be partially explained by an increase in admission standards and/or an increase in ACT composite cut-off scores for placement in remedial courses. Also, the change in remediation rates for research institutions in the state of Oklahoma may generate misleading conclusions. For example, Oklahoma State University remediates their student deficiencies at Northern Oklahoma College. Therefore, the number of students enrolled in remedial courses reported by Oklahoma State University is substantially lower (61 remedial students) when compared to the University of Oklahoma (380 remedial students) during the 2006-2007 academic year (Oklahoma State Regents for Higher Education, 2008b). Regional institutions are also affected by a change in remediation rates if there are no community colleges near their campus to take care of their remedial needs.

Although a review of the literature has illuminated concerns about the cost effectiveness of developmental education, the financial costs associated with remediation in the Oklahoma higher education budget is small compared to total funds ($5.760 billion) available for appropriation for the 2006 fiscal year (Oklahoma Executive Budget, 2006). The total funds appropriated to the Oklahoma State Regents for Higher Education during the 2006 fiscal year were $865.2 million. In 2006-2007, $2.3 million was generated from student remedial course fees to offset costs of offering remedial courses (OSRHE, 2008).

Context of the Problem

Beginning in the fall of 1994, Oklahoma higher education institutions were required to use a first-cut score of 19 on the ACT for entry-level assessment in the subject areas of English, mathematics, science, and reading (OSRHE, 2008b). Students may also demonstrate proficiency by an approved entry-level secondary assessment and placement process. Students who are unable to demonstrate curricular proficiency in one or more subject areas are evaluated to determine appropriate remedial course placement.

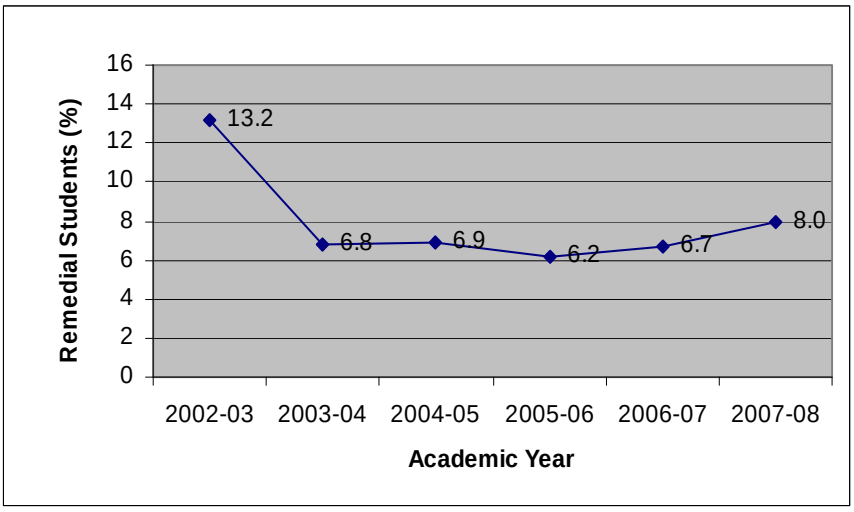
The University of Oklahoma utilizes the Computer-adaptive Placement Assessment and Support System (COMPASS) as a preliminary screening instrument for placement in reading, English, and mathematics. COMPASS is an enhanced assessment test produced by ACT (OSRHE, 2008b). Minimum cut-scores used for determining course placement in reading, English, algebra, and college algebra are 81, 85, 60, and 45, respectively. Developmental/remedial English, mathematics, science, and reading courses are identified with a "0" as the first digit in the 4-digit course number. Consequently, courses numbered 0000 to 0009 do not count for college credit toward

degree requirements. Furthermore, students are assessed a supplemental fee per credit hour for remedial courses.

Statement of the Problem

Gauging progress of retention rate trends of first-year developmental/remedial students at the University of Oklahoma (OU) is somewhat masked by continual increases in six-year graduation rates, increases in headcount and full-time equivalent (FTE) enrollments, and significant decreases in the number of first-time students placed in developmental/remedial coursework during the 2002-2003 to 2005-2006 academic years. The number of Oklahoma first-time freshmen students requiring remediation coursework (OSRHE, 2009) at research institutions decreased substantially from 13.2 percent in 2002-2003 to 6.8 in 2003-2004 as illustrated in Figure 1. The trend of first-time freshmen students placed in remedial courses decreased slightly from 6.9 percent in 2004-2005 to 6.2 percent in 2005-2006, then increased to 8.0 percent in 2007-2008,

Figure 1. Percent of First-Time Freshmen Enrolled in Remedial Courses at Oklahoma Research Institutions

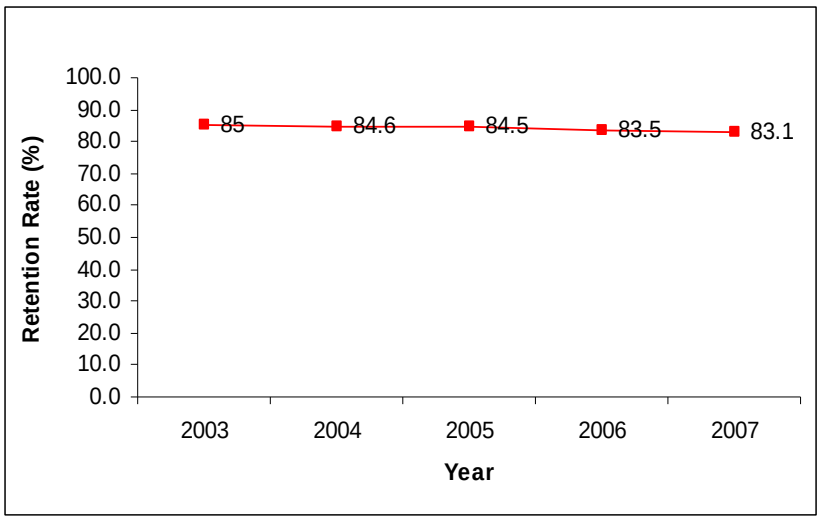


Note. From data reported to the Oklahoma State Regents for Higher Education, 2009.

respectively. Research shows that approximately 85% of students drop out of college within the first two years (Astin, 1977). The first-year retention rate is usually considered by researchers (Tinto, 1988, 1993, and 1996; Wyman, 1997) as the largest and most critical during the freshman year. Tinto (1993) stated that of 2.4 million students who entered institutions of higher education in 1993 for the first time, over 1.5 million students will leave the institution where they first entered college without earning a college degree.

In contrast to the literature review, retention rates for first-time, full-time, degree-seeking students at the University of Oklahoma are relatively high after one year and has decreased only slightly from 85.0 in 2003 to 84.6, 84.5, 83.5, and 83.1 percent in the 2004, 2005, 2006, and 2007 academic years, respectively (see Figure 2).

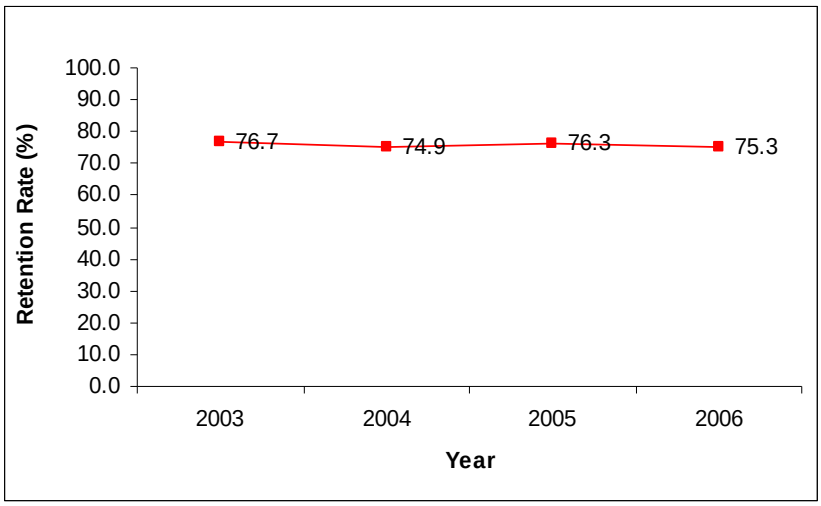
Figure 2. Retention Rates After One Year for First-Time, Full-Time, Degree-Seeking Freshmen Students from Fall 2003 to Fall 2007



Note. From data reported to the University of Oklahoma, 2009a. Retention rates include students beginning on the Norman campus.

Retention rates for University of Oklahoma first-time, full-time, degree-seeking students after two years fluctuated to moderate rates at 76.7, 74.9, 76.3, and 75.3 percent during the fall 2003, 2004, 2005, and 2006 academic years, respectively (see Figure 3).

Figure 3. Retention Rates After Two Years for First-Time, Full-Time, Degree-Seeking Freshmen Students from Fall 2003 to Fall 2006



Note. From data reported to the University of Oklahoma, 2009a. Retention rates include students beginning on the Norman campus.

Although prior assessment studies focus on factors such as gender, ACT composite scores, high school grade point average, and rank in class to study retention and persistence patterns at colleges and universities of varying student populations, there is limited research on the persistence and retention patterns of students placed in developmental/remedial courses at a four-year research university.

Purpose of the Study

This study filled a gap in the literature by contributing empirical research to the field by examining what demographic, family characteristics, pre-college, and college academic performance factors predict persistence between those students who are placed

in developmental/remedial courses and those students who are not placed in developmental/remedial courses at a 4-year public research institution. Pantages and Creedon (1978) suggest that identifying potential dropouts before withdrawal decisions are made will help decision-makers develop appropriate intervention programs that may decrease voluntary dropout rates. Examining student background, family characteristics, pre-college, and college academic performance factors will assist decision-makers with improving institutional policies related to retention standards to better understand differences in persistence trends between student groups at a 4-year public institution.

Research Questions for the Study

The research questions and theoretical framework for this study were derived from a review of the literature on the issues and trends of persistence and developmental/remedial education in higher education institutions. An extensive review of the literature on empirical studies and theoretical models was conducted, and discussed in detail in Chapter 2. This review was conducted to understand the demographic, pre-college, family, and college academic attributes of underprepared students enrolled in developmental/remedial courses which contributed toward the development of the first research question. The review of the literature revealed varying results from studies on the statistical significance of gender, race/ethnicity, ACT composite scores, family income, financial aid status, and remediation status variables on persistence, whereas high school and college grades were reported as strong predictors of persistence, which contributed toward the development of the second, third, and fourth research questions. A review of the literature helped the researcher formulate the following research questions:

Research Question 1

What are selected demographic (gender and race/ethnicity), pre-college (high school grade point average, ACT composite score), family (family income and financial aid status), and college academic performance (college cumulative grade point average) characteristics of first-time students placed/not placed in remedial/developmental courses at the University of Oklahoma during the fall 2006 through the fall 2008 semesters?

Research Question 2

Are there statistically significant differences in student demographic (gender and race/ethnicity) and family characteristics (family income and financial aid status) on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

The following null hypotheses were tested:

Null Hypothesis #1

There is no statistically significant difference in gender on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Null Hypothesis #2

There is no statistically significant difference in race/ethnicity on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Null Hypothesis #3

There is no statistically significant difference in family income on persistence between students who were placed in remedial/developmental courses and students

who were not placed in remedial/developmental courses.

Null Hypothesis #4

There is no statistically significant difference in financial aid status on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Research Question 3

Is there a statistically significant relationship between high school grade point average, ACT composite scores, college cumulative grade point average and persistence? The following null hypotheses were tested:

Null Hypothesis #5

There is no statistically significant relationship between high school grade point average and persistence.

Null Hypothesis #6

There is no statistically significant relationship between ACT composite scores and persistence.

Null Hypothesis #7

There is no statistically significant relationship between college cumulative grade point average and persistence.

Research Question 4

What student demographic (gender and race/ethnicity), pre-college (high school grade point average, and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) factors predict persistence?

The following null hypothesis for this research question below was tested:

Null Hypothesis #8

There are no statistically significant effects of demographic (gender and race/ethnicity), pre-college (high school grade point average, and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) on persistence.

Operational Definitions for the Study

This section provides operational definitions of key terms relevant to this study:

ACT. Previously known as the American College Testing program (currently known as ACT, pronounced as "A – C – T" since 1996), measures educational development and readiness to pursue college-level coursework in English, mathematics, natural sciences, and social studies as defined by the National Center for Education Statistics (National Center for Education Statistics, 2009).

ACT composite score. The ACT composite score is the average of four scale scores received on the English, mathematics, reading, and science multiple-choice tests on the American College Test. Raw scores are converted to scale scores ranging from 1 to 36. The ACT is a test administered nationally to high school seniors to aid in college admissions decisions (ACT, 2008b).

Appropriation. The legal authorization by the Legislature to make expenditures and/or incur obligations limited by fund, agency, department, or program, amount, character, or time period (State of Oklahoma, 2005).

Attrition. Generally referred by theorists (Spady, 1970; Tinto, 1975, 1987,1993; Bean, 1980, 1985) as college dropout rates. Defined in this study as the number

of first-time freshmen who were admitted and enrolled at the University of Oklahoma and did not return for one or more semesters between the fall 2006 and fall 2008 semesters.

Cohort. A specific group of students established for tracking purposes (National Center for Education Statistics, 2009).

College academic performance. A college student's cumulative grade point average, as determined at the University of Oklahoma (2009c), where each hour of grades A, B, C, D, and F are computed in a student's semester or overall grade point average and carry the following grade point values: A=4, B=3, C=2, D=1, and F=0.

Developmental course. English, mathematics, science, or reading course designed to assist students with reaching stated goals (Ross, 1970). Developmental courses are identified with a "0" as the first digit in the 4-digit course number.

Developmental student. In this study, a developmental student is one who has enrolled in at least one developmental English, mathematics, science, or reading course to correct academic deficiencies utilizing a holistic approach to refine the education developmental process (Kozeracki, 2002).

Dropout. Referred by Tinto (1993) as students who did not complete their intended degree program.

Family income. A student's estimate of his/her parent's total income as self-reported on the ACT 2005-2006 form. Choices are: less than $18,000, about $18,000 to $24,000, about $24,000 to $30,000, about $30,000 to $36,000, about $36,000 to $42,000, about $42,000 to $50,000, about $50,000 to $60,000, about $60,000 to $80,000, about $80,000 to $100,000, and more than $100,000 (ACT, 2005-2006).

Financial Aid status. An indicator defined in this study as a student who has/has not been awarded financial aid (i.e., federal and/or state grants, scholarships, and/or loans) as reported on the OSRHE Unitized Data System enrollment file.

First generation college student. Defined as students where neither parent has more than a high school education (Pascarella, Pierson, Wolniak, & Terenzini, 2004).

First-time freshman student. A freshman student entering the University of Oklahoma (OU) directly from high school who has never attended any college (including students who enrolled in the fall term and attended college in the prior summer for the first time). Also included are students who entered with advanced standing college credits prior to graduating from high school as defined in the Oklahoma State Regents for Higher Education Student Data Report (OSRHE, 2009b). First-time freshmen students are defined in this study as students entering OU directly from high school as a first-time, full- or part-time status and having 6 or fewer transfer hours.

Full-time student. A freshman student enrolled in a minimum of 12 credit hours per semester as defined by the University of Oklahoma (2009a) for undergraduate students.

Gender. A student's gender as female and male as self-identified in the OSRHE Unitized Data System student enrollment file.

High school grade point average (GPA). Defined by the University of Oklahoma's admissions criteria as an unweighted cumulative high school grade point average computed on a four-point scale, where A=4, B=3, C=2, D=1, and F=0 as recorded on the high school transcript.

Non-Persisters. Defined in this study as students who were officially admitted to

an institution and do not remain enrolled at the same institution beyond the first semester.

Null Hypothesis. Used to assess the probability that relationships are legitimate or likely a function of chance (Ary, Jacobs, & Razavieh, 2002).

Persistence. Existence of students from the original cohort group who are enrolled in college during the following year as defined by the OSRHE (OSRHE, 2009b). Persistence is defined in this study as the decision to remain in or withdraw from the institution where the student originally began study and is measured by whether or not the student remained within the original institution beyond the first semester.

Persistence Scores. Calculated by coding a "1" for the fall 2006 semester and each subsequent semester a student enrolled at OU. A "0" was coded for each semester a student did not return following the fall 2006 semester. As a result, the minimum and maximum total persistence score that could be earned is "1" and "7", respectively.

Persisters. Defined in this study as students who were admitted to the University of Oklahoma and remained enrolled at this institution beyond the first semester.

Pre-college academic performance. Defined in this study as a student's high school grade point average (GPA) and composite ACT score.

Purposive sample. Sample elements judged to be representative from the population and are selected in a non-random manner with a specific goal/purpose in mind (Ary, Jacobs, & Razavieh, 2002).

Race/ethnicity. A student's self-identified race/ethnicity on the Oklahoma State Regents for Higher Education (OSRHE) Unitized Data System 2006-07 student enrollment file. Choices include African American/Non-Hispanic, American

Indian/Alaska Native, Asian/Pacific Islander, Hispanic, and White/Non-Hispanic.

Remedial courses. Defined by the National Center for Education Statistics (2009) as courses designed for students who are deficient in general competencies necessary for a regular postsecondary curriculum and educational setting. In this study, remedial courses are defined as courses that compensate for a lack of basic reading, writing, and arithmetic (i.e., addition, subtraction, multiplication, and division) skills in prior learning. Remedial courses are identified with a "0" as the first digit in the 4-digit course number.

Remedial instruction. Course instruction designed to provide students with prerequisite reading, writing, and arithmetic (i.e., addition, subtraction, multiplication, and division) skills that are essential for eventual success in the course (Ross, 1970).

Remedial status. Students who are deficient in general competencies necessary for a regular postsecondary curriculum and educational setting (NCES, 2009). Remedial status is an indicator used in this study to determine whether or not a first-time freshman student admitted and enrolled at the University of Oklahoma was placed in at least one remedial/developmental English, mathematics, reading, or science course.

Retention. Students who remain at the same institution where they started until they complete their degree program (NCES, 2000). Defined in this study as the number of first-time freshmen students admitted and retained beyond the first semester at the University of Oklahoma.

Retention rate. Defined by the National Center for Education Statistics (2009) as the percent of first-time bachelor (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled in the current fall semester. In this study, the

retention rate is defined as the percentage at which first-time freshmen students persist at the University of Oklahoma from the fall 2006 through the fall 2008 semesters.

Traditional college student. Unlike non-traditional students, traditional students typically live in a campus residence, are younger than 25, primarily full-time, and are greatly influenced by the social and academic environment of the institution (Bean & Metzner, 1985). A traditional college student is defined in this study as a freshman student entering the University of Oklahoma directly from high school as a first-time, full- or part-time status below the age of 24, excluding transfer and concurrently enrolled high school students, but including students who may have 6 or fewer transfer hours.

Unduplicated headcount. Defined by the Oklahoma State Regents for Higher Education (2009b) as a student who is counted once for the full-year time period or for the fall semester within the institution.

Assumptions

1. It is assumed that the data collected for this study was uploaded accurately into the Oklahoma State Regents for Higher Education Oracle database.
2. All student demographic and profile data received from ACT, Inc. was self-reported and is assumed to be accurate information provided by the student.

Delimitations

1. This study was limited to one single public 4-year research institution in the state of Oklahoma.
2. This study was limited to first-time freshmen enrolled at the University of Oklahoma during the fall 2006 through the fall 2008 semesters.
3. Researchers should use caution when attempting to generalize the results to other

institutions.

4. Albeit transfer students have had an opportunity to develop good study habits and have more higher education experience than first-time entering freshmen, the transfer student population (first-time freshmen with more than 6 transfer hours) was outside of the population scope for this study.

Limitations

1. The target population was comprised of first-time, full- and part-time, degree-seeking students at one single public 4-year research institution.
2. The nature of the freshman student characteristics may not be representative of those students at other institutions.

Summary

Although courses have been offered to college students deficient in English, reading, writing, and mathematics since the early nineteenth century, providing academic assistance to underprepared students is still a heavily debated topic but a significant issue in higher education. Nationwide and statewide trends show that remediation is most likely offered by 2-year public colleges than any other institutional types. Although the total number of students in Oklahoma enrolled in remedial courses decreased between 2005-2006 to 2007-2008 academic years, the percent of first-time freshmen enrolled in remedial courses during this time period fluctuated for the state system.

Research on retention and persistence patterns of underprepared students at 4-year public institutions is limited. This study examined student background, family characteristics, pre-college, and college academic performance factors that help predict persistence to better assist decision-makers improve persistence and retention rates.

Furthermore, this study will assist faculty, advisors, and administrators refining their current intervention programs to strengthen retention and increase academic success.

Organization of the Study

This study is organized in five chapters. Chapter 1 provided an introduction and background of the problem related to persistence and retention of students at higher education institutions. Chapter 2 presents an overview of the literature related to issues on enrollment and remediation trends, followed by a discussion of relevant theoretical models on student departure and variables that influence students' decision to persist or dropout of college. Chapter 3 describes the methodology, research design, study variables, data collection procedures, and a plan for analysis utilized for this study. Chapter 4 summarizes the data results and research analysis and Chapter 5 provides a discussion of the research findings, conclusions, and recommendations for future research.

CHAPTER II: REVIEW OF THE LITERATURE

A review of the literature presents an overview of the underpinnings of current issues related to developmental/remedial education at higher education institutions. The literature review first examines accessibility and affordability issues in higher education. An examination of nationwide and statewide enrollment and remedial education trends are discussed followed by a review of the purpose and placement of developmental/remedial education in higher education. Controversial anomalies over *developmental* versus *remedial* coursework labeling in the American higher education system are examined in the review of the literature. Theoretical models on college student departure, retention studies, and validation studies by researchers that predict student persistence and dropout decisions are also discussed. The review of the literature ends with an examination of student demographic, family, pre-college, and college academic performance variables pertinent to this study.

Accessibility and Affordability Issues in Higher Education

Academic and Federal Support

During the early nineteenth century, preparatory departments were established to help students lacking basic skills in English, mathematics, and reading succeed in college-level courses (Wyatt, 1992). Consequently, overall student enrollments increased resulting in more preparatory than regular students. Although the emergence of preparatory departments fostered enrollment growth and financial viability, the existence of underprepared students at Yale University in 1828 was met with resistance from students wishing to maintain high scholarship and a prestigious image at the institution (Wyatt, 1992). Other universities launched similar remedies to increase student

preparation in college-level courses. The University of Wisconsin established a preparatory department in 1849 to assist students with basic educational skills. Since the late nineteenth century, Harvard University has assisted underprepared students by offering courses to students deficient in basic skills in writing (Crowe, 1998; Wyatt, 1992). By 1907, over half of the students enrolled at Harvard, Princeton, Yale, and Columbia universities did not meet college entrance requirements (Wyatt, 1992). As a result, developmental programs were provided to accommodate underprepared students by providing remedial reading courses and study skills centers throughout the twentieth century (Crowe, 1998; Wyatt, 1992).

Federal legislation widened the doors of higher education institutions and increased opportunities for traditional and non-traditional students to further their education. The Morrill Land Grant Act of 1862 was an initiative by Congress that was responsible for fostering growth and increasing access to higher education by donating land to states to provide colleges that would address the needs of agriculture and the mechanical arts. Following World War II, legislation increased opportunities for veterans to attend college. The GI Bill of 1944 allowed active duty persons and veterans to refresh their skills and further their education at colleges and universities. By the fall of 1946, 2,232,000 (including approximately 60,000 women) veterans attended college under the GI Bill of Rights (Bonner, 1986; Wyatt, 1992). Furthermore, colleges and universities accommodated veterans by providing developmental coursework to underprepared students (Bonner, 1986; Wyatt, 1992).

During the early twentieth century, a shift in the American economy from agriculture to industrial factories was accompanied by an increased popularity of junior

colleges emerging as separate institutions. The Truman Commission in 1948 spearheaded the transformation of junior colleges to remove economic barriers by providing affordable educational opportunities to the entire community and returning servicemen after World War II (Valadez, 2002). The recommendations by the Commission expanded community colleges, provided scholarships, and increased access to college and "… urged the extension of mass education to the university level" (Bonner, 1986, p. 47). After the Soviet launch of Sputnik in 1957, Congress passed the National Defense Education Act the following year. The National Defense Education Act (NDEA) of 1958 improved the quality of higher education by stimulating the advancement of, and education in, mathematics, science, modern foreign languages, and health programs (Bonner, 1986). Furthermore, the NDEA provided federal loans, fellowships, and new research grants to students who were not veterans toward the advancement of programs determined to be central to the nation's defense (Bonner, 1986).

