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## Education as Feminism for Nontraditional Aged Women Receiving Pell Grants

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FLORIDA STATE UNIVERSITY  
COLLEGE OF EDUCATION

EDUCATION AS FEMINISM  
FOR NONTRADITIONAL AGED WOMEN RECEIVING PELL GRANTS

By

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This dissertation is dedicated to my mother. When she did not know, she sought knowledge. When she did not understand my homework, she took me to the library, sat beside me, and we learned it together. It is through this degree that I continue her legacy...when I do not know, I will seek knowledge.

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## **ABSTRACT**

This study centers the experiences of nontraditional aged women who are 24 or older and the usefulness of Pell Grant funding to increase outcomes for attainment at the certificate, bachelor's, and associate's degree level in higher education. Critical feminist policy analysis guided the research structure, centering of women, and recommendations for policy guided by the results of the research. Using data from the Beginning Postsecondary Students Longitudinal Survey 2004/09, a secondary data analysis was completed to better understand factors influencing attainment, particularly for nontraditional age women. Through the use of descriptive statistics, ordered and multinomial logistic regression, and estimations of predicted probabilities, it was found that nontraditional students have less favorable outcomes for attainment, compared to traditional 18-23 year old students. Women and those receiving Pell Grant funds totaling \$18,000 and above, however, had higher attainment outcomes compared to men and those with lower Pell Grant amounts, making a case for the merits of protecting and retaining federal aid funding to enhance low-income, nontraditional aged women's chances of completing postsecondary degrees.

# CHAPTER 1

## INTRODUCTION

Higher education continues to be at the forefront of U.S. policy discussions at the state and national level. Considering the value placed on higher education and its increasing cost, access is often out of reach for low-income individuals who would benefit the most (Cornacchione & Daugherty, 2013). When the option to study beyond the high school degree is not attainable, many enter into the workforce. However, these same students often reach a glass ceiling in their earnings and advancement, leading them to return to higher education (Prince & Jenkins, 2005). While this is a favorable scenario, some students, particularly those above the traditional age range of 18-24, have dependents to care for; or have limited funding to use for higher education (Locke & Mckenzie, 2016; Sosulski, 2003). This is especially true for women returning to college.

Federal programs such as the Federal Pell Grant (Pell Grant) have continued to provide some relief for low-income students to work towards their educational goals (Goldrick-Rab, 2010). Pell Grants over time have been stretched thin, with more students entering higher education who are low-income (Goldrick-Rab, 2016). This program also exceeds others in their support of funding college students (Singell & Stone, 2007). Programs like the Pell Grant helped 31% of students with dependents in the 2015-2016 academic year access higher education (Protopsaltis & Parrott, 2017).

For students who are both lower income and parenting, there are considerable challenges, even when these students are academically prepared to succeed. Additionally, women students who are parenting may find the task of higher education more daunting as they juggle multiple responsibilities. This study places women at the center, while also exploring ways that Pell

Grants support their pursuit of higher education. With women at the center of the study, feminist theory is central to the exploration of their experience in higher education.

### **Theoretical Foundation**

Feminist theory aims to center women in order to highlight practices that disproportionately affect women (Creswell, 2007). The literature review includes an in-depth history of feminism and its more recent use in policy analysis. This additional feminist framework is selected because of its connection to education access and income stability for women (Budig & England, 2001; England, 2010). Women sought higher education following their involvement in the workforce in the 1900s as a means to maintain financial security should divorce occur (Goldin, 2006). Although this shift towards higher education began as a path toward independence, this also led more women into the workforce at all ages (Goldin, 2006). Critical policy analysis and feminist theory is used to interpret the results and to provide recommendations on Pell Grant financial aid policy. Use of these theoretical frameworks jointly connect policy to women's outcomes in higher education.

### **Background of Study**

Women's exploration of higher education has progressed over time, from the acceptance of women to colleges and universities, to their surpassing the enrollment of men (DiPrete & Buchmann, 2013). The National Center for Education Statistics includes enrollment data from 1970 with men representing close to 58% of students, to a 2019 projection of enrollment showing 56% enrollment of women (NCES, 2017). Much can change in 50 years. Parallel to this inversion of enrollment where women now create the majority in higher education, the same is also true of the workforce (Kane & Rouse, 1999).

Women participate in the workforce at higher rates than men, as shown in a study by Mosia and Hipple (2006). The study showed that women's participation in the workforce was 35% in 1948, and increased to 75.3% in 2005. In this same study, men's participation decreased from 96.6% to 90.5% during the same timeframe. This shift in both higher education and workforce participation signals that gender roles and norms are changing in favor of women in education and work; however, childbearing and often childcare continue as expectations and choices for women nationwide. While this study is concerned mostly with women and higher education in the United States, these same trends and expectations hold true throughout societies across the world. According to a review of articles on gender, work, and childcare, by Gjerdingen, McGovern, Bekker, Lundberg, and Willemssen (2000) women only showed a decrease in household chores due to increased work, while men maintained their same effort in the home. Across the three countries included in the study, there has been an increase in flexibility of work to support child and home responsibilities, however, there has not been a shift in increasing men's involvement in those same duties (Gjerdingen, et al., 2000; Treas, 1987).

This study does provide some insight into two-parent, heterosexual households, the decrease of time committed to work, and the increase of attention to the home remaining women's responsibilities. Even now, time-use studies show female partners continue to do the majority of domestic housework and less desirable childcare roles, with implications for women's professional opportunities and rewards (Offer & Schneider, 2011). If this is the case for work, pursuit of a degree can seem impossible without adequate support. Similarly, when women students are from low-income backgrounds, the responsibilities do not change in the home, but the available income provides less flexibility.

Broader higher education context surrounding the needs of low-income students include a consideration of the history of the Pell Grant and its usefulness, the rise in older students participating in higher education, and the setting of the community college as an accessible route for degree completion (Ainsworth & Roscigno, 2005; Baker & Doyle, 2017; Federal Student Aid, 2018). Students like these are often faced with financial limitations even with community college costs being less than four-year institutions.

While many nontraditional aged students (24 and older) encounter financial limitations, those who are able to matriculate show similar academic performance to that of traditional aged students (Donaldson, Graham, Kasworm, & Dirx, 1999). However, the status of the Pell Grant has fluctuated over time. As tuition costs continue to rise, this benefit no longer meets the needs of nontraditional low-income students (Soares, 2013). Pell Grants are given in an amount that is relative to the cost of attendance. Public and private institutions continue to increase tuition, thus, Pell Grants come up short for a majority of students receiving the benefit (Singell & Stone, 2007). One reason for this is the increase in the number of students who receive Pell Grants, along with steady growth in the number of nontraditional students in college (Seftor & Turner, 2002). The researchers also add that there is a need for additional research on financial aid and its ability to contribute to the education of nontraditional students.

Federal grant and aid programs continue to be an option for low-income students to avoid a hefty loan balance (Dowd, 2003; Dowd & Coury, 2013). For low-income nontraditional students specifically, the rise in the price of higher education shows a low return on their investment of time and finances when balancing work and family, even for Pell Grant recipients as federal funds dwindle (Psacharopoulos, 1994). Pell Grants are federally funded, and available to students who are from households that have below \$40,000 in annual income (Long, 2004).

These programs do not provide enough financial support to focus on education to break the cycle of poverty. However, as with much of the research on nontraditional women students who have attained a credential in higher education, there is a notable shift for families from low wage work to steady, upward mobility (Adair, 2001; Goldin, 2006; Thompson, 1993).

In order to effectively examine low-income students in higher education and a longstanding Pell Grant federal aid policy, a framework that considers inequality in policy making was appropriate. Examining the perceptions and influences policy makers use to decide how much and to whom policy benefits apply will clarify assumptions about recipient groups' throughout the decision making process (Schneider & Ingram, 1993). An example of this is the different life experiences of policy makers at the federal level who have a higher income and their role in making policy that will affect the outcomes of individuals and groups who are living at or below the poverty line (Schneider & Ingram, 1997). In particular, it is important to consider the multiple ways this inequality can disproportionately hinder students that fall within a nontraditional age range. Critical feminist policy analysis assisted in clarifying inequities for women especially in higher education.

However, the presence of nontraditional students in higher education is not new. Adult women began enrolling as early as the 1800s through distance education, followed in the 1900s by veterans and women desiring to enter the workforce after raising their children (Bergmann, 2001; Miller, Gault, & Thorman, 2011). Nontraditional students during these early years in higher education, similar to present day, still opt for community colleges (Lakin, Mullane, & Robinson, 2007; Leigh & Gill, 1997). Within Chapter Two, a more expansive literature will cover the development of the Pell Grant, the presence of women in higher education, and the relevance of age when considering degree completion amidst family and work responsibilities.

Similarly, greater emphasis will be made on the aforementioned theoretical groundings of the study. Finally, past research will be incorporated in order to lay the foundation related to the problem posed in the study.

### **Statement of the Problem**

At the core of the United States economic landscape, the workforce and higher education have a symbiotic relationship. It is estimated that there will be limited opportunities in the workforce for anyone lacking postsecondary education (Hillman & Orians, 2013; Soares, 2013). This shortage of opportunities contributes to the high percentage of unemployment among those who do not complete education beyond high school (Kelly & Strawn, 2011). These same students are increasing in number across the U.S., particularly online, with an estimated 80% participating in online learning in 2010 (Soares, 2013). These same students seek support from federal aid, like the Pell Grant to help them finish their next step in higher education.

Declines in Pell Grant allocations hold back the progress of students who seek a four-year degree (Protopsaltis & Parrott, 2017). A substantial increase in Pell Grants available for adult students to pursue higher education is needed to break the cycle of poverty and allow greater access to college. To add, the likelihood of transfer for nontraditional students from a two-year to a four-year is low due to cost, which lengthens time-to-degree completion (Dougherty & Kienzl, 2006). While these nontraditional students often have lower wage work and see gains in wages following the completion of a certificate or two-year degree, the economic return on the investment in a bachelor's degree often is not worth it (Grott & Oosterbeek, 1992).

There are many factors at four-year institutions that present barriers for adult students: they are unprepared to recruit, retain, and graduate low-income students. Four-year institutions are even less prepared for nontraditional students especially those who have children (Kasworm,



2010; Wilsey, 2013). At the same time, greater numbers of traditional students are enrolling in community colleges because of cost, inverting a system that was meant to broaden access to all economic levels (Flores & Shepherd, 2014). What cannot be ignored is the cost of higher education and its ability to strongly influence the type of institution to attend and whