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THE EFFECTS OF PREGNANCY ON STUDENT PROGRESS

Sarah Hope Steinkamp

Southern Illinois University Carbondale, steinkamp@siu.edu

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THE EFFECTS OF PREGNANCY ON
STUDENT PROGRESS

by

Sarah Hope Steinkamp

B.A., Wells College, 2003

M.S., Ithaca College, 2011

A Dissertation

Submitted in Partial Fulfillment of the Requirements for the
Doctor of Philosophy in Higher Education

Department of Educational Administration and Higher Education
Southern Illinois University Carbondale
May 2017

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DISSERTATION APPROVAL

THE EFFECTS OF PREGNANCY ON
STUDENT PROGRESS

By

Sarah Hope Steinkamp

A Dissertation Submitted in Partial

Fulfillment of the Requirements

for the Degree of Ph.D.

in the field of Education

Approved by:

Judith Green, Ph.D. Chair

Saran Donahoo, Ph.D.

Sosonya Jones, Ph.D.

Yanyan Sheng, Ph.D.

Paul Bennett, M.D.

Graduate School
Southern Illinois University Carbondale
March 3, 2017

AN ABSTRACT OF THE DISSERTATION OF

Sarah Steinkamp, for the Doctor of Philosophy degree in Education, presented on March 3, 2017, at Southern Illinois University Carbondale.

TITLE: THE EFFECTS OF PREGNANCY ON STUDENT PROGRESS

MAJOR PROFESSOR: Dr. Judith Green

Abstract

Ample evidence exists establishing the relationship between pregnancy during high school and subsequent educational difficulties, yet little research has investigated the relationship between pregnancy during college and subsequent educational difficulties. The purpose of this study was to determine if a relationship exists between pregnancy in undergraduate college students and educational attainment and to determine the strength and direction of said relationship. A quantitative research approach composed of historical medical and retention data was utilized. Vincent Tinto's theory of student departure was applied to frame the use of experience of pregnancy diagnosis as a variable related to retention. Findings indicate a negative relationship between pregnancy diagnosis and educational retention, with specific ages and ethnicities at increased risk.

DEDICATION

This work is dedicated to the women who have come before me: To those who have suffered and sacrificed so that I may come this far; to the women who have raised and taught me; to my great-grandmothers, grandmothers, mother, sisters, and loved ones . . . my many teachers who have known and seen me more clearly than I see myself. Each of them has gifted me with knowledge and strength. This work and everything that follows was made possible because of the love they have shown and the sacrifices they have made. More specifically, this work is dedicated to my grandmother, Margaret, in recognition of her profound love.

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TABLE OF CONTENTS

<u>CHAPTER</u>	<u>PAGE</u>
ABSTRACT.....	i
DEDICATION.....	ii
ACKNOWLEDGMENTS	iii
LIST OF TABLES.....	viii
LIST OF FIGURES	ix
CHAPTERS	
CHAPTER 1 – INTRODUCTION.....	1
Background.....	2
Problem Statement.....	5
Purpose of the Study.....	5
Research Questions and Research Hypotheses.....	6
Research Question 1	6
Research Question 2	6
Research Question 3	7
Significance of the Study.....	7
Positionality	9
Delimitations.....	11
Limitations	11
Definitions of Key Terms	12
Summary.....	15

CHAPTER 2 – REVIEW OF THE LITERATURE	16
Theory	16
Development of Retention Theory in Higher Education	17
Purpose of Retention Theories	20
Impact of Retention Theories on Programming in Higher Education	20
Potential of Theory in Higher Education	22
Incorporation of Theory into Practice	23
Retention Research	24
Institution-Specific Research	24
Role of the Institution	26
Students’ Role in Retention	33
Institutional and Student Role Correspondence.....	35
Factors that Affect the Retention of Undergraduate Students	37
Access to Higher Education.....	38
Demographics of Students	39
Student Transitions	42
Student Integration.....	43
Educational Interruptions.....	43
Student Experiences.....	44
The Relation of Pregnancy, Childbearing, and Parenthood to Retention	45
Pregnancy.....	45
Childbearing.....	47
Parenting	49

Summary	51
CHAPTER 3 – METHODOLOGY	52
Choice of Methodology	52
Structure of Quantitative Research	54
Research Design.....	54
Population and Sample	55
Consideration of Participants	57
Procedure	58
Data Collection	60
Alternative Data Collection Options.....	62
Preparation of Data	63
Data Analysis	68
Assumptions of the Study	70
Summary.....	72
CHAPTER 4 – Results.....	73
Research Question 1: Demographics	73
Variables and Statistical Methods Used	74
Results from Hypothesis Testing	74
Research Question 2: Relationship.....	78
Variables and Statistical Methods Used	78
Results from Hypothesis Testing	79
Research Question 3: Strength and Direction.....	800
Variables and Statistical Methods Used	81

Results from Hypothesis Testing	81
Additional Analysis	82
Variables and Statistical Methods Used	83
Results from Additional Testing.....	83
Summary	88
CHAPTER 5 – DISCUSSION.....	90
Research Question 1 Discussion.....	90
Research Question 2 Discussion.....	93
Research Question 3 Discussion.....	94
Additional Testing Results.....	94
Major Findings.....	95
Suggestions for Future Research	96
Recommendations for Higher Education.....	98
Recommendations for Individual Institutions.....	99
Recommendations for Middleton University.....	100
Conclusions.....	101
REFERENCES	103
VITA.....	116

LIST OF TABLES

<u>TABLE</u>	<u>PAGE</u>
Table 1 Demographic Characteristics of Pregnant Students by Age.....	66
Table 2 Demographic Characteristics of Pregnant Students by Ethnicity.....	67
Table 3 Pregnancy Rates of Students by Age.....	75
Table 4 Pregnancy Rates of Students by Ethnicity.....	76
Table 5 Odds Ratio of Pregnancy for Students by Ethnicity.....	77
Table 6 Significant Findings in Research Question 1.....	78
Table 7 Progress Rate by Pregnancy Status.....	79
Table 8 Odds Ratio of Progress by Pregnancy Status.....	80
Table 9 Significant Findings in Research Question 2.....	80
Table 10 Progress Differences of Students by Age and Pregnancy Status.....	84
Table 11 Progress Differences of Students by Ethnicity and Pregnancy Status.....	85
Table 12 Progress Differences of Black/African American Students by Age and Pregnanc Status.....	87
Table 13 Progress Differences of 18 and 19 Year Old Students by Pregnancy Status.....	88
Table 14 Odds Ratio of Progress of 18 and 19 Year Old Students by Pregnancy Status.....	88

LIST OF FIGURES

<u>FIGURE</u>	<u>PAGE</u>
Figure 1 Schematic Diagram of a Comparative Research Approach	59

CHAPTER 1

INTRODUCTION

Researchers have yet to determine what causes attrition. Although researchers and practitioners have studied retention and attrition for 80 years, preventing attrition is still an unattainable goal (Astin, 1984; Demetriou & Schmitz-Sciborski, 2011; Pascarella & Terenzini, 2005; Swail, 2004; Tinto, Goodsell, & Russo, 1993). Many projects have found associations of demographics, experiences, and student dispositions with higher chances of attrition or retention, yet many areas of retention research have been ignored, understudied, or forgotten (Demetriou & Schmitz-Sciborski, 2011). For instance, a large-scale examination of the relationship between pregnancy and retention in an undergraduate population has never occurred.

While research has established a negative relationship between a pregnancy diagnosis and educational progress at the high school level (Alan Guttmacher Institute, 1994; Hoffman, 2006; Jones, Astone, Keyl, Kim, & Alexander, 1999; Upchurch & McCarthy, 1990), little research (Raley, Kim, & Daniels, 2012) has determined whether a similar negative relationship exists for undergraduate pregnant students. Current research on the topic, most notably the research of Raley et al. (2012), has not addressed issues with the research that might influence the findings. For example, for women who become pregnant, the potential shame experiences might influence self-reporting of pregnancies within surveys. The Alan Guttmacher Institute (1994) has widely discussed this shame after pregnancy, but the institute fell short of discussing the importance of collecting data for research from medical records rather than from self-reporting because of the stigma and shame after of pregnancy. Examining medical records can offer an avenue to data accuracy, eliminating any potential misrepresentations students may report because of the shame felt when being asked to self-disclose their pregnancy. The present

research project addresses the relationship between pregnancy and undergraduate student retention, including the strength and direction of the relationship between pregnancy and retention.

Background

Researchers developed retention theories in the early 1930s to improve understanding of retention and attrition. Retention theorists have studied the factors that affect retention, such as experiences (establishing friendships with other students or connections with faculty) and student demographics, which disproportionately affect retention and attrition within the university. Over the past 80 years, scholars have learned a great deal about student progress, retention, attrition prevention programming, factors that affect attrition, and actions that can be taken on the university level to improve the odds of graduating for students at risk of leaving the university (Astin, 1984; Demetriou & Schmitz-Sciborski, 2011; Pascarella & Terenzini, 2005; Swail, 2004; Tinto, 1993; Tinto et al., 1993). This research assists practitioners in evaluating and designing programs that enable students to reach their full potential and progress through college.

Examples of research affecting practice include Swail (2004) and Atherton (2014). Swail was part of a landmark study conducted for the Lumina for Education Foundation. This research in retention programming and practices observed 19 public and private institutions that serve low-income students. Swail's findings were important because he was able to show, while a great deal of institutional attributes were important to retention (e.g., institutions with staff dedicated to retention efforts, an institutional commitment to retaining students, teaching and learning strategies based on best practice), nothing was as important as the monetary resources that an institution invested into their students. "[S]chools with money were able to secure additional resources as necessary, could implement almost any strategy they wanted to, and,

perhaps more importantly in the retention debate, were able to attract more qualified and competitive students” (Swail, 2004, p. 7).

Swail (2004) noted the importance of the student’s ability before educational programming, raising the question of preparation of students or programs ability to be retained. Swail (2004) posited the important retention concept of preparedness, which Atherton (2014) studied. Atherton conducted research on over 6,000 first-generation college students using the Cooperative Institutional Research Program survey. Atherton found that insufficient preparedness contributed to overall difficulties in a student’s transition to college and eventually to negative retention and attainment outcomes for first-generation students. Such researchers as Swail (2004) and Atherton (2014) have enabled practitioners to understand better the specific issues at play in retention.

Retention research is a vast field, with many researchers concentrating on a particular aspect of higher education practice affecting student retention. Much of this research discusses how to direct programming to create student development and educational achievement to increase retention on specific campuses (Astin, 1984; Atherton, 2014; Demetriou & Schmitz-Sciborski, 2011; Pascarella & Terenzini, 2005; Swail, 2004; Tinto, 1993; Tinto et al. 1993). For instance, Atherton examined first-generation college students in a national survey while Astin assessed the amount of physical and psychological energy students invested in their studies, currently known as *engagement*. While retention and progress research is important, retention research often instilled the idea that educational achievement was paramount to all other needs of students (Tinto, 1993). Discussions of retention have often failed to address the simplification that underlies the direction of much of the research. Researchers must conduct studies to determine how to prevent not only the symptoms of attrition but also the causes of attrition.

This dissertation examines the relationship between undergraduate student pregnancy, retention, and progress toward graduation. Investigating these issues could not only determine what the impact of pregnancy is on retention but also establish a baseline for later addressing a larger question of how pregnancy prevention programming can improve retention rates. Although a great deal of research has examined high school educational attainment and pregnancy (Alan Guttmacher Institute, 1994; Hoffman, 2006; Hoyert & Xu, 2012; Jones et al., 1999; Upchurch & McCarthy, 1990), little research has addressed student pregnancy and retention at post-secondary institutions. Raley et al. (2012) is the single relevant study that addressed the success of students who became pregnant but did not directly compare such students to those who did not (Raley et al., 2012). Raley et al. used the National Longitudinal Survey of Youth study ($N = 7,838$) to examine the associations between adolescent fertility expectations, pregnancy, and college enrollment. Chapter 2 includes an elaboration of the specific findings of the Raley et al. study.

While examining the relationship between pregnancy and educational progress, I will determine the extent to which pregnancy was a concern in previous studies of retention, the demographic differences between those who become pregnant and those who have a negative pregnancy test, and the demographic differences between those who leave the institution after a pregnancy and those who remain or graduate. Researchers have examined in detail demographic characteristics (specifically race and ethnicity) that positively and negatively affect retention. A recent study by the Retention Task Force of the University of North Carolina at Chapel Hill (2011) found the 6-year graduation rates for students in the Carolinas showed significant racial differences. The Retention Task Force found that Asian students graduated at a rate of 89.3% and transferred at a rate of 4.1% while 6.6% did neither within 6 years; Black/African American

students in the study graduated at the rate of 77.8% and transferred at a rate of 6.8% while 15.4% did neither. Hispanic/Latino/a students graduated at a rate of 87.1% and transferred at a rate of 9.5% while 3.5% did neither; White students graduated at a rate of 89.1% and transferred at a rate of 4.8% while 6.2% did neither (Retention Task Force, 2011). These differences along race/ethnicity lines represent the larger differences throughout the country, although specific variances by race/ethnicity are different across the country and across institutions. No one has examined the relationship between pregnancy, demographics, and educational progress or retention in a meaningful way (Raley et al., 2012). This research is an attempt to determine the strength and direction of the relationship, as well as the confounding factors that affect progress and retention after a pregnancy diagnosis.

Problem Statement

Retention after undergraduate pregnancy has gone largely unstudied because of the assumed small proportion of students affected (Raley et al., 2012). This assumption of the population draws on self-disclosed pregnancy data rather than medical records. Inherent to the issue at hand is the shame and fear surrounding pregnancy that women often experience (Alan Guttmacher Institute, 1994). To understand the problem more thoroughly, research is needed to ascertain, through data collected from reliable sources, the extent of pregnancy on college campuses, the characteristics of those who become pregnant while in college, and the relationships that these pregnancies have with educational progress and retention.

Purpose of the Study

The purpose of this study was to identify (a) the demographic characteristics of undergraduate pregnant students, (b) the differences between pregnant undergraduate students and those not diagnosed as pregnant, (c) the relationship between pregnancy and progress in

higher education, and (d) the strength and direction of that relationship. To accomplish this, I designed a quantitative research project to identify a sample that represented the larger target population. The intent was to fill a gap in the literature by researching the relationship between pregnancy and educational progress in a higher education setting.

Research Questions and Research Hypotheses

Research Question 1

What are the demographic differences between pregnant traditional-aged students and their non-pregnant peers? The purpose of RQ1 was to identify demographic/characteristic differences between pregnant students and their non-pregnant peers. The Centers for Disease Control and Prevention's Pregnancy Risk Assessment Monitoring System (PRAMS) noted stark differences in age of first pregnancy by race/ethnicity. The PRAMS documented the differences that race, socioeconomic status, age, geographic location, and educational attainment play in the age of first pregnancy (Centers for Disease Control and Prevention, 2015). The research hypothesis for the first research question predicted a significant demographic difference in age and ethnicity between pregnant students and their non-pregnant peers.

Research Question 2

What is the relationship between a positive pregnancy test and college retention among traditional-aged undergraduate students? RQ2 addressed whether a significant relationship exists between students' positive pregnancy tests and their graduation or continuation in enrollment. The purpose of this research question was to identify relationships between positive pregnancy tests (the independent variable) and college progress (the dependent variable) for traditional-aged (18-24 years) undergraduate students (the population). At this time, little research has focused on college retention among traditional-aged pregnant undergraduate students. The research

hypothesis for this research question predicted a significant relationship between positive pregnancy tests and college progress among traditional-aged undergraduate students.

Research Question 3

If the results for RQ2 indicate a relationship between pregnancy and college retention, what is the strength and direction of that relationship? The purpose of RQ3 was to quantify the relationship between students' pregnancy and their progress. The research hypothesis for RQ3 predicted a significant negative relationship between pregnancy in an undergraduate traditional-aged student and progress in the university.

Significance of the Study

Students entering college are more likely to drop out than to graduate. In 2015, the National Center for Education Statistics (NCES) published retention and graduation data, examining the national 2007 freshman class. The NCES report showed 60% of all students and 61% of female students who entered a public 4-year college in 2008 graduated within 6 years (U.S. Department of Education, National Center for Education Statistics [DOE NCES], 2016). Continuing investigations into retention and attrition from post-secondary institutions have shown students leaving college in great numbers nationally and at individual institutions (Tinto, 1993; DOE NCES, 2016).

For the purpose of this research project, I investigated Middelton University, a mid-sized, 4-year, Midwestern, public institution. I chose Middelton University for this study because its retention rates fall near the average retention rates of public 4-year universities. National data published in 2016 by the NCES on the average graduation rate for incoming first-year students at public institutions entering in 2008 showed the 6-year graduation rate was 58%. The graduation rate was higher for female students (61%) than for male students (55%; DOE NCES, 2016).

National data for 4-year institutions with open-admission policies have the lowest graduation rate (36%; DOE NCES, 2016). Middleton University was an ideal selection because it represented an institution with a lower graduation rate, situated approximately halfway between 50% and 25% (DOE NCES, 2016). It represents an institution that has attrition. Thus, examination and investigation of this attrition are feasible.

Retention rates differ by race as well as by gender. For first-year students who entered Middleton University in the fall of 2009, wide discrepancies existed between the graduation rates of different racial groups. For example, 55% of White students graduated within 6 years compared to 29% of Black students, 24% of Latino/Hispanic students, and 41% of Asian students. The graduation rates of Middleton University were similar to national trends in graduation rates by race/ethnicity (DOE NCES, 2015).

National statistics are important to this research for several reasons. First, they represent a challenge to the process of the educational system to retain students. Second, they illustrate a potential area for further research. The issue of why this retention problem occurs has been and will continue to be studied to determine why students leave institutions, which students leave institutions, and how best to support students and prevent attrition from institutions. Retention is a multifaceted issue, and the relationship between pregnancy and retention may show similarities to other retention relationships previously studied. Additionally, further research on the relationship between pregnancy and retention may challenge the veracity of the current retention knowledge.

Historically, a great deal of research has addressed the relationship between pregnancy and high school retention. National information on high school pregnancy indicates distinct racial and economic divides affecting those who become pregnant and at what age they become

pregnant. If these trends continue for college-aged students, the question of pregnancy and retention will also address racial inequity. Although the overall retention rates may not be highly correlated to pregnancy, a correlation between pregnancy in educational communities and retention issues may exist (Alan Guttmacher Institute, 1994).

