Spring 2010

The Significance of Interactions: Understanding Gender, Ethnicity/race, and Socioeconomic Status as Related to the Likelihood of Bachelor's Degree Completion

Valerie Cyrina Lundy
University of Pennsylvania, valeriel@dolphin.upenn.edu

The Significance of Interactions: Understanding Gender, Ethnicity/race, and Socioeconomic Status as Related to the Likelihood of Bachelor's Degree Completion

Abstract

Although access to a postsecondary education has increased exponentially since 1970, access to a bachelor's degree has not grown as swiftly. National data highlight improvements in the aggregate, but disguise important disparities in completion across groups. Specifically, these data mask inequality in bachelor's degree attainment across and within groups defined by gender, ethnicity/race, and socioeconomic status.

Although predictive models have shed light on disparities in completion with respect to gender, ethnicity/race, and socioeconomic status, few predictive models incorporate the interaction of these demographic constructs. Since gaps in completion persist both within and across groups, additional consideration of interactions may prove helpful for retention efforts.

Using Tinto's conceptual model of student departure, this dissertation examines a model of bachelor's degree completion, focusing on the interaction of gender, ethnicity/race, and socioeconomic status. Framed by critical race feminist theory, this research acknowledges variance in privilege and marginalization by gender, ethnicity/race, and socioeconomic status, as well as the interaction of these characteristics. Logistic regression analyses are used to identify likelihood of degree completion within six years using the Beginning Postsecondary Students data set.

Descriptive analyses show that gender, ethnicity/race, socioeconomic status groups are related to bachelor's degree completion and suggest that these variables may interact to predict attainment. None of the interactions were statistically significant in the logistic regression analyses. This research highlights differences in conceptual and statistical interactions, and how additional research may be needed theoretically and empirically. Implications for research incorporating a critical race feminist approach and interactions are also presented.

Degree Type
Dissertation

Degree Name
Doctor of Philosophy (PhD)

Graduate Group
Education

First Advisor
Laura W. Perna

Second Advisor
Marybeth Gasman

Third Advisor
Marvin Titus

THE SIGNIFICANCE OF INTERACTIONS:

UNDERSTANDING GENDER, ETHNICITY/RACE, AND SOCIOECONOMIC

STATUS AS RELATED TO THE LIKELIHOOD OF BACHELOR'S DEGREE

COMPLETION

Valerie Cyrina Lundy

A DISSERTATION

in

EDUCATION

Presented to the Faculties of the University of Pennsylvania
in
Partial Fulfillment of the Requirements for the

Degree of Doctor of Philosophy

2010

Supervisor of Dissertation:

_____

Laura W. Perna, Associate Professor of Education

Graduate Group Chairperson:

_____

Stanton E. F. Wortham, Professor of Education

Dissertation Committee:

Laura W. Perna, Associate Professor of Education, University of Pennsylvania

Marybeth Gasman, Associate Professor of Education, University of Pennsylvania

Marvin Titus, Assistant Professor, University of Maryland, College Park

The Significance of Interactions: Understanding Gender, Ethnicity/race, and

Socioeconomic Status as Related to the Likelihood of Bachelor's Degree Completion

COPYRIGHT

2010

Valerie Cyrina Lundy

DEDICATION

This dissertation work is dedicated to my immediate Overall-Stewart-Wagner-Alexander family, and especially my parents. To Skip specifically, I hope that the completion of this doctoral degree program will pave the way for me to give back to the world as much as you gave me in our (short) time together.

I would also like to dedicate this work to Mr. Brian Andrew Wagner. I hope you eventually come to know how much you have inspired me to persevere over the years.

Gasman, who was the first Penn faculty member to show a genuine interest in my ideas. Thank you for reminding me that productivity and light-heartedness can comingle. I would also like to thank Dr. Rachelle Winkle Wagner who has been a great colleague and example to follow as I transition from graduate student to researcher. Also, many, many thanks to (Dr.)Drew Gitomer for showing me what life outside of academe might look, feel, and sound like. I appreciate you taking a chance on me as your intern, and showing a genuine interest in my future. I would also like to specifically thank Ms. Karen Carter, Ms. Christine Lee, Dr. Robert Boruch, Dr. Diana Slaughter-Defoe, Dr. Susan Yoon, Dr. Ed Boe, Dr. Marvin Titus, Dr. Matt Hartley, and Dr. Joni Finney for your encouragement and support. A special thanks is due to Dr. Laura W. Perna, who will always have my utmost respect and admiration. Thank you for always providing substantive and critical feedback. You inspire me to find my intellectual limits and appreciate my humanity. Like others, I admire your professional style and demeanor.

This dissertation would not have been possible without funding I received from the Ford Foundation Diversity Dissertation Fellowship, which allowed me to complete the dissertation, maintain my residence in Philadelphia, and access a unique community of scholars. I am also thankful to the U.S. Department of Education and National Center for Education Statistics for their programs that establish and maintain data on postsecondary students and institutions.

Finally, I would be remiss if I didn't thank Mr. Kahlil Gibran Fitzgerald. My achievements up to and through this doctoral program have come to fruition in many ways because of your presence. Although the chapters of this dissertation have been completed, I hope to continue writing our story.

ABSTRACT

THE SIGNIFICANCE OF INTERACTIONS:

UNDERSTANDING GENDER, ETHNICITY/RACE, AND SOCIOECONOMIC

STATUS AS RELATED TO THE LIKELIHOOD OF BACHELOR'S DEGREE

COMPLETION

Valerie Cyrina Lundy

Supervised by: Laura W. Perna, Ph.D.

Although access to a postsecondary education has increased exponentially since 1970, access to a bachelor's degree has not grown as swiftly. Moreover, while national longitudinal trend data highlight improvements in bachelor's degree completion in the aggregate, they disguise important disparities in bachelor's degree completion across groups. Specifically, these data mask inequality in bachelor's degree attainment across and within groups, particularly groups defined by gender, ethnicity/race, and socioeconomic status.

Conceptual models accompanying research on bachelor's degree completion have included both student- and institution-level characteristics. Although these models have shed light on disparities in completion with respect to gender, ethnicity/race, and socioeconomic status, few predictive models incorporate the interaction of these demographic constructs. Since gaps in bachelor's degree completion persist both within and across groups, additional consideration of interactions may prove helpful for future retention efforts.

Using Tinto's conceptual model of student departure, this dissertation examines a model of bachelor's degree completion, focusing on the interaction of gender, ethnicity/race, and socioeconomic status. Framed by critical race feminist theory, this research acknowledges variance in privilege and marginalization by gender, ethnicity/race, and socioeconomic status, as well as the interaction of these characteristics. Logistic regression analyses are used to identify likelihood of degree completion within six years using the Beginning Postsecondary Students data set.

Descriptive analyses show that gender, ethnicity/race, socioeconomic status groups are related to bachelor's degree completion and suggest that these variables may interact to predict bachelor's degree completion. Nonetheless, none of the interactions were statistically significant in the logistic regression analyses. This research highlights the differences in conceptual and statistical interactions, and how additional research may be needed both theoretically and empirically. Implications for policy and practice incorporating a critical race feminist theoretical approach and statistical interactions are also presented.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: Purpose and Introduction

Introduction

Matriculation to a bachelor's degree program is an important milestone in any individual's educational and professional trajectory. Although postsecondary persistence research often focuses on the first two years of college, a time during which most students either stop out, drop out, or withdraw (Kojaku & Nunez, 1999; Peter & Forrest Cataldi, 2005), bachelor's degree completion may be a more substantial achievement based on the magnitude and multitude of benefits to individuals and society (Astin, Tsui, & Avalos, 1996; Baum & Ma, 2007; Perna, 2005; Schuh, 2005). In general, individuals who complete bachelor's degree programs have higher future wages, better jobs, and improved health outcomes; their communities and society gain through increased tax revenue, lower likelihood of criminalization, and greater civic engagement (Baum, 2001). Furthermore, the costs – social, emotional, and financial among others – to students and families are higher when students fail to graduate than when they complete a four-year degree (Kinnick & Kempner, 1988). Therefore, understanding predictors of bachelor's degree completion is an important and relevant undertaking for postsecondary stakeholders.

Although access to a postsecondary education has increased exponentially since 1970, bachelor's degree attainment has not grown as swiftly (Horn & Berger, 2004; Postsecondary Education Opportunity, 2003). Data from the National Center for Education Statistics (Snyder, Dillow, & Hoffman, 2009) show that the number of full-time students enrolled in four-year colleges and universities nearly doubled between 1970 and 2005, increasing from approximately 5.8 million to 10.8 million. However, the

number of individuals completing bachelor's degrees does not appear to have grown as fast during the same period. In fact, between 1971 and 2000 bachelor's degree attainment increased from 17 percent to 29 percent (Horn & Berger, 2004; NCES, 2008). However, while these national longitudinal trend data highlight improvements in bachelor's degree completion in the aggregate, they disguise important disparities in bachelor's degree completion.

An analysis of data from the Integrated Postsecondary Education Data System (IPEDS) reveals that, among first-time, first-year students enrolled in bachelor's degree seeking institutions in the United States in 2001, the average six-year cohort graduation rate is only 56.1 percent (National Center for Higher Education Management Systems [NCHEMS], 2009). In effect, almost half of all students first beginning bachelor's degree programs will fail to graduate from that initial institution within six years of initial enrollment (Peter & Forrest Cataldi, 2005).

Moreover, this average graduation rate conceals disparities in bachelor's degree completion across three focal demographic characteristics: gender, ethnicity/race, and socioeconomic status (e.g., Choy, 2001; Horn & Carroll, 2007; Peter & Horn, 2005). Although initially men earned more bachelor's degrees than women, this trend has reversed (Buchamann & DiPrete, 2006; Goldin, Katz & Kuziemko, 2006; Leppel, 2002). On average six-year graduation rates for White and Asian students are higher than the rates for African American, Latina/o, and Native American students (Hudson, 2003; Kao & Thompson, 2003; Pascarella, 1985). Also, students from higher socioeconomic strata are more likely to complete bachelor's degrees than their peers at the lower end of the socioeconomic stratum (Terenzini, Bernal, & Cabrera, 2001). These differences in

2

completion suggest that access to a bachelor's degree program is not equivalent to completion of a bachelor's degree, especially for certain demographic groups.

Among students who matriculate to bachelor's degree programs, those who fail to reach completion represent direct and indirect losses for students and the institutions of higher education they attend (Baum, 2001; Perna, 2005; Schuh, 2005). Some argue that the most direct penalty for failing to graduate is felt by students, as they enroll in (and pay for) college with the anticipation of earning a degree and reaping the associated private benefits (e.g., higher future wages and increased likelihood of upward social mobility) (Kane, 1999; King, 1999; Paulsen, 1998, Perna, 2005).

Figure 1 shows that there are quantifiable wage benefits associated with enrolling in and completing a postsecondary education compared to enrolling but not completing (Baum & Ma, 2007). For example, whereas the median earnings of a high school graduate are approximately $31,500, individuals who enroll in college but do not obtain a degree earn nearly 20 percent more, $37,100 (Baum & Ma, 2007). Completion of a postsecondary degree increases the earnings benefit even further, such that students who complete an associate's or bachelor's degree average earnings of $40,600 and $50,900, respectively (Baum & Ma, 2007). This 30 percent difference in average annual earnings for individuals who enroll in college compared to those who enroll *and* complete a bachelor's degree is substantial by any account. However, differences in earnings are a result of multiple factors including, but not limited to postsecondary educational enrollment and completion, pre-college academic achievement, motivation, and socioeconomic status, as noted by Baum and Ma (2007).

Furthermore, disparities in wages associated with higher levels of education based on both education level and income permeate gender and ethnicity/race groups (Baum & Ma, 2007; Browne & Misra, 2003; Perna, 2005). For example, Figure 1 shows that median earnings for an Asian male with a master's degree are $51,300, compared to $37,500 and $46,900 earned by a White female and male with the same educational credentials, respectively (Baum & Ma, 2007). While postsecondary educational attainment does not necessarily result in equal outcomes across gender or ethnic/racial groups, there is a distinct trend – postsecondary education beyond high school is associated with higher average earnings. Conversely, failure to complete a bachelor's degree can inhibit an individual's future earning power, an issue that may be especially important for socioeconomically disadvantaged groups.

Four-year institutions of higher education are also adversely affected by student attrition, or failure to graduate from bachelor's degree programs. Schuh (2005) points out both short- and long-term institutional costs of attrition from recruiting efforts, financial aid investments, tuition revenue and future alumni giving. Schuh suggests that every bachelor's degree-seeking student who fails to graduate costs an institution approximately $2,000, whereas the institutional cost for students who graduate is only $500. Along these lines, bachelor's degree completion is one measure that contributes to an institution's understanding of whether institutional expenditures and revenues are balanced (Dolence, 1998).
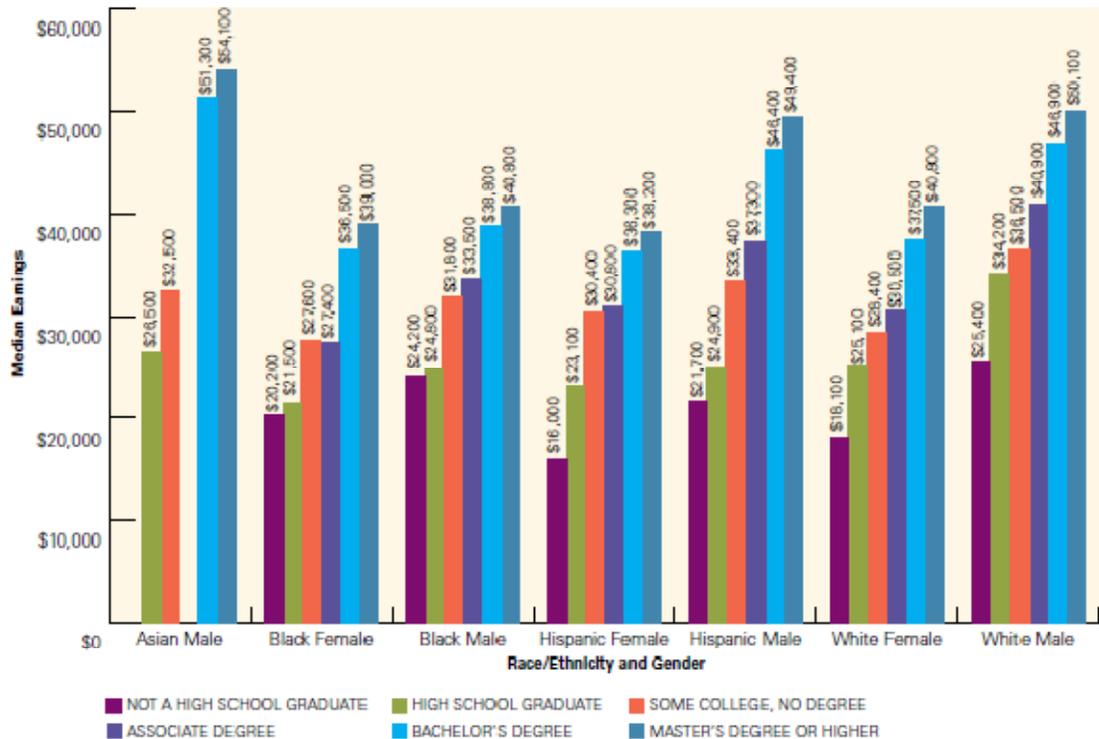
Note: Sample sizes for Asian females and Asian males with less than a high school diploma and associates degree are too small to allow reliable reporting.

Source: U.S. Census Bureau, 2006, PINC-03, as presented in Baum & Ma (2007), Figure 1.4

Figure 1. Median Earnings of Full-time Workers Ages 25-34, by Race/Ethnicity, Gender, and Education Level, 2005

Furthermore, institutions with six-year bachelor's degree completion rates below the national average or the average of their perceived peer institutions may be adversely affected. The federal Student Right-to-Know and Campus Security Act of 1990 (SRKCS), inspired by higher education accountability discourse, requires institutions to disclose retention and graduation rates. These data are incorporated into calculations of institutional rankings, especially the popular *U.S. News & World Report*, and thus used by students and families to compare institutions. Consequently, presenting high attainment rates for SRKCS by graduating degree-seeking students is a natural

5

institutional incentive (Alexander, 2000; Astin et al., 1996; Dill & Soo, 2005; *U.S. News & World Report*, 2008).

The simultaneous increase in college enrollments and costs unaccompanied by comparable increases in bachelor's degree completion (overall and for subgroups) has been the focus of other calls for institutional accountability (Baum, 2001; Heller, 2001). Institutions with large endowments have come under fire for their role in inhibiting college access and degree completion, particularly through perceived under-investment in scholarship and grant aid (e.g., McPherson & Shapiro, 2006; Wolverton, 2008). Some legislators, including Senator Charles Grassley of Iowa, have suggested requiring minimum annual endowment payouts to ensure institutions put forth a good-faith effort to address degree completion as a requirement for retaining their tax-exempt status (Keenan, 2008).

The known benefits from receipt of a bachelor's degree to students, institutions, and society underscore calls for accountability in higher education, specifically as it pertains to completion. As Astin and colleagues (1996) note, "students and parents have an obvious interest in retention since attending college is of little value in career development unless the student is able to persist through completion of some degree" (Astin et al., 1996, p. 1). That disparities in bachelor's degree completion across gender, ethnicity/race, and socioeconomic status groups persist, suggests that continued and other, perhaps more demographically nuanced retention efforts, are needed.

Disparities in Completion

Student persistence to bachelor's degree completion is important for both students and institutions of higher education, as completion confers public and private economic

and non-economic benefits to individuals and society (Baum & Ma, 2007; Perna, 2005; Schuh, 2005). However, the attainment gaps across groups based on student-level background characteristics (e.g., ethnicity/race, gender, academic preparation, socioeconomic, and first-generation status) means that some students and their respective demographic communities are considerably less likely to reap the rewards associated with degree completion (see Astin et al., 1996; DesJardins, Kim, & Rzonca, 2003; Vartanian, Karen, Buck, & Cadge, 2007).

Table 1 summarizes six-year graduation rates for first-time, full-time male and female African American (also referred to as Black), Hispanic (subsequently referred to as Latina/o), and White students who entered four-year institutions in 1997 (NCHEMS, 2009). At the student level, the data reveal differences in graduation rates across ethnicity/race and gender groups. For example, Table 1 shows that the average six-year graduation rate is lower for male than female students at all four-year institutions: 51.3 percent compared to 56.8 percent, respectively. Consideration of ethnicity/race reveals lower six-year graduation rates for African American (38.5%) and Latina/o (43.5%) students at four-year institutions than for White students (57.3%).

While these data confirm findings from past research describing disparities across gender and ethnic/racial groups, Table 1 also provides evidence of disparities in completion between these two groups. For example, Table 1 shows that the average six-year bachelor's degree completion rate is not only higher for women than men, but also that the magnitude of the gap varies by ethnicity/race. The largest difference in attainment by gender lies within the African American student population, where the six-year graduation rate for men (32.8 percent) is approximately ten percentage points lower

than it is for women (42.4 percent) (NCHEMS, 2009). For other racial/ethnic groups, the

gender gap is approximately 6 percentage points.

Table 1

Degrees Granted Within Six Years by all 4-Year
Institutions, by Ethnicity/race, and Gender: 1997-2003

Ethnicity/Race and Gender	All 4-Year Institutions
African American	38.5
Men	32.8
Women	42.4
Latina/o	43.5
Men	40.0
Women	46.2
White	57.3
Men	54.4
Women	59.8
Other	56.7
Men	56.5
Women	59.8
All Men	51.3
All Women	56.8
Grand Total	54.3

Source: National Center for Higher Education

Management Systems (2009).

Besides differences in ethnicity/race and gender, there are also notable differences

in bachelor's degree enrollment and achievement based on socioeconomic status (Baum

& Ma, 2007). However, compared to ethnicity/race and gender, bachelor's degree

completion disparities based on measures of socioeconomic status are still relatively

under-examined. Researchers typically measure socioeconomic status as a composite

variable, including parent's level of education, family income, and parent's occupations

(Baum & Ma, 2007). While students from low socioeconomic strata are often

disadvantaged in college due to less rigorous pre-college course-taking, preparation, or

attending less-well resourced high schools, for example (Perna, 2005), there is evidence to suggest that even after controlling for academic achievement disparities in completion persist (e.g., Walpole, 2008). For example, in their cohort analysis, among students with the lowest standardized test scores, individuals "from high [socioeconomic status] backgrounds were almost twice as likely as those from low [socioeconomic status] backgrounds to enroll and 10 times as likely to earn a bachelor's degree" (Baum & Ma, 2007, p. 35). These data emphasize the relationship between social class and bachelor's degree completion, but also suggests that the strength of the relationship is not explained by academic achievement alone.

Furthermore, the data suggest that socioeconomic status explains a considerable amount of the variance in disparities across ethnic/racial groups. Baum and Ma (2007) note that, "among white, black, and [Latina/o] students enrolled full-time in four-year institutions, higher family incomes and higher parent education levels are associated with higher degree completion rates" (p. 37). The effect of socioeconomic status within ethnicity/race also varies. For example, although Asian American students are more likely to complete bachelor's degrees overall, within this group, individuals from poorer countries, like Vietnam and Laos average lower degree attainment rates than their wealthier same-race peers from China or Japan (see Lee & Kumashiro, 2005). There is virtually no research on understanding differences in bachelor's degree completion by gender and how socioeconomic status may moderate outcomes.

As the descriptive data suggest, while there are important disparities in bachelor's degree completion across gender, ethnic/racial, and socioeconomic status groups, there are also noteworthy differences within the groups as well. Therefore interventions that

focus on only one demographic characteristic may inadvertently perpetuate an unequal

distribution of the benefits of higher education to groups that are already marginalized.

Rather than focusing on singular demographic characteristics to improve bachelor's

degree completion models, the data suggest that consideration of multiple characteristics

may be more helpful. Along those lines, additional attention to students at the

intersections (e.g., gender and socioeconomic status, ethnicity/race and gender) may

improve the conceptualization of bachelor's degree completion, as well as retention

policy-making.