The Civil Rights Act of 1964 ended segregation in public places and removed educational barriers by extending equal opportunities to all students in primary, secondary, and postsecondary education institutions. In response to demand for equal educational opportunities for economically, socially, and educationally-disadvantaged groups, comprehensive support programs were developed to assist disadvantaged students (Kulik, Kulik, & Shwalb, 1983). These programs were supported by the federal government and provided services such as tutoring, learning centers, guidance and counseling, and study skills courses. As a result, developmental education support programs were needed for new groups of students who gained access to higher education

institutions (Bonner, 1986). The Higher Education Act (HEA) of 1965 was intended to provide financial assistance and educational resources to students attending colleges and universities (Bonner, 1986). Specifically, the HEA increased educational resources such as federal grants, scholarships and low-interest loans to assist students attending higher education institutions (Bonner, 1986).

During the 1960s, two-year colleges were characterized by growth and expansion in their curricula, programs, campus sizes, and open admission policies that led to "…a great influx of underprepared students" (Wyatt, 1992, p. 11). This expansion in size was also met with an expansion of non-traditional students comprised of part-timers (including those requiring a flexible schedule that would coincide with their work schedules), women, minorities, and special population groups such as physically-challenged adults, returning older women, and recent immigrants. Since the 1960s, the mission of the community college has been to provide a wide array of academic and non academic programs, such as collegiate/transfer, career/occupational, developmental education, and community service education. Nationwide, approximately 55 percent of all community college students take courses in remedial mathematics or English (Haveman & Smeeding, 2006). Nationwide findings from the National Center for Education Statistics (2003) reported that in the fall of 2000, remediation was more likely offered by public 2-year colleges (98 percent) than any other institutional types. Also, findings revealed that remediation was most likely offered by public 4-year colleges (80 percent) than private 4-year institutions (59 percent). Community colleges still tend to be the primary source for developmental education, which is consistent with their mission to provide open access and meet the needs of the community (National Center for

Education Statistics, 2003). Kozeracki (2002) noted that:

> High schools have been heavily criticized for failing to prepare students academically, and four-year colleges and universities across the nation are exploring policies that would shift the responsibility for developmental education almost exclusively to the community colleges. Despite these figures, a number of states are considering or have already implemented policies that limit the availability of, or funding for, developmental courses at the college level. (p. 1)

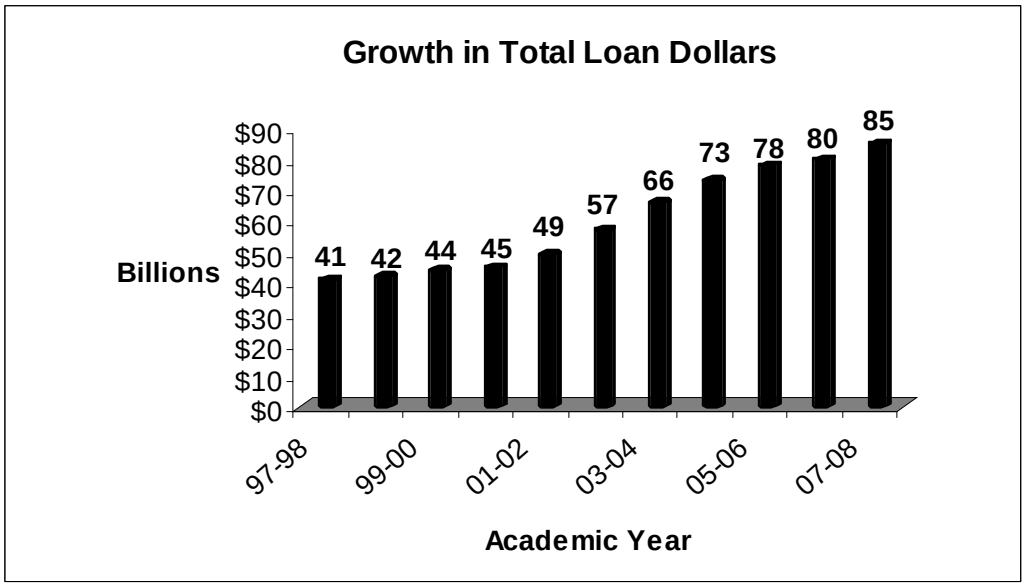
Higher education institutions are challenged to increase their academic standards and accountability as funding in higher education becomes more competitive. Findings from the Secretary of Education's Commission indicated that funding will not grow fast enough to support enrollment demand without addressing issues such as accountability, productivity, and efficiency (U.S. Department of Education, 2006). Consequently, both enrollment growth and decreased funding allocations have contributed toward shaping the future development of higher education. State appropriations related to higher education as a percentage of state taxes have steadily decreased from 14.4 percent in 1985-86 to 11.9 percent in 1995-96 and decreased again to 10.8 percent in 2005-2006 (Southern Regional Education Board, 2007a). As a result, institutions must absorb operational costs by increasing tuition and fees resulting in higher financial costs passed along to the students.

Higher Education Affordability Issues

College affordability throughout the United States is exacerbated by increased college tuition and a decline or flat family income (Callan, 2008). The financial cost of attending college has increased substantially for low and middle income families after

accounting for scholarships and grants. As a result, the burden of paying for college has increased more for low and middle income families (Callan, 2008). As college tuition continues to outpace family income, the potential of higher education being beyond the reach of most Americans would exacerbate the financial burdens of those students who do enroll in college (Callan, 2008). Consequently, current trends reveal students are borrowing more money in the form of student loans to fund education costs since personal income, scholarships, and grants no longer keep pace with rising tuition costs. Findings from The College Board (2008) revealed a substantial growth in total loans from $57 billion in 2002-2003 to $85 billion in 2007-2008 (see Figure 4).

Figure 4. Total Increase of Student Loans from 1997-1998 to 2007-2008



Note. From "Figure 6. Growth of Stafford, PLUS, and Nonfederal Loan Dollars in Constant (2007) Dollars 1997-98 to 2006-2007," by The College Board, 2008.

Nationwide, the average debt per bachelor's degree recipient increased from $10,600 in 2000-2001 to $12,400 in 2006-2007 for all four-year institutions, whereas the average

debt per bachelor's degree recipient increased from $9,600 in 2000-2001 to $10,500 in 2006-2007 for public four-year institutions (The College Board, 2008).

Findings from The National Center for Public Policy and Higher Education (Callahan, 2008) revealed disparities in educational preparedness by ethnicity, family income, and state, which limits our nation's ability to increase the educational attainment of our workforce and remain competitive in our global economy. College affordability has become more difficult for modest and low incomes coupled with increased student debt. For families in the lowest quintile (20%), an additional 16 percent of their income was needed to cover net costs (tuition, room and board), as a percentage of median family income, to attend a public four-year institution in 2007-2008 compared to only an additional 3 percent of income needed for families in the highest quintile (20%) in the same year. Also, families in the middle quintile needed an additional 7 percent of family income to cover net costs to attend college (Callahan, 2008).

According to the Southern Regional Education Board (2007a), spending for scholarships and fellowships increased slightly from 13 percent in 2001 to 18 percent in 2006 at public two-year institutions and increased slightly from 7 percent in 2001 to 10 percent in 2006 at public four-year institutions, respectively. The median annual income in 2005 for households in Oklahoma was $37,645 compared to a median income of $39,818 and $46,326 for SREB states and throughout the nation, respectively (Southern Regional Education Board, 2007a). In 2006, the median funds needed from annual family income required to pay for annual tuition and fees for full-time undergraduate students attending a public four-year college or university was $5,000 nationwide (56 percent increase from 1996 after adjusting for inflation), compared to $3,300 for

undergraduate students attending a public four-year college or university in the state of Oklahoma, which is a 55 percent increase from 1996 after adjusting for inflation (Southern Regional Education Board, 2007a). Although the percentage of grants and scholarships received by students has increased between 2001-2002 and 2005-2006, students also needed loans and employment to help finance education costs, which together total almost as much as grants (Southern Regional Education Board (2007a).

A five-year trend from 2001 to 2006 indicate that appropriations increased 25% at public two-year colleges in SREB states followed by a 79% increase in tuition and fee revenues, with a combined funding growth of 39 percent (Southern Regional Education Board, 2007a). Appropriations increased only 12 percent for public four-year institutions in SREB states followed by a 77 percent increase in tuition and fee revenues, with a combined funding growth of 34 percent. Therefore, as funding appropriations for public higher education institutions decrease, tuition and fee revenues increase to fund institutional operational costs.

There was an additional $5.50 in tuition and fees at Oklahoma's public two-year colleges for every additional appropriated dollar from 2001 to 2006 (Southern Regional Education Board, 2007a). Oklahoma received 36% of higher education funding from state appropriations and tuition and fees from 2001 to 2006, compared to 34% for all SREB states. Although students are confronted with a growing trend of increased tuition and fees, this is still the largest source of funding for public higher education institutions. As a result, the ultimate challenge for decision-makers at higher education institutions is to assist students with achieving their educational goals within funding limitations to contribute toward a better educated workforce (Southern Regional Education Board,

2007a).

Educational, Economic, and Societal Benefits

There are individual and societal benefits realized from students persisting and completing their educational goals. Individuals can experience higher salary and greater employment opportunities that lead toward an improved quality of life. The value of higher education may prolong attendance for extrinsic rewards of access to jobs or social groups (Bean, 1985).

Societal benefits gained from students who obtain their educational goals are increased tax revenues and greater economic wealth. The value of education is usually linked to private economic gains such as better career opportunities and higher earnings (Ishitani, 2006). According to a poll by the Chronicle of Higher Education, findings indicated that the most important role for a higher education institution is preparing undergraduates for a career (Selingo, 2003). Higher levels of education result in higher earnings and tax revenues for federal, state, and local governments leading to higher personal income per capita and decreased long-term poverty (Education Pays, 2007).

Nationwide and Statewide Enrollment Trends

Nationwide Educational Attainment Statistics

According to the National Center for Public Policy and Higher Education (Callahan, 2006), higher education institutions are doing well on measures of accessibility and degree completion, but there has been little improvement since the early 1990s. Higher education must respond to an increased knowledge-based global society (Callahan, 2006). If the United States does not keep pace with educational attainment levels globally, there is a risk of losing a competitive advantage in the job market

and economic prosperity.

On an international scale, the United States is one of the top nations in the proportion of older adults (ages 35 to 64) holding a college degree (2nd to Canada), but drops to 7th in educational attainment of younger adults between the ages 25 to 34 (Callahan, 2006). Nationwide, about two-thirds of students in four-year colleges and universities complete a bachelor's degree within six years. Statewide findings from the National Center for Public Policy and Higher Education (Callahan, 2006) stated that there were modest gains in students completing degrees and certificates, where 65 percent of first-year community college students returned for their second year and 67 percent of students at four-year institutions completed a bachelor's degree within six years after college enrollment.

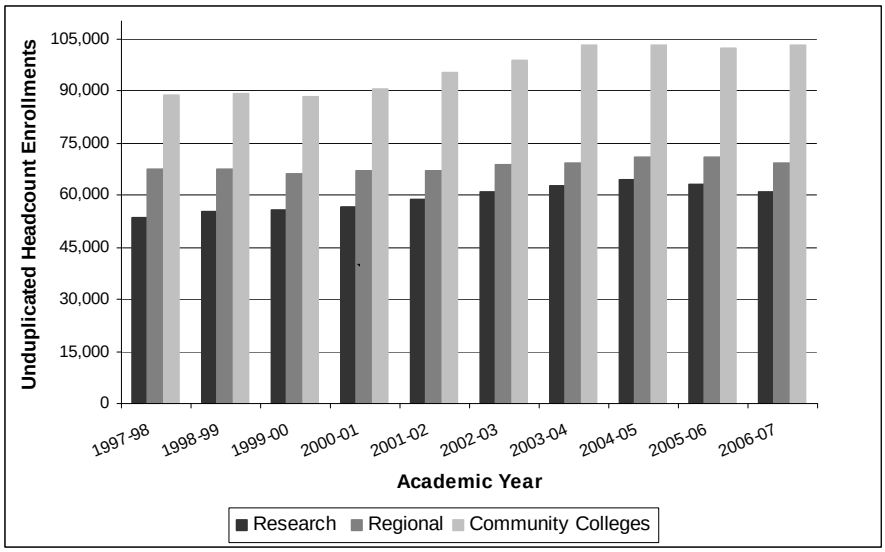
Higher education decision-makers continue to focus on factors that influence student enrollment persistence patterns leading to degree completion. According to the Southern Regional Education Board (2007a), about two-thirds of students in four-year colleges and universities complete a bachelor's degree within six years nationwide. Also, first-year persistence rates of students from the 2004 cohort who remained enrolled at the institution they first attended, as well as students who transferred to other colleges the next fall semester, was 84 percent for all four-year colleges and universities in Southern Regional Education Board (SREB) states, compared to 81 percent for the state of Oklahoma (Southern Regional Education Board, 2007a).

Statewide Enrollment Statistics

Annual unduplicated headcount enrollments (students are counted only once for the academic summer, fall, and spring year) for public higher education institutions

decreased from 210,823 in 1996-1997 to 209,371 in 1997-1998 and then generally increased to 238,245 in 2004-2005, but decreased over the next two years to 233,203 in 2006-2007, as illustrated in Figure 5 (OSRHE, 2007b; OSRHE, 2009b). Overall, public higher education enrollments increased 11.0 percent during the 1997-1998 to 2006-2007 ten-year time period (OSRHE, 2009b). Furthermore, fall enrollments at public research, regional, and community colleges increased 17.4, 6.3, and 14.4 percent, respectively.

Figure 5. Ten-Year Comparison of Annual Unduplicated Headcount Enrollment from 1997-1998 to 2006-2007

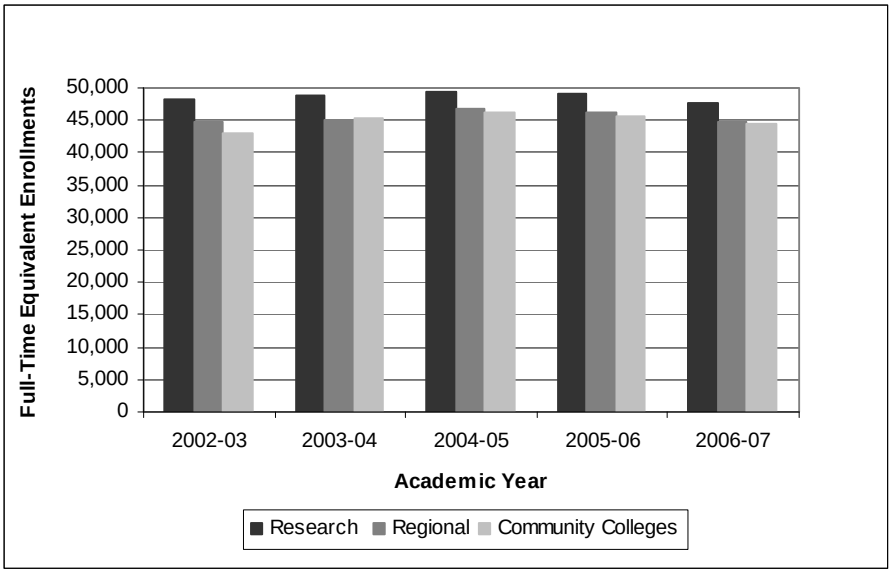


Note. From data reported to the OSRHE, 2009b, p. 30.

A five-year comparison of Oklahoma public institutions show a 0.5 percent increase in annual full-time equivalent (FTE) enrollments from 2002-2003 to 2006-2007 followed by a 3.9 percent decrease in annual FTE enrollments from 2004-2005 to 2006-2007, as illustrated in Figure 6 (OSRHE, 2009b). Furthermore, research and regional universities experienced FTE enrollment decreases equal to 1.2 and 0.2 percent, whereas community colleges had a FTE enrollment increase equal to 3.2 percent from

2002-2003 to 2006-2007, respectively (OSRHE, 2009b). Although administrators have been pressured throughout the years to improve accountability and performance standards in higher education, Grubb (1991) noted that economic pressures, such as a lack of resources to improve teaching or encourage innovation, have compelled institutions to concentrate more on increasing enrollments while diminishing the importance of teaching and improving their practice.

Figure 6. Five-Year Comparison of Annual Full-Time Equivalent (FTE) Enrollments at Public Institutions from 2002-2003 to 2006-2007



Note. From data reported to the Oklahoma State Regents for Higher Education, 2009b, p. 38.

The continual increase in college enrollments from 1955 to 2005 can be explained by a population growth equal to 80 percent (Southern Regional Education Board, 2007a). During this same time period, college enrollments rose 559 percent nationwide, where student enrollments in Southern Regional Education Board (SREB) states had increased from 25 to 32 percent of the national total enrollments (Southern Regional Education Board, 2007a). The Southern Regional Education Board is a nonprofit organization that

is comprised of 16 member states (Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia) who work together to advance education and the economic life of the region (Southern Regional Education Board, 2007a).

During the 2002-2003 thru 2006-2007 academic years, research institutions had more annual full-time equivalent (FTE) enrollments than regional and community colleges at Oklahoma public institutions (OSRHE, 2009b). However, the FTE enrollment gap between regional institutions and community colleges has continually decreased over this five-year period. For example, regional institutions had 1,961 more annual FTE enrollments in 2002-2003 than community colleges; however, during the following year, community colleges gain slightly more annual FTE enrollments (253 more community college enrollments) in 2003-2004 than regional institutions. Thus, the gap between regional and community college FTE enrollments remained small for the next three academic years where regional institutions had 477 more FTE enrollments than community colleges in 2006-2007 when compared to 1,961 more regional enrollments in 2002-2003. Therefore, as costs continue to be a concern for students seeking to further their education, community colleges may become an institution of choice in the future where first-time entering students may take advantage of their open access and affordability policies.

Nationwide and Statewide Developmental/Remedial Education Providers

Nationwide Providers of Developmental/Remedial Education

As mentioned in Chapter One, of those institutions offering developmental/remedial courses nationwide during the fall 2000 semester, findings from

the National Center for Education Statistics (2003) reported that remediation was more likely offered by public 2-year colleges (98 percent) than any other institutional types and remediation was most likely offered by public 4-year colleges (80 percent) than private 4-year institutions (59 percent). Although some policy makers believe that community colleges are better equipped to support remedial intervention programs due to their open admission standards and their mission to serve the community, remedial courses are needed to help underprepared students succeed in college-level coursework (Hoyt & Sorensen, 2001). In the fall of 2000, approximately 76 percent of Title IV degree-granting institutions reported offering at least one remedial course in reading, writing, or mathematics and 28 percent of entering freshmen enrolled in at least one remedial course in reading, writing, or math (National Center for Education Statistics, 2003). The most frequently mentioned remedial subjects reported by Title IV degree-granting institutions were general science, biology, chemistry, physics, English as a second language, study skills, and basic computer skills. Public 2-year institutions (37 percent) were most likely to offer the aforementioned remedial subjects than public (15 percent) or private 4-year institutions (11 percent), respectively (National Center for Education Statistics, 2003).

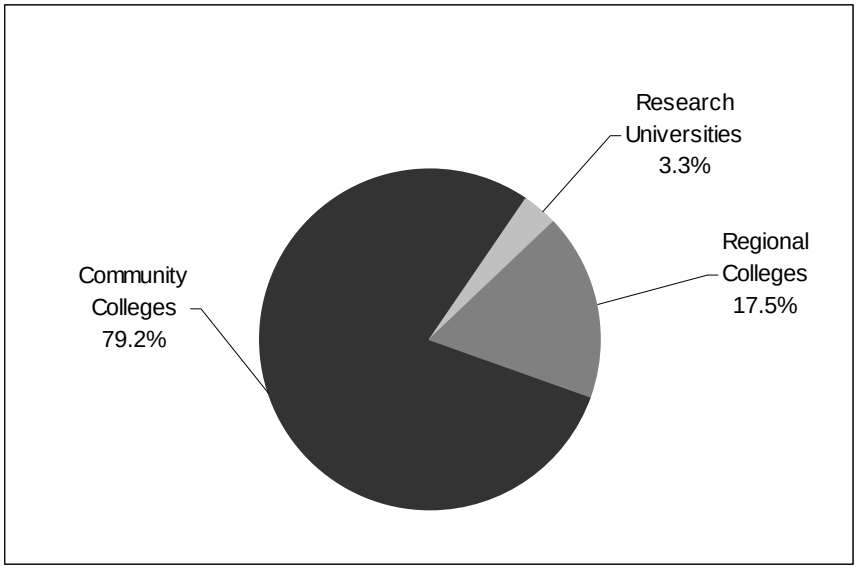
According to a review of the literature (National Center for Education Statistics, 2002), low-income ethnic minorities are more likely to enroll in developmental courses than middle and upper income students. As a result, "students of color, students from less affluent families, and students for whom English is a second language are greatly overrepresented groups in remedial courses" (Attwell, Lavin, Domina, & Levey, 2006, p. 887). Boylan and Bonham (2005) portend that developmental education can be viewed as a gateway to postsecondary education by promoting the retention of minority students.

As a result, “these students diversify the campus population at all levels and in all courses” (Boylan & Bonham, 2005, p. 60).

Statewide Providers of Developmental/Remedial Education

A review of the literature reveals an increased trend of students enrolled in remedial coursework. This trend has resulted in system-wide state-mandated policies requiring students to complete remedial coursework if they do not meet required cut-off scores on placement exams. The percentages of Oklahoma students enrolled in remedial courses at research universities during the 2007-2008 academic year was equal to 3.3 percent (1,268 students), followed by 17.5 percent (6,682 students) and 79.2 percent for regional and community colleges (30,265 students), respectively, as illustrated in Figure 7 (OSRHE, 2009).

Figure 7. Institutional Distribution of Oklahoma Students Taking Remedial Courses from 2007-2008



Note. From data reported to the Oklahoma State Regents for Higher Education, 2009.

Although the percent of first-time freshmen enrolled in remedial courses decreased for the state system from 37.8% in 2005-2006 to 36.8% in 2007-2008, the percent of first-time freshmen enrolled in remedial courses at research universities increased from 6.2 percent in 2005-2006 to 6.7 and 8.0 percent in both 2006-2007 and 2007-2008 academic years, respectively (OSRHE, 2007a, 2008, 2009). Community colleges still tend to be the primary source for remedial coursework in the Oklahoma state system. In 2005-2006, 51.5 percent of first-time entering freshmen were enrolled in remedial courses at community colleges, followed by a slight decrease at 49.9 percent in 2006-2007 and remained steady at 49.9 percent in 2007-2008, respectively. Slightly over 79 percent (30,265) of Oklahoma students were enrolled in remedial courses at community colleges during the 2007-2008 academic year, which is consistent with their mission to provide open access to the community (OSRHE, 2009). Remediation by subject for fall 2007, first-time freshmen, was 31.8 percent, 17.5 percent, 4.8 percent, and 2.3 percent for mathematics, English, reading, and science, respectively (OSRHE, 2009). Furthermore, the percentage of freshmen attending Oklahoma public institutions with an ACT score below 19 from the fall 1997 to fall 2007 decreased in English from 22.6 to 20.3 percent, science from 17.7 to 16.0 percent, and mathematics from 27.7 to 27.4 percent whereas reading increased from 18.1 to 18.2 percent (OSRHE, 2009).

Although remediation has been of national concern since the early nineteenth century, higher education institutions will continually need to accommodate students who are underprepared for college-level coursework. Although some critics argue over whether or not to eliminate remediation or limit remediation to 2-year colleges, it will never completely go away (Crowe, 1998). Therefore, the task of preparing students to

succeed in higher education is the responsibility of both the student and higher education institutions to increase student success, retention, and graduation rates. According to Tinto (1987), "If there is a secret to successful retention, it lies in the willingness of institutions to involve themselves in the social and intellectual development of their students" (p. 7). Consequently, a failure to achieve favorable student retention rates, particularly from the freshman through sophomore year, may result in a loss of tuition revenue that may negatively impact an institution's financial viability due to enrollment volatility.

Issues on Developmental/Remedial Education

A major dilemma facing higher education institutions is resolving transition issues for college students during the first year, especially those serving underprepared and underrepresented populations (Raab & Adam, 2005). Researchers have become increasingly aware of the social and economic factors that contribute to how well students transition from secondary to postsecondary institutions. If students do not resolve transition issues in the first year, especially during the first semester, the likelihood of persisting at the same institution is diminished impacting future enrollments and graduation rates (Raab & Adam, 2005). Research conducted by ACT (2007) show that if students are ready for college, dropout rates and remediation costs are reduced and more students will persist and graduate from college. College readiness is referred to as the level of preparation needed by students to be ready to enroll in credit-bearing courses at a two-year or four-year institution without remediation (ACT, 2004b). According to ACT (2008, p. 2), the impact of college readiness on persistence is driven by salient points listed below:

- Students who are ready for college are less likely to need remediation in English or mathematics than students who are not ready (typically by 36 to 47 percentage points), regardless of gender, race/ethnicity, or family income.
- Students who engage in earlier college readiness planning, such as through PLAN and the ACT, are less likely to need remediation in English or mathematics than those who participate only in the ACT (by 3 to 12 percentage points).
- Students who take or plan to take a core curriculum in high school are less likely to need remediation in English or mathematics than those who do not take or plan to take a core curriculum (typically by about 8 percentage points), regardless of gender, race/ethnicity, and family income.
- Students who take higher-level English courses and a foreign language in high school are less likely to need remediation in English than those who do not take these courses (by up to 31 percentage points), regardless of gender, race/ethnicity, or family income.
- Students who take higher-level mathematics courses in high school are less likely to need remediation in mathematics than those who do not take these courses (by up to 34 percentage points), regardless of gender, race/ethnicity, or family income.

Academic intensity is the most important variable in the pre-college student experience (Adelman, 2006). According to research conducted by ACT (2008) on student success, students who take a rigorous core curriculum in high school are less likely to need remediation in English or mathematics than high school students who do

not take a core curriculum, regardless of race, gender, and family income. Also, students who take a core high school curriculum are more likely to succeed in specific first-year college courses than those who do not take a core curriculum. A core college preparatory curriculum is defined by ACT as four years or more of English and three years or more of mathematics, social sciences, and natural sciences (ACT, 2004b). The Achieving Classroom Excellence Act (ACE) is an Oklahoma state law that requires high school students to complete a college preparatory curriculum, beginning with the ninth-grade in academic year 2006-2007, aligned to the current state standards prior to high school graduation. The ACE Act is an initiative by the Governor to improve course requirements to create public school standards that will prepare high school students for college. As a result, the state of Oklahoma has made much progress toward reaching K-16 alignment on English and the number of mathematics courses and topics students should take in high school. Since the passing of the ACE legislation in 2006, data from ACT revealed that the national average ACT composite scores increased at a slightly higher rate in 2007 to 21.2 from 21.1 in 2006. Therefore, improving college readiness is crucial to the development of a diverse and talented labor force that is able to maintain and increase U.S. economic competitiveness throughout the world (ACT, 2004b).

The Role of Developmental/Remedial Education

Higher education decision-makers are challenged with justifying the role of developmental education at four-year institutions. This sensitive topic sparks a controversial debate regarding the question of quality and access to higher education for academically underprepared students. Assisting academically underprepared students to succeed in college has been part of the higher education system since the early nineteenth

century. Federal legislation initiatives, such as the G.I. Bill in 1944 and the Higher Education Act of 1965 were policies that opened the doors and created greater access to higher education institutions for students who needed developmental courses. The debate over providing developmental education at public universities stems from the "push and pull between providing quality, access, and cost containment" (Jehangir, 2002, p. 19).

Opponents against remedial education argue that the widespread need for remedial education at colleges and universities has ultimately increased costs to the students and taxpayers for education that should have been mastered in high school (Hoyt & Sorenson, 2001). Concerns have been raised by educators regarding the quality of secondary education and their efforts to prepare students for college. Ponessa (1996) refers to the *chain of blame* metaphor to describe how universities blame the need for remediation on high schools, and the high schools blame middle schools and middle schools blame the elementary schools for underprepared students. According to Ignash (1997), high school educators complain of overcrowded classrooms and poor funding that hinder their ability and efforts to prepare students for college.

There is still much debate regarding where developmental/remedial courses should be taught. Advocates for quality in higher education argue that offering developmental/remedial courses waters down the value of a college degree and legislators complain that taxpayers are paying twice for the education of the same student (Hardin, 1998). In contrast, supporters for developmental/remedial education view the controversy of remediation as an attack on access to higher education institutions. Edwards (1993) asserts that both quality and access can be mutually interdependent, not mutually exclusive goals.

Some four-year institutions assert that developmental/remedial courses are not college-level courses and they, therefore, should not be required to offer these courses (Ignash, 1997). According to scholars (Bettinger & Long, 2004; Kozeracki, 2002), arguments have emerged encouraging the removal of developmental/remedial courses from public four-year universities in several states and redirecting students to community colleges. Community colleges argue that they deliver a disproportionate amount of developmental/remedial courses to students. Consequently, some community colleges are concerned that policies limiting developmental/remedial courses at four-year institutions will target them as remedial mills, undermining the career and continuing education components of the community college mission (Chenoweth, 1998). In this regard, the community colleges have emerged as the battleground in which debates in remedial education policies are enacted (Shaw, 1997).

A number of diverse initiatives have been implemented at higher education institution campuses to address access, retention, and persistence toward graduation for underrepresented and underprepared college students. According to a review of the literature, evidence suggests that academic intervention programs have at least a modest effect with helping students overcome pre-college academic deficiencies and associated disadvantages (Pascarella & Terenzini, 2005). Although remedial intervention programs provide short-term benefits by increasing academic performance for underprepared students within the first year in college, researchers have suggested that remediation efforts provide long-term benefits ranging from two to six years (Braley & Ogden, 1997; Easterling, Patten, & Krile, 1995; Weissman, Silke, & Bulakowski, 1997). As a result, policies that prevent underprepared developmental students from enrolling in

developmental/remedial courses at four-year colleges and universities will require that these students begin their postsecondary experience at a community college and may inadvertently reduce the likelihood of these students persisting and graduating from college. Furthermore, Tierney stated "public education has a responsibility greater than admitting those who score highest on a standardized test. Public higher education is a public good" (Tierney, 1997, p. 192).

Developmental versus Remedial Education Labeling

Remedial education can be defined as services for students lacking basic reading, writing, and arithmetic skills. In Oklahoma, students are required to enroll in remedial courses if they score below 19 on ACT subject tests. State-mandated remedial education consists of non-credit courses for students who do not demonstrate minimum competencies in mathematics, English, reading, and science. Other known names for remedial education are developmental education, and basic skills (Phipps, 1998; Ross, 1970).

Although the terms remedial and developmental are frequently used interchangeably, there is a trend toward using the word "developmental" to avoid unintentional stigmatization associated with the word "remedial." Ross (1970) argues that there is an important distinction between "remedial" and "developmental" with important connotations. The word "remedial" most often brings about a negative connotation toward the student as being a slow learner or stigmatized as someone with a learning disability. Remedial instruction can be described as the acquisition of skills or additional instruction necessary to succeed in a course, but not part of the normal day-to-day requirements of a given course (Ross, 1970). In contrast, instruction that facilitates

the advancement of students through a sequence of objectives that assists them with reaching a stated goal is referred to as developmental instruction. Therefore, Ross (1970) recommended that emphasis be placed on the type of instruction, not on the content being studied or course title. By using consistent and universally accepted terminology, misrepresentations of the words "remedial" and "developmental" instruction would be eliminated and would lead toward meaningful instruction with a focus toward the education process of the student.

Casazza (1999) described four major assumptions that differentiate developmental education from remediation:

1. Developmental education is a comprehensive process that looks at the learner from a holistic viewpoint.
2. There is focus on the intellectual, social, and emotional growth and use learning theory to inform the process.
3. There is an underlying assumption that all learners are talented and should be identified by educators to support other areas.
4. Developmental education is not limited to learners at a particular level.

Furthermore, a remedial approach "zeroes in on one aspect of an individual and assumes that represents the whole" (Casazza, 1999, p. 4).

Using the terms developmental education and remediation interchangeably has caused much confusion and controversy. According to a study by Deil-Amen and Rosenbaum (2002), the word "developmental" was an inoffensive expression which downplayed the negative and highlighted the positive aspects of students' remedial placement. Their study explored remedial approaches that avoid the stigma associated

with *remedial* labeling at two community colleges. Interviews were conducted with 130 students and approximately 54 faculty and staff. The researchers also observed classrooms and facilitated focus groups with students to gather more data on student's perceptions about remediation. Archival data such as college catalogs and course schedules were reviewed with a focus on remedial offerings as well as primary research on the history and structure of the district's organizational structure. Deil-Amen and Rosenbaum (2002) administered five-point Likert surveys to 804 students at both colleges to collect information about students' goals, attitudes, experiences, course-taking patterns, and perceptions.

Findings from Deil-Amen and Rosenbaum (2002) revealed that students were most often not clear about their remedial status. Students consulted with their counselors and were simply advised to enroll in a sequence of developmental courses, but were in fact unaware they were enrolling in non-credit remedial courses. Furthermore, the word *developmental* was used in conversations between staff members and students as opposed to the word *remediation*. Consequently, avoiding remedial labels during structured counseling and excluding remedial/developmental verbiage from course titles may result in misperceptions and distorted or unclear information regarding students' awareness about the placement policies and credit status of remedial courses. Also, scholars argue that the stigma-free approach to remedial labeling may result in timely delays on career decisions where other options that would increase awareness regarding remedial placement policies could have been explored.

Studies on College Student Retention

Livingston's study (2007) proposed to contribute to the body of knowledge on

student retention by examining demographic, financial, and educational factors to understand their relationship with shaping graduation rates of students attending Virginia's fifteen public colleges and universities. The population was comprised of Virginia high school students attending a Virginia institution for the first time in either the 1993 or 1997 academic year. The study utilized an ex post facto design. Descriptive and regression analysis using longitudinal data was used to understand how demographic, financial, and educational factors were related to graduation.

Results from the Livingston (2007) study revealed that high school grade point average and total family income best predicted baccalaureate degree completion in six years. Findings also indicated that students most likely to graduate within six years did not require financial aid or work-study and students with high mathematics SAT scores were more likely to graduate. Recommendations for further research included the consideration of factors such as student work status, age, full-or-part-time enrollment status, and type of courses taken in high school to understand their relationship with degree completion. Livingston (2007) also suggested that further research is needed to understand how factors, such as parental education and student work status are related to graduation within six years of entering a public four-year institution.

In a recent study conducted by Stillman (2007), demographic, secondary school experiences, and finances and socioeconomic characteristics were examined that were associated with first-to-second-year student retention at Southern Oregon University (SOU) to better understand students who may be at retention risk. The study (Stillman, 2007) utilized a purposive sample that included first-time freshmen attending SOU during the fall 2005. The entire population was included in the study and consisted of

796 first-year students. The Annual Freshman Survey, developed by the Cooperative Institutional Research Program (CIRP) was administered to all first-year students during their colloquium course in the fall of 2005. Students not present during the colloquium course were mailed the survey. Social security numbers were deleted and students were identified by student identification numbers to comply with privacy and confidentiality policies. The raw score dataset from fall 2005 was compared to the fall 2006 dataset of students returning to SOU. Chi-square tests were used to test for the existence of relationships between the independent variables and the dependent variable (persisters and non-persisters). Parametric tests were inappropriate because the data was using a nominal/categorical scale (Stillman, 2007).

Findings from the Stillman (2007) study revealed a statistically significant relationship between high school grade point average, SAT/ACT score, and parental educational level. However, there were no statistically significant relationships observed between independent variables gender, native language, college distance from home, living arrangements, religious preference, ethnicity, high school type, parental income, and concern over finances on student persistence. Findings from this study on the relationship between gender and retention support the existing literature where gender does not directly influence persistence, but was directly related to college grade point average (GPA) and graduation rate. Results from this study conflicted with themes supported in the literature where ethnicity, religion, college distance from home, living arrangements, native language, and parental income influence student persistence. Furthermore, Stillman (2007) indicated a need to conduct further research by replicating this study to reexamine freshmen characteristics to determine if retention initiatives

impact college retention.

Theoretical Models on College Student Departure

Durkheim's Theory of Suicide

Works from Spady and Tinto's theoretical model on student departure was derived from Durkheim's theory of suicide (Durkheim, 1961). Durkheim posited that individual integration into the social and intellectual structure of society will enable individuals to establish membership within varying communities (Tinto, 1987). Durkheim noted that "suicide is more likely to occur when individuals are insufficiently integrated into the fabric of society" (Tinto, 1975, p. 91).

The Theory of Suicide helps one understand how the social environment could account for variations of suicide rates between and within countries over time (Durkheim, 1961). Durkheim asserts that "individual integration into the social and intellectual life of society and the social and intellectual membership which that integration promotes are essential elements of social existence in human society" (Tinto, 1987, p. 102). As a result, suicide rates can be reduced by restructuring society and effectively integrating individuals into the social and intellectual elements of life (Tinto, 1987).

Spady's Theoretical Model on Student Attrition

Although Durkheim was concerned with aggregate rates of suicide, Spady's theoretical model (1970) paralleled Durkheim by employing a comparative study of rates of departure among higher education institutions. Spady applied Durkheim's model (1961) to analyze institutional departure rates over time, as Durkheim analyzed differences in suicide rates between societies, to examine departure variations among institutions. In order to adapt Durkheim's theory into the institution of higher education,

Spady moved toward a theory of individual departure within institutions of higher education. Furthermore, Spady suggests that if college is viewed as a social system, dropout from this social system can be treated in a manner analogous to suicide in society (Spady, 1970). Consequently, lack of integration into either the academic or college social system may lead to low commitment and increase a student's decision to dropout of college. As a result, Spady (1970) suggested that more research is needed on the relationship between student attributes and the institutional environment as they pertain to both academic and social subsystems of the university toward a more theoretical approach.

Spady (1971) utilized a theoretical model on student attrition to explain the undergraduate dropout process from higher education. Longitudinal data was collected from questionnaires, college records, admissions applications, and semistructured interviews. The population was comprised of 683 first-year students attending the College of the University of Chicago in 1965. Spady posited that the decision to leave college is the result of a complex social process that includes family and previous educational background, academic potential, normative congruence, friendship support, grade performance, social integration, satisfaction, and institutional commitment.

Both normative congruence and friendship support parallel Durkheim's model (1961) used to describe moral consciousness and collective affiliations. Multiple regression analysis was used to ascertain the independent contribution of the independent variables on the dependent variable dropout. Findings from this study revealed that academic performance was the primary determinant of the dropout process for men, but is complemented by institutional commitment and social integration. However, the

decision to leave an institution for women was strongly influenced by their commitment to college, followed by academic related variables.

Vincent Tinto's Theory of Student Departure

While some researchers identified variables that correlate with student attrition (Pantages & Creedon, 1978; Sexton, 1965; Summerskill, 1962), other researchers examined how variables influence attrition (Bean, 1980, 1985; Pascarella, 1980; Spady, 1970; Tinto, 1975, 1993). Much attention has been given to student background, educational, institutional goals and commitment, and academic and social integration to identify the constructs that best explain persistence and retention patterns leading to graduation from college. Both Spady and Tinto argued that college dropout is not well understood due an inadequate definition of dropout. Also, more focus is given to a descriptive rather than a theory-based research emphasis (Spady, 1970; Tinto, 1975). As a result, there has been little explanation as to why particular variables affect attrition.

Tinto (1975) posited that much remains unknown about the dropout process because prior research provided inadequate attention to theoretical models that seek to not only describe, but also explain the processes that influence individual's decision to leave higher education institutions. Tinto's (1975) theoretical model on dropout behavior was drawn from the works of Durkheim (1961) in an attempt to provide theory-based explanations that will help understand the student dropout process. Tinto (1975) noted that Durkheim's (1961) theory of suicide was primarily descriptive and did not explain how different individuals attempt suicide (dropout behavior). Although Durkheim (1961) does not imply that institutional departure leads to suicide, Tinto (1987) suggests that the analogies between the two situations regarding withdrawal from local communities

versus withdrawal from an institution warranted further investigation.

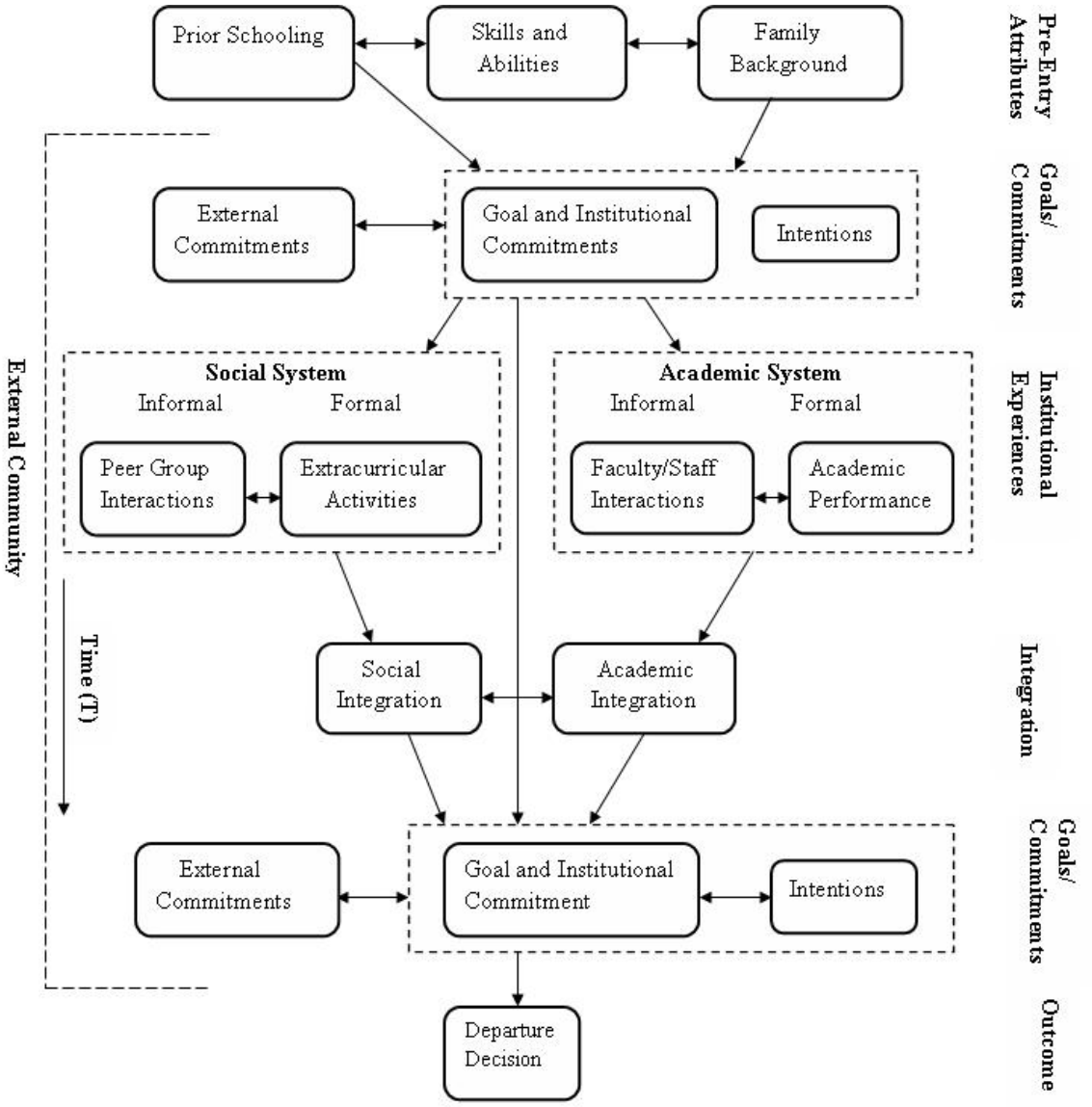
Tinto (1975) sought to formulate a theoretical model that would explain individual and institutional interactions that influence an individual's decision to drop out of college and to distinguish between processes that lead to various forms of dropout behavior. Tinto (1987) also included the cost-analysis component, derived from the field of economics, addressing investment in alternative educational activities. The core of the model is comprised of academic and social integration in college. Tinto found that graduation was influenced by both social and academic integration. As students become integrated into the academic and social environment, they are more likely to become more committed and persist at their institution (Tinto, 1975). Therefore, institutional interventions should be implemented to reduce student attrition. Furthermore, if at-risk students are accurately identified, institutional intervention programs will be most effective (Pascarella & Terenzini, 1980).

Tinto did not include finances in his earlier model (1975). He suggested that students often cited financial problems as reasons for departure from college; however, this reason only masks the primary reasons for withdrawing from college. Although short-term fluctuations of financial support may impact patterns of persistence, Tinto (1987) posited that "Finances do not appear to be a long-term factor in persistence" (p. 82). Furthermore, Tinto (1987) noted that although finances play an important role in the withdrawal process, finances on student departure are largely an indirect effect on student withdrawal.

In Tinto's (1987) Longitudinal Model of Institutional Departure, the persistence process is longitudinal and is regarded as a function of a student's academic and social

interactions of their college experience over a period of time over multiple semesters or years as illustrated in Figure 8.

Figure 8. Tinto's Longitudinal Model of Institutional Departure



Note. From Tinto's Longitudinal Model of Institutional Departure, 1993.

Tinto's (1987) Longitudinal Model of Institutional Departure focus on explaining dropout behavior from institutions of higher education and is viewed as an institutional model of

dropout. Furthermore, Tinto (1987) purports that students come to college with a range of background characteristics (e.g., sex, race, family social status, and high school performance) and goal commitments that influence a student's college performance. Although finances were not explicitly included in Tinto's earlier model (1975), he acknowledged that finances affect a student's decision to persist or leave an institution in his Longitudinal Model of Institutional Departure (Tinto, 1993). Furthermore, these background characteristics and goal commitments interact with an institution's social and academic system. Tinto posited that persistence in college is directly related to how well a student integrates with an institution's academic and social systems (Pascarella & Terenzini, 1980).

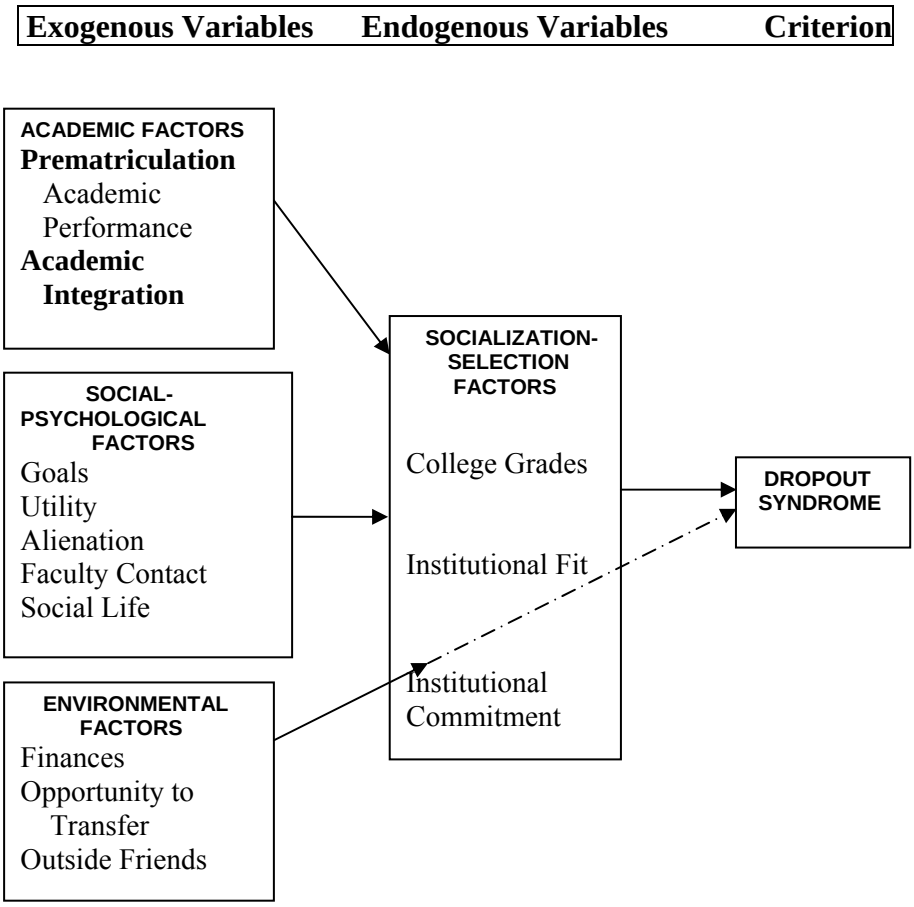
Bean's Model of Student Attrition

Bean's (1980) model of Student Attrition is drawn from the works of organizational turnover models (March & Simon, 1958) and attitude-behavior interaction models (Bentler & Speckhart, 1979). The student attrition model is analogous to turnover in the workplace. Therefore, the intention to stay or leave is a predictor of persistence. Bean recognized the importance of external factors, such as family approval of institutional choice, financial attitudes, encouragement from friends, and transfer opportunities to other institutions, which affect a student's attitudes while attending college. The organizational, personal, and environmental variables of the Student Attrition Model have been extensively tested and have been found to be supported by Bean (1980) on shaping attitudes and intention to persist on the dropout dependent variable.

Bean (1985) developed a conceptual model to examine the interaction effects that

affect dropout syndrome, which is comprised of a combination of the intent to leave, discussing leaving, and attrition variables, as illustrated in Figure 9.

Figure 9. Bean's Conceptual Model of Dropout Syndrome



Note. From Bean's Conceptual Model of Dropout Syndrome, 1985.

Although Tinto's (1975) model of student departure was derived from Durkheim's (1961) theories of suicide, Bean's (1985) model was derived from theories of socialization with emphasis on academic, social, and socialization of students at their college. Prior research studies did not find that other variables contributed to explaining the variance on dropout (except for college grade point average) after the intent to leave was held constant (Bean, 1980, 1982). As a result, dropout syndrome as the criterion variable is defined as both a conscious and openly discussed intent to leave an institution

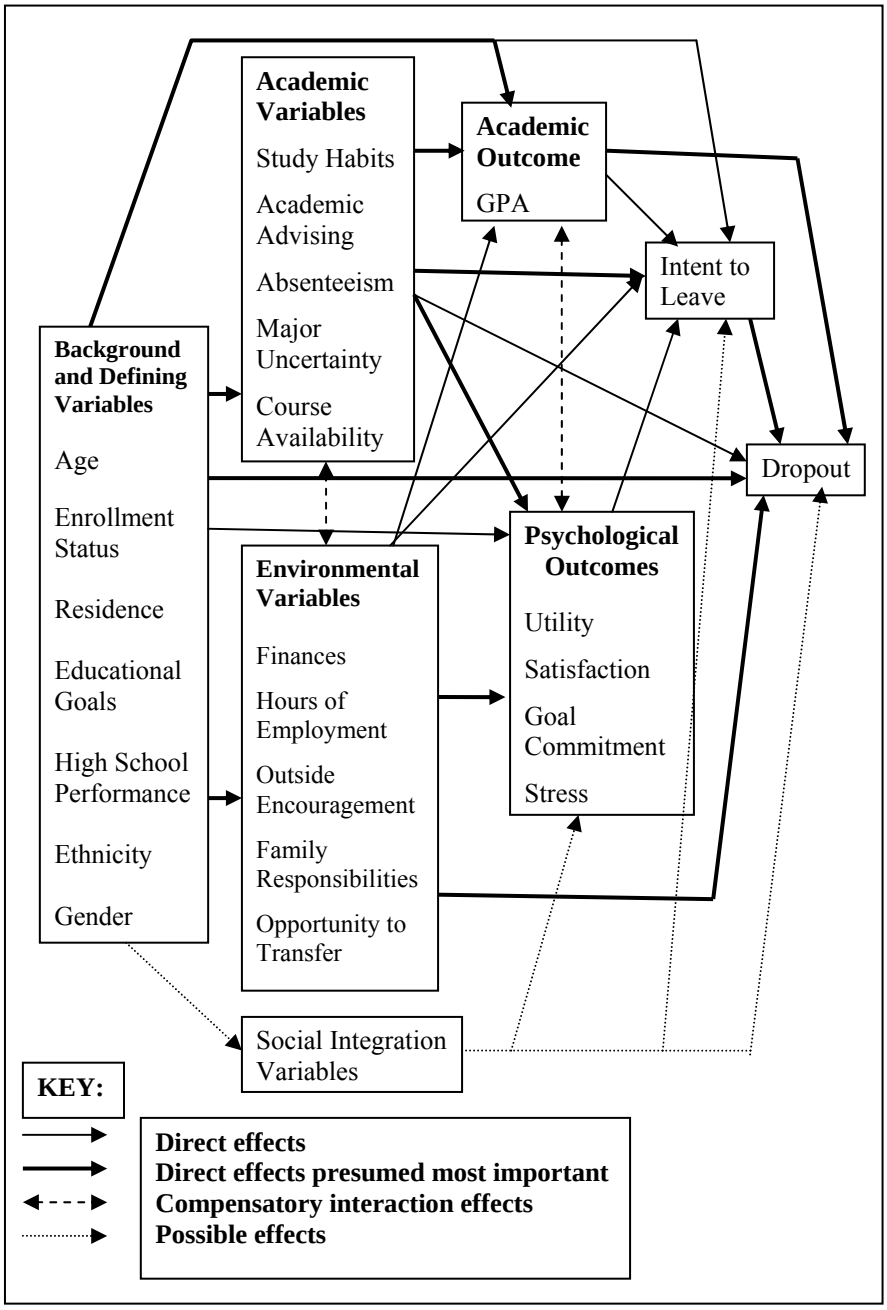
coupled with attrition. Dropout syndrome was not measured as a dichotomous variable since it represents both students who voluntarily intended to leave and attrition. Results from the path analysis revealed that college grades, institutional fit, and institutional commitment were significant predictors of dropout syndrome accounting for 27 to 47 percent of the variance in the criterion variable. Results also show that students play a more active role in their socialization process where a student's peers serve as important agents of socialization than faculty contacts.

Bean and Metzner's Conceptual Model of Non-traditional Student Attrition

Bean and Metzner (1985) developed a conceptual model of student attrition to define non-traditional students and better understand why non-traditional students dropout of college, as illustrated in Figure 10. This theoretical model was derived from traditional student attrition and behavioral models to depict how non-traditional students are affected more by the external environment rather than by social integration variables. A non-traditional student is one who typically commutes to the campus, attends part-time, typically 25 years old or older, primarily concerned with academic courses, certification, and degrees, and is not too influenced by the social environment of the institution (Bean & Metzner, 1985).

Although prior researchers (Pascarella, 1980; Spady, 1970; Tinto, 1975) focused on the social integration aspect to explain attrition, Bean and Metzner (1985) posited that a different theoretical model must be developed since the lack of social integration is a characteristic of a non-traditional student. The conceptual model of non-traditional student attrition is primarily based on four variable sets: (1) background variables (age, enrollment status, residence, educational goals, high school performance, ethnicity, and

Figure 10. Bean and Metzner's Conceptual Model of Non-traditional Student Attrition



Note. From Bean and Metzner's Conceptual Model of Non-traditional Student Attrition, 1985.

gender) , (2) academic performance (study habits, academic advising, absenteeism, major certainty, and course availability), (3) environmental variables (finances, hours of employment, outside encouragement, family responsibilities, and opportunity to transfer)

and (4) intent to leave. The interaction effects and relationship between environmental and academic support are examined empirically in the conceptual model for non-traditional students. The conceptual model of the student attrition for non-traditional students provides a framework from past studies to guide researchers and help understand how the background, academic performance, environment, and intent to leave variables impact attrition for non-traditional students.

Studies Validating Tinto's Model of Student Departure

Pascarella and Terenzini

The predictive validity of the social and academic integration dimensions of Tinto's (1975) conceptual model between freshman year persisters and voluntary dropouts was examined by Pascarella and Terenzini (1980). A longitudinal design was utilized to examine the influences on attrition of students' pre-college characteristics at Syracuse University. The population was comprised of a random sample of 1,905 incoming freshmen. Participants responded to a 55-item questionnaire regarding their college experience and background information. A follow-up 34-item questionnaire was mailed to 1,457 students who responded in July 1976 to collect information regarding the reality of participants' institutional integration with a 53.1 percent response rate (773 freshmen). The sample was divided into two random samples where the larger of the two was used as a calibration sample for the statistical analyses.

Chi-square goodness of fit tests revealed that these 773 freshmen were found to be representative of the freshman population. The study (Pascarella & Terenzini, 1980) looked at the extent to which the assessment of social and academic integration as well as institutional/goal commitment predict persistence when controlling for pre-college

characteristics. In addition, Pascarella and Terenzini (1980) controlled for cumulative college grade point average (GPA) and involvement in extracurricular activities variables since they are potentially significant aspects of academic and social integration dimensions.

Principal components factor analysis was used to determine the consistency of 34 institutional integration items posited by Tinto's (1975) model. Multivariate analysis of covariance was used to determine whether or not the institutional integration scales significantly differentiated between freshman year persisters and voluntary dropouts. Discriminant analysis was used to examine the predictive validity of institutional integration scales and to examine variable contributions to group discrimination for the study (Pascarella & Terenzini, 1980). Also, partial correlations were used to examine the degree of association between each scale and criterion variable while controlling for pre-enrollment, academic performance, and involvement in extracurricular activities variables. The dependent variable was freshman persistence/voluntary dropout behavior, where a code of 1 represented persisters and a code of 0 represented voluntary dropouts.

Findings from the Pascarella and Terenzini (1980) study revealed significant associations between student-faculty relationships and persistence, which is consistent with previous research that support significant associations between informal contacts between student-faculty relationships and college persistence. Their study also revealed significant interactions between sex and scores on the institutional and goal commitments scales and peer-group interactions. Five factors (peer-group interactions, interactions with faculty, faculty concern for student development and teaching, academic and intellectual development, and institutional/goal commitments) loaded and accounted for

44.45 percent of the variance which is consistent with dimensions in Tinto's (1975) model. Results from partial correlations revealed intercorrelations among the five added institutional integration scales where it appeared that these dimensions were independent of one another (ranged from .01 to .33) and significantly differentiated freshmen persisters from voluntary dropouts. Although findings (Pascarella & Terenzini, 1980) revealed that the institutional/goal commitments scale contributed the most to group discrimination, freshmen grade performance and extent of involvement in extracurricular activities were not significant contributors to persistence/voluntary dropout decisions.

Munro's Causal Model on Dropout Behavior

A study conducted by Munro (1981) adds to the knowledge of existing literature on college attrition by moving beyond descriptive and correlation studies to develop a parsimonious causal model and drawing participants from a nationwide longitudinal study that is guided by Tinto's (1975) theoretical model. The sample was comprised of 6,018 full-time entering students at 4-year colleges in the fall of 1972. A path analysis was used to test Tinto's college dropout model to develop a parsimonious causal model.

Findings from the study (Munro, 1981) revealed that all of the antecedent variables, except for institutional commitment, were related to at least one variable, which is consistent with Tinto's (1975) model. Although pre-college characteristics predicted college integration, this component did not directly affect the students' dropout decisions. The model accounted for 14 percent of the variation on withdrawal behavior. High school performance was a stronger predictor of college academic performance than aptitude, which is consistent with prior research (Munro, 1979; Peng et al., 1977).

Two measures of personality, self-esteem and locus of control, were included in

the model with self-esteem prevailing as the stronger predictor (Munro, 1981). Perceived parental aspirations had the strongest direct effect on educational aspirations. Educational aspirations (for both the student and parents) were the strongest predictors of the educational goal commitment than academic integration. Munro (1981) found that academic integration has a stronger influence on institutional commitment than social integration, which contradicted Tinto's (1975) assertions that academic integration most directly affects goal commitment and social integration strongly affects institutional commitment.

Understanding College Persistence

A comprehensive study was conducted by Cabrera, Castañeda, Nora, and Hengstler, (1992) to fill a gap in the literature by explaining the extent to which Bean's Model of Student Departure (1980, 1982, 1990) and Tinto's Student Integration Model (1975, 1987) converge to better understand college persistence. Although there is little research on the extent to which these theories converge and diverge, this study examined the convergent and discriminant validity between these two theories to illuminate our understanding of the persistence process. Cabrera, Castañeda, Nora, and Hengstler, (1992) examined Tinto's Student Integration Model (1975, 1987) and Bean's Student Attrition Model (1980, 1982, 1990) to better understand attrition in traditional and urban institutions.

Tinto's theory (1975, 1987) explains what motivates students' to leave college before graduating. Tinto posited that attrition is a result of interactions between a student and his/her college environment. This theory asserts that persistence is a match between an individual's motivation and academic integration as well as the institution's academic

and social characteristics which work together to shape goal commitment and institutional commitment variables. As a result, the stronger the goal commitment/institutional commitment, the greater the probability of persistence.

Contradictory results from prior research studies on the impact of pre-college, commitment, and integration factors on persistence are attributed to institution type, gender, ethnicity, inconsistencies on how the constructs are measured and a lack of control for external variables (Cabrera et al., 1992). Although Tinto's Student Integration Model (1975, 1987) is useful to researchers seeking to understand significant factors that influence persistence, there is a gap in the theory where non-institutional external factors, such as parental support and ability to pay, are not addressed when explaining the college persistence process. Tinto (1993) did, however, later acknowledge that finances affect a student's decision to persist or leave an institution in his Longitudinal Model of Institutional Departure.

Bean's (1980, 1982) work on student attrition builds on organizational turnover (March & Simon, 1958) and attitude-behavior interaction models (Bentler & Speckhart, 1979). Bean portends that attrition is analogous to organizational turnover where behavioral intentions to stay or leave are predictors of persistence. Therefore, the Student Attrition Model (Bean, 1980, 1982) asserts that beliefs are shaped by attitudes about student college experiences and attitudes are shaped by our behavioral intent to persist. Findings from Bean and Vesper (1990) revealed that external factors to the institution play a major role in affecting student attitudes and their intent and decision to persist.

A review of the literature notes that both Bean's Student Attrition Model (1980, 1982, 1990) and Tinto's Student Integration Model (1975, 1987) presumed correctly that

persistence in college is a product of interactions between personal and institutional factors (Cabrera et al., 1992). Whereas Tinto's Student Integration Model (1975, 1987) emphasizes academic integration, social integration, institutional and goal commitment, which account for high effects on persistence, Bean's Student Attrition Model (1980, 1982) emphasizes the role of attitudes, intent to persist, institutional fit, and external factors on decisions to withdraw from college (Cabrera et al., 1992). Also, the intent to persist from Bean's Model of Student Attrition was found to be the outcome of a match between the student and institution.

As a result, there is an overlap between the two theories regarding organizational factors (academic integration and courses) and institutional commitments. Although Tinto's Student Integration Model (1975, 1987) appears to be more robust in terms of the number of hypotheses validated, Bean's Model of Student Attrition (1980, 1982) accounts for more variance attributed to both Intent to persist (60.3 percent from Bean's model versus 36 percent from Tinto's model) and Persistence (44 percent from Bean's model versus 38 percent from Tinto's model) due to significant effects of parental encouragement, support from friends, and finances. This finding supports Bean's proposition that there are more complex external factors to the institution than those represented by Tinto's Student Integration Model that affect college persistence (Cabrera et al., 1992). Also, 70 percent of Tinto's hypotheses were confirmed compared to 40 percent of Bean's hypotheses being supported. The course construct in Bean's Student Attrition Model (1980, 1982) could be regarded as a measure of the academic integration construct in Tinto's Student Integration Model (1975, 1987). Also, the institutional commitment construct in Tinto's Student Integration Model (1975, 1987) is referred to as

the institutional fit construct in Bean's Student Attrition Model (1980, 1982). The primary contribution of the Student Attrition Model (1980, 1982) is illuminating the role that external factors play on the college persistence process.

Findings from the study conducted by Cabrera et al. (1992) revealed that both Tinto's Student Integration Model (1975, 1987) and Bean's Student Attrition Model (1980, 1982) are appropriate models for understanding attrition in traditional and urban institutions. Findings also revealed that the role of environmental factors influenced student socialization and academic experiences, which support Bean's findings that environmental factors (e.g., encouragement and support from significant others) should be incorporated into conceptual frameworks when examining student persistence in college. By merging the two theories, a more comprehensive understanding among the individual, environmental, and institutional variables on the persistence process was achieved. Furthermore, these findings will aid institutional researchers and decision-makers by understanding the interplay between institutional, personal, and external factors when conducting assessment studies designed to prevent college attrition.

Theoretical Framework

Extensive research has been conducted on various student groups from different institutions to analyze the relationships and predictability of variables that influence persistence and retention. Although some researchers (Bean, 1980, 1982; Bean & Metzner, 1985) have developed theoretical models that focus on non-traditional students, Tinto's longitudinal model of institutional departure (1993) is widely utilized and focuses on traditional college students at four-year colleges and universities. Therefore, Tinto's model is appropriate for this study for examining demographic, pre-entry, family, and

college academic performance variables that predict persistence of first-time entering traditional college students at a four-year public university.

Tinto's (1993) Longitudinal Model of Institutional Departure focuses on explaining dropout behavior from institutions of higher education and examines student persistence/dropout behavior of traditional students at four-year colleges. Tinto's Longitudinal Model of Institutional Departure (1993) includes family background, skills and abilities, and prior schooling as pre-entry attributes, which was intended to "… speak to the longitudinal process of departure as it occurs within an institution of higher education" (p. 112). Students attending higher education institutions enter with a wide range of personal attributes, family background and community characteristics, skills, financial resources, dispositions, and pre-college academic experiences. This study examined the personal attributes, operationalized as student demographic attributes (measured as gender and ethnicity), family background (measured as family income, and financial aid status), prior schooling, operationalized as pre-college academic experiences (measured as high school GPA and ACT composite score) and college academic performance (measured as college cumulative grade point average and remedial status) variables to determine any significant differences on persistence between students who are placed in remedial courses and students who are not placed in remedial courses.

Theoretical Significance

Prior empirical and theoretical research studies on student dropout behavior and persistence has guided this study on the appropriate methodology and theoretical frameworks in higher education. This study aimed to go beyond the works of previous researchers who examined persistence at higher education institutions to expand the

existing knowledge base by analyzing persistence patterns and examining pre-entry and college academic performance to predict persistence of freshmen students placed/not placed in remedial/developmental courses at a four-year public research institution.

Tinto (1993) portends that his Longitudinal Model of Institutional Departure aims to be policy relevant so that policymakers may utilize this model as a guide for institutional action toward retaining students until degree completion. The intent of this study is to help Oklahoma policymakers understand the dropout process since most of the studies and reports are descriptive rather than theory-based. Furthermore, empirical studies suggest that more research is needed on the retention and persistence processes at four-year institutions.

Empirical studies on persistence and retention of developmental/remedial students at four-year selective universities are limited. The intent of this study is to contribute knowledge to the field by examining how student demographic, pre-college, family characteristics, and college academic performance predict first-time entering freshman through sophomore persistence at a four-year public research university. Furthermore, this study will assist faculty, advisors, and administrators with refining their current intervention programs to strengthen retention and improve academic success of first-time, degree-seeking freshmen students.

Practical Significance

This study contributes to the body of knowledge on student retention research to better understand what background, family characteristics, pre-college, and college academic factors help influence a first-time, degree-seeking freshman student's intent to persist or not persist at a public four-year research institution. Tinto (1987) stated that:

> Nevertheless, it is the case that improved pre-entry information aimed at the needs of future students can be an effective tool in reducing, over the long run, student departure from institutions of higher education ....More importantly, it conveys to all students the perception that the institution is sufficiently committed to and respecting of student competence to provide them with accurate information for their own decision making. (p. 143)

Student attrition may be significantly reduced through timely and effective interventions if students with a high probability of dropping out can be accurately identified (Pascarella & Terenzini, 1978, 1980).

Prediction research can benefit decision-makers (e.g., Academic and Student Affairs officers, administrators, and faculty) by helping them to better understand what background, family characteristics, pre-college, and college academic factors predict student persistence from their freshman through sophomore year. Understanding persistence and retention trends can inform decision-makers on how to improve pre-entry information and strengthen current retention efforts at their institution. Furthermore, knowledge of retention/persistence trends can benefit decision-makers by improving institutional effectiveness through policy changes and/or adjustments in areas such as curricular design, course scheduling, and student support services to increase academic performance and retention rates (Wyman, 1997).

Research Study Variables

Student Demographic Variables

Gender. In a review of the literature, there have been varying results from studies conducted on the effects of gender differences on persistence. Recent research

conducted by Corbett, Hill, and St. Rose (2008) revealed that both men and women are more likely to graduate from college today than ever before; however, women outnumber men by a ratio of 2-to-1 on earning college degrees. Furthermore, men are graduating from high school and earning college degrees at an all time high and women are attending and graduating from college at higher rates than their male peers. Results from a study by Hagedorn (2005) revealed that graduation rates for female students were 20% higher than male students.

In contrast, findings from other researchers (Anderson, 1988; Horn, Peter, & Rooney, 2002; Pritchard, 2003) revealed that gender is not influenced by persistence. In a review of the literature by Pantages and Creedon (1978), sex was not found to be a significant factor for overall attrition rates but may be a significant factor for individual institutions. Findings from other studies (Johansson & Rossmann, 1973; Summerskill, 1962) revealed that there is little or no significant difference between the sexes on attrition.

Race/Ethnicity. Although the composition of the college entrance pool for minorities have changed significantly over the past few decades, there have been varying results from studies conducted on ethnic differences on persistence. Empirical research by Astin (1975) and Bennett and Bean (1984) reported that Black students had lower persistence rates than White students. In contrast, research findings utilizing national samples of students attending four-year colleges disclosed greater persistence of Black students at four-year institutions than White students after controlling for socioeconomic status, aspiration, and past academic achievement (Astin, 1971; Peng et al., 1978).

Findings from a study by Terenzini and Pascarella (1978) revealed significant

and unique interactions in gender, major, and race/ethnicity on the possibility of dropping out voluntarily. However, pre-college traits (e.g., race, ethnicity, major) were not significantly related to attrition. Furthermore, findings from a study by Braxton, Duster, and Pascarella (1988) revealed that minority students were more likely to depart from college than their peers.

Pre-College Academic Variables

High school grade point average. High school grades and scholastic measures are recognized by researchers as the most reliable predictors of academic achievement and college persistence than standardized ACT/SAT scores (Astin, 1971, 1972, 1997; Bean & Metzner, 1985; Eckland, 1964; Hoffman, 2002; Munro, 1981; Pantages & Creedon, 1978; Tinto, 1975). Findings from a study conducted by Astin (1997) revealed that the use of high school grades is a viable predictor of college persistence. Researchers have found high school grades to be strong predictors of college academic achievement than any other factor (Hoffman, 2002; Munro, 1981; Zheng et al., 2002).

Hoffman and Lowitzi (2005) examined the influence of pre-college characteristics on student involvement and student success between varying racial and religious groups at a private Lutheran university. A Student Opinion Survey was distributed to the sample population comprised of 522 full-time degree-seeking students enrolled during the fall 2000 semester. Findings from the path analysis model (Hoffman & Lowitzi, 2005) revealed that high school grades were a strong and significant predictor of academic achievement for students of color and non-Lutheran students, but a weaker predictor of academic achievement for Lutheran students. Also, high school grades were strong statistically significant predictors of retention for students of color but not for

non-Lutherans.

Bershinski (1993) investigated demographic, attitudinal, and achievement variables that predict the following outcome groups for students enrolled in a remedial mathematics course during the fall 1992 semester at a four-year institution: a successful completer, unsuccessful completer, and noncompleter for remedial mathematics students. Findings from the study conducted by Bershinski (1993) revealed that high school grade point average was found to be a significant predictor of outcome group membership for traditional students at a four-year institution. Research by Livingston (2007) examined demographic, financial, and educational factors related to graduation from Virginia's public colleges and universities. Findings from analyzing the 1993 and 1997 admission cohorts utilizing regression analysis revealed that high school grades predicted bachelor degree completion (Livingston, 2007).

Other scholars have found high school grades to be strong predictors of college academic achievement. Findings from a study by Bean (1986) revealed that high school grades indirectly influenced a student's decision to drop out of college whereas past academic performance was the best predictor of future academic performance. Astin (1997) analyzed data on 52,898 students attending 365 baccalaureate institutions using average high school grades to generate a regression formula to estimate institutional expected retention rates. Findings from this national longitudinal retention study (Astin, 1997) revealed that high school grades are viable predictors of college persistence.

ACT composite scores. The ACT instrument is a curriculum-based tool used to measure college readiness (ACT, 2007). ACT composite scores are frequently used by colleges as admission and course placement criteria where scores range from 1 through

36. The ACT test includes four components: (1) student profile inventory, (2) high school grade and course information, (3) academic achievement tests in English, mathematics, science, and reading, and (4) career interest inventory. ACT (2004b) asserts that the more rigorous and challenging the high school courses, the more likely students will be ready for college and will persist and graduate from college.

The literature reveals varying results on the predictability of scholastic aptitude measured by SAT and ACT scores and persistence/dropout decisions. Tracey and Robbins (2006) examined the relationship between college cumulative GPA and ACT composite scores by analyzing first-time freshmen enrollment information from 87 colleges and universities from four states for students enrolled between 1994 and 2003. The relationship between ACT scores and college GPA was examined using hierarchical linear regression. Findings from the study revealed a statistically significant relationship between ACT scores and college cumulative GPAs over time, where mean college GPAs varied significantly across institutions. As a result, the ACT score was found to be a predictive indicator of college GPA over time.

Noble (2003) examined the effects of ACT composite scores on college admission decisions for students from selected racial/ethnic groups. The population was comprised of two samples: (1) African American and Caucasian American group from 43 institutions and the (2) Hispanic and Caucasian American group from 25 institutions. Findings from this study (Noble, 2003) revealed that ACT composite scores were accurate predictors of student success for first-year African American students than of Caucasian American students, but the opposite was true for first-year Hispanic students.

McGrath (1997) conducted a study to examine the relationship between attrition

and specific demographic, academic, financial, and social factors at a private college in an effort to increase the freshman to sophomore college retention rate to 85 percent. A College Student Inventory was administered to 353 freshman participants enrolled during the 1994-1995 academic year to identify pre-college experiences and attributes that predict college retention. Results from the analysis revealed that high school grade point average, combined SAT scores, and first semester grade point averages were significant predictors of retention. As a result, students who were retained within the first year of college tend to have higher combined SAT scores, high school grades, and first semester grade point averages than students who were not retained.

Stillman (2007) examined demographic, secondary school experiences, and finance factors to understand which factors are associated with first-to-second-year retention at Southern Oregon University (SOU). An Annual Freshman Survey (AFS) was administered to first-year students attending SOU during the fall 2005-2006 academic year. After analyzing results from the Annual Freshman Surveys, findings revealed a statistically significant relationship between SAT/ACT scores and persistence. Although this study (Stillman, 2007) supports prior research findings which revealed SAT/ACT scores directly influence persistence, some researchers (Munro, 1981; Pascarella & Terenzini, 1983) found that test scores did not have a direct influence on persistence/dropout decisions.

Academic rigor. The state of Oklahoma has taken measures to help prepare students for college by aligning their core admission criteria with the recommended ACT core college preparatory curriculum. Students planning to attend a public college or university in Oklahoma are required to complete the 15-unit core curriculum in high

school for college entry. The required units include 4 units in English, 3 units in mathematics, 3 units of history and citizenship skills, and 2 units of laboratory science (may have two lab sciences and three other units beginning in 2009). In addition, 3 units must be completed from any aforementioned subjects or students may select a subject from computer science or a foreign language.

The mathematics core requirements for students admitted to Oklahoma public colleges or universities include three units from the following courses: algebra I, algebra II, geometry, trigonometry, mathematics analysis, calculus, or advanced placement statistics. The English core curriculum requirements for high school freshman students attending Oklahoma public colleges or universities include four units from the following courses: grammar, composition, and literature. Although academic rigor is an important variable that is used to analyze how well students are prepared for college, this variable will not be used in this study since students entering Oklahoma public colleges and universities are required to take high school courses that are aligned with the 15 unit core curriculum required for students attending an Oklahoma public college or university.

Family Background Variables

Parental income. Although Tinto (1993) acknowledged that finances affect a student's decision to persist or leave an institution, a review of the literature revealed varying conclusions on the effects of parental income on persistence. Cabrera et al. (1990) reported that ability to pay for college finances can moderate effects of other variables on persistence. In contrast, prior research by Astin (1973) and Eckland (1965) revealed that family income was not a direct factor related to college attrition.

Stage and Rushin (1993) utilized the High School and Beyond (HSB) database to

measure the parental income characteristics of a conceptual student persistence model. A sample of 1,111 participants was generated from a nationally representative sample of 28,000 high school seniors entering four-year public institutions using 1980 as the base year. Follow-up analysis was conducted after six-years using structural equation analysis to estimate relationships between causal factors and persistence. Findings from this study (Stage & Rushin, 1993) revealed that parental income was the third most useful factor for predicting persistence, where student high school grade point average and parental educational level were the first and second most useful factors, respectively.

A study conducted by Corbett, Hill, and St. Rose (2008) examined trends in gender equity from elementary school to college and factors that influence student achievement by race and family income level. Findings reveal disparities by race/ethnicity and family income, specifically for African American, Hispanic, and low-income students. Furthermore, findings from the study (Corbett, Hill, & St. Rose, 2008) revealed that family income is closely associated with academic performance.

Financial aid status. Findings on the effects of student aid on retention and persistence yielded varying results. Researchers (Paulsen & St. John, 2002; Tinto, 1993) assert that the economy influences where students decide to go to college and how long they remain. Consequently, a financial aid package that successfully attracts students to a college or university may not be enough to keep a student there after being faced with the cost of living realities (St. John, 2000). Although some researchers (Bean, 1985; Cabrera, Nora, & Castañeda, 1992) indicate that financial aid influences persistence, there is growing evidence by other researchers who assert that student aid is no longer sufficient to support persistence since students respond to price and subsidies (e.g., debt

burden or inadequate financial aid) in their persistence decisions (St. John & Starkey, 1995).

Cabrera, Nora, and Castañeda (1992) examined the role of finances on college persistence utilizing a causal model by linear structural equations. A longitudinal design was used to analyze data on 466 full-time, first-time college students under the age of 24 attending a large urban commuter institution during the fall 1988 to the fall 1989 semesters. Data was analyzed from questionnaires, college transcripts, and institutional financial aid records to determine enrollment status and explore the direct and indirect effects of finances on persistence. Findings revealed a significant direct effect of financial aid on college grade point average and a student's intent to persist.

A study by Voorhees (1985) examined the impact of student finances on persistence of freshmen in high financial need. The population consisted of 343 freshmen financial aid recipients enrolled at a major university in the Southwest during the fall 1980. The data was analyzed using structural equation modeling to allow for a priori relationships among variables. According to Voorhees (1985), financial need and noncampus-based loans and grants have direct effects on new freshman persistence regardless of the type and/or amount of campus-based aid. Furthermore, there was a positive significant effect of federal campus-based financial programs on persistence.

According to a review of the literature (Pantages & Creedon, 1978), students tend to rank finances as the highest ranking factor for leaving college. However, this is not the only reason that prompts students to drop out of college since students may eventually reenroll at a later time. Although Pantages and Creedon (1978) found financial aid to be a significant predictor of persistence in college, they noted that this variable tends

to be more of a psychological function rather than economic impact.

In contrast, Bean (1985) examined factors that affect dropout syndrome at a major Midwestern research university. After data were analyzed from student records and questionnaires, results from the path analysis revealed that finances had a negative influence on dropout syndrome. St. John (2002) examined reasons for the ambiguous conclusions regarding existing research on the impact of student financial aid on enrollment. Findings revealed that student aid does have an immediate and direct effect on whether students enroll and can afford to persist with enrollment. St. John (2002) also posited that if financial aid packages are revised due to state, federal, or institutional policies, these changes may impact a student's decision about whether or not to enroll and/or continue full-time.

First generation college students. According to the review of the literature, first-generation students are more likely to have college retention rates lower than their counterparts (Horn, 1998; Riehl, 1994). National data examined by Nunez and Cuccaro-Alamin (1998) revealed that first-generation college students persisted and earned degrees at lower rates than their peers. Furthermore, Nunez and Cuccaro-Alamin (1998) noted that first-generation status had a negative effect on persistence and educational attainment.

Ishitani (2003) reported that first-generation students were less likely to complete their college degree program than their counterparts over time. Also, the risk of attrition among first-generation students in the first year was 71 percent higher than their counterparts with two college-educated parents. Also, Pantages and Creedon (1978) revealed from their study that of the demographic variables, parental education was the

most significant factor, but did not appear to be the primary factor for overall attrition rates.

Although the first-generation college student variable is an important indicator in determining whether students persist in college, this variable is not collected as part of the Oklahoma State Regents for Higher Education (OSRHE) student detail enrollment record. This variable is collected from high school students on the ACT PLAN instrument, which is a "pre-ACT" test administered to high school 10th grade students. Therefore, this variable is not utilized in this study.

College Academic Performance

College cumulative grade point average. Researchers have sought to understand the influence of academic achievement, specifically college grades, on persistence by conducting both national and institutional studies from the first to the second year and beyond (Cabrera, Nora, & Castañeda, 1993; Cabrera et al., 1999). Findings from researchers (Bean, 1985; Pascarella & Terenzini, 2005) revealed that college grades are one of the most consistent predictors of student persistence and degree completion. Other researchers (Nora, 1990; Voorhees, 1985) have reported a significant direct effect between college academic performance and persistence.

Cabrera, Nora, & Castañeda (1993) developed a baseline theoretical model by integrating both Tinto's Student Integration Model (1975, 1987) and Bean's Student Attrition Model (1980, 1982) to better understand the persistence problem. There were 466 useable survey questionnaires and college transcripts examined from fall 1998 entering freshmen at a large southern urban institution. Findings from a longitudinal research design revealed that Intent to Persist (0.485) and Cumulative Grade Point

Average (0.463) variables accounted for the largest total effect on persistence decisions.

Adelman (1999) examined transcript and survey data of high school sophomores to understand the influence of first-year college grades on graduation. After following students for 12 years after graduating from high school, findings from the study (Adelman, 1999) revealed that first-year college grades are positive predictors of degree completion. Findings from a study by Pantages and Creedon (1978) reported that first semester college grades have been found to be an accurate predictor of college attrition for low grades, but high grades do not necessarily guarantee persistence.

McGrath (1997) conducted a study to examine demographic, academic, financial, and social factors to identify the best predictors of retention at a private college of 353 freshman students enrolled during the 1994-95 academic year. Results from the t-test found a significant difference between groups and found first semester college GPA to be a significant predictor of retention. Results of the logistic regression analysis revealed that the first semester college GPA is the strongest variable in predicting persistence between the first and second years. As a result, students who were retained tend to have higher first semester grade point averages than students who were not retained. Although study habits play a role in determining persistence or withdrawal from college, attention to the significance of a student's study habits as a predictor of persistence is beyond the scope of this study.

Remedial status. Although there have been numerous studies on persistence, reviews tend to be narrative analysis lacking quantitative statistical tools to study the effects and relationships among variables (Kulik, Kulik, & Shwalb, 1983). According to Sawyer (1997), one simple way to indicate the effectiveness of remedial instruction is to

compare the conditional probability of success function for students who have previously received remedial/developmental instruction with that of students who have not received remedial/developmental instruction. By examining retention of only underprepared students, researchers may not detect a relationship between remedial education and retention (Hoyt, 1999).

Although more research is needed to reveal more quantitative conclusions, findings on the effect of special programs such as remedial/developmental programs have been mixed. Findings from Hoyt (1999) revealed that remediation had no significant relationship with persistence, but taking remedial courses in two or three areas significantly increased the chances of dropout. Research by Livingston (2007) examined demographic, financial, and educational factors related to graduation from Virginia's public colleges and universities. Findings from analyzing the 1993 and 1997 admission cohorts utilizing regression analysis revealed that students who were not enrolled in remedial courses were most likely to persist and graduate than students who were enrolled in remedial courses.

Adelman (1998) examined the relationship between a student's need for remedial courses and degree completion by examining college transcripts of high school students who graduated in 1982. Findings from this study (Adelman, 1998) revealed that 60 percent of college students who did not take remedial courses and 55 percent of those students who completed only one remedial course earned a college degree by the age of 30 (Adelman, 1998). In contrast, 35 percent of the students who completed five or more remedial courses earned either a bachelor's or associate's degree. Findings from a recent study by Adelman (2006) show that the number of remedial courses taken influenced

time to degree from college, but found no significant relationship between remedial courses taken and graduation with a bachelor's degree.

A meta-analysis synthesis of findings from 60 studies by Kulik, Kulik, and Shwalb (1983) revealed that students enrolled in remedial/developmental programs remained in college somewhat longer than students who were not enrolled in remedial/developmental programs. Findings from 57 studies on the effect of special programs on student achievement (college cumulative grade point average) revealed positive effects. There were 44 out of 57 studies that revealed higher college grade point averages for students enrolled in remedial/developmental programs and 17 out of 57 studies reported statistically significant differences in college cumulative GPA between the special programs group and the control group. Kulik, Kulik, and Shwalb (1983) reported that of 30 studies that examined the effect of special programs on persistence for college students, 21 of the studies revealed higher persistence rates for students enrolled in remedial/developmental programs than students not enrolled in remedial/developmental programs. Findings also revealed that special programs (e.g., remedial/developmental programs) have a statistically significant effect on student persistence in college, but persistence effects are smaller and more difficult to detect than effects on college grade point average.

Summary

A review of the literature delineates a long history of developmental/remedial education to assist underprepared students deficient in basic reading, writing, and mathematics skills in higher education. Although federal legislation increased access to higher education institutions for new population groups, support programs (e.g., tutoring

services, learning centers, counseling services, and study skills courses) were offered to assist economically, socially, and educationally disadvantaged students. Despite the fact that higher education institutions are challenged to increase academic standards and accountability with decreased state appropriations, the number of Oklahoma students enrolled in remedial courses has decreased slightly over the last few years but will probably never go away (Crowe, 1998). Therefore, the question regarding which higher education institutions should offer remediation courses to assist underprepared students remains to be debated.

In Oklahoma, community colleges are the primary providers of developmental/remedial courses (79 percent) and 4-year public institutions collectively enrolled 20.8 percent of students in developmental/remedial coursework during the 2007-2008 academic year (OSRHE, 2009). Although developmental/remedial intervention programs provide short-term benefits by increasing academic performance for underprepared students within the first year in college, long-term benefits are realized when college students achieve their educational goals (Braley & Ogden, 1997; Easterling, Patten, & Krile, 1995; Weissman, J., Silke, E., & Bulakowski, C., 1997). Therefore, the purpose of this study was to examine what student demographic, pre-college, family, and college academic performance factors predict student retention from the freshman through sophomore year.

This chapter provided a review of the literature relative to issues on developmental/remedial education, nationwide and statewide enrollment, and developmental/remediation trends. This chapter also examined the role of developmental/remedial education, developmental versus remedial education labeling,

and studies that focus on student retention. Earlier empirical theoretical frameworks that examine factors influencing student retention and persistence (Bean, 1980; Bean & Metzner, 1985; Cabrera, Castañeda, Nora, A., & Hengstler, 1992; Pascarella & Terenzini, 1980; Spady, 1970; Tinto, 1975, 1993), validation studies, and a discussion of the variables on student dropouts were examined for their relevancy within the scope of this study. Chapter 3 presents an overview of the site description, research design, target population, and study variables for the study and the plan for analysis.

CHAPTER III: METHODOLOGY

This study examined student demographic, family characteristics, pre-college, and college academic performance factors that predict persistence from the fall 2006 through fall 2008 semesters between students who were placed in at least one English, mathematics, or science developmental/remedial course and students who were not placed in developmental/remedial courses at a four-year public institution. This chapter is organized around the following sections: site description, research design, data collection procedures, population for the study, and an analysis of the study variables and research questions. This study focused on the following objectives:

1. To examine the descriptive student demographic, family characteristics, pre-college, and college academic performance factors of first-time, full-time and part-time freshmen admitted and enrolled from the fall 2006 through the fall 2008 semesters.
2. To determine if there were any significant group mean differences in student demographic and family characteristics on persistence between students who were placed in remedial courses and students who were not placed in remedial courses.
3. To examine any relationships between high school grade point average, ACT composite scores, college cumulative grade point average, and persistence.
4. To determine what student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status)

factors predict persistence.

Site Description

The University of Oklahoma (OU) is a large public research institution with a Carnegie classification as a Research University (high research activity) comprised of three campus programs: the Norman, Oklahoma campus (includes on-campus and off-campus outreach programs), the Health Sciences Center campus located in Oklahoma City, and the Tulsa, Oklahoma campus. The total university headcount enrollment for all three campuses during the fall 2008 was 30,092. The total student Norman on-campus undergraduate headcount enrollment was equal to 18,791 during the fall 2008 (University of Oklahoma, 2009a). OU is known for its academic excellence and attracts top students from across the nation and over 100 countries world-wide.

The University of Oklahoma is governed by the University of Oklahoma Board of Regents and is part of the state system. The Oklahoma State Regents for Higher Education is the coordinating board for the state system, which is comprised of 25 public colleges and universities, 11 constituent agencies, and the Ardmore higher education center. The University of Oklahoma is committed to the mission of teaching, research, and community service (University of Oklahoma, 2009b). Although educators and administrators purport that anyone should have an opportunity to get an education, admission standards at four-year institutions are more selective than open door policies at community colleges.

Research Design

The University of Oklahoma is a large public research university located in Norman, Oklahoma (main campus). The total undergraduate Norman on-campus

headcount enrollment was 18,855, 19,015, and 18,791 during the fall 2006, fall 2007, and fall 2008 semesters, respectively (University of Oklahoma, 2007, 2008, 2009a). This research study is classified as predictive non-experimental quantitative research since and the primary purpose of this study was predictive and the independent variables have already occurred and can not be manipulated (Johnson, 2001).

An ex post facto design was used in this study to test hypotheses about main effects on persistence. An ex post facto design was appropriate since this study examined group differences on persistence after the independent variables have occurred between students placed/not placed in remedial courses. Although the results cannot be utilized as proof of a cause and effect relationship (Mertens, 2005), Johnson (2001) posited that non-experimental research is important to educators because further research is needed on these non-manipulable independent variables in the field of education.

Data Collection Procedures

Longitudinal data was analyzed using data previously collected through the Oklahoma State Regents for Higher Education Unitized Data System (UDS). The UDS data has been collected since 1976 and is currently stored in the OSRHE relational database. All state system institutions are required to submit student enrollment level data electronically using a Secure File Transfer Protocol (sFTP) to the Oklahoma State Regents' office following each fall, spring, and summer semester. Institution data files are processed through an electronic edit program and uploaded to the OSRHE Oracle relational database after passing data entry and file validation routines. Student ACT data contains demographic, ACT composite score, and ACT subject score information. The ACT data files are processed, validated and uploaded to the OSRHE Oracle

relational database.

Pre-existing secondary data was requested from the Research and Analysis department at the Oklahoma State Regents for Higher Education (OSRHE). Data requested for this study was derived from two primary sources from the OSRHE Oracle database: the Unitized Data System (UDS) data collection and the student ACT data table. The UDS information contains student demographic, admission, course enrollment, degree, and financial aid information. The family income variable was also extracted from the ACT data table and included in this study. All data utilized for this study was student level detail data. The student data was de-identified by replacing student names and social security numbers with computer generated unique identifiers to comply with the Family Educational Rights and Privacy Act (FERPA). Student enrollment level data was utilized since aggregate data do not describe the behavior of each group member (Tinto, 1987). Cross-sectional data will not identify students that may eventually return to college and/or graduate from the same institution (Pantages & Creedon, 1978). Furthermore, cross-sectional designs are inadequate for the consideration of pre-college student traits and college student experiences (Terenzini & Pascarella, 1978).

Study Variables

This study utilized Tinto's Longitudinal Model of Institutional Departure (1993) to analyze the main effects of prior schooling, skills and abilities, and family background characteristics on persistence between first year degree-seeking freshmen students. Tinto's Longitudinal Model of Institutional Departure (1993) was utilized in this study to understand what demographic, family characteristics, pre-college, and college academic

variables predict persistence on traditional college degree-seeking freshmen students at a four-year public university. Specifically, the student demographic (race/ethnicity and gender), family characteristics (family income and financial aid status), pre-college (high school GPA and ACT composite scores), and college academic performance (college cumulative grade point average and remedial status) independent variables were examined to determine factors that predict college persistence.

The race/ethnicity variable was categorized into five groups: African American/non-Hispanic = 0, American Indian/Alaskan Native = 1, Asian/Pacific Islander = 2, Hispanic = 3, White/non-Hispanic = 4. The gender variable was measured as a categorical variable where 1 = male and 0= female. Family income is measured as a dichotomized dummy variable where 1 = Less than $50,000.01 and 0 = greater than $50,000. The financial aid status variable was measured as a categorical variable where 1 = awarded financial aid and 0 = financial aid not awarded. High school GPA, college cumulative GPA (first semester college cumulative GPA), and ACT composite score variables were measured as continuous variables. The remedial status variable was measured as a categorical variable where 1 = a student placed in at least one developmental/remedial course and 0 = a student not placed in a developmental/remedial course.

The dependent variable, persistence, was measured as a continuous variable (coded as 1 = persisters and 0 = non-persisters) and is defined as students who were officially admitted to OU and persisted/did not persist at this institution during the fall 2006 through the fall 2008 semesters. Persistence scores were calculated by coding a "1" for the fall 2006 semester and each subsequent semester a student enrolled at OU and a

"0" was coded for each semester a student did not return to OU following the fall 2006 semester. Measuring persistence as a continuous variable allowed for greater precision and description of the effects on the dependent variable. The population was comprised of two groups: (1) first-time freshmen students who were admitted, enrolled, and placed in at least one developmental/remedial course and (2) first-time freshmen students who were admitted, enrolled, but not placed in developmental/remedial courses.

Description of the Population

The target population was comprised of freshmen students admitted and enrolled at the University of Oklahoma (OU) Norman on-campus program between the fall 2006 to the fall 2008. The subject pool for this study was comprised of first-time, full-time and part-time, degree-seeking freshmen between 17 and 21 years of age. This study targeted a purposive sample of first-time, degree-seeking freshmen enrolled in the fall 2006 semester through the fall 2008 semester. Of the 380 students enrolled in remediation courses in the fall 2006 semester, 332 students were unable to demonstrate curricular proficiency in one or more subject areas resulting in remedial course placement. The population for this study was comprised of two groups: (1) 332 fall 2006 first-time, degree-seeking freshmen students who were admitted, enrolled, and placed in at least one developmental/remedial course and (2) 2,881 fall 2006 first-time, degree-seeking freshmen students who were admitted, enrolled, but not placed in developmental courses. Since the entire population was targeted, sampling was not employed. The target population did not include concurrently enrolled high school students, but included first-time freshmen who may have earned 6 or fewer transfer credit hours prior to being admitted to OU.

A review of the literature revealed that students are more likely to drop out of postsecondary education during the first year than any other time (Eckland, 1964; NCHEMS, 2002). According to Tinto (1987), the first year of college is the most critical period, especially during the first semester and the incidence of withdrawal is highest during the early stages of college. Therefore, targeting this population will help policymakers better understand how to improve their current transition and intervention programs beyond the first year to provide long-term academic and social assistance to increase retention rates of first-time entering students through the sophomore year.

Plan for Analysis

The data for this study was analyzed using the Statistical Package for Social Sciences (SPSS), version 17.0 for Windows. Research questions were restated in the null form to test the null hypotheses and examine the relationship of gender, race/ethnicity, family income, financial aid status, and remedial status on persistence. Descriptive statistics, Factorial Analysis of Variance (ANOVA), Pearson's product-moment correlations, and stepwise multiple regression statistical tools were utilized to analyze the data for this study.

Descriptive statistics provide information on frequency distribution and means on student demographic, family characteristics, pre-college, and college academic performance. Inferential statistics allow us to estimate the probability that our findings can be generalized back to the population of interest. The Factorial Analysis of Variance (ANOVA) was used to determine differences in means between students who were placed in remedial courses and students who were not placed in remedial courses. Pearson's product-moment correlation analysis helps to identify relationships and

correlations between continuous variables. Multiple regression statistics was used to analyze the relationships between variables and determine how much of the variance is accounted for by manipulating the set of independent variables relative to the percentage of variance unaccounted for. The alpha level of significance for this study is set at the .05 level to control for Type I errors where there is a 5 percent (5 in 100) probability that the difference is a product of chance. The most commonly used levels of significance in the education field are .05 and .01 levels (Ary, Jacobs, & Razavieh, 2002).

Research Questions

Research Question 1

Descriptive statistics was employed to identify student demographic, family characteristics, pre-college, and college academic performance. Frequencies and descriptive statistics were used to answer the first research question below:

What are selected demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family (family income and financial aid status), and college academic performance (first semester college cumulative grade point average) characteristics of first-time students placed/not placed in remedial/developmental courses at the University of Oklahoma during the fall 2006 through the fall 2008 semesters?

Research Question 2

The Factorial Analysis of Variance (ANOVA) inferential statistics was used to determine if there were any statistically significant differences in means between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses. This study utilized Factorial ANOVAs to determine

the amount of variance accounted for by the independent variables. The Factorial ANOVAs were used to analyze the second research question below:

Are there statistically significant differences in student demographic (gender and race/ethnicity) and family characteristics (family income and financial aid status) on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

The following null hypotheses were tested:

Null Hypothesis #1

There is no statistically significant difference in gender on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Null Hypothesis #2

There is no statistically significant difference in race/ethnicity on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Null Hypothesis #3

There is no statistically significant difference in family income on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Null Hypothesis #4

There is no statistically significant difference in financial aid status on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses.

Research Question 3

Pearson's product-moment correlation coefficient was used to identify the direction and strength of linear relationships of continuous variables. The correlation coefficient values range from -1.00 (perfect negative relationship), +1.00 (perfect positive relationship), and 0 (no relationship). Correlation coefficients were used to measure the direction and strength of relationships between the high school grade point average, ACT composite score, college cumulative grade point, and persistence, answering research question number three in this study below:

Is there a statistically significant relationship between high school grade point average, ACT composite scores, college cumulative grade point average and persistence? The following null hypotheses were tested:

Null Hypothesis #5

There is no statistically significant relationship between high school grade point average and persistence.

Null Hypothesis #6

There is no statistically significant relationship between ACT composite scores and persistence.

Null Hypothesis #7

There is no statistically significant relationship between college cumulative grade point average and persistence.

Research Question 4

Multiple regression was used to predict which set of independent variables give rise to the strongest prediction of the dependent variable, answering the fourth research

question. This study regressed the dependent variable persistence on the gender, race/ethnicity, family income, financial aid status, high school GPA, ACT composite score, college cumulative GPA, and remedial status predictor variables to determine the proportion of variance on persistence that is explained by the set of predictor variables. The stepwise method was utilized to ensure that the predictor variables contributing to the success of the model were retained. The stepwise method was employed to derive the most parsimonious model possible since the smallest numbers of predictor variables were included in the model. The fourth research question is listed below:

What student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) factors predict persistence?

The following null hypothesis for this research question below was tested:

Null Hypothesis #8

There are no statistically significant effects of demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) on persistence.

Threats to Internal and External Validity

Using only one institution instead of multiple institutions helps to control for threats to internal validity. This study was limited to one single public 4-year research institution in the state of Oklahoma. Therefore, there could be a threat to external validity in that we should use caution when attempting to generalize the results to other

institutions.

Summary

This chapter presented an overview of the site description, research design, data collection procedures, population for the study, and research analysis for this study. Descriptive statistics, Factorial ANOVA, Pearson's *r*, and multiple regression were discussed as statistical tools used to analyze the data for this study. Chapter 4 presents a discussion of the results and data analysis conducted for four research questions and eight hypotheses and concludes with a summary of the findings.

CHAPTER IV: RESULTS AND DATA ANALYSIS

This chapter presents the results and data analysis from this study in four sections. The first section analyzed descriptive data on student demographics for the first research question. The second section analyzed the Factoral Analysis of Variance results for research question two and four hypotheses on group mean differences between students who were placed in remedial courses and students who were not placed in remedial courses. Pearson's Product-Moment Correlations analyzed results from the third research question and three hypotheses on relationships between academic variables and persistence for the third section. The fourth section analyzed stepwise multiple regression results for the fourth research question and hypothesis for eight predictor variables on persistence. Lastly, a summary of the findings from this study concludes this chapter.

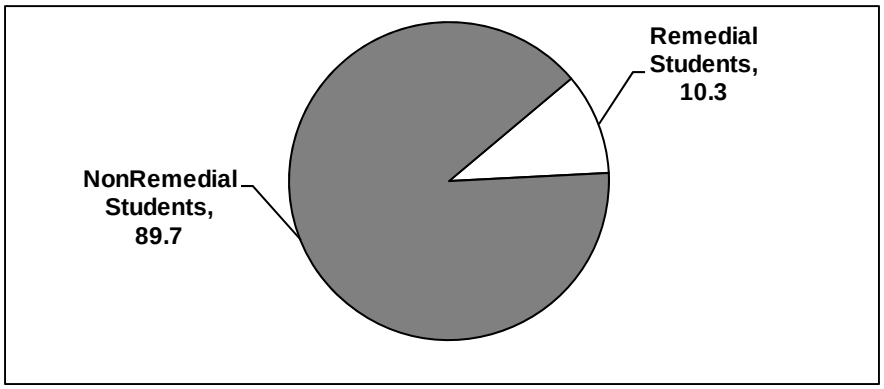
This study investigated first-time, full-time and part-time, degree-seeking freshmen admitted and enrolled from the fall 2006 through the fall 2008 semesters at the University of Oklahoma. The Statistical Package for the Social Sciences (SPSS), version 17.0 for Windows was used to analyze the data. Tables are included in each section to aid in the discussion of the statistical analysis and results.

Section I: Descriptive Data Analysis

The first research question examined in this study was: "What are selected student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family (family income and financial aid status), and college academic performance (college cumulative grade point average) characteristics of first-time students placed/not placed in remedial courses at the University of Oklahoma

during the fall 2006 through the fall 2008 semesters?" The first research question employed descriptive statistics to provide frequency distributions and percentages on student background characteristics. The subject pool for this study was comprised of 3,213 first-time, full-time and part-time, degree-seeking freshmen students enrolled at the University of Oklahoma during the fall 2006 through the fall 2008 semesters. Of this total, 332 students were placed in remedial courses while 2881 students were not placed in remedial courses (see Figure 11).

Figure 11. Percentage of Fall 2006 First-Time, Degree-Seeking, Part-Time and Full-Time Students



Note. Data is from pre-existing data reported to the Oklahoma State Regents for Higher Education (OSRHE).

Student demographic, pre-college, family, and college academic performance characteristics of the population are presented in Table 1. The percentage of females was higher than males in both remedial and nonremedial groups. The percentage of females accounted for 59.6% of the students placed in remedial courses while males accounted for 40.4% of the students placed in remedial courses. Also, females accounted for 52.2% of the students who were not placed in remedial courses compared to males accounting for 47.8% of the nonremedial student population.

Table 1

Demographic Characteristics

Variable	Remedial Population Frequency (*N*=332)	Remedial Population Percent (%)	NonRemedial Population Frequency (*N*=2,881)	NonRemedial Population Percent (%)
Gender				
Male	134	40.4	1378	47.8
Female	198	59.6	1503	52.2
Ethnicity				
African American/non-Hispanic	53	16.0	145	5.0
American Indian/Alaskan Native	34	10.2	218	7.6
Asian/Pacific Islander	17	5.1	176	6.1
Hispanic	21	6.3	124	4.3
White/non-Hispanic	207	62.3	2218	77.0
Family Income				
Less than $50,000.01	26	7.8	123	4.3
Greater than $50,000	44	13.3	437	15.2
Missing Response	262	78.9	2321	80.6
Financial Aid Status				
Financial Aid Not Awarded	61	18.4	460	16.0
Financial Aid Awarded	271	81.6	2421	84.0

Note. There were 262 student family income responses that were not reported in this study. Data is from pre-existing data reported to the OSRHE.

The ethnic proportion of the remedial and nonremedial students remained relatively constant between groups. The ethnic proportion of nonremedial students were predominantly White/Non-Hispanic (77%) students, while 5.0% were African American/Non-Hispanic, 7.6% were American Indian/Alaska Native, 6.1% were Asian/Pacific Islander, and 4.3% were Hispanic, respectively. The ethnic proportion of remedial students were primarily White/Non-Hispanic students (62.3%), while 16% were

African American/Non-Hispanic, 10.2% were American Indian/Alaska Native, 5.1% were Asian/Pacific Islander, and 6.3% were Hispanic.

The family income variable was collected from the 2005-2006 ACT form. This variable was self-reported by students who estimated their parent's total income. The percentage of responses missing for this variable was significantly large for both remedial (78.9%) and nonremedial (80.6%) groups. This large percentage of missing responses may be due in part to students being unprepared or unable to provide estimates of their parents' income during the time the ACT exam was administered. As a result, 13.3% of remedial students and 15.2% of nonremedial students reported that their family income was greater than $50,000. Also, 7.8% and 4.3% of students reported family incomes less than $50,000.01 for remedial and nonremedial groups, respectively.

Most of the remedial and nonremedial students reported being awarded financial aid. While 84% of nonremedial students were awarded financial aid, 16% of nonremedial students were not awarded financial aid. Furthermore, 81.6% of remedial students reported being awarded financial aid, while 18.4% of remedial students reported that they were not awarded financial aid.

Summary statistics for high school GPA, composite ACT scores, college cumulative GPA for the fall 2006 semester and total persistence scores are provided in Table 2 for remedial students and Table 3 for nonremedial students. The average high school GPA for both remedial (M = 3.41, SD = .409) and nonremedial (M = 3.60, SD = .351) first-time, degree-seeking freshmen students was relatively high. The average composite ACT scores for remedial students was lower (M = 20.79, SD = 2.900) than nonremedial students (M = 26.16, SD = 3.634). The first semester college cumulative

GPA varied for remedial (M = 2.759, SD = .7996) and nonremedial students (M = 3.026, SD = .8132).

Table 2

College Cumulative GPA, High School GPA, ACT Composite Score, and Total Persistence Scores for the Remedial Student Population

Variable	Frequency	Min	Max	Mean	*SD*
1st Semester College Cumulative GPA	317	0.6	4.0	2.759	.7996
High School GPA	325	2.0	4.0	3.41	.409
ACT Composite Score	328	14	29	20.79	2.900
Total Persistence Score	332	1	7	4.49	1.795

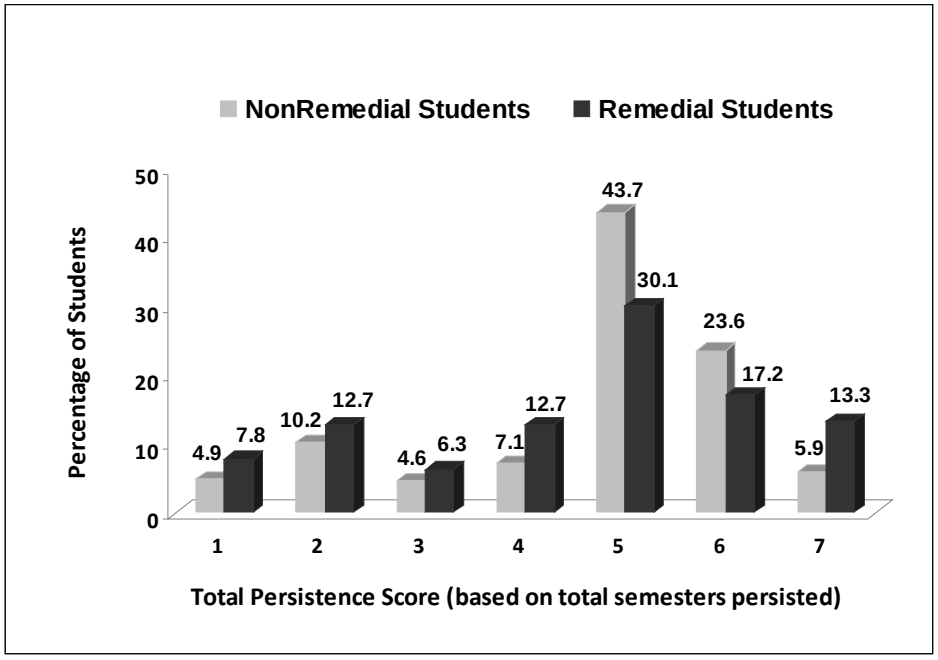
Table 3

College Cumulative GPA, High School GPA, ACT Composite Score, and Total Persistence Scores for the NonRemedial Student Population

Variable	Frequency	Min	Max	Mean	*SD*
1st Semester College Cumulative GPA	2832	0.2	4.0	3.026	.8132
High School GPA	2689	2.0	4.0	3.60	.351
ACT Composite Score	2869	14	36	26.16	3.634
Total Persistence Score	2881	1	7	4.69	1.528

The dependent variable, persistence, was measured as a continuous variable (coded as 1 = persisters and 0 = non-persisters) to allow for greater precision and description of the effects on the dependent variable. Persistence is defined in this study as students who were officially admitted to OU and persisted or did not persist at this institution during the fall 2006 through the fall 2008 semesters. The total persistence score was calculated by first coding a "1" for the fall 2006 semester for each student included in the population (N = 3,213). Next, a "1" was coded for each semester a student enrolled at OU anytime following the fall 2006 through the fall 2008 semesters and coded a "0" if the student did not return. As a result, the minimum and maximum total persistence score that could be earned is "1" and "7", respectively.

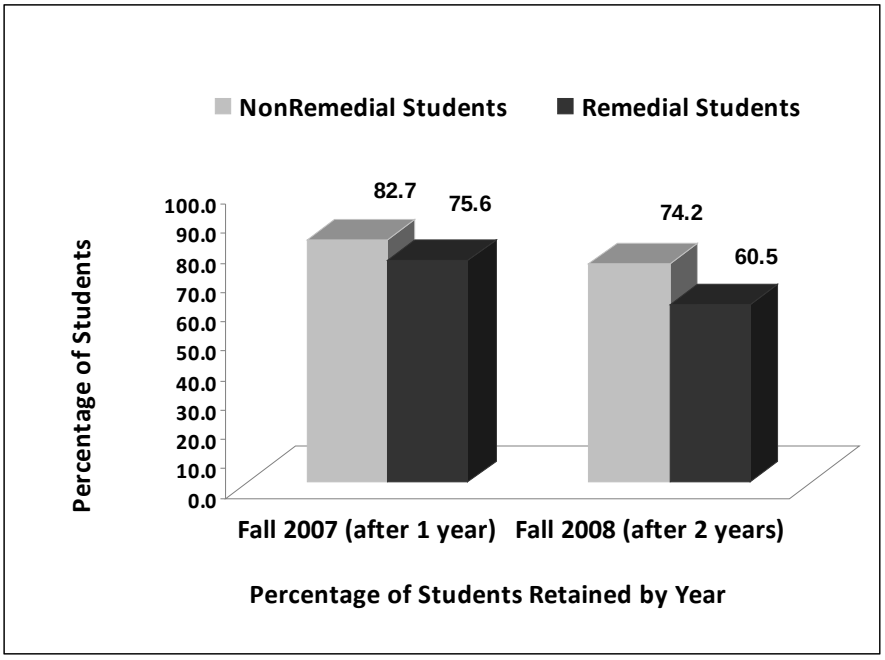
Figure 12. Total Persistence Score for First-Time, Full-Time and Part-Time, Degree-Seeking Students from Fall 2006 through Fall 2008



Note. Data is from pre-existing data reported to the Oklahoma State Regents for Higher Education (OSRHE).

Figure 12 represents the proportion of remedial and nonremedial students who persisted from the fall 2006 through the fall 2008 semesters. Descriptive statistics revealed that remedial (M = 4.49, SD = 1.795) and nonremedial (M = 4.69, SD = 1.528) students persisted on average for five semesters. The proportion of remedial students persisting for five or more semesters was 60.5%, while 39.5% persisted less than five semesters. Furthermore, 73.2% of nonremedial students persisted for five or more semesters while 26.8% persisted less than five semesters. Results from the analysis revealed that the proportion of first-time, degree-seeking freshmen students retained through the fall 2007 decreased from the fall 2006 semester (see Figure 13).

Figure 13. Comparison of First-Time, Full-Time and Part-Time, Degree-Seeking Freshmen Students Retained for the Fall 2006 Cohort



Note. Data is from pre-existing data reported to the Oklahoma State Regents for Higher Education (OSRHE).

Evidence from the descriptive statistics revealed that the proportion of first-time, degree-

seeking freshmen students returning through the fall 2008 semester was 60.5% and 74.2% for both remedial and nonremedial student populations, respectively.

Summary of Descriptive Data Analysis

Descriptive statistics in this study show that on average, 60.5% of remedial students persisted for five or more semesters, while 39.5% persisted for four semesters or less at the same institution. Furthermore, 73.2% of nonremedial students persisted for five or more semesters while 26.8% persisted less than five semesters at the same institution. Overall, 10.3% of the student population was comprised of remedial students while 89.7% of the student population was comprised of nonremedial students.

Females accounted for 52.9% of the population, while males accounted for 47.1% of the population. The overall ethnic proportion of students for this study was comprised of predominantly White/Non-Hispanic (75.5%) students, while 6.2.0% were African American/Non-Hispanic, 7.8% were American Indian/Alaska Native, 6.0% were Asian/Pacific Islander, and 4.5% were Hispanic, respectively. The average high school GPA for students placed in remedial courses was 3.41 compared to 3.60 for students not placed in remedial courses. The overall proportion of students awarded financial aid was 83.8%, while 16.2% of the population was not awarded financial aid. The overall proportion of students reporting a total family income less than $50,000.01 was 23.7%, while 76.3% reported a total family income greater than $50,000.

Section II: Factorial Analysis of Variance Results

The second research question examined in this study was: "Are there statistically significant differences in student demographic (gender and race/ethnicity) and family characteristics (family income and financial aid status) on persistence between students

who were placed in remedial courses and students who were not placed in remedial courses?" This question examined the mean differences in gender, race/ethnicity, family income, and financial aid status characteristics between students who were placed in remedial courses and students who were not placed in remedial courses. The Factorial Analysis of Variance (ANOVA) was used in this study to test group differences in means on persistence between students placed in remedial courses and students not placed in remedial courses during the fall 2006 through the fall 2008 semesters. Factorial ANOVAs allow the researcher to assess the effects of two or more independent variables on a single dependent variable and any possible combined effects of the independent variables within the same analysis (Ary, Jacobs, & Razavieh, 2002). The effect size is also reported, where Cohen's (1992) conventional guidelines state that .01, .06, and .14 represents a small, medium, and large effect size, respectively. Factorial ANOVA Summary tables are included in this section to aid in the discussion of the statistical analysis and results. The researcher examined four hypotheses, which are discussed in the following section.

Null Hypothesis #1 - Gender

The first null hypothesis examined in this study was: "There is no statistically significant difference in gender on persistence between students who were placed in remedial courses and students who were not placed in remedial courses." A 2 X 2 Factorial ANOVA was computed to determine any mean differences in gender on persistence between remedial and nonremedial students. Descriptive and summary tables are provided to show mean differences in gender on persistence between remedial and nonremedial students.

Females accounted for 59.6% of the students placed in remedial courses (M = 4.43, SD = 1.803), while males accounted for 40.3% of remedial students (M = 4.58, SD = 1.787) as illustrated in Table 4. Also, females accounted for 52.2% of nonremedial students (M = 4.71, SD = 1.501) while males represented 47.8% (M = 4.69, SD = 1.558) of the population. Overall, females represented 52.9% of the population compared to males accounting for 47.1% of the population.

Table 4

Mean Differences in Gender on Persistence by Remediation Status

	Remedial Students			NonRemedial Students		
Variable	*N*	Mean	*SD*	*N*	Mean	*SD*
Male	134	4.58	1.787	1378	4.67	1.558
Female	198	4.43	1.803	1503	4.71	1.501
Total	332	4.49	1.795	2881	4.69	1.528

There was no statistically significant main effect of gender obtained on persistence, $F(1, 3209) = .399$, $p = .528$. There was a statistically insignificant interaction between gender and remedial status, such that overall remedial status differences did not depend on gender, $F(1, 3209) = 1.065$, $p = .302$. Since there was no statistically significant mean difference found in gender on persistence, the null hypothesis was maintained.

There was a statistically significant main effect obtained for remediation status, $F(1, 3209) = 3.948$, $p = .047$) as illustrated in Table 5. The effect size of the difference in overall remedial status was very small (0.001) and the observed power was moderate (.511). There were overall significant mean differences in remediation status on

Table 5

ANOVA Summary Table for Gender on Persistence by Remediation Status

Source	Sum of Squares	*df*	Mean Square	*F*	*p*	η_p^2
Gender	.968	1	.968	.399	.528	.000
Remediation Status	9.582	1	9.582	3.948	.047	.001
Gender* Remediation Status	2.585	1	2.585	1.065	.302	.000
Error	7789.476	3209	2.427			
Total	77832.000	3213				
Corrected Total	7803.989	3212				

persistence (*M* = 4.67, *SD* = 1.559). Students who were not placed in remedial courses had higher mean scores and were more likely to persist (*M* = 4.69, *SD* = 1.528) than students placed in remedial courses (*M* = 4.49, *SD* = 1.795).

Null Hypothesis #2 – Race/Ethnicity

The second null hypothesis examined in this study was: "There is no statistically significant difference in race/ethnicity on persistence between students who were placed in remedial courses and students who were not placed in remedial courses." A 2 X 5 Factorial ANOVA was computed to determine any mean differences in race/ethnicity (African American/non-Hispanic, American Indian/Alaskan Native, Asian/Pacific Islander, Hispanic, and White/non-Hispanic) on persistence between remedial and nonremedial students. Descriptive and summary tables are provided to show mean differences in ethnicity on persistence between remedial and nonremedial students.

The ethnic proportion of remedial students is as follows (see Table 6):

62.3% (*M* = 4.46, *SD* = 1.663) were White/Non-Hispanic, 16% (*M* = 4.94, *SD* = 2.089) were African American/Non-Hispanic, 10.2% (*M* = 3.62, *SD* = 1.970) were American Indian/Alaska Native, 5.1% (*M* = 5.12, *SD* = .993) were Asian/Pacific Islander, and 6.3% (*M* = 4.57, *SD* = 2.039) were Hispanic.

Table 6

Mean Differences in Ethnicity on Persistence by Remediation Status

Variable	Remedial Students			NonRemedial Students		
	N	Mean	*SD*	*N*	Mean	*SD*
African American/ Non-Hispanic	53	4.94	2.089	145	4.84	1.393
American Indian/ Alaskan Native	34	3.62	1.970	218	4.21	1.688
Asian/Pacific Islander	17	5.12	.993	176	4.96	1.428
Hispanic	21	4.57	2.039	124	4.54	1.456
White/Non-Hispanic	207	4.46	1.663	2218	4.71	1.523
Total	332	4.49	1.795	2881	4.69	1.528

The ethnic proportion of nonremedial students is as follows (see Table 6): 77% (*M* = 4.71, *SD* = 1.523) were White/Non-Hispanic, 5.0% (*M* = 4.84, *SD* = 1.393) were African American/Non-Hispanic, 7.6% (*M* = 4.21, *SD* = 1.688) were American Indian/Alaska Native, 6.1% (*M* = 4.96, *SD* = 1.428) were Asian/Pacific Islander, and 4.3% (*M* = 4.54, *SD* = 1.456) were Hispanic, respectively. Overall, 10.3% of the student population is comprised of remedial students while 89.7% of the student population is comprised of nonremedial students.

Table 7

ANOVA Summary Table for Ethnicity on Persistence by Remediation Status

Source	Sum of Squares	*df*	Mean Square	*F*	*p*	η_p^2
Ethnicity	80.411	4	20.103	8.386	.000	.010
Remediation Status	1.673	1	1.673	.698	.404	.000
Ethnicity * Remediation Status	11.580	4	2.895	1.208	.305	.002
Error	7678.390	3203	2.397			
Total	77832.000	3213				
Corrected Total	7803.989	3212				

There was a statistically significant main effect obtained for ethnicity on persistence, $F(4, 3203) = 8.386$, $p < .01$) as illustrated in Table 7. The effect size of the difference in overall remedial status was small (0.010) and the observed power was very strong (.999). Games-Howell Post Hoc multiple comparisons were computed on the race/ethnicity variable to determine which ethnic group means resulted in the strongest differences where population variances were assumed to be unequal. The Games-Howell post-hoc comparison is a powerful and widely used procedure when population variances are uncertain and sample sizes are unequal (Field, 2000). Comparisons on remedial and nonremedial students revealed the following results: (1) a statistically significant mean difference exists between the African American/non-Hispanic and American Indian/Alaskan Native groups on persistence ($M = .74$, $p < .01$, 95% CI [.31, 1.17]), (2) a statistically significant mean difference between White/non-Hispanic and American

Indian/Alaskan Native students on persistence (M = .56, p < .01, 95% CI [.25, .87]), and (3) a statistically significant mean difference between Asian/Pacific Islander and American Indian/Alaskan Native students on persistence (M = .84, p < .01, 95% CI [.44, 1.25]). There were no other significant group differences obtained. Among the ethnic groups, the overall group means revealed that the Asian/Pacific Islander ethnic group was more likely to persist at the same institution (M = 4.97, SD = 1.394), followed by African American/non-Hispanic (M = 4.87, SD = 1.604), White/non-Hispanic ethnic groups (M = 4.69, SD = 1.536), Hispanic (M = 4.54, SD = 1.546), and American Indian/Alaskan Native (M = 4.13, SD = 1.736).

There was no statistically significant main effect between remedial and nonremedial students obtained on persistence, $F(1, 3203) = .698$, $p = .404$. There was a statistically insignificant interaction obtained between ethnicity and remediation status on persistence, $F(4, 3203) = 1.208$, $p = .305$, such that overall ethnic differences did not depend on the level of remediation status. Since the only statistically significant main effect was found in ethnicity, the null hypothesis was partially rejected.

Null Hypothesis #3 – Family Income

The third null hypothesis examined in this study was: "There is no statistically significant difference in family income on persistence between students who were placed in remedial courses and students who were not placed in remedial courses." A 2 X 2 Factorial ANOVA was computed to determine any mean differences in family income on persistence for students reporting a family income less than $50,000.01 and students reporting a family income greater than $50,000.00 between remedial and nonremedial students. Descriptive and summary tables are provided to show mean differences

in family income on persistence between remedial and nonremedial.

There was significant variance in total responses on family income for both remedial and nonremedial students. The family income variable is a self-reported response from high school students on the ACT form. The total number of responses on total family income was 630 out of the total student population (N = 3,213). The number of missing responses (N = 2,583) could be impacted by how knowledgeable the high school student was about their total family income during the time the ACT exam was administered. Remedial students reporting a total family income less than $50,000.01 accounted for 37.1% of the student population (M = 4.35, SD = 1.875), while 62.9% reported a total family income greater than $50,000 ($M$ = 4.50, SD = 1.677) as illustrated in Table 8.

Table 8

Mean Differences in Family Income on Persistence by Remediation Status

	Remedial Students			NonRemedial Students		
Variable	*N*	Mean	*SD*	*N*	Mean	*SD*
Less than $50,000.01	26	4.35	1.875	123	4.39	1.744
Greater than $50,000	44	4.50	1.677	437	4.88	1.403
Total	70	4.44	1.742	560	4.77	1.497

Also, 22% (M = 4.39, SD = 1.744) of nonremedial students reported a total family income less than $50,000.01, while 78% ($M$ = 4.88, SD = 1.403) reported a total family income greater than $50,000. Overall, 23.7% of the student population reported a total family income less than $50,000.01, while 76.3% of the student population reported a total family income greater than $50,000.

There was a statistically insignificant main effect obtained for family income $F(1, 626) = 2.507$, $p = .114$) and remediation status, $F(1, 626) = 1.086$, $p = .298$) as illustrated in Table 9. The effect size in overall family income (0.004) and remedial status was very small (0.002). The observed power for family income (.353) and remedial status (.180) was low. There was no statistically significant interaction found between family income and remedial status on persistence, $F(1, 626) = .680$, $p = .410$. There was a statistically insignificant effect obtained in family income on persistence between remedial and nonremedial students. Therefore, the null hypothesis was maintained.

Table 9

ANOVA Summary Table for Family Income on Persistence by Remediation Status

Source	Sum of Squares	*df*	Mean Square	*F*	*p*	η_p^2
Family Income	5.762	1	5.762	2.507	.114	.004
Remediation Status	2.496	1	2.496	1.086	.298	.002
Family Income* Remediation Status	1.564	1	1.564	.680	.410	.001
Error	1438.725	626	2.298			
Total	15593.000	630				
Corrected Total	1468.732	629				

Null Hypothesis #4 – Financial Aid Status

The fourth null hypothesis examined in this study was: "There is no statistically significant difference in financial aid status on persistence between students who were placed in remedial courses and students who were not placed in remedial courses." A

2 X 2 Factorial ANOVA was computed to determine any mean differences in financial aid status (students awarded financial aid and students not awarded financial aid) on persistence between remedial and nonremedial students. Descriptive and summary tables are provided to show mean differences in financial aid on persistence between remedial and nonremedial students.

Remedial students awarded financial aid accounted for 81.6% (M = 4.57, SD = 1.802) of the student population, while 18.4% (M = 4.13, SD = 1.737) were not awarded financial aid as illustrated in Table 10. Also, 84% of nonremedial students (M = 4.75, SD = 1.469) were awarded financial aid, while 16% (M = 4.36, SD = 1.775) were not awarded financial aid. Overall, 83.8% of the student population was awarded financial aid compared to 16.2% not awarded financial aid.

Table 10

Mean Differences in Financial Aid Status on Persistence by Remediation Status

	Remedial Students			NonRemedial Students		
Variable	*N*	Mean	*SD*	*N*	Mean	*SD*
Financial Aid Awarded	271	4.57	1.802	2421	4.75	1.469
No Financial Aid Awarded	61	4.13	1.737	460	4.36	1.775
Total	332	4.49	1.795	2881	4.69	1.528

There was a statistically significant main effect obtained for financial aid status, $F(1, 3209) = 12.825$, $p < .01$) as illustrated in Table 11. The effect size of the difference in overall financial aid status was small (0.004), but the observed power was very high (.947). There were overall significant mean differences in financial aid status on

persistence (M = 4.67, SD = 1.559). Students who received financial aid were more likely to persist (M = 4.73, SD = 1.506) than students who were not awarded financial aid (M = 4.33, SD = 1.770).

Table 11

ANOVA Summary Table for Financial Aid Status on Persistence by Remediation Status

Source	Sum of Squares	*df*	Mean Square	*F*	*p*	η_p^2
Financial Aid Status	30.862	1	30.862	12.825	.000	.004
Remediation Status	7.256	1	7.256	3.015	.083	.001
Financial Aid Status * Remediation Status	.090	1	.090	.037	.847	.000
Error	7722.129	3209	2.406			
Total	77832.000	3213				
Corrected Total	7803.989	3212				

The main effect of remediation status approached significance, $F(1, 3209) = 3.015$, $p = .083$). The effect size of the difference in overall remedial status very small (0.001), and the observed power was moderate (.411). There was a statistically insignificant interaction between financial aid status and remedial status, such that overall financial aid status differences did not depend on remediation status, $F(1, 3209) = .037$, $p = .847$. The effect size was very small (0.000) and there was little observed power (.054). Since the only statistically significant main effect obtained was financial aid status on persistence, the null hypothesis was partially rejected.

Summary of Factorial Analysis of Variance Results

Factorial Analysis of Variance (ANOVA) was used to determine differences in

means between students who were placed in remedial courses and students who were not placed in remedial courses. Among the ethnic groups, the overall group means revealed that the Asian/Pacific Islander ethnic group was more likely to persist at the same institution ($M = 4.97$, $SD = 1.394$), followed by African American/non-Hispanic ($M = 4.87$, $SD = 1.604$), White/non-Hispanic ethnic groups ($M = 4.69$, $SD = 1.536$), Hispanic ($M = 4.54$, $SD = 1.546$), and American Indian/Alaskan Native ($M = 4.13$, $SD = 1.736$). There was a statistically significant main effect obtained for financial aid status, $F(1, 3209) = 12.825$, $p < .01$). There were no statistically significant main effects obtained for gender, $F(1, 3209) = .399$, $p = .528$, and family income, $F(1, 626) = 2.507$, $p = .114$), on persistence. There were statistically insignificant interactions found in gender, ethnicity, family income, and financial aid on persistence between remedial and nonremedial students.

Section III: Pearson's Product-Moment Correlation Results

The third research question examined in this study was: "Is there a statistically significant relationship between high school grade point average, ACT composite scores, college cumulative grade point average and persistence?" Pearson's product-moment correlations were computed to examine relationships between high school GPA, ACT composite scores, college cumulative GPA, and persistence. Summary correlation coefficients and statistical significance information is included to aid in the discussion of statistical results for the remedial and nonremedial population groups. The effect size is also reported, where conventional guidelines (Cohen, 1992) state that .10 is a small effect, .30 represents a medium effect size, and .50 or greater represents a large

effect size. The researcher examined three hypotheses, which are discussed in the following section.

Null Hypothesis #5 – High School Grade Point Average

The fifth null hypothesis examined in this study was: "There is no statistically significant relationship between high school grade point average (GPA) and persistence." A Pearson product-moment correlation coefficient was computed to assess the strength and direction of the relationship between high school GPA and persistence scores (see Table 12).

Table 12

Summary Correlations Between Academic Factors and Persistence

Variable	Mean	*SD*	*r*
High School GPA	3.58	.362	.177**
ACT Composite Score	25.61	3.920	.118**
First Semester College Cumulative GPA	2.99	.816	.422**

Note. ** Correlation is significant at the .01 level (2-tailed).

There was a statistically significant positive, although weak, correlation between high school GPA and persistence scores, $r(3014) = .177$, $p < .01$). An increase in high school grade point average was correlated with an increase in the student's total persistence score. First-time, degree-seeking, beginning freshmen entering college with high academic scores from high school were likely to persist through their sophomore year. The correlation is significant at the .01 level. Therefore, the null hypothesis was rejected.

Null Hypothesis #6 – ACT Composite Score

The sixth null hypothesis examined in this study was: "There is no statistically significant relationship between ACT composite score and persistence." A Pearson product-moment correlation coefficient was computed to assess the strength and direction of the relationship between ACT composite scores and persistence. Results from Pearson's *r* revealed a positive correlation between ACT composite score and persistence scores, $r(3197) = .118$, $p < .01$, indicating a positive, although weak, significant relationship between the two variables. An increase in ACT composite scores was correlated with an increase in the student's total persistence score. Students with high ACT composite scores were likely to persist through their sophomore year. The correlation between composite ACT score and persistence is significant at the .01 level. Therefore, the null hypothesis was rejected.

Null Hypothesis #7 – College Cumulative Grade Point Average

The seventh null hypothesis examined in this study was: "There is no statistically significant relationship between college cumulative grade point average and persistence." A Pearson product-moment correlation coefficient was computed to assess the strength and direction of the relationship between the first semester college cumulative grade point average and persistence. Results from Pearson's *r* revealed a positive correlation between the first semester college cumulative GPA and persistence scores, $r(3149) = .422$, $p < .01$, indicating a moderately strong significant relationship between the two variables. An increase in the first semester college cumulative GPA scores was correlated with an increase in the student's total persistence score. Students with high first semester college grade point averages were more likely to persist through their

sophomore year. The correlation is significant at the .01 level. Therefore, the null hypothesis was rejected.

Summary of Pearson's Product-Moment Correlation Results

Pearson's product-moment correlations were computed to examine relationships between high school GPA, ACT composite scores, college cumulative GPA, and persistence. There was a statistically significant correlation between high school GPA, $r(3014) = .177$, $p < .01$), ACT composite score, $r(3197) = .118$, $p < .01$, the first semester college cumulative GPA, $r(3149) = .422$, $p < .01$, and the dependent variable persistence. These correlations were found to be significant at the .01 level; therefore, the null hypotheses were rejected.

Section IV: Stepwise Multiple Regression Results

The fourth research question examined in this study was: "What student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) factors predict persistence?" A stepwise multiple regression analysis was performed using gender, race/ethnicity, ACT composite score, high school GPA, family income, financial aid status, college cumulative GPA, and remedial status as predictor variables and persistence as the criterion variable. The stepwise method was employed to derive at the most parsimonious model possible since the smallest number of predictor variables are included in the model. Summary tables of the multiple regression results are included in this section to aid in the discussion of the statistical analysis. The researcher examined one hypothesis statement, which are discussed in the following

section.

Null Hypothesis #8

The eighth null hypothesis examined in this study was: "There are no statistically significant effects of student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) on persistence." A stepwise multiple regression analysis was performed using gender, race/ethnicity, ACT composite score, high school GPA, family income, financial aid status, college cumulative GPA, and remedial status as predictor variables and persistence as the criterion variable. Multicollinearity statistics revealed that the tolerance values for the predictor variables were greater than .1 indicating that there is no violation in multicollinearity. A tolerance value close to 1 indicates little multicollinearity violations. A tolerance value close to 0 suggests that independent variables are highly correlated with one another resulting in a violation of multicollinearity.

The stepwise method was employed to determine which predictor variables are selected in the model for entry or removal. The independent variable with the strongest correlation on the dependent variable is entered into the model first (see Table 13). The first semester college cumulative GPA was entered first into the prediction equation model as the strongest predicator variable and all other variables were removed. The first semester college cumulative GPA variable accounted for slightly over 24% (.241) of variance on the model and had a strong correlation (.491) on persistence.

The stepwise method entered high school GPA into the second prediction model

Table 13

Multiple Regression Model Summary

Variable	R	R^2	Adjusted R^2	Standard Error of the Estimate
First Semester College Cumulative GPA	.491	.241	.240	1.315
High School GPA	.511	.261	.259	1.299

as the next variable with the highest partial correlation on persistence after controlling for the first independent variable. High school GPA accounted for an additional 2% of variance in Model 2 (see Table 14). Results from the final stepwise regression show that first semester college GPA and high school GPA revealed a significant contribution to Model 2 on persistence, $F(2, 596) = 105.240$, $p < .01$. Model 2 accounted for slightly over 26% ($R^2 = .261$) of the variance and demonstrated a strong correlation coefficient value, $R = .511$. The results show that first semester college cumulative GPA had a statistically significant positive effect on persistence, ($\beta = .999$, $p < .01$). High school GPA had a statistically significant inverse effect on persistence, ($\beta = -.731$, $p < .01$). Although two predictor variables, first semester college cumulative GPA and high school GPA, were statistically significant predictors of persistence, the remaining variables (gender, race/ethnicity, ACT composite score, family income, financial aid, and remedial status) did not contribute to the final multiple regression model. Therefore, the null hypothesis was partially rejected.

Table 14

Multiple Regression Coefficients Model Summary

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	*p*
1	(Constant)	2.253	.189		11.902	< .01
	1st Semester College Cumulative GPA	.859	.062	.491	13.783	< .01
2	(Constant)	4.501	.596		7.555	< .01
	1s Semester College Cumulative GPA	.999	.071	.572	14.074	< .01
	High School GPA	-.731	.184	-.162	-3.974	< .01

Summary of Stepwise Multiple Regression Results

A stepwise multiple regression analysis was employed using gender, ethnicity, ACT composite score, high school GPA, family income, financial aid status, college cumulative GPA, and remedial status as predictor variables and persistence as the criterion variable. Results showed a significant effect in first semester college cumulative GPA on persistence, ($\beta = .999$, $p < .01$), while high school GPA had a significant inverse effect on persistence, ($\beta = -.731$, $p < .01$). Both predictor variables accounted for 26% of the variance in the final model (Model 2). Gender, ethnicity, composite ACT score, family income, financial aid, and remedial status did not contribute to the final multiple regression model.

Summary

This study examined four research questions and eight hypotheses about the relationships and group differences in student demographics, family characteristics, pre-

college factors, and college academic performance variables on persistence. The population for this study was comprised of a purposive sample of first-time degree-seeking freshmen enrolled in the fall 2006 semester through the fall 2008 semester at the University of Oklahoma. The population was comprised of two groups: (1) 332 fall 2006 first-time degree-seeking freshmen students who were admitted, enrolled, and placed in at least one remedial course and (2) 2,881 fall 2006 first-time, degree-seeking freshmen students who were admitted, enrolled, but not placed in developmental courses. Longitudinal data was collected from the Oklahoma State Regents for Higher Education Unitized Data System (UDS).

An ex post facto design was used in this study to examine group differences on persistence after the independent variables have occurred between remedial and nonremedial students. This study utilized Tinto's Longitudinal Model of Institutional Departure (1993) to analyze student demographic (race/ethnicity and gender), family characteristics (family income, and financial aid status), pre-college (high school GPA, and ACT composite scores), and college academic performance (college cumulative grade point average and remedial status) variables to determine factors that predict college persistence. The dependent variable, persistence, was measured as a continuous variable (coded as 1 = persisters and 0 = non-persisters) for students who were officially admitted to OU and persisted or did not persist at this institution during the fall 2006 through the fall 2008 semesters. The independent variables, gender, race/ethnicity, family income, financial aid status, and remedial status, were measured as dichotomous variables and high school GPA, first semester college cumulative GPA, and ACT composite score were measured continuous variables.

Factorial Analysis of Variance (ANOVA) results revealed that there was no statistically significant interaction effects of gender, ethnicity, family income, and financial aid obtained on persistence between remedial and nonremedial students. However, there were statistically significant mean differences at the .01 percent level obtained for ethnicity, financial aid, and remedial status on persistence. Pearson's product-moment correlations results revealed a statistically significant relationship at the .01 percent level between high school GPA, first semester college cumulative GPA, and ACT composite score on persistence. Stepwise multiple regression results revealed that first semester college cumulative GPA and high school GPA were statistically significant predictors of persistence and accounted for slightly over 26% (R^2 = .261) of the variance in the final model (Model 2). Chapter 5 presents a discussion of the research findings as they relate to the literature review, conclusions, and recommendations for future research and practice.

CHAPTER V: FINDINGS, CONCLUSION, AND RECOMMENDATIONS FOR FUTURE RESEARCH AND PRACTICE

A review of the literature delineates a long history of remedial education to assist underprepared students deficient in basic reading, writing, and mathematics skills in higher education. In Oklahoma, community colleges are the primary providers of remedial courses (79 percent) and 4-year public institutions collectively enrolled 20.8 percent of students in remedial coursework during the 2007-2008 academic year (OSRHE, 2009). The number of Oklahoma first-time freshmen students requiring remediation coursework (OSRHE, 2009) at research institutions has decreased substantially from 13.2 percent in 2002-2003 to 8.0 percent in 2007-2008. Based on the results from this study, the researcher suggests that the task of preparing students to succeed in higher education is a shared responsibility of both the student and higher education institutions to increase student success, persistence, and graduation rates. Prior research shows that approximately 85% of students drop out of college within the first two years (Astin, 1977) and the first year of college is recognized as the most critical period where withdrawal rates are the highest (Tinto, 1987).

Although intervention programs have been designed to improve retention and persistence rates of first-year students, research (Hunter, Tobolowsy, & Gardner, 2010) shows that sophomores are largely ignored because there are no intervention programs designed to target retention and persistence of second-year students. There is limited research on persistence and retention patterns of students placed in remedial courses and freshman-through-sophomore persistence at a four-year research university. However, institutions such as the University of Oklahoma have designed programs to address the

needs of sophomore students and committed to the retention of these students. Programs such as the Strategies for Success course at the Norman campus is designed for students who are on probation. This course focuses on areas such as study habits, time management, emotional intelligence, etc., to reduce the number of students on academic probation and improve retention and graduation rates and the Sooner Success Program also at the Norman campus is designed to provide academic coaching and advising for freshmen who were placed on a wait list. These programs are just a few of the initiatives in moving toward the development of an academic plan to assist sophomores with the selection of a major, career interests, and campus involvement (University of Oklahoma, 2009e).

The purpose of this study was to examine student demographic, family characteristics, pre-college, and college academic factors that predict persistence between students who were placed in remediation courses and students who were not placed in remediation courses from the fall 2006 through the fall 2008 semesters at the University of Oklahoma. To accomplish this purpose, an ex post facto design was used to examine group differences on persistence. The population for this study was comprised of first-time, full-time and part-time, degree-seeking freshmen enrolled in the fall 2006 semester through the fall 2008 semester. Longitudinal data was collected from the Oklahoma State Regents for Higher Education Unitized Data System (UDS), which was comprised of 332 students placed in remedial courses and 2881 students not placed in remedial courses. The student data was de-identified by replacing student names and social security numbers with computer-generated, unique identifiers to comply with the Family Educational Rights and Privacy Act (FERPA). This chapter discusses the research

findings, conclusion, and recommendations for future research and practice.

Findings of the Study

The findings from this study are presented using the four research questions and eight hypotheses from this study. A discussion of the literature review is included to show how findings from this study relate to findings from prior research.

Research Question #1

The first research question examined in this study was: "What are selected student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family (family income and financial aid status), and college academic performance (college cumulative grade point average) characteristics of first-time students placed/not placed in remedial/developmental courses at the University of Oklahoma during the fall 2006 through the fall 2008 semesters?" Descriptive statistics were used to collect information on frequency distribution and means on student demographic, pre-college, family characteristics, and college academic performance. The percentage of females accounted for 59.6% of the students placed in remedial courses, while males accounted for 40.4% of the students placed in remedial courses. Also, females accounted for 52.2% of the students who were not placed in remedial courses compared to males accounting for 47.8% of the nonremedial student population. Findings from this study show that on average, 60.5% of remedial students persisted for five or more semesters, while 39.5% persisted for four semesters or less at the same institution. Furthermore, 73.2% of nonremedial students persisted for five or more semesters, while 26.8% persisted less than five semesters at the same institution.

The overall ethnic groups for this study were comprised of predominantly

White/Non-Hispanic (75.5%) students, while 6.2% were African American/Non-Hispanic, 7.8% were American Indian/Alaska Native, 6.0% were Asian/Pacific Islander, and 4.5% were Hispanic, respectively. The average high school GPA for students placed in remedial courses was 3.41 compared to 3.60 for students not placed in remedial courses. The overall proportion of students awarded financial aid was 83.8%, while 16.2% of the population was not awarded financial aid. The proportion of students reporting a total family income less than $50,000.01 was 23.7%, while 76.3% reported a total family income greater than $50,000.

Research Question #2

The second research question examined in this study was: "Are there statistically significant differences in student demographic (gender and race/ethnicity) and family characteristics (family income and financial aid status) on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses?" Factorial Analysis of Variance (ANOVA) was used to determine differences in means between students who were placed in remedial courses and students who were not placed in remedial courses. Four null hypotheses were used to examine differences in gender, race/ethnicity, family income, and financial aid status between remedial and nonremedial students.

Null Hypothesis #1 - Gender

The first null hypothesis examined in this study was: "There is no statistically significant difference in gender on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses." Previous research (Anderson, 1988; Horn, Peter, &

Rooney, 2002; Pritchard, 2003; Pantages & Creedon, 1978) indicating gender not found to be a significant factor on persistence is consistent with the results from this study. Results from this study revealed no statistically significant main effect of gender obtained on persistence. As a result, gender was not significantly related to persistence. Also, there was no statistically significant interaction found between gender and remedial status on persistence.

Null Hypothesis #2 – Race/Ethnicity

The second null hypothesis examined in this study was: "There is no statistically significant difference in race/ethnicity on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses." Previous research (Terenzini & Pascarella, 1978) revealed significant interactions in pre-college traits (e.g., race/ethnicity, gender, etc.) on voluntary dropouts. Results from other researchers (Astin, 1971; Peng et al., 1978) show greater persistence of Black students at four-year institutions than White students after controlling for socioeconomic status, aspiration, and past academic achievement.

These findings were consistent with the results found in this study, where a statistically significant main effect was obtained for race/ethnicity on persistence. Post hoc comparisons on ethnicity for remedial and nonremedial students revealed the following results: (1) a statistically significant mean difference exists between the African American/non-Hispanic and American Indian/Alaskan Native groups on persistence ($M = .74$, $p < .01$, 95% CI [.31, 1.17]), (2) a statistically significant mean difference between White/non-Hispanic students and American Indian/Alaskan Native on persistence ($M = .56$, $p < .01$, 95% CI [.25, .87]), and (3) a statistically significant mean

difference between Asian/Pacific Islander and American Indian/Alaskan Native students on persistence ($M = .84$, $p < .01$, 95% CI [.44, 1.25]).

Among the ethnic groups, the overall group means revealed that the Asian/Pacific Islander ethnic group is more likely to persist at the University of Oklahoma ($M = 4.97$, $SD = 1.394$), followed by African American/non-Hispanic ($M = 4.87$, $SD = 1.604$), White/non-Hispanic ethnic groups ($M = 4.69$, $SD = 1.536$), Hispanic ($M = 4.54$, $SD = 1.546$), and American Indian/Alaskan Native ($M = 4.13$, $SD = 1.736$). There was no statistically significant interaction found between remedial status and race/ethnicity.

Null Hypothesis #3 – Family Income

The third null hypothesis examined in this study was: "There is no statistically significant difference in family income on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/developmental courses." The literature revealed varying results on the predictability of family income on persistence. Prior research (Corbett, Hill, & St. Rose, 2008) revealed that family income is closely associated with academic performance. Findings in this study are consistent with results found in prior research (Astin, 1973 & Eckland, 1965), where results revealed an insignificant relationship between family income and persistence. Also, there was no statistically significant interaction found between family income and remedial status on persistence.

Null Hypothesis #4 – Financial Aid Status

The fourth null hypothesis examined in this study was: "There is no statistically significant difference in financial aid status on persistence between students who were placed in remedial/developmental courses and students who were not placed in remedial/

developmental courses." Findings from previous research (Bean, 1985; Cabrera, Nora, & Castañeda, 1992) revealed a significant direct effect of financial aid on college grade point average and a student's intent to persist. Voorhees (1985) found that financial need and non-campus-based loans and grants have direct effects on new freshman persistence regardless of the type and/or amount of campus-based aid awarded. Results from this study pertaining to financial aid are consistent with findings in the literature review. There was a statistically significant main effect obtained for financial aid status on persistence. Students who received financial aid (regardless of the type of aid awarded) were more likely to persist than students who were not awarded financial aid. Also, there was no statistically significant interaction found between financial aid and remedial status on persistence.

Research conducted by scholars (Kulik, Kulik, & Shwalb, 1983; Livingston, 2007) on remedial status in college showed that students who were not placed in remedial courses had higher mean scores and were more likely to persist in college than students placed in remedial courses. Findings from Kulik, Kulik, & Shwalb (1983) revealed that special programs (e.g., remedial/developmental programs) have a statistically significant effect on student persistence in college, but persistence effects are smaller and more difficult to detect than effects on college grade point average. Results from this study pertaining to remedial status are consistent with findings in the literature review. There was a statistically significant effect found in remedial status on persistence, but there were no statistically significant interactions found in gender, ethnicity, family income, and financial aid between remedial and nonremedial students. Students who were not placed in remedial courses are more likely to persist than students who were

placed in remedial courses.

Research Question #3

The third research question examined in this study was: "Is there a statistically significant relationship between high school grade point average, ACT composite scores, college cumulative grade point average, and persistence?" Pearson's product-moment correlations were used to identify relationships and correlations between high school GPA, first semester college cumulative GPA, and ACT composite score variables. Three null hypotheses were used to examine the relationship between high school grade point average, ACT composite scores, college cumulative grade point average, and persistence for the third research question.

Null Hypothesis #5 – High School Grade Point Average

The fifth null hypothesis examined in this study was: "There is no statistically significant relationship between high school grade point average and persistence." Previous research (Astin, 1971, 1972, 1997; Bean & Metzner, 1985; Eckland, 1964; Hoffman, 2002; Munro, 1981; Pantages & Creedon, 1978; Tinto, 1975) shows high school grades to be a reliable and viable predictor of academic achievement and college persistence. Results from this study, pertaining to high school GPA, were consistent with findings in the literature review. A statistically significant correlation was obtained between high school GPA and persistence but the impact of high school GPA was not very strong. Students with high academic GPAs from high school were more likely to persist at the same institution.

Null Hypothesis #6 – ACT Composite Score

The sixth null hypothesis examined in this study was: "There is no statistically

significant relationship between ACT composite scores and persistence." The literature reveals varying results on the predictability of scholastic aptitude measured by SAT and ACT scores and persistence. Results from some researchers (McGrath, 1997; Stillman, 2007) revealed that combined SAT/ACT scores were significant predictors of retention. In contrast, previous research (Munro, 1981; Pascarella & Terenzini, 1983) found that ACT composite scores did not have a direct influence on persistence/dropout decisions. Results from this study, pertaining to ACT composite scores, are somewhat consistent with findings in the literature review. Although ACT composite scores were found to be related to persistence in this study, ACT scores were not found to be a significant predictor of persistence. Students with high ACT composite scores were more likely to persist at the same institution.

Null Hypothesis #7 – College Cumulative Grade Point Average

The seventh null hypothesis examined in this study was: "There is no statistically significant relationship between college cumulative grade point average and persistence." College academic performance is recognized by researchers as the most reliable predictor of academic achievement and college persistence. Findings from researchers (Bean, 1985; Pascarella & Terenzini, 2005) revealed that college grades are one of the most consistent predictors of student persistence and degree completion. Other researchers (Voorhees, 1985; Nora, 1990) have reported a significant direct effect between college academic performance and persistence. Adelman (1999) found that first-year college grades are positive predictors of degree completion. These findings are consistent with the results found in this study. There was a relationship found between the first semester college cumulative GPA and persistence. Students with higher first semester

college GPAs were more likely to persist at the University of Oklahoma.

Research Question #4

The fourth research question examined in this study was: "What student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) factors predict persistence?" A stepwise multiple regression analysis was employed using gender, ethnicity, ACT composite score, high school GPA, family income, financial aid status, college cumulative GPA, and remedial status as predictor variables and persistence as the criterion variable.

Null Hypothesis #8

The eighth null hypothesis examined in this study was: "There are no statistically significant effects of student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) on persistence." High school grades and scholastic measures are recognized by researchers as the most reliable predictors of academic achievement and college persistence (Astin, 1971, 1972, 1997; Bean & Metzner, 1985; Eckland, 1964; Hoffman, 2002; Munro, 1981; Pantages & Creedon, 1978; Tinto, 1975). Findings from researchers (Bean, 1985; Pascarella & Terenzini, 2005) revealed that college grades are one of the most consistent predictors of student persistence and degree completion. Findings from a study by Adelman (1999) revealed that first-year college grades are positive predictors of degree completion. Findings from

a study conducted by Cabrera, Nora, and Castañeda (1993) revealed that Intent to Persist (0.485) and Cumulative Grade Point Average (0.463) variables accounted for the largest total effect on persistence decisions.

Findings from this study were consistent with the literature review. High school GPA and first semester college cumulative GPA were significant predictors of persistence. The strongest predictor variables on persistence were first semester college cumulative GPA and high school GPA. The first semester college cumulative GPA and high school GPA accounted for slightly over 26% of the variance in the final model (Model 2), which clearly indicates there were other influences on persistence. Gender, ethnicity, composite ACT score, family income, financial aid, and remedial status did not contribute to the final multiple regression Model 2.

Summary of the Findings

In summary, the first null hypothesis for research question number two was partially rejected. Gender was found to be statistically insignificant on persistence but remedial status was found to be statistically significant on persistence. There was no significant interaction found between remedial status and gender on persistence. There was a statistically significant relationship found between ethnicity and persistence but no significant interaction found between ethnicity and remedial status on persistence. Therefore, the second null hypothesis was partially rejected. There were no statistically significant differences found in family income on persistence and no significant interaction found between remedial status and family income. Therefore, the third hypothesis was maintained. There was a statistically significant difference found in financial aid status on persistence and no significant interaction found between

remedial status and financial aid. Therefore, the fourth null hypothesis was partially rejected.

The third research question investigated the relationship between high school GPA, first semester college cumulative GPA, ACT composite scores, and persistence. Findings from this study revealed that high school GPA, first semester college cumulative GPA, and ACT composite were significantly related to persistence. Therefore, the fifth, sixth, and seventh null hypotheses were all rejected in favor of the alternative hypotheses. The strongest predictor variables on persistence were first semester college cumulative GPA and high school GPA. Together, they accounted for slightly over 26% of the variance, which clearly indicates that there are other influences on persistence. The remaining variables, gender, race/ethnicity, composite ACT score, family income, financial aid, and remedial status, did not explain any variance on persistence. Therefore, they were not included in the final regression model (Model 2).

Conclusion

American colleges and universities have taken note of the deficiencies of students' reading, writing, and mathematics skills since the early nineteenth century. Higher education institutions are challenged to increase their academic standards and accountability as funding in higher education becomes more competitive. Although nationwide trends show that remediation is more likely offered by public 2-year colleges (98 percent) than any other institutional types, regional and research institutions are continually challenged to accommodate students who are underprepared for college-level coursework. Providing academic assistance not only helps underprepared students achieve their full potential, but also strengthens American higher education institutions'

goal to increase the educational attainment of our workforce and remain competitive in our global economy.

Remediation programs are colleges' and universities' efforts to accommodate students who are underprepared for college-level coursework. Prior research (Braley & Ogden, 1997; Easterling, Patten, & Krile, 1995; Weissman, Silke, & Bulakowski, 1997) shows that remedial intervention programs provide short-term and long-term benefits by increasing academic performance toward persistence for underprepared students. This study revealed a significant relationship between remedial status and persistence. These results suggest that students who are not placed in remedial courses are more likely prepared for college coursework and will persist in college when compared to students who are placed in remedial courses. Consequently, a student's decision to persist or not persist at the same institution was influenced by whether or not they were placed in remedial courses. Although findings from this study revealed a small proportion (10.3%) of students placed in remedial courses, there is still a need to offer these courses so that students may succeed in college (Hoyt & Sorensen, 2001). If students do not resolve transition issues in the first year, especially during the first semester, the likelihood of persisting at the same institution is diminished, impacting future enrollments and graduation rates (Raab & Adam, 2005).

Remedial students may benefit from the academic support services that currently exist at the OU campus, such as individualized academic counseling, tutoring assistance, writing services and, math labs to help overcome their academic deficiencies and increase persistence. The Strategies for Success course at the OU campus is designed for students who are on probation. The course focuses on areas such as study habits, time

management, emotional intelligence, etc., to improve retention and graduation rates (University of Oklahoma, 2009d). The researcher believes that a seminar that familiarizes at-risk students of the academic services available, ongoing individualized counseling, and motivational speakers focused on student success and career opportunities may help increase persistence beyond the sophomore year. Furthermore, the researcher believes that the task of preparing students to succeed in higher education is the responsibility of both the student and higher education institutions to increase student success, persistence, and graduation rates.

College grades are found to be the single best predictors of student persistence and degree completion (Adelman, 1999; Bean, 1985; Cabrera, Nora, & Castañeda, 1993; Pascarella & Terenzini, 2005). Findings from this study revealed that high school GPA and the first semester college cumulative GPA together explains 26% of persistence in college. Although findings revealed that students entered college with high grade point averages from high school, the inverse relationship on persistence suggests that they may not persist at OU beyond the first year. Implications from these findings suggest that the first semester college cumulative GPA is a greater predictor of persistence at a public research institution. Findings also suggest that high academic performance in high school may not predict persistence at the same institution.

The Counseling and Advisement for Retention Effectiveness (CARE) program currently exists at the University of Oklahoma and is designed to assist at-risk students in being successful in college (University of Oklahoma, 2009d). An academic plan or centralized advising center may help increase persistence of sophomore students by designing counseling and advisement sessions to resolve issues related to their academic

interests and services, selecting a major, and future goals. Wilson, Mason, and Ewinig (1997) found that students' chances of persisting in college increase with the number of counseling sessions (up to six or seven sessions).

The Gateway to College Learning and the Freshmen Seminar series currently exist to mentor freshmen and help them with their transition from high school to college. This seminar series focuses on academic life, time management, study skills, how to access campus resources, and maintaining physical and mental well-being to further academic success (University of Oklahoma, 2009d). The Sooner Success Program at the OU campus has taken steps toward developing a sophomore-specific plan to assist sophomores with the selection of a major, career interests, and theory-based issues (University of Oklahoma, 2009e). A sophomore-specific program could incorporate organized lectures, residential hall programs, retreats, and research opportunities to work with faculty outside of class to sophomores to become engaged in their academic and career interests.

Previous research (Terenzini & Pascarella, 1978) revealed significant interactions in pre-college traits (e.g., race/ethnicity, gender, etc.) on voluntary dropouts. Results from prior studies (Astin, 1971; Peng et al., 1978) show greater persistence of Black students at four-year institutions than White students after controlling for socioeconomic status, aspiration, and past academic achievement. These findings were consistent with the results found in this study, where a statistically significant main effect was obtained for race/ethnicity on persistence. Among the ethnic groups, the overall group means revealed that the Asian/Pacific Islander ethnic group was more likely to persist at the same institution ($M = 4.97$, $SD = 1.394$), followed by African American/non-Hispanic (*M*

= 4.87, *SD* = 1.604), White/non-Hispanic ethnic groups (*M* = 4.69, *SD* = 1.536), Hispanic (*M* = 4.54, *SD* = 1.546), and American Indian/Alaskan Native (*M* = 4.13, *SD* = 1.736).

The Student Life Office at the University of Oklahoma currently provides cultural and social support, such as mentoring programs, counseling, leadership and development opportunities, academic support, cultural enrichment events, new student orientation, and tutorial guidance, for students to increase retention and persistence. Project Threshold is a federally funded program at the OU campus designed to serve economically disadvantaged, disabled, and first generation students to increase retention and graduation rates. Project Threshold provides academic advisement, financial aid information, enrollment assistance, computer lab access, and tutorial services to assist students with a successful transition through college (University of Oklahoma, 2009f). Evidence from this study suggests that cultural diversity programs that educate the campus community on diverse cultural traditions may build a more inclusive campus environment for students of color attending predominately white campuses. The researcher recommends that college administrators and academic/student affairs officers ensure that special population groups continue to have access and are encouraged to utilize the cultural and social support, advising, and counseling programs to foster student success and increase student persistence.

Findings from previous research (Bean, 1985; Cabrera, Nora, & Castañeda, 1992) revealed a significant direct effect of financial aid on college grade point average and a student's intent to persist. These findings were consistent with findings in this study, where a statistically significant relationship was found between financial aid status and persistence. Although there were no statistically significant main effects in family

income on persistence in this study, this study revealed that students who received any financial aid were more likely to persist than students who were not awarded financial aid.

As funding appropriations for public higher education institutions tend to decrease during challenging economic times, tuition and fee revenues increase to fund institutional operational costs. Research by Paulsen, St. John, and Carter (2005) revealed differences in college costs perceptions by ethnic origins. African Americans valued student aid and were more vulnerable to prices than other ethnic groups. Latino students considered their ability to work as opposed to taking out loans, and White students were negatively influenced by living expenses and debt. Consequently, students lacking financial assistance (e.g., grants, scholarships, loans, and work-study) may not persist at the same institution. Prior research (Cabrera, Nora, & Castañeda, 1992) shows that the ability to pay for college influences students' academic and social experience in college. As a result, this issue should concern college administrators because students will make decisions on where to persist in college based on their ability to finance their college education.

The OU Guide to Financial Aid and Scholarships is currently available to inform students of the various state, federal, and institutional financial aid programs (University of Oklahoma, 2010). The researcher recommends that the effects of student financial aid on persistence be assessed to monitor enrollment management outcomes and student financial aid packaging options. As financial aid packages change due to state and federal policy changes, students may ultimately base their decision on where to attend college according to the amount of financial aid awarded. As the cost of attending

college continues to escalate, students are challenged to consider the quality of their college experiences and associated costs with continued enrollment (St. John, 2000). Consequently, students may consider the cost of tuition, meals, lodging, and location when selecting to attend college or re-enroll in college. Given the unpredictability of the availability of state appropriations and federal grants, researching the effects of student financial aid on persistence may allow university administrators and financial aid officers to make better decisions on how to optimize their budgets with financial aid packages in an effort to increase retention and persistence rates. The following sections discuss recommendations for future research and practice.

Recommendations for Future Research

The following recommendations for future research are discussed to understand and implement sophomore retention programs to improve retention and persistence rates:

1. The researcher recommends replicating this study comparing research institutions statewide to examine student demographic (gender and race/ethnicity), pre-college (high school grade point average and ACT composite score), family characteristics (family income and financial aid status), and college academic performance (college cumulative grade point average and remedial status) factors that predict persistence.
2. The researcher recommends follow-up research to investigate the social integration and institution commitment components to better understand how these factors contribute to student retention and persistence. The Camp Crimson program at the OU campus is designed to teach and mentor to new freshmen about academic expectations and the history and traditions of the

campus to ease their transition to OU (University of Oklahoma, 2009g). Sophomores frequently volunteer to participate at this 3-day camp to mentor new freshmen and remain engaged with faculty, students, and the community. The President's Distinguished Faculty Mentoring program is designed to connect students with experienced faculty mentors to help students with their transition to college and create nurturing and personal relationships (University of Oklahoma, 2009d). According to Tinto (1975), as students become integrated into the academic and social environment, they are more likely to become more committed and persist at their institution.

3. The researcher recommends investigating out of classroom experiences, such as working part-time or full-time, enrollment interruptions, full-time/part-time enrollment, participation in extracurricular activities, living and learning on-campus communities, and campus climate, as well as first generation students to determine their impact on sophomore retention and persistence patterns.

Summary of Recommendations for Future Research

Findings from this research study revealed significant differences in mean scores for remediation status, race/ethnicity, and financial aid status. Findings also revealed a statistically significant relationship between high school grade point average, ACT composite score, first semester college cumulative grade point average, and remedial status. An examination of social integration, institutional commitment, and out of classroom experiences variables on persistence beyond the first-year is recommended to improve student retention and persistence in college. Furthermore, future research is needed to examine how peer group interactions, extracurricular activities, faculty and

staff interactions, and academic performance influence persistence patterns in college.

Recommendations for Practice

The following recommendations for practice are discussed for the successful retention and persistence of sophomore students (Hunter, Tobolowsy, & Gardner, 2010):

1. The researcher recommends conducting a self-study to discuss, analyze, and monitor issues relevant to the sophomore year experience. A self-study would allow stakeholders to assess how institutional policies and practices impact student outcomes so that a comprehensive program can be packaged and implemented that is alert to the issues and needs of sophomore students.
2. The researcher recommends developing a cross-campus task force by including faculty, administrators, academic and student affairs, institutional researchers, academic advisors, and students as partners of the sophomore transition to improve the academic and social, and institutional commitment of second-year students. The President's Graduation and Retention Task Force at the OU campus is designed to review policies and academic programs to implement effective retention initiatives and increase retention and graduation rates (University of Oklahoma, 2004). The task force is co-chaired by the Senior Vice-President for Academic Affairs and Provost and the Vice-President for Administration. Others on the President's task force include the Dean of University College, Dean of Arts and Sciences, Associate Athletics Director for Academic Affairs, and the Registrar (University of Oklahoma, 2004). Involving all stakeholders campus-wide could encourage participation, support, communication, and commitment toward the

development of a comprehensive sophomore program in an effort to retain these students.

3. The researcher recommends that the OU Graduation Office continue their efforts with moving toward the development of a sophomore-specific retention program that will help second-year students connect with the faculty, advisors, and their major department. For example, the Sooner Success Program is designed to provide academic coaching and advising for freshmen who were placed on a wait list (University of Oklahoma, 2009e). By moving toward an academic plan to assist sophomores, the Sooner Success Program can assist sophomores with the selection of a major, career interests, and theory-based issues. Research (Hunter, Tobolowsy, & Gardner, 2010) shows that a sophomore-specific program or seminar focusing on sophomore-specific issues, such as articulating goals and future plans, study-abroad programs, internships, and selecting a major, will help students resolve issues, such as understanding the meaning and purpose of their academic interests.
4. The researcher recommends that Academic Affairs, Student Affairs, and Career Services work together and coordinate sophomore-specific workshops and seminars to connect these students with juniors, seniors, alumni, community leaders, and internship options to illuminate how students' academic interests relate to their career interests.
5. The researcher recommends that Academic Affairs administrators work with Advisors to develop an academic plan to ensure that sophomores are connected with advisors to provide support and assistance that is sensitive to

the needs of second-year students. According to Hunter, Tobolowsy, and Gardner (2010, p. 223), "…. Advisors play a key role in helping sophomores gain a better understanding of their sense of self and an academic major, plan for domestic or study abroad opportunities, and investigate internships". New incoming freshmen receive standardized and individualized advisement at the University College and OU Scholars program (University of Oklahoma (2009h). Once freshmen begin taking courses in their major, advising standards at the colleges vary making it difficult to navigate through the advisement system after a student decides to change their major. The researcher believes that an academic plan or centralized advising center would assist sophomores with selecting a major, time management, campus resources, academic plans, and career-related goals and other sophomore-specific issues. Academic advisor training and development programs and can be tailored using a variety of methods, such as workshops, small group discussions, and webinars to better understand what competencies are needed to effectively advise sophomores (Hunter, Tobolowsy, & Gardner, 2010). Training topics could include role playing, case studies, and simulations that cater to the needs of the institution and sophomore students.

Summary of Recommendations for Practice

Much attention is given to first-year students to assist them with their transition from high school to college, but limited research exists that focuses on retention and persistence in college beyond the first year. Furthering the development of a retention program designed to focus on sophomore-specific issues related to their academic

interests, selecting a major, and articulating future goals may assist students with accomplishing their academic interests and career goals. Resolving sophomore transition issues may make second-year students feel connected to faculty, advisors and their major department, which may increase commitment to persist at their institution.

Summary

Providing academic assistance and support services to underprepared students not only helps to overcome their academic deficiencies, but also strengthens American higher education institutions' goal to maintain enrollments in efforts to increase persistence and college success. In addition, cultural and social support services will foster a more inclusive campus environment and may increase retention and persistence rates. This study showed that a student's decision to persist or not persist in college is impacted by whether or not he/she receives financial aid. Administrators and policy makers may make better decisions on how to optimize their budgets with financial aid packages by conducting further research on how loans, grants, and scholarships affect persistence.

One challenge institutions face is that little is known about how sophomores differ from first-year students. Although there is extensive literature on the first-year experience, one should exercise caution when applying what is known about first-year students to students beyond the first-year in college (Hunter, Tobolowsky, & Gardner, 2010). More research on issues and concerns of the sophomore student population will help provide insights on appropriate sophomore-specific programs that are responsive to the needs of second-year college students to improve retention and persistence rates.

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APPENDICES

APPENDIX A

Institutional Review Board Approval Letter

The University of Oklahoma
OFFICE FOR HUMAN RESEARCH PARTICIPANT PROTECTION

IRB Number: 12825
Category: 4
Approval Date: January 11, 2010

January 12, 2010

Sheilynda Stewart
Dept. of Educational Leadership & Policy Studies
8313 Megan Drive
Oklahoma City, OK 73135

Dear Ms. Stewart:

RE: An Examination of Pre-Entry and Academic Performance Factors that Predict Persistence for Academically Underprepared Students at a Public Research University

On behalf of the Institutional Review Board (IRB), I have reviewed the above-referenced research project and determined that it meets the criteria in 45 CFR 46, as amended, for exemption from IRB review. You may proceed with the research as proposed. Please note that any changes in the protocol will need to be submitted to the IRB for review as changes could affect this determination of exempt status. Also note that you should notify the IRB office when this project is completed, so we can remove it from our files.

If you have any questions or need additional information, please do not hesitate to call the IRB office at (405) 325-8110 or send an email to irb@ou.edu.

Cordially,

Lynn Devenport, Ph.D.
Chair, Institutional Review Board

Ltr_Prot_Fappv_X

660 Parrington Oval, Suite 316, Norman, Oklahoma 73019-3085 PHONE: (405) 325-8110 FAX:(405) 325-2373

APPENDIX B

Research Approval Letter

OKLAHOMA STATE REGENTS FOR HIGHER EDUCATION

Improving our future by degrees

December 7, 2009

IRB Coordinator
University of Oklahoma

Dear IRB Committee,

Sheilynda Stewart has completed a data request form and has been approved to receive specific data from the State Regents' Unitized Data System in support of her research. By signing the form she indicates agreement to the limitations on the use of unitary data according to Federal law and State Regents' policy. That policy states, "The requester agrees to maintain the confidentiality of the data provided, use the data exclusively for the intended purpose, store the data in a secure area, and dispose of the data in an approved manner (i.e., shredding). Requesters may be held liable for the information divulged to unauthorized parties as a result of negligent maintenance or use of reports by requesters or their agents."

Cordially,

Tony Hutchison

Tony Hutchison
Vice Chancellor for Strategic Planning, Analysis and Workforce and Economic Development
Oklahoma State Regents for Higher Education

655 Research Parkway, Suite 200 - Oklahoma City, Oklahoma 73104-3603
P.O. Box 108850 - Oklahoma City, Oklahoma 73101-8850