Researchers (Raley et al., 2012) studying pregnancy and retention in higher education concluded, while pregnancy greatly affects retention on an individual level, so few women become pregnant that relatively few reasons for concern arise at an institutional level (Raley et al., 2012). Research on the subject, most notably Raley et al. (2012), has addressed the larger picture of institutional retention rather than the effect on individuals who become pregnant. Rather than taking a commodified view of retention that only investigates issues that affect institutional level retention, this present research addressed both the effect on the institution, as well as on the individual student.

In addition, it is likely that more pregnancies occur than students disclose to campus authorities and on surveys. While a small portion of students may have indicated that pregnancy was a reason for leaving their institutions, during the course of this research, developing a clearer understanding about the breadth of the issue on the campus was important, starting with the extent to which students receive pregnancy diagnoses. Therefore, data included medical records, rather than self-reported data.

Positionality

My work as a wellness coordinator directly informed my position and the vantage point from which I worked on this project. Through my work as a sex educator, I spearhead sexual health education and oversee pregnancy counseling for newly diagnosed students. As a practitioner in the field of student health, I have worked with pregnant students to provide

options counseling. Options counselors work with students who are unexpectedly pregnant to give them information on pregnancy, adoption, and termination in a safe and supportive environment. They provide help to students who often have trouble navigating complicated medical or educational systems. I have seen firsthand the wide spectrum of outcomes for pregnant students. I have also had the opportunity to talk with pregnant students about their thinking regarding pregnancy and the educational conflicts that often occur after a pregnancy diagnosis.

As an educator, I am interested in the ramifications of pregnancy for students who become pregnant while enrolled in higher education. After researching the topic, I was disappointed with the lack of quality studies, as well as the dismissal of the issue of pregnancy on college campuses. The research concerning how pregnancy affects educational progress, retention, completion, and enrollment status, among other variables, was judgmental, lacking, or missing entirely. This situation may be because of (a) the absence of data from students who do not want to admit to the institution they are pregnant, (b) assumptions about who becomes pregnant during college, (c) the difficulty of studying students who have already left an institution, (d) unwillingness on the part of researchers to study marginalized students' successes and failures, or (e) even fear on the part of the institutions that do not want to draw attention to a problem like pregnancy or sexual activity.

As I moved forward with this project, I was aware of my privilege. I was cognizant of the power and privilege that I hold, not only through my race, but also through my education, language, and current socioeconomic status. It was clear that my vantage point as a woman who has not struggled with college pregnancy makes me an outsider and reduces my understanding of the complexities of the issues. Even with these preconditions, I chose to use the present study to

answer questions that researchers have left unanswered. To leave them unasked would be to discount the struggles of students already frequently silenced.

Delimitations

This study addressed the characteristics of pregnant undergraduate students at Middleton University to determine whether a relationship exists between positive pregnancy diagnosis during undergraduate years and retention. This study did not focus on students' plans for their pregnancies, medical actions taken after the pregnancy diagnoses, or pregnancies not diagnosed by Middleton Health Service. Rather, this study focused on students' Middleton University positive pregnancy test and educational progress and retention after diagnosis. This research addressed the relationship between pregnancy and retention at an institution of higher education. Further implications beyond the institution under investigation, for example, how pregnancy may affect retention at other institutions or what effect a pregnancy may have beyond university enrollment, were outside the scope of this work.

Limitations

This research examined pregnancy and retention within a 6-year span, which is a relatively short period. Specifically, the focus of the present study was on pregnancy data from July 1, 2009, through June 30, 2015, from the Electronic Medical Record and retention data between July 1, 2009, and July 1, 2016. Therefore, these data do not predict changes in the trajectory of pregnancy or retention in the future.

Missing data are a concern in a sample constructed from archival documents. Missing or incomplete information on race, date of birth, sex, attrition, retention, pregnancy test results, enrollment status, or graduation status resulted in the omission of individual cases from the study. However, missing or incomplete information on age, ethnicity, or credits taken did not

result in omission of individual cases from the study. To increase transparency, Chapter 4 includes documentation and discussion of elimination of cases.

Definitions of Key Terms

Attrition. *Attrition* refers to the departure of a previously enrolled student from all forms of higher education prior to completion of a degree or other credential (Johnson, 2012).

Childbearing. This term refers to the process of conception, pregnancy, or childbirth. For the purpose of this study, *childbearing* refers to the act of giving birth to a child, rather than pregnancy or parenting. While pregnancy is a precursor to childbearing, parenting is not (“Childbearing,” n.d.).

Drop-out. This term refers to previously enrolled students who do not reenroll or do not complete their intended degree program or set of courses (Tinto, 1993).

Educational attainment. *Educational attainment* refers to the idea of educational progress in goal-oriented fashion. *Attainment* specifically refers to a degree or certification completion within an educational setting. Educational attainment need not include earning a terminal degree but could indicate achievement in a minor or specific area of interest.

Graduation. Graduation involves an award or acceptance of an academic degree or diploma, often representing an ending of a course of study. It can represent a terminal degree or the completion of a degree or certificate.

Graduation rate. *Graduation rate* refers to the percent of students who graduate with a degree within a set period (generally 4 or 6 years after initial enrollment). Often, graduation rates can indicate the differences between various groups of students or between institutions.

Marginalized identity. A marginalized identity is any identity that leads to loss of control based on racial, social, or ecological criteria. Within this study, the term *marginalized identity*

refers to students who identify as a group that has been historically disempowered or a group that, by its very nature, limits the amount of power an individual could hold (e.g., students with a lower socioeconomic status having limited economic ability based solely on their economic power or a Black student having less social or economic capital based on her status as *Black* and the historically marginalized status of Black women in this country). This researcher also views *woman* as a marginalized identity based on historical disempowerment and historical lack of control over body and economy.

Parenting. Parenting is an activity that involves raising a child, with the associated responsibilities. Within this study, pregnancy, childbearing, and parenting represent three distinct ideas. Parenting does not require pregnancy and childbearing. As a way to delineate between the relationships of parenting and retention and pregnancy and retention, *parenting*, in this present work, occurs in reference to previous research and the conflation of these ideas.

Postsecondary education. *Postsecondary education* is provision of a formal instructional program whose curriculum is primarily for students who have advanced beyond compulsory education in their schooling. It includes programs whose purposes are academic, vocational, and professional education but excludes adult basic education programs (“Postsecondary Education,” 2016).

Postsecondary educational institution. A postsecondary institution has a primary purpose of providing postsecondary education (“Postsecondary Education Institution,” 2016).

Pregnancy. *Pregnancy* is the period during which a woman carries a developing embryo and fetus (World Health Organization, 2015).

Progress. *Progress* refers to movement toward improvement or a more developed state or to a forward position. Progress in education does not necessarily mean academic success in

the form of grades or degrees; rather, it is an increase in the forward motion of education, a gaining of knowledge or understanding. In this present study, it refers to a student's ability to continue enrollment, not stopping out or dropping out ("Progress," 2016).

Public institution. A public institution is supported primarily by public funds and operated by publically elected and appointed officials ("Public Institutions," 2016).

Opt-out. This term refers to students who leave their institutions because they have achieved their particular goals (i.e., completion of a course or set of courses they desired or needed). Their goals may not necessarily have been to complete a degree program or certification program (Bonham & Luckie, 1993).

Retention. This term refers to the ability to keep or continue something. For students, it refers to the ability to continue pursuing education at an institution ("Retention," 2016).

Retention rate. *Retention rate* is a measurement of the percentage of first-time students seeking bachelors' degrees who continue their studies at the same institution the following fall ("Retention Rate," n.d.).

Stop-out. This term refers to students who begin with a plan of study but for some reason, withdraw and leave for a period and then reenroll to complete their degrees (Ahson, Gentemann, & Phelps, 1998).

Traditionally aged undergraduate student. This term refers to a college student between 18 and 24 years of age. Although the average age of students has been changing, in this study, focusing on traditional-aged students limited the cases to those students less than 25 years of age (Adelman, 2005).

Undergraduate. *Undergraduate* denotes education beyond high school, a student's first tertiary degree or a post-secondary degree (Binkley, 2012).

Summary

Little research has examined the relationship between positive pregnancy diagnosis and retention in an undergraduate institution. Current research is both limited in scope and heavily influenced whether students are willing to self-disclose positive pregnancy tests. I sought to determine the relationship between pregnancy diagnosis and retention at an institution, as well as to determine whether such confounding factors as ethnicity, age, or enrollment affected student retention after the pregnancy.

CHAPTER 2

REVIEW OF THE LITERATURE

To achieve a thorough description of retention theory, retention research, and the factors that affect the retention of undergraduate students, I first contextualize each problem and then discuss the problems as interrelated issues. In doing so, I attempt to gain understanding of the complex relationship between factors that affect retention as seen from a historical perspective and examine how understanding of retention has evolved into its current complexity. I attempt to delineate the intersections of retention issues, centering on the experience of pregnancy as crucial to the view of retention taken in this work.

Theory

An analysis of college retention reveals several factors that institutions need to address: access to college, student demographics, student transitions, student integration, student experiences, educational interruptions, and the role of the institution. Through analysis of these specific areas, researchers have found new information for explaining retention and attrition (Astin, 1984; Demetriou & Schmitz-Sciborski, 2011; Pascarella & Terenzini, 2005; Swail, 2004; Tinto et al., 1993). Each institution is responsible for its own retention research. Although data from other universities and meta-data are vital for informing new research and interventions at any institution, prominent researcher Tinto (1993) warned that each institution has specific needs that the individual institution's research should address and evaluate.

In the last 80 years, researchers have developed universal themes linked to the study of retention. Commonly explored themes are students' parental education levels, socioeconomic status, access to education, ability to transition to college smoothly, and interactions with faculty and other students once they are enrolled. These themes often occur together in discussions

building understanding of retention. However, these more general analyses cannot take the place of institution-specific research when addressing institutional challenges (Tinto, 1993).

Development of Retention Theory in Higher Education

In the 1970s, rather than collecting and reporting data, as previous retention research had done, researchers began developing student retention theories and models to explain educational retention phenomena. Spady (1970) adopted Durkheim's suicide model from his prominent work *Suicide* (1897/1951) to explain post-secondary students leaving institutions. Durkheim's model evaluated such factors as religion and marital status to explain differences in suicide rates within the population (Durkheim, 1897/1951). Spady's model included similar variables, such as academic potential, normative congruence, grade performance, intellectual development, and friendship support, to predict retention (see also Demetriou & Schmitz-Sciborski, 2011). Subsequently, Spady (1971) identified academic performance as the dominant factor in retention. Current retention theories continue to highlight academic performance, in both high school and college, as a central factor in the retention of students (Demetriou & Schmitz-Sciborski, 2011).

Five years later, Tinto (1975) developed a student integration theory of attrition (also based on Durkheim's model), examining attrition rather than retention at a university. Tinto's theory had a great deal in common with the Spady (1970, 1971) models, but Tinto emphasized the social integration of the student, as well as formal and informal academic experiences. The idea of social integration is different from friendship support in that it is a more overarching look at the systems of social support rather than examining only classmates. Social integration arises from classmates and faculty friendships, as well as students' participation in student organizations and traditions (Tinto, 1975). Tinto argued three factors influence the academic success of students: student commitment to academic goals, student career goals, and the

institution (Tinto, 1975).

In many ways, the 1975 publication of Vincent Tinto's model signified the beginning of the current dialogue surrounding undergraduate student retention. Tinto's sociological model indicated students who integrate into an educational community have an increased commitment to the institution, resulting in the institution being more likely to retain them. Researchers in the field have criticized, revised, and reinforced the work of Tinto over the last 40 years, often noting that the student population that Tinto studied was predominantly White male students (Swail, 2004). Tinto (1986, 1993) revised and augmented his theory of student departure to fit the trends and changing times while emerging as one of the seminal theories describing student retention in the United States. The theory serves as a foundation for researchers and practitioners studying retention, attrition, achievement, educational policy, and more. Tinto's theory is often criticized, and fundamental flaws have been discussed, resulting in researchers calling into question some of its major tenets. Despite these drawbacks, his theory remains the basis for much of the research on retention today. Hundreds of research studies over the past half century have addressed the major themes of retention in the theory of student departure discussed in Tinto (1986, 1993), and the themes remain important when examining retention today (Renn & Reason, 2013).

Theories are not meant to be untouchable; rather, they are collections of ideas to be tested and reworked. In this way, the theory of student departure creates a framework to understand retention and departure. Tinto's theory (1986, 1993) was not meant to be perfect, but used and revised. By using Tinto's theory as a framework to understand the multidimensional issues that encompass retention and attrition, higher education practitioners can create interventions grounded in a theory that necessarily complicates the issues of retention. The use of Tinto's

theory troubles the water of retention research by delineating the segmentation of higher education and focusing on the many concerns represented by retention research (Renn & Reason, 2013).

A decade after the publication of Tinto's original theory, Astin (1984) put forward a theory to conceptualize how students develop during their college experience. Astin's theory centers on three elements as well: student demographics and prior lived experiences; environment and the experiences a student has while enrolled; and the students' knowledge, attitudes, and beliefs after college (Astin, 1984; Pascarella & Terenzini, 2005). Astin's work focused on how the institution and the student interact to create particular experiences that benefit or harm the student's relationship with the institution.

Tinto's works are seminal documents for researchers studying retention on college campuses, and they have significantly influenced even those researchers who disagree with Tinto's findings (Berger & Lyon, 2005; Swail, 2004; Tinto, 2007). Critics have also influenced Tinto's work. Over the last 40 years, Tinto has revised his works. His most recent additions address including motivational variables. Researchers have addressed such variables as student goals, expectancy, academic self-concept, and motivation for education to gain understanding into college student retention and graduation (Tinto, 2007).

The purpose of Tinto's theory was to examine the variables affecting college student retention and attrition. By examining these variables, researchers and practitioners are able to gain better understanding of retention and attrition as a complex universal. If retention were examined without an overarching theory such as Tinto's, researchers and practitioners would be unable to see the universality of the current retention problem. According to Renn and Reason (2013), only through the lens of theory can a practitioner begin to understand the implications of

student attrition beyond a particular institution or area of interest.

Purpose of Retention Theories

The purpose of retention theories is to explain retention, guide the creation of programming, and enhance institution initiatives. Rather than practitioners developing retention programs based solely on experience or instinct, researchers are able to develop a theoretical framework on which to build initiatives. Retention theories encourage purposeful programming and guide thoughtful change at institutions (Panos, & Astin, 1968; Tinto, 1975, 1993, 1999, 2000, 2004, 2007).

Impact of Retention Theories on Programming in Higher Education

The theories of Spady (1970, 1971), Tinto (1975, 1986), and Astin (1984) concerning retention built a foundation for the next 40 years of retention research and programs. Themes that emerged in the 1970s and 1980s—such as student transition, integration, demographics, aptitude, and experiences—are still vital parts of current retention work. Although these theories are timeworn, current researchers and practitioners still use them (Pascarella & Terenzini, 2005).

First-year experience programs at undergraduate institutions across the country have indicated the influence of theory on retention programming. First-year experience programs engage first-year students in the campus community through planned group activities for increasing long-term retention at the institution. Theorists proposed these programs, designed to acclimate students to the campus and encourage student interactions with peers and staff, long before their current universal acceptance (Gardner, 1986).

First-year experience programs began at the University of South Carolina in the early 1970s, and their early success gained attention across the country. These programs “represent a deliberately designed attempt to provide a rite of passage in which students are supported,

welcomed, celebrated, and ultimately assimilated” (Gardner, 1986, p. 266). After the program had had years of success in South Carolina, Tinto (1993) evaluated the practice and later discussed it in the theory of student departure. This work supported the use of first-year experience programs, arguing the experience of the transition to college needed to be addressed specifically and programming was required to integrate students into the community (Tinto, 1993).

As universities across the country attempted to stem the tide of young college students leaving their institutions, they turned to Tinto’s (1993) theories to help them in the construction of programming based on theory. In the 20 years since Tinto’s work, a growing number of institutions have incorporated first-year experience programs and reported positive effects on retention rates among first-year students (Reason, Cox, McIntosh, & Terenzini, 2011). These initial first-year experience programs were based on the idea that early experiences of inclusion and achievement provide a foundation for later success (Gardner, 1986). Tinto specifically discussed the importance of integrating students into the culture through the creation of departments and programming aimed at enculturating students into the university system during their initial transition to college (Reason et al., 2011). Tinto’s discussion of first-year engagement and the importance of immediate programmatic engagement for students again spurred a great deal of growth and interest in first-year student retention practices. By 2006, 95% of 4-year institutions had seminars designed to retain and support first-year students (Reason et al., 2011). Purdie (2007) also used Tinto’s theory to develop first-year experience programs, finding that these programs did increase the likelihood of student retention.

Potential of Theory in Higher Education

Early retention studies of Astin (1984), Spady (1970, 1971), and Tinto (1975) developed theories based on small populations of largely White male students. Others in the field have attempted to expand their studies to include marginalized populations. Smedley, Myers, and Harrell (1993) researched the stressors students face while enrolled in college, specifically the stressors of life and marginalized student status that could affect students' successful transition to college. Smedley and colleagues reported, "More debilitating minority status stressors were those that undermined students' academic confidence and ability to bond to the university" (p. 448). Although parallels between these original theories and the findings of Smedley et al. do exist, Smedley et al. noted students' minority status was a factor in their retention at their universities, a fact that had not been addressed in the retention theories of Astin (1984), Spady (1970, 1971), or Tinto (1975).

Many researchers have questioned Tinto's view of the importance of involvement in a social community through a student's assimilation into a dominant culture. Indeed, for many students, the delineation between social involvement and cultural assimilation may well be a fine line. Tierney (1999) specifically argued that cultural assimilation on the part of a marginalized student leaves the student culturally assimilated to the dominant culture but results in a loss of identity on the part of the student (Tierney, 1999). Tierney contended social integration and the loss of identity were devastating for such students, inhibiting their retention and attainment. Other studies have found academic involvement affected retention positively, but social involvement had little to no effect on retention (Baird, 1991; Nippert, 2000).

Braxton, Sullivan, and Johnson (1997) challenged Tinto's theory for its inadequate applicability to marginalized students. They proposed that, in the future, researchers should test

the empirical internal consistency of Tinto's theory for marginalized groups of students. They suggested further examination or modification may be necessary to use Tinto's theory with marginalized groups. Braxton et al. also suggested using other theoretical perspectives for studying the retention of racial or ethnic minority-group students might be preferable.

Incorporation of Theory into Practice

While institutions incorporate theory into practice in various ways, many have chosen to use the model proposed by Knefelkamp, Golec, and Wells (1985, an 11-step model developed to connect theories to the applied work of practitioners and program developers. The model was originally intended for use by practitioners in student affairs; however, it has been widely implemented in many fields within education. Evans, Forney, Guido, Patton, and Renn (2009) argued that the model is also appropriate for practitioners throughout education because it facilitates the incorporation of theory into the development and implementation of interventions, thus increasing the role of theory in higher education.

The model created by Knefelkamp et al. (1985 delineates the appropriate integration of theory into practice for those in the field, using 11 steps:

1. Identify concerns to be addressed,
2. Determine goals and outcomes,
3. Identify useful theories,
4. Analyze student characteristics based on the selected theory,
5. Analyze environment based on the selected theory,
6. Identify sources for challenge and support,
7. Reexamine goals and outcomes based on theoretical analysis,
8. Design the intervention,

9. Implement the intervention,
10. Evaluate the outcomes, and
11. Redesign the intervention if necessary.

This model encourages practitioners in higher education to use theory by describing a straightforward implementation process. As a result, practitioners can identify characteristics, environments, and sources of challenges and support based on the theory selected. By using this process, practitioners in higher education are able to see the potential challenges of new projects or initiatives prior to an intervention, thus preparing them for problems that may arise.

For many practitioners, ideas for new interventions and programming come from the theories of others in the field who have come before them. Practitioners use theories to build on their own anecdotal experiences and the concerns, goals, or outcomes identified as troublesome by their institutions or students. The role of retention theory in higher education was to facilitate superior practice and research by basing current research on the findings of the past. By using theory in practice and research in higher education, practitioners are constructing a matrix incorporating codified ideas from theories with new findings. In doing so, practitioners in higher education continually create new ideas—and potentially new theories—to increase options for future practitioners.

Retention Research

Institution-Specific Research

Retention research is an ever-changing examination of students, experiences, institutions, and trends affecting students' ability to continue their educational journeys. Often, researchers study retention as an economic imperative from the perspective of the institution. An institution must keep the students they admit if they are to remain financially viable, especially when

institutional enrollment is low. This perspective affects the commitment of the institution to the individual student, diminishing the student's needs in comparison to the needs of the institution. If a student is in crisis, the institution should play a role in managing that crisis, give assistance, assess underlying issues at the institution, and address them. Conflict occurs when the institution has to choose between doing what is best for the student and what is best for the institution's bottom line. For instance, when health concerns during a pregnancy make it difficult for a student to continue her education, a university may make it difficult for her to leave so as to maintain her as an enrolled student rather than placing her health and well-being before the institutional need of enrollment.

One of the greatest problems facing the study of retention has been the lack of high quality data. Often, universities do not collect detailed data on demographic characteristics, academic circumstances, or reasons for leaving from students who leave the institution (Hall, 2001). Additional issues arise in examining national data because the United States does not track students who transfer or take additional credits at institutions where they did not begin their academic careers (Noble, 2003).

Tinto (1993) encouraged institution-specific retention research because, just as the student is an individual, the institution is a unique environment.

While it is true that such multi-institutional studies can be quite revealing of the aggregate patterns of departure from the enterprise as a whole and of the manner in which individual and institutional attributes may be associated with those patterns, they are of little use to either researchers or policy planners concerned with the character and roots of student departure from specific institutions. (pp. 36)

Large-scale research is important; however, an institution should make programming and policy changes based on research conducted elsewhere. Rather, institutions should examine their specific circumstances and those of their students to determine the causes of retention problems and the best interventions to implement.

Although I was interested in studying retention as a whole, of particular interest to me was the retention and persistence of students who became pregnant as a traditional-aged undergraduate. A small amount of published research has addressed college student pregnancy and the retention and persistence of these students. This present research addresses the relationship between pregnancy and retention at a particular institution, Middleton University.

Role of the Institution

Student departure and persistence are longitudinal processes. Therefore, Tinto (1986, 1993) argued retention research should acknowledge the processes affecting retention and persistence began long before the student came to campus. Although the process begins before interactions with the institution, an institution can improve retention through research-driven interventions.

A slump in enrollment at 4-year institutions in the early 1980s focused more attention on enrollment management and retention. With fewer students enrolling at institutions nationwide (Berger & Lyon, 2005), the retention of students who did enroll became more crucial.

Institutions responded by creating enrollment management systems/departments and encouraging enrollment and retention as vital fields of study (Berger & Lyon, 2005). Enrollment management typically takes a macro approach to student services by addressing institutions as a whole entity. Collaboration between institutional departments, such as academics, admissions, recruitment, retention, and student affairs, was encouraged to improve student retention, but it is unclear at

this point whether collaboration alone can affect retention (Demetriou & Schmitz-Sciborski, 2011).

Present-day retention research often centers on the concept of collaboration as a key to the retention problem, noting that, as more departments work towards solutions to retention problems, institutional systems should not be working against each other but should be forming collaborative and integrated approaches that build on the strengths of the individuals and departments participating (Keels, 2004; Salinitri, 2005; Thayer, 2000; Tinto, 2000). The concept of collaboration is important to retention because it encourages practitioners to see retention as the multifaceted problem that it is and encourages a multifaceted approach to the institutional solutions (Keels, 2004; Salinitri, 2005; Thayer, 2000; Tinto, 2000). Following such studies, many colleges adopted whole-campus community collaboration as a way to improve retention.

The research of Habley (2004), Swail (1995), and Wyckoff (1998) presented a cohesive argument for both building stronger connections among departments and understanding that interactions on campus directly relate to student achievement. Habley suggested the work of academic advising should not be limited to advisors but should include all members of the campus community (Habley, 2004). Swail (1995) argued for stronger cohesion among departments involved in smoothing the transition to college. Wyckoff discussed how every interaction—whether with a faculty member, a staff person, a student, or an administrator—influences student retention. Together, these ideas place the work of retention, not on individual students but on the whole community of the institution (Wyckoff, 1998). Additional research into retention echoes the idea of institutional commitment to retention, further indicating the need for institutions to prioritize retention at the administrative level (Braxton & Brier, 1989; Halpin, 1990; Pascarella & Terenzini, 1980). Tinto (2004) published similar research, suggesting

that both formal and informal social and academic support must be a part of the campus culture in institutions interested in increasing student retention.

Tinto et al. (1993) argued the institutional systems, both inside and outside the classroom, could assist in retention practices. Through collaboration, both classroom teaching and non-academic units can effect retention. In addition to academics, departments like student affairs, athletics, and Greek life (to name a few) have a role in student retention because they influence the student experience (Tinto et al., 1993).

The previously noted studies emphasizing collaboration between departments moved focus from the student to the institution. Doing so led to a critical reexamination of institutional roles. Institutional integrity was then discussed because it related to student retention, in essence, how well an institution aligns itself (in actions) with the mission and goals it espouses. Researchers argued for the equitable treatment of students and the equitable implementation and development of rules and policies (Braxton & Hirschy, 2005; Braxton et al., 2014).

Institutions have invested in programs and policies such as first-year student orientation (Pascarella, Terenzi, & Wolfe, 1986), academic advising (Voorhees, 1990), and student involvement in institutional decision-making (Bean, 1980). Students need to have these resources available to them and to believe that the institution is supportive of their needs. The more students believe their institutions are committed to students, the more likely they are to be socially integrated and the better their odds of persisting at the institution (Braxton et al., 2014).

By the turn of the 21st century, campuses were constructing cross-campus collaborations between departments that involved both the academic and social entities of the institution as well as collaborations with departments addressing the varying needs of diverse students to address the retention concerns. Researchers and practitioners alike saw this collaboration as the center of

the institutional programs to effect retention (Keels, 2004; Salinitri, 2005; Thayer, 2000; Tinto, 2000). In a study of single, low-income undergraduate mothers, Austin and McDermott (2003) found many barriers to educational achievement (such as access to affordable food, childcare, and housing). The women in the study overcame these barriers by applying strategies and using campus resources developed for student persistence. One strategy was entering less rigorous academic programs. Campus resources included social networks among students, faculty, and staff; faculty relationships; university services such as housing, dining, financial aid, student legal, and childcare; and support from peers, family, and community. Each participant discussed the importance of her personal belief that a college education would be worth the effort and strain in the end. The belief that education was worth the effort was associated with increased retention of students (Austin & McDermott, 2003). Additionally, Austin and McDermott found an increase in retention rates among students who used campus retention resources.

Tinto (1993) argued institutions have many ways to affect retention rates, including creating retention-specific programming and implementing policy changes that encourage students to continue enrollment. He also discussed the more human side of retention practice, imploring institutions to connect with students on an individual level:

An institution's capacity to retain students was directly related to its ability to reach out and make contact with students and integrate them into the social and intellectual fabric of institutional life. It hinges on the establishment of a healthy, caring educational environment which enables all individuals, not just some, to find a niche in one or more of the many social and intellectual communities of the institution. . . . Communities, educational or otherwise, which care for and reach out to their members and which are committed to their members' welfare are also those which keep and nourish their

members. (Tinto, 1993, pp. 204–205)

Tinto discussed the responsibility of the institution to its students, not simply to house and teach them but to ensure to the best of its ability that they have the opportunity and resources to succeed. Pregnant students require a “healthy, caring educational environment” just as the traditional student does (Tinto, 1993, p. 204). Although Tinto did not speak directly to the needs of special populations or students with specific needs, his work underscores the idea that institutions work with students to create a healthy environment (Tinto, 1993).

To help institutions achieve this goal, Tinto (1993) delineated both principles of effective retention and principles of effective implementation. In combination, these principles guide institutions concerning not only operationalized strategies to affect retention but the specific ways to apply a strategy. The principles of effective retention that Tinto discussed are institutional commitment to students (indicating that effective retention programs are committed to students and set student welfare ahead of other institutional goals, such as commercial viability), educational commitment (indicating retention programs are first and foremost dedicated to the education of all of their students and value the success of all the students they serve), and social and intellectual community (indicating retention programs are committed to the development of supportive social and educational communities where all students are integrated as competent members of the institutional community; Tinto, 1993). These principles focus the attention and resources of the institutions on what Tinto sees as the purpose of retention initiatives: to ensure that every student has the opportunity to succeed within the educational community. Every student having the opportunity to succeed includes students who are pregnant, have just given birth, or who are raising a child. Although Tinto did not specifically address student groups who should be afforded this opportunity, he did clearly state that the

opportunity should be for every student (Tinto, 1993).

Further, Tinto (1993) created the principles of effective implementation, a selection of actionable steps for institutions. In discussing these principles, he delineated the institutional role in aiding in the implementation of the principles in his theory and its role in aiding in student success. Tinto designed these principles of implementation so that an institution could use them as a checklist to ensure that, as they move forward on retention work as an institution, the work is grounded in theory and best practice. The principles of effective implementation were proposed as a rubric for institutions struggling to determine how to begin the process of retention initiatives.

Tinto (1993) argued the work of retention should be supported by the institution, which should encourage staff and faculty participation in retention work. “Institutions should provide resources for program development and incentives for program participation that reach out to faculty and staff alike” (Tinto, 1993, p. 149). In this principle, Tinto placed the responsibility of retention on everyone’s shoulders. Rather than allocating retention initiatives to a department or administrative team, Tinto asserted that retention programming should be developed and implemented across campus. Institutions should view the work of retention as a long-term investment in future programming. “Institutions should commit themselves to a long-term process of program development” (Tinto, 1993, p. 149). Tinto discouraged short-lived or shallow programming that applies quick fixes to entrenched institutional problems. Rather, Tinto emphasized the need for institutional commitment to the development of long-term initiatives that will increase retention for years to come.

Further, Tinto (1993) proposed retention work was everyone’s work. “Institutions should place ownership for institutional change in the hands of those across the campus who have to

implement that change” (Tinto, 1993, p. 150). Rather than design a program separate from the people who will implement it, institutions should give the ownership of programs to those who have the responsibility of implementing them to be successful. Thus, he discussed retention as a collaborative effort. “Institutional actions should be coordinated in a collaborative fashion to insure a systematic, campus wide approach to student retention” (Tinto, 1993, p. 151). In short, Tinto recommended campuses view retention programming as interconnected rather than disjointed and encouraged the use of cross-campus collaboration to coordinate retention programming and resources. Rather than institutions working against themselves with multiple disparate programs or initiatives unknown to the rest of campus, institutions should endeavor to coordinate so that retention efforts build on each other and collaborate so that separate entities on campus are not working against each other.

Tinto (1993) encouraged institutions to see staff and faculty development as an investment in retention. “Institutions should act to insure that faculty and staff possess the skills needed to assist and educate their students” (Tinto, 1993, p. 151). Although time spent in staff development was not necessarily a retention effort, it was a logical conclusion that, the more development and education staff attain, the better equipped they would be to work with students who need their help. If institutions invest in increasing the skills of their faculty and staff, they would increase the knowledge and resources available to students who are in need. If faculty and staff are the first line of defense against drop out, it is in the institution’s best interest to equip them to the best of the institution’s ability.

Throughout his work, Tinto (1993) encouraged institutions to view attrition as an issue that affects students immediately, noting the disproportionately high amount of attrition early in college careers. “Institutions should front-load their efforts on behalf of student retention”

(Tinto, 1993, p. 152). First-year retention efforts have a great possibility of success because, as a student's years in college increase, the likelihood of his or her leaving an institution decreases. For this reason, it makes sense to address as many issues as possible during a student's first year. As institutions address problems with students, they eliminate issues later on in the college career by teaching students how to handle stress, integrate into the community, or communicate with faculty. These skills, if taught early, have long-term effects on individual students.

“Institutions and programs should continually assess their actions with an eye toward improvement” (Tinto, 1993, p. 152). Tinto demonstrated this concept in his own work when he reworked and addressed new themes over time. Tinto discussed the idea that trends and themes change. What students experienced in 1975 was not the same as what they were experiencing in 1993, nor were the students the same. Tinto saw that the role of practitioners and programmers was to be vigilant and constantly assess the current situation of retention.

The principles of effective implementation are an articulation of the institutional role in student retention (Tinto, 1993). Institutions can use these principles as a guide to specific strategies for retention intervention enactment. These principles are also a standard to assess the strategies that an institution has had in the past or is doing currently. The role of the institution in retention is not to make changes once and remain stagnant but to be part of an evolving system with the goal of student success.

Students' Role in Retention

Ironically, Tinto's (1993) discussion of the student's part in retention was less specific. There are no principles for students. Rather, Tinto described the roles that students play in their own educational retention as innate. Tinto discussed the theory of student departure. This theory posits that students' dispositions affect their educational retention. To that end, a student must

act to promote positive educational outcomes by becoming engaged in the institutional community. Additionally, Tinto discussed the idea that students' own willingness determines their success.

Nevertheless there does emerge among the diversity of behaviors reported in research on this question a number of pertinent common themes. These pertain to the disposition of the individuals who enter higher education, to the character of their interactional experiences within the institution following entry, and to the external forces which sometimes influence their behavior within the institution. On the individual level, two attributes that stand out as the primary roots of departure are described by the terms "intention" and "commitment." Each refer to important personal dispositions with which individuals enter institutions of higher education. These not only help set the boundaries of individual attainment but also serve to color the character of individual experiences within the institution following entry. (Tinto, 1993, p. 37)

In essence, Tinto was discussing the importance of students engaging with their college community with an open disposition, the intention to engage in new experiences, and a commitment to work through the difficult transitions ahead. Perhaps this was the role of the student: to engage in the experience with a disposition that allows him or her to succeed.

In addition, Tinto (1993) emphasized the need to understand better the relationship between students' involvement in both the academic and social community and the effect that their involvement in both areas has on persistence. Tinto's 1993 revision of his 1975 model included a discussion of the interaction between behavior and perception of integration with a student's social and academic environments. Although Tinto (1993) never discussed academic and social integration as having a specific role in student retention, much of his work focused on

the underlying concepts of student integration in both the social and academic areas of the institutional community.

Several researchers have tested Tinto's original ideas. Researchers such as Pascarella and Terenzini (1980), Braxton and Brier (1989), and Halpin (1990) surmised that Tinto's discussion of the part that students play in their own retention was to integrate themselves, both academically and socially, into the institutional community. These researchers focused on student's perceptions of academic and social integration and found a need for greater specificity in both the types of interactions considered social and academic as well as the diversity of the student participants.

Institutional and Student Role Correspondence

In his 1993 work *Leaving College*, Tinto conceptualized the roles that both students and institution constructed simultaneously. As a result, these roles correspond well, as two intertwined pieces of his retention theory. The role of the student was to integrate into the institutional community by becoming involved in both social avenues to foster friendship and cohesion within the social sphere and academic avenues. Both stimulate students' interests in academic attainment.

Academic and social integration together encourage the student to feel connected to the people at the institution and the academic work of the institution, which may perhaps lead to an attachment to the institution itself (Tinto, 1993). The principle of effective retention most closely aligned with student integration was the principle of social and intellectual community. This principle directs retention programs to develop supportive social and educational communities in which all students are included as competent members of the institutional

community. This principle aligns well with the student's role and, in effect, tasks the institution with supporting the student's role.

The remaining two principles of effective retention, institutional commitment to students and educational commitment, integrate into the roles of students but are not as closely linked. These two principles state that effective retention programs are committed to the education of all of their students and put student welfare ahead of all other institutional goals (Tinto, 1993). These two principles ensure that institutions treat every student equitably and see student success as the most important aspect of the institution, thus allowing all students to integrate better into the institution.

Although Tinto (1993) did not refer specifically to marginalized students, the principles indicate retention of marginalized students should be as important as retention of other students. Thus, the institution has a responsibility to make culturally marginalized and historically underrepresented students welcome by offering students culturally appropriate opportunities for both social and academic engagement. The principles indicate all students' well-being is paramount to the needs of the institution and place even marginalized students' needs above the institution's needs. As noted, circumstances exist in which the best interests of the institution and the best interests of the students are at odds. Tinto (1993) frequently insisted that the institution should put the needs of the student first. This principle created issues for universities, particularly when it was in a student's best interest to leave the institution.

Many instances can occur causing the best interest of the student to be taking time away from the institution. However, the model in Tinto (1993) leaves no room for deviation. If a student were having mental health concerns, were pregnant, or had had a bad experience at the institution, it could be in her best interest to leave the institution. Unfortunately, it may be in the

best interest of the institution to keep the student and her tuition dollars. If an institution fails to follow the principles, conflict will ensue. Institutions that choose to retain students when it is solely in the best interest of the institution are in direct opposition to Tinto's principles.

Tinto (1993) delineated clear student and institutional roles in terms of retention. The role of the student was to engage openly in social and academic areas of the institution, thereby integrating into the fabric of the institution. The role of the institution was to support the student by creating an institutional commitment to students, education, and the social and intellectual community (Tinto, 1993). Tinto asserted, by doing fulfilling its role, the institution supports students in their efforts to have an open disposition, their intentions to engage in new experiences, and their commitment to work through the difficult transitions ahead. For students to engage in the experience with a disposition that allows them to succeed, institutional support must be present. These roles together create an institution in which education, students, and community are valued and students become an integral part of the larger academic community. Ironically, this situation does not occur when students become pregnant because of the lack of institutional support.

Factors that Affect the Retention of Undergraduate Students

Six factors affect student retention as it relates to pregnancy diagnosis. These six factors include access to higher education, demographics of students, student transitions, student integration, educational interruptions, and student experiences. These six factors have been studied independently but have yet to be studied as part of a matrix or intersection of identities and experiences that affect retention for pregnant students.

Access to Higher Education

Accessing higher education is complicated for marginalized students. “Access to higher education was not only a matter of getting into university, it was a matter of staying in and emerging in good standing” (U.K. House of Commons Select Committee on Education and Employment, 2001, para. 1). In the 1960s, as the Civil Rights Movement gained power and began addressing issues of access to education, equity, and equality, specific questions of retention among marginalized students arose. The central focus in retention research became who was able to access education, who graduated, and who was successful in attaining their degrees. As the Civil Rights Movement progressed, inequity in access not only to educational institutions but also to services at these institutions was addressed on the individual and community levels (Berger & Lyon, 2005). Campuses addressed these concerns by creating student services on campus to assist students and increase access, retention, and graduation. Educational success through academic and financial institutional support was a way to increase equity (McDonough & Fann, 2007). Current retention research continues to address issues of access and equity in education (Braxton & Hirschy, 2014; Tinto, 1993). However, concerns about retention and graduation have overshadowed the issue of access to education.

Gaining initial access to post-secondary education has never guaranteed graduation for marginalized students. Once students gain access, the problem becomes retention, educational attainment, and graduation (DOE NCES, 2015). Rates of graduation vary widely across institutions, by demographics or by region (Tinto, 2003; DOE NCES, 2015). Current enrollment trends show an increase in attendance by various racial and ethnic groups previously limited in their access to higher education. These recent changes are believed to be due to wide-scale changes in the demographics of the United States as a whole, as well as changes in the number of

Latino/a students who are able to and are interested in attending college (Pryor, Hurtado, Saenz, Santos, & Korn, 2007).

Demographics of Students

For nearly 80 years, universities have acknowledged a difference in retention rate based on demographic characteristics. Age, race, and socioeconomic status (SES) all affect retention rates. In 1938, McNeely published data from 60 post-secondary institutions. His work examined reasons for departure as well as basic demographic and social engagement information of students at particular institutions. He noted important differences in reasons for leaving college by demographic characteristics, such as SES and age. For example, students from lower socioeconomic statuses were more likely to leave school because of financial strains on their families requiring them to earn money to support the rest of the family (Berger & Lyon, 2005; Demetriou & Schmitz-Sciborski, 2011).

These distinct differences between demographic groups persisted unchallenged until the Civil Rights Movement, when African American students demanded equity in education. Students obtained services such as financial aid and academic coaching to overcome the disparity for marginalized students resulting from economic, racial, and ethnic differences (Berger & Lyon, 2005). In the 1990s, retention research and institutional work on campuses focused on encouraging previously underrepresented populations to succeed. Similar to the campaigns of the 1960s, again in the 1990s, students of color, racial and religious minorities, and students from disadvantaged backgrounds were moved to the forefront of retention research. Again, scholars found divergent retention profiles for minority and majority students. Often, these disparities represented wide differences in retention rates between White and Black students (Berger & Lyon, 2005; see also Demetriou & Schmitz-Sciborski, 2011; Swail, 2004).

Nationwide, 42% of Black college students who began college earned their degree in 6 years, compared to 62% of White students (*Black Student College Rates Remain Low*, 2013).

In 1993, Tinto discussed the differing needs of students from various backgrounds, referring to the concept of tailored interventions for different students or populations. He pinpointed students of color, students from low-income families, non-traditional students, and transfer students as some of those who may benefit from additional group-specific interventions. Practitioners continue to use this strategy by working with marginalized groups in ways different from majority groups. Examples include work with Black resource centers, veterans services, and so on. These groups have all shown benefits from these interventions and are retained by institutions at higher rates than are similar students at institutions without such interventions (Berger & Lyon, 2005; Demetriou & Schmitz-Sciborski, 2011; Swail, 2004; Tinto, 1993).

Research into the campus climate for historically marginalized students found the overall perception of institutional fairness is negative. Marginalized and historically underrepresented student groups report experiencing a hostile climate at predominantly White institutions (PWI). Notably, studies repeatedly show that White students perceive a less hostile environment than do students of color (Rankin & Reason, 2005). A hostile environment for students of color was linked to additional educational difficulties, including attrition from an institution altogether (Rankin & Reason, 2005). Creating a welcoming atmosphere in which students from many different backgrounds can succeed is paramount to institutional success (Rankin & Reason, 2005).

Research on Latino/a students has shown they are less likely to look for or use institutional support when they experience challenges in college transitions (Kearney, Draper, & Barón, 2005). These challenges occur when students are transitioning to college, between years,

or between majors. This lack of resource use was of particular note at PWIs where Latino/a students represented a marginalized student group (Kearney et al., 2005).

The SES of students and their parents' familiarity with the college environment affects students' understanding of higher education because students of lower SES are less likely to have been taught by their families what higher education is really like. This lack of first- or second-hand experience with higher education makes it more difficult for these students to prepare themselves for success in higher education (Hovdhaugen, 2009). Students from lower SES backgrounds with parents who did not attend college are less likely to have the knowledge needed to choose effectively an appropriate college or an institution that fits their needs (Hovdhaugen, 2009). Additionally, low SES students have less cultural capital, are less likely to enter college in the first place (McDonough, 1994), and are less likely to have gone to a school system that properly prepared them for higher education (McDonough, 1994). Thus, these students are more likely to require additional help to achieve academically (McDonough, 1994). Hovdhaugen (2009) found that students from families with less education had the greatest risk of dropping out. He also indicated students from well-educated families were less likely to leave their institutions, and if they did, they were more likely to transfer to another university.

For some students, graduation is not the goal of education. Specifically, for students from lower SES backgrounds, the end goal may not be a degree. Students may have goals of learning new skills or gaining knowledge, regardless of degree completion. Still others may return to education when economic or family circumstances change. To say that all students who do not graduate view their situations as failures would be misleading (Noble, 2003). Hodgkinson and Bloomer (2000) argued that students, specifically students with lower SES, often begin educational pursuits with specific knowledge or economic goals in mind. Once such students

have achieved their goals, they may be less likely to continue in education beyond their original objectives. The underlying assumption that all students enroll with the intention of graduating is false. This fallacy was a part of the reason retention research in the past was flawed. Perhaps students are not initiating their education with the intention of graduating but with the intention of gaining knowledge, developing skills, or experiencing social freedom (Noble, 2003).

Student Transitions

First-year attrition represents approximately half of all attrition from U.S. universities (Australian Department of Employment, Science and Technology Strategic Analysis and Evaluation Group, 2004; DeAngelo, 2014; Johnson, 1994; Pattengale, 2000). Tinto (1999) focused on first-year experiences because this transition is the most abrupt and potentially damaging for students who lack support. Tinto recommended investment in academic advising and argued that advising should be an integral part of the student's transition to college. Early academic advising promotes student development and involvement in academic success (Tinto, 1999).

Researchers who have examined attrition and retention after the first year propose that factors influencing later-year attrition may be significantly different from factors influencing first-year attrition (DeAngelo, 2014; Pattengale & Schreiner, 2000). Interestingly, little research has explored later attrition. Pattengale and Schreiner (2000) noted, for institutions to have a long-term effect, they must address retention programming after the first year. Students must receive continued support for the issues originally addressed in the first year through programming and support, lest problems persist and lead to later attrition (Pattengale & Schreiner, 2000).

Student Integration

Ironically, Tinto (1993) argued that student demographic characteristics, such as race or SES, play a smaller role in retention than does student integration into the institution. Tinto contended social and academic integration prominently influences students' decisions to continue to study at a specific institution. He referred to the effective social and academic integration into the institution as *congruence*, the degree to which institution, staff, and fellow students mirror a student's values and opinions. Integration is difficult to achieve when incongruence exists between the values of students and the institution. McNeely (1938) published data on the social engagement of students, as well as the retention and attrition of those students. His findings were revolutionary because they showed that social engagement and student integration into the network of their community positively affects retention. This type of research has been repeated regularly in retention studies and continues to show the positive influence of integration on retention (Berger & Lyon, 2005; Demetriou & Schmitz-Sciborski, 2011).

Educational Interruptions

During the 1970s, the tradition of attending the same institution for 4 years ended. Students began to attend multiple institutions for different lengths of time (Goldrick-Rab, 2006). Students began to require more flexibility from their educational endeavors (Adelman, 1999). Retention research changed to accommodate this transition in attendance (Adelman, 1999). While this shift represented a change in the length of time a student took to complete a degree, it also signified the beginning of the stopping out culture. Stopping out occurs when students interrupts college attendance for a semester or longer before re-enrolling and continuing their educations (Goldrick-Rab, 2006). Although stopping out does not directly indicate an institution's failure to retain a student, it does increase the student's risk of future interruption in

educational achievement and makes graduation less likely (Des Jardins & McCall, 2010). It may have implications for pregnant students who need to take time off and stop-out because of pregnancy, miscarriage, termination, or birth. Contemporary retention research continues to study stopping out and the transitions students make from one institution to another (Des Jardins & McCall, 2010).

Student Experiences

Stage (1980) contended that formal and informal experiences affect students' integration into their institutions and, therefore, partially determine retention. These experiences can be positive, such as establishing affirmative friendships and experiencing social freedom, though they can also be negative, such as experiencing social ostracism, unexpected pregnancy, or sexual assault. New friendships and positive experiences at college have a recognizable effect on students' transition to college. Students who transition successfully to college often experience friendships and social interaction, often seen as part of social integration by researchers (DeAngelo, 2014; Stage, 1980).

Developing new friendships can help students work through the tough transition to college, as well as offer support for other concerns in their lives. Tinto (1975) found that college dropouts perceived they did not have the same level of social integration or positive peer experiences as those who persisted in college. Additionally, Tinto found friendship and the support of a peer group leads to college persistence (Tinto, 1975). Mohr, Eiche, and Sedlacek (1998) conducted interviews with returning and non-returning students at a public university. They found personal problems, such as mental health and family concerns, were among the top reasons for students permanently leaving the university. Interestingly, they also identified isolation and dissatisfaction with access to resources (some of which may have helped them with

their concerns), as additional reasons for leaving the institution.

The Relation of Pregnancy, Childbearing, and Parenthood to Retention

In most research studies, pregnancy, childbearing, and parenting have been conflated and often discussed as though they were one singular experience. However, they are distinct experiences that should not be amalgamated into one single experience (Alan Guttmacher Institute, 1994; Hofferth & Moore, 1979; Hofferth, Reid, & Mott, 2001; Raley et al., 2012; Ribar, 1994; Rindfuss, Bumpass, & St. John, 1980; Rindfuss, St. John, & Bumpass, 1984; Upchurch, and McCarthy, 1990). Pregnancy is often the first experience in this chain of frequently linked factors and will be the focus of this dissertation.

Pregnancy

Recent research by Raley et al. (2012) discussed students' post-secondary educational retention after pregnancy, indicating that, after becoming pregnant, a student was between 1.67 and 2.13 times more likely to drop out than her peers were. The researchers noted few students become pregnant while at college (higher education being considered a protective factor). Of college dropouts, 3.4% were related to pregnancy at a 4-year institution. The researchers concluded this number was not necessarily relevant to the retention discussion because it was so small (Raley et al., 2012).

Among the limited research on the topic of college student pregnancy is research published in the *Journal of American College Health*. "The State of the Union: Sexual Health Disparities in a National Sample of US College Students" (Buhi, Marhefka, & Hoban, 2010) addressed the size of the problem of college student pregnancy. The research findings, that relatively few students self-report pregnancies, mirror the research of others. Of the 29,170 responding to the National survey, only 1.9% reported having an unintended pregnancy or

getting someone else pregnant within the last school year. The research indicated ethnicity as an area of interest, showing that nearly 4 times as many Black students (6.6%) as White students (1.7%) self-reported an unintended pregnancy in the previous school year (Buhi et al., 2010). Unfortunately, the research did not address pregnancy diagnosis related to age or retention. Again, the pregnancy diagnoses for this research relied on self-reported data, calling into question its veracity.

The research of Buhi et al. (2010) had several issues or limitations. First, the data were collected through a survey with a self-reported approach, not through medical records. Second, only 2,605 men and women participated in the survey. The researchers did not report how many were female or how many were pregnant. This lack of information calls into question the scope of the research and its findings (Raley et al., 2012). Because few studies have addressed how pregnancy affects post-secondary educational retention, parallels must be drawn to the educational attainment and problems of high school students.

In the mid-1990s, approximately one million adolescent (12–19 years of age) pregnancies occurred annually in this country. Of these pregnancies, only 14% yielded an intended birth, 37% resulted in an unintended birth, 35% were terminated, and 14% ended in miscarriage (Alan Guttmacher Institute, 1994). One million pregnancies resulted in approximately 510,000 live births. The mid-1990s was a time of increased adolescent pregnancy, resulting in a great deal of attention to the issue (Alan Guttmacher Institute, 1994).

Research from the early 1990s delineated the stark differences in educational achievement between high-school-aged students who had a pregnancy and those who did not and the demographic differences between these groups. Upchurch and McCarthy (1990) found the high-school-completion rate for women who had had a pregnancy by the age of 17 or younger

was 54.5%, compared to women who had not had a documented pregnancy (95.5%). These figures indicate more than a 40% difference between the two groups. Moreover, they found distinct differences by ethnicity. Black women's completion rate fell less than White women's completion rate, falling to 60.6% with a pregnancy as opposed to 92.8% without a pregnancy (32.2% change) while White women's completion rate fell to 53.7% from 96.5% (42.8% change). In Hispanic women, pregnancy had the greatest effect on completing high school, falling to only 36.6% after a pregnancy, compared to 90.1% without a pregnancy (53.5% difference; Upchurch & McCarthy, 1990).

Teen pregnancy rates dropped significantly between 2000 and 2008. In research compiled from National Center for Health Statistics data, researchers found the pregnancy rate for women between the ages of 18 and 19 years had dropped from 135.8 per 1,000 in 2000 to 114.2 per 1,000 in 2008 rates (Hoyert & Xu, 2012). The research indicated increased access to affordable birth control and a change in sexual health education in high schools were responsible for the changes in pregnancy rates (Hoyert & Xu, 2012). The report also addressed the widespread differences between White women and women of color in the study. Most notably, the research showed that Asian and Pacific Islanders were the only ethnicities to have a lower pregnancy rate than White women while all other ethnicities had pregnancy rates that were double or triple the rates of White adolescents. While rates overall have decreased, marginalized communities are disproportionately affected by teen pregnancy (Hoyert & Xu, 2012).

Childbearing

A great deal of research has addressed the effect that childbearing has on educational attainment in high school. Research methods and interpretations have changed over time as researchers have been able to address initial biases and shortcomings in their research. The

initial researchers who studied educational achievement and childbearing, known as traditionalists, contended that teen childbearing was detrimental to women because it caused them to complete less education than their peers who waited to bear children later in life (Hofferth & Hayes 1987). The research of the traditionalists showed causation without analyzing the characteristics and demographics of the women who were giving birth at younger ages. In doing so, the traditionalists overlooked differences that led women to complete less education than their peers regardless of childbearing. Traditionalist researchers have used a variety of methodological techniques to find the causal relationship between childbearing and educational attainment, yet they have often overlooked distinct differences between groups (Hofferth & Moore, 1979; Hofferth et al., 2001; Ribar, 1994; Rindfuss et al., 1980; Rindfuss et al., 1984; Upchurch & McCarthy, 1990). While evidence exists that mitigates and complicates the proven effect of childbearing on educational achievement, traditionalists have continued to discuss the detrimental nature of early (often high-school-aged) childbearing on women's educational achievement (Hofferth et al., 2001; Ribar, 1994; Rindfuss et al., 1984; Upchurch & McCarthy, 1990). Additional research was necessary to determine whether the detrimental effects of childbearing were causal (Hofferth et al., 2001).

A second wave of researchers, known as revisionists, maintained the effects of young childbearing are overstated because early child bearers differ substantially from young women who do not have children or who wait to have children in ways that may affect their educational achievement regardless of childbearing (Hofferth et al., 2001; Hoffman, 1998). While revisionists have researched the substantial disadvantages and reduced opportunities with which early child bearers struggle, many revisionists have contended these disadvantages may be resulting from preexisting social conditions. They further contended these outcomes may not

differ substantially if the women had not had children. Revisionist researchers have addressed the concerns in such a way as to move the field toward a consensus that, although early child bearing—specifically childbearing before the completion of high school degree attainment—influences young women’s educational attainment, its influence was weaker than previously believed by traditionalist researchers (Hofferth et al., 2001; Hoffman, 1998). Additional research on early child bearing from 2006 found only about 2 percent of female students who bore a child before the age of 18 graduated with a 4-year college degree by age 30, compared to 9% of women who waited until they were 20 to 21 years of age to bear their first child (Hoffman, 2006). These statistics show distinctly different educational outcomes at different ages.

Reporting their large-scale longitudinal quantitative research project, Jones et al. (1999) suggested childbearing prior to completion of high school reduces the probability of completing high school by only 8–10%. Although high school completion may be more attainable for women who give birth, enrollment in college involves less reliance on federal support programs; public programs for teenage mothers generally end at high school completion or graduation, so the institutional support women with children were accustomed to is not legislated at the post-secondary level (Hofferth et al., 2001). One option for improving the progress of women who give birth may be to tailor university programs for pregnant and parenting students. Tinto (1993) made a similar argument in addressing the need for tailored interventions for different students or populations. Additional evidence indicates interventions that target reduction of childbearing improve young women’s education outcomes (Jones et al., 1999).

Parenting

Stevenson, Maton, and Teti (1998) conducted research into teen mothers in high school and argue for the need for programming specific to the needs of teen mothers to help them stay

in school. The researchers found that, without specialized programs to teach young mothers how to stay in school and care for their children, teen mothers had a hard time graduating from high school or earning a GED. While the researchers noted not all dropouts among teen mothers occur because of pregnancy and mothering, referring to the revisionist understanding of identities coming into play, they noted the additive effect of parenthood, schooling, and additional social risk factors that lead to pregnancy have a clear relationship with retention and progression (Stevenson et al., 1998). Additionally, Hofferth et al. (2001) found that teen mothers (including 18 and 19 year olds) completed 1.9–2.2 fewer years of education than did their peers who did not give birth until age 30 or older. Hofferth et al. (2001) wrote as revisionists who took into account the demographics of their subjects and still found a significant subsequent gap in educational achievement for women who became mothers at 18 and 19 years old.

In a study of single low-income undergraduate mothers, Austin and McDermott (2003) found specific barriers to educational achievement. The women overcame these educational barriers by developing strategies and using resources for persistence. These resources included social networks among students, faculty and staff; faculty relationships; university services, such as housing, dining, financial aid, and childcare; more flexible academic programs; and support from family and community. Participant belief in the importance of her college education notably that it would be worth the effort and strain in the end, was integral to her success (Austin & McDermott, 2003). In addition to students attitudes affecting their success, major actions by the government to regulate how institutions treat their pregnant and parenting students has sought to effect student success. Since the passage of Title IX by the U.S. Congress, sex discrimination, which includes discrimination based on sex, gender, pregnancy, childbirth, and parental status, has been prohibited in both high schools and universities that receive federal

funding (DOE, Office of Civil Rights, 2013).

Research and university programming needs to address these students to keep up with this growing number of students identified as nontraditional to insure their success. Although nontraditional students only comprise a portion of the students I am studying (because not all pregnant students would give birth or parent), they are the most visible on campus because they are pursuing education in addition to taking care of their children (Brown & Nichols, 2013).

Summary

The study of retention theories in general has enabled researchers to understand better the concerns central to retention. As theories have progressed and become more robust over time, they developed to encompass more diverse students and issues. Institutions have become accountable for retention because their financial survival depends on retention rates. Furthermore, an institution's image is strongly associated with its retention rates; thus, institutions have become more focused on preventing attrition. Research into the factors that influence retention has clarified the issue, with six of these factors possibly being related to retention of pregnant students. This dissertation examines the relationship between pregnancy and retention using a revisionist lens to examine pregnancy and the student development theory as a framework to approach retention.

CHAPTER 3

METHODOLOGY

To describe the methodology used in this research project, I will discuss the choice of methodology, structure of quantitative research, research design, purpose, procedure, data collection, alternative data collection options, preparation of data, data analysis, and assumptions of the study. I also explain the reasoning for the methodology chosen. Further, I clarify the steps taken to prepare and analyze the data.

Choice of Methodology

Quantitative research generally falls into one of three categories: replication-based research (intended to imitate existing research), data-driven research (intended to identify a cause or relationship previously unstudied), and theory-driven research (intended to test, modify, or create a theory; Paulsen, 2013). For this dissertation, I used a data-driven research approach to identify a possible relationship previously dismissed as minimally important. While the area of retention research was well studied and documented, the relationship between pregnancy and retention in higher education was not extensively researched. This lack of theories or previous research on the subject makes it ideal for a data-driven research project (Treloar & Wilkinson, 2008).

The data-driven research approach often involves largely unexamined or unavailable records and discovers patterns in the data. Data-driven research is not necessarily grounded in theory because the topics or themes have not been researched so fewer theories are available to draw from. The focus of data-driven research is gathering empirical evidence and interpreting those data using statistical measures. In doing so, the researcher attempts to determine the relationship between the independent and dependent variables, as well as additional associations

relevant to the research (Treloar & Wilkinson, 2008).

Traditional quantitative researchers use post-positivist philosophies. Post-positivists argue that causes generally determine effects and outcomes (Creswell, 2012). Phillips and Burbules (2000) discussed five aspects of the post-positivist worldview and explained the key traditions for post-positivist thinking in detail. These traditions include the following ideas: absolute truth is not possible to prove, research is a process of constructing ideas and refining theories based on research, data and evidence shape awareness, research seeks to develop new ideas to explain a situation, and objectivity is an essential part of quality research.

Each tradition in the post-positivist worldview has a purpose in the study of phenomena. The idea that absolute truth is not possible to prove was important because it ensured the role of the researcher was not to establish “truth” but rather to identify inaccuracies and raise questions about the data the researchers examine. The tradition that research is a process of constructing ideas and refining theories based on research moves researchers not only to create new ideas and theories to explain phenomena but also to reexamine theories previously constructed to determine whether new evidence or a different population changes previously established theories. The notion that data and evidence shape awareness pushes the researcher to use data to inform the creation of ideas and theories. Traditionally, researchers seek to develop new ideas to explain a situation, focus the point of research on moving the discipline forward as a whole, find new information, and share ideas with others in the field. Furthermore, the tradition that objectivity is an essential part of quality research impels the researcher to keep an open mind, act ethically, and address bias and objectivity openly. These aspects of the post-positivist worldview align well with my own worldview and the research I am interested in conducting. The post-positivist worldview helped to shape the direction and content of this research (Phillips &

Burbules, 2000).

Structure of Quantitative Research

Quantitative research tests objective theories by exploring relationships between variables. In quantitative research, variables are generally numeric (or converted to a numerical value) and are analyzed using statistical procedures. As with all research, quantitative research must address issues of bias and alternative explanations for phenomena (Creswell, 2012). The structure of quantitative research design is the scientific method, using deductive reasoning. The researcher observes an unexplained phenomenon, generates a hypothesis, accumulates data, analyzes the data using statistical procedures, and forms conclusions that either support or fail to support the hypotheses (Creswell, 2012).

Quantitative research represents a logical, objective way of addressing questions whose solution is quantifiable. In this research project, I used numeric data from historical, medical, and retention sources; therefore, the research is quantitative in nature. I used both descriptive and comparative research questions to assess the studied groups. I designed the research questions to determine whether a relationship existed between the independent variable and the dependent variable. In this project, the relationship investigated was between positive pregnancy students' tests and the students' retention at Middleton University (Creswell, 2012).

Research Design

In this research project, I used an exploratory quantitative analysis of a cross-sectional data set collected by a third party. This research was non-experimental in nature because I was not capable of manipulating the independent variable of a student having a positive pregnancy test (Wiersma & Jurs, 2009). Collected third-party data enabled the quantitative research analyses needed to answer the three research questions.

Research Question 1: What are the demographic differences between pregnant traditional-aged students and their non-pregnant peers?

Research Question 2: What is the relationship between a positive pregnancy test and college retention among traditional-aged undergraduate students?

Research Questions 3: If the results for RQ2 indicate a relationship between pregnancy and college retention, what is the strength and direction of that relationship?

Population and Sample

Sampling is advantageous in a research study because it allows the researcher to work with a more manageable amount of data. It takes less time if the researcher wants to study the entire population and encourages a higher quality of research because researchers have more time to devote to the project as a whole. If done properly, sampling can assist in achieving a robust participant group to study (Gliner, Morgan, & Leech, 2009; Shadish, Cook, & Campbell, 2002). The sampling process involves three steps. First, the researcher identifies the target population, the group the researcher would like to generalize the research findings to. Once the target population is determined, the researcher examines the concerns or plausibility of using this large population and decides on the accessible population. The accessible population is a small portion of the target population. The accessible population is a demographically similar population, made up of a portion of the target population that the researcher believes is reasonable to investigate. Often, this group is determined by considering limited resources or time constraints of the research project. Accessible populations are more manageable in number for research purposes (Gliner et al., 2009; Shadish et al., 2002).

The researcher then selects a sample from the accessible population. This group is often smaller than the accessible population, but in some cases, the accessible population is small

enough that it is possible for the researcher to work with the entire accessible population. Random selection is possible, but selection should result in a portion of the accessible population that represents the target population. The researcher then asks members of the selected sample to participate in the research project (Gliner et al., 2009; Shadish et al., 2002). The final step in determining the sample is to run the study and determine the participants who complete the study or whose data are complete and usable. Those participants who do not complete the study or whose data are missing are withdrawn from the actual sample (Gliner et al., 2009; Shadish et al., 2002).

For this research project, the target population was all traditional-aged female undergraduate college students (regardless of pregnancy status) at Middelton University. This population was not reachable because of its size, the lack of medical records for every female student, and the various ways Middelton University maintained student records over the years. To make the research project achievable, an accessible population of traditional-aged female Middelton University undergraduate students who had been tested for pregnancy at Middelton Health Services between July 1, 2009, and June 30, 2015, represented the accessible population. The selected sample was similar to the accessible sample; however, data were missing for some individuals in the accessible sample, resulting in removal of those individuals' data from the selected sample.

After I noted missing or inaccurate data in the fields of race, date of birth, birth sex, and graduation and eliminated those individuals' records from the sample, the actual selected sample remained. I then examined the remaining selected sample to determine whether it had similar demographic characteristics to the target population. The sample was demographically different from the target population because there was a larger number of Black and African American

students in the sample of students who had requested pregnancy tests than the campus population proportion would estimate. This finding affected how I worked with the remaining data. I noted the difference in race/ethnicity proportions in the target population and the sample population but did not control for those differences. To address the disproportionality of the pregnancy testing data would obfuscate the differences seen in the analysis concerning who was on campus and who has requested pregnancy tests.

The sample was different from the target population. The difference in the sample population and the target population is an interesting finding that is relevant for future research. The sample in this data set represented a local population and did not represent a larger national population. Studies with larger national populations could determine whether differences exist according to institution type, region, and so on (Gliner et al., 2009).

Consideration of Participants

This research used an analysis of secondary redacted data collected by the Middleton Health Services at Middleton University. Therefore, I had no contact or interactions with individual participants within the research project. Prior to any data collection, I submitted the appropriate application to the Human Subjects Committee for review and received approval (Appendix A). This committee is responsible for reviewing all human-subject related research projects conducted by students affiliated with Middleton University. The Human Subjects Committee protects participants involved in research projects, researchers, and the university from incurring negative consequences because of the research project. A full review was necessary for this project because the variables being examined involved both health and educational information.

Procedure

Statistical procedures enable a researcher to analyze data to determine relationships and possible effects between the independent variable and the dependent variable, in this case having a positive pregnancy test and remaining at the institution (Creswell, 2012). This research involved descriptive, comparative, and proportional analysis to address the research questions. Descriptive research describes information for a single group. For this study, the purpose of descriptive analysis was to determine the demographic characteristics of students tested for pregnancy to describe the sample.

Researchers use comparative research to determine how one group compares to another. I used this comparative research to examine the differences between two groups: undergraduate traditional-aged students diagnosed as pregnant and their peers with negative pregnancy tests. Comparative research asks the question, “What was the difference between these two groups?” It compares groups based on outcomes or demographics. With this research, I wanted to determine the difference between the demographics of the groups and the difference in retention between the groups. Although comparative research questions never prove causation, comparative research can determine whether significant differences exist between two groups. I used correlational statistics to assess the relationship between variables (Creswell, 2012; Gliner et al., 2009; Shadish et al., 2002).

In comparative research, a researcher studies two or more groups to determine whether an independent variable has a relationship with a dependent variable. In the case of this research, the independent variable was a positive pregnancy test, and the dependent variable was retention at the institution. Because neither pregnancy nor retention was a manipulable variable in this study, a comparative research design was well suited for this research project (Creswell, 2012).

A comparative research design is shown in Figure 1.

<u>Sample</u>	<u>Assignment</u>	<u>Independent Variable (IV) Group</u>	<u>Attribute IV</u>	<u>Dependent Variable (DV) Average Score for Group</u>
Pos. test -> 1, 2, 3	Non Random	Pos. test (1, 2, 3)	Level 1: P	Retention rate
Neg. test -> 4, 5, 6	Non Random	Neg. test (4, 5, 6)	Level 2: N	Retention rate

Figure 1. Schematic diagram of a comparative research approach. Adapted from *Research Methods in Applied Settings* (2nd ed.), by J. A. Gliner, G. A. Morgan, and N. L. Leech, 2009, New York, NY: Rutledge, pp. 92-93.

As shown in Figure 1, comparative designs use data from two distinct sample groups. For this project, the samples are representative of students who have tested positive for pregnancy and students who have tested negative for pregnancy at Middleton Health Services. As discussed above, I did not manipulate this independent variable, and I did not randomly assign participants to groups.

Assignment of individuals to groups occurred based on the presence or absence of a positive pregnancy test in the students' Middleton University health records. I represented each group by an attribute independent variable (IV). For this design, "Pos. test" indicated students with positive pregnancy tests while "Neg. test" indicated students with negative pregnancy tests. The dependent variable for this project was the retention of students at the university. Retention rate was determined based on the retention or attrition of students in each group (Gliner et al., 2009).

This comparative research approach was non-experimental because I did not randomly assign the students to groups, for the independent variable was neither changeable nor active. While true experiments require experimental designs and pre- or post-test experimentation, the nature of the pregnancy and retention data prevented research involving pre- and post-test

experimentation or manipulation of participants. Instead, I extracted existing data to create a data set (Gliner et al., 2009). I used correlational analysis to assess the relationship between the variables (Creswell, 2012; Gliner et al., 2009; Shadish et al., 2002).

Data Collection

For this research project, I used medical documents from Middleton Health Services as one data source. The data collected did not come directly from participants but from archives and medical records. One advantage of using document data collection rather than obtaining the information from the participant directly was accuracy. For example, while I could have collected data about previous pregnancies directly from students, the students might have been unwilling to answer the questions honestly. Additionally, data concerning the specific dates of the pregnancy tests or the dates students left the institution are more accurate when drawn from an institutional document rather than the first-hand account of a participant (Gliner et al., 2009; Shadish et al., 2002).

The accuracy of the data in this project relied on the accuracy of the data collected by Middleton Health Services. Prior to July 2009, Middleton University's Middleton Health Services used paper medical files to document student health information. In July of 2009, Middleton Health Services transitioned from a paper records system to an electronic medical records (EMR) system. The specific system was *Point 'N Click*. Although records prior to July 2009 were available, these records had been handled multiple times, transcribed from paper to digital, and entered after the students' dates of service. This multiple handling of records could lead to inaccuracy in the medical records. Additionally, the transcription of the paper records into the EMR system occurred without the ability to check the accuracy of the records with the students at the time of service (a current practice of Middleton Health Services since

implementation of EMR). Thus, I omitted these records, although they were vast, from the data set for this research because of their potential inaccuracy.

The data set collected from Middleton Health Services included records of pregnancy data with dates ranging from July 1, 2009, to June 30, 2015. I collected retention, graduation, and enrollment data from the student health records database for dates ranging from July 1, 2009, to July 1, 2016, to determine what occurred in relation to retention after the pregnancy tests were administered. The data set consisted of health records for students who had been diagnosed as pregnant as well as for students who were tested for pregnancy but had a negative test results. I used extracted data from the Middleton Health Services EMR to determine the sample to be studied. I included all data for students who had had pregnancy tests at Middleton University's Middleton Health Services between July 1, 2009, and June 30, 2015. I determined participant eligibility, based on age and enrollment, after capturing the data.

After I identified the sample, a third party at Middleton Health Services collected and imported data from the EMR to a data file. The imported data set included additional information on the demographic characteristics of the individuals in the sample. During data collection, a member of the Middleton University Health Services staff redacted students' names and identification numbers from the data set. Additionally, the staff recoded participants' dates of birth from month, day, and year to ages in years at the time of the pregnancy test to help protect anonymity of the students. Middleton Health Services staff provided access to the data file for the research project only after redaction had occurred.

I stored the data file and output in a digital file on the Middleton Health Services hard drive and cloud storage. I password protected these files so they were accessible only through an identification pin and password used in the Middleton Health Services building. I never printed

the data set or saved it elsewhere to ensure accuracy and confidentiality. Additionally, after data collection, I was the only person outside of Middelton Health Services with access to the data set or medical information it contained.

Alternative Data Collection Options

Alternatives for data collection did exist. Middelton University's Middelton Health Services participates in the American College Health Association's (ACHA) National College Health Assessment (NCHA). Students from Middelton University take the survey for this assessment during the fall semesters of odd years. This student survey asks questions about sexual history and behavior, as well as questions regarding pregnancies in the previous year.

Unfortunately, the data from this survey are aggregate data. Thus, determining who these students were as individual cases and their retention after pregnancy was impossible.

Additionally, students who had left the university after a pregnancy would not have been included in the survey because they were no longer enrolled at the institution. Furthermore, the ACHA's NCHA survey was self-reported, and those who had become pregnant may not have been willing to share information about their pregnancies.

In addition to the ACHA's NCHA survey, I considered creating my own survey and collecting data from students currently enrolled in Middelton University. However, this option presented two issues. First, this option would not resolve the problem of self-reported data. Students might have felt that pregnancy diagnosis was too private to share, that they did not want to admit to the diagnosis, or that the survey was intruding into a personal area of their lives. If this were the case, the data would be skewed and inaccurate. Second, it would not address retention, and I was interested not only in who became pregnant but also in what happened to them after pregnancy. Students who had left the institution because of pregnancy would not have

been available for survey. Thus, I did not use either option for this dissertation. Additional research in the future may find constructive ways to address the issues with these options in ways that overcome their challenges or that use them to triangulate the data collected.

Preparation of Data

This study's accessible population included 18–24-year-old undergraduate students who attended Middleton University between 2009 and 2016 and had requested a pregnancy test at Middleton Health Services between July 1, 2009, and June 30, 2015. Additional information on student progress continued from July 1, 2009, until August 1, 2016, enabling me to examine progress after pregnancy for students who were tested in 2015. The original data set received from Middleton Health Services contained 8,039 cases. These cases were individual pregnancy tests diagnoses, not individual students. Prior to Middleton Health Services releasing the data, staff removed or converted the identifiable student data, such as name, identification number, and date of birth, to maintain confidentiality. The staff member eliminated students' names, anonymized students' identification numbers, and converted students' dates of birth from month, day, and year to month and year and age at time of diagnosis, thus assuring participant anonymity.

The data set for this project came from Middleton Health Services after the Internal Review Board and the Middleton Health Services Director approved the protocol and safe data storage standards. The original data set from Middleton Health Services contained 8,039 student records relating to pregnancy testing between July 1, 2009, and June 30, 2015. These records represented positive pregnancy tests, negative pregnancy tests, individuals who had had multiple tests, and individuals with both positive and negative pregnancy test results for different testing

dates. For this analysis, it was vital the data represent individual students rather than individual tests of the same student.

Of the 8,039 records indicating pregnancy testing, five had missing or inaccurate vital data. Student anonymized identification numbers, pregnancy test collection dates, and pregnancy test results identified the vital data. I eliminated the five records with missing data (omitted test results) from the data set. For records with missing non-vital data, I noted “No Response” for the variable under examination. This process left 8,034 valid records relating to pregnancy testing. Five hundred and twenty-eight records indicated positive pregnancy test diagnoses. Of the 528 positive pregnancy test diagnoses between July 1, 2009, and June 30, 2015, 56 were for duplicate individuals. Twenty-eight students had pregnancy diagnoses twice during the 6-year period. No students had a positive pregnancy test diagnosis more than twice. Four of these pregnancy diagnoses were less than 9 months apart. It was not possible to know whether these four records represented second pregnancies or second tests within one pregnancy. For the purposes of this research, I entered into the data set only the latest pregnancy test when a single student had more than one diagnosis of pregnancy, regardless of the amount of time between the two diagnoses. I marked and eliminated the initial pregnancy test in such cases. The pregnant students remaining in the data set had only one positive pregnancy test recorded.

Thus, of the 528 records, 28 indicating second positive pregnancy tests remained in the pregnancy data set to prevent students having multiple pregnancy tests from having a greater weight in the analysis or skewing the data. I created a recoded variable, Last Pregnant, to denote students’ most recent (in some cases first) positive pregnancy diagnosis at Middleton Health Service. Removal of the duplicate records for students left 500 unique student records to analyze, representing one positive pregnancy diagnosis each.

Of the 7,478 negative pregnancy tests, 4,991 represented individuals who had requested multiple pregnancy tests. The number of pregnancy tests per student ranged from one to 15 tests over the 6-year period. For any individual who had received a negative pregnancy test result more than once in the 6-year period, I removed all but the last negative test record from the data set. Doing so left 2,487 individual student records indicating negative pregnancy test results.

An additional 218 cases were identified as students who had had both negative and positive pregnancy tests. I eliminated these 218 records from the negative test subset but retained them in the positive pregnancy subset. Thus, the data were exclusive. Each record represented only one of two distinct data subsets. In the final data set, I identified students as belonging to one of two categories (with a positive pregnancy test or with no positive pregnancy test). Doing so left 500 individual records in the positive pregnancy subset, 2,269 individual records in the negative pregnancy test subset, and 2,769 individual records in the entire final data set.

Of the 2,769 students represented in the sample, the most common age was 19 years old, with 583 student representing 21.1% of the sample. The least common age was 24 years old, with 150 students representing only 5.4% of the sample. Table 1 shows the student information by age and pregnancy status.

For the students represented in the sample, the most common ethnicity was White, with 1,148 students representing 41.5% of the sample. Black students also represented a large proportion of the sample, with 1,029 students representing 37.2% of the sample. The least common ethnicity was Native Hawaiian/Pacific Islander, with two students representing only 0.1% of the sample. Table 2 shows the student cases by ethnicity and pregnancy status. Within this table students with multiple pregnancies are separated by ethnicity.

Table 1

Demographic Characteristics of Pregnant Students by Age

Variables		Negative Pregnancy Test	Positive Pregnancy Test	Multiple Positive Pregnancy Tests	Total Pregnancy Tests	
Age	18	Count	438	79	1	518
		% within Age	84.6	15.3	0.2	100.0
		% within column	19.3	16.7	3.6	18.7
	19	Count	477	102	4	583
		% within Age	81.8	17.5	0.7	100.0
		% within column	21.0	21.6	14.3	21.1
	20	Count	355	84	5	444
		% within Age	80.0	18.9	1.1	100.0
		% within column	15.6	17.8	17.9	16.0
	21	Count	381	98	10	489
		% within Age	77.9	20.0	2.0	100.0
		% within column	16.8	20.8	35.7	17.7
	22	Count	303	63	5	371
		% within Age	81.7	17.0	1.3	100.0
		% within column	13.4	13.3	17.9	13.4
	23	Count	180	32	2	214
		% within Age	84.1	15.0	0.9	100.0
		% within column	7.9	6.8	7.1	7.7
	24	Count	135	14	1	150
		% within Age	90.0	9.3	0.7	100.0
		% within column	5.9	3.0	3.6	5.4
Total		Count	2269	472	28	2769
		% within all Ages	81.9	17.0	1.0	100.0
		% within column	100.0	100.0	100.0	100.0
		% of Total	81.9	17.0	1.0	100.0

Table 2

Demographic Characteristics of Pregnant Students by Ethnicity

Variables		Negative Pregnancy Test	Positive Pregnancy Test	Multiple Positive Pregnancy Tests	Total Pregnancy Tests
No Response	Count	315	51	0	366
	% within Ethnicity	86.1	13.9	0.0	100.0
	% within column	13.9	10.8	0.0	13.2
American Indian/ Native Alaskan	Count	17	1	0	18
	% within Ethnicity	94.4	5.6	0.0	100.0
	% within column	0.7	0.2	0.0	0.7
Asian	Count	57	8	0	65
	% within Ethnicity	87.7	12.3	0.0	100.0
	% within column	2.5	1.7	0.0	2.3
Black/ African American	Count	687	317	25	1029
	% within Ethnicity	66.8	30.8	2.4	100.0
	% within column	30.3	67.2	89.3	37.2
Hispanic/ Latina	Count	127	14	0	141
	% within Ethnicity	90.1	9.9	0.0	100.0
	% within column	5.6	3.0	0.0	5.1
Native Hawaiian/ Pacific Islander	Count	1	1	0	2
	% within Ethnicity	50.0	50.0	0.0	100.0
	% within column	0.0	0.2	0.0	0.1
White	Count	1065	80	3	1148
	% within Ethnicity	92.8	7.0	0.3	100.0
	% within column	46.9	16.9	10.7	41.5
Total	Count	2269	472	28	2769
	% within row	81.9	17.0	1.0	100.0
	% within column	100.0	100.0	100.0	100.0

To calculate the progress of students, I created a new variable, *Progress*, and coded it as follows. I coded students who did not continue their education and did not graduate after a pregnancy test with a *0*; students enrolled in the institution for the summer or fall term (June 2016 or August 2016) I considered enrolled and continuing and coded with a *1*. I also coded with a *1* students who had graduated after their pregnancy tests because they had advanced to graduation. I labeled the variable *Progress* and used it to determine whether a student had either graduated or continued in her educational enrollment in the institution after a pregnancy test. The progress variable was created to address the issue of individuals being tested at different ages, with some cases representing students at a closer age to traditional graduation than others.

To answer RQ1, I analyzed age and ethnicity demographics. RQ2 addressed the relationship between positive pregnancy tests and academic progress. I used the significant findings for Research Questions 1 and 2 in answering RQ3, which addressed the strength and directions of the relationship. I used the SPSS, Version 24.0, by IBM, to analyze the data in this study.

Data Analysis

The statistical analysis of the data set involved four steps to address the three research questions. In analyzing these data, I answered the research questions using the scientific approach to data analysis. First, I conducted an exploratory analysis of the variables Age and Ethnicity to determine who became pregnant at Middletton University. The research specifically focused on ethnicity and age at the time of the diagnosis. I chose the variables of interest because little knowledge of this problem at the post-secondary level exists. However, the chosen variables for this study appear in the literature on high school pregnancy and retention as factors

that affect retention rates at the high school level (Alan Guttmacher Institute, 1994; Hoffman, 2006; Hoyert & Xu, 2012; Jones et al., 1999; Upchurch & McCarthy, 1990).

Second, after establishing the descriptive statistics for determining raw numbers for both groups, I compared these numbers to determine how subgroups by age or ethnicity compared to one another. The purpose was to determine whether specific subgroups were more likely to become pregnant than other subgroups. The results allowed me to report a proportion of students in a particular subgroup that had tested positive for pregnancy. In addition, it allowed for comparing subgroups to one another. Similar research has addressed high school students and populations as a whole (Alan Guttmacher Institute, 1994; Hoffman, 2006; Hoyert & Xu, 2012; Jones et al., 1999; Upchurch & McCarthy, 1990).

Third, I examined the portion of students as a whole that became pregnant and remained enrolled in school or graduated. I used Pearson's Chi-square analysis to compare the expected outcome to the observed outcomes. I then constructed the analysis by first creating a two-by-two cross-tabulation table to determine how many students were retained or graduated after diagnosis, how many were retained but did not graduate, how many were not retained so did not graduate, or how many were not retained but graduated. Then, I used Pearson's Chi-square to determine the difference between the expected and observed outcomes. The Pearson's Chi-square statistic represents the difference between observed data and expected data and the significance level represents the chance no true relationship exists between the two categorical variables (Creswell, 2012; Gliner et al., 2009; Shadish et al., 2002). Fourth, I examined the demographic information as it related to graduation and retention, investigating the odds ratio, relative risk, and phi correlation to determine the strength and direction of the relationship

between pregnancy and retention. I conducted analyses to determine the extent of differences in retention and graduation among various distinct groups.

Assumptions of the Study

In this study, several assumptions helped the research move forward. I made several attempts to ensure these assumptions were logically sound and based on available current research in the field. One assumption was that no significant differences existed in retention and demographic information between students who came to Middleton Health Services for pregnancy diagnoses and those who used at-home pregnancy tests or went to outside clinics and doctors for diagnoses. Additional research is necessary to determine whether differences exist between students who used Middleton Health Services for their health care needs and the student population as a whole.

Another assumption was that the health records at Middleton Health Services were accurate. Middleton Health Services records are checked for accuracy and quality assurance internally as part of the accreditation that occurs for the clinic and are assumed accurate on that basis. Additionally, I made no supposition as to what students do if the institution does not retain them. The interest was in the retention of students by the institution at which they were diagnosed. Many opportunities for students to leave their institution and go to another institution occur.

While this study examined only pregnancy, other experiences closely associated with pregnancy may be associated with other outcomes. Middleton University views changes in attendance after pregnancy diagnosis as attrition; therefore, in this study, these instances count as a lack of retention. Students who bear children may choose to leave Middleton and attend other institutions closer to their homes or institutions with better childcare options than those offered at

Middelton University. However, this research project did not examine the records for such students.

I assumed the retention research and theories of Tinto (1975, 1986, 1993, 1999, 2000, 2003, 2004, 2007) are valid for examining pregnancy and retention. This study builds on theories of Vincent Tinto and, through Tinto, the work of Astin (1984) on student retention because Tinto derived much of his early ideas from Astin's early work with inputs, environment, and output theory. Tinto maintained that students decide to stay at an institution based on their commitment to the institution, their experiences at the institution, the institution's commitment to the student, and the students' commitment to their educational and career goals (Tinto, 1975, 1986, 1993, 1999, 2000, 2003, 2004, 2007; see also Astin, 1984; Panos & Astin, 1968). Tinto's theory of student departure indicates a student's experiences at his or her institution are significant to retention. Tinto (1975, 1993, 1999, 2000, 2004, 2007) theorized that experiences have an effect on retention at a university and often used this theory to discuss positive experiences, such as social inclusion, friendship development, and interactions with faculty. In addition, I assumed that a specific experience, such as a pregnancy during undergraduate education, can be studied similar to other educational experiences and that the experience has an effect on institutional retention. Within the context of this research, I assumed having a positive pregnancy test is a unique experience, differing from other student experiences on campus.

Within this research project, I used Tinto's models and theories as the conceptual framework. I aimed to determine whether a positive pregnancy test, analyzed as a student's experience at the institution, had a relationship with her retention at the institution. While retention research was generalizable, a specific or previously unstudied experience may affect retention in different ways from traditional experiences of the larger population.

Therefore, a major assumption in the study was the concept of pregnancy as an experience. Similar to Tinto's (1975, 1993, 1999, 2000, 2004, 2007) understanding of experiences affecting retention, I grounded this research in the ideas that women who experience pregnancies are experiencing changes that affect their retention at the institution. I could find no reason to assume pregnancy would interact with retention differently from other experiences discussed by Tinto (1975, 1993, 1999, 2000, 2004, 2007).

Chapter 4 addresses the findings of the analysis pertaining to the research questions guiding this project. It includes discussion of the research questions, corresponding hypotheses, variables, statistical methods, and significance of the findings. Additionally, the statistical results pertaining to each research question appear in tables depicting data analysis results where appropriate.

Summary

The structure and design of this quantitative research project provide an opportunity to investigate the relationship between positive pregnancy and retention at post-secondary institutions. Because this population would be too large to study effectively, this design allows a sample to represent the population. Analysis of this sample was an attempt to determine whether a relationship exists between a positive pregnancy test and retention at Middelton University.

In this chapter, discussion of the research questions, methodology, rationale, data collection techniques, data analysis, and reliability and validity of the research project comprised an overview of the project, its purpose, and design. Difficulty in gaining access to data and the lack of prior research on the specific topic primarily dictated the design of the project. In conducting the research in this manner, it was possible to identify the relationship between pregnancy and retention, as well as to bring additional attention to the phenomenon.

CHAPTER 4

RESULTS

The purpose of this study was to analyze the relationship between pregnancy status and progress in higher education as determined by the answers to three research questions. The first question addressed whether demographic differences exist between students with positive pregnancy tests and those with negative pregnancy tests. The second question addressed the relationship between pregnancy diagnosis, demographics, and retention. The third question addressed the strength and direction of the relationship between pregnancy and retention. Additional analyses were conducted to clarify further the findings of the original research questions.

Research Question 1: Demographics

What are the demographic differences between pregnant traditional-aged undergraduate students and their non-pregnant peers? The demographics of pregnant students and their non-pregnant peers were the focus of RQ1. For this question, pregnancy status was the dependent variable, with participants identified as either pregnant or non-pregnant. I identified pregnant participants through the Middleton Health Services medical records as having had one or more positive pregnancy test(s) between July 1, 2009, and June 30, 2015. Non-pregnant students were identified as students having had only negative pregnancy tests between July 1, 2009, and June 30, 2015. To compare demographics, I constructed a data set to divide records by pregnancy test results. I then analyzed the data for students identified as pregnant or not pregnant in terms of demographic categories of age and ethnicity.

Variables and Statistical Methods Used

The demographic data for this research question were age and ethnicity. Descriptive statistics showed these demographic characteristics, and Chi-square analysis revealed the significant differences between students never diagnosed as pregnant and students diagnosed as pregnant. The first data subset included 28 records indicating multiple pregnancy diagnoses and 472 records indicating one pregnancy diagnosis, for a total of 500 student records. Additionally, 2,269 student records indicating negative pregnancy diagnosis comprised the second data subset. Both data subsets represent the complete data set.

Results from Hypothesis Testing

Age. The complete data set was used to investigate age. Within the pregnant and never pregnant student categories, age was divided by years into seven categories: 18, 19, 20, 21, 22, 23, and 24 years. The largest age groups in the sample were for students aged 19, 20, and 21. Nineteen-year-olds represented the largest portion overall, at 21.1% of the sample, and accounted for 21.2% of the pregnancies. Twenty-year-olds comprised 16.0% of the sample and 17.8% of the pregnancies, and twenty-one-year-olds comprised 17.7% of the sample and included the majority (21.6%) of the pregnancies. Conversely, students older than 21 were less likely to be diagnosed as pregnant. Twenty-four-year-olds comprised the smallest portion of the sample (5.4%) and were least likely to be pregnant, with only 3.0% of the pregnancies (Table 3). A significant association existed between age and positive pregnancy test result ($\chi^2 (6, N = 2,769) = 16.227, p < .05$).

Table 3

Pregnancy Rates of Students by Age

Variable	Subgroup <i>n</i>	% sample	Pregnant <i>n</i>	% pregnant	χ^2	<i>p</i> -value
Age					16.227	0.013*
18	518	18.7	80	16.0		
19	583	21.1	106	21.2		
20	444	16.0	89	17.8		
21	489	17.7	108	21.6		
22	317	13.4	68	13.6		
23	214	7.7	34	6.8		
24	150	5.4	15	3.0		

Note. Degrees of freedom = 6; $\wedge p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Ethnicity. I used the complete data set to investigate ethnicity. Students ethnicities were determined by using the ethnicity listed within EMR. This information is pulled from students school records and is self-identified when a student applies the university. Students' self-identification recorded in the medical records determined ethnicity. To analyze ethnicity as a variable accurately, I removed 366 records from the data set for analysis of pregnancy and ethnicity because of missing ethnicity designations. Of those records, 310 were of non-pregnant students, and 51 were of pregnant students.

All three groups (students with multiple pregnancies, only one pregnancy, and no pregnancy) included participants from ethnicities that represented less than 1% of the data set. An additional category was created in order to reduce the possibility that these small numbers in the data set would impact the data analysis and findings. Ethnicities with small numbers in the data set comprised the category "Other" to eliminate issues associated with analyzing data. I combined the records for students who self-identified as American Indian, Native Alaskan, Asian, Native Hawaiian, and Pacific Islander into the ethnicity category of "Other." I was

cautious in interpreting data from this combined category because it represented distinct ethnicities that may not have similar attributes or progression in higher education.

Among the remaining 2,403 students tested for pregnancy at Middleton Health Services (Table 4), significant differences existed between the proportion of ethnicities in the study population and the proportion of ethnicities in the pregnant population. Black/African American students represented 42.8% of the sample and 76.2% of the positive pregnancy tests. Whites represented 47.8% of the sample and 18.5% of the positive pregnancy tests. Hispanic or Latina students represented 5.9% of the sample and 3.1% of the positive pregnancies while “Other” (a variable including American Indian, Native Alaskan, Asian, Native Hawaiian, and Pacific Islander) students represented 3.5% of the sample and 2.2% of the positive pregnancy tests. Thus, a significant association existed between ethnicity and diagnosis of pregnancy ($\chi^2(3, N = 2,403) = 252.338, p < .001$).

Table 4

Pregnancy Rates of Students by Ethnicity

Variable	Subgroup <i>n</i>	% Sample	Pregnant <i>n</i>	% of Pregnancies	χ^2	<i>p</i> -value
Ethnicity					252.338	0.000***
Other	85	3.5	10	2.2		
Black/ African America	1029	42.8	342	76.2		
Hispanic/ Latina	141	5.9	14	3.1		
White	1148	47.8	83	18.5		

Note. Degrees of freedom = 3; $\wedge p < 0.1$; $*p < 0.05$; $**p < 0.01$; $***p < 0.001$.

Tables 3 and 4 show the summary results for RQ1. Specifically, these results indicate a significant relationship between pregnancy and age and pregnancy and ethnicity. Thus, the

findings for the analysis of age and ethnicity do not support the null hypothesis that no significant demographic differences exist between pregnant traditional-aged undergraduate students and their non-pregnant peers, indicating rejection of the null hypothesis.

Additional analysis determined the odds ratio relating to pregnancy between only White and Black/African American students. This analysis was conducted because previous research on pregnancy among high school students examined these two groups, in particular, and cited race and ethnicity as a significant factor in pregnancy rate differences between Black/African American and White high school students (Alan Guttmacher Institute, 1994; Buhi et al., 2010; Hofferth & Moore, 1979; Hofferth et al., 2001; Raley et al., 2012; Ribar, 1994; Rindfuss et al., 1980; Rindfuss et al., 1984; Upchurch & McCarthy, 1990). To conduct this analysis, I created a new subcategory to examine only Black/African American and White students. This data set included records for 2,178 students, of which 1029 self-identified as Black or African American and 1,147 self-identified as White (Table 5).

Table 5

Odds Ratio of Pregnancy for Students by Ethnicity

Variable	Subgroup <i>n</i>	Pregnant <i>n</i>	% Pregnant	OR
Ethnicity				
Black/ African American	1029	342	33.2	6.466
White	1148	83	7.1	

Note. There was a 95% confidence interval between 4.988 and 8.380.

Analysis of only Black/African American and White students did not alter the results of the odds ratio. Based on the findings of the odds ratio, I conclude Black/African American students were diagnosed as pregnant 6.466 times more often than were White students at

Middelton Student Health. The 95% confidence interval for this analysis was between 4.988 and 8.380, indicating this disparity in pregnancy odds is likely to persist through additional analysis. Additional analysis of academic progress among Black/African American students was completed on the increased odds of pregnancy diagnosis (Table 6).

Table 6

Significant Findings in Research Question 1

Variables Measured	Pregnancy Status
Demographic Characteristics	
Age	Significant
Ethnicity Significant	Significant

Research Question 2: Relationship

What is the relationship between a positive pregnancy test and college retention among traditional-aged undergraduate students? I investigated whether a relationship existed between a positive pregnancy test and academic progress to answer Research Question 2. Data for this research question came from Middleton Health Services records on pregnancy status, enrollment, and graduation status.

Variables and Statistical Methods Used

The variables used for this research question were pregnancy test results and the created variable “progress.” I coded data for students who did not continue their education and did not graduate after receiving a positive pregnancy test as 0. I coded data for students enrolled in the institution for the summer or fall term (June or August of 2016), considered enrolled and continuing, with a 1. I also coded records for students who had graduated after having their pregnancy tests with a 1 because they had advanced to graduation. I labeled the variable

Progress and used it to determine whether a student had either graduated or continued in her educational enrollment in the institution after a pregnancy test. Using Chi-square analysis, I tested whether a relationship existed between students having positive pregnancy tests and their retention.

Results from Hypothesis Testing

Positive pregnancy results. The results from the chi-square analysis indicated significant differences in retention outcome by pregnancy status. Students with positive pregnancy tests progressed at a rate of 50.6%. That is, students diagnosed as pregnant continued to be enrolled after pregnancy 50.6% of the time. Students without positive pregnancy tests progressed at a rate of 63.7%; that is, 63.7% of the students continued to be enrolled after their pregnancy tests (Table 7). These data indicate a significant association between pregnancy diagnosis and academic progress ($\chi^2(1, N = 2,769) = 29.784, p < .001$). Thus, the odds of a student continuing enrollment after being diagnosed as pregnant is 1.715 times less than if she had had a negative diagnosis (Table 8).

Table 7

Progress Rate by Pregnancy Status

Variable	Subgroup <i>n</i>	% Sample	Progress <i>N</i>	% Progressed	χ^2	<i>p</i> -value
Progress					29.784	0.000***
Not pregnant	2,269	81.9	1,146	63.7		
Pregnant	500	18.1	253	50.6		

Note. Degrees of Freedom = 1; $^{\wedge}p < 0.1$; $*p < 0.05$; $**p < 0.01$; $***p < 0.001$.

Table 8

Odds Ratio of Progress by Pregnancy Status

Variable	Subgroup <i>n</i>	Progress <i>n</i>	% Progressed	OR
Pregnancy				
Never diagnosed as pregnant	2,269	1446	63.7	1.715
One or more diagnosed pregnancies	500	253	50.6	

Note. There was a 95% confidence interval between 1.411 and 2.085.

Table 9 shows the significance of findings for RQ2. Specifically, these findings indicate pregnancy status being correlated to progress in higher education. The findings for the analysis of pregnancy status and progress do not support the null hypothesis for RQ2 (i.e., a significant relationship exists between pregnancy test result and continued progress in higher education). These findings indicate rejection of the null hypothesis.

Table 9

Significant Findings in Research Question 2

Variables Measured	Progress
Demographic Characteristics	
Pregnancy Status	Significant

Research Question 3: Strength and Direction

If the results for RQ2 indicate a relationship between pregnancy and college retention, what is the strength and direction of the relationship? RQ3 addressed the strength and direction of the relationship determined when answering RQ2. To determine the strength and direction of the relationship between pregnancy and retention, I performed three analyses: the phi correlation, relative risk, and risk difference. Together, these three measures give a clearer

understanding of the relationship and strength of relationship between students' pregnancy status and retention.

Variables and Statistical Methods Used

The variables for this research question were pregnancy status and progress. I used the phi coefficient to determine the effect size of positive pregnancy status on progress in higher education. This analysis used the complete data set.

To determine the strength and direction of the relationship, I analyzed two nominal dichotomous variables (pregnancy test result and progress). The correlation coefficient under examination was the phi coefficient (ϕ). Phi correlation coefficients apply when two dichotomous variables are under analysis to determine the correlation between the two variables. Phi correlation is an analysis tool used to address differences in a sample and to overcome some of the issues within a data sample. Revisionists have previously used phi correlations to acknowledge preexisting social differences, such as ethnicity or social classes effect (Hofferth et al., 2001; Hoffman, 1998).

Results from Hypothesis Testing

The findings of the phi analysis indicated a weak negative relationship between pregnancy and progress, with $\phi = -0.104(1)$, $p < .001$. Thus, pregnancy accounted for approximately 1.1% of the variance in the outcome of progress. A large ϕ^2 value is not required to make the argument for an important effect. Small ϕ^2 values can be meaningful if the χ^2 value is significant and if the ϕ^2 value demonstrates a portion of the variance (Howell, 2007). Analysis for RQ2 determined the Chi-square is significant ($\chi^2(1, N = 2,769) = 29.784$, $p < .001$), so the ϕ^2 value, although weak, is noted as significant in the findings. A weak relationship, in this case, means that a student who is diagnosed as pregnant is less likely to progress than a student who is

not diagnosed as pregnant. The negative relationship is a result of the coding of pregnancy diagnosis.

I conducted additional analysis to determine the relative risk resulting from pregnancy. The findings of the analysis to determine relative risk indicate a relative risk of 1.259. That is, the relative risk of having an unsuccessful outcome in college (not progressing) is approximately 1.3 times higher for students in the data set with positive pregnancy tests than for students in the data set with no positive pregnancy tests.

I conducted further analysis to determine the risk difference between pregnant and non-pregnant students in the data set. The findings of the analysis to determine risk differences indicate the risk difference is 0.131, indicating a 13.1% greater risk of not progressing for students who were diagnosed as pregnant than for students not diagnosed as pregnant. This outcome supports the phi coefficient findings because phi and risk difference typically have similar magnitudes (Gliner et al., 2009).

The findings for RQ3 indicate the relationship between pregnancy and retention is negative but weak. The findings for the analysis of direction and strength of the relationship between pregnancy status and progress are significant. Thus, the findings do not support the null hypothesis for RQ3, indicating its rejection.

Additional Analysis

I conducted additional analysis to determine whether specific demographics within the sample data for students who were pregnant had a more significant relationship with progress. To run this analysis, I used the same data sets as used in the original analysis. Additional analysis included identifying areas for future research.

Variables and Statistical Methods Used

The variables for additional analysis were pregnancy status, age, ethnicity, and progress. These variables were used to determine the relative risk and risk difference for students with a positive pregnancy status. I assessed their risk of not progressing in higher education.

Results from Additional Testing

To assist the direction of future research, I divided merged data into subgroups and reanalyzed them with Chi-square tests (Tables 10 and 11). Table 10 shows the distinct differences not only between students' progress on the basis of pregnancy status but also among students' progress on the basis of pregnancy at various ages. Results indicated notable differences among students' progress by age. Findings indicate, while 12.5% of pregnant 18-year-olds progressed, 73.7% of pregnant 24-year-olds progressed. The data represent a significant association between the age of a student at the time of pregnancy diagnosis and progress ($\chi^2 (13, N=2,769) = 469.084, p < .001$). This finding indicates progress after pregnancy has a relationship with the age of the student at the time of her diagnosis.

Table 10

Progress Differences of Students by Age and Pregnancy Status

Variable	Subgroup <i>n</i>	% Sample	Progress <i>n</i>	% Progressed	χ^2	<i>p</i> -value
Age and Pregnancy Status					469.084	0.000***
18 Negative	438	15.8	147	33.6		
18 Positive	80	2.9	10	12.5		
19 Negative	477	17.2	254	53.2		
19 Positive	106	3.8	34	32.1		
20 Negative	355	12.8	227	63.9		
20 Positive	89	3.2	46	51.7		
21 Negative	381	13.8	312	81.9		
21 Positive	108	3.9	78	72.2		
22 Negative	303	10.9	247	81.5		
22 Positive	68	2.5	48	70.6		
23 Negative	180	6.5	150	83.3		
23 Positive	34	1.2	26	76.5		
24 Negative	135	4.9	109	80.7		
24 Positive	15	0.5	11	73.3		

Note. Degrees of Freedom = 13; $^{\wedge}p < 0.1$; $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Table 11 indicates the distinct differences in ethnicity and progress based on pregnancy. The results indicate notable differences between students' progress by ethnicity and pregnancy status. Findings indicate, while 48.5% of pregnant Black/African American students progressed, 70.7% of pregnant White students progressed. The data in Table 11 indicate a significant association between the ethnicity of students with positive pregnancy results and their progress ($\chi^2 (7, N = 2,403) = 234.664, p < .001$). Furthermore, differences between the percent of progress within ethnicities were also of interest. The data analysis showed positive pregnancy diagnosis had an increasing effect on progress for both White and Black/African American students but a negative effect on the progress of Hispanic/Latina students and students

designated as Other. Further investigation of these findings was necessary because they were counterintuitive and seemed to negate the literature.

Table 11

Progress Differences of Students by Ethnicity and Pregnancy Status

Variable	Subgroup <i>n</i>	% Sample	Progress <i>n</i>	% Progressed	χ^2	<i>p</i> -value
Ethnicity and Pregnancy Status					234.664	0.000***
Black/African American -Negative	687	28.6	311	45.3		
Black/African American-Positive	342	14.2	166	48.5		
Hispanic/Latina- Negative	127	5.3	73	57.5		
Hispanic/ Latina- Positive	14	0.6	6	42.9		
Other Ethnicity- Negative	75	3.1	47	62.7		
Other Ethnicity- Positive	11	0.5	3	27.3		
White-Negative	1065	44.3	830	55.6		
White-Positive	82	3.4	58	70.7		

Note. Degrees of Freedom = 7; $\wedge p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

To investigate further the findings in Table 11, I extracted the Black/African American records from the complete data set. I selected only Black/African American records because this subset of cases had the greatest number of records with positive pregnancy diagnoses. Data shown in Table 12 indicate the distinct differences between age and progress based on pregnancy diagnosis among Black/African American students. While Table 11 indicates pregnancy has a positive effect on progress, Table 12 clarifies these data. In all but two cases (20- and 21-year-olds), when delineated by age, Black/African American students were less likely to progress

after a pregnancy diagnosis. However, Black/African American students were more likely to test negative as younger students and were more likely to test positive as older students.

Because older students had higher rates of progress, a false dichotomy occurs. It could lead to the false interpretation that pregnancy has a positive effect on progress. In fact, pregnancy has a negative effect on progress in five of the seven age categories. Among Black/African American records only, notable differences occurred between students' progress by age and pregnancy status. Findings indicate 29.5% of 19-year-olds with positive diagnoses progressed, compared to 37.1% of 19-year-olds with negative diagnoses. Further differentiation exists in the records of 22-year-olds, with 79.3% of students with negative diagnoses progressing compared to 66.0% of students with positive pregnancy diagnoses. This data subset has a relatively small number of cases, and because several age categories have fewer records than other age categories, caution is necessary in interpreting these data. I included these data in Table 12 to clarify the data in Table 11. With a smaller number of records represented in the subset, the normal approximation test (via the use of Chi-square) would be questionable. Thus, Table 12 shows the issue through descriptive statistics.

To examine how age specifically may have affected these results, I created another data set representing the participants in the original data set who were 18 and 19 years old at the time of their pregnancy tests. I chose 18- and 19-year-olds because they were a large subgroup (over 1,000) and were close in age to high school students, who were traditionally studied in similar studies (Alan Guttmacher Institute, 1994; Buhi et al., 2010; Hofferth & Moore, 1979; Hofferth et al., 2001; Raley et al., 2012; Ribar, 1994; Rindfuss et al., 1980; Rindfuss et al., 1984; Upchurch, and McCarthy, 1990). This new data set had 1,101 individual records, 915 indicating negative pregnancy diagnoses and 186 indicating positive pregnancy diagnoses (Table 13).

Table 12

Progress Differences of Black/African American Students by Age and Pregnancy Status

Variable	Subgroup <i>n</i>	% Sample	Progress <i>n</i>	% Progressed
Age and Pregnancy Status				
18 –Negative	183	17.8	32	17.5
18 –Positive	54	5.2	7	13.0
19 –Negative	178	17.3	66	37.1
19 –Positive	78	7.6	23	29.5
20 –Negative	103	10.0	49	47.6
20 –Positive	61	5.9	34	55.7
21 –Negative	84	8.2	58	69.0
21 –Positive	78	7.6	55	70.5
22 –Negative	82	8.0	65	79.3
22 –Positive	50	4.9	33	66.0
23 –Negative	36	3.5	26	72.2
23 –Positive	14	1.4	10	71.4
24 –Negative	21	14.2	15	71.4
24 –Positive	7	0.7	4	57.1

Eighteen and 19 year old students with negative pregnancy diagnoses had a 43.8% chance of progressing or graduating while students who were diagnosed as pregnant progressed or graduated at a rate of 23.7%, with phi (ϕ) ($1, N = 1,101$) = -0.154 , $\phi^2 = 0.024$. The data in Table 13 indicate a significant association between pregnancy test results and progress (χ^2 ($1, N = 1,101$) = 26.112, $p < .001$). Table 14 shows the odds ratio for pregnancy and progression of 18- and 19-year-olds. Based on the odds ratio, the odds of a student progressing once she was diagnosed as pregnant were 2.5 (Table 13), less than if she had obtained a negative diagnosis. The 95% confidence interval for this analysis was between 1.8 and 3.6. The difference in odds ratios for 18- and 19-year-olds (Table 14) compared to the original data set containing records of 18- to 24-year-olds (2.518 and 1.715, respectively) indicates an important area for further study.

Table 13

Progress Differences of 18 and 19 Year Old Students by Pregnancy Status

Variable	Subgroup <i>n</i>	% Sample	Progress <i>n</i>	% Progressed	χ^2	<i>p</i> -value
Pregnancy Status					26.112	0.000***
Negative	915	83.1	401	43.8		
Positive	186	16.9	44	23.7		

Note. Degrees of Freedom = 1; $^{\wedge}p < 0.1$; $*p < 0.05$; $**p < 0.01$; $***p < 0.001$.

Table 14

Odds Ratio of Progress of 18 and 19 Year Old Students by Pregnancy Status

Variable	Subgroup <i>n</i>	Progress <i>n</i>	% Progressed	OR
Pregnancy				
Never diagnosed as pregnant	915	401	43.8	2.518
One or more diagnosed pregnancies	186	44	23.7	

Note. There was a 95% confidence interval between 1.752 and 3.618.

Summary

To answer three research questions, I conducted data analysis. Further analysis of the sample data indicated specific areas for future research. RQ1 asked, “What are the demographic differences between pregnant traditional-aged students and their non-pregnant peers?” Significant differences between the expected and observed values in relation to demographic differences indicated rejecting the null hypothesis for RQ1. RQ2 was worded “What is the relationship between a positive pregnancy test and college retention among traditional-aged undergraduate students?” Significant differences between the expected and observed values in the relationship between pregnancy status and retention indicated rejecting the null hypothesis

for RQ2. RQ3 asked, “If the results for RQ2 indicate a relationship between pregnancy and college retention, what is the strength and direction of that relationship?” A weak significant and negative relationship appeared in the analysis, indicating rejection of the null hypothesis for RQ3. Although the strength of the relationship was considered weak, in instances in which the consequences of an outcome are strong (as they are with retention), even a weak relationship is significant.

CHAPTER 5

DISCUSSION

A discussion of the findings of this work will include discussions of all three research questions, major findings, and suggestions for future research, as well as recommendations for higher education, additional testing results, individual institutions, and Middlton University. In this research project, data analysis established corroborating and contradicting evidence to past research. Because this research project was exploratory in nature, I suggest additional areas for future research.

This is the first large-scale study to examine the relationship between pregnancy and retention in an undergraduate student population. Thus, the purpose of this dissertation was to determine whether a relationship between pregnancy and retention existed and, if so, to determine the strength and direction of that relationship. Although specific institutions and researchers have delved into retention challenges and pregnancy separately, few have combined the two areas and addressed their intersection and relationship. The research available lacks the parity of data relating to both pregnancy and retention in one linked student sample and ignores differences across demographic groups, often using a traditionalist approach to pregnancy research (Hofferth & Moore, 1979; Hofferth et al., 2001; Ribar, 1994; Rindfuss et al., 1980; Rindfuss et al., 1984; Upchurch & McCarthy, 1990). In this chapter, I discuss the findings of this research, offer suggestions for areas of future research, and recommend immediate actions for higher education institutions.

Research Question 1 Discussion

RQ1 asked, “What are the demographic differences between pregnant traditional-aged students and their non-pregnant peers?” To address this question, age and ethnicity were the two

demographic variables used from Middleton Health Services records. Because much of the existing research on pregnancy and educational progress centered on high-school-aged students, I felt it was important to determine whether age was a factor in pregnancy analysis (Alan Guttmacher Institute, 1994; Buhi et al., 2010; Hofferth & Moore, 1979; Hofferth et al., 2001; Raley et al., 2012; Ribar, 1994; Rindfuss et al., 1980; Rindfuss et al., 1984; Upchurch, & McCarthy, 1990).

Nineteen year olds represented the largest portion of the sample (21.1%); however, these students did not represent the largest portion of pregnancy diagnoses. This finding indicates pregnancy testing is occurring disproportionately at a younger age while positive pregnancy diagnosis is occurring at a slightly older age. Twenty-one year olds, comprising only 17.7% of the sample, represented the largest portion (21.6%) of the number of pregnancies. Conversely, 24 year olds composed the smallest portion of the sample (5.4%) and were least likely to be pregnant, with only 3.0% of the number of pregnancies. This finding may have less to do with the number of pregnancies among 24 year olds than with the number of 24 year olds still enrolled as undergraduates. These data were significant ($\chi^2(6, N = 27, 69) = 16.227, p < .05$). This information was important because it establishes that, within this sample, the expected values of student pregnancies are not equal to the observed values. Expected values, all things being equal, would state the percentage of pregnant students in any given age group would be equal to the percentage of that age group in the sample. However, the findings indicate significant differences between observed and expected values. Continued research must identify what specific student groups are more or less at risk for becoming pregnant. Age at diagnosis appears to be a demographic factor that plays a significant role in student progress.

Significant differences also occurred in sample demographics and pregnancy by ethnicity,

with Black/African American students accounting for 76.2% of the positive pregnancy tests and Whites accounting for only 18.5% of the positive pregnancy tests. Hispanic or Latina students represented 5.9% of the sample and 3.1% of the positive pregnancy tests while “Other” (a variable representing American Indian, Native Alaskan, Asian, Native Hawaiian, and Pacific Islander students) represented 3.5% of the sample and 2.2% of the positive pregnancy tests. I performed a Chi-square test of independence to examine the relation between ethnicity and positive pregnancy diagnosis. The relation between these variables was significant ($X^2(3, N = 2,769) = 252.338, p < .01$). Black/African American students were more likely to receive a positive pregnancy test diagnosis than were White students. This finding indicates Black students are more likely to be diagnosed as positive than are other student populations. The finding has direct implications for how universities conduct programming aimed at preventing pregnancy and who these pregnancy prevention programs are directed toward. Seventy-six percent of pregnancies were in the Black community on the Middletown campus during the years selected for this research; therefore, the campus should address pregnancy prevention within the Black community in particular. These results support the findings of Buhi et al. (2010). In a national sample, Buhi et al. found that Black college students were 4 times more likely (6.6%) than White college students (1.7%) to become pregnant.

Significant differences appeared in the observed and expected proportions of the whole sample by ethnicity as opposed to the proportions of the pregnant subset by ethnicity. This finding indicates significant differences between students who receive pregnancy tests and students diagnosed as pregnant. With Black/African American students representing more than three quarters of the pregnancies, this finding indicates significant differences, not just between the population and those being tested for pregnancy, but between those being tested for

pregnancy and those being diagnosed as pregnant. Women of color were disproportionately diagnosed as pregnant compared to their portion of the institutional population and their portion of the tested group. The findings on ethnicity in this study support the findings of other researchers indicating ethnicity affects pregnancy rates (Buhi et al., 2010; Upchurch & McCarthy, 1990).

Research Question 2 Discussion

RQ2 was worded “What is the relationship between a positive pregnancy test and college retention among traditional-aged undergraduate students?” The results showed significant differences between observed and expected values of pregnant student retention rates and the retention rates for students not diagnosed as pregnant. The data showed a larger percentage of pregnant students did not graduate or did not continue to be enrolled in classes than did their non-pregnant peers. Thus, among pregnant students in the data set, retention and progress were less likely than for their non-pregnant peers.

Students with negative pregnancy tests progressed at a rate of 63.7%, meaning that 63.7% of the students remained enrolled or graduated after their pregnancy tests. Students with positive pregnancy tests progressed at a rate of only 50.6%. That is, students diagnosed as pregnant continued to enroll after pregnancy or graduated only 50.6% of the time, indicating a 13.1% difference in retention rates between those diagnosed as pregnant and their non-pregnant peers. The findings indicate a significant association between pregnancy diagnosis and progress. This research question was important because it addressed the difference in progress and outcome for pregnant and non-pregnant students, indicating a need for programming and policy at institutions to address the issue.

As noted in Chapter 2, this type of odds ratio analysis can be incorrectly interpreted if research eliminates the additional social demographics of these retention differences. Only examining the odds ratio would lead to a traditionalist modality, possibly obfuscating complicating factors in the data delineated in RQ3 (Hofferth & Hayes 1987). See Table 8 for detailed results of the analysis.

Research Question 3 Discussion

RQ3 was worded “If the results for RQ2 indicate a relationship between pregnancy and college retention, what is the strength and direction of that relationship?” The results of the three analyses performed to determine the strength and direction of the relationship between pregnancy and college retention showed a weak but significant negative effect of pregnancy on retention. The findings of the phi analysis indicated a weak negative relationship between pregnancy and progress ($\phi = -.104$, $\phi^2 = 0.011$, $X^2(1) = 29.784$, $p \leq .000$).

The relative risk to retention resulting from pregnancy was calculated to be 1.259, indicating pregnant students are 1.3 times less likely to continue or graduate than their non-pregnant peers. Interestingly, the risk difference associated with pregnancy in the data set was .131, indicating a 13.1% greater risk of not progressing among students in the data set diagnosed as pregnant compared to students in the data set not diagnosed as pregnant. All of these analyses indicate a negative and weak relationship between pregnancy and retention. These findings show, while pregnancy has a negative correlation to progress, it does not indicate that progress is not possible after pregnancy.

Additional Testing Results

While the additional analysis conducted was not part of the original research project, it represents areas of interest important to future research projects. More specifically, the potential

differences between 18- and 19-year-old students and older undergraduate students should be examined in more detail with a larger data set. I conducted additional data analysis to identify areas for future study. Most notably, this analysis brought to light potential for research on the combined effect of age and ethnicity on progress. Further, the additional analysis focused on the potential issues of previous studies that did not delineate age and ethnicity.

Age plays a key role in retention. Among 18-year-old students, only 33.6% of students not diagnosed as pregnant and 12.5% of students diagnosed as pregnant progressed toward graduation. However, the negative test population might not represent the total population of non-pregnant women within the institution. The National Center for Education Statistics (NCES) national data report showed that, on average, 61% of female students who entered a public 4-year college in 2008 graduated within 6 years (DOE NCES, 2015). That is, Middleton University students diagnosed as pregnant progressed at a rate that was 48.5% less than the average 6-year female national graduation rate. Because progression was a constructed variable encompassing graduation and continued enrollment, the progress rate can be assumed larger than the graduation rate. Further analysis of 18- and 19-year-old students found the odds of progressing once a student was diagnosed as pregnant were 2.518 less than if she had had a negative diagnosis (Table 13). This is a much larger difference in progress than seen in the analysis of the whole data set, in which the odds of progress for pregnant students was only 1.75 less than if they had had negative diagnoses.

Major Findings

In the data set, significant differences exist between students diagnosed as pregnant and those not diagnosed as pregnant. Differences in diagnosis by ethnicity, along with a negative relationship found between pregnancy and retention, indicate the issues associated with

pregnancy are disproportionately affecting women of color, specifically Black/African American women. Women of color represent 52.2% of the sample but 81.5% of the pregnancies. Previous research did not address this disparity in pregnancy rates among undergraduate women of color and White women within higher education. Furthermore, no previous research indicated pregnancy has a weak negative relationship with retention in institutions of higher education.

Even though, according to these findings, students of color tend to experience higher rates of pregnancy than White students, these women are not doomed by their diagnoses but can and do show academic progress after pregnancy. These findings also indicate that, the older a student is, the more likely she is to remain in or return to college after a pregnancy. Indeed, with each additional year in age, a student was more likely to progress and graduate regardless of pregnancy status. This finding indicates specific groups of women may be more at risk for the negative consequences of pregnancy than others. Indeed younger women, who were less likely to progress after pregnancy, and women of color who tended to be diagnosed at higher rates, are groups that may need additional institutional programs to address these issues.

Suggestions for Future Research

No previous research has addressed the relationship between pregnancy and retention in undergraduate students and differentiated between students in various demographic groups. Future research into additional demographics of students, such as their expected family contribution (EFC), marital status, religion, and nationality would add to the literature. Additionally, researchers at other institutions may have access to additional data not released for this dissertation project, which would further clarify the positionality of students and help to differentiate between previously collapsed demographic characteristics, such as ethnicity and

socioeconomic status. If institutions were more willing to provide data, researchers could address the issues of pregnancy and retention with increased accuracy.

Additional research on young students (ages 18–19 years) is particularly important to the field because many of the retention issues students face come early in the academic career. Of specific interest should be the difference in pregnancy status of 18- and 19-year-old undergraduate students and their subsequent retention. In addition, further longitudinal research on why some students have persisted after a pregnancy at a young age, specifically qualitative interviews with previously pregnant students, students who bore children, or mothering/parenting students who have persisted, could be informative. Asking pregnant students what factors contributed to their retention or attrition after a positive pregnancy test would add to the depth of these research findings.

Likewise, future research to investigate the outcomes of college student pregnancies (termination, miscarriage, delivery, or parenthood) would help delineate some of the possible areas of differentiation of this sample in terms of pregnancy and retention. Great differences may exist in outcomes occurring after pregnancy diagnosis (termination, miscarriage, delivery, or parenthood). This information was not available for this research project but could prove informative as researchers move forward to understand better the issues presented here. Additionally, future studies on the relationship between pregnancy and retention are necessary to address the specific areas of concern brought to light in this research. Key to the success of future research will be cooperation between researchers and institutions under investigation.

Finally, future research comparing sexually active students (via pregnancy test being required), pregnant students (via pregnancy test result), and the female institutional level retention rates by age and ethnicity could be vital. By conducting such analysis, researchers

would be able to assess the relative risks and risk differences of sexual activity as gender. I did not conduct such analysis for this research because of limitations in data and the Human Subjects Committee approval process. Future research should attempt to work with institutional research departments in order to gain access to additional data limited in this research.

Recommendations for Higher Education

Many institutions have limited funds available to address institutional retention issues. Unfortunately, as budget constraints persist, resources addressing issues related to retention will continue to be critical. Budget constraints within many institutions make current, data-driven research an imperative because retention challenges and budget challenges are closely intertwined. In addition, campus administrators may not have the knowledge and experience to determine adequately specific areas of concern regarding retention. Thus, administrators in higher education must work with researchers to delve into underlying issues to make budget decisions with accurate information and data-driven research.

After researchers have analyzed an institution's issues with retention, the institutions could benefit from working together to effect change. Through partnerships and collaboration, researchers may be able to address issues on a national or regional level. As more student data become available, researchers may be able to compile and analyze the data to identify similarities and trends not clear within single institutions.

An example of the need for collaboration occurs in this research project. Students self-identifying as American Indian, Native Alaskan, Asian, Native Hawaiian, and Pacific Islander were few. Drawing any specific conclusions about the groups was difficult because their small numbers often made analysis impossible. If these data were examined as part of a larger data set of national data, analysis would be possible. If researchers could create a national data set in

which tens or hundreds of thousands of student medical records could be analyzed, identifying trends through analysis would be possible in a way that is impossible with smaller data sets.

Recommendations for Individual Institutions

Campuses across the country should address the relationship of pregnancy to retention. Institutions must begin to address pregnancy and retention issues on their campuses on an individual basis, rather than by acquiring aggregated national data, especially because universities often rely on such national data to determine institutional direction. With the continued rising costs and declining budgets of higher education, campus administrators should consider the possibility that research from outside their institutions may not adequately represent their student populations, causing them to overlook particular areas of interest for their specific communities. Individual universities have access to data that could help them address retention concerns within their own student populations and within specific demographics of those populations. Furthermore, broadening research efforts to include departments outside of specific institutional research departments, such as those who work with students through prevention programming or affinity groups, could help in identifying areas of concern particular to a campus or student population. Determining no issues exist without investigating within the institution is a mistake (Tinto, 1993).

Each institution must put solving the problems of retention above the fear of appearing to have complicated unsolved problems. Maintaining the university's image without addressing the underlying issues will not solve retention problems. Universities should encourage research in these areas rather than trying to prevent this research from being conducted. Although protecting the image of the university is vital as retention challenges are addressed, for the long-

term success of the institution, engaging in solving problems rather than obscuring and deflecting concerns over retention is crucial.

Recommendations for Middelton University

Middelton University and its students can benefit from this research. The findings of this project indicate three key themes that Middelton University could focus on to address the concerns raised by this research. These three themes are directing resources to prevent pregnancy in general, directing resources to prevent pregnancy among 18- and 19-year-olds and students of color in particular, and directing resources to support pregnant students.

Many professionals are currently working on pregnancy prevention. Programs are addressing sexual health education, access to affordable and effective birth control, ensuring students are aware of campus resources already in place, and working proactively to generate new initiatives that are evidence informed and data driven. Currently, prevention programs and programs that focus on specific affinity groups are in place. For this work to be more effective, an understanding between administrators and prevention staff must occur. Without an understanding of the importance of these programs and further expansion of the current programs by investing staff time and university resources, these programs will not be successful.

Preventing pregnancy among 18- and 19-year-olds and students of color, in particular, requires substantial university collaboration and coordination. To accomplish this goal, the university should address sexual health education in targeted approaches for specific populations and provide access to affordable and effective birth control that women of color and young women are interested in. Additionally, this goal could be reached by ensuring campus resources are both age and culturally appropriate, ensuring collaboration across campus with centers like the Black Resource Center. Last, university coordination could foster student organizations to

bring women of color to the table, working proactively to generate new programs that are evidence informed and data driven. Successfully addressing this theme requires development of new, targeted approaches.

To support the students on campus who are already pregnant or who may become pregnant, Middelton University should direct resources to supporting pregnant students. This goal could be accomplished by thoughtfully addressing students' immediate concerns when they learn they are pregnant through offering skilled counseling; providing access to affordable, on-campus, comprehensive medical care; ensuring campus resources are culturally appropriate; fostering collaboration across campus with transitional services; and creating with student input programs that are evidence informed and data driven. Successfully addressing this theme would necessitate collaboration among multiple departments and a wider understanding of the needs of pregnant students. Campus resources exist for parenting students, but such resources are lacking for pregnant students.

Conclusions

This study addressed the demographic characteristics, pregnancy status, and retention rates of traditional-aged undergraduate students who were tested for pregnancy at Middelton Health Services between July 1, 2009, and June 30, 2015. The data set of 2,769 records represented traditional-aged undergraduate students tested for pregnancy between July 1, 2009, and June 30, 2015. This study was an exploratory study to determine whether a relationship between pregnancy and retention existed at the Middelton University campus and to propose the possibility that a relationship could exist on a national level. This research fills a gap in the literature by providing an inquiry into the relationships among pregnancy, progress, and

retention. Additionally, this research addressed demographics of students who may be disproportionately affected by pregnancy.

The foundational theory for this research project was Tinto's theory of student departure (1986, 1993). Tinto's theory explored ways in which a specific experience in college affects student retention. While Tinto's theory focused on the social integration of the student, as well as formal and informal academic experiences, this present research focused solely on the experience of pregnancy diagnosis.

This study indicated both the experience of pregnancy diagnosis and demographic characteristics as important when addressing issues of retention. Although the focus of this project was on the relationship between pregnancy and retention, the research indicated other statistically significant variables that influence the relationship between traditional-aged undergraduate students and retention. Specifically, although a positive pregnancy test made a student less likely to progress, other variables, such as age and ethnicity, were also statistically significant.

The findings in this dissertation indicate the importance of research on individual campuses. An institution's ability to address issues of retention is directly related to its ability to research and understand the issues on its own campus. Looking forward, practitioners and researchers must strive to affect students' lives, not only in the classroom, but also through meaningful research into the experiences of their students. Student health practitioners and researchers have a unique vantage point from which to practice in the field and access both data and students. If researchers are to have an effect on the education and retention of students, they must take full advantage of their circumstances to further the knowledge in the field.

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VITA

Southern Illinois University Carbondale

Sarah H. Steinkamp

Steinkamp@siu.edu

Wells College

Bachelor of Arts, Sociology, May 2003

Ithaca College

Master of Science in Education, Health Education, August 2011

Dissertation Title:

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Major Professor: Dr. Judith Green