Statement of the Problem

Given the drawbacks of attrition to students, families and institutions, gaps in

attainment across groups, and the relatively high rate of attrition overall, it is not

surprising that education stakeholders have aggressively pursued research on persistence

and completion over the past 40 years. Volumes have been written on the predictors of

bachelor's degree completion, initially focusing on student-level traits, and more recently

incorporating institution-level characteristics. Measures such as students' gender,

ethnicity/race, and socioeconomic status, as well as institutional size, selectivity, racial

composition, and expenditures have all been shown to be related to the likelihood of

bachelor's degree completion (e.g., Astin et al., 1996; Berger & Milem, 2000; Fleming,

1984; Kim, 2007; Titus, 2006a). Although these and similar contributions have shed light

on predictors of bachelor's degree attainment, the persistent gaps in completion within

and across groups suggest additional and alternative approaches to study this

phenomenon may be warranted.

One limitation of previous bachelor's degree completion research is the focus on student demographic characteristics in isolation. For example, the research on ethnicity/race oftentimes neglects to explicitly incorporate other important demographic traits – like gender or socioeconomic status. In this vein, Acker (2006) notes that "most studies of the production of class, gender, and racial inequalities in organizations have focused on one or another of these categories, rarely attempting to study them as complex, mutually reinforcing or contradicting processes" (p. 442). Yet, while education scholars support consideration of these demographic constructs individually and in combination (see Acker, 2006; Constantine, 2002; Howard, 2000; Ken, 2007; McCall, 2005; Muhammad, Smith, & Duncan, 2008; Riegle-Crumb, 2006; Schwalbe, Godwin, Holden, Schrock, & Thompson, 2000), rhetorical support has only slightly permeated the quantitative research on bachelor's degree completion. As Chen and DesJardins (2009) note, quantitative studies of postsecondary success are limited, as they do not usually consider statistical interaction effects. That said, attention to the ways that gender, race/ethnicity, and socioeconomic status interact to influence bachelor's degree completion might shed additional insight into understanding of disparities in degree attainment both between and across these demographic groups.

An approach that incorporates statistical interactions of demographic characteristics to better understand bachelor's degree completion may provide an opportunity to build upon extant research. By definition, "an interaction effect is said to exist when the effect of an independent variable on a dependent variable differs depending on the value of a third variable" (Jaccard, 2001, p. 12). Alternatively, and in more qualitative terms, Asher (2007) suggests "unpacked" approaches that do not

11

incorporate interactions may be "closeting or repressing certain aspects of [students']

hybrid identities . . . silencing multiplicities and erasing parts" (p. 69). For example,

Table 1 exposes a difference in the relationship between ethnicity/race and bachelor's

degree completion rates based on gender (NCHEMS, 2009). For African American men

and women the 6-year graduation rates are 32.8 and 42.4 percent, respectively. Given

these data, ignoring differences by gender in retention strategies for African Americans

may perpetuate disparities in completion.

Similarly, interventions for women may also require differential efforts based on

student ethnicity/race. Table 1 shows that, while women in all groups are more likely to

graduate than their same-race male peers, interventions designed to improve African

American and Latina/o completion that neglect ethnicity/race may be inherently limited.

Both examples suggest that approaches that address multiple constructs together (e.g.,

ethnicity/race and gender) could play an important role in decreasing attainment gaps.

Further, including attention to the ways that socioeconomic status interacts with gender

and ethnicity/race to predict bachelor's degree completion may also enhance the

conceptualization of and remedies to attrition from bachelor's degree programs.

While some postsecondary education scholars (e.g., Brunn, 2009; Chavous,

Harris, Rivas, Helaire, & Green, 2004; Gurin, Dey, Hurtado, & Gurin, 2002) have begun

to consider the intersections of gender, ethnicity/race, and socioeconomic status,

empirical limitations remain. First, studies on the inter-relatedness of gender,

ethnicity/race, and socioeconomic status have largely remained within the qualitative

research tradition (e.g., Barajas & Pierce, 2001; Grant & Sleeter, 1986; Lareau, 2003;

Winkle-Wagner, 2008). Although appropriate for generating multi-faceted, in-depth

understandings of the experiences of students of a particular gender, racial/ethnic, and socioeconomic status group, qualitative approaches do not reveal the relationship between these demographic variables and degree completion after controlling for other variables or over a larger population. Second, while there is a need to understand multiple systems of inequality to promote achievement for all students, there is tremendous uncertainty surrounding the use of appropriate methodological techniques (Chen, 2008; Reason, 2009; Schwalbe et al., 2000). As such, the challenge for quantitative scholars interested in modeling bachelor's degree completion is identifying methods that will incorporate conceptual notions of intersectionality while providing an acceptable degree of statistical significance.

In addition to empirical limitations, there are also theoretical and conceptual limitations to prior research. Within higher educational research, quantitative methods have rarely been executed with an explicit commitment to critical social theory. These critical paradigms were put forth and instigated by individuals associated with the Frankfurt School, to expose inequality and re-think remediation (Lemert, 2004; Harris, 2003). Applying this approach to research on bachelor's degree completion suggests a need to move beyond simply identifying group disparities based on one characteristic. Further, postsecondary education researchers rely heavily on frameworks like Tinto's (1993) Interactionalist Theory of Student Departure, which hinges on understanding student commitment to and integration into a specific college environment. Although Tinto's model acknowledges student demographic and background characteristics, it does not specify how to account for intersecting traits. This omission may inhibit progress, as Reason (2009) states, "researchers must study the conditional or interactional effects of

demographic variables . . . to move our understanding of students further" (p. 487). Given

Tinto's inarticulation of how to address multiple or intersecting characteristics,

alternative approaches are necessary.

A critical race feminist approach may be useful for framing Tinto's (1993) theory

because it embraces inclusive notions of gender, ethnic/racial, and class inequality and

marginalization. Critical race feminist theory acknowledges that marginalization is fluid

and context-specific (Hill Collins, 2000; Hurtado, 1996). Landry (2007) notes that, while

gender, ethnicity/race, and socioeconomic status cannot be separated, each characteristic

is not always relevant in a given situation. He further notes that these characteristics do

not necessarily have an additive relationship, but rather they are interactive (Landry,

2007). Thus, combining critical race feminist theory with Tinto's (1993) theory of student

departure supports inclusion of demographic interactions as they may improve models of

bachelor's degree completion by recognizing both conceptual and statistical variation

with respect to gender, ethnicity/race, and socioeconomic status group. For example,

while in the aggregate White students may be privileged by race on a predominately

White college campus, this does not preclude White male or female students from being

marginalized. As such, women and men of any gender, ethnic/racial or socioeconomic

strata can be marginalized or privileged based on dominant historical, structural and

heteronormative cultures of the college.

A review the data in Table 1 and the critical quantitative paradigm underscore the

importance of exploring intersectionality or interactionality of student-level demographic

characteristics to predict bachelor's degree completion. Specifically, the data reveal an

interaction between ethnicity/race and gender. Yet, there are very few instances in which

the statistical interaction of variables is fore-grounded in bachelor's degree completion research (e.g., Alexander, 1982; Chen, 2008). An interaction between two (or more) variables indicates that the effect of one variable on a particular outcome depends on the values of one or more other variables (Jaccard, 2001, 2003). Within regression analysis, interactions are often discouraged because of the way they complicate the interpretation of findings (Jaccard, 2001, 2003); however, using regression analyses to examine interactions may shed light on more demographically nuanced interventions for improving bachelor's degree completion for all students and reducing gaps in completion across and within groups. Of note, there is virtually no research on how socioeconomic status might influence degree completion with respect to gender or ethnicity/race.

Purpose of this Research

Both national and university-specific retention efforts often target students based on a single student-level variable, like gender or ethnicity/race (e.g., Muraksin & Lee, 2004; Thayer, 2000). This focus may obscure the role of other potentially critical facets of student backgrounds that also affect postsecondary completion. While prior research establishes that gender, ethnicity/race, and socioeconomic status are important predictors of bachelor's degree completion (see Astin et al., 1996; Pascarella & Terenzini, 2005), this study explores how these characteristics interact to influence completion. "The interaction effects of variables have increased in importance as the diversity within higher education [has grown]," (p. 491) and thus this study explores how gender, ethnicity/race, and socioeconomic status interact using a critical race feminist approach and Tinto's (1993) model of student departure.

15

The expanding notion of quantitative criticalist approaches in higher education affords scholars intellectual space to consider new research questions pertinent to long-standing issues (Baez, 2007). With a few exceptions, virtually all studies of postsecondary student completion have focused on isolating the effects of single predictor variables. In one exception, Chen (2008) explores the effects of financial aid on college student dropout risk. Using logistic regression analysis, Chen (2008) examines the ways that financial aid interacts with income, ethnicity/race, and year in college to predict completion. Given Chen's (2008) finding that interactions can contribute significantly to models of bachelor's degree completion, examining how gender, ethnicity/race, and socioeconomic status interact to affect likelihood of degree completion appears reasonable.

Research questions. The purpose of this dissertation is to understand how gender, ethnicity/race, and socioeconomic status interact to predict bachelor's degree completion using a national sample of students first-entering postsecondary institutions in the fall of 1995 drawn from the Beginning Postsecondary Students (BPS:96/01) longitudinal dataset. Logistic regression was used to identify variations in the relationship between gender, ethnicity/race, socioeconomic status, and the probability of completing a bachelor's degree from any institution within six years. The analyses include first-time, full-time African American, Asian, Latina/o, and White students. The specific research questions are:

1. How does the relationship between gender and the likelihood of bachelor's degree completion vary by ethnicity/race and socioeconomic status?

2. How does the relationship between ethnicity/race and bachelor's degree completion vary based on gender and socioeconomic status?

To clarify, this research examines interactions of gender with race/ethnicity and socioeconomic status, and then interactions of race/ethnicity with gender and socioeconomic status. Due to small cell sizes, this research does not attempt to examine three-way interactions among gender, ethnicity/race, and socioeconomic status with respect to likelihood of bachelor's degree completion.

The findings from this dissertation contribute to higher education research in at least two ways. First, this research adds to the critical quantitative canon, providing an alternative philosophical and theoretical approach to modeling bachelor's degree completion. Second, this research builds on others' use of interactions to better understand the predictors of bachelor's degree completion, by focusing exclusively on student-level demographic traits. By incorporating interaction terms, this dissertation better models the complexity of students' background characteristics and their relationship to bachelor's degree completion. Ultimately, the results of this study inform the conceptualization of bachelor's degree attainment, as well as the development of interventions to improve bachelor's degree completion for all students.

Organization of this Dissertation

This introductory chapter describes how bachelor's degree completion varies across and within groups. In addition, this chapter points out how neglecting to theorize and model the interaction of student demographic characteristics may hinder conceptualization of effective retention strategies. This dissertation research uses critical race feminist theory in conjunction with Tinto's (1993) Interactionalist Theory of Student

17

Departure to focus on the interaction of gender, ethnicity/race, and socioeconomic status in a model of bachelor's degree completion. The literature review, presented in Chapter 2, describes and critiques what is known from prior research about the relationship between gender, ethnicity/race, socioeconomic status and bachelor's degree completion. In addition, this review summarizes and critiques research on bachelor's degree completion that acknowledges other student- as well as institution-level characteristics that affect completion. Chapter 3 describes in more depth the conceptual model and theoretical frameworks that guide this research. Chapter 4 reviews the research questions, describes the BPS:(96/01) dataset, and delineates the methodological approach. The findings of the descriptive and logistic regression analyses are presented in Chapter 5. Chapter 6 follows with a discussion of the findings, conclusions, and implications for theory, statistical modeling, and retention program development.

CHAPTER 2: Review of the Literature

Introduction

Descriptive data confirm growth in the number of bachelor's degrees being conferred annually (Snyder et al., 2009). However, differences in bachelor's degree completion persist across groups and within groups, though less attention is given to the latter. Descriptive reports consistently note disparities by gender, ethnicity/race, socioeconomic status, and even institution-level characteristics in bachelor's degree attainment. While descriptive data shed light on both cross-sectional and longitudinal trends on bachelor's degree completion or attainment rates, this research is limited in at least three ways.

First, descriptive analyses by nature only illustrate the number of completers and completion rates. As such, these reports shed light on patterns, but lack theoretical grounding to explain attrition or offer solutions related to attainment disparities. Second, despite accounting for demographic characteristics like gender, ethnicity/race, socioeconomic status, first-generation status, and other across-group differences, oftentimes there is little consideration of within-group differences. Trent's (1991) descriptive work concludes that intervention strategies related to degree attainment should be "group specific and gender specific," (p. 59) thereby highlighting ethnicity/race and gender. Finally, the role of institution-level characteristics in descriptive bachelor's degree attainment research is often not a primary focus. By definition, persistence and completion research relates to predicting a students' attainment based on a given set of student characteristics. As such, retention efforts often pertain to changing the students' skills or experience in order to improve likelihood of completion. Yet, increasingly

institutional characteristics (e.g., sector, selectivity, and expenditures) are used to provide additional context to research on bachelor's degree completion. Although institutional characteristics appear to have a significant relationship to degree completion, there is little consensus on how to interpret that relationship in order improve retention. In spite of these limitations, descriptive analyses are nevertheless a critical first step in understanding bachelor's degree completion and attainment rates.

The following literature review incorporates scholarship spanning two important areas. The largest substantive area summarizes and critiques research on student-level background characteristics and their role in predicting bachelor's degree completion. Reflecting the research questions, specific attention is given to gender, ethnicity/race, and socioeconomic status. Second, the review describes and critiques research that focuses on the role of other student-level characteristics as well as institution-level characteristics in predicting bachelor's degree attainment.

Student-level Characteristics

Although the descriptive statistics and reports provide little information on the mechanisms of bachelor's degree attainment, the findings inform the construction of relevant statistical models. Scholars have long known that relationships exist between student characteristics and postsecondary success, and bachelor's degree completion in particular (e.g., Astin, 1993; Bean, 1990; Tinto, 1993). Coinciding with the influx of women and minorities to American colleges and universities in the 1960's, most research on postsecondary success (or attrition) has focused on gender or ethnicity/race, and not socioeconomic status. In fact, these initial considerations arguably confounded the role of socioeconomic status and ethnicity/race, essentially assuming minority status was

equivalent to low-income status (e.g., Kane, 1994). However, in recent years, socioeconomic status has become a more focal student-level characteristic in higher education research, as the number of less affluent students entering the postsecondary education pipeline has increased significantly (Baum & Ma, 2007). To address the two research questions, this section of the literature review focuses on what is known from research about the relationship between three student-level characteristics and bachelor's degree completion: gender, ethnicity/race, and socioeconomic status.

Gender. Descriptive data explicitly highlight gender differences in bachelor's degree attainment and the shift in advantage from male to female students that took place between 1970 and 2000 (Snyder et al., 2009). Some, but not all, of this shift in advantage is attributable to gains by women in accessing postsecondary education (Cameron & Heckman, 2001; Goldin et al., 2006). While some research has examined gender differences in college choice and access (Bank, 1995; Bischoping & Bell, 1998; Horn & Carroll, 2006), less literature has specifically considered gender differences in bachelor's degree attainment.

In studies of bachelor's degree completion where gender is not the primary focus, the findings are inconsistent. For example, one group of scholars studied likelihood of graduation for students at one university and found that female students were more likely than male students to graduate after four- and five-years in bachelor's degree programs (Wohlgemuth, Whalen, Sullivan, Nading, Shelly, & Wang, 2007). Most of the observed gender gap was attributed to academic factors: female students tended to earn better grades, switch majors fewer times, take more credits per term, and enroll in majors with fewer units (Wohlgemuth et al., 2007).

Other research uses nationally representative samples to include attention to institutional characteristics in addition to background, environmental, and financial traits (e.g., Alexander, Riordan, Fennessey, & Pallas, 1982; Arbona & Nora, 2007; Oseguera, 2005; Titus, 2006a, 2006b; Thompson et al., 2006). In these more extensive models of completion, gender often becomes insignificant once other student- and institution-level characteristics are taken into account (e.g., Alexander et al., 1982; Oseguera, 2005).

Like Wohlgemuth and colleagues (2007), the literature specifically pertaining to gender disparities in postsecondary outcomes attributes a significant proportion of the gap to women's higher academic achievement (e.g., Jacobs, 1996). In fact, research shows that among students entering bachelor's degree programs, women tend to have higher high school grades, on average, whereas men have higher college entrance standardized test scores (Jacobs, 1999; Young & Fisler, 2000). While these differences in traditional measures of academic achievement are consistent with other research, the findings allude to consideration of factors besides academic achievement that also play a role in explaining gender gaps in completion (Buchman & DiPrete, 2006; Jacobs, 1999).

Buchman and DiPrete (2006) provide one of very few focused and comprehensive examinations of the gender gap in bachelor's degree completion. Their study uses data from the General Social Survey (GSS) and the National Educational Longitudinal Study (NELS:88/00). The GSS provides aggregate information on educational attainment and social background; the NELS presents student-level data on educational attainment, academic achievement, and social background. Buhman and DiPrete consider multiple sociologically and economically based theoretical explanations for the gender gap in completion including status attainment, gender role socialization, gender egalitarianism,

and gender specific pathways through higher education. While each explanation appears to account for some of the gender shift in bachelor's degree attainment from men to women, the authors conclude that the gender gap is primarily attributable to the differential rate of return for a father's college education to daughters and sons (Buchman & DiPrete, 2006). That is, having a father who was less educated or absent had a greater negative affect on attrition throughout the educational pipeline for male than for female students.

Further, while female students' overall academic achievement prior to college enrollment was higher than for men, Buchman and DiPrete (2006) concluded that the associated advantage in completion is not conferred until postsecondary matriculation. This conclusion suggests that gender differences in student experiences and behavior during college play an important role in the persistence of the attainment gender gap (Buchman & DiPrete, 2006), a finding supported by postsecondary persistence research (e.g., Leppel, 2002; Nora et al., 1996; Strauss, 2004). Leppel concluded that integration is an important predictor of persistence regardless of gender, but also noted that women persisted more because of decision-making (e.g., the decision of women to enroll in majors requiring fewer units, Leppel, 2002). In sum, although there is little research focused specifically on the role of gender in predicting bachelor's degree completion, descriptive (e.g., Peter & Horn, 2005; Snyder et al., 2009) and inferential (e.g., Astin et al., 1996, Trent, 1991) research suggests that gender is a relevant factor.

Ethnicity/Race. Coinciding primarily with the significant influx of African Americans into postsecondary institutions in the 1950s and 1960s, postsecondary educational research concerned with ethnicity/race initially focused on White and African

American students attending either historically White institutions (HWIs) or historically Black colleges and universities (HBCUs) (e.g., Fleming, 1984; Gurin & Epps, 1975). Although the comparative research on HBCUs and HWIs examined student ethnicity/race, in effect, undergraduate demographic ethnic/racial composition, an institution-level characteristic, was the true focus. Nonetheless, much of the subsequent research on postsecondary outcomes comparing ethnicity/race groups pertains to Black and White students (e.g., Alexander et al., 1982; Kodrzycki, 2004; Thompson, Gorin, Obeidat, & Chen, 2006; Sibulkin & Butler, 2005). Research examining this particular binary-comparison often concludes that differences in African American and White students' postsecondary educational attainment are rooted in socio-historical and socio-demographic factors. For example, in Kodrzycki's analysis, geography is included to capture characteristics related to migration patterns, housing segregation, as well as regional educational attainment and economic viability.

More recent descriptive research that considers the five major ethnicity/race groups suggests some broad conclusions about bachelor's degree completion. In general, White and Asian students are more likely to obtain bachelor's degrees than their African American, Latina/o, and Native American students, as noted in descriptive (e.g., NCHEMS, 2009) and multivariate analytical research (e.g., Jespens, 2008; Porter, 1989; Vartanian et al., 2007). Few scholars compare White and non-White groups with regard to postsecondary persistence and completion. In their single institution study of college success and SAT scores, Hoffman and Lowitzki (2005) found that higher academic achievement in high school is positively associated with bachelor's degree completion. Their analysis also suggests that the effect of standardized test scores on academic

success in college may be smaller for non-White students than their White peers (Hoffman & Lowitzki, 2005). However, the growing diversity of the non-White undergraduate population makes the strength and utility of this White versus non-White comparison unclear.

That said, some scholars have found evidence that differences in bachelor's degree completion rates between ethnic/racial groups may be negligible or insignificant depending on model construction (e.g., Alexander et al., 1982; Jespen, 2008; Light & Strayer, 2002; Murtaugh, Burns, & Schuster, 1999). The typical moderators of observed racial/ethnic differences in bachelor's degree completion are measures of academic achievement and family background characteristics, like socioeconomic status (e.g., Alexander et al., 1982; DesJardins, Ahlburg, & McCall, 2006; Murtaugh et al., 1999; Titus, 2006a; Vartanian et al., 2007).

Deeper consideration of ethnicity/race is evident in the more contemporary inclusion of Asian and Pacific Islander (subsequently referred to as Asian), Latina/o, and Native American/Alaskan Native students in research, likely related to the Office of Management and Budget's 1997 and 2000 modifications to data collection. Inclusion of Asian and Latina/o students is especially important, given the exponential growth of these populations in the United States (Snyder et al., 2009). Between 1967 and 2007, Asian students increased from 2 percent of the college-going population to 7 percent and the Latina/o college student population grew from 4 to 11 percent (Snyder et al., 2009). In comparison, growth for White, African American and Native American students was considerably smaller or negative (Snyder et al., 2009). The tremendous growth Asians

and Latina/o populations has in many ways instigated education stakeholders' deeper consideration of outcomes by ethnicity/race beyond the Black-White paradigm.

In an effort to explain observed differences by ethnicity/race in educational attainment, scholars often rely on sociological frameworks describing "cultural orientation" (i.e., differences in orientation to schooling) or "structural position" (e.g., fit between skills and abilities and the needs of the local economy) (e.g., Kao & Thompson, 2003; Ogbu, 1992). In the context of higher education, these constructs imply that ethnic/racial group college choice, experiences, and outcomes are related to varying forms of capital based on group membership (Becker, 1962; Perna, 2000). This type of theoretical consideration justifies disaggregation of research on bachelor's degree completion by ethnicity/race (e.g., Arbona & Nora, 2007; Teranishi, Ceja, Antonio, & McDonough, 2004; Walpole, 2008). In effect, acknowledging differences in experience based on ethnicity/race allows for a more context specific framework when examining and evaluating mechanisms affecting completion. Furthermore, postsecondary scholars commonly disaggregate ethnicity/race when examining college access and choice (e.g., Teranishi et al., 2004), so it is appropriate that research on completion have a similar bent.

Although there are differences in the predictors of bachelor's degree completion across ethnicity/race, for all groups elements of their academic background, college experiences, and institutional characteristics are important (e.g., Adleman, 2006; Oseguera, 2005; Wohlgemuth et al., 2007). While some scholars focus on African American students in higher education exclusively (e.g., Cohen & Nee, 2000), other research incorporates multivariate analyses where multiple racial/ethnic groups are

considered, including African Americans (e.g., Kane, 1994; Oseguera, 2005; Pascarella, 1985). The prevailing view of what is known about African American students and bachelor's degree attainment draws from both types of research. In general, African American students' completion is affected by socio-demographic characteristics, like gender and socioeconomic status (Allen, 1992; Cohen & Nee, 2000; Thomas, 1981; Thompson et al., 2006). Academic achievement measures (i.e., high school grades and standardized test scores) are also important in predicting Black student's bachelor's degree completion (Allen, 1992; Oseguera, 2005; Thomas, 1981), though perhaps not as important as for White students (Hoffman & Lowitzki, 2005).

One study used multiple data sets (e.g., NELS(88:00), College Board Exam Data Reports, IPEDS, and Common Core of Data) to examine African American students' postsecondary educational experiences and outcomes (Thompson, Gorin, Obeidat, & Chen, 2006). The regressions examining bachelor's degree completion between Black and White students revealed that gender, socioeconomic status, educational expectations and academic achievement were all important factors (Thompson et al., 2006). Black and White women were more likely to obtain bachelor's degrees than their same-race male peers. However, the effect of gender was larger among African American students, such that gender accounted for nearly 15 percent of the variance in degree attainment, compared to only 1 percent for White students (Thompson et al., 2006). In fact, for African American students, gender and socioeconomic status accounted for almost one quarter of the variance in likelihood of completion (Thompson et al., 2006).

Other research shows the importance of institution-level characteristics to bachelor's degree completion for African American students. These institution-level

27

characteristics include faculty-student ratio, student body-racial composition, expenditures on instruction and academic support services, undergraduate racial composition, level of degree offerings, and propensity to become socially integrated (Allen, 1992; Kim & Conrad, 2006; Oseguera, 2005; Thomas, 1981).

With regard to Latina/o students, some scholars focus exclusively on this population (e.g., Fry, 2004; Solórzano, Villalpando, & Oseguera, 2005), while others employ multivariate analyses with racial/ethnic groups that include Latina/os (e.g., Ganderson & Santos, 1995). Fry conducted a comprehensive comparison of Latina/o and White college completion gaps using the National Educational Longitudinal Study (NESL: 88/2000), focusing specifically on students with similar levels of academic achievement. In this research, institution type (i.e., selectivity and highest degree offered) played a significant role in likelihood of bachelor's degree completion. Specifically, among equally prepared White and Latina/o students, the latter were more likely to matriculate to a less selective institution (Fry, 2004). Since institutional selectivity is positively correlated with bachelor's degree completion, this research shows that Latina/o students, even those that are high achieving, are at a disadvantage in degree completion even before finishing their first college courses (Fry, 2004).

For Latina/o students, gender appears relatively unimportant, but socioeconomic status and pre-college academic achievement significantly influence likelihood of bachelor's degree completion (Arbona & Nora, 2007; Ganderson & Santos, 1995). In addition, factors related to family (i.e., parental expectations and religion) and peer group (i.e., peer college-going attitudes and expectations, peer intellectual self-esteem, student body diversity) are also important predictors of bachelor's degree completion for

28

Latina/os (Arbona & Nora, 2007; Nora, Cabrera, Hagedorn, & Pascarella, 1996; Oseguera, 2005). In terms of experiential and institution-level characteristics that predict completion for Latina/o students, significant characteristics include: working on campus, student services expenditures, large percentage of commuters, institution size, and propensity for social integration (Hurtado & Ponjuan, 2005; Oseguera, 2005).

In comparison to research on Black and Latina/o students, there is little research on the predictors of bachelor's degree completion specifically for White or Asian students. Student-level predictors of completion for White students include pre-college academic achievement, parental education level, and religion (Oseguera, 2005). Environmental- and institution-level characteristics affecting White students' bachelor's degree completion include propensity for academic integration, institutional commitment, peer intellectual self-esteem, faculty-student ratio, expenditures on instruction and academic support services, level of degree offerings, institution size, and institutional commitment (Oseguera, 2005). For Asian students, student level predictors of bachelor's degree completion include measures of pre-college achievement, ethnicity, parent income, and socioeconomic status (Oseguera, 2005; Vartanian et al., 2007). In terms of college experiences, institutional commitment and propensity for academic integration are also important predictors of persistence for Asian students (Gloria & Ho, 2003), as are institutional characteristics like student body diversity and institutional size (Oseguera, 2005).

In effect, the research on ethnicity/race confirms that different contexts affect students' educational persistence and outcomes differently (e.g., Acker, 2006; Asher, 2007; Hill Collins, 2000; Hurtado, 1996). In addition, research reveals both across-group

differences, but also noteworthy and pervasive within-group differences. Disaggregation of ethnicity among Asians by Teranishi and colleagues (2004) with regard to college choice lends credence to descriptive research on within-group differences in completion as well (see Gloria & Ho, 2003 or Lee & Kumashiro, 2005). For example, Lee and Kumashiro (2005) note that Asian ethnic groups with high rates of poverty have low levels of educational attainment and those with lower rates of poverty have higher rates of educational attainment. Multiple scholars affirm that both ethnic group and socioeconomic status should be taken into account when studying Asian students' postsecondary educational outcomes (e.g., Gloria & Ho, 2003; Lee & Kumashiro, 2005; Teranishi et al., 2004). Others suggest that similar considerations are relevant for students from other ethnic/racial groups (e.g., Ganderson & Santos, 1995; Massey, Mooney, Torres, & Charles, 2007). As Chen (2008) notes: "models that include race/ethnicity often treat it only as a control factor as a whole without closely examining the diversity within these racial groups" (p. 218).

In summary, the literature suggests that ethnicity/race is an important factor related to predicting bachelor's degree completion, but that models should also include other socio-demographic, academic achievement, familial, experiential and institutional characteristics (e.g., Astin, 1993; Fischer, 2007; Pascarella & Terenzini, 2005). In addition, where data are available, within ethnic/racial group differences should be considered.

Socioeconomic status. There is a sizeable body of research on social class (or socioeconomic status) and postsecondary aspirations access, choice, and experiences (e.g., McDonough, 1997; Perna, 2000; Paulsen & St. John, 2002). McDonough rather

eloquently and extensively explores the role of social class and college choice. Her case study analysis of twelve high school seniors in California identifies how opportunity structures related to college choice vary based on socioeconomic status. However, there is relatively little scholarship extending that body of work with regard to social class and bachelor's degree completion.

Research on bachelor's degree completion and socioeconomic status may be relatively underdeveloped because scholars who incorporate social class tend to focus on intermediate issues like student decision-making, experiences and behaviors rather than degree completion (e.g., Hahs-Vaughn, 2004; Goldrick-Rab, 2006; Paulsen & St. John, 2002; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996; Walpole, 2003, 2008). For example, Goldrick-Rab (2006) found that students from economically disadvantaged backgrounds were more likely to choose postsecondary pathways that lead to interrupted enrollment. This research establishes a link between social class and persistence, therefore suggesting that a relationship between social class and degree attainment may also exist.

Some longitudinal research on socioeconomic status implies that students from lower socioeconomic strata are African American or members of another non-White ethnic/racial group. However, this assumption is largely due to the effects of legalized segregation in work and education prior to the mid-1950s. Over time the appropriateness of this assumption has diminished as more recent demographic and economic data reveal that socioeconomic status is not always synonymous with African American or more broadly, ethnic/racial minority group membership, especially with regard to bachelor's degree-seeking students (Baum & Ma, 2007; Ishitani, 2006; Perna, 2008; Walpole, 2008).

Another limitation of this research is the variety of ways that socioeconomic status has been measured in studies of bachelor's degree attainment. For example, in a related, but different operationalization of socioeconomic status, Choy (2001) focuses on the role of parent's education level in understanding completion disparities. In that research Choy (2001) highlights postsecondary completion among students whose parents did not attend college, a group she labels first-generation college students. These data reveal that first-generation students are less likely to obtain a bachelor's degree than their non-first-generation peers after five years (Choy, 2001). In other research, familial influence is also defined as a proxy for socioeconomic status. Some scholars have examined disrupted families (e.g., List & Wolfle, 2000) and others have concentrated on the presence of fathers (e.g., Ver Ploeg, 2002), while others have focused on first-generation students and parental involvement (e.g., McCarron & Inkles, 2006).

Regardless of the measurement of socioeconomic status, research on bachelor's degree attainment reveals consistent findings. Students from higher social classes are more likely to complete bachelor's degrees, compared to their lower social class peers (e.g., Alexander et al., 1982; Choy, 2001; Titus, 2006a). In their logistic regression analysis of data from the National Longitudinal Study of the High School Class of 1972, Alexander and colleagues (1982) found that socioeconomic status is positively related to bachelor's degree completion for Black and White students above and beyond the influence of either ethnicity/race or gender. More recent work accounting for both student- and institution-level characteristics supports these findings as well (e.g., DesJardins et al., 2006; Titus, 2006a; Walpole, 2008).

For example, Titus (2006a) presents research on the role of institutional financial context on likelihood of bachelor's degree completion among students from low socioeconomic backgrounds. This research is relatively exceptional in its explicit attention to postsecondary outcomes of one demographic characteristics (socioeconomic status), and not ethnic/racial or gender group. Using the Beginning Postsecondary Students (BPS:96/01) data set, the results confirmed that compared to students in higher socioeconomic quartiles, students from the lowest socioeconomic strata are have a lower likelihood of bachelor's degree completion within six years (Titus, 2006a). This and the related body of research suggest that, while socioeconomic status is important, its effect can be reduced considerably by controlling for student academic achievement prior to enrolling in college (see Choy, 2001) and institutional characteristics (Titus, 2006a).

Although research using NCES databases often uses a standard measure of socioeconomic status, the operationalization in research using other sources is not always consistent. Most often socioeconomic status is measured as a composite variable that includes parents' income, occupational prestige, and educational attainment (see Walpole, 2003, 2008). However, among these factors, parental educational attainment can be defined in various ways, including having at least one parent with no postsecondary education exposure and having no parent with at least a bachelor's degree. This variability confuses and sometimes conflates whether and how social and/or cultural capital transmitted through parents is related to college success, or more pertinent to this research, bachelor's degree completion. Furthermore, the widening social class gap in the United States among the bachelor's degree seeking population (Choy, 2001) suggests that socioeconomic status is an important factor to consider in models of completion.

Since postsecondary research on socioeconomic status often focuses on behaviors and decision-making, a related limitation pertains to the incorporation of time (i.e., when student behave in certain ways or make certain decisions). Acknowledging the timing of student persistence decision-making, through such analyses as event history modeling, allows for nuance in understanding how and when students stop out, dropout or withdraw based on measures of class (see DesJardins et al., 2003; DesJardins et al., 2006; Ishitani, 2006). For example, in a study using data from the NELS:88 and NELS:1988-2000 Postsecondary Education Transcript Study, Ishitani (2006) found that first-generation students (in this case students whose parents attained a high school diploma or less) were at higher risk for college stop out, dropout or withdrawal, and more susceptible to longer time to degree completion than their peers whose parents had higher levels of attainment. Research also shows that students with parents who had some college, but no degree were advantaged in terms of likelihood and timeliness of completion over students whose parents never attended college (Choy, 2001; Ishitani, 2006). By incorporating time, Ishitani (2006) concluded that time-specific departure risks and interventions could be taken into consideration to improve retention.

Another important limitation of research on socioeconomic status pertains to the treatment of socioeconomic status. For example, in Walpole's (2008) study on socioeconomic status and the postsecondary experiences of African American students, the sample was divided into quintiles. The subsequent analyses only compared students from the highest and lowest socioeconomic strata in order to emphasize differences. While this approach highlights the differences in students from either extreme of the socioeconomic ladder, it effectively ignores students in the middle. Such omission may

be problematic as it reduces the population under consideration, privileges individuals at the extremes, and neglects others that may also encounter socioeconomically-based barriers. Many students aspiring to a bachelor's degree are from lower-income – though not necessarily the lowest-income – families and communities (Baum & Ma, 2007; Kojaku, et al., 1998). The research on financial aid highlights this issue by noting that students in the lower and middle of the income distribution may also be disadvantaged in terms of persistence and completion because of low social and cultural capital (see Paulsen & St. John, 2002).

Nonetheless, even with consideration of these limitations, some tentative conclusions about the relationship between socioeconomic status and bachelor's degree completion may be drawn. Students from higher socioeconomic strata are privileged over their less affluent peers in terms of postsecondary college choice, enrollment, persistence, and post-baccalaureate outcomes (Choy, 2001; Walpole, 2003, 2008; Terenzini, et al., 2001; Titus, 2006a). Further, because there are significant differences in how students from the highest and lowest social class strata enter and experience college (e.g., Goldrick-Rab, 2007; McDonough, 1997), it follows that differences in bachelor's degree completion might also vary by socioeconomic status as well.

Other student-level characteristics. Although gender, ethnicity/race, and socioeconomic status are central to the research questions, other student-level characteristics also affect bachelor's degree completion. The subsequent sections briefly describe research on the roles of academic achievement, academic major, financial aid, and working in predicting bachelor's degree completion.

Academic Achievement. Academic achievement appears to play a significant role in predicting bachelor's degree completion as well as degree attainment rates. Some suggest that academic achievement is one of the most important factors in predicting completion (e.g., Alexander et al., 1982; Murtaugh et al., 1999). Most multivariate analyses measure academic achievement in terms of high school indicators like grade point average, course taking, and standardized achievement test scores (e.g., DesJardins et al., 2006; Hoffman & Lowitzki, 2005; Trusty & Niles, 2004; Zwick & Sklar, 2005), though also including measures of achievement during college.

High school course taking, especially in mathematics, appears to play an important role in persistence to bachelor's degree completion (Adelman, 1999, 2006; Trusty & Niles, 2004). Using the High School and Beyond/Sophomore Cohort and National Educational Longitudinal Study, Adelman (2006) ran logistic regressions on level of high school math and bachelor's degree completion. The results confirmed that there is a positive and cumulative relationship between the level of mathematics course taking and bachelor's degree completion rates (Adelman, 2006). Others confirm that students who take Algebra 2, Trigonometry, Pre-Calculus and Calculus were more likely to obtain a bachelor's degree within eight years of high school completion than their peers who did not take these classes in high school (Trusty & Niles, 2004). However, mathematics course taking may capture confounding issues related to secondary school institutional context and opportunity (Adelman, 2006; Perna, 2000). Standardized test scores on postsecondary entrance exams are also used to consider entrée and persistence in bachelor's degree programs (e.g., Hoffman & Lowitzki, 2005); however, little comparable research on degree attainment exists (e.g., Astin et al., 1996).

36

Some research on bachelor's degree completion incorporates postsecondary measures of academic achievement like remedial education, course-taking patterns, college grade point average, course-taking intensity, and major field of study (e.g., Adleman, 1999; Kreysa, 2007; Merisotis & Phipps, 2000; Tan, 2002). However, in the aggregate this body of literature lacks depth. For example, while some research reveals a negative effect of remedial education on bachelor's degree completion (Kreysa, 2007), this finding may reflect the virtual segregation of remedial education within community college and the fact that bachelor's degree completion is less likely for students who begin at two-year than those first enrolling in four-year institutions (e.g., Shaw, 1997).

Academic major. There is also little consensus within the literature on the relationship between academic major and bachelor's degree completion, though this ambiguity appears to reflect differences in research design. Differences in design include single compared to multiple institution studies, sociological and economic frameworks to explain differences in major choice, and even research involving institutions where the academic major is declared early versus later.

Early studies show no relationship between academic major and degree attainment (e.g., Alexander & Eckland, 1977; Pascarella, Smart, Ethington, & Nettles, 1987). Other research uses economic frameworks to consider perceived and actual economic returns to an academic major; however, that body of literature is rarely found in research on bachelor's degree completion (see Arcidiacono, 2004). Yet, others have found that academic major is related to persistence and bachelor's degree attainment (e.g., Pascarella, Ethington, & Smart, 1988; St. John, Hu, Simmons, Carter, & Weber, 2004). For example, one study found that majoring in social sciences compared to all

other fields is associated with higher postsecondary attainment (e.g., Pascarella, Ethington, & Smart, 1988). Others have found that students majoring in the sciences are more likely to reach higher levels of postsecondary attainment than their peers in education or social sciences (e.g., Thomas & Gordon, 1983).

Still other research suggests that the influence of academic major on postsecondary success varies by ethnicity/race (St. John et al., 2004). St. John and colleagues explored academic major and first- and second-year persistence (not bachelor's degree completion) for Black and White students attending one institution. Overall, the results suggest that major field is unrelated to students' decisions about persistence and that White students are more likely to persist than their African American peers (St. John et al., 2004). However, using a labor market outcomes perspective, there were differences in major and racial group membership. For example, African American students were more likely to major in fields with immediate economic returns, whereas White students were likely to consider the long-term investment of graduate education (St. John et al, 2004).

Other research on the relationship between academic major and bachelor's degree completion provides a more nuanced understanding of science, technology, engineering, and mathematics (STEM) and non-STEM majors (e.g., Fenske, Porter, & DuBrock, 2000; Seymour & Hewitt, 1997). Single institution research suggests that STEM majors persist and graduate at higher rates than their non-STEM peers, but that the former also take longer to graduate (Fenske et al., 2000). In more nationally representative research, Tan (2002) uses the Beginning Postsecondary Students longitudinal study and multiple regression analysis to examine graduation rates of STEM and non-STEM majors,

examining differences by gender and ethnicity/race. Similar to the work by Seymour and Hewitt (1997), Tan's (2002) research suggests that only one third of STEM students will persist in a STEM major to graduation. Among STEM undergraduates, ethnicity/race was important, whereas gender was not significant. The research suggests that academic major may affect likelihood of bachelor's degree completion, but the relationship between major and students' demographic background characteristics remains unclear.

Financial aid. Student financial aid is generally used to increase college access and college-going by decreasing the cost of college through some combination of scholarships, grants, and loans (Baum, 2007). In general, scholars agree that financial aid promotes postsecondary persistence and attainment (Alon, 2007; Cabrera, Nora & Castenada, 1992; Dooris, Guidos, & Stine, 2007; Gansemer-Toph & Schuh, 2005; Kim, 2007). Scholarships and grants appear to be more positively related to bachelor's degree completion compared to loans (Fenske et al., 2000), though the magnitude of their effect may change from initial entry through graduation.

In fact, loan debt accrual may be detrimental to student completion of a bachelor's degree. In a logistic regression analysis of the Beginning Postsecondary Students data, Dowd (2004) found that subsidized loans taken in the first year had a positive effect on persistence in bachelor's degree programs at public colleges, but not attainment. However, after controlling for various student- and institution-level characteristics, Kim (2007) found a negative relationship between first-year loan debt and the likelihood of bachelor's degree completion for African American and low-income students. Other research suggests that loans can have a positive effect on bachelor's degree completion. Chen and DesJardins (2008) studied dropout risk differences by income group, paying

specific attention to financial aid type. They found that loans (as well as work-study aid) are associated with lower risks of dropout after controlling for other factors. In this vein, bachelor's degree completion appears related to financial aid type, ethnicity/race, and socioeconomic status, as well as institution-level characteristics (e.g., sector). Other postsecondary scholars have identified similar relationships between demographic traits, financial aid, and institutional characteristics (e.g., Alon, 2007; Gansemer-Toph & Schuh, 2006).

Working in college. According to multiple scholars, many college students work during college (Astin, 1993; Pascarella & Terenzini, 2005). Although some might work to gain experience, many do so to contribute to their own living expenses or pay costs not covered by their parents of financial aid (King & Bannon, 2002; Pascarella & Terenzini, 2005; Perna, 2010). In general, the literature notes that working may not adversely affect students if they are working part-time, and may in fact be beneficial to persistence and eventual completion if they work part-time on-campus (Pascarella & Terenzini, 2005). Specifically, many concede that there is a non-linear relationship between the number of hours worked and postsecondary satisfaction, development, and performance (Astin, 1993; Furr & Elling, 2000). In general, students working no more than 20 hours per week are positively affected, whereas their peers who work more hours are less likely to graduate. However, overall, there is little research focusing on working students.

Institution-level Characteristics

Institutional characteristics are often used to account for unexplained variance in models of bachelor's degree completion that have historically focused on student-level characteristics (e.g., Oseguera, 2005; Kim, Rhoades, & Woodard, 2003). Although

institutional characteristics related to bachelor's degree completion are virtually immutable and reflect many external political, cultural, and historical forces, they expose institutional contextual factors that influence student success.

Descriptive reports on bachelor's degree completion shed light on the relative importance of institution-level characteristics. Astin and colleagues (1996) found that students attending public colleges and universities have lower attainment rates overall compared to their peers attending private colleges and universities. This finding was consistent across all ethnic/racial groups and is consistent with findings from other descriptive reports that incorporate institutional context (e.g., Horn & Carroll, 2007).

Horn and Carroll (2007) shed light on the role of institutional context by comparing graduation rates across institutions with similar characteristics. This descriptive report analyzed a sample of approximately 1,300 bachelor's degree granting institutions to identify relationships between attainment rates and institutional selectivity, Carnegie classification, and undergraduate enrollment size (Horn & Carroll, 2007). The primary finding was that graduation rates are inversely related to the size of the low-income population at the institution (as measured by Pell Grant eligibility), even when Carnegie classification and selectivity level are held constant (Horn & Carroll, 2007). The Federal Pell Grant Program provides need-based grants to low-income undergraduate and certain post-baccalaureate students to promote access to postsecondary education. In general, students eligible for Pell Grants have a total family income up to $50,000, although most Pell funding goes to students with a total family income below $20,000.

Horn and Carroll's (2007) work also confirmed previous findings related to completion gaps by student gender and ethnic/racial group (e.g., Astin et al., 1996;

41

NCHEMS, 2009). Specifically, women graduated at higher rates than men, and there were gaps in graduation rates between ethnic/racial groups. With regard to institutional characteristics, the completion disparities by ethnicity/race decreased as the size of the institution's low-income student population decreased (Horn & Carroll, 2007). Multivariate regression analyses on the fall 1994 cohort of Cooperative Institutional Research Program (CIRP) by Oseguera (2005) also found that institutions with large undergraduate enrollments have lower rates of bachelor's degree completion than smaller institutions.

Undergraduate admissions selectivity criteria are another institution-related measure included in research on bachelor's degree completion (e.g., Bowen & Bok, 1998; Meliguizo, 2008). Institutional selectivity is typically measured by the average aggregate incoming freshman's standardized entrance exam scores (i.e., the ACT or SAT) and/or average high school grade point average, although some measure selectivity by the proportion of applications accepted (e.g., Hamrick, Schuh, & Shelley, 2004) or other factors (see *U.S. News & World Report*, 2008). Descriptive research indicates that more selective institutions average higher graduation rates (Horn & Carroll, 2007); conversely, lower institutional selectivity is associated with lower rates of bachelor's degree completion (Oseguera, 2005; Titus, 2004).

The relationship between selectivity and minority students' postsecondary access and completion is especially disquieting with regard to the mismatch hypothesis. In effect, the mismatch hypothesis predicts that minority students enrolling in selective institutions with lower achievement scores than the institutional average will have lower graduation rates than minority students attending less selective institutions where their

42

entrance scores are more similar to average entrance scores (Alon & Tienda, 2005). In research that controls for a variety of student-level background characteristics, however, students of similar aptitude are more likely to obtain a bachelor's degree if they attend a more selective undergraduate institution (see Alon & Tienda, 2003; Light & Strayer, 2000).

Related research on institutional selectivity and minority students' postsecondary attainment reveals that minority students in selective institutions often perform as well or better than their White peers (Melguizo, 2008; Small & Winship, 2006). According to Meliguizo's regression analysis of data from the National Educational Longitudional Study (NELS:88/2000), African American and Latina/o students attending the most selective institutions were more likely to complete bachelor's degrees within eight years than their peers at less selective institutions. Small and Winship (2006) take this research further by using data from College and Beyond and hierarchical linear modeling to better account for student- and institution-level characteristics. Their findings reveal that, although selectivity exerts a positive force on graduation for all students attending elite institutions, minority students receive a greater advantage over their White and Asian peers attending similar institutions, after controlling for various student- and institution-level characteristics (Small & Winship, 2006).

While institutional selectivity appears related to bachelor's degree completion, the effects may be moderated by other institution-level variables. Although their study was not on bachelor's degree completion, Eide and colleagues (1998) found that attending a selective private college exerted a more positive influence on graduate school

matriculation than for students attending less selective institutions, even highly selective public institutions.

Along these lines, postsecondary institutional sector is also an important factor in postsecondary educational research (e.g., Baum, 2007; Dowd, 2004; Scott, Bailey, & Kienzl, 2006). Research on institutional sector and bachelor's degree persistence and completion consistently suggests that, compared to attending a public institution, students at private colleges are more likely to graduate (Astin, 1993; Pascarella & Terenzini, 2005; Oseguera, 2005). However, the lower likelihood of success at a public institution is somewhat problematic. As Dowd (2004) reminds, the average lower sticker price at public institutions makes them more accessible to students from fewer financial means, thereby implying that financially disadvantaged students attending public institutions may be put at a further disadvantage for persisting due to the influence of sector. Although Dowd's (2004) research focuses on postsecondary access, it highlights the importance of cost and financial aid as mechanisms for promoting completion. In other research on sector, Scott and colleagues (2006) developed a modified regression model to better account for the resources in public and private colleges during calculation of bachelor's degree graduation rates. The findings suggest that when adjustments are made for student population and institutional resources, public institutions are more effective at graduating students (Scott et al., 2006).

Somewhat related to sector and selectivity, institutional expenditures also appear to play an important role in students' bachelor's degree attainment. In general, institutions that have larger expenditures have higher rates of completion (e.g., Gansamer-Toph & Schuh, 2006; Hamrick, Schuh & Schelley, 2004; Oseguera, 2005).

Using data from the IPEDS, Hamrick and colleagues (2004) found that institutional expenditures explained between 21 and 34 percent of the variance in bachelor's degree completion in their study on institutional characteristics, resource allocation, and graduation rates. Although some research focuses on expenditures in the aggregate, others (e.g., Oseguera, 2005) differentiate between expenditures for academic support, student services, library, instruction, administration, institutional support, and institutional grants, as delineated in the IPEDS surveys.

In her study of bachelor's degree completion, Oseguera (2005) found that students attending less selective institutions, which often have lower levels of expenditures (as noted by Horn & Carroll, 2007), are also less likely to obtain a bachelor's degree. This finding coincides with a more narrowly tailored study on bachelor's degree completion, private institutions, and selectivity (Gansamer-Toph & Schuh, 2006). Gansamer-Toph and Schuh concluded that, among "low selectivity institutions, the amount of institutional and academic support expenditures did not have a direct effect on graduation rates" (p. 629). In another study the relationship between expenditures on student services and graduation rates was non-significant (Ryan, 2004). Nonetheless, while expenditures appear to play a role in bachelor's degree completion, the aggregate nature of this measure and the potentially confounding role with sector make it difficult to interpret in larger-scale research focused on improving attainment.

Taking yet another nuanced consideration of institutional context, Titus (2004, 2006a, 2006b) explores in multiple studies the importance of financial context on postsecondary success and completion. Using multi-level modeling and the Beginning Postsecondary Students (96:01) data set, he found that institutional context does exert a

significant force on student persistence (Titus, 2004; 2006b). The descriptive analysis confirmed that students from lower socioeconomic strata are more likely to be enrolled in postsecondary institutions with lower financial resourced (Titus, 2006b). In these multilevel models of bachelor's degree completion, demographic characteristics, namely gender, ethnicity/race, and socioeconomic status were not significant after other variables at the student- and institution-level were taken into account (Titus, 2006b). In addition, the results suggest bachelor's degree completion is positively influenced by tuition revenue, expenditures per full-time equivalent student, as well as expenditure patterns (Titus, 2006b).

Another institution-level characteristic that appears in research on postsecondary outcomes and bachelor's degree completion is Carnegie Classification. This classification system was developed to help researchers compare postsecondary institutions with similar characteristics including but not limited to types of degrees offered, highest degree offered, curriculum, enrollment, research capacity/focus, and staff size (NCES, 2009). One study found a significant difference in student outcomes based on institutional Carnegie classification (Pike, Kuh, Gonyea, 2003). However, Oseguera's (2005) work on bachelor's degree completion, which does not explicitly include Carnegie classification, found that African American and White students attending doctoral degree-granting institutions are less likely to reach completion. Hamrick and colleagues (2004) also incorporate Carnegie classification in their study of bachelor's degree completion rates to address factors that may be influenced by institutional or political processes. In general, the results of this research suggest that higher completion rates are associated with institutions that offer bachelor's and master's, but not doctoral degrees - a

46

finding mirrored by other researchers (e.g., Astin, 1993; Bowen & Bok, 1988; Hamrick et al., 2004; Pascarella & Terenzini, 2005).

Interactions in Bachelor's Degree Completion Research

Although not often the focus, there is some evidence that there are interactions between variables often used to examine postsecondary outcomes. In fact, there is considerable qualitative education-related research that focuses on relationships between demographic characteristics (Lareau, 2003; McDonough, 1997; Winkle-Wagner, 2008). Although not explicit in McDonough's (1997) work, her study on the relationship between social class and college-going provides insight on the college decision-making process for White female students. In a more explicit example, Winkle-Wagner (2008) presents an ethnographic study examining how the intersection of ethnicity/race and gender among African American women informs notions of identity. In both cases, the authors suggest that multiple demographic factors may influence student's behaviors, decision-making, and ultimate postsecondary success.

While the qualitative paradigm provides an important avenue for scholars interested in intersectionality, there remains a void in the quantitative arena. The research on bachelor's degree completion provides some attention to the relationship between variables, which in some--but not all cases—makes reference to statistical interactions. That noted, postsecondary research that incorporates notions of intersectionality often focuses on gender and ethnicity/race, and less so on socioeconomic status. This trend is evidenced within the more quantitatively oriented postsecondary research.

Although there is little research focused specifically on the ways that gender, ethnicity/race, and socioeconomic status interact to predict bachelor's degree completion,

47

many models include each of these demographic variables, reiterating their importance. In an early study of bachelor's degree completion among African American and White students, interactions of gender, ethnicity/race, and socioeconomic status were considered (Alexander et al., 1982). In this more dated piece, Alexander and colleagues' logistic regression analysis used the National Longitudinal Study for the Class of 1972 (NLS: 72) and found differences in likelihood of completion by ethnicity/race were significantly moderated by social status. Once the significance of main effects had been identified in the regression models, two-way interactions and even one three-way interaction were included for gender, ethnicity/race, and socioeconomic status. The ethnicity/race by socioeconomic status interaction was significant in a model that excluded gender. The findings indicated that among low- and middle-class youth, Black students were more likely to complete bachelor's degrees, and among high-income youth, White students were more likely to reach attainment (Alexander et al., 1982). Guided by their research questions and not the previous models, Alexander and colleagues (1982) included interactions for ethnicity/race and socioeconomic status, ethnicity/race and curricular track, and gender and ethnicity/race in a different model of completion. All interactions contributed to the regression model, but not significantly. The authors concluded that: "these interactions, then, represent minor perturbations in an otherwise simple structure" (Alexander et al., 1982, p. 325).

In a more recent study of bachelor's degree completion for White and Black students, Thompson and colleagues (2006) included an interaction for gender and ethnicity/race. The findings revealed that the interaction was indeed significant, in this

48

case that the likelihood of completion varied by gender for African Americans but not for Whites (Thompson et al., 2006).

While these scholars provide evidence that students' demographic backgrounds matter in predictive models of bachelor's degree completion, there is also some recent work incorporating interactions of other variable types. In particular, Rong Chen has authored or co-authored several studies that consider the interaction of financial aid-related variables (e.g., Chen, 2008; Chen & DesJardins, 2008). This research shows that students respond to scholarships, grants, and loans differently, and also that understanding these levels of responsiveness can be used to inform retention-related policies.

Overall, the evidence suggests that statistical interactions ought to be considered in research on bachelor's degree completion for at least two reasons. First, theoretical and qualitative scholars allude to intersectionality and its potential influence on postsecondary success both explicitly and implicitly (e.g., Asher, 2007; Carter, Sellars, & Squires, 2002; Grant & Sleeter, 1986; West & Fenstermaker, 1995; Winkle-Wagner, 2008). While those scholars continue to examine primarily demographic factors, incorporation of intersectionality is still not typically considered in the quantitative research paradigm. As statistical modeling improves, it is reasonable to consider more research with interactions that might capture intersectionality. Second, there is evidence of interactions being significant predictors of bachelor's degree completion in a few studies, but given the age of these data, the continued relevance of these findings to current college students is unclear (e.g., Alexander et al., 1982; Trent, 1984; Thompson et al., 2006). Although research including statistical interactions is infrequent and the findings are inconsistent

and dated, descriptive data suggest interactions among the variables predicting bachelor's degree completion, namely gender, ethnicity/race, socioeconomic status, and financial aid.

Summary

Historically, research has focused on examining the relationship between students' socio-demographic characteristics and bachelor's degree completion. Descriptive research (e.g., Baum & Ma, 2007; Kojaku & Nunez, 1999; Peter & Forrest Cataldi, 2005) describes patterns in bachelor's degree attainment across and sometimes within gender, ethnic/racial, and socioeconomic status groups. Research using multivariate analyses (e.g., Astin et al., 1996; Oseguera, 2005; Titus, 2004) largely confirms these patterns and attempts to explain the observed relationship between student and/or institutional factors and completion.

But, complicating this body of research is the use of statistical models that may oversimplify the complex and dynamic role of factors influencing completion. As descriptive and multivariate analyses research suggest, there are notable relationships and sometimes interactions between gender, ethnicity/race, and socioeconomic status. However, despite the suggested relationship between these three socio-demographic characteristics and bachelor's degree completion, little recent research uses multivariate analyses to systematically examine these interactions statistically.

The absence of attention to the ways that student demographic characteristics interact to influence bachelor's degree program reflects, at least in part, a limitation of the conceptualization of attainment models. The next chapter presents a theoretical

framework and conceptual model that attempts to account for intersectionality in

bachelor's degree attainment.

CHAPTER 3: Theoretical Approach & Conceptual Model

Introduction

The persistent gaps in postsecondary completion have challenged higher education stakeholders for many years (as evidenced by Astin, 1993; Bean, 1990; Kinnick & Kempner, 1988; Pascarella & Terenzini, 2005). Overall, the research suggests that students' demographic characteristics and academic experiences, as well as their engagement with the institutional environment all play a role in bachelor's degree attainment. The findings from this research have contributed to the development of systematic and individual institution retention strategies (e.g., Braxton, Brier, & Steele, 2007; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005). However, despite these important contributions, this research has not translated into a significant reduction in gaps in postsecondary attainment across and within groups (IPEDS, 2009). Moreover, since in comparison to research on persistence, relatively few predictive studies of bachelor's degree completion exist, additional perspectives may be warranted (as noted by Adelman, 2006). In particular, revisiting the conceptual and theoretical frameworks used in bachelor's degree attainment research may be helpful in better understanding attrition.

Higher education scholars grounded in traditional disciplines (e.g., psychology, sociology, and economics) have provided important insights into the sources of degree completion gaps, why they persist, and how they might be ameliorated. Whereas sociological frameworks for bachelor's degree completion focus on students' interactions and relationships (e.g., Kao & Thompson, 2003), economists stress the cost-benefit analysis of departure (e.g., Paulsen & St. John, 2002), and psychologists accentuate internal processes that affect student decisions to persist until completion (e.g., Magolda,

1992). Interdisciplinary frameworks (e.g., education, gender and ethnic studies) also inform postsecondary persistence and completion, generally attempting to weave elements of the disciplinary perspectives into more conceptually and contextually robust frameworks. This chapter describes the theoretical approach (critical race feminism) and conceptual model (Tinto's (1993) widely used Theory of Student Departure) that guide this dissertation research.

Critical Social and Critical Race Feminist Theory

According to Harris (2003), critical social theory is used to answer persistent questions where alternative considerations have been repressed. Understanding bachelor's degree completion is undoubtedly a persistent question in higher education research (as noted by Adelman, 1999, 2006). Further, one might accept that 'alternative considerations' to understanding bachelor's degree completion have been 'repressed,' as significantly decreasing attainment gaps remains elusive. In effect, contemporary research fails to provide postsecondary stakeholders with applicable and actionable findings useful for the development of more nuanced and effective interventions.

The origins of critical social theory are often attributed to founders and advocates of the Frankfurt Institute for Social Research (Harris, 2003). In effect, critical social theory acknowledges that complex processes (e.g., postsecondary persistence to graduation) must be simplified to engender understanding, but that, oftentimes, such simplification results in the concealment or omission of social and/or historical processes (Harris, 2003). Thus, if scholars neglect to account for important social or historical context when understanding students' paths to bachelor's degree attainment, remedial efforts may inevitably be flawed.

53

Critical social theory works as a mechanism from which to examine processes like postsecondary attainment. Like all organizations, postsecondary institutions vary in their practices and procedures, many of which are said to contribute to the perpetuation of "class, gender, and racial inequalities" (Acker, 2006, p. 447). In the context of this dissertation, current approaches to understanding bachelor's degree completion disparities may be flawed in their conceptualization of inequality, and therefore prevent the development of more robust models and retention strategies. However, while critical social theory is relevant to a study that aims to equalize access to a bachelor's degree both across and within groups, its tradition holds well-noted limitations (see Harris, 2003; Ladson-Billings & Tate, 1995). Aside from the utopian nature of critical social theory, its roots in labor market politics make it insufficient for application to issues contemporary educational settings, which include more sociological elements.

Specifically, critical social theory is flawed in terms of acknowledging and addressing the historical, systematic, and institutional oppression of underrepresented people (including ethnic/racial minorities, women, differently-abled, homosexual or transgendered, and low-income individuals) in the United States. As a result, alternative theoretical paradigms, like critical race feminist theory were engendered. Generally attributed to the backlash against feminist theory based on middle-class White women's experiences, critical race feminism seeks a utopian equality, like critical social theory. However, critical race feminist theory explicitly recognizes power dynamics between men and women overall, but also within and across various social strata (Hurtado, 1996; Hill Collins, 2000). In effect, critical race feminist theory complicates the meaning of privilege, suggesting that marginalization is context-specific. Further, these authors note

that marginalization/privilege in one situation does not necessarily translate into marginalization/privilege in all spaces (Hill Collins, 2000; Hurtado, 1996; Landry, 2007).

The critical race feminist affirmation of variation in marginalization is consistent with a substantial body of educational research, both implicitly and explicitly (e.g., Asher, 2007; Epps, 1995; McCall, 2005; Riegle-Crumb, 2006). Using the teacher education classroom as an example, Asher (2007) asserts that multicultural pedagogy must acknowledge the contradictory tensions of marginalization to truly accept diversity. This more philosophical approach encourages an inclusive environment that "engages the intersecting tensions of race, culture, gender, and sexuality in critical, dialogical, and self-reflexive ways" (Asher, 2007, p. 71). Others like Reigle-Crumb (2006) conduct more applied research on the intersection of ethnicity/race and gender and high school course taking. This research concluded that, "race-ethnicity does not shape math course taking in identical ways for male and female students" (Reigle-Crumb, 2006, p. 116). In sum, this research reinforces the theoretical, but also practical need for examining inequality at intersections. Critical race feminist theory lends credence to consideration of interactions between student demographic characteristics to predict bachelor's degree completion, as it acknowledges multiple types of marginalization (e.g., gender, ethnicity/race, and class).

Critical Quantitative Higher Education Research

Conceding that qualitative and quantitative methods have a symbiotic relationship that neither privileges nor denies importance to either (or other) approach(es), a critical quantitative orientation, "rather than confirming conventional wisdom and seeking consensus, adapts a proactive stance by consciously choosing questions that seek to challenge" the status quo (Stage, 2007, p. 8), conceptually as well as methodologically. In

a complementary tangent of the critical race feminist theoretical approach, some higher education scholars have embraced a paradigm termed *critical quantitative research*. In Stage's (2007) edited volume, the contributors repeatedly indicate that, while quantitative research is important to policy-making, more critical orientations are needed to effectively improve postsecondary inequality.

Accordingly, this dissertation research acknowledges various types of marginality and incorporates critical stances on intersectionality with bachelor's degree completion research. Similar to the work by Chen (2008) that includes statistical interactions, this research attempts to improve models of bachelor's degree completion by considering interactions of demographic characteristics, specifically gender, ethnicity/race, and socioeconomic status.

Postsecondary Attainment Theory

While critical race feminist and critical quantitative theoretical orientations provide a philosophical rationale for incorporating the interaction of student-level demographic characteristics in models of bachelor's degree completion, these theories are limited without appropriate contextualization. The research on postsecondary persistence, retention, and bachelor's degree completion is best characterized as involving models of college impact (Pascarella & Terenzini, 2005). Research on college impact highlights the relationship between students and the institutions they attend, rather than focusing on individual student growth (Pascarella & Terenzini, 2005). College impact models include attention to students' development and relationships while in college, in addition to structural, organizational, and environmental factors (Astin, 1993; Tinto, 1993; Pascarella 1985). Not surprisingly, college impact models are often grounded with a combination of

56

psychological- and sociologically-grounded lenses to account for student demographic and background characteristics, attitudes and behaviors, as well as the student's relationships with peers, faculty, and staff in the postsecondary institution. Institutional characteristics, including, but not limited to, size, selectivity, and faculty-student ratios have also been included in college impact models.

Tinto's Interactionalist Theory of Student Departure

Recognizing the various aspects of college student attrition, Tinto (1993) developed a conceptual college impact model based primarily in anthropology and sociology. In the almost thirty years since being developed, Tinto's (1993) Interactionalist Theory of Student Departure remains one of the best well-known and most frequently cited conceptual models of persistence through postsecondary institutions (Braxton, Hirschy, & McClendon, 2004). This model describes voluntary departure, or attrition from bachelor's degree programs, as a longitudinal process affected by students' commitments to and interactions with the collegiate environment. Tinto's (1993) model is not relevant for students forced to stop out or withdraw because of poor academic achievement. Figure 2 summarizes Tinto's (1993) model; the key aspects of the model are described below.

Acknowledging that students arrive in postsecondary institutions with certain personal, familial, academic, and financial dispositions and resources, the first element of Tinto's (1993) departure process acknowledges student pre-entry attributes: (1) family background, (2), skills and abilities, and (3) prior schooling. These characteristics include such demographic and background characteristics as ethnicity/race, gender, (dis)ability status, financial resources, academic motivation, and past academic achievement (e.g.,

high school grade point average, standardized college admissions test scores, and college

grade point average) (Tinto, 1993).
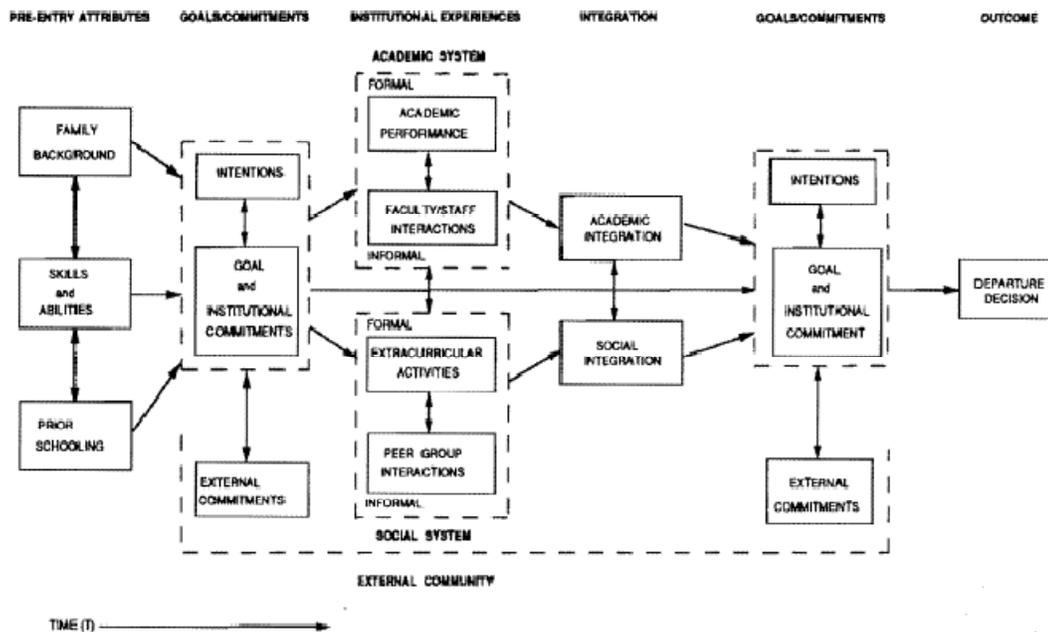
Source: (Tinto, 1993, p. 114)

Figure 2. Tinto's Interactionalist Model of Student Departure

With these pre-entry attributes, students develop initial goals and/or

commitments. This development is described as the degree to which students are

committed to the academic institution they enroll in and their academic goals while at the

institution. Though not stated explicitly by Tinto (1993), the notion of initial commitment

implicitly suggests that students anticipate completing their degree program at this first

institution. This assumption is especially important since the likelihood of a student

completing their degree from the first institution they attend has decreased (Peter &

Forrest Cataldi, 2005). The model also accounts for the role of external commitments,

which play a role in students' initial orientation and commitment to goal setting in the

college environment. External commitments include financial obligations (e.g., the need to support a spouse or dependents) and other priorities (e.g., working) (Tinto, 1993).

Given those individual attributes, goals, and commitments, students interact with the formal and informal academic and social systems of the institution (Tinto, 1993). Students' academic experiences are comprised of a formal and informal system. The formal academic system pertains primarily to the student's academic performance, whereas the informal system is related to students' interactions with faculty and/or staff members. Students' social experiences are also composed of formal and informal components. Formal social experiences include students' participation and engagement in extracurricular activities, whereas informal social experiences include peer group interactions.

The construction of students' institutional experiences into academic and social realms contributes to students corresponding academic and social integration. Tinto (1993) states that, along with the context of students' pre-entry attributes, initial commitments, and institutional experiences, academic and social integration influences their subsequent commitments to the institution, including the goal of degree attainment. The greater a students level of academic integration, the greater their subsequent level of commitment in terms of completion. A similar, positive relationship is expected for social integration and subsequent levels of commitment to the institution (Tinto, 1993).

More specifically, academic integration is comprised of two dimensions (i.e., structural and normative) that coincide with the formal and informal systems. The structural aspect of academic integration entails the meeting of explicit standards of the college or university, whereas normative integration pertains to an individual's

identification with the beliefs, values and norms inherent in the academic system. In terms of social integration, Tinto (1993) focuses on the degree of alignment between the individual student and the social system of an institution. Social integration reflects the student's perception of his or her degree of congruence with the attitudes, values, beliefs, and norms of the social communities of a college or university. Student integration, in both the academic and social realms, then influences subsequent commitments to the institution. Accordingly, the greater the level of subsequent commitment to graduation and the institution, the greater the likelihood the student will persist to degree completion.

One important aspect of Tinto's (1993) model pertains to the role of external community on commitments, goals, institutional experiences and integration. Coinciding with its grounding in theories on suicide, Tinto's model suggests that interaction with external communities can positively or negatively influence attrition. This postulate has been criticized, especially with regard to historically marginalized students, as Tinto (1993) implies that students from these communities have academic values less aligned with postsecondary institutional beliefs, norms, and traditions. More specifically, the implication is that connection to these communities negatively affects persistence, and that these 'vulnerable' students should sever those ties to better assimilate. Though initially established as a conceptual model, much of the research prior to Tinto's (1993) work was based primarily on White male students - another important consideration related to the evolution of departure theory. Thus with the diversification of higher education, this notion of assimilation as necessary to reach graduation has been challenged both theoretically and through empirical work focusing specifically on non-White students' assimilation (Cabrera et al., 1992; Tierney, 1992; Braxton, Hirschy, &

McClendon, 2004). Another limitation of Tinto's (1993) conceptual model is that it implies that degree completion is synonymous with positive (academic or social) integration, which has not been confirmed empirically (e.g., Braxton, Hirschy, & McClendon, 1997). In fact, qualitative research on underrepresented students' marginalization on college campuses suggests the opposite; namely that students can persist and graduate when marginalized by peers or the institution (e.g., Winkle Wagner, 2008).

Another relevant consideration of Tinto's (1993) model is its explanation of the departure process within a given college or university, not groups or systems of institutions. Braxton and colleagues (1997) extend Tinto's (1993) model both in terms of theory development but also through empirical research pertaining to students in multiple institutions. By aggregating institutional data to understand persistence and completion, analyses of students attending multiple institutions highlight trends at the student- and institution-level.

In their review of research on Tinto's (1993) model, Braxton and colleagues (1997) suggest that student entry characteristics affect the level of initial commitment to the institution, goal of graduating from college, and students' likelihood of persistence. In addition, Braxton and colleagues (1997) suggest that the most important aspects of Tinto's model are the positive relationships between academic and social integration and subsequent commitments to the institution and goal of degree completion.

Although consideration of integration, engagement, or involvement in conceptual and empirical models of bachelor's degree attainment is important (e.g., Astin, 1993; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008), these variables are often poorly measured

61

(as noted by Braxton et al., 1997). While there is an obvious linkage between students'

interactions on campus, academic progress, and decisions to complete a bachelor's

degree, the validity of retrospective survey measures of integration is unclear. Further,

whether standardized measures of integration, like those in the large databases is useful,

remains unclear, as students need not be fully engaged, involved, or integrated to

successfully complete degree programs.

Critical Race Feminist Approach to Tinto's Theory

Considerable research suggests that the likelihood of bachelor's degree

completion is related to student background, achievement, experiential (e.g., integration,

involvement, or engagement), and even institution-level characteristics. To address the

two research questions in this dissertation, a critical race feminist perspective is used to

conduct and present the analysis (as further discussed in Chapter 4). In this dissertation

research, a critical race feminist perspective justifies extra attention to student

demographic background characteristics – that is, gender, ethnicity/race, and

socioeconomic status – than other elements of Tinto's (1993) conceptual model. In

addition, because the interaction of gender, ethnicity/race, and socioeconomic status is

focal to the research questions, per Jaccard's (2001, 2003) suggestion, the conceptual

(and subsequent statistical) model is simplified significantly. Element of the student

background, achievement, integration, and institution-level characteristics, are specified

in the next chapter. In effect, the model used in this research employs Tinto's (1993)

theory, but the analysis and findings are interpreted using a critical race feminist

perspective.

Summary

This chapter presented a summary of the rationale for using critical race feminist theory to frame Tinto's (1993) Interactionalist Theory of Student Departure in research on bachelor's degree completion. Although existing frameworks and research on bachelor's degree completion have revealed a variety of characteristics, processes, and mechanisms that promote bachelor's degree completion, gaps in bachelor's degree completion by gender, ethnicity/race, and socioeconomic status remain. Consistent with Tinto's (1993) model, this dissertation assumes that bachelor's degree completion is a result of various student- and institution-level characteristics. But, drawing on critical theories, this dissertation focuses on the role of student-level demographic characteristics, and the interactions among these characteristics.

CHAPTER 4: Research Design and Methodology

Introduction

While various reports and research shed light on bachelor's degree attainment, highlighting disparities across and within groups, this area of research has several limitations. First, most research on postsecondary persistence and retention does not focus on bachelor's degree completion due to the empirically-based finding that attrition occurs primarily during the first and second academic years (Kojaku & Nunez, 1999). Nonetheless, economic and social justice perspectives suggest that the benefits of completing a bachelor's degree outweigh the benefits of merely enrolling (e.g., Kane, 1994; King, 1999; Paulsen, 1998, Perna, 2005). Second, although economically- and sociologically-based frameworks permeate higher education outcomes research, these frameworks often provide little guidance for designing effective, actionable solutions for specific populations. The purpose of this research is to use extant research to build and test a model of bachelor's degree completion that more completely conceptualizes the ways that demographic characteristics interact to predict bachelor's degree attainment. Though this research does not evaluate a retention solution, per se, the results contribute to the conceptualization of retention strategies.

Past research confirms that a variety of student and institution level characteristics significantly predict bachelor's degree completion and account for group disparities (e.g., Oseguera, 2005; Titus, 2006a, 2006b; Vartanian et al., 2007). Incorporating those findings and building on the quantitative criticalist paradigm in higher education (Stage, 2007), this research provides additional insight into persistent gaps in bachelor's degree completion by focusing on the interaction of student-level demographic characteristics.

Framed with a critical race feminist perspective, this research acknowledges privilege and marginalization by ethnicity/race, gender, and socioeconomic status in bachelor's degree granting postsecondary educational settings. For example, this framework suggests that, whereas White students may be relatively more privileged in higher education compared to other ethnic/racial groups, White women and lower-income White students (regardless of gender) may be less privileged than higher income or male students from other ethnic/racial groups (Hill Collins, 2000; Hurtado, 1996).

Along these lines, this dissertation seeks to understand whether gender, ethnicity/race, and socioeconomic status interact to significantly predict bachelor's degree completion using a national sample of students first-entering postsecondary institutions in the fall of 1995 from the Beginning Postsecondary Students longitudinal survey (BPS:96/01). By exploring how these three student-level demographic characteristics interact, this research highlights disparities in completion across as well as within groups. Identifying subgroups that are highly susceptible of attrition contributes to the development of better-targeted interventions. This dissertation addresses the following two research questions:

1. How does the relationship between gender and the likelihood of bachelor's degree completion vary by race/ethnicity and socioeconomic status?

2. How does the relationship between race/ethnicity and bachelor's degree completion vary based on gender or socioeconomic status?

The remainder of this chapter describes in detail the research design, including the BPS:(96/01) dataset, analytic sample, and statistical analyses, and reviews the variables

included in this model of bachelor's degree completion. Limitations of the study are also presented.

Research Design

      Data. The research questions are addressed using data sponsored by the U.S. Department of Education's National Center for Education Statistics (NCES), the Beginning Postsecondary Students (BPS:96/01) longitudinal study. The BPS: 96/01 includes data designed to identify persistence and completion of first-time, first-year students in postsecondary institutions nationwide. The data for this second cohort of the BPS originates from the 1996 National Postsecondary Student Aid Survey (NPSAS:96), a study that is also sponsored by NCES.

      The NPSAS is a cross-sectional study of undergraduate, graduate, and first-professional students that identifies how students and their families pay for postsecondary education. The NPSAS utilizes a two-stage sampling frame, where a sample of institutions was first selected, and then students within these institutions were chosen. For the NPSAS:96, this strategy resulted in a national sample of institutions of higher education (n=1,670), and then a sample of postsecondary students within those institutions (n=23,090). When weighted, the data are representative of the population of undergraduate and graduate students attending postsecondary educational institutions nationwide. The data in the BPS is considered nested, as students are nested within postsecondary institutions. Both cross-sectional and panel weights were used to make the data nationally representative, to maintain external validity, and to control for sampling strategies for various groups (Wine, Heuer, Wheeless, Francis, Franklin, & Dudley, 2000).

All responding first-time, first-year NPSAS:96 students were selected for the BPS: 96/01 study (n=10,350 were eligible). NCES collected BPS data for first-time, first-year students attending postsecondary institutions at three time points: via NPSAS:96 in the first year of postsecondary enrollment, then three years (response rate: 92%) and six years later (response rate: 88%) (Wine et al., 2000).

Similar to past research on bachelor's degree completion, the sample for this study is limited to first-time, full-time bachelor's degree seeking students who first enrolled in four-year colleges and universities during the 1995-1996 academic year (see Titus, 2006b). These limitations are based on the BPS data set research design, including the fact that data are not collected from students six years after their initial enrollment (Wine et al., 2002), but also coincide with previously noted information on the benefits of higher education. Namely, students entering four-year bachelor's degree programs are conferred greater benefits compared to graduates of other programs (e.g., two-year associate's programs), as noted by Baum and Ma (2007). In addition, although many students enroll in college part-time, this study was limited to students who first enrolled full-time, as the expectation of graduating within six years pertains to full-time status.

Among the 10,350 eligible for the BPS, 9,130 students responded to the BPS:96/01. For this study, the analytic sample was further limited to students who initially enrolled full-time at a four-year college or university (n=4,980). The normalized panel weight (B01AWT), i.e., the panel weight designed to analyze longitudinal data from students who completed at least two of the three surveys, was used in this research to make the sample nationally representative without inflating the sample size (Wine et al., 2000).

Statistical Analysis

  This section describes the variables used to construct the logistic regression models. The variables that are included in the analyses are summarized on Table 2. In addition, this section includes an overview of the planned statistical analyses and then concludes by reviewing the limitations of this study.

Variables

  This section describes the dependent and independent variables included in the analyses. There are three primary student-level demographic characteristics of interest: ethnicity/race, gender, and socioeconomic status. Other student-level background characteristics included in the model measure pre-college academic achievement, academic and social integration, and hours worked per week while enrolled during 2001 or the last term enrolled. Institutional characteristics are measured by two variables: selectivity and sector. Table 2 summarizes the variables included in the model.

  Dependent variable. The outcome, bachelor's degree completion, is a dichotomous variable that measures whether students were awarded a bachelor's degree by the 2001-2002 academic year at any institution (i.e., six years after initial enrollment). Students who enrolled and completed a degree are coded 1; individuals that had not obtained a bachelor's degree by the 2001-2002 academic year are coded 0. System- rather than institutional-retention was considered in this study. Since the focus of the research questions is on demographic characteristics, and not on level or type of integration at a particular institution, system-wide completion is an appropriate definition of the dependent variable.

Table 2

Description of BPS Variables Used

Variables	Definition
Dependent variable	
Bachelor's degree attainment by 2001	Earned a bachelor's degree from any institution before the end of the 2000-1 academic year (0 = no, 1 = yes)
Independent variables	
Gender	Male = 0, Female = 1
Ethnicity/race	Student ethnicity/race; series of dummy variable for African American, Asian, Latina/o, and White. Where applicable, White students were the reference group.
Socioeconomic status	Socioeconomic diversity index ranging from 0-2, based on three indicators of socioeconomic disadvantage: total family income as a percentage of the 1994 federal poverty level, the highest educational level completed by either parent, and the proportion of the student body in the student's high school eligible for the free or reduced-price lunch program in 1994-95. Variable was recoded into 3 categories and two separate dummy variables for minimally disadvantaged, and moderately or highly disadvantaged. Not disadvantaged is the reference category.
Student-level	
High school grade point average	NCES derived, weighted average of self-report high school grade point average at time of college entrance exam in five subject areas (English, math, foreign languages, science, and social studies). This variable was recoded into four dummy variables for individuals reporting grades of A to A-, A- to B, B to B-, and B- to F, with the reference group A to A-.
SAT score	SAT combined score, derived as either the sum of SAT verbal and math scores, or the ACT composite score converted to an estimated SAT combined score. These values were transformed into z-scores.
Academic integration	Overall level of academic integration experienced by the respondent during the 1995-6 academic year. NCES derived composite of (1) participated in study groups, (2) had social contact with faculty, (3) met with an academic advisor, or (4) talked with faculty about academic matters outside of class. These values were transformed into z-scores.
Social integration	Overall level of social integration by the respondent during the 1995-6 academic year. NCES derived composite of (1) attended fine arts activities, (2) participated in intramural non-varsity sports, (3) participated in varsity or intercollegiate sports, (4) participated in school clubs, or (5) gone places with friends from school. These values were transformed into z-scores.
Hours worked per week while enrolled	Number of hours a student reported working per week if they held a job during the last term enrolled (or in 2001). This variable was recoded into four categories and three dummy variables for: working 1 to 14, 15-25, and 26 or more hours per week. The reference group was working 0 hours per week.
Institution-level	
Control	Public = 0, Private = 1
Selectivity	Institutional selectivity; series of dummy variables for least selective, selective, and very selective. Least selective is the reference group.

Source: Beginning Postsecondary Students, BPS(96/01).

Independent variables. Based on the research questions, the three primary independent variables of interest are gender, race/ethnicity, and socioeconomic status.

Gender. Research shows that gender is often, though not always, a significant predictor of bachelor's degree attainment (Buchmann & DiPrete, 2006; Jacobs, 1999; Thompson et al., 2006, Wohlgemuth et al., 2007). Gender is included in the model as a dichotomous categorical measure, with respondents coded as 0 for male, and 1 for female.

Ethnicity/Race. In order to address the research questions and better understand the ethnic/racial gaps in bachelor's degree completion, a series of categorical measures of ethnicity/race are included in the model (i.e., African American, Asian, Latina/o, and White). White students are the reference group.

Socioeconomic status. Based on enrollment trends, the economic recession, and extant postsecondary research, increased attention to socioeconomic status is warranted in research on bachelor's degree completion. Socioeconomic status was measured using a standardized categorical index developed by NCES representing three indicators of socioeconomic disadvantage: family income, highest level of education by either parent, and the proportion of the student's high school peers eligible for free or reduced-lunch programs during the 1994-1995 academic year (Wine et al., 2000). This composite index ranged from 0 to 2, a scale of increasing disadvantage. To answer the research questions, socioeconomic status was recoded into three dummy variables. Since the majority of the original cases were for students considered "not disadvantaged," this was the reference group. The two dichotomous dummy variables included in the logistic regression analyses captured "minimally disadvantaged" (0=not minimally disadvantaged,

1=minimally disadvantaged) and "moderately to highly disadvantaged" (0=not moderately to highly disadvantaged, 1=moderately to highly disadvantaged) relative to not disadvantaged.

Control variables. Reflecting the conceptual model (Tinto, 1993), the analyses include variables to control for students' pre-entry academic achievement, academic and social integration, hours worked per week, and institutional characteristics.

High school GPA. Among pre-college academic characteristics, high school GPA is one of the most highly predictive of postsecondary success and attainment. As a result, self-report cumulative high school GPA is included in the regression model. The quasi-continuous variable had the following seven categories: 1 = D- to D, 2 = D to C-, 3 = C- to C, 4 = C to B-, 5 = B- to B, 6 = B to A-, and 7 = A- to A. However, based on the distribution of cases in the final analytic sample, this variable was recoded into four dummy variables: B- to F, B to B-, A- to B-, and A to A-. In the analyses, A to A- served as the reference group.

Derived SAT score. College entrance exam scores have also been found to be strong predictors of postsecondary persistence and bachelor's degree completion. As such, SAT I scores were derived by NCES using SAT I scores and ACT scores that were converted into SAT scores by the College Board. This variable is continuous and ranges from 400 to 1550, but was transformed into a standardized value (z-score), which was then used in the models.

Hours worked per week. According to some (Pascarella & Terenzini, 2005; Perna, 2010), more and more undergraduate students work during college. The literature suggests that working during college may support and inhibit persistence to a bachelor's

degree, highlighting the lack of consensus on the issue. The number of hours worked per week during the last term was included in this model to examine the role working might play on likelihood of completion. This continuous variable indicates the number of hours the respondent reported working per week during their last term enrolled or in 2001. Based on the literature and distribution of cases in the final analytic sample, this variable was recoded into a series of dummy variables reflecting no work, 1-19 hours worked per week, 20 to 25 hours worked per week, and 26 or more hours worked per week. The reference group was not working.

Climate-academic integration 95-96. According to numerous scholars (e.g., Astin, 1993; Kuh et al., 2008; Oseguera, 2005; Wohlgemuth et al., 2007), as well as the conceptual model (Tinto, 1993), students who are more academically integrated are more likely to persist to completion. This composite continuous student-level variable was derived by NCES based on participation in study groups, having social contact with faculty, meeting with an academic advisor, or talking with faculty about academic matters outside of class. Values for academic integration was from 100 to 300. The standardized version of this variable was used in the models.

Climate-social integration 95-96. Social integration is also an important element of Tinto's (1993) conceptual model. Somewhat related to academic integration, social integration is more concerned with undergraduates' participation in activities outside of the classroom and engagement with other students. This composite, continuous student-level variable was derived by NCES based on the average of respondents based on participation in fine arts activities, intramural or non-varsity sports, varsity or intercollegiate sports, school clubs or going places with friends from school. Values for

social integration range from 100 to 300. The standardized version of this variable was used in the models.

Institution control. Since considerable research reveals consistent differences in persistence and degree completion based on control (e.g., Astin et al., 1996; Dowd, 2004; Scott et al., 2006), the model included a variable indicating whether an institution is public or private. Similar to past research, institutional control was measured as a dummy variable, with public institutions coded as 0, private institutions coded as 1.

Institutional selectivity. Although the focus of this study is not on institutional characteristics, selectivity has often been found to play an important role in bachelor's degree completion. In general, selectivity is positively related to bachelor's degree completion. In this study, the institutional selectivity variable was derived by the NCES from two existing variables in the BPS dataset. The most selective institutions were those where the 25th percentile of SAT I /ACT scores of freshmen entering in the fall 1997 was greater than 1000. Selective institutions were identified as Research University I and II, Baccalaureate I institutions, and private not-for-profit Doctoral University I and II institutions that did not meet the "very selective" criteria. All other institutions were categorized as "least selective." For this research, institutional selectivity was measured with two dummy variables (selective and very selective), with least selective institutions coded as the reference group.

BPS panel weight. This panel weight is appropriate for application to longitudinal analyses and addresses students responding to all three waves of the BPS: 96/01 in 1996, 1998, and 2001. The normalized panel weight was used to prevent over-inflation of the weighted sample size on standard errors and statistical tests.

Variables not included. There are numerous other student- (e.g., academic major or financial aid) and institution-level variables (e.g., expenditures) that support the conceptual model and extant research on bachelor's degree completion. However, in order to develop a relatively simple model that would accommodate the interactions without stressing the limited BPS data set, a smaller number of predictor variables were used.

Descriptive analysis. Descriptive analyses were used to provide contextual information about the final analytic sample. List-wise deletion reduced the sample size from 4,980 by approximately 55 percent. The two variables with the most missing data were self-report high school grade point average and number of hours worked per week. In fact, of the approximately 5,000 cases, nearly 2,000 were removed due to missing data, resulting in a final analytic sample of 2,720. Table 3 presents a summary of descriptive statistics for the final analytic sample.

Table 4 presents a summary of the missing data. The missing data analyses show significant differences between cases included and excluded from the analyses for each of the three continuous variables included in the model – SAT scores, academic integration, and social integration. A review of the differences in means for these three variables suggest that the cases in the analyses had lower SAT scores, lower academic integration, and lower social integration, on average, than the cases that were excluded. As noted on Table 4, students with the lowest high school GPA were more likely to be included than students with higher high school GPAs.

With regard to the three focal demographic characteristics there were also some significant differences. As Table 4 notes, a higher share of women than men (57.6

percent) were included in the final analysis. With regard to ethnicity/race, a higher share of Asian (62.4 percent) than of African American, Asian, Latina/o, and White students were included in the analyses (of 54.8 percent, 56.7 percent, and 53.1 percent, respectively). The analyses also include a lower share of not-SES disadvantaged (50.4 percent) than of minimally disadvantage (58.0 percent) and moderately to highly disadvantaged (62.3 percent).

With regard to institutional characteristics, the case included in the analyses represent a higher share of public (55.1 percent) than private (52.4 percent) institutions. The cases in the analyses also over-represent students attending less rather than more selective institutions, as 58.7 percent of the cases attending institutions categorized as "least selective" but 47.6 percent of the cases attending institutions categorized as "selective" and 49.4 percent of the cases attending institutions classified as "very selective" were included in the final analysis.

Table 3

Descriptive Statistics of Final Sample (n=2,720)

Variable	Descriptor	Percent (%)	Mean	Minimum	Maximum	Std Dev
Dependent variable						
Completion	Bachelor's by 2001	50.7		0	1	
Independent variables						
Student-level variables						
Gender	Female	52.6		0	1	
	Male	47.4				
Ethnicity/race	White	76.3		0	1	
	African American	7.6		0	1	
	Latina/o	8.5		0	1	
	Asian	7.6		0	1	
Socioeconomic status						
	Not disadvantaged	53.4		0	1	
	Minimally disadvantaged	31.5		0	1	
	Moderately or highly disadvantaged	13.3		0	1	
High school GPA						
	A to A-	43.7		0	1	
	A- to B	30.6		0	1	
	B to B-	15.5		0	1	
	B- to F	10.2		0	1	
SAT score			0	-2.51	1.98	1
Academic integration (z-score)			0	-2.03	1.74	1
Social integration (z-score)			0	-1.99	2.08	1
Hours worked per week during last term						
	0 hrs	32.7				
	1-19 hrs	11.1		0	1	
	20-25 hrs	13.4		0	1	
	26 or more hrs	20.6		0	1	
Institution-level variables						
Control	Public	64.8		0	1	
	Private	35.2				
Selectivity	Least selective	57.7		0	1	
	Selective	17.6		0	1	
	Very selective	24.7		0	1	

Source: Beginning Postsecondary Students, BPS(96/01).

Logistic regression analysis. Logistic regression analysis was used to address the two research questions. Logistic regression analysis is one of the most common analytical techniques in higher education research pertaining to completion (Peng, So, Stage, & St. John, 2002). According to Peng and colleagues (2002), there are two reasons logistic regression is preferable to other approaches. First, logistic regression models can contain both continuous and categorical predictor variables. Although the primary predictors - gender, ethnicity/race, and socioeconomic status- are categorical, other variables included in the predictive model, like academic and social integration, for example, are continuous. Second, logistic regression models do not assume a linear relationship between continuous predictors and the dependent variable and are not constrained by assumptions of normality.

In this research, logistic regression is used to predict whether a student completed or did not complete a bachelor's degree by 2001 at any institution, six years after first enrolling in their first postsecondary institution. In order to address the research questions, five iterations of regression were planned. First, an initial regression was performed that included all variables specified in the model, with no interactions. Per the first research question, the second regression focused on gender and bachelor's degree completion. As such, this second regression included all variables and interactions for gender by ethnicity/race and gender by socioeconomic status. To further explore statistically significant interactions by gender, a third set of regression analyses was planned for male and female students separately.

Table 4

Missing Data Analysis

Variable	Final Analytic Sample		
	Total	Included	Excluded
Bachelor's Degree Completion	100.0	54.9	45.1
Gender			
Female	100.0	57.6	42.4
Male	100.0	52.0	48.9
Race/ethnicity			
African American	100.0	54.8	45.2
Asian	100.0	62.4	37.6
Latina/o	100.0	56.7	43.3
White	100.0	53.1	46.9
Socioeconomic status			
Not disadvantaged	100.0	50.4	49.6
Minimally disadvantaged	100.0	58.0	42.0
Moderately or highly disadvantaged	100.0	62.3	37.7
High school GPA			
A to A-	100.0	35.3	64.7
A- to B	100.0	35.0	65.0
B to B-	100.0	35.0	65.0
B- to F	100.0	41.7	58.3
SAT score			
N	4800	2720	2080
Mean	0	-0.249	0.299
Standard Dev.	1	1.182	0.599
Academic integration (z score)			
N	4800	2720	2080
Mean	0	-0.079	0.664
Standard Dev.	1	1.232	0.545
Social integration (z score)			
N	4800	2720	2080
Mean	0	-0.076	0.748
Standard Dev.	1	1.234	0.574
Hours worked per week			
0 hours	100.0	42.1	57.9
1 to 19 hours	100.0	29.4	70.6
20 to 25 hours	100.0	34.9	65.1
26 or more hours	100.0	38.8	61.2
Sector			
Public	100.0	55.1	44.9
Private	100.0	52.4	47.6
Selectivity			
Not selective	100.0	58.7	41.3
Selective	100.0	47.6	52.4
Very selective	100.0	49.4	50.6

Note: List-wise deletion was used to remove cases for which any data was missing on any of the variables included in the model. Those cases are considered excluded; all remaining cases were included.

Source: Analysis of Beginning Postsecondary Students, BPS(96/01).

*p<0.05

To address the second research question related to ethnicity/race, the fourth model planned included all variables, as well as interactions for race/ethnicity by gender and socioeconomic status. Finally, the fifth set of logistic regression models was planned to explore any statistically significant interactions by conducting separate models of bachelor's degree completion by ethnicity/race group.

Limitations

One benefit of conducting educational research is the possibility of better understanding successes, challenges, and ultimately increasing equity. In this research, the purpose is to understand how gender, ethnicity/race, and socioeconomic status interact to predict bachelor's degree among matriculated students. That said, research exploring macro-level issues inevitably results in the use of estimations and generalizations, which oftentimes lack precision in conceptualization or operationalization. Delineating the primary limitations in this research exposes shortcomings, but is necessary for interpreting the results of the data analysis.

Secondary data. While the use of secondary data (e.g., BPS: 96/01 and IPEDS surveys) reduces data collection time and associated costs, practical limitations exist. Namely, the data in the BPS were not collected to specifically address the research questions for this study. There are at least three limitations of the available data for this dissertation. First, the outcome variable, bachelor's degree completion within six years, neglects to account for individuals within the dataset who eventually complete bachelor's

79

degrees beyond that given time horizon (see Peter & Forrest Cataldi, 2005). This six-year time period may be especially problematic when calculating completion for certain groups (Adleman, 2000; Pascarella, 1985).

Second, limitations of the BPS pertain to sample size, particularly of ethnic/racial and gender groups. According to some scholars, there is a minimum sample size necessary to construct a stable sample (Peng et al., 2002). Within the dataset used, the number of cases for each of the focal measures in this study (ethnicity/race, gender, and socioeconomic status) varies considerably. Particularly problematic for this study are the relatively small numbers of African American, Asian, and Latina/o students compared to the number of White students. Further, the small number of American Indian/Alaskan Native students included in this and many similar data sets prohibits modeling the behavior or experiences of this group. Lack of information about this group of students may be an important contributor to poor postsecondary enrollment and persistence rates (see Pavel, Skinner, Cahalan, Tippeconnic, & Stein, 1998).

Third, the sampling frame for the BPS relies on nested data, in which students are nested within postsecondary educational institutions. Therefore, there may not be independence of observations, a basic assumption of regression analysis. More concretely, if the data are nested and observations are not independent there may be similar institutional cultures, organizational structures, and student body population characteristics, for example, that exert a force on the sample in terms of completion beyond the incorporation of the control variables previously noted. Statistically, confidence intervals and corresponding p-values would be smaller, thereby making it more difficult to identify significant differences between groups. This issue could be

80

remedied with multi-level modeling (i.e., hierarchical generalized linear modeling).

However, multi-level modeling is not used in this dissertation, given the conceptual focus

on interactions at the student level, rather than institution-level effects.

Conceptual model. This research posits that student background, student

integration, and institutional environmental characteristics affect persistence to bachelor's

degree completion. However, in the BPS dataset, measures of academic and social

integration were only collected during students' first academic year. While these

variables shed light on student behaviors and can be used to understand the role of

individual measures of environment on completion, their operationalization via the

conceptual model may be problematic. As many scholars note, persistence in a bachelor's

degree program should be considered time dependent (e.g., Chen, 2008; DesJardins, et

al., 2003; Murtaugh et al., 1999). In effect, the model employed in this research assumes

that respondents' behaviors in that first year do not change and are representative of

subsequent 'integration,' which may or may not be true. However, including integration

measures beyond the first year would likely result in considerable missing data, as

students who do not persist beyond the first year could be eliminated from the analysis.

Regression analysis. Methodological approach is an important aspect of any

empirical research. While oftentimes there is potential to use relatively more complex

statistical techniques, numerous scholars note that choice of methods should depend

primarily on research questions and data availability. Regression analysis, and

specifically logistic regression analysis, is common in postsecondary research on student

departure (Peng et al., 2002). However, multi-level modeling is also used in research on

bachelor's degree completion as a means for accounting for violations in the assumption

of independence of observations and the nesting of students within institutions (see Raudenbush & Bryk, 2002; Titus, 2004, 2006a). Nonetheless, multi-level modeling is not used in this study, as the research questions focus specifically on understanding the interactions of variables at the student level and the data set holds limited samples by ethnicity/race.

Missing data. A final limitation pertains to missing data within the BPS data set (see Table 4). Missing data often prove problematic when statistical analyses are conducted as they can bias the analytic sample and thereby alter the size and significance of relationships between variables. To date, there is no consensus regarding the use of list-wise deletion or imputation strategies to complete data sets, as each method has advantages and disadvantages (Allison, 2001). In this study, list-wise deletion is used to treat missing data. Since there are significant differences in the initial and final analytic sample, the findings of this research should be received with caution.

Summary

The purpose of this chapter was to review the study design and methodology. A review of the research questions and outline of the statistical analyses was presented. In addition, a description of the variables used to construct the predictive model of bachelor's degree completion was also provided. The next chapter presents the results.

CHAPTER 5: Results

Introduction

The purpose of this dissertation is to understand how gender, ethnicity/race, and socioeconomic status interact to predict bachelor's degree completion using a national sample of students first-entering postsecondary institutions in the fall of 1996 drawn from the Beginning Postsecondary Students (BPS:96/01). The research questions are:

1. How does the relationship between gender and the likelihood of bachelor's degree completion vary by ethnicity/race and socioeconomic status?

2. How does the relationship between ethnicity/race and bachelor's degree completion vary based on gender or socioeconomic status?

This examination of bachelor's degree completion uses Tinto's (1993) theory of student departure, but is theoretically framed by critical race feminist theory. A comprehensive set of logistic regressions was performed to address the research questions and assess variations in the relationship between gender, ethnicity/race, socioeconomic status, and bachelor's degree completion within six years.

Descriptive Analyses

The purpose of this section is to describe observed differences in bachelor's degree completion by gender, ethnicity/race, and socioeconomic status. Crosstabs provide a first step toward understanding the relationship between variables, in this case whether the three focal demographic characteristics are related to whether a student completed a bachelor's degree. Crosstabs were performed between the focal demographic characteristics and the outcome variable, completion of a bachelor's degree within six years of first enrolling in higher education.

Overall, the six-year graduation rate for students included in this sample was 58.9 percent. Table 5 shows variations in six-year graduation rates by gender, with 55.5 percent of males and 61.6 percent of female students earning bachelor's degrees within six years.

Table 5. *Six-Year Completion Rates by Gender*

	Total	Male	Female
Completion rate	58.9	55.5	61.6

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Table 6 shows variations in six-year graduation rates across ethnic/racial groups. Asian and White students were observed to have the highest rates of graduation within six years (70.7 percent and 62.0 percent, respectively). In contrast, Latina/os graduated at a rate of 46.7 percent and African Americans graduated at a rate of 42.4 percent.

Table 6. *Six-Year Completion Rates by Ethnicity/race and Gender*

Ethnic/racial group	Completion	Gender		Total
		Male	Female	
African American	Yes	33.8	47.5	42.4
	No	66.2	52.4	57.6
Asian	Yes	66.2	74.8	70.7
	No	33.7	25.1	29.3
Latina/o	Yes	43.9	48.8	46.7
	No	56.1	51.2	53.2
White	Yes	58.6	64.9	62.0
	No	41.3	35.1	38.0

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Further, bachelor's degree completion rates were considerably higher for Asians and Whites than Latinos and African Americans, even when accounting for gender (also see Table 6). Specifically, 66.2 percent of Asian males and 58.6 percent of White males, compared with 43.9 percent of Latinos and 33.8 percent of African American males, completed bachelor's degrees within six years. Approximately 74.8 percent of Asian

females and 64.9 percent of White females, but only 47.5 percent of African American females and 48.8 percent of Latinas, completed bachelor's degrees within six years.

The descriptive analyses suggest variations in the relationship between gender and bachelor's degree completion based on race/ethnicity, as the magnitude of the gender gap in degree completion rates varies across racial/ethnic groups. The female advantage in six-year graduation rates was larger for African Americans (13.7 percentage points) than for Asians (8.6 percentage points), Latinos (4.9 percentage points), and Whites (6.3 percentage points).

Table 7 shows variations in observed six-year bachelor's degree attainment rates by socioeconomic status. Individuals who were not disadvantaged graduated at a rate of 66.3 percent, substantially higher than the rate for their more disadvantaged peers. Among students considered minimally disadvantaged, 52.0 percent graduated within six years, and among students considered moderately or highly socioeconomically disadvantaged, only 39.3 percent graduated within six years. Table 7 also shows variations in observed six-year bachelor's degree completion rates based on socioeconomic status and gender. Students who are not disadvantaged appear to fare better with regard to completion overall.

Although the completion rate is higher for female students, regardless of socioeconomic status, the data in Table 7 also suggest an interaction between gender and socioeconomic status. The female advantage in six-year bachelor's degree completion rates is higher for students who are moderately or highly disadvantaged (11 percentage points) than for students who are minimally disadvantaged (4 percentage points).

Table 7. *Six-Year Completion Rates by Socioeconomic Status and Gender*

Socioeconomic status	Completion	Gender		Total
		Male	Female	
Not disadvantaged		100.0	100.0	100.0
	Yes	62.3	69.6	66.3
	No	37.7	30.3	33.7
Minimally disadvantaged		100.0	100.0	100.0
	Yes	49.7	53.7	52.0
	No	50.3	46.2	48.0
Moderately or highly disadvantaged		100.0	100.0	100.0
	Yes	32.9	43.9	39.3
	No	67.1	56.1	60.7

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Table 8 shows variations in observed six-year bachelor's degree completion rates for socioeconomic status and ethnicity/race. Among all ethnic/racial groups, students not disadvantaged graduated at higher rates than those that were moderately or highly disadvantaged, except for Asian students. The strength of the observed relationships between socioeconomic status and bachelor's degree completion appears strongest for Whites and weakest for African Americans, as the percentage point difference in six-year graduation rates for students who are not disadvantaged and students who are moderately or highly disadvantaged is 28.5 percentage points for Whites and 2.6 percentage points for African Americans. It is also important to note ethnic/racial differences in the distribution of students across socioeconomic status groups. For reference, only 31.0 and 35.4 percent of the Black and Latina/o students in the analyses were not disadvantaged, compared to 51.1 percent of Asian and 60.1 percent of White students.

Descriptive analyses also suggest that observed bachelor's degree completion rates vary based on gender, race/ethnicity, and socioeconomic status. Regardless of ethnicity/race or socioeconomic status, bachelor's degree completion rates are higher for women than for men. Table 9 shows six-year completion rates for students classified as 'not disadvantaged' by gender and ethnicity/race. For each group, graduation rates are

higher for women than men. Among these relatively more privileged students, there are large gaps in completion across and within groups. The largest within ethnicity/race group disparity in completion is for African American male (67.6 percent) and female students (78.4 percent). The smallest within ethnicity/race group disparity is for White students, where the difference is only 7.3 percentage points, compared to 11.3 percentage points for African Americans.

Table 8. *Six-Year Completion Rates by Ethnicity/race and Socioeconomic Status*

Ethnic/racial group	Completion	Not disadvantaged	Minimally disadvantaged	Moderately or highly disadvantaged
African American		100.0	100.0	100.0
	Yes	47.8	42.6	45.2
	No	52.1	57.4	54.8
Asian		100.0	100.0	100.0
	Yes	73.5	75	55.2
	No	26.5	25	44.8
Latina/o		100.0	100.0	100.0
	Yes	55.4	45.4	37.4
	No	44.6	54.6	62.6
White		100.0	100.0	100.0
	Yes	68.2	53	39.7
	No	31.8	47	60.3
Total	Yes	61.2	54	44.4
	No	38.8	46	55.6

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Descriptive analyses also indicate that the relationship between gender and ethnicity/race and completion rates varies based on socioeconomic status. Table 9 shows that, for students who were not disadvantaged in terms of socioeconomic status, the female advantage in six-year bachelor's degree completion rates did not vary substantially by ethnicity/race. The gender gap in six-year bachelor's degree completion rates was only slightly smaller for Whites (7.3 percentage points) than for Latinos (9.8

percentage points), Asians (10.8 percentage points), and African Americans (11.3

percentage points).

Table 9. *Six-Year Completion Rates for Students 'Not Disadvantaged,' Gender by Ethnicity/Race*

Gender		Ethnicity/race				
	Completion	Total	Asian	Black	Latina/o	White
Women		100.0	100.0	100.0	100.0	100.0
	Yes	69.7	78.4	52.1	59.8	71.6
	No	30.3	21.6	47.9	40.2	28.4
Men		100.0	100.0	100.0	100.0	100.0
	Yes	62.3	67.6	40.8	50.0	64.3
	No	37.7	32.4	59.2	50.0	35.7

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Table 10 shows a different pattern in the relationship between gender and

ethnicity/race and six-year completion rates for students classified as 'minimally

disadvantaged.' For these students, the female advantage in six-year completion rates was

considerably larger for African Americans (14.2 percentage points) than for Asians (7.7

percentage points), Whites (4.3 percentage points), and Latinos. For Latinos who were

minimally disadvantaged, six-year bachelor's degree completion rates were comparable

for females (45.3 percent) and males (46.4 percent).

Table 10. *Six-Year Completion Rate for Students 'Minimally Disadvantaged,' Gender by Ethnicity/Race*

Gender		Ethnicity/race				
	Completion	Total	Asian	Black	Latina/o	White
Women		100.0	100.0	100.0	100.0	100.0
	Yes	53.9	79.1	48.0	45.3	54.9
	No	46.1	20.9	52.0	54.7	45.1
Men		100.0	100.0	100.0	100.0	100.0
	Yes	49.8	71.4	33.8	46.4	50.6
	No	50.	28.6	66.2	53.6	49.4

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Table 11 also shows a larger gender gap in six-year completion rates for African

American students than for other ethnic/race groups among those who were 'moderately

or highly disadvantaged'. Graduation rates were higher for women than men regardless of ethnicity/race. But, among these moderately or highly disadvantaged students, the largest within ethnic/race group gender disparity in completion is for African Americans (16.5 percentage points). Similar to the minimally disadvantaged students, the smallest within ethnicity/race group gender disparity was for Latina/o students, where the difference is only 8.4 percentage points (40.7 percent for Latinas and 32.3 percent for Latinos).

Table 11. *Six-Year Completion Rate for Students 'Moderately or Highly Disadvantaged,' Gender by Ethnicity/Race*

Gender		Ethnicity/race				
	Completion	Total	Asian	Black	Latina/o	White
Women		100.0	100.0	100.0	100.0	100.0
	Yes	43.9	59.4	40.5	40.7	44.5
	No	56.1	40.6	59.5	59.3	55.5
Men		100.0	100.0	100.0	100.0	100.0
	Yes	33.1	50.0	24.0	32.3	33.7
	No	66.9	50.0	76.0	67.7	66.3

Source: Analyses of Beginning Postsecondary Students, BPS(96/01).

Logistic Regression

Logistic regression analyses were used to identify differences in likelihood of bachelor's degree completion within six years, with specific attention to the relationship between gender, ethnicity/race, and socioeconomic status, after controlling for other variables. Multiple sets of regressions were performed to examine the relationship between these variables and bachelor's degree completion as specified by the research design. Each set of logistic regression models is described separately.

All variables, no interactions. The first logistic regression model included all variables in the model based on Tinto's (1993) theory of student departure and as noted in Chapter 4, but no interaction terms. Table 12 presents the results of this analysis. In

this initial model, gender and socioeconomic status were significant predictors of bachelor's degree attainment. Table 12 shows that the likelihood of completing a bachelor's degree in six years was significantly higher for women than for men (odds-ratio = 1.213, p<0.05); but significantly lower for students from moderate to highly disadvantaged compared to students who were not disadvantaged (odds ratio = 0.641, p<0.05), after controlling for other variables.

Table 12 also shows that likelihood of completion was significantly lower for students who had grades between A- to B (odds ratio = 0.604, p<0.05), B- to B (odds ratio = 0.363, p<0.05), and B- to F (odds ratio = 0.262, p<0.05) compared to students with grades ranging from A to A-.

In addition, students with higher SAT scores were significantly more likely to graduate within six years (odds ratio = 1.310, p<0.05), as were individuals who were more socially integrated (odds ratio = 1.299, p<0.05), net of other variables. Compared to individuals who worked zero hours a week during their last term enrolled (or in 2001), students who worked between 1 and 14 hrs (odds ratio = 1.775, p<0.05) and 15-25 hours per week (odds ratio = 1.819, p<0.05) were significantly more likely to graduate with a bachelor's degree; students who worked 26 or more hours per week were significantly less likely to complete bachelor's degrees within six years (odds ratio = 0.343, p<0.05). Bachelor's degree completion rates were also higher for students who attended public rather than private institutions (odds-ratio = 1.644, p<0.05) and very selective rather than the least selective institutions (odds-ratio = 1.510, p<0.05).

All variables, interactions for gender by ethnicity/race and gender by SES. The second logistic regression model included all independent and control variables as

well as all interactions for gender and ethnicity/race and SES. Specifically, this resulted in five interaction terms: gender by Black, gender by Asian, gender by Latina/o, gender by minimally disadvantaged, and gender by moderately to highly disadvantaged. None of the interactions with gender was statistically significant.

All variables, separate models by gender. Separate logistic regression analyses for women and men were planned to facilitate the interpretation of gender interactions. However, none of the interactions by gender were statistically significant. As such, separate models for women and men were not tested.

All variables, interactions for ethnicity/race by gender and SES. The fourth set of logistic regression analyses run were considered to focus on ethnicity/race in predicting bachelor's degree completion. Nine interaction terms were included in this model: Black by gender, Black by minimally disadvantaged, Black by moderately or highly disadvantaged, Asian by gender, Asian by minimally disadvantaged, Asian by moderately or highly disadvantaged, and Latina/o by gender, Latina/o by minimally disadvantaged, and Latina/o by moderately or highly disadvantaged. Of the three focal demographic characteristics, only moderately to highly disadvantaged was a significant predictor of bachelor's degree completion (odds ratio = 0.537, $p<0.05$). In addition, none of the nine interactions was statistically significant.

All variables, separate models by ethnicity/race. The final set of planned logistic regression models was separate models by ethnic/racial group. However, as none of the interactions by ethnicity/race were statistically significant no separate models by race/ethnicity were conducted.

Table 12. *Full Logistic Regression Model, No Interactions*

Variable name	B	S.E.	Sig.	Odds Ratio
Female	0.193	0.091	0.034	1.213
Male (reference category)				
Black	-0.271	0.149	0.069	0.763
Asian	-0.044	0.199	0.823	0.957
Latina/o	-0.235	0.159	0.14	0.79
White (reference category)				
Minimally disadvantaged	-0.035	0.101	0.733	0.966
Moderately to highly disadvantaged	-0.445	0.154	0.004	0.641
Not disadvantaged (reference category)				
B- to F	-1.341	0.174	0.000	0.262
B to B-	-1.015	0.136	0.000	0.363
A- to B	-0.505	0.109	0.000	0.604
A to A- (reference category)				
SAT score	0.27	0.099	0.006	1.31
Academic integration	-0.007	0.078	0.932	0.993
Social integration	0.261	0.078	0.001	1.299
1-14 hrs per wk	0.574	0.152	0.000	1.775
14-25 hrs per wk	0.598	0.188	0.001	1.819
26 or more hrs per wk	-1.07	0.123	0.000	0.343
0 hrs per wk (reference category)				
Private	0.497	0.098	0.000	1.644
Public (reference category)				
Selective	0.22	0.117	0.060	1.246
Very selective	0.412	0.124	0.001	1.510
Least selective (reference category)				
Constant	1.091	0.156	0.000	2.977

Note: 1. The reference group for ethnicity/race is White, for socioeconomic disadvantage is not disadvantaged, high

school GPA is A to A-, for hours working per week during the last semester enrolled or in 2001 is zero, and for

selectivity, least selective is the reference group. The reference group for selectivity is least selective.

Source: Beginning Postsecondary Students, BPS(96/01). 2. In this model, 90.5 percent of the 2,720 cases were

correctly classified and the Cox & Snell R^2 was equal to 20.9 and the Nagelkerke R^2 was equal to 29.6.

$p < 0.05$

Summary

This chapter presented descriptive and logistic regression analyses used to answer

the two research questions and examine the relationship between the three focal

demographic student-level characteristics. Descriptive statistics confirm that there are

differences in the relationship between gender and ethnicity/race and gender and

socioeconomic status with respect to bachelor's degree completion. After controlling for

other variables in the logistic regression analyses, gender and socioeconomic status were

significant predictors of bachelor's degree completion. Interactions between the three

focal variables were not significant in any of the logistic regression models. A summary

and discussion of the findings are presented in the next chapter. The final chapter also

includes implications of this research for research, policy, practice, and ends with a brief

conclusion.

CHAPTER 6: Discussion & Implications

Introduction

This chapter reviews the findings and discusses them in the context of research on bachelor's degree completion. Specific attention is given toward implications for practice and policy, as higher education research that focuses on student success is intrinsically practical. Finally, a brief concluding note is offered.

Summary of Findings

At least four conclusions may be drawn from these analyses. First, the descriptive findings are consistent with past research showing that bachelor's degree completion rates are higher for women than for men (e.g., Buchmann & DiPrete, 2006; Jacobs, 1999; Wohlegmuth et al., 2007), Asian compared to White, Latina/o, and African American students (e.g., Astin et al., 1996; Oseguera, 2005), and students with higher socioeconomic status compared to those of lower socioeconomic status (Baum & Ma, 2007; Walpole, 2003, 2008). In addition, the findings of the logistic regression analysis show that gender and socioeconomic status are statistically significant predictors of bachelor's degree completion even after controlling for measures of pre-college achievement (i.e., high school GPA and SAT scores), academic and social integration, number of hours worked per week, institutional sector and selectivity. The findings from the logistic regression models; however, do not reveal a significant difference by ethnicity/race.

Second, the results of this research suggest that observed interactions among gender, ethnicity/race, socioeconomic status, and bachelor's degree completion may be explained by other predictors of persistence. This research focused on aligning the

conceptual and statistical interaction of student-level demographic characteristics using a critical race feminist perspective and Tinto's (1993) conceptual model of student departure. Such framing was anticipated to reveal differences in likelihood of completion both across and within demographic groups. However, despite the observed differences and the conceptual framework, the relationship between particular demographic characteristics and bachelor's degree completion did not depend on the other demographic variables in the logistic regression analyses in this study.

The lack of statistical significance for the interactions among gender, ethnicity/race, and socioeconomic status may be attributable to the BPS data set and final analytic sample. Missing data may have influenced the findings. Low numbers of students in particular gender, ethnicity/race, and socioeconomic status subgroups may have also reduced the statistical power to detect interactions. For example, among African Americans, there were large observed disparities in gender but no statistically significant interactions were detected. However, the unweighted number of African Americans included in the sample was 560, of which 44.1 percent were male. Given this limitation with the data set, the results of the descriptive analyses, and the underlying conceptual framework, sustained attention toward gender, ethnicity/race, and socioeconomic status remains relevant.

Third, like prior research, the results document the positive relationship between academic achievement and likelihood of completion. In this dissertation, high school GPA and SAT score are positively related to the likelihood of bachelor's degree completion after controlling for other variables. However, these findings should be taken with caution, as past research that shows that academic achievement alone does not

95

prevent students from withdrawing from degree programs. For example, Baum and Ma's (2007) work shows that even after controlling for academic achievement, differences in completion persist based on other demographic characteristics, like social class.

Hours worked during the last year enrolled also significantly predicted completion. In general, there were significant differences between likelihood of completion among individuals who did not work and those who worked between 1 and 14, 15-25, and 26 or hours per week. Consistent with prior research suggesting that working between 1 and 20 hours per week may be positively related to the likelihood of persistence and completion (e.g., Pascarella & Terenzini, 2005; Perna, 2010), the results of this research show that a greater likelihood of degree completion for students who work between 1 and 25 hours per week than for students who do not work. Moreover, also like other research, working more than 25 hours per week is associated with lower likelihood of bachelor's degree completion than not working. Prior research suggesting that students' social integration is a key element to completion was also confirmed by the findings in this dissertation (Braxton et al., 2007; Kuh et al., 2008; Tinto, 1993). The findings also confirmed that institution-level characteristics, like sector and selectivity, should continue to be included in models of bachelor's degree completion along with measures of student characteristics.

Finally, this research suggests that continued attention to Tinto's (1993) Theory of Student Departure is warranted. While modifications by John Braxton and other higher education scholars (e.g., Braxton et al., 1997; Braxton et al., 2007) have provided important insight to this theory, continued gaps in bachelor's degree attainment across groups suggest that more conceptual and methodological work is required. The critical

race feminist theoretical approach in conjunction with Tinto's (1993) theory may be particularly useful with regard to acknowledging the possibility of marginalization for all students, and working to understand students at the intersections of gender, ethnicity/race, and socioeconomic status specifically.

Implications for Practice

While this research supports the consideration of gender, ethnicity/race, and socioeconomic status to examine the predictors of bachelor's degree completion, the findings also have implications for retention programming (Blake, 2007; Braxton & McClendon, 2001; Tinto, 2006). Among the seven guidelines suggested for shaping practice, Braxton and colleagues (2007) note that: "practicing institutional integrity by assuring the congruence of institutional actions with the goals and values espoused by the institution" (p. 11) is necessary. As few institutions would suggest their mission is to inhibit student completion of their bachelor's degree programs, it behooves postsecondary stakeholders (e.g., faculty and staff) to make concerted efforts at better understanding how demography (among other things) plays a role in matriculated students' attainment.

In terms of retention programming, this may mean educating staff on differences both within and between gender, ethnic/racial and socioeconomic status groups (Blake, 2007; Kuh et al., 2005). Given the results of the descriptive analyses from this study, such education may encourage the development of more nuanced retention strategies that incorporate attention to multiple demographic characteristics, particularly gender, ethnicity/race, and socioeconomic status. If attention is not provided to the nuance in demographic differences between bachelor's degree completion and attrition,

postsecondary stakeholders may inadvertently perpetuate the unequal distribution of benefits that are conferred in a lifetime. Though statistical interactions among gender, ethnicity/race, and socioeconomic status were not found in this study, descriptive data in this and other studies suggest relationships among these characteristics (i.e., Nettles & Perna, 1997; NCHEMS, 2009; Thompson et al., 2006).

While ethnicity/race remains an important predictor in models of completion, other demographic characteristics are also relevant. As Lundberg and colleagues (2007) remind retention specialists, some demographic characteristics may be correlated, but, for example, "institutions cannot assume that addressing the needs of first-generation students will concomitantly address the needs of students of color" (p. 76). Along those lines, more attention by way of retention should be provided for students from lower socioeconomic strata. At present, few organizations and programs identify at-risk students based on socioeconomic status and continuously support their persistence to completion beyond admissions. The findings from this research suggest that the virtual omission of social class in postsecondary education retention efforts may in fact serve to inhibit decreases in completion gaps.

Implications for Research

As Adelman (2006) noted, research on bachelor's degree completion remains scant. The research presented in this dissertation confirms that more should be done to understand likelihood of bachelor's degree completion since attrition remains likely for the average student. While additional quantitative research is necessary to improve predictive models of completion, an equally important aspect of this research pertains to

theory development. A discussion of the implications of this research in terms of theory development and quantitative analysis is noted below.

Theory development. The findings of this research suggest that consideration of interactions in postsecondary educational research, and specifically prediction of bachelor's degree completion, should continue to be explored. Classic as well as more contemporary sociological theory development shows that approaches like critical race feminist theory, highlighted in this dissertation, may prove useful in terms of better understanding marginalization. However, per Creswell (2003), additional theoretical and qualitative research is needed to continue refining the conceptualization of disparities in bachelor's degree completion.

John Braxton has shown in multiple scholarly contributions (e.g., Braxton, Brier, & Steele, 2007; Braxton, Hirschy, & McClendon, 2004) that consideration of integration and use of Tinto's (1993) conceptual model of student departure must be extended to improve retention. While refined measurement of academic and social integration is important, translating support of integration by faculty members for students is crucial (Blake, 2007; Pike et al., 2003). For example, scholars who study diversity, critical race theory, and postsecondary success directly and indirectly show how the campus culture and environment can inhibit attainment. Further, the problems with persistence and attrition by students deemed academically capable suggest that more work is needed to theorize postsecondary success and completion (Massey & Fischer, 2005; Spencer, Steele, & Quinn, 1999).

Quantitative research. To address the limitations of this research, additional quantitative research in the field of higher education is needed. First, this study should be

replicated with other data sets, specifically institutional data. In fact, institutional data is the most appropriate type of data for an institution seeking to identify retention solutions for marginalized students. While retention policies may be developed based on trends for national data, institutional data is the appropriate level for which to implement effective context-specific solutions.

Second, models of bachelor's degree completion should continue to include student and institutional characteristics, as well as interactions where appropriate. Building upon this and Chen's (2008) work specifically, others might consider the interaction of working, financial aid, and demography in modeling bachelor's degree completion. Although political pressures to improve bachelor's degree completion rates are well intentioned, more research should be conducted to identify and account for these seemingly relevant contextual factors. In a similar vein, scholars must expand the body of research on minority-serving institutions, and both minority and majority students on campus (see Kim, 2001; Kim & Conrad, 2006). For example, relatively little is known about the institutional context of historically Black colleges and universities (HBCUs) and how they 'confer' success to African American students, and yet, HBCU proponents often declare their success with African American students based on older data, theoretically anemic approaches, and poorly defined measures of institutional context. Similar issues pertain our understanding of the benefits Latina/o students receive at Hispanic-serving institutions, or Native students at Tribal Colleges and Universities, and women at single-sex institutions. More focused research in these areas may inform modeling and policy-making at traditionally White, and/or co-educational postsecondary institutions.

Along related lines, there is considerable room for improvement in retention-related research. In particular, stakeholders might use institutional research to (1) better understand factors affecting retention at individual institutions, (2) seek improvements in the calculation of graduation rates (see Astin, 1997), and (3) participate in value-added research to better identify and characterize success. Furthermore, it is likely that use of institutional data, as opposed to nationally representative data (i.e., like the BPS) will prove more useful for institutions attempting to identify and address the needs of marginalized or at risk students at the intersections of gender, ethnicity/race, and socioeconomic status. Better use of institutional data will help individual institutions with their own undergraduates. Such research may also prove helpful for peer institutions seeking alternative perspectives as well.

Additional research on the role of socioeconomic status and bachelor's degree completion is needed. Scholars have noted the large influx of undergraduates from lower socioeconomic strata to bachelor's degree programs (Baum & Ma, 2007), and yet, while some colleges and universities have attempted to address financial barriers (e.g., Perna, Lundy-Wagner, Yee, Brill & Tedal, in press), scholars have yet to fully characterize the economic aspect of persistence to attainment. Work like Titus' (2006a) should continue to specifically examine students from one socioeconomic stratum to better understand the gaps in both persistence and completion by socioeconomic status. In fact, the descriptive tables (i.e., Table 9, Table 10, and Table 11) reveal a large influence of socioeconomic status on six-year graduation rates in this research.

Along similar lines, the analyses presented in this dissertation also implicitly support past research – theoretical and empirical – on the relationship between student

socioeconomic status, working, and bachelor's degree completion. Although the model

presented does not include a measure of financial aid, the consensus among higher

education stakeholders is that financial aid continues to be an important factor in

providing access to college for many lower income and financially needy students (Chen,

2008; Terenzini, Bernal, & Cabrera, 2001). More research is needed to identify the

differential effects of scholarship, grant, and various types of loan aid on completion.

Continued attention should also be paid toward aligning the needs, goals, and efforts at

accountability of higher education and financial aid policy at the national, regional, and

institution level (National Center on Public Policy, 2009). While programs like the

highly-recognized Georgia Hope Scholarship *on average* provide students with a unique

opportunity to obtain a local education at low cost (Dee & Jackson, 1999; Dynarski,

2000), the inability by politicians and other policy-makers to effectively address issues

related to need- and merit-based aid for low- and lower-income students remains

problematic (Baum, 2007; Gladieux & Perna, 2005; Perna et al., in press). The persistent

significance of socioeconomic status in this study suggests that working and financial aid,

among other economically related factors should continue to be explored in

understanding and improving degree attainment.

Finally, while descriptive statistics provide information on basic relationships

between institutional characteristics and bachelor's degree completion, more work is

needed. Selectivity and sector consistently have a significant effect on completion, yet

other characteristics may shed additional light onto disparities. For example, additional

attention to bachelor's degree completion gaps across gender, ethnicity/race, and

socioeconomic status at institutions with large and/or successful athletics programs (e.g.,

Tucker, 2004), or sponsored research programs (e.g., Kim et al., 2003) might be considered more fully. This would not only improve transparency in funding allocation, but may also inform how such allocations affect student success and completion.

Conclusion

Although access to a bachelor's degree has expanded over the past fifty years, the bachelor's degree remains an elusive goal for many students who matriculate to four-year colleges and universities. While disparities in bachelor's degree completion are persistent across gender, ethnicity/race, and socioeconomic status, this research provides a logical rationale for considering different theoretical approaches and incorporating statistical interactions to improve predictive models. As such, it follows that models of completion may inform subsequent research on attainment and even modifications in retention policy and practice. All admitted four-year postsecondary students deserve support from their institution to successfully complete bachelor's degree programs. By developing more nuanced and critical models of bachelor's degree completion, the benefits of such a degree will be afforded to more students, institutions, and communities.

BIBLIOGRAPHY

Acker, J. (2006). Inequality regimes: Gender, class, and race in organizations. *Gender & Society, 20*(4), 441-464.

Adleman, C. (1999). *Answers in the Toolbox: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Adleman, C. (2006). *The Tool box Revisited: Paths to degree completion from high school through college*. U.S. Department of Education, Washington, DC.

Alexander, F.K. (2000). The changing face of accountability: Monitoring and assessing institutional performance in higher education. *Journal of Higher Education, 71*(4), 411-431.

Alexander, K.L., Riordan, C., Fennessey, J., & Pallas, A.M. (1982). Social background, academic resources, and college graduation: Recent evidence from the National Longitudinal Survey. *American Journal of Education, 90*(4), 315-333.

Allison, P. D. (2001) *Missing Data*. Newbury Park, CA: Sage.

Alon, S. (2007). The influence of financial aid in leveling group differences in graduating from elite institutions. *Economics of Education Review, 26*, 296-311.

Alon, S., & Tienda, M. (2005). Assessing the ''Mismatch" hypothesis: Differentials in college graduation rates by institutional selectivity. *Sociology of Education, 78*(4), 294–315.

Arcidiacono, P. (2004). Ability sorting and the returns to college major. *Journal of Econometrics, 121*, 343-375.

Asher, N. (2007). Made in the (Multicultural) U.S.A.: Unpacking tensions of race, culture, gender, and sexuality in education. *Educational Researcher, 36*, 65-73.

Astin, A.W. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.

Astin, A.W. (1997). How "good" is your institution's retention rate? *Research in Higher Education, 38*(6), 647-658.

Astin, A.W., & Oseguera, L. (2005). Pre-college and institutional influences on degree attainment. In A. Siedman (Ed.), *College student retention: Formula for student success* (pp. 245-276). Westport, CT: ACE/Praeger Publishers.

Astin, A.W., Tsui, L., & Avalos, J. (1996). *Degree attainment rates at American colleges and universities: Effects of race, gender, and institutional type*. Los Angeles, CA: Higher Education Research Institute, UCLA.

Baez, B. (2007). Thinking critically about critical: Quantitative research as social critique. In (Ed.) Stage F.K. Using quantitative data to answer critical questions. *New Directions for Institutional Research, 133*, 17-23.

Barajas, H.L. & Pierce, J.L. (2001). The significance of race and gender in school success among Latinas and Latinos in college. *Gender & Society, 15*(6), 859-878.

Baum, S. (2001). *Higher Education: Dollars and Sense*. College Board: New York, NY.

Baum, S. (2007). Hard heads and soft hearts: Balancing equity and efficiency in institutional student aid policy. *New Directions for Higher Education,* 40, 75-85.

Baum, S., & Ma, J. (2007). *Education pays: The benefits of higher education for individuals and society*. New York, NY: College Board.

Bean, J.P. (1990). Why students leave: Insights from research. In D. Hossler and JP Bean (Eds.), The strategic management of college enrollments (pp. 147-169). San Francisco: Jossey-Bass.

Becker, G.S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy, 70*(S5), 9-49.

Berger, J.B., & Milem, J.F. (2000). Organizational behavior in higher education and student outcomes. In J.C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 15, pp. 268-338). New York, NY: Agathon Press.

Bischoping, K. & Bell, S. (1998). Gender and contradictory definitions of university accessibility. *Review of Higher Education, 21*(2).

Blake, J.H. (2007). The crucial role of student affairs professionals in the learning process. *New Directions for Student Services,* 117, 65-72.

Bowen, W.G., & Bok, D.C. (1998*). The shape of the river: Long-term consequences of considering race in college and university admissions*. Princeton, NJ: Princeton University Press.

Braxton, J.M., Brier, E.M., and Steele, S.L. (2007). Shaping retention from research to practice. *Journal of College Student Retention, 9*(3), 377-399.

Braxton, J.M., Hirschy, A.S., & McClendon, S.A. (2004). *Understanding and Reducing College Student Departure*. ASHE-ERIC Higher 2004.

Braxton, J.M. & McClendon, S.A. (2001). The fostering of social integration and retention through institutional practice. *Journal of College Student Retention: Research, Theory, and Practice, 3*(1), 57-71.

Braxton, J.M., Sullivan, S., & Johnson, R.M. (1997). *Appraising Tinto's Theory of College Student Departure*. New York, NY: Agathon Press.

Brown & Misra (2003). The intersection of gender and race in the labor market. *Annual Review of Sociology, 29*(1), 487-513.

Brunn, R. (2009). *Intersectionality at work: Race, class, and gender gaps in post-secondary achievement and attainment*. Unpublished doctoral dissertation, University of Pennsylvania, Philadelphia.

Buchmann, C. & DiPrete, T.A. (2006). The growing female advantage in college completion: The role of family background and academic achievement. *American Sociological Review, 71*(4), 515-541.

Cabrera, A.F. (1994). Logistic regression analysis in higher education: An applied perspective. In J.C. Smart (Ed.), *Higher Education: Handbook of Theory and Practice,* Volume 10 (pp. 225-256). New York, NY: Agathon Press.

Cabrera, A.F., Casteneda, M.B., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *Journal of Higher Education, 63*(2), 143-164.

Cabrera, A.F., Nora, A., & Castenada, M.B. (1992). The role of finances in the persistence process: A structural model. *Research in Higher Education, 33*(5), 571-593.

Chavous, T.M., Harris, A., Rivas, D., Helaire, L., & Green, L. (2004). Racial stereotypes and gender in context: African Americans at Predominately Black and Predominately White colleges. *Sex Roles, 51*(1/2), 1-16.

Chen, R. (2008). Financial aid and student dropout in higher education: A heterogeneous research approach. *Higher Education: Handbook of Theory and Research, 23*, 209-239.

Chen, R. & DesJardins, S.L. (2008). Exploring the effects of financial aid on the gap in student dropout risks by income level. *Research in Higher Education, 49*(1), 1-18.

Choy, S.P. (2001). Students whose parents did not go to college: Postsecondary access, persistence, and attainment. *The Condition of Education.* Washington, DC: National Center for Education Statistics.

Constantine, M.G. (2002). The intersection of race, ethnicity, gender, and social class in counseling: Examining selves in cultural contexts. *Journal of Multicultural Counseling and Development, 30*(4), 210-215.

DesJardins, S.L., Ahlburg, D.A., McCall, B.P. (2006). The effects of interrupted enrollment on graduation from college: Racial, income and ability differences. *Economics of Education Review,25*(6), 575-590.

DesJardins, S.L., Kim, D., & Rzonca, C.S. (2003). A nested analysis of factors affecting bachelor's degree completion. *Journal of College Student Retention, 4*(4), 407-435.

Dill, D.D. & Soo, M. (2005). Academic quality, league tables, and public policy: A cross-national analysis of university ranking systems. *Higher Education, 49*(4), 495-533.

Dolence, M.G. (1998). Strategic enrollment management. In C. Swann & S.E. Henderson (Ed.), *Handbook for the College Admissions Profession* (pp. 71-92). Westport, CT: Greenwood Press.

Dowd, A. C. (2004). Income and financial aid effects on persistence and degree attainment in public colleges. *Education Policy Analysis Archives, 12*(21).

Dynarski, S. (2000). *Hope for whom? Financial aid for the middle class and its impact on college attendance*. National Bureau of Economic Research, Working Paper No. W7756.

Epps, E.G. (1995). Race, class, and educational opportunity: Trends in the sociology of education. *Sociological Forces, 10*(4), 593-608.

Fenske, R.H., Porter, J.D., & DuBrock, C.P. (2000). Tracking financial aid and persistence of women, minority, and needy students in science, engineering, and mathematics. *Research in Higher Education, 41*(1), 67-94.

Fischer, M.J. (2007). Settling into campus life: Differences by race/ethnicity in college involvement and outcomes. *Journal of Higher Education, 78*(2), 125-161.

Fleming, J. (1984). *Blacks in college: A comparative study of students' success in Black and White institutions*. San Francisco, CA: Jossey-Bass.

Fry, R. (2004). *Latino youth finishing college: The role of selective pathways*. Pew Hispanic Center: Washington, DC.

Furr, S.R. & Elling, T.W. (2000). The influence of work on college student development. *NASPA Journal, 37*(2), 454-470.

Gladieux, L. & Perna, L. (2005). *Borrowers who drop out: A neglected aspect of the college student loan trend* (05-2). National Center for Public Policy and Higher Education: San Jose, CA.

Goldin, C., Katz, L.F., & Kuziemko, I. (2006). The homecoming of American college women: The reversal of the college gender gap. *Journal of Economic Perspectives, 20*(4), 133-156.

Goldrick-Rab, S. (2006). Following their every move: An investigation of social-class differences in college pathways. *Sociology of Education, 79*(1), 61-79.

Gose, B. (2005, February 25). The chorus grows louder for class-based affirmative action. *Chronicle of Higher Education, 51*(25), B5-B6.

Grant, C.A. & Sleeter, C.E. (1986). Race, class, and gender in education research: An argument for integrative analysis. *Review of Educational Research, 56*(2), 195-211.

Gurin, P., Dey, E.L., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review, 72*(3), 330-367.

Hahs-Vaughn (2004). The impact of parents' education level on college students: An analysis using the BPS longitudinal study 1990-92/94. *Journal of College Student Development, 45*(5), 483-500.

Harris, D. (2003). Teaching yourself social theory: Theory, culture & society. *Newbury Park: Sage Publications.*

Hill Collins, P. (2000). *Black feminist thought: Knowledge, consciousness, and the politics of empowerment* (2nd Ed.). New York, NY: Routledge.

Hoffman, J.L., & Lowitzki, K.E. (2005). Predicting college success with high school grades and test scores: Limitations for minority students. *Review of Higher Education, 28*(4), 455-474.

Horn, L., & Berger, R. (2004). *College persistence on the rise? Changes in 5-year degree completion and postsecondary persistence between 1994 and 2000* (NCES 2004-156). National Center for Education Statistics. Washington, DC: U.S. Department of Education.

Horn & Carroll (2007). *Putting college graduation rates into context: How 4-year college graduation rates vary with selectivity and size of low-income enrollment*. National Center for Education Statistics. Washington, DC: U.S. Department of Education.

Hudson, L. (2003). Racial/ethnic differences in the path to a postsecondary credential. *Education Statistics Quarterly, 5*(2). Retrieved May 2, 2008, from http://nces.ed.gov/programs/quarterly/Vol_5/5_2/q4_2.asp.

Hurtado, A. (1996). *The color of privilege: Three blasphemes on race and feminism.* Ann Arbor, MI: University of Michigan Press.

Ishitani, T.T. (2006). Studying attrition and degree completion behavior among first-generation college students in the United States. *Journal of Higher Education, 77*(5), 861-884.

Jaccard, J.J. (2001). Interaction effects in logistic regression. (Quantitative Applications in the Social Sciences). *Newbury Park: Sage Publications*.

Jaccard, J.J. (2003). Interaction effect in multiple regression. (Quantitative Applications in the Social Sciences). *Newbury Park: Sage Publications*.

Jacobs, J.A. (1996). Gender inequality and higher education. *Annual Review of Sociology, 22*, 153-185.

Jacobs, J.A. (1999). Gender and the stratification of colleges. *Journal of Higher Education, 70*(2), 161-187.

Kane, T.J. (1994). *Race, college attendance and college completion*. Brookings Institute: Washington, DC.

Kao, G. & Thompson, J.S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology, 29*, 417-442.

Keenan, M. (January 25, 2008). Harvard, Yale quizzed about endowment spending, costs. Bloomberg.com. Retrieved October 2, 2008: http://www.bloomberg.com/apps/news?pid=20601103&sid=aawgVPPUwbNs&refer=us.

Kim, D. (2007). The effect of loans on students' degree attainment: Differences by student and institutional characteristics. *Harvard Educational Review, 77*(1), 64-100.

Kim, M.M. (2001). Institutional effectiveness of women-only colleges. *Journal of Higher Education, 72*(3), 287-321.

Kim, M.M., & Conrad, C.F. (2006). The impact of historically Black colleges and universities on the academic success of African-American students. *Research in Higher Education, 47*(4), 399-427.

Kim, M.M., Rhoades, G., & Woodard, D.B. (2003). Sponsored research versus graduating students? Intervening variables and unanticipated findings in public research universities. *Research in Higher Education, 44*, 51-81.

King, T. & Bannon, E. (2002). *At What Cost? The price that working students pay for a college education*. United States Public Interest Research Group: Washington, DC.

King, J.E. (1999). *Money Matters: The impact of race/ethnicity and gender on how students pay for college*. American Council on Education: Washington, DC.

Kinnick, M.K. & Kempner, K. (1988). Beyond "front door" access: Attaining the bachelor's degree. *Research in Higher Education, 29*(4), 299-318.

Kodrzycki, Y.K. (2004). College completion gaps between Blacks and Whites: What accounts for regional differences? *New England Economic Review, 37-62.*

Kojaku, L.K. & Nunez, A. (1999). *Descriptive summary of 1995-96 Beginning Postsecondary Students, with profiles of students entering 2- and 4-year institutions*. National Postsecondary Aid Study: 1995-96. Statistical Analysis Report. National Center for Education Statistics: Washington, DC.

Kreysa, (2007). The impact of remediation on persistence of under-prepared college students. *Journal of College Student Development, 8*(2), 251-270.

Kuh, G.D., Cruce, T.M., Shoup, R., Kinzie, J., & Gonyea, R.M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *Journal of Higher Education, 79*(5), 540-563.

Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J., & Associates (2005). *Student success in college: Creating conditions that matter*. San Francisco, CA: Jossey-Bass.

Ladson-Billings, G. & Tate, W.F. (1995). Toward a critical theory of education. *Teacher's College Record, 97*, 47-68.

Landry, B. (2007). *Race, Gender, and Class: Theory and Methods of Analysis*. Upper Saddle River, NJ: Prentice Hall.

Lareau, A. (2003). *Unequal childhoods: Class, race, and family life*. Berkeley, CA: Regents of the University of California.

Lee, S.J. & Kumashiro, K.K. (2005). *A Report on the Status of Asian Americans and Pacific Islanders in Education: Beyond the "Model Minority" Stereotype*. Washington, DC: National Education Association.

Lemert, C. (2004). *Social theory: The multicultural and classic readings* (3rd Ed). Boulder, CO: Westview Press.

Leppel, K. (2002). Similarities and differences in the college persistence of men and women. *Review of Higher Education*, 25(4), 433-450.

List, J.H. & Wolf, L.M. (2000). The effect of father's presence on postsecondary educational attainment among Whites and Blacks. *Research in Higher Education, 41*(5), 623-636.

Lundberg, C.A., Schreiner, L.A., Hovaguimian, K.D., & Miller, S.S. (2007). First-generation status and student race/ethnicity as distinct predictors of student involvement and learning. *NASPA Journal, 44*(1), 57-83.

Magolda, M.B.B. (1992). *Knowing and reasoning in college: Gender-related patterns in students' intellectual development*. San Francisco, CA: Jossey Bass.

Massey, D.S. & Fischer, M.J. (2005). Stereotype threat and academic performance: New findings from a racially diverse sample of college freshmen. *Du Bois Review, 2*(1), 45-67.

Massey, D.S., Mooney, M., Torres, K.C., & Charles, C.Z. (2007). Black immigrants and Black natives attending selective colleges and universities in the United States. *American Journal of Education, 113*(2), 243-272.

McCall, L. (2005). The complexity of intersectionality. *Journal of Women in Culture and Society, 30*(31), 1771-1800.

McCarron, G.P. & Inkelas, K.K. (2006). The gap between educational aspirations and attainment for first-generation college students and the role of parental involvement. *Journal of College Student Development, 47*(5), 534-549.

Melguizo, T. (2008). Quality matters: Assessing the impact of attending more selective institutions on college completion rates of minorities. *Research in Higher Education, 49*, 214-236.

McCormick, A.C. (2003). Swirling and double-dipping: New patterns of student attendance and their implications for higher education. *New Directions for Higher Education,* 121, 13-24.

McPherson, M. S., & Schapiro, M. O. (2006). Watch want we do (and not what we say): How student aid awards vary with financial need and academic merit. In M. S. McPherson and M. O. Schapiro (Eds.), *College access: Opportunity or privilege?* (pp. 49-73). New York, NY: College Board.

Merisotis, J.P. & Phipps, R.A. (2000). Remedial education in colleges and universities: What's really going on. *Review of Higher Education, 24*(1), 67-85.

Muhammad, C.G., Smith, M.J., & Duncan, G.A. (2008). College choice and college experiences: Intersections of race and gender along the secondary to post-secondary education continuum. *Negro Educational Review, 59*(3-4), 141-146.

Muraksin, L. & Lee, L. (2004). *Raising the graduation rates of low-income college students*. Pell Institute for the Study of Opportunity in Higher Education: Washington, DC.

Murtaugh, P.A., Burns, L.D., & Schuster, J. (1999). Predicting the retention of university students. *Research in Higher Education, 40*(3), 355-371.

National Center for Higher Education Management Systems (NCHEMS), 2009. Retrieved April 30, 2009 from http://www.nchems.org/.

Nettles, M.T., & Perna, L.W. (1997). *The African American education data book: Higher and adult education, Volume I*. Fairfax, VA: Frederick D. Patterson Research Institute of The College Fund/UNCF.

Nora, A., Cabrera, A., Hagedorn, L.S., & Pascarella, E. (1996). Differential impacts of academic and social experiences on college-related behavioral outcomes across different ethnic and gender groups at four-year institutions. *Research in Higher Education, 37*(4), 427-451.

Oseguera, L. (2005). Four and six-year baccalaureate degree completion by institutional characteristics and racial/ethnic groups. *Journal of College Student Retention, 7*(1/2), 19-59.

Pascarella, E.T. (1985). Racial differences in factors associated with bachelor's degree completion: A nine-year follow-up. *Research in Higher Education, 23*(4), 351-373.

Pascarella, E.T., Ethington, C.A., & Smart, J.C. (1988). The influence of college on humanitarian/civic involvement values. *Journal of Higher Education, 59*(4), 412-437.

Pascarella, E.T., & Terenzini, P. (2005). *How college affects students: A third decade of research, Volume 2*. San Francisco, CA: Jossey-Bass.

Pascarella, E.T., Smart, J.C., Ethington, C.A., & Nettles, M.T. (1987). The influence of college on self-concept: A consideration of race and gender differences. *American Educational Research Journal, 24*(1), 49-77.

Paulsen, M.B. (1998). Recent research on the economics of attending college: Returns on investment and responsiveness to price. *Research in Higher Education, 39*(4), 471-498.

Paulsen, M.B., & St. John, E.P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *Journal of Higher Education, 73*(2), 189-236.

Pavel, D.M., Skinner, R.R., Cahalan, M., Tippeconnic, J., & Stein, W. (1998). *American Indians and Alaska Natives in Postsecondary Education*. (NCES 98-291). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Perna, L.W. (1998). The contribution of financial aid to undergraduate persistence. *Journal of Student Financial Aid, 28*(3), 25-40.

Perna, L.W. (2000). The differences in the decision to attend college among African Americans, Hispanics, and Whites. *Journal of Higher Education, 71*(2), 117-141.

Perna, L.W. (2005). The benefits of higher education: Sex, racial/ethnic, and socioeconomic group differences. *Review of Higher Education, 29*(1), 23-52.

Perna, L.W. (2008). Understanding high school students' willingness to borrow to pay college prices. *Research in Higher Education, 49*(7), 589-606.

Perna, L.W. & Thomas, S. (2008). *Theoretical Perspectives on Student Success: Understanding the Contributions of the Disciplines. ASHE Higher Education Report, 34*(1).

Perna, L.W. (Ed.) (2010). *Understanding the working college student: New research and its implications for policy and practice*. Sterling, VA: Stylus Press.

Perna, L. W., Lundy-Wagner, V., Yee, A., Brill, L., & Teran, T. (in press). Showing them the money: The role of institutional financial aid policies and communication strategies in attracting low-income students. In A. Kezar (Ed.), *Recognizing and serving low-income students in postsecondary education*. New York, NY: Routledge.

Peter, K., & Forrest Cataldi, E. (2005). *The Road Less Traveled? Students Who Enroll in Multiple Institutions* (NCES 2005-157). U.S. Department of Education, National

Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Peter, K. & Horn, L. (2005). *Gender differences in participation and completion of undergraduate education and how they have changed over time*. U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Postsecondary Education Opportunity (2003). *Undergraduate degree completion by age 25 to 29 for those who enter college 1947 to 2002*. Oskaloosa, IA: Mortenson Research Seminar on Public Policy Analysis of Opportunity for Postsecondary Education.

Raines, J., & McAdams, C.B. (2006). College and social class. *Cross Currents, 56*(1), 46-57.

Raudenbush, S.W., & Byrk, A.S. (2002). *Hierarchical linear models.* Newbury Park, CA: Sage.

Reason, R.D. (2009). Student variables that predict retention: Recent research and new developments. *NASPA Journal, 46*(3), 482-501.

Riegle-Crumb, C. (2006). The path through math: Course sequences and academic performance at the intersection of race-ethnicity and gender. *American Journal of Education, 113*, 101-122.

Ryan, J.F. (2004). The relationship between institutional expenditures and degree attainment at baccalaureate colleges. *Research in Higher Education, 45*(2), 97-114.

Schuh, J.H. (2005). Finances and retention: Trends and potential implications. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 277-293). Westport, CT: American Council on Education/Praeger Publishers.

Schwalbe, M., Godwin, S., Holden, D., Schrock, D., & Thompson, S. (2000). Generic processes in the reproduction of inequality. *Social Forces, 79*(2), 419-452.

Scott, M., Bailey, T., & Kienzl, G. (2006). Relative success? Determinants of college graduation rates in public and private colleges in the U.S. *Research in Higher Education, 47*(3), 249-279.

Seymour, E. & Hewitt, N.M. (1997). *Talking about leaving: Why undergraduate leave the sciences*. Boulder, CO: Westview Press.

Shaw, K.M. (1997). Remedial education as ideological battleground: Emerging remedial education policies in the community college. *Educational Evaluation & Policy Analysis, 19*(2), 284-296.

Shin, J., & Milton, S. (2004). The effects of performance budgeting and funding programs on graduation rate in public four-year colleges and universities. *Education Policy Analysis Archives, 12*(22).

Snyder, T.D., Dillow, S.A., & Hoffman, C.M. (2009). *Digest of Education Statistics 2008* (NCES-2009-020). National Center for Education Statistics, Institute for Education Sciences, U.S. Department of Education. Washington, DC.

Solórzano, D.G., Villalpando, O., & Oseguera, L. (2005). Educational inequities and Latina/o undergraduate students in the United States: A critical race analysis of their educational progress. *Journal of Hispanic Education, 4*, 272-294.

Spencer, S.J., Steele, C.M., & Quinn, D.M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology, 35*, 4-28.

St. John, E.P. (1991). What really influences minority attendance? Sequential analysis of the High School and Beyond Sophomore Cohort. *Research in Higher Education, 32*(2), 141-158.

St. John, E.P., Hu, S., Simmons, A.B., and Musoba, G.D. (2000). Aptitude vs. merit: What matters in persistence. *Review of Higher Education, 24*(2), 131-152.

St. John, E.P., Hu, S., Simmons, A., Carter, D.F., Weber, J. (2004). What difference does a major make? The influence of college major field on persistence by African American and White students. *Research in Higher Education, 45*(3), 209-232.

St. John, E.P., Paulsen, M.B., & Carter, D.F. (2005). Diversity, college cost, and postsecondary opportunity: An examination of the financial nexus between college choice and persistence for African American and Whites. *Journal of Higher Education,* 76(5), 545-569.

Stage, F.K. (1989). Motivation, academic and social integration, and the early dropout. *American Educational Research Journal, 26*(3), 385-402.

Stage, F.K. (2007). Using quantitative data to answer critical questions. *New Directions for Institutional Research*, 133.

Teranishi, R.T., Ceja, M., Antonio, A.L., & McDonough, P. (2004). The college-choice process for Asian Pacific Americans: Ethncity and socioeconomic class in context. *Review of Higher Education, 27*(4), 527-551.

Terenzini, P.T., Cabrera, A., & Bernal, E.M. (2001). *Swimming against the tide: The poor in American Higher Education,* Research Report No. 2001-1. College Board, New York: NY.

Terenzini, P.T., Springer, L., Yaeger, P.M., Pascarella, E.T., & Nora, A. (1996). First-generation college students: Characteristics, experiences and cognitive development. *Research in Higher Education, 37*(1), 1-22.

Thayer, P.B. (2000). Retaining first generation and low income students. *Opportunity Outlook,* 2-8.

Thomas, S.L. (2000). Deferred costs and economic returns to college quality, major, and academic performance. *Research in Higher Education,* 41, 281-313.

Thomas, S.L. & Zhang, L. (2005). Post-baccalaureate wage growth within 4 years of graduation: The effects of college quality and college major. *Research in Higher Education, 46*(4), 437-459.

Thompson, M.S., Gorin, J.S., Obeidat, K., & Chen, Y. (2006). Understanding differences in postsecondary educational attainment: A comparison of predictive measures for Black and White students. *Journal of Negro Education, 75*(3), 546-562.

Tierney, W.G. (1992). An anthropological analysis of student participation in college. *Journal of Higher Education, 63*(6), 603-618.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago, IL: University of Chicago Press.

Tinto, V. (2006). Research and practice of student retention: What's next? *Journal of College Student Retention: Research, Theory, and Practice, 8*(1), 1-19.

Titus, M.A. (2004). Examining the influence of institutional context on persistence at four-year colleges and universities: A multilevel approach. *Research in Higher Education, 45*(7), 673-699.

Titus, M.A. (2006a). Understanding college degree completion of students with low socioeconomic status: The influence of institution financial context. *Research in Higher Education, 47*(4), 371-398.

Titus, M.A. (2006b). Understanding the influence of the financial context of institutions on student persistence at four-year colleges and universities. *Journal of Higher Education, 77*(2), 353-375.

Trent, W.T. (1991). Focus on equity: Race and gender differences in degree attainment, 1975-76; 1980-81. In W.R.Allen, E.G. Epps, & N.Z. Haniff (Eds.), *College in*

Black and White: African American students in predominately White and in historically Black public universities. Albany: State University of New York Press.

Trusty, J., & Niles, S.G. (2004). Realized potential or lost talent: High school variables and bachelor's degree completion. *Career Development Quarterly, 53*(1), 2-15.

Tucker, I.B. (2004). A reexamination of the effect of big-time football and basketball success on graduation rates and alumni giving rates. *Economics of Education Review, 23*, 655-661.

U.S. News & World Report (2008). Best colleges 2009. Retrieved July 17, 2008, from http://colleges.usnews.rankingsandreviews.com/usnews/edu/college/rankings/rank index_brief.php

Vartanian, T.P., Karen, D., Buck, P.W., & Cadge, W. (2007). Early factors leading to college graduation for Asians and non-Asians in the United States. *Sociological Quarterly, 48*(2), 165-197.

Ver Ploeg, M. (2002). Children from disrupted families as adults: Family structure, college attendance and college completion. *Economics of Education Review, 21*, 171-184.

Walpole, M. (2003). Socioeconomic status and college: How SES affects college experiences and outcomes. *Review of Higher Education, 27*(3), 45-73.

Walpole, M. (2008). Emerging from the pipeline: African American students, socioeconomic status, and college experiences and outcomes. *Research in Higher Education, 49*, 237-255.

Wine, J.S., Heuer, R.E., Wheeless, S.C., Francis, T.L., Franklin, J.W., & Dudley, K.M. (2002). *Beginning Postsecondary Students Longitudinal Study 1996-2001 (BPS:1996/2001) Methodology Report* (NCES 2002-171).Washington, DC: NCES.

Winkle-Wagner, R. (2008). Not feminist but strong: Black women's reflections on race and gender in college. *Negro Educational Review, 59*(3/4), 181-195.

Wohlgemuth, D., Whalen, D., Sullivan, J., Nading, C., Shelley, M., & Wang, Y. (2007). Financial, academic, and environmental influences on the retention and graduation of students. *Journal of College Student Development, 8*(4), 457-475.

Young, J.W. & Fisler, J.L. (2000). Sex differences on the SAT: An analysis of demographic and educational variables. *Research in Higher Education, 41*(3), 401-416.

Young, J.W., & Johnson, P.M. (2004). The impact of an SES-based model on a college's undergraduate admissions outcomes. *Research in Higher Education, 45*(7), 777-797.

Zwick, R. & Sklar, J.C. (2005). Predicting college grades and degree completion using high school grades and SAT scores: The role of student ethnicity and first language. *American Educational Research Journal, 42*(3), 439-464.