THE RELATIONSHIP OF SOPHOMORE STUDENT DEBT ON RETENTION IN A PRIVATE UNIVERSITY

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ABSTRACT

Paul Johnson, Advisor

The purpose of this study is to better understand what impacts a student continuing their degree at a four-year, private university beyond the second year. Furthermore, understanding if certain student characteristics are reliable in predicting which students are more likely to persist beyond the second year of education. For this study there were 878 students from Ohio public schools who as first-time freshmen enrolled at a four-year, private university in Ohio during the 2009-2011 academic years. The data were gathered from Midwest Private University’s (a pseudonym) financial aid and institutional research offices and included 15 variables relating to the demographic, enrollment, and academic characteristics of the included students. Two research questions were utilized in this study. Binomial logistic regression was used to determine if the variables were more likely to predict student persistence. The results indicate that five variables have a positive correlation with those persisting beyond the sophomore year of college: higher high school and college GPA’s, completing more college credits during the first two years of college, being a varsity athlete, and being a university “legacy”. The results also indicated that student loan debt, race, gender, geographic location of the high school, or the high school ranking did not impact the persistence of the student.

Understanding how to better retain students is important for everyone involved in the education process. Helping student’s complete their degrees is an educationally, professionally, and financially imperative topic for University’s, communities, industry, government, and most of all-the student. The results of the study indicate that more research is needed nationally, but also at individual universities to better understand the specific variables that are unique to each institution.
DEDICATION

I dedicate this dissertation to my beautiful wife, Jennifer, and my wonderful children, Emma and Tyler. You have been with me during this long and exciting process. Thank you for your encouragement, love, and the joy you have brought me throughout the years. I’ve enjoyed how you all participated in this journey with me over the past four years and look forward to our next exciting journey together.

I also dedicate this to my parents, John and Rita. You always supported my education—even when I probably didn’t prove that I was retaining any of it! I always think of what you gave up to give us more growing up—it has helped me be a better individual and professional every day. You always gave us exactly what we needed: support, motivation, and love.
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To my friends and colleagues that I have worked with in my various stops along the way—I appreciate how you have made me a better professional. Hopefully this degree will continue my development as a professional and not end until long after I retire. I also want to thank every student I ever had the pleasure to teach. All of you unknowingly helped me in some way, and I will repay that by helping future students accomplish their goals.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER I: INTRODUCTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>Rationale</td>
<td>3</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>4</td>
</tr>
<tr>
<td>Research Questions</td>
<td>5</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>5</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>6</td>
</tr>
<tr>
<td>Organization of the Remaining Chapters</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER II: LITERATURE REVIEW</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>11</td>
</tr>
<tr>
<td>College Entrance Exams</td>
<td>16</td>
</tr>
<tr>
<td>High School GPA</td>
<td>19</td>
</tr>
<tr>
<td>College Credit in High School</td>
<td>21</td>
</tr>
<tr>
<td>District Typology</td>
<td>23</td>
</tr>
<tr>
<td>Ohio High School Performance Indicators</td>
<td>29</td>
</tr>
<tr>
<td>Race</td>
<td>30</td>
</tr>
<tr>
<td>Gender</td>
<td>33</td>
</tr>
<tr>
<td>Student Persistence through the Sophomore Year</td>
<td>35</td>
</tr>
<tr>
<td>College GPA</td>
<td>37</td>
</tr>
<tr>
<td>Academic Credits Earned per Term/Year</td>
<td>39</td>
</tr>
<tr>
<td>Full-Time versus Part-Time Students</td>
<td>41</td>
</tr>
<tr>
<td>Topic</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>The Impact of Student Involvement</td>
<td>43</td>
</tr>
<tr>
<td>Student Debt</td>
<td>45</td>
</tr>
<tr>
<td>Summary</td>
<td>48</td>
</tr>
<tr>
<td>CHAPTER III: METHODOLOGY</td>
<td>51</td>
</tr>
<tr>
<td>Introduction</td>
<td>51</td>
</tr>
<tr>
<td>Data Sources</td>
<td>51</td>
</tr>
<tr>
<td>Identifying the Study’s Sample</td>
<td>53</td>
</tr>
<tr>
<td>Conceptual Framework</td>
<td>54</td>
</tr>
<tr>
<td>Modeling Student Retention</td>
<td>56</td>
</tr>
<tr>
<td>Interpreting Results of Logistic Regression</td>
<td>56</td>
</tr>
<tr>
<td>Odds Ratios</td>
<td>56</td>
</tr>
<tr>
<td>Significance Testing</td>
<td>57</td>
</tr>
<tr>
<td>Indicators of Model Quality</td>
<td>57</td>
</tr>
<tr>
<td>Variables in the Models Related to Student Persistence</td>
<td>58</td>
</tr>
<tr>
<td>Student Demographics</td>
<td>58</td>
</tr>
<tr>
<td>Student Enrollment Characteristics</td>
<td>59</td>
</tr>
<tr>
<td>Student Academic Characteristics</td>
<td>59</td>
</tr>
<tr>
<td>Delimitations</td>
<td>62</td>
</tr>
<tr>
<td>Limitations</td>
<td>62</td>
</tr>
<tr>
<td>CHAPTER IV: PRESENTATION AND ANALYSIS OF RESULTS</td>
<td>64</td>
</tr>
<tr>
<td>Introduction</td>
<td>64</td>
</tr>
<tr>
<td>Descriptive Analysis</td>
<td>64</td>
</tr>
<tr>
<td>Student Enrollment</td>
<td>66</td>
</tr>
</tbody>
</table>
LIST OF FIGURES/TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2013 Ohio Department of Education School District Typology</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Institutional Profile of Midwest Private University</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>Variables in the Model</td>
<td>61</td>
</tr>
<tr>
<td>4</td>
<td>Descriptive Statistics of First-Time Student Cohorts, Academic Years 2009-2011</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>ACT Scores, Academic Years 2009-2011</td>
<td>66</td>
</tr>
<tr>
<td>6</td>
<td>Final High School GPA, Academic Years 2009-2011</td>
<td>67</td>
</tr>
<tr>
<td>7</td>
<td>College Credits Completed While in High School, Academic Years 2009-2011</td>
<td>67</td>
</tr>
<tr>
<td>8</td>
<td>Descriptive Statistics of Student Persistence and Debt Levels</td>
<td>68</td>
</tr>
<tr>
<td>9</td>
<td>Descriptive Statistics of Student Persistence and Expected Family Contribution</td>
<td>68</td>
</tr>
<tr>
<td>10</td>
<td>Student Persistence Outcomes</td>
<td>69</td>
</tr>
<tr>
<td>11</td>
<td>Logistic Regression Outcomes</td>
<td>71</td>
</tr>
<tr>
<td>12</td>
<td>Variance Inflation Factor Analysis</td>
<td>72</td>
</tr>
<tr>
<td>13</td>
<td>Summary of Results</td>
<td>74</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conceptual Framework for Student Retention</td>
<td>55</td>
</tr>
</tbody>
</table>
CHAPTER I: INTRODUCTION

Background of the Problem

There has been much debate regarding the most reliable way to select students for admission to post-secondary institutions and retain them once they have enrolled. After admissions, enrolling and retaining a student for a bachelor’s degree program becomes one of the university’s highest priorities. For example the State of Ohio recently changed the funding process for public universities. Within Ohio’s Fiscal Year 2014 Budget, public universities may have up to 50% of their State Share of Instruction (SSI) provided based on degree completion (Ohio Board of Regents, 2013). While private universities in Ohio do not have to worry about the direct impact of this funding model, it could have an indirect impact as public and privates compete for the same students as well as alumni and business donors who help underwrite annual budgets. Additionally, to ensure proper usage of federally backed loan and grant dollars, the federal government may begin applying pressure to these institutions by determining if students received an adequate education relating to the degree and its cost. Within academia, significant numbers of research studies have focused on students’ completing their first year of coursework and the impact of that first year on graduation, but there is a paucity of research regarding the completion of the second year of an academic program in the literature (Graunke & Woosley, 2005).

Universities must select students who will successfully complete their degree in order to utilize their resources to run an efficient and effective business model. How universities select students and invest in their future is not as simple as accepting all who walk through the door. Understanding students’ abilities to accomplish a specific degree
predicting the abilities of a student to successfully complete a program is critical (Robinson, 2004). When determining whom to admit, universities must realize that selecting a student who fails academically will utilize important campus resources that could be directed to successful students.

Determining how universities will ensure that admitted students continue to progress through the degree program is the central theme of retention. This process begins prior to student enrollment and continues through each academic term until graduation. Arguments have been made to select students utilizing their high school grade point average (HS GPA), standardized testing (i.e., ACT or SAT) or other quantitative methods (Cimetta, D’Agostino, & Levin, 2010). The selection process for the university also includes determining which selected students fulfill the academic mission or other institutional goals, such as increasing minority student, student athlete, gender type, or international student populations. Understanding which applicants have the most potential for academic success may be the responsibility of both the institution and the prospective student.

Historically, student debt has evolved and expanded substantially over the past 50 years. While the Guaranteed Student Loan (GSL) program began in 1965 through the United States Government with options such as Stafford Loans and PLUS loans, Jeffery Williams (2006) indicated that in the first 13 years of lending the GSL program provided $12 billion in loans, jumping to approximately $15-20 billion per year in the 1990’s. By 2006, Williams indicated that the government was providing over $40 billion per year in
these federally-backed loans for higher education. In 2009, the U.S. Government ended the GSL program and completely replaced it with the Direct Loan program to, among other things, work more seamlessly with PLUS Loans and to provide funds to reduce the federal deficit. The reasoning behind this increase in loan support begins with a large growth in tuition and fees. In 1976, the average cost for tuition and fees was $924 a year compared to $6,067 in 2002 (Williams, 2006). At private universities the cost was more dramatic, rising from $3,051 to $22,686 during the same time period (2006). Sustaining this growth in the cost of college and access to manageable student funding is critical to understanding the needs of current and future students.

Creating understanding surrounding what criteria, such as gender, race, academic qualifications, or financial burden best predict a student’s success beyond the second year of college is an important area of research. If changes occur from the second to third year of a student’s degree program universities should be aware of potential red flags to identify barriers to student success.

**Rationale**

At this time, the literature is limited in describing a clear and effective method or framework for identifying the characteristics possessed by students that lead to completing their second year of college (Seidman, 2005). While literature provides information on the strengths and weaknesses for each variable that potentially indicate success, there are limited studies addressing a combination of factors that impact students and help them succeed beyond the first year (Graunke & Woosley, 2005).

Midwest Private University (a pseudonym, the subject of this study), as well as other public and private colleges and universities, could benefit from research indicating
which students fit the academic profile of their institution and from data indicating which students might potentially struggle academically through the second year of their degree program. Understanding which students leave during various stages of their degree path could be beneficial in preventing unexpected departures and minimizing the financial impact for both the student and the institution.

**Purpose of the Study**

The purpose of this study was to examine the relationship between key student enrollment data and students' persistence within an undergraduate college degree program, specifically through the second year. This study also sought to understand the relationship between student debt and students’ persistence within an undergraduate college degree program through the second year. Lastly, this study attempted to fill a knowledge gap within the academic literature regarding persistence beyond the second year.

For this study, the sample consisted of almost 900 students who entered a private, central Ohio university and were directly admitted to each of its undergraduate programs. While the university recruits beyond Ohio, most of its students are residents of Ohio. This study focused only on those who graduated from Ohio, public high schools. Most students at Midwest Private University come from average to above average academic backgrounds. These students come from a variety of financial backgrounds and most are traditional students who are admitted directly from high school to college. Almost all students in this data set live on campus in university provided residence halls. Data consisted of three types: student demographics, enrollment characteristics, and academic characteristics through the second year. All data points were secondary in nature and
were initially collected by professionals within the institution’s Financial Aid and
Institutional Research offices. Data listed students by their “university ID number” to
provide anonymity. Ohio high school typology and performance indicator data were
secured from the Ohio Department of Education website. SPSS 20 statistical software
was utilized and a logistic regression was performed to determine which factors indicated
a likelihood of student success or failure regarding retention beyond the second year of
their degree program.

Research Questions

1. What is the relationship between federal student loan debt and persistence beyond the
   second year, controlling for variables within the model?
2. What other student characteristics best predict student persistence beyond the second
   year?

Significance of the Study

This study sought to build upon the small amount of research relating to the
persistence of students through the second year of an undergraduate degree program
(Graunke & Woosley, 2005). Universities determine which students will be admitted to
fit the institution’s academic profile. Attracting students who are academically qualified
to attend a university may determine who is retained beyond the first year. Research
shows that the more academically selective the university, the more likely a student is
retained beyond the first year due to the higher level of academic preparation and support
of the individual student (Seidman, 2005).

Engaging students directly with a curriculum that is challenging and related to
their professional goals could increase the value for students attending college (Schreiner
& Pattengale, 2000). Academic and professional curriculum should extend to student activities, residence hall programming, and cultural events on campus (2000).

Considering that the median family income for a family of four in 2000 was just over $54,000 per year, finding avenues to provide a student with options to attend a four-year, private university that may cost over $25,000 a year is potentially burdensome (Williams, 2006). Students who struggle financially may not be able to take advantage of all services and programs due to work and family commitments. Clearly communicating the goals of the academic curriculum, campus programming and student services will help college students understand that the courses they are taking directly apply to the successful completion of their degree program.

Based upon previous research, this study focused on specific variables that have impacted student success in various studies. As a result, the variables discussed in this literature review include: college entrance exams, HS GPA, college credit in high school, district typology, high school performance indicators, race, gender, persistence to the sophomore year of college, college GPA, academic credits in college, full-time vs. part-time college enrollment, student involvement in college, and student debt to fund college.

**Definition of Terms**

The following terms will be used in this study.

- **ACT**: Four subject, standardized test utilized as an entrance exam to college (ACT, 2012).

- **Admission**: When an institution grants an offer to a prospective student to enroll in coursework based on successful selection criteria.
- **Advanced Placement (AP) Credit**: Supervised by “The College Board” this standardized curriculum and final exam allows students to potentially earn college credit while completing high school in a variety of course topics (Klopfenstein & Lively, 2012).

- **District Typology**: Ohio Department of Education system to determine how public schools will be evaluated based on items such as geography, size, local median family income, and minority enrollment (Ohio Department of Education, 2013c).

- **Dual Enrollment**: Program allowing high school students to earn college credit while in high school for a specific university. This college credit is often limited to the university sponsoring, or teaching, the course, and is not transferable (Lerner & Brand, 2007).

- **Enrollment**: Describing when a prospective student becomes an actual, official student at said institution and is registered in various courses.

- **Enrollment Data**: Information collected by a university to understand the preparation and academic ability of a student as well as the student’s “fit” with the university. For the purposes of this study, the variables included enrollment data such as: college entrance exam scores, HS GPA, previous college credits, ethnicity/race, and gender.

- **Ethnicity**: As defined by Midwest Private University, ethnicity refers to one of seven major categories: Hispanic/Latino, American Indian or Alaskan Native, Asian, Black/African American, Native Hawaiian or Other Pacific Islander, multiracial, or White. These categories are sometimes also referred to as “race”.

• **Expected Family Contribution:** Per www.fasfa.edu (2012), this is a “measure of a family’s financial strength and is calculated according to a formula established by law.”

• **First Generation:** A student who has no immediate family members who have ever attended a college or a university.

• **Full-Time Student:** Students enrolled in 12, or more, academic credits per term (Seidman, 2005).

• **Gender:** For the purpose of this study, gender is defined utilizing the U.S. Census Bureau’s definition of a person’s biological sex (U.S. Census Bureau, 2013).

• **HS GPA:** High school grade point average. Refers to the individual’s final, total grade point average at high school graduation. All scores within this study will be calculated on a 4.00 weighted scale.

• **Involvement:** “Amount of physical and psychological energy a student devotes to the academic experience.” This includes campus-related student activities. (Astin, 1984, p. 297).

• **Legacy:** Student who has a parent, or other identified family members, who previously attended the same university.

• **Matriculation:** Enrolling as a degree candidate in a college or university.

• **Non-traditional:** Students who do not immediately transition from high school to college. These students are typically older in their first term than traditional freshmen, most often because they did not enter the university in the fall term after high school graduation.
• **Part-Time Student:** Students enrolled and taking fewer than 12 academic credits per term (Seidman, 2005).

• **Performance Index:** Ohio Department of Education determination of the overall performance of each school by assessing the achievement of each student on a scale of 0-120 based on student performance on achievement and graduation tests for grades 3-10. Scores are weighted based on the individual performance of the student on an eight level scale with “Tests Not Taken” earning a 0.0 weighted score and “Advanced Plus” earning a 1.3 weighted score being the criteria at each end of the continuum (Ohio Department of Education, 2013a).

• **Persistence:** “The desire and action of a student to stay within the system of higher education from beginning year through degree completion” (Seidman, 2005, p. 7).

• **Post-Secondary Option:** “Enrollment programs that are provided at minimal or no cost to students and where course credits can be applied toward both secondary and postsecondary institutions” concurrently (Taylor, 1997, para. 12).

• **Selectivity:** An institution determining that a student meets minimum criteria for admission based on posted guidelines of an academic, occupational, social, or spiritual nature as well as other factors.

• **Student Debt:** The borrowing of money, in the form of a loan, to pay for the expenses related to participating in higher education (Seidman, 2005).

• **Success:** A student at an institution that completes a degree and graduates. This student meets all academic, social and financial requirements for degree completion and receives a diploma.
• **Traditional Student:** Students who immediately transition from high school to college. These students are typically between the ages of 17-19 years old and began college in the fall term after their high school graduation.

• **Y1, Y2, College GPA:** Refers to the individual students college GPA at the end of their first (Y1 GPA) and second (Y2 GPA) academic year within the University.

**Organization of the Remaining Chapters**

This study is organized as follows: Chapter 1 includes the introduction, background of the problem, rationale, purpose for the study, statement of the research questions, significance of the study, and definition of terms. Chapter 2 reviews the literature on student selection, enrollment, retention, matriculation, and policy decisions. Chapter 3 is an explanation of the research methodology used, data collection, conceptual framework, and procedures of this study. Chapter 4 examines the results of the data analysis and descriptive statistics. Chapter 5 discusses each research question result, the conclusions, recommendations for leadership and policy, and recommendations for future research.
CHAPTER II: LITERATURE REVIEW

Introduction

This chapter examines the academic literature surrounding the student enrollment process and the likelihood of retaining each student through the sophomore year of a bachelor’s degree program. This literature focuses on the topics of academic performance in high school and college, financial aid, and student involvement during college. The literature review concludes by examining the impact of student debt relating to student retention and success.

Truell and Woosley (2008) conducted an interesting and relevant look at the success of students within undergraduate business programs. Their research examined factors contributing to student success after completing two years of a business program at a large, public, Midwestern university. The researchers examined data from 284 students admitted into the college of business after attaining junior status at the institution, and proceeded to conduct a logistic regression to predict what data indicated the student would successfully complete their degree. These researchers found that most students admitted to the program in their junior year (84%), graduated. While the research by Truell and Woosley (2008) is only generalizable to the small group of students studied, the study supports the idea that each year closer a university gets a student to graduation increases the likelihood of success. Thus, based on this study, it appears that retaining a student beyond the first year is still not enough (2008).

Enhancing graduation rates has become a baseline goal of retention efforts for most universities. At the same time, determining student satisfaction, academic progress, and financial impact after the first year have been collectively overlooked in the research.
For instance, when Fischer (2007) examined data from the National Center for Education Statistics of almost 4,000 students at 28 institutions nationally, she noted that at the end of their sophomore year Black and Hispanic students were more likely to have a lower GPA and were responsible for a greater portion of higher education costs than their White and Asian counterparts. One risk factor Fischer (2007) found that supported this statistic was that Black and Hispanic students, at a rate three times higher than their peers, were first-generation college students. However, regardless of race, Fischer (2007) found that being a first-generation student increases the risk for a lower GPA at the end of their sophomore year. Similarly, Pascarella, Pierson, Wolniak, and Terenzini (2004) conducted research that showed that supporting first-generation students and determining how to assist them in mitigating academic and financial risks may help them matriculate towards their degree by reducing academic and financial issues.

While Tinto’s 1975 interactionalist theory laid the groundwork for many researchers within higher education to understand how studying student academic performance and on-campus activities together improved retention, much of the work since has expanded the knowledge-base (Berger & Milem, 1999). As student involvement theory has evolved, researchers have begun assembling variables relating to how the individual student develops on campus. For example, Terenzini, Pascarella, and Blimling (1996) conducted a literature review and found that students could be positively impacted by certain aspects of where they reside during college, holding a part-time campus job, participating in student activities with their peers, and professional internships or study abroad experiences. Potentially increasing the opportunity for
student success by identifying which variables improve student persistence was paramount in this dissertation research.

In 2010, Mattern, Shaw, and Kobrin examined academic fit specifically to understand which is more important, the “Right School” or the “Best School”. Ultimately, the researchers were attempting to understand if the student selected a school that provided a positive outcome for the student. Utilizing data from The College Board of over 143,000 students entering college in the United States during 2005, the researchers examined SAT scores, SAT questionnaire responses, FY GPA (college) and first-year retention (did the student stay at the initial institution for a second year). Initial findings showed that approximately “43% of students attended a University that was aligned with their ability” and did not overreach or underachieve with regards to the selection of an institution (p. 376). This research also showed that academically aligned students had the highest rate of retention. Overall, it appears that the more selective the institution is, the higher the rate of retention.

Within higher education institutions, admissions and financial aid offices work hand-in-hand to recruit students. These departments ensure that enough qualified students apply, enroll and have the ability to pay their tuition bills. Financial aid also must balance servicing those prospective students who have not yet enrolled while maintaining positive relationships with current students who will be part of the campus culture for the foreseeable future. One survey found that each admissions officer at private institutions balanced approximately 350 applicants during a time when a majority of office budgets saw no increase in financial resources for those professional staff members (Greene & Greene, 2011).
For example, enrollment professionals must balance traveling to prospective students, utilizing technology to reach the masses (while providing an individual feel), work with high school guidance counselors, and describe the financial aid process (Greene & Greene, 2011). Admissions budgets have shrunk or remained stagnant while campus budgets continue to have half of its liabilities accounted for in faculty and staff compensations (Chabotar, 2010). Fiscally it is critical to recruit and retain the most effective students if up to 80% of an annual campus operating revenue is dependent on student tuition and fees (Scannell, 2012).

The Common Application has been one trend in higher education designed to assist enrollment departments for over 35 years. This application allows prospective undergraduate students to complete one “form” and submit the online document to over 500 member universities. Researchers have examined its impact on various aspects of the college selection process. Ehrenberg and Liu (2009) examined how the Common Application may help institutions participating in its use. The researchers found that participating universities increased their application size by about 5% and enrollment by almost 4%. They also found that by using the common application, the rate of enrollment by students of color was over 15% and that the use of Pell grants was over 2%. Thus, while this method may not be a magic bullet for all enrollment departments, it may have positive impacts for some. Additionally, universities attempt to simplify the admissions process by using the common application to increase the student enrollment yield, or increase the number of students who complete the entire application process and enroll in classes. This is important when private universities only yield enrollment in approximately 36% of their applicants (Jaschik, 2012). Simple and wide-reaching
application methods may be appealing to reduce the cost of recruiting each student. On average private universities spend $2,400 to recruit and enroll each student (Noel-Levitz, 2013).

Another trend indicates that online learning has become more acceptable to the mainstream considering over 10% of the higher education population participates in online degree programs. With high speed internet and better computers becoming accessible to more of the United States, online learning is emerging as an educational option that is flexible and cost-efficient for traditional students, thus introducing competition to the private university (Shaw, 2011). Enrollment departments will have to create plans in coordination with the academic affairs professionals to address these issues to continue to recruit and retain students who are interested in utilizing technology as part of their learning process.

Research by Chajewski, Mattern, and Shaw (2011) utilized a logistic regression in their study and found that 83% of high school students who completed at least one Advanced Placement exam enrolled in college at higher rates as compared to 45% of the non-AP participants. Although students participating in AP courses and exams may have some selectivity bias there is a notable difference in college enrollment that could potentially serve admissions professionals.

Regardless of how students apply to a university, or their advanced academic pursuits in high school, students must show that they will be successful if enrolled at the institution. Universities now examine a wide variety of characteristics such as: academic qualifications, non-academic interests, geographic background, and others to determine the qualifications of every applicant.
This literature review examined factors that have been identified as contributing to student persistence and success through the first two years of an undergraduate college program. Due to limited previous research, this study will focus on specific variables that have impacted student success in various studies. Those variables discussed in this literature review include: college entrance exams, HS GPA, college credit in high school, district typology, high school performance indicators, race, gender, persistence to the sophomore year of college, college GPA, academic credits in college, full-time vs. part-time college enrollment, student involvement in college, and student debt to fund college.

**College Entrance Exams**

Universities have long held the notion that one of the best predictors of student success in college are standardized tests (Seidman, 2005). Determining the validity behind this variable is important for each university to secure the best possible student population at their institution. While the SAT has been utilized to determine student success since 1926, and the ACT since 1959, they have each undergone vast changes throughout the years (Syverson, 2007). While the SAT began for students not attending private preparatory schools in the eastern United States as a way to help apply to multiple universities, its growth came as a result of the GI Bill post World War II. The ACT began primarily for Midwestern universities as an off-shoot of the Iowa Testing Programs (2007). Universities can utilize standardized tests, such as ACT and SAT, to not only admit a student and potentially determine success through the first year of coursework, and beyond. Students with higher standardized test scores are more likely to graduate within six years when compared to students with lower scores (Seidman, 2005). During
2013, 1.8 million high school graduates took the ACT in an attempt to enter college (ACT, Inc., 2013).

Determining a correlation between various standardized tests, academic performance in high school, and college success would allow many admissions professionals to stay true to a defined profile for student admission at their respective institution. Cimetta, D’Agostino, and Levin (2010) examined the relationship of high school achievement tests and the academic success of college students by utilizing a stepwise regression. The authors examined the results of the “Arizona Instrument to Measure Standards” high school test from 1999 and 2000 and the performance of those 1,600 individual students at college for four-years. Other researchers go as far to suggest that an SAT score is not as important a predictor of college success as the first year college GPA (Syverson, 2007). Overall, based on Cimetta, D’Agostino, and Levin’s (2010) research, it does not appear that combining HS GPA, the SAT, and a state-wide standardized test are more likely to predict academic success in college than the SAT alone.

Unfortunately, examining test scores alone can create a slippery slope. The 2010 study by Combs et al., indicates that during the 2005-2006 school year, males scored 25 points higher on the SAT exam than females. While this should make selection easy for a college, females were more likely to enroll and graduate within five years than their male counterparts (King, 2006). ACT, Inc. reported that in 2013 only 26% of all students taking the ACT exam met the “College Readiness Benchmark” across all four subject areas (ACT, Inc., 2013, pg. 1). Of the students meeting all four benchmarks, African Americans only accounted for 5% of this population while 50% of African Americans,
Hispanics, and American Indians did not reach benchmarks in any of the subject areas. Over the past five years Asian and White students have easily averaged a 22 (or above) composite ACT score, while African American, American Indian, and Hispanic students have struggled to stay in the 17-19 composite score range (2013).

Research studies have examined combining multiple variables with the college entrance exam to determine if there is significant predictive value present. For example, one study examined HS GPA and the SAT or ACT when compared against certain citizenship and behavior criteria in an attempt to find a measure that balances admission factors for minorities (Sinha, Oswald, Imus, & Schmitt, 2011). By conducting a regression these researchers were able to weight the various predictors differently based on the values of a university and determine a different outcome. This research indicates that it may be possible to weigh various factors in the admissions process and predict students who will be successful at an individual university based on those predetermined values. Another study conducted a multiple regression analyses of 257 students and found that when examining both the ACT/SAT with a first-year college class like General Psychology one can determine overall student GPA after just the first two exams (Marsh, Vandehey, & Diekoff, 2008). The predictive correlation between the first two General Psychology exams and the ACT exam provided a 40% variance in GPA, while the SAT provided a 32% variance. This type of prediction could prove to be beneficial for universities in regards to the retention and success of students.

While higher entrance exam scores may lead to more student success, there must be other factors indicating which students will successfully graduate. Continuing to examine disparities in exam performance and outcomes by ethnicity, race and gender are
important aspects for professionals, both academically and practically. The determination of a student’s admission to a university based solely on an entrance exam scores is not typical, but could be possible.

**High School GPA**

Although subtle, differences in HS GPA seem to suggest those who persist beyond the first year, and to graduation, performed better in high school. When examining over 2,000 college freshmen’s HS GPA, Seidman (2005) found that the average student entered college with a 3.17 HS GPA but those that persisted through the beginning of the third year, had an average of a 3.26 HS GPA. By searching for a slightly higher caliber student, a small, private institution seeking to ensure that students are retained and graduate could potentially increase its retention rate.

The correlation between high school and college GPA’s is significant and provides an opportunity for colleges to use this metric as a definition of college readiness (Roderick, Nagaoka, & Coca, 2009). With research showing that a HS GPA of 3.0 or higher provides the student with a “50% or greater likelihood of graduating from a four-year college within six years” colleges could more accurately predict who will be successful in attaining a degree (2009, p.196).

Soars’ examination of the literature identifies various studies providing arguments for the use of HS GPA in the college selection process. For example, Soares cited Sternberg’s 2012 research study indicating that by testing students on various practical, creative, and judgment based questions that when paired with HS GPA can eliminate the need for an SAT and level “racial and ethnic-group differences” (Soares, 2012, pg. 67). Research further indicates that HS GPA, gender, and leadership experiences correlate
more with first semester and first-year college GPA than an SAT when conducting a one-way ANOVA (Mattson, 2007). This type of correlation is another interesting discussion topic regarding how a university can begin looking at variables to improve recruitment and retention strategies based on a desired population set. Certain researchers would disagree with the elimination of utilizing both HS GPA and an ACT or SAT score as a predictive model. For example, Berry & Sackett (2009) posit that utilizing both the HS GPA and SAT score predicts between 30%-40% of a college freshmen’s first year GPA.

Additionally, self-selection bias could account for some bias in the literature regarding student success in college relating to HS GPA. In one study, Levin & Wycokoff (1991) suggested that 82% of the engineering students who persist to their sophomore year had HS GPA’s above 3.0. On the surface this variable indicates a strong likelihood of determining which students succeed and which fail. Determining if students with lower HS GPA’s could succeed in college but are not applying is important to understand. Also determining why 100% of students who were successful in high school do not persist beyond the second year of college is critical in gauging student motivation.

Assessing HS GPA is important as a practical application for professionals working in higher education. Although there seems to be varying levels of correlation, most researchers agree that high school performance will lead to similar college performance. Determining if HS GPA is a variable that improves the likelihood of success in college appears to be a true and valuable path to examine within this research study.
Over the past 50 years, United States high school students have been given the opportunity to earn college credit through a variety of academic activities that could reduce the amount of coursework needed for their bachelor’s degree. The credit can come in the form of Advanced Placement courses taught at students’ high schools, Post-Secondary Option courses at a local college, or Dual Enrollment courses taught at the high school but sponsored by a specific university. Regardless of option, these courses provide opportunities to increase knowledge, potentially decrease higher education costs, and potentially shorten a degree path for the student.

Advanced Placement programs offer a standardized test that allows a high school student who earns an adequate score to receive college credit. Each university determines the amount of credit allowed and many institutions are currently raising the requirement on a needed score for the individual to earn academic credit. Although this program is over 50 years old, it has received criticism because the individual student must “pass” a generalized test on the topic and universities only provide credit to those students with the highest test scores (Schneider, 2009). This creates a system where a student who “passes” a course may not receive college credit for their efforts. However, despite the criticisms, Advanced Placement credit is not in danger of going away anytime soon. In the past decade, the College Board has had double the amount of students taking an AP Exam with 1.6 million exams completed in 2009 (Chajewski, Mattern, & Shaw, 2011).

One study indicates that Advanced Placement programs may pose a disadvantage to students. Since all colleges and universities do not accept AP credit equally, Wilson
and Adelson (2012) found that students in Texas were more likely to stay closer to home. This result appears to be correlated to the fact that the colleges farther away required higher SAT entrance scores than those closer to students’ homes and although the students completed AP coursework, they did not have an appropriate score to earn college credit. This is one factor that may provide high school students with a false indication of college preparation.

Dual Enrollment programs are offered in conjunction with a sponsoring college that is typically located in the same geographic area as the participating high school. This program allows the student to complete their high school requirements while earning college credit at the sponsoring college, thus limiting the student’s higher educational choices after graduation (Klopfenstein & Lively, 2012). Programs can be taught at the high school or on the sponsoring college campus. Research conducted by Sadler, Sonnert, Tai, and Klopfenstein (2010) indicated that if the student completes the dual enrollment course on a college campus they are more likely to complete their undergraduate degree faster than their peers. This research could indicate that exposing high school students to college formats and providing them with college credits prior to college enrollment, they can complete their degree more efficiently and successfully.

Another interesting study examined the relationship between postsecondary-option credits for those in high school technology or vocational (professional preparatory) programs. Research by Meyer (2012) indicated that after examining over 1,000 students in Ohio who completed post-secondary option credits to those who earned more credits than the median were less likely to continue onto, or complete, college. This type of research may indicate that understanding the goals of student may also influence
the projected outcome. For example, students entering technical professions who already have acquired a substantial amount of college credit may feel prepared to enter the workforce indicating a college diploma is not the end goal.

The literature shows that there are many ways for a high school student to potentially earn college credit. Regardless of method, these types of college credit, earned while still in high school, can reduce the time on task during a bachelor’s degree program, the amount of money needed to attend college, and allow the student to enter their chosen career path sooner. These factors are all true if the student completes their degree successfully. Overall, it appears that earning college credits while in high school is beneficial to most students. This credit reduces student debt and prepares students for the rigor of college sooner. Earning college credit in high school also reduces the need for general education coursework when enrolling at a four-year university and allowing the student to take classes within their major sooner. Lastly, with all variables, aligning student and university goals is still important, particularly with technically-oriented career paths.

**District Typology**

Beginning in 2005 the State of Ohio created a new public school district “typology” to group schools based on similar geographic and demographic classifications. Schools are grouped based on geographic location: “Rural, Small Town, Urban and Suburban” (Ohio Department of Education, 2013c). These groupings are broken down further into eight classifications based on poverty level and school population. Ultimately, this creates eight school types that range from a total of six to
124 schools within each typology. Due to the lack of data and small student populations, five schools were removed from the typology and given no designation.

Each grouping was created to determine whether the school was in a descriptor grouping such as, “Rural-High Student Poverty & Small Student Population” or “Suburban-Low Student Poverty & Average Student Population Size” (2013c). These groupings were created by examining the following six dimensions: district size, school poverty, socioeconomic composite, location composite, race & ethnicity, and tax capacity” (Ohio Department of Education, 2013b). By examining these groupings the State of Ohio measured district factors such as the number of students, those living in poverty, the economic condition of the area, potential tax revenue, and other factors to systematically compare schools within the various groups so that evaluation can occur on an “apples to apples” basis.

At the conclusion of the 2013 academic year, the State of Ohio identified 609 school districts across eight typologies (Ohio Department of Education, 2013b). This data will be utilized to determine school district performance on the Ohio Performance Indicators assessment. Since these eight typologies (see Table 1) are determined by a combination of regional influences, such as property values and median incomes, or local adults with a bachelor’s degree or more, students must overcome these indirect influences to succeed.

Due to these newly created typologies, no research has been conducted and evaluated in the literature. However, the existing literature does describe the impact of school geography and the difference between public and private high schools. This study
sought to understand the impact of public schooling, but evaluating the differences in the literature is needed to provide a framework of understanding.

Table 1

*2013 Ohio Department of Education School District Typology*

<table>
<thead>
<tr>
<th>2013 Typology Code</th>
<th>Major Grouping</th>
<th>Full Descriptor</th>
<th>Districts Within Typology</th>
<th>Students Within Typology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rural</td>
<td>Rural - High Student Poverty &amp; Small Student Population</td>
<td>124</td>
<td>170,000</td>
</tr>
<tr>
<td>2</td>
<td>Rural</td>
<td>Rural - Average Student Poverty &amp; Very Small Student Population</td>
<td>107</td>
<td>110,000</td>
</tr>
<tr>
<td>3</td>
<td>Small Town</td>
<td>Small Town - Low Student Poverty &amp; Small Student Population</td>
<td>111</td>
<td>185,000</td>
</tr>
<tr>
<td>4</td>
<td>Small Town</td>
<td>Small Town - High Student Poverty &amp; Average Student Population Size</td>
<td>89</td>
<td>200,000</td>
</tr>
<tr>
<td>5</td>
<td>Suburban</td>
<td>Suburban - Low Student Poverty &amp; Average Student Population Size</td>
<td>77</td>
<td>320,000</td>
</tr>
<tr>
<td>6</td>
<td>Suburban</td>
<td>Suburban - Very Low Student Poverty &amp; Large Student Population</td>
<td>46</td>
<td>240,000</td>
</tr>
<tr>
<td>7</td>
<td>Urban</td>
<td>Urban - High Student Poverty &amp; Average Student Population</td>
<td>49</td>
<td>225,000</td>
</tr>
<tr>
<td>8</td>
<td>Urban</td>
<td>Urban - Very High Student Poverty &amp; Very Large Student Population</td>
<td>6</td>
<td>185,000</td>
</tr>
</tbody>
</table>

Determining where students are more prepared for college may reduce overhead costs for the university during the recruitment process and allow for a more adequate supply of potential students. Understanding if an urban or rural high school setting impacts preparation for college is an important question for higher education in the 21st Century.
In 1997 Chicago Public Schools, one of the largest urban school districts in the United States, created a curriculum that requires “College Prep for All” to ensure that graduating students have completed enough math, science, English, and other important coursework (Lee & Ready, 2009, p. 145). Chicago Public Schools attempt to improve student preparedness by providing ninth graders in need of extra support with additional coursework and tutoring in math and English. Although Chicago has not seen a significant change in the number of students enrolling in four-year colleges, this policy change has attempted to prepare those that do attend college with more rigorous coursework.

Urban high school students who want to attend four-year colleges may not always complete the process that allows for enrollment. Of students in the Chicago and Boston area and in urban schools that indicate high postsecondary aspirations, only about half of them complete a college application process and enroll, compared to their suburban counterparts who enroll at a 91% rate (Roderick, Nagaoka, & Coca, 2009). This type of application and enrollment disparity promotes the negative image that admissions professionals at some four-year institutions do not spend the time in assisting these urban school students attempting to reach a quality university.

Rural students often attend smaller schools due to their lower density surroundings, and thus, potentially limiting resources and offerings. On a positive note more rural high schools are offering dual enrollment courses in conjunction with their local community colleges (Klopfenstein & Lively, 2012). These dual enrollment courses provide access to college courses that may help reduce future tuition costs and increase college readiness. One recent study may address why rural students attend colleges near
their home. Researchers examined over 2,000 students who enrolled at the University of North Dakota in 2003 to find that the farther from the University, the less likely a student is to matriculate (Goenner & Pauls, 2006). Their research also indicates that the average income of the applications zip code increased the probability of enrollment, indicating that highly affluent locations will increase enrollment (2006).

Within Ohio, classifying school districts in three typologies also creates a distinct category for suburban type schools. These schools have some similarities, but also many differences from their urban and rural neighbors. Historically, suburban districts were formed after World War II and the flight from urban areas increased. One research study examined 124 public school districts near New York City to examine differences between urban and suburban school districts (Mangino & Silver, 2010). After conducting a multivariate regression utilizing eight variables, the researchers concluded that suburban schools were able to spend up to $10,000 more per student than nearby urban schools (2010). These researchers also concluded that the extra resources within suburban schools allowed those individual students to overcome more obstacles and allow for a school to perform more positively (2010). A different study found that in over 7,500 high school students there was a high adjusted dropout rate in suburban areas despite the fact that suburban schools were able to limit the turnover of students as compared to their urban neighbors (Rumberger & Thomas, 2000). While most research indicates that suburban schools offer more resources and are able to provide better overall academic instruction, there are obviously struggles in all educational settings that need to be evaluated and understood by higher educational professionals.
As with rural versus urban high schools, determining the impact of private versus public high schools could impact student preparedness and retention. While the historical model of private, “boarding” schools may be the norm, newer schools set in the same communities as their public counterparts have become commonplace. Determining the academic profile of each of type of these schools is important.

Private, tuition-based high schools may, generally speaking, have an advantage due to their smaller size. Student participation and academic progress appear to have a greater impact in smaller academic settings of less than 900 students (Kuo, 2010). While many public schools achieve this metric, private schools have an obvious advantage to limit their enrollment based on internal policy where public schools rely on legislative mandates that may require opening their doors to more students. Even with HS GPA being such an important factor in predicting student success in college, unfortunately only 25% of Chicago Public Schools graduates have above a 3.0 GPA (Roderick, Nagaoka, & Coca, 2009). When evaluating the potential for academic success in college, this appears to limit the available pool of students for colleges.

Unfortunately, almost a third of public school students do not graduate with a diploma (Horyna & Bonds-Raack, 2012). Although a portion of this high rate can be attributed to selectivity bias, it appears that self-selecting to be a part of a private school setting improves the chances of completing high school and potentially moving on to college. This selectivity bias can also be related to where the student is from geographically. A study of almost 10,000 students over a five-year period found that students are 2.25 times more likely to attend a school within 60 miles of their high school (Johnson, 2008).
Understanding the various types and locations of districts could improve matriculation, persistence, and graduation success. Understanding the variations between each type of high school, including academic rigor and parental involvement, can improve the admission yield while accomplishing the goal of graduating more students. Efficiency could also be attained in recruiting students by understanding that those geographically closer are more likely to matriculate, while those farther away will not. These variables provide as many questions as answers.

**Ohio High School Performance Indicators**

The State of Ohio now utilizes “Performance Indicators” to create a measurement system that tabulates student knowledge within each school district leading to an “A-F” grade (Ohio Department of Education, 2013c). This school district grading system allows the state to communicate the effectiveness of each school to its constituents. Each school district receives grades for six individual “components”, which are then combined into one overall grade for the school district. The individual component areas are: “Achievement, Progress, Gap Closing, Graduation Rate, K-3 Literacy, and Prepared for Success” (Ohio Department of Education, 2013d). These components measure the schools’ performance against national criteria, its annual improvement, if it is reducing deficiencies in subject areas such as reading or math, the effectiveness at graduating students, improved reading amongst K-3 graders, students’ readiness to enter college or the workforce. These measurements are intended to provide feedback to schools that can then accurately communicate their successes and failures to the community in an easily understandable method.
The Performance Index Score is calculated based on the individual performance of each student and then combined with all other students within the school district to determine a final score on a scale of 0-120 (Ohio Department of Education, 2013a). These scores are determined by student performance on achievement and graduation tests for third through tenth grade students and are weighted on a scale with seven intervals with the lowest being “Tests not Taken” receiving a 0.0 weight and “Advance Plus” performance being the highest and receiving a 1.3 weight (2013a). Overall, when combined with the Ohio District Typology the Performance Index Score should provide an “apples to apples” comparison for community members, administrators, and legislators.

**Race**

When evaluating the success rates of enrolled students, race and gender can significantly impact the outcome of each student. While success varies by institution, whites and females are more likely to persist and graduate than their counterparts (Seidman, 2005). Ensuring all who are admitted have an equal chance at graduation should be an ethical, foundational goal of any institution. Gaining entry to a four-year university appears difficult for minorities. One research study indicated that of almost 4,700 white and Hispanic students, whites were more likely to attend a four-year institution (O’Connor, Hammack, & Scott, 2009). Their research also indicated that the Hispanic students in their study were 12% more likely to begin their academic studies at a community college as compared to their white counterparts (2009). A different study found that Asian applicants were up to 30% less likely to be admitted than their white counterparts (Espenshade, Hale, & Chung, 2005). Although many of these studies are
limited to the campuses and students involved, they begin to show various types of barriers.

While many positive steps have been taken over the last three decades to increase enrollment at four-year colleges by students of color, graduation rates have not made the same, significant, climbs. For example, while total enrollment by African-American students has increased by 18% in the past three decades, there has been only a 6% increase of those students successfully completing their bachelor’s degree (O’Connor, Hammack, & Scott, 2009). This enrollment is more negatively impacted because such limited portions of African-American (23%) and Latino (20%) students are academically prepared for college as compared to their white (40%) counterparts (2009). Although students who are not academically prepared in high school still end up attending college, it can significantly impact access for a population of students who are sorely underrepresented.

With regards to minority applications and enrollment in college, most research creates a parallel with white students indicating that students whose parent(s) attended college and those with higher incomes are more likely to attend. Research also appears to show that for students of color, parental involvement in the decision-making process will increase the likelihood of enrollment (Bergerson, 2009). Another research study of almost 10,000 college applicants found that only 17% were minorities and that their average SAT score was 175 points lower than the non-minority applicants (Young & Johnson, 2004). Unfortunately, for minority students who have not been exposed to the academic requirements of college because their parents did not attend, the lack of preparation is displayed within these SAT scores.
In California students who attended high schools with large populations of minorities are less likely to be offered AP and dual enrollment courses than those of their white counterparts (Bergerson, 2009). Separate research indicates that those minority students who do complete college credits while in high school are more likely to attend college (Lerner and Brand, 2007). Understanding preparation issues such as these may impact admissions decisions by higher education administrators.

Currently, minority racial groups account for 25% of the traditional student population in colleges (Keup, 2008). Minority students are still massively underrepresented on college campuses, as compared to the general population. Based on the lack of progress towards graduation by minority students, excitement regarding enrollment gains should be tempered. A study of almost 9,000 white and African American students in Indiana found that African American students were more likely to be part-time students, partly because of increased financial aid need and the likelihood of supporting themselves (St. John, Hu, Simmons, Carter, & Weber, 2004).

Recently Kinzie, Gonyea, Shoup, and Kuh (2008) discussed the College Learning for the New Global Century report from 2007 and expressed concern at the low levels of participation by minority students in high impact educational practices. The lack of participation in these high impact educational practices indicates that minorities who are able to attend college may not be getting the same education as their non-minority classmates. Minority students who consider the financial ramifications of participating in these activities will consistently be at a disadvantage within the academic setting. Also indicated in a research study evaluating the differing cost of universities by Braucher (2012), is the process of academic and financial disparity. The research indicated that
when including university grant aid, the difference between the published and actual price for a private, nonprofit university is on average $16,000. This unknown difference can put a minority who does not understand how to negotiate for more assistance, at a financial and academic disadvantage. This disadvantage may lead a minority student to only apply at less expensive universities. Minority students paying more up front either have fewer financial resources to attempt extra high impact educational practices or have to work more and thus have less time for educational activities.

The United States has one of the most racially diverse populations in the world. Unfortunately, research indicates that there are common and persistent barriers preventing certain groups from accessing quality higher education. These barriers appear to begin within family settings, socioeconomic backgrounds, and the academic preparation provided by the student’s local K-12 school system. Overcoming these issues and finding students who are able to succeed is a challenge for the higher education professional.

**Gender**

Understanding the differences relating to gender is important in preparing admissions professionals, faculty, and campus staff to assist students based on potentially different needs. Determining academic differences may allow students to prepare better prior to arriving on campus. These differences may also allow a university to create more effective policies and procedure to retain students throughout their degree plan. In a research study examining Christian universities, Waller (2008) found that in 2005, females were less likely to graduate from the Christian colleges in the United States as compared to their public university counterparts. In contrast, a separate research study
found that females were more likely to receive preference with regards to admissions
(Espenshade, Hale, & Chung, 2005). Unfortunately, more research is needed to ensure
equity throughout campus admissions procedures.

Although males score higher on the ACT or SAT exams, females are more likely
to graduate in five years (King, 2006). Determining the college readiness of each gender
appears to provide an advantage to males in math and reading over females (Combs et al,
2010). Understanding these indicators and dichotomies can increase the likelihood of
providing adequate support to students upon enrollment. Gender impacts student
participation in activities on campus, especially with respect to living arrangements and
ethnic background (Case, 2011). After surveying 991 students at faith-based institutions
regarding their academic and student-involvement during their four-year experience,
Case (2011) concluded that females were more likely to benefit positively from living on
campus during their first year of college, including those white females who were most
likely to participate in student groups on campus.

In Norway females were more likely to successfully complete degree programs
that are female-dominated compared to those that were gender neutral or male-dominated
(Mastekaasa & Semby, 2006). Although Mastekaasa and Semby’s (2006) examination
of these 2,400 students is limited within the geographic nature of its implementation
compared to the purpose of this dissertation, it provides insight into potential impact of
retention due to gender and program selection.

Like racial barriers, the need for clear understanding of the differences between
genders leading to academic success and failure is critical. Unlike the racial indicators, it
appears that the academic issues surrounding gender are more complicated and lack the
clear-cut direction to provide higher education professionals. Determining where to allocate resources and how to effectively prepare students will help to enhance academic and professional programs for future generations.

**Student Persistence through the Sophomore Year**

The need to retain students until they complete their degree program is important for financial, academic, and far-reaching societal issues. While students mostly want to complete the needed coursework to obtain a degree, the amount of financial investment by each student varies widely depending on family contribution, university and governmental grants, and cost of the university. A student completing a degree has the potential to impact society in many ways due to the type of industry the graduate works within professionally, the geographical area where the individual spends their time, and if the graduate mentors other educationally. Unfortunately, as recently as 2010, research indicates that 35% of students who entered college dropped out with no plans to return after 6 years (Radford, Berkner, & Wheeless, 2010). Of those 35% of students who dropped out, most of those removed themselves from college in the first 3 years of their academic program. Other retention research shows that those completing an Advanced Placement course are more likely to enroll in a second year of college than those not participating in AP courses (Chajewski, Mattern, & Shaw, 2011). This is important to note for colleges attempting to retain students and move them towards matriculation.

Research does indicate that one group most likely to graduate from college is “white, females, not dating, who live on campus their first semester, and one or both parents having a 4-year degree” (Sparkman, Maulding, & Roberts, 2012, p. 648). While these findings are limited to one institution, it may provide an indication to who is
currently succeeding the most in the established framework of that institution and who may need more assistance to complete their degree. Other research appears to indicate that those full-time students who were not working appear to continue their college education. A study in Italy found that of 228 students, those who had to work either full or part-time jobs while in college accounted for almost 20% of those dropping out (Gilardi & Guglielmetti, 2011). These studies indicate that spending more time on-campus, living or studying, provides an advantage to completing a degree.

Hunter (2006) identified over a dozen key programming areas that will help universities in preparing students at the beginning of their college experience move in a positive direction towards graduation. These experiences begin with orientation and progress through various social, service, and academic events throughout the first year. Focusing students on these types of retention efforts when they first enter the educational community establishes the expectations for the students to matriculate towards their degree.

Doolen and Long (2007) explored the retention of freshman engineering students at Oregon State University. Although Doolen and Long (2007) found that many students were positive towards the engineering field due to salary and type of job activities the future worker would perform, their research identified several areas of concern with regards to the potential loss of students. For example, teaching and learning styles were not congruent in many cases and potentially lead to students who were unable to grasp core information to continue on their degree path. Their research showed that students “occasionally” or “frequently” worried about grasping important knowledge relating to their major, cost to attend the university, and the academic workload (2007).
To improve retention from the onset many institutions have implemented academic courses to assist students in their transition to the campus and educate them on the expectations of their degree plan. While these programs have been implemented in various forms, Almaraz, Bassett, and Sawyerr (2010) examined the impact of a freshman year class directly tied to the students major within a college of business. Utilizing pre and post surveys of 361 students enrolled in this first term transitional course these researchers determined students completing the course felt more confident and prepared for their degree plan, especially the traditionally high-risk first-generation college students. Examples like these are ways in which university can implement coursework to help students adjust and feel as though they are a part of the campus and prepared for their upcoming academic career.

It may behoove a university to complete a “retention plan” that addresses the identified areas needed for student success and implement goals and outcomes surrounding those factors. Unfortunately most institutions do not use a retention plan and fail to understand if they are helping, or hurting, a student. While almost 90% of universities implement academic support programs, conduct first-year programs, and have honors programming, most do not have programs for second year students or create a retention plan annually (Noel-Levitz, 2007).

**College GPA**

Although studies indicate that HS GPA and ACT scores are likely to predict a college GPA, other factors must impact the success or failure of a student (Sparkman, Maulding & Roberts, 2012). While many high school students are high academic
achievers they do not all succeed, while conversely, some poor high school performers receive college diplomas.

The importance of determining which incoming freshmen are at risk for failing in their academic pursuits is important to ensure adequate support services are available. As part of a course 102 undergraduate students were assessed the “LASSI” and “GIBB” instruments to determine if college GPA can be predicted (Kern, Fagley & Miller, 1998). The research found that utilizing the LASSI, GIBB, and ACT scores together could accurately predict college GPA’s over the next several academic terms. The study indicated that these types of unique screening tools, if proven highly accurate, could provide universities with a dynamic resource to retain students.

When evaluating retention, determining factors that will increase the likelihood for a student to complete their degree is important. After completing a study of 204 undergraduates, DeBaerard, Spielmans, and Julka (2004) found that students with higher first term, Y1 GPA’s were more likely to be retained by the university. The authors had students complete the Social Support Risk Factor and the Multidimensional Perceived Social Support Scale (MPSSS) and found those students attaining a 3.10 or above were more likely to be retained versus a 2.50 or below for those not retained. While their study aimed to determine if other social or health factors, such as mental health issues or smoking, influenced retention their research did not support such findings. It is important to note that research could begin to correlate risk factors for students that will be successful, or retained, including Y1 GPA that indicates a “red flag”.

The factors to determine how students can academically achieve more were the focus of Kuh’s et al., 2008 study on first-year college grades. The study focused on how
to better retain students towards graduation and the impact of first-year engagement. After examining over 6,000 students from 18 colleges across the United States who had completed the *National Survey of Student Engagement (NSSE)* at least once between 2000 and 2003 the authors found that those students with lower ACT’s (20 composite) were able to improve their college GPA .06 points by participating in educational activities such as studying or tutoring. The amount of improvement decreased as the student ACT increased, but still provided a marginal (.02%) increase in Y1 GPA (2008). The researchers also found that participating in these academic activities helped a majority of students in their second year, especially African American students. The research by Kuh et al, is another example of how determining risk can mitigate the attrition of students during their academic experience. Lastly, research shows that Y1 GPA determines not only the cumulative college GPA amongst graduates, but the likelihood of graduation within six years (Gayles, 2012). Gayles’ research shows, through a logistic regression, that when the Y1 GPA for a student increases it also increases, and in some cases doubles, the likelihood of graduation (2012).

**Academic Credits Earned per Term/Year**

Universities establish academic calendars and determine a degree path that involves taking a variety of courses in a determined sequence for a student to obtain a degree. Often times the more introductory courses are at the beginning of the degree to establish a foundation of ideas and concepts, with more difficult and specialized skills occurring as the student reaches completion. Students take varying course loads of credits based on academic ability, financial security and outside commitments, such as
work and personal life responsibilities. Full-time students are almost 10% more likely to persist to the next academic year than those who are part-time status (Seidman, 2005).

First-generation college students take fewer credit hours per term than their peers based on a study of 1,613 entering college in the Fall of 1992 (Pascarella et al., 2004). Their study showed that first-generation students attempted fewer credit hours, worked more hours at a job, and lived off campus when compared against their peers. Their study also suggests that the negative impact of this first-year experience may have a cumulative effect at the end of the second and third years of the degree plan. Students begin to fall behind in their progression towards a degree and ability to focus on academics and ability to spend time on campus, thus decreasing their performance level (Pascarella et al., 2004).

Another group of students who are less likely to persist are those who often take courses and gain no credit toward the degree path. This type of student can take several forms, including those who have to repeat or take remedial courses. This type of student can significantly increase the time it takes to earn a four-year degree and the amount of money they borrow. Due to these factors, taking even three credit hours of remedial coursework reduces success by 15% and remedial work combined with excessive use of withdrawals or course repeats reduces the likelihood of graduation by 50% (Kinzie, Goyea, Shoup, & Kuh, 2008).

When examining a student’s ability to complete their degree in a timely manner, higher education in general must understand the likelihood of a student being able to complete a specific degree. Robinson (2004) analyzed the student’s likelihood of graduation and found that 58% followed a “straight path” through their degree plan and
did not have to retake courses, stop or withdrawal, allowing these students to graduate “on time”. There was a small population (8%) that graduated in the same amount of time after having failed some coursework, with another 8% of students who dropped out temporarily. The study also found that 11% of students transferred to another program within the university, with many returning to the original program of entry. These results indicate that students are able to complete the program in the allotted time and have many degree plan options indicating that degree plan is not a single barrier to retaining and matriculating students.

**Full-Time versus Part-Time Students**

The amount of credit hours a student completes per term towards their graduation is important for students earning a bachelor’s degree. In most cases the university and the student want the degree completed in as efficient a period of time as possible.

In the United States college credits are awarded based on the degree granting institution. Universities may determine their credit hours in any way they wish, but if the institution wishes to qualify for Title IV funding and provide federal financial aid most choose to follow the Department of Education’s basic definitions (Wellman, 2005). This includes how full and part-time statuses are defined. This uneven definition of credits can hamper a student when transferring between universities and finding differing application of credits. For example, Laitinen (2013) discussed the inability for students to transfer between universities because of the unequal application of the term “credit”. Laitinen goes on to discuss how students believe credits are “currency and assume they will transfer from one school to the next”, when in reality each school gets to determine
which courses, credits, and level of performance qualify to complete a degree (Laitinen, 2013, pgs. 64-65).

Traditional students are the largest group of full-time enrolled students at four-year campuses. These students typically have not had to work during their degree to save money towards their degree path or support others prior to attending (Sales, Drolet, & Bonneau, 2001). Those with financial issues or who are not academically ready are more likely to attend as a part-time student, could take as many as seven years longer to complete a degree, but most importantly are more likely not to complete the degree.

The literature has indicated that part-time students appear to be at a disadvantage when compared to their full-time counterparts with regards to graduation success rates. A recent study examining private universities found that although there may be more opportunities for part-time students to enroll, the lack of flexibility and limited class schedules clearly limits the potential for success for this type of student (Walker, 2008). Ensuring that part-time students are being adequately served through campus support programs at smaller, private universities is key to the success of these part-time students.

The disadvantage to part-time students is indicated in two other research studies. The first examines over 4,500 students (of which almost 350 were part-time) and the likelihood of students to stay enrolled or return after dropping out (Stratton, O’Toole, & Wetzel, 2007). This study focused on students beginning in 1992 and found that part-time students, especially those first generation college students, were more likely to drop out of college. Recent research indicates that almost 50% of students enroll at part-time status at least one term during their undergraduate program (Chen, 2007). Chen’s
research also indicates that part-time students may also be entering college at an academic disadvantage needing more remedial coursework.

A study conducted in the United Kingdom of almost 1,400 students in their final year of high school found that students who have to work while completing their degree are more likely to live at home and take less courses (Callender & Jackson, 2008). Fully understanding the capacity of coursework students are able to complete will allow universities to create programs that better meet the needs of its students. Also, by understanding students and their academic motives universities will be better suited to provide academic, financial and social services to increase student success.

Research appears to conclude that part-time students at four-year universities are at a disadvantage. These disadvantages are exacerbated by the need to work, take remedial coursework, and being unable to participate in many campus activities and academic resources. Universities will need to examine the impact of course offerings, available resources, and clearly communicating goals to all students to increase success for all.

**The Impact of Student Involvement**

One aspect of matriculation is to ensure that students are engaged academically and socially on campus immediately upon beginning their experience. Students should be active within their courses with their faculty and socially as a part of co-curricular activities. The need for student involvement varies throughout the student experience and is based on the wide-range of variables that may impact a student during their time on campus (Astin, 1984). Examining student involvement is important to understand why students may fit certain admission criteria. A research study by Espenshade, Hale,
and Chung (2005) found that students recruited for varsity athletics received admissions preferences when compared to their cohort. Overall, determining a balance between how much to get a student involved to increase their academic, social and professional success is a key aspect of the higher education professional.

Examining how the student spends time on the campus is more than just academics. Student involvement theory asserts that academics, interactions with faculty members, participation in student organizations, and spending time on campus are all important aspects of a well-rounded student (Astin, 1984). The five stages of the student involvement theory are: 1) student investment of “physical and psychological energy”, 2) student involvement “occurs along a continuum”, 3) student involvement is “both quantitative and qualitative”, 4) student learning is “directly proportional to the quality and quantity of student involvement”, 5) effective education is directly related to “the capacity of that policy or practice to increase student involvement” (1984, p. 298). Astin (1984) asserted that the student’s experience on campus is a two-sided coin that must be balanced and that both the academic and co-curricular involvement of the student enhances each other.

The need for student involvement is reinforced by Wolniak, Mayhew, and Engberg (2012) who showed that students who move on to the second year of their degree plan were more likely to be engaged academically and socially on campus. These types of indicators provide cause for universities to determine which factors influence their specific students to persist beyond the first year. Lastly, research indicates that first-year students who envisioned their campus involvement “accurately predicted their future involvement” (Case, 2011, p. 183).
Traditional students are more likely to be engaged in on-campus activities as a way to socialize and deal with emotional stressors. These activities allow peer interaction with others from their age group, since non-traditional students are less likely to participate because they focus strictly on academic activities and personal responsibilities (Bye, Pushkar, & Conway, 2007). Expanding this point is discussion by Pace (1998) focusing on the emergence of technology and distance learning impacting, or eliminating, the on-campus engagement. Pace’s (1998) central argument is that traditional students need to be immersed in these behavioral settings for a well-rounded experience that will help the student both academically and non-academically.

It is important to determine the impact of the engagement of traditional students with regards to their academic success. One aspect of success by traditional students was displayed by the research of over 1,100 random students across the nation who completed the College Student Experience Questionnaire (CSEQ). Pike and Kuh (2005) determined that those students who lived on campus were more likely to have direct, positive gains with regards to learning and indirect positive gains regarding social engagement. For residential campuses, with a high number of traditional students, this type of data provides important benchmarks for where student learning can begin.

Student involvement in the classroom, and in social activities, appears to foster an environment of growth for the student. Shaping how to balance the requirements of the classroom and nonacademic pursuits may impact retaining students.

Student Debt

When creating plans to help students proceed towards graduation, managing student debt levels is a difficult balancing act of providing services to a student at a
manageable price. When costs exceed the student’s ability to pay, offering loans is an option that is the student’s right to decline. Research conducted by Wolniak, Mayhew and Engberg (2012) showed students who receive more grants and take out less student loans (debt) are also more likely to persist to that next academic term. As recently as 2012 “the average student debt was more than $27,000” and defaults on student loans have more than doubled since 2007 (Ross, 2013, p. 24).

A significant portion of college students use some form of financial aid to complete their college payment plans. To increase the likelihood of enrollment, colleges can assist prospective students in completing their admissions application and federal financial aid application to help improve enrollment by 50% for those students in need of federally backed loans (Roderick, Nagaoka, & Coca, 2009). The investment of time in assisting these prospective students is worthwhile when a significant portion of these students may be first-generation college students and the first to navigate the federal loan and college payment process.

Examining the impact of how parents support their child financially during college is an important aspect to examine. Since approximately 45% of financial aid came from federal loans in 2008, totaling over $4 billion dollars in support, students, parents, and universities may want to examine how to effectively curtail loans (Elliott & Beverly, 2011). Research suggests that of students who are on course for their academic degree, 82% of students come from high-income households that make over $84,000 annually. Their research suggests that parents who have the ability to save for both the family in general and the student’s academic pursuits increases the likelihood of student success. Additionally, the research also shows that when the student has college savings
of their own, it increases their academic success two fold. The research also suggests that those who have the personal ability to fund their college education may borrow less and be more academically successful.

Similarly, the perception of the student and parent about utilizing loans can impact where, or if, a student attends college. After interviewing almost 600 parents, teachers and students from five states, Perna (2008) found that almost all of the 9th & 11th graders participating did not fully understand how the federal and private college loan programs are distributed or repaid. The researcher also found that there is a high level of anxiety by both the students and parents from middle and low-resource (income) schools with regards to paying back loans. Many of these students view the process of taking out a loan for college as “risky” and are hesitant to borrow (2008). Conversely, parents and students in high-resource schools understand the potential need for loans and have considered the cost-benefit analysis of how much they may need to borrow compared to the increase in salary after graduation. These interviews identify a gap in education between prospective students and families on the proper usage of the student loan program.

For those students who persist in their degree plan, financial aid can be a viable option to assist in the completion process. Those “non-completers” who take out loans and are left without a degree may feel twice the financial effect: a lower paying job and the need to pay back student loans. The U.S. Department of Education indicates that as recently as 2009 of those students who received Pell Grants, 30% failed to complete a degree within six years (Soldner, 2011). The impact on these non-completers is reinforced by research indicating that non-completers were 7% less likely to be employed
and earn almost $9,000 less than their degree attaining counterparts (Chang Wei & Horn, 2013).

Economic support from their family members is not an option for some students. When examining almost 8,000 students from public high schools Easton-Brooks and Davis (2007, p. 538) found that “income-generated assets” were a more likely predictor of student success than traditional SES variables for African-Americans. The research found the opposite result for European Americans. While the study focused on high school students, one could argue that finding solutions that encourage and engage students and parents of all types to complete high school and make college an option is an important step. Similarly, a separate study examined 530 students to find adult learners were more concerned over the ability to pay back student loans (Kimmel, Gaylor, Grubbs, & Hayes, 2012). Those adult learners are investing time thinking about how they will pay for student loans, working during their degree plan, and determining the value of the degree more than their traditionally aged counterparts.

Student debt appears to be one, if not the biggest, key factor in determining which students matriculate to, and persist in, college. While there also appears to be a clear line drawn with student debt regarding race, other factors appear to be important. Higher education needs to continue asking questions relating to the differences in gender, age, professional experience and the types of degrees sought to fully understand these issues.

**Summary**

Ensuring that a student is making positive, significant progress towards completing their degree is the foundation of any retention plan. When students arrive on campus at the beginning of their freshman year, one of their academic goals is to
complete their degree and graduate. Universities are in a unique position to create the entire academic process that the student must choose to follow and complete so that they can graduate. By holding the power over what classes students have to take, when, at what cost, and to what “success” for each course is defined as, means that after a significant investment of time, money, intellect and emotion, the university can determine that the student is not worthy of the degree.

Previous literature suggests that a variety of demographic, student performance, and college policies can impact student persistence beyond the first year of college. Literature also indicates that accounting for high-risk factors, such as race, gender, and financial debt could prepare both the student and university for success. The examined research confirms the generally accepted notion that high quality schools with more financial resources provide students with more preparation and possibly more college credit when entering college. Those students entering college with higher HS GPA’s and college entrance exams appear to have a better foothold on college than those attempting to catch-up academically. The literature does suggest that university policies relating to which Advanced Placement, and other college preparatory programs, credits transfer to their institution can positively or negatively impact student success as well.

Literature also indicates that students coming from families with secure financial backing to assist with college expenses and those families who have successfully completed college will improve their child’s likelihood of success in college. Limiting student debt appears to enhance the student experience, allow more time for academic coursework, and allow the student to graduate in a normal timeframe. For those students who are not first-generation college students they appear to have emotional and
intellectual support that helps navigate all aspects of the college process and encourage academic persistence.

In summary, research suggests that universities must be cognizant of the types of students applying to their institution and how they will be evaluating those who are admitted. Furthermore, the research indicates that universities must be selective in the students they admit to ensure compatibility for both the expectations of the student and the institution (Mattern, Shaw, & Kobrin, 2010). Lastly, while attracting, admitting and enrolling a student may be vital to a university’s success, retaining those students is equally important. Universities that take the time to evaluate the degree path, the ability of a student, and factors that impact persistence, increase the likelihood for success.
CHAPTER III: METHODOLOGY

Introduction

The purpose of this study was to examine the relationship between high school academic performance, initial college academic performance, and college debt with regards to students' persistence within an undergraduate college through their second year. This study sought to determine if there are certain variables more characteristic in students that continue to persist beyond the second year of an undergraduate program and the potential impact of student loan debt levels. This study examined variables representing admissions selection criteria, high school quality, initial college performance, college debt, and student involvement while exploring differences and similarities between those successful students who complete the second year of an undergraduate degree path and those who do not. These data reflected cohorts from three academic years. This chapter describes the data sources and the analyzed samples, along with describing the proposed statistical methods and model used.

Data Sources

Data were collected directly from the Midwest Private University (a pseudonym). All students within this sample are from public high schools within the state of Ohio. Most students come from above average academic backgrounds (HS GPA or ACT/SAT scores) with an average ACT composite score of 26 (See Table 2), compared to the national composite score of 20.9 for entering freshmen in the 2013-2014 academic year, and are traditional in age direct from high school (ACT, 2013). The information from within the sample was processed by university employees and provided directly to the researcher. Data were also be obtained from the State of Ohio’s Department of
Education website to determine high school geographic typology and school district performance index. The school district performance index is an Ohio Department of Education determination of the overall performance of each school by assessing the achievement of each student on a scale of 0-120 regarding grades 3-10’s performance on achievement and graduation tests (Ohio Department of Education, 2013a). This information is public information and relates to the student’s high school of origin. No information was directly obtained from the student’s high school.

Midwest Private University is a small, private, faith-based university in Ohio. This university offers undergraduate and graduate degree programs to over 3,500 students annually. Approximately 15% of the campus identifies themselves as a minority. There are over 50 undergraduate academic majors, and over 250 extracurricular and varsity athletic activities for students to choose.

Table 2

Institutional Profile of Midwest Private University

<table>
<thead>
<tr>
<th>Enrollment Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student enrollment</td>
<td>3,250</td>
</tr>
<tr>
<td>Average ACT composite</td>
<td>26</td>
</tr>
<tr>
<td>% receiving student aid (grants, scholarships, or federal financial aid)</td>
<td>Over 90%</td>
</tr>
<tr>
<td>Admissions selectivity</td>
<td>65% of applications are accepted</td>
</tr>
<tr>
<td>Admissions yield</td>
<td>27%</td>
</tr>
<tr>
<td>In state enrollees</td>
<td>80%</td>
</tr>
<tr>
<td>Out of state enrollees</td>
<td>15%</td>
</tr>
<tr>
<td>International enrollees</td>
<td>5%</td>
</tr>
<tr>
<td>Gender distribution</td>
<td>50% Male/50% Female</td>
</tr>
<tr>
<td>Ethnic distribution</td>
<td>85% White</td>
</tr>
<tr>
<td>Number of undergraduate majors</td>
<td>50</td>
</tr>
<tr>
<td>Number of student activities and varsity sports</td>
<td>250</td>
</tr>
</tbody>
</table>

Note: Student enrollment information is rounded to the nearest hundred to protect the identity of the cooperating university. Exact figures of the remaining characteristics were rounded to the nearest “5” to protect the identity of the cooperating university.
Identifying the Study’s Sample

Participants in this study came from university panel data on students admitted to undergraduate programs during the 2009-2010 to 2011-2012 academic years. This university directly admits all students to the college of admissions, so all students entered their respective major during their first year. The students during this three-year time period represent almost 900 participants.

The data were assumed to be reliable and valid since the data are generally accepted across the university and are used for a variety of internal and external university reports. Data consisted of student performance while in high school (i.e., an ACT or scaled SAT score) and the type of high school attended. Student race and gender were also included. Lastly, college performance, participation, and student federal loan levels were utilized as a measure. The data types received from the university lead to creating appropriate coding systems for loading into the statistical software. Data were requested from the Midwest Private University (a pseudonym), a private university in the Midwestern United States, from its departments of financial aid and institutional research. The university student ID number was utilized as an identifier to keep confidentiality within the student data set. Data in this study were approved by Midwest Private University’s Institutional Review Board in November 2012 for initial collection and Bowling Green State University’s Human Subjects Review Board in April 2014 approved its use through an Exempt Review status (see Appendix for approval documents). Data originating from the State of Ohio’s Department of Education are publicly available on their website and relates only to the high school of origin and not the individual student.
The data from each university department were combined based on the student ID number into a Microsoft Excel spreadsheet. Once combined, the data was reviewed to ensure that information is consistent and accurate. Lastly, information was loaded into the SPSS 20 software for statistical analysis.

**Conceptual Framework**

The design of this study was guided by a conceptual framework (see Figure 1) that identified factors that may lead to a student continuing their education beyond the second year of their educational process (retention) or leaving the university (attrition). These variables include academic background, ethnic background, gender, federal student loan status, and other quantitative factors that create a profile for each student prior to enrollment at the university and during their first two-years on campus.

The conceptual framework in Figure 1 shows various stages of the student academic process. “Student Demographics” are those factors out of the student’s control (e.g., gender, ethnic background, high school district typology and high school performance indicators) prior to enrollment at the University. While debate could occur over the high school geographic typology and school district performance index being included in this section, often the student is at the mercy of where the parent(s) choose to reside. “Student Enrollment Characteristics” refer to the student’s academic profile prior to enrolling at the university (e.g., ACT score or earning college credits while in high school). Lastly, “Student Academic Characteristics” are those persistence factors that evolve while enrolled (e.g., amount of financial aid need, college GPA by year) and impact the likelihood of success for each student.
Figure 1. Conceptual Framework for Student Retention.

The logistic regression model for student retention is shown below:

Retention Model

\[ Y_{ij} = \alpha + \beta_1 AC_{ij} + \beta_2 HG_{ij} + \beta_3 CH_{ij} + \beta_4 DT_{ij} + \beta_5 PI_{ij} + \beta_6 RG_{ij} + \beta_7 CG_{ij} + \beta_8 CC_{ij} + \beta_9 FT_{ij} + \beta_{10} SI_{ij} + \beta_{11} VA_{ij} + \beta_{12} SL_{ij} + \beta_{13} FC_{ij} + \beta_{14} LG_{ij} + \epsilon_{ij} \]

Such that:

\[ Y_{ij} = \text{Retention of the individual i in Year j} \]
\[ P(Y=0) = \text{Individual in year i in Year j stays at the university} \]
\[ P(Y=1) = \text{Individual in year i in Year j leaves the university} \]

\[ AC_{ij} \quad \text{A variable of student ACT score of Individual i in Year j;} \]
\[ HG_{ij} \quad \text{A variable of HS GPA of Individual i in Year j;} \]
\[ CH_{ij} \quad \text{A variable of college credits while in high school of Individual i in Year j;} \]
\[ DT_{ij} \quad \text{A variable of high school district typology of Individual i in Year j;} \]
\[ PI_{ij} \quad \text{A variable of high school performance indicators of Individual i in Year j;} \]
\[ RG_{ij} \quad \text{A vector of race and gender of Individual i in Year j;} \]
\[ CG_{ij} \quad \text{A variable of college GPA of Individual i in Term j;} \]
\[ CC_{ij} \quad \text{A variable of student college credits of Individual i in Term j;} \]
\[ FT_{ij} \quad \text{A variable of student course load status of Individual i in Year j;} \]
\[ SI_{ij} \quad \text{A variable of student involvement of Individual i in Year j;} \]
\[ VA_{ij} \quad \text{A variable of varsity athletic participation of Individual i in Year j;} \]
\[ SL_{ij} \quad \text{A variable of student loan dollars of Individual i in Year j;} \]
\[ FC_{ij} \quad \text{A variable of expected family contribution of Individual i in Year j;} \]
\[ LG_{ij} \quad \text{A variable of legacy status of Individual i in Year j;} \]
\[ \epsilon_{ij} \quad \text{Error term assumed to be logistically distributed} \]
Modeling Student Retention

This study sought to determine what variables are associated with the retention of enrolled students through the first two years of matriculation. Although ordinary least squared regression (OLS) is a common statistical approach in social science research, it is not appropriate for this study, which has a dichotomous outcome pointing to why a student persists or not.

Since OLS regression is not an appropriate option, this study utilized a binominal logistic regression to help predict the probability of each independent variable based on its relationship to the dichotomous dependent variable.

Interpreting Results of Logistic Regression

In this section, interpreting the results of a binominal logistic regression is discussed. Those items include: odds ratios, significance testing, and indicators of model quality.

Odds Ratios

Understanding the likelihood of an event occurring, or not, when examining the different variables helps define odds ratio (Wang, 2011). An example of odds ratio is when at the completion of a study the outcome states, because of X, someone is Y times more likely to do something. As the slope, or likelihood, increases, the odds that a positive association increases. Conversely, if the slope decreases, a negative relationship is inferred (Menard, 2002). This relationship is tested against all independent variables within the model in order to determine the relationship with the dependent variable. By comparing the difference in odds before and after the change in independent variables one can better understand the positive (outcome greater than 1) or negative effects (outcome between 0 and 1).
Significance Testing

To evaluate each independent variable’s contribution of the dependent variable is an important step in a logistic regression analysis. This research utilized the Wald statistic to “test for the statistical significance of individual coefficients” (Menard, 2002, p. 43). The Wald statistic will only model the null hypothesis against various coefficients to provide direction for the researcher. Unfortunately, the Wald statistic provides an unstable result in studies with a small sample size because of an inflated standard error, potentially leading researchers to fail to reject the null hypothesis (Bewick, Cheek, & Ball, 2005). Due to the potentially unstable result from the Wald statistic a likelihood ratio test will be conducted to confirm or reject the null hypothesis. This test assesses the distribution of the degrees of freedom with each variable included, and excluded, from the model (2002).

Indicators of Model Quality

Traditional R-squared goodness-to-fit measures do not apply in logistic regression analysis. R-square is typically the square of the correlation and then uses the model’s predicted and actual values and ranges between 0-1 and used to explain variation between variables (Mertler & Vanatta, 2010). In logistic regression, a pseudo R-square scale attempts to compare how much variation from the dependent variable has occurred. Utilizing a pseudo R-squared accounts for the variations between variables but completes this process through an estimation process. The SPSS 20 data analysis package will run and report both modeling processes for Pseudo R-squared from both Cox & Snell and Nagelkerke. Multicollinearity diagnostics of the model will include running simple correlations among similar predictor variables. Examining the standard errors of the predictor variables within the model (looking for excessively large standard errors) is
important to understand the tolerance value. Variance inflation factor analysis (VIF) will also be conducted for the predictor variables to understand linear associations. Myers (1990) has stated that, “Though no rule of thumb on numerical values is foolproof, it is generally believed that if any VIF exceeds 10, there is reason for at least some concern…” (p. 369). This suggestion has been reiterated in more recently published statistical texts for the social sciences (e.g., Kutner et al., 2004; Stevens, 2002). When conducting a logistic regression certain independent variables (IV’s) can cause issues because they rely on other independent variables. Due to this reliance, the lower the multicollinearity the more likely the need to remove independent variables that may be causing issues.

Variables in the Models Related to Student Persistence

The following is a description of the variables entered into the retention model (See Table 3). The operationalization of variables will be explained. Lastly, citing relevant sources will provide evidence of their grounding by the literature.

Student Demographics

This study examined the District Typology \( DT_{ij} \) based on the Ohio Department of Education’s (ODE) evaluation standards. This typology will categorically identify each school district based on the ODE’s typology code (0=Special Districts; 1=Rural-High Student Poverty & Small Student Population; 2=Rural-Average Student Poverty & Very Small Student Population; 3=Small Town-Low Student Poverty & Small Student Population; 4=Small Town-High Student Poverty & Average Student Population Size; 5=Suburban-Low Student Poverty & Average Student Population Size; 6=Suburban-Very Low Student Poverty & Large Student Population; 7=Urban-High Student Poverty & Average Student Population; 8=Urban-Very High Student Poverty & Very Large
Student Population. This study examined the ODE Performance Indicator \( PI_{ij} \). This variable was assessed on a continuous scale of 0-120 as indicated by the State of Ohio.

Each student’s racial background will be identified \( RG_{ij} \) categorically (0=Other/Multi-Racial; 1=White/Caucasian). Data were treated as panel data and will be dummy coded to identify the importance of each categorical variable. The individual student’s gender was also identified categorically (0=Female; 1=Male).

**Student Enrollment Characteristics**

In this study, a variable of the ACT Score \( AC_{ij} \) of the individual student \( i \) in one of the various years \( j \) was identified. This variable was assessed on a scale (Continuous) of 1-36, with the highest reported score being utilized when there is more than one test score provided. Students earning credits through Advanced Placement (AP) testing, Post-Secondary Options, or Dual Enrollment \( CH_{ij} \) had their applicable credits noted on a continuous basis as the appropriate interval quantity of 0.5-65 semester hours. The individual high school student’s overall high school GPA \( HG_{ij} \) utilized a continuous scale from 0.00-4.99. Midwest Private University converts all high school GPA’s to a 4.00 scale, even though weighted scores may range from 4.00-4.99.

**Student Academic Characteristics**

While enrolled in the university, the following factors were utilized to evaluate the impact of student retention through the second year of college. These factors may change from year-to-year and impact a student’s decision to continue school on a term-by-term basis. The characteristics of an individual \( i \) in year \( j \) include the amount of academic credits (Continuous) earned by a student \( CC_{ij} \) and may include fractions. The
overall student’s college GPA (Continuous) at the conclusion of each academic year \( CG_{ij} \) was averaged to the hundredths position (i.e., 3.25 GPA).

Determining the course load a student undertakes each academic year and their status as a full-time or part-time student \( FT_{ij} \) was categorically operationalized (0=Full-Time Student; 1=Part-Time Student).

Those entering the university were identified if they were the first member of their family to attend Midwest Private University or not \( FG_{ij} \). This variable (Categorical: 0=Legacy; 1=Not a Legacy) will include if the student has family who has previously completed college at the university.

Certain students choose to participate in activities \( SI_{ij} \) and varsity athletics \( VA_{ij} \). This participation may impact the individual students’ ability in a given year (j) to succeed academically. Student involvement in each extra-curricular, on-campus student group will be noted as the appropriate interval quantity (Continuously 0-15). Based on their first and second year of enrollment each student’s involvement was quantified.

For varsity athletics, students will be identified based on their participation each academic year (Categorical: 0=No Varsity Participation; 1=Varsity Participation). The primary variable of interest in this study is the amount of student federal loan debt a student must incur to continue their degree path. For that reason, each individual student (i) will have their student federal loan debt level \( SL_{ij} \) evaluated each year (j). Student federal loan debt level (Continuously) will be tracked on an academic year basis in terms of dollars. Associated with this variable, each student will have their family’s financial
strength calculated \( F_{C_{ij}} \) according the formula established by law in the United States and will be provided (Continuous) by Midwest Private University.

**Table 3**

*Variables in the Model*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Grounding in the Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance indicators</td>
<td>Continuous</td>
<td>Ohio Department of Education, 2013a; Ohio Department of Education, 2013c; Ohio Department of Education, 2013d</td>
</tr>
<tr>
<td>Race</td>
<td>Categorical</td>
<td>ACT, 2013; Bergerson, 2009; Braucher, 2012; Espenshade, Hale, &amp; Chung, 2005; Fischer, 2007; Keup, 2008; Kinzie, Gonyea, Shoup, &amp; Kuh, 2008; Roderick, Nagaoka &amp; Coca, 2009; O’Connor, Hammack, &amp; Scott, 2009; Seidman, 2005</td>
</tr>
<tr>
<td>Gender</td>
<td>Categorical</td>
<td>Case, 2011; Espenshade, Hale, &amp; Chung, 2005; King, 2006; Mastekaasa &amp; Semby, 2006; Seidman, 2005; Sinha, Oswald, Imus, &amp; Schmitt, 2011; Waller, 2008</td>
</tr>
<tr>
<td>ACT or SAT score</td>
<td>Continuous</td>
<td>Cimetta, D’Agostino, &amp; Levin, 2010; King, 2006; Marsh, Vandehey, &amp; Diekoff, 2008; Seidman, 2005; Syverson, 2007</td>
</tr>
<tr>
<td>College credits earned in high school</td>
<td>Continuous</td>
<td>Chajewski, Matter, &amp; Shaw, 2011; Klopfenstein &amp; Lively, 2012; Meyer, 2012; Sadler, Sonnert, Tai &amp; Klopfenstein, 2010; Schneider, 2009; Wilson and Adelson, 2012</td>
</tr>
<tr>
<td>High School GPA</td>
<td>Continuous</td>
<td>Berry &amp; Sackett, 2009; Cimetta, D’Agostino, &amp; Levin, 2010; Levin &amp; Wyckoff, 1991; Mattson, 2007; Roderick, Nagaoka &amp; Coca, 2009; Seidman, 2005; Soares, 2012</td>
</tr>
<tr>
<td>College credits</td>
<td>Continuous</td>
<td>Kinzie, Gonyea, Shoup, &amp; Kuh, 2008; Pascarella et al, 2004; Robinson, 2004; Seidman, 2005</td>
</tr>
<tr>
<td>Full-time vs Part-time status</td>
<td>Categorical</td>
<td>Calleender &amp; Jackson, 2008; Chen, 2007; Laithinen, 2013; Sales, Drolet, &amp; Bonneau, 2011; Stratton, O’Toole, &amp; Wetzel, 2007; Walker, 2008; Wellman, 2005</td>
</tr>
<tr>
<td>First generation status</td>
<td>Categorical</td>
<td>Fischer, 2007; Pascarella, Pierson, Wolniak, and Terenzini, 2004</td>
</tr>
<tr>
<td>Student involvement</td>
<td>Continuous</td>
<td>Astin, 1984; Berger and Milem, 1999; Bye, Pushkar, &amp; Conway, 2007; Case, 2011; Espenshade, Hale, &amp; Chung, 2005; Pace, 1998; Pike &amp; Kuh, 2005; Wolniak, Mayhew &amp; Engberg, 2010</td>
</tr>
<tr>
<td>College varsity athletics</td>
<td>Categorical</td>
<td>Astin, 1984; Espenshade, Hale, &amp; Chung, 2005; Wolniak, Mayhew &amp; Engberg, 2010</td>
</tr>
<tr>
<td>Student debt level and EFC</td>
<td>Continuous</td>
<td>Chang Wei &amp; Horn, 2013; Elliott &amp; Beverly, 2011; Kimmel, Gaylor, Grubbs, &amp; Hayes, 2012; Perna, 2008; Roderick, Nagaoka &amp; Coca, 2009; Ross, 2013; Soldner, 2011; Williams, 2006; Wolniak, Mayhew &amp; Engberg, 2012</td>
</tr>
</tbody>
</table>
Delimitations

This study utilized existing data provided by Midwest Private University in the state of Ohio. This information was processed by university employees of Midwest Private University and provided to the researcher and relies on the institution’s internal processes for the accuracy and reliability of the data.

This study is delimited to a single private, undergraduate four-year university in a Midwestern state over a three-year admissions span. The data included students enrolling as freshmen from the 2009-2010 through 2011-2012 academic years. The study is also delimited to examining only the first and second year of student performance to understand who attains third-year status in the retention process. Due to the size and ethnic make-up of the data set, students were classified as either “white/Caucasian” or “other/multi-racial”. The data included limited amounts of those identifying an ethnic background other than white. Lastly, this study only examined entering students who originated from a public high school in Ohio as compared to their high school performance indicators and district typology on a consistent basis.

In order to control for grading styles and varying fees the data set excluded students that transferred colleges within the university after the start of their college experience. This choice was made to focus only on students who entered college as a first-time freshman and maintained consistency in one academic program.

Limitations

This study utilized existing data provided by Midwest Private University in the state of Ohio. The information came individually from each of two different sources on campus (financial aid and institutional research) and were combined based on university
student ID number by the researcher. Data regarding the high school district typology and performance indicators were obtained publicly from the State of Ohio’s Department of Education website. Data were combined and then analyzed utilizing SPSS 20.

The data were limited to the financial aid information that is accessible for all enrolled students, the “Expected Family Contribution” and federal loan amounts that certain students accepted on a term-by-term basis. Although some students utilize other means of financial assistance, from sources such as grants, family members, or outside jobs, these items cannot be controlled for in this study.

Information within this data set was limited to student data from three undergraduate colleges on the campus. The students were from the Colleges of Arts & Sciences, College of Business Administration, and the College of Engineering.

Since the data utilized is consistently used for internal and governmental reporting reasons, it was reviewed by the appropriate university supervisors and administrators. Lastly, a logistic regression analysis does not show causation. It only makes inferences regarding the variables within the formula.
CHAPTER IV: PRESENTATION AND ANALYSIS OF RESULTS

Introduction

The purpose of this study was to examine the relationship between high school academic performance, initial college academic performance, and college federal loan debt with regards to students' persistence within an undergraduate college beyond their second year. Specifically, it sought to determine if there are certain criteria that are more likely in students who persist beyond the second year of an undergraduate program when considering the potential impact of student federal loan debt levels. This chapter includes descriptive statistics, the results of inferential analyses, and closes with a summary of findings.

Descriptive Analysis

In this chapter, descriptive analyses of the data are presented. Initially, student demographics are examined and discussed. These are followed by specific descriptive analysis relating to frequencies and percentages of student enrollment and persistence, which also serve as the primary independent variables within this study.

For the study 878 first-time, freshmen students from Midwest Private University’s three undergraduate colleges (Business, Arts & Sciences, and Engineering) who entered during the 2009-2011 academic years were included (see Table 4). All students were from Ohio public high schools. Of the students studied, 817 (88%) self-identified as Caucasian. Of the remaining 12% of students, 25 (2.7%) self-identified as African-American, 8 (0.9%) as Hispanic, 21 (2.3%) as multiracial/other, 2 (0.2%) as Pacific Islander, 4 (0.4%) as Asian, and 1 (0.1%) as American Indian. Those students not reporting race (66) were categorized as “Caucasian” due to the likelihood of this
demographic occurring at Midwest Private University at the time the study sample occurred. All non-Caucasians were grouped in one category for the purposes of the study to increase sample size within this variable. With regard to gender, 347 (39.5%) were females and 531 (60.5%) were males. Lastly, due to limited selection sizes within certain high school geographic groups, the eight state of Ohio subgroups were combine into four like groups: rural (23%), small town (37%), suburban (31%) and urban (9%).

Table 4

Descriptive Statistics of First-Time Student Cohorts, Academic Years 2009-2011

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>16</td>
<td>35</td>
<td>25.28</td>
<td>3.61</td>
</tr>
<tr>
<td>High School GPA</td>
<td>1.81</td>
<td>4.91</td>
<td>3.5627</td>
<td>0.48</td>
</tr>
<tr>
<td>College Credits while in High School</td>
<td>0</td>
<td>44</td>
<td>2.41</td>
<td>6.10</td>
</tr>
<tr>
<td>High School Performance Indicator</td>
<td>67.33</td>
<td>115.12</td>
<td>102.72</td>
<td>6.07</td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>1</td>
<td>0.60</td>
<td>0.48</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>1</td>
<td>0.40</td>
<td>0.48</td>
</tr>
<tr>
<td>College GPA</td>
<td>0</td>
<td>4</td>
<td>2.98</td>
<td>0.80</td>
</tr>
<tr>
<td>College Credits</td>
<td>0</td>
<td>29</td>
<td>12.30</td>
<td>3.85</td>
</tr>
<tr>
<td>Full-Time Status</td>
<td>0</td>
<td>1</td>
<td>0.53</td>
<td>0.49</td>
</tr>
<tr>
<td>Part-Time Status</td>
<td>0</td>
<td>1</td>
<td>0.47</td>
<td>0.49</td>
</tr>
<tr>
<td>Student Involvement</td>
<td>1</td>
<td>14</td>
<td>2.25</td>
<td>1.6565</td>
</tr>
<tr>
<td>Varsity Athletics</td>
<td>0</td>
<td>1</td>
<td>0.36</td>
<td>0.48</td>
</tr>
<tr>
<td>Student Loan Dollars</td>
<td>0</td>
<td>62,212.49</td>
<td>12,636.43</td>
<td>13,960.32</td>
</tr>
<tr>
<td>Expected Family Contribution</td>
<td>0</td>
<td>99,999.00</td>
<td>7,849.86</td>
<td>12,913.79</td>
</tr>
<tr>
<td>Legacy</td>
<td>0</td>
<td>1</td>
<td>0.15</td>
<td>0.36</td>
</tr>
<tr>
<td>Non-Legacy</td>
<td>0</td>
<td>1</td>
<td>0.85</td>
<td>0.36</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>0</td>
<td>1</td>
<td>0.88</td>
<td>0.32</td>
</tr>
<tr>
<td>Other/Multi-Racial</td>
<td>0</td>
<td>1</td>
<td>0.12</td>
<td>0.32</td>
</tr>
<tr>
<td>Rural High School</td>
<td>0</td>
<td>1</td>
<td>0.23</td>
<td>0.41</td>
</tr>
<tr>
<td>Small Town High School</td>
<td>0</td>
<td>1</td>
<td>0.37</td>
<td>0.47</td>
</tr>
<tr>
<td>Suburban High School</td>
<td>0</td>
<td>1</td>
<td>0.31</td>
<td>0.45</td>
</tr>
<tr>
<td>Urban High School</td>
<td>0</td>
<td>1</td>
<td>0.09</td>
<td>0.27</td>
</tr>
</tbody>
</table>
Student Enrollment

In this section, specific descriptive analysis relating to frequencies and percentages of student enrollment are presented. A frequency distribution (see Table 5) indicated the largest percentage (43.9%) of students in the study achieved a composite ACT score of between 21-25. The second largest group of students (36.4%) scored in the next highest grouping, 26-30, thus, categorizing most students in the middle of the scoring grid and surpassing the national averages that are based on race or gender (ACT, 2013).

Table 5

<table>
<thead>
<tr>
<th>Composite Scores</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
<td>88</td>
<td>10.0</td>
</tr>
<tr>
<td>21-25</td>
<td>384</td>
<td>43.9</td>
</tr>
<tr>
<td>26-30</td>
<td>319</td>
<td>36.4</td>
</tr>
<tr>
<td>31-35</td>
<td>85</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Two (2) students were admitted without reporting a final ACT composite or SAT score.

A separate frequency distribution (see Table 6) examined the final HS GPA the student(s) achieved prior to entering college. These GPA’s were placed into five like groups to determine the percentage and distribution of similar academic achievers. The largest percentage of HS GPA’s (46.6%) indicates high academic performers entered the University with a 3.51-4.00 HS GPA. In total, 86.2% of entering students had above a 3.0 HS GPA.
Finally, a frequency distribution (see Table 7) examined the amount of college credits a student completed while in high school. By far, the largest (78.2%) group of students did not gain any college credit through PSEO or Advanced Placement testing prior to enrolling at the University. For those students completing college credits in high school the amount earned is distributed relatively evenly for those earning between 6-44 credits.

Table 7

<table>
<thead>
<tr>
<th>Amount of Credits</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>687</td>
<td>78.2</td>
</tr>
<tr>
<td>1-5</td>
<td>70</td>
<td>8.0</td>
</tr>
<tr>
<td>6-10</td>
<td>40</td>
<td>4.6</td>
</tr>
<tr>
<td>11-15</td>
<td>27</td>
<td>3.1</td>
</tr>
<tr>
<td>16-20</td>
<td>32</td>
<td>3.6</td>
</tr>
<tr>
<td>21-44</td>
<td>22</td>
<td>2.5</td>
</tr>
</tbody>
</table>

In this section, descriptive analysis relating to the mean student debt levels of those persisting, compared to those not persisting, were examined. Student debt levels were individually tracked for each academic year of enrollment. Those students who did not persist, did not see an increase in student loan debt. This examination found the mean
difference (see Table 8) between those persisting into a third year of education was $2,555.

Table 8

Descriptive Statistics of Student Persistence and Debt Levels

<table>
<thead>
<tr>
<th>Persistence</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Persist</td>
<td>177</td>
<td>$10,081</td>
<td>11,166.62</td>
</tr>
<tr>
<td>Persisted to Third Year</td>
<td>701</td>
<td>$12,636</td>
<td>14,511.47</td>
</tr>
</tbody>
</table>

Descriptive statistics were also examined for the level of Expected Family Contribution (EFC) in regards to persistence (see Table 9). These statistics indicate that students who failed to persist expected to receive $1,163 less in financial support than their peers who persist to the third year. While this may not be surprising based on previous literature, those failing to persist typically receive less financial support, it is interesting that this sample also utilized less student loan dollars.

Table 9

Descriptive Statistics of Student Persistence and Expected Family Contribution

<table>
<thead>
<tr>
<th>Persistence</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Persist</td>
<td>177</td>
<td>$6,921</td>
<td>12,740.57</td>
</tr>
<tr>
<td>Persisted to Third Year</td>
<td>701</td>
<td>$8,084</td>
<td>12,913.80</td>
</tr>
</tbody>
</table>

Research Question 1

The primary research question posed in this study is the following: What is the relationship between federal student loan debt and persistence beyond the second year, controlling for variables within the model?

Research Question 2

Secondarily, this study also asks, what other student characteristics are associated with student persistence beyond the second year?
In this section, specific descriptive analysis relating to frequencies and percentages of persistence are presented, and also serve as the primary independent variable within this study. The variable examined if the student enrolled in the third year of college, thus, effectively placing the student near the unofficial “halfway mark” of their degree program. The frequency distribution (see Table 10) indicated that a majority (79.8%) of enrolled students continued to their third year of study.

Table 10

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Persist</td>
<td>177</td>
<td>20.2%</td>
</tr>
<tr>
<td>Persisted to Third Year</td>
<td>701</td>
<td>79.8%</td>
</tr>
</tbody>
</table>

Binomial logistic regression analysis was conducted to determine the student characteristics that predict student persistence. The chi-square reported (-2 Log Likelihood = 2271.479, $\chi^2(17) = 489.603$, $p < .0001$) indicates the model is significant. This model correctly predicts 89.5% of the cases. The Nagelkerke’s $R^2$ of .233 indicates a moderate relationship between prediction and grouping. Results indicate that five factors were more likely associated with individuals who persisted beyond the second year of college at Midwest Private University.

Results of the logistic regression produced a significant model to predict student success. Five key student enrollment characteristics of students who persist to their third academic year (see Table 11) were produced from the regression when controlling for other variables. While some universities utilize both HS GPA and ACT scores to determine admission, in this sample only HS GPA was associated with persistence. The odds ratio suggests for each increase in HS GPA increases the likelihood of persistence
1.65 times (p<.01). An odds ratio greater than 1 indicates a positive relationship with the dependent variable. Data also indicate that those students who enter the university as a “legacy” by having a past family member who attended, appear to increase their persistence by an odds ratio of 1.79. Three student characteristics appear to help a student persist once entering the university. The odds ratio shows that for each increase in college GPA (2.48) and college credit (1.09) will improve the likelihood of a student persisting (p<.001). Results also indicate that varsity athletes persist 1.29 times more often than non-athletes (p<.05). Lastly, when controlling from all other variable the results indicate students from urban high schools fail to persist due to an odds ratio of .605 when compared to the suburban student referent group (p<.05). The logit coefficient for this variable is -.502 indicating an increase likelihood of urban students failing to persist by 50%.

A Pearson Correlation was also conducted examining the significant relationships of each student enrollment characteristic. Weak correlations were found between ten of the variables and one indicated a moderate correlation. Results found significant relationships on 14 of the variables at the p > .01 level. Similarly, a Variance Inflation Factor (VIF) Analysis (see Table 12) was conducted to examine linear associations. Results of the VIF suggest multicollinearity is not an issue since the results are exceedingly low. Since results approaching 5 would raise concerns, and result of 10 would indicate multicollinearity, the results are all below 3 indicating a safe result.
Table 11

**Logistic Regression Outcomes**

<table>
<thead>
<tr>
<th>Item</th>
<th>B</th>
<th>SE</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>-0.020</td>
<td>0.020</td>
<td>0.980</td>
</tr>
<tr>
<td>HS GPA</td>
<td>0.505</td>
<td>0.151</td>
<td>1.657***</td>
</tr>
<tr>
<td>College Credits while in High School</td>
<td>-0.001</td>
<td>0.010</td>
<td>0.999</td>
</tr>
<tr>
<td>High School Performance Indicator</td>
<td>-0.017</td>
<td>0.011</td>
<td>0.984</td>
</tr>
<tr>
<td>Gender (0=female, 1=male)</td>
<td>0.088</td>
<td>0.131</td>
<td>1.092</td>
</tr>
<tr>
<td>College GPA</td>
<td>0.911</td>
<td>0.084</td>
<td>2.488****</td>
</tr>
<tr>
<td>College Credits</td>
<td>0.089</td>
<td>0.024</td>
<td>1.093****</td>
</tr>
<tr>
<td>Enrollment Status (0=Full-Time, 1=Part-Time)</td>
<td>0.192</td>
<td>0.163</td>
<td>1.212</td>
</tr>
<tr>
<td>Student Involvement</td>
<td>0.075</td>
<td>0.046</td>
<td>1.078</td>
</tr>
<tr>
<td>Varsity Athletics</td>
<td>0.258</td>
<td>0.129</td>
<td>1.295**</td>
</tr>
<tr>
<td>Student Loan Dollars</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Expected Family Contribution</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Legacy (0=Legacy, 1=Non Legacy)</td>
<td>0.583</td>
<td>0.178</td>
<td>1.792**</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>-0.366</td>
<td>0.221</td>
<td>0.693</td>
</tr>
<tr>
<td>Rural High School</td>
<td>-0.306</td>
<td>0.174</td>
<td>0.736*</td>
</tr>
<tr>
<td>Small Town High School</td>
<td>0.117</td>
<td>0.155</td>
<td>1.124</td>
</tr>
<tr>
<td>Urban High School</td>
<td>-0.502</td>
<td>0.235</td>
<td>0.605*</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.054</td>
<td>1.301</td>
<td>0.348</td>
</tr>
</tbody>
</table>

*Significant at .10
**Significant at .05
***Significant at .01
****Significant at .001

<table>
<thead>
<tr>
<th>-2 Log Likelihood</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>2271.479†</td>
<td>0.118</td>
<td>0.233</td>
</tr>
</tbody>
</table>

†Estimation terminated at iteration number 6 because parameter estimates changed by less than 0.001
Table 12

*Variance Inflation Factor Analysis*

<table>
<thead>
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**Summary**

This study sought to examine the relationship between student enrollment characteristics and persistence beyond the second year of college, with specific interest in student debt levels. The sample consisted of 878 Ohio public high school students who as freshmen enrolled at Midwest Private University from the Fall of 2009 through the Fall of 2011 as first-time college students. Data were collected from Midwest Private University’s financial aid and institutional research offices.

Two research questions were assessed in this study. Table 13 presents a summary of the research questions and the related results. Descriptive statistics were utilized to analyze Research Question 1, which examined the relationship between federal student loan debt levels and persistence beyond the second year of college. Results indicate that
those students who persist beyond the second year of college utilize $2,555 (M=$12,636) more in student federal loan dollars than their peers who fail to persist (M=$10,081). Those students who failed to persist had a lower Expected Family Contribution (M=$6,921) than those who successfully persisted (M=$8,084), a difference of $1,163 in expected family financial support. This also takes into account that due to the limited sample size of certain Ohio District Typologies, this study combines various, like, geographic areas.

Binomial logistic regression was utilized to analyze both Research Questions 1 and 2, examining which student characteristics best predicted student persistence beyond the second year of college. The regression utilized a 17 factor model which accurately predicted 89.5% of the cases. Five variables were found to significantly predict student persistence: HS GPA, amount of college credits per year, college GPA by year, participation in varsity athletics, and if the student was a legacy at the university. The odds ratio indicated that these attributes increased persistence between 1.09 to 2.48 times.

Results indicate students who attended an urban high school failed to persist to the third year with an odds ratio of 0.605.

Finally, a Pearson Correlation and VIF Analysis were used to examine all of the results. The Pearson Correlation found 11 correlations, with the strongest being college GPA (r = 0.37) and 14 significant relationships at the p > 0.01 level. The VIF Analysis indicated that there was no multicollinearity since no scores exceeded 2 (e.g., Kutner et al., 2004; Stevens, 2002).
## Summary of Results

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Results</th>
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| 1. What is the relationship between federal student loan debt and persistence beyond the second year, controlling for variables within the model? | - Students who persist:  
  - Utilize more in student loan assistance ($M = 12,636$)  
  - Have a higher Expected Family Contribution Level ($M = 8,084$)  
- No significant relations was found between student federal loan debt and persistence beyond the second year. |
| 2. What other student characteristics best predict student persistence beyond the second year? | - A significant 17 factor predictive model  
- Six items significantly predict student persistence: high school GPA, college credits earn each year, college GPA, participation in varsity athletics, and being a university legacy, along with a negative association with those from urban high schools.  
- Model accurately predicted 89.5% of cases |
CHAPTER V: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This research study examines the impact of student enrollment characteristics and persistence at one four-year, private Midwestern university. This study specifically sought to understand the relationship between student loan debt and persistence beyond the second year of college. This chapter provides a summary of the study and its significance for leadership, policy, and future research.

Many four-year universities are aimed at degree completion, not transient, short-term education. While there may be other educational missions and goals, currently the federal government, alumni, and families of prospective students want to know if beginning a degree at a university will be a wise investment. Understanding which students will enroll and successfully complete a degree accomplishes one aspect of the university’s strategic mission. In creating a university comprised of intellectually prepared and diverse students, institutions often statistically analyze who is, and who is not, applying in an attempt to determine who will successfully persist to graduation. Universities face a variety of problems when selecting and enrolling a student who fails to persist. Resources are invested in a student who is expected to be on campus for four years, but leaves after one or two. Universities who are unable to recognize and fix this retention issue face the potential of decreased financial resources, negative public relations, and government intervention until student persistence and success has been reached.

Panel data were collected from the financial aid and institutional research offices of Midwest Private University. The sample for this study was comprised of 878 students
who attended Ohio public high schools and enrolled at Midwest Private University as first-time freshmen in the 2009-2011 academic years. The data were analyzed through a binomial logistic regression. Results of the study found that student debt did not impact persistence beyond the second year of college. Also, results show that five factors may increase the likelihood of persistence: HS GPA, amount of college credits per year, college GPA by year, participation in varsity athletics, and if the student was a legacy at the university. By examining these variables, universities may be able to make decisions that will aid the student in persisting towards graduation.

Discussion by Research Question

Research Question 1

The first research question asked: What is the relationship between federal student loan debt and persistence beyond the second year, controlling for variables within the model? Descriptive statistics were analyzed regarding federal student loan debt levels and their persistence to the start of their third year of college. Descriptive statistics show that 701 students (79.8%) within the sample persisted to the start of their third year. Results indicate there is not a relationship between federal student loan debt levels and persistence. The mean federal student loan debt for those persisting and completing two full years of college was $12,636 compared to $10,636 for those not persisting. This $1,555 mean difference in federal student loans is not a determining factor in persistence. The data also indicate that those students who failed to persist (20.2%) had an Expected Family Contribution of $1,163 less than their counterparts. Results did not indicate a significant relationship between federal student loan debt and persistence. Significance level for this variable was .459.
Previously this study discussed research by Perna (2008) who wrote that many low-income students found the process of taking out a loan for college as “risky” and are hesitant to borrow. Conversely, parents and students in high-resource schools understand the potential need for loans and have considered the cost-benefit analysis of how much they may need to borrow compared to the increase in salary after graduation. The results surrounding this question could be viewed as surprising by some since it is often assumed that there is a price ceiling regarding education and access. While this may be true for some, the question may need further examination to better understand why certain students in certain situations view student debt as a barrier. The group of students in this data set may have already assessed the price-point prior to enrollment and are no longer concerned by the cost.

**Research Question 2**

The second research question asked: What other student characteristics best predict student persistence beyond the second year? Binomial logistic regression resulted in a model that successfully predicted persistence beyond the second year in 89.5% of cases regarding five student characteristics. The study utilized a conceptual framework addressing three different areas of each student’s life: Demographics (i.e., race and gender), Enrollment Characteristics (pre-college academics), and Academic Characteristics (during college). Of the variables included in regression, there was at least one variable predicting persistence from each of the three areas of the conceptual framework. The six characteristics predicting persistence are: HS GPA, amount of college credits per year, college GPA by year, participation in varsity athletics, if the student was a legacy at the university, and if the student attended an urban high school.
Of those variables, only attending an urban high school is negatively associated with persistence.

There is limited research in the literature that examines a large combination of variables to predict success beyond the second year of college. Most studies are limited to retaining students through the first year or follow students until graduation. While further research examining a variety of student characteristics prior to and during college will be needed, assumptions in the literature will have to help reconcile the outcomes from this study. For example, within this study, being a “legacy”, or someone who had other family members attend the university, had a positive relationship with persisting beyond the second year. The involvement of the student’s family during the college experience may improve the chances of success. As noted in the ASHE Higher Education Report (2008) using a variety of methods to increase participation from family members, especially parents, by educating them on campus norms can lead to their future participation in various initiatives. For example, educating these family members on “drinking and student financial management” can improve retention by potentially eliminating the negative impact of drinking on student GPA or legal consequences due to stress over financial issues (2008). Providing education to interested family members through social media, email, and at campus events (i.e., Parents Weekend) is a nominal investment to gain returns of financial donations and time from these supporters.

Identifying these six student characteristics provides an exciting opportunity for universities across the nation to explore what variables may identify persistence and success in their student populations. Also, universities that can accurately identify their successes may also be able to begin addressing their shortcomings. University’s that are
not meeting the needs of certain student populations can then implement a continuous improvement plan, instead of implement effective student success strategies from a position of “catch-up”.

**Conclusion**

This research study indicates five significant conclusions. First, student debt and persistence is about more than a number. The data failed to indicate a relationship between those who did not persist and higher federal debt levels. While this outcome is revealing, understanding how debt does influence enrollment and persistence is a paramount issue in moving higher education forward, as literature indicates that as of 2008, 45% of student loans come from the federal government totaling over $4 billion (Elliott & Beverly, 2011). Understanding whether or not the total cost of education is a burden that impacts student performance for certain students also needs further exploration. While Midwest Private University does not have a high adult learner population this is one sub-population that research indicates is concerned over the ability to pay back student loans (Kimmel, Gaylor, Grubbs, & Hayes, 2012). Since this research is limited to the participants (traditional college-aged students) within the sample, more research is needed on this topic to fully explore the impact of student debt while the student is enrolled.

Second, increases in the HS GPA, college GPA, and amount of college credits completed will increase the likelihood of student success. Since high school success could predict college success, supporting students will be a critical journey. Previous literature has found support for these indicators. Seidman (2005) confirms that an increase in HS GPA increases the likelihood of persistence beyond the second year of
college. New research by indicates that testing students on various practical, creative, and judgment based questions and pairing that information with HS GPA can eliminate the need for an SAT and also level “racial and ethnic-group differences” (Soares, 2012, pg. 67). Additionally, this study confirms the results of DeBaerard, Spielmans, and Julka (2004) findings that increasing the GPA of a first-year college students increases the likelihood of retention. Helping students successfully complete their coursework will not only improve their college GPA but also allow them to progress more quickly toward the goal of obtaining their degree on time. This study found that successfully completing credits increases the likelihood of persistence. This is reinforced by research that shows how remedial coursework, withdrawals and course repeats reduces the likelihood of persistence (Kinzie, Goyea, Shoup, & Kuh, 2008). Creating a university plan to understand the relationship between these predictors and student persistence can help improve retention and graduation.

Third, **high school quality and location do not always indicate success.** The present study found no significant differences with regard to the quality or location of the high school and persistence. Although, self-selection bias could be argued in this context, since more well-prepared students applied, were admitted and then enrolled at a private university, within this population those that enrolled still persisted at similar rates. The students in this study attended Ohio public high schools that had Ohio Department of Education Performance Index scores in the range of 67.33-115.12 (scale of 0-120). Students from schools throughout the entire performance indicator range, including students from lower performing high schools, were able to persist. Further examination of the State of Ohio’s District Typologies and Performance Index Scores regarding
student enrollment, academic performance and persistence is imperative in understanding how to better equip high school students for college (2013a; 2013c).

Fourth, **varsity athletes can succeed academically in the right environment.** Examining student involvement, specifically varsity athletics, is important to understand why students may fit certain admission criteria. Determining what truly makes a “student-athlete” could help universities who struggle with preparing athletes for a life after sports. Within this study it was found that by participating in a varsity sport these types of students persist academically, longer than their peers. Again, while certain self-selection biases and accommodations could be accounted for during admission and enrollment, it does not appear that these individuals were significantly different than other sub-populations on campus other than their interest in varsity athletics (Espenshade, Hale, and Chung, 2005). For example, athletes at this university could have been recruited for both their physical and intellectual prowess while utilizing their academic support services (i.e., tutoring, study time) appropriately during matriculation. Overall, this population shows promise that students can be multi-faceted, engaged and succeed while in college. Determining how to expand this to other sub-populations at other universities will be important.

Lastly, **selecting the right college could be all in the family.** There is a paucity of research regarding the impact of being a legacy student at a university. Most students who are legacies are probably less likely to be first-generation students, thus increasing their chances of persisting. Those who are first-generation students often take less credit hours per term and have lower GPA’s by the end of their second year (Pascarella et al., 2004; Fischer, 2007). More research is needed to understand the mentality of the student
and family when selecting a university. Understanding at what point a student “knows” the same university their parent, grandparent, or other family member attended is also the right choice for them, is an important metric to address in higher education.

**Recommendations for Leadership and Policy**

Student persistence begins long before the enrollment process of student applications and university admission. The university’s investment in the student selection process begins long before a student submits an application. Research shows prospective students will rely on a variety of factors to determine which university meets their standard of quality with regards to the programs and support needed to achieve their academic and career goals (Mattern, Shaw & Kobrin, 2010). More research is needed on how to select students that are able to persist and accomplish those academic and career goals in the most efficient manner possible.

The first recommendation would be for universities to invest more resources in creating a student profile that campuses can support academically in a well-rounded manner, recruiting students who match that profile, and providing resources to assist goals related to persistence and graduation. The 2003 report from ASHE-Eric focused on strengthening aspects of campus that support student success through university-wide efforts such as collaboration, fiscal stability, and individualizing programs to the campus in which the program will be implemented. ASHE-Eric (2003) provides a four-stage process for university presidents to help with new retention initiatives by preplanning, planning, implementing, and monitoring new programs, but also indicates that many presidents will not see retention programming as an issue that they must champion, leaving it to various departments such as student affairs or academic affairs. These
resources must include appropriately qualified and trained individuals who advise, tutor, and provide intervention programs for students who are struggling with various life issues. Each member of the university faculty and staff must be held accountable for improving the likelihood that each student will be able to persist. While the university must have a clear mission regarding serving the students the next difficult task is ensuring each faculty and staff member clearly understands their portion of the mission while fulfilling it effectively.

The second recommendation would be to clearly utilize marketing and communication strategies to best disseminate the mission of the university. This promotional process includes how the university will help prospective students reach academic and career goals, financially afford the degree process, and how the university will support the student throughout the degree plan. Part of this plan will need to address the type of student the university is seeking that will best fit into the academic community, including the academic profile of desired students. Each university needs to “own” their mission, outcomes, campus culture, and how they will hold each student accountable.

One unfortunate promotional issue that university leadership has had to deal with for the past 20 years is college rankings. These ranking are often created by the popular press, use weak statistical methods, utilize information from only about 50% of universities in the United States, and present comparison information so that their readers can quickly and easily choose which institutions meet their needs academically (Bastedo & Bowman, 2011; Harvey, 2008). Bowman and Bastedo (2009) found that by moving onto the “front page” of the college rankings positively impacted admissions. Results
also indicated that moving up in the rankings is important for most national universities, but not liberal arts schools due to their selective admissions and higher costs (2009). Lastly, the results also indicate that higher priced institutions have a perception of more quality and prestige (2009). In August of 2013 President Obama introduced a plan to begin ranking colleges across the United States and tie those results to federal loan dollars. A federal ranking system would have to evaluate over 7,000 colleges with various missions, geography, and student goals (Weise, 2013). While tying financial aid to rankings would need the approval of Congress the President appears poised to implement a ranking system as a first step by the Fall of 2015 (Edwards, 2014).

These popular press rankings may not truly represent a statistical difference, but more of a perceived and superficial one, so that interested parties can “shop” for a potential college like they are using Consumer Reports to purchase an efficient dishwasher. Since colleges and universities seek to meet the needs of their potential recruitment pool, they often use these rankings to assure students and families of how this degree will benefit them in the future.

Regardless of the marketing and communications plan developed, university leadership must be cognizant of the positive and negative messages regarding their academic programs that are communicated in a global, 24/7, digital manner. Understanding what information prospective students are seeking and providing that to them in an efficient manner is critical. Students want to be confident in their choice of a university to ensure their career goals can be accomplished.
Recommendations for Future Research

This study adds to the existing research by expanding the types of student characteristics and duration of retention examined within a study. The outcomes of the study increase the need for discussion regarding what characteristics may increase the likelihood of student persistence. Understanding these characteristics may allow students and administrators to make better decisions regarding enrollment.

This study utilized existing data provided by Midwest Private University in the state of Ohio, along with high school district typology and performance indicators from the State of Ohio’s Department of Education. Expanding this research to multiple universities from across the nation could expand the generalization of the results to more students. Further research could include public or for-profit universities, those with varying academic programs, and with various cost models.

This study is limited to the financial aid information that is accessible for all enrolled students, the “Expected Family Contribution” and federal loan amounts that students accepted on a term-by-term basis. Combined, these items provide a converse relationship since it can be inferred that those who have less family support would potentially need more financial help in the form of federal student loans. Within this sample there is no statistical relationship between persistence and student federal loan debt. Also, more research would be needed to understand if students within this study utilized all loan options available during their matriculation. Due to limited sample sizes, the Ohio District Typologies were combined based on similar geography and not economic status. Future studies could explore other means of financial assistance, from sources such as grants, family members, or outside jobs, since these items cannot be
controlled for in this study or due to the lack of a larger sample size from the respective geographic areas.

This study utilized a logistic regression analysis which does not show causation, it only makes inferences regarding the variables within the formula. Further research could combine student characteristics and utilize a mixed-methods approach by interviewing students on their persistence outcome. Additional variables could also be included to determine if certain student characteristics are unique or desirable by higher educational professionals. For example, many institutions have not fully explored the possibilities of bringing home-schooled students into their settings. After interviewing admissions professionals who had reviewed the documents of home-schooled applicants Sorey and Duggan (2008) found that “all respondents either strongly agreed (45%) or agreed (55%) that they expected homeschooled graduates to be as successful academically as students who graduated from an accredited high school” (p. 26).

Lastly, each university should have a clear understanding of student satisfaction regarding various academic and support services within the campus community. The university should be able to identify where services are deficient or non-existent. While not every student can always be satisfied, providing a reasonable mode for communicating concerns to the university should be provided and promoted. Most importantly, issues should be addressed in a timely manner with potential solutions clearly communicated within the university. If students feel that more advising, tutoring, or differentiated dining options are important to allow them to accomplish their academic goals more efficiently then university leadership should listen and respond to those concerns. Allowing the student to be a participant in the creation of solutions within the
campus community could ultimately be one of the most rewarding learning processes for each student.
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Dear Matthew,

The Institutional Review Board at [redacted] has received your research proposal entitled “Doctoral Dissertation Informational Gathering.” This protocol has been granted Exempt Review status.

After careful review of the proposal, the IRB of [redacted] has approved the protocol. Protocol approval is good for one year after the date of submission. Any revisions or changes to the protocol must be submitted to the IRB and approved prior to their implementation.

If you have any questions, comments or concerns, please contact the Institutional Review Board at [redacted]

Sincerely,

[redacted]
Chair, Institutional Review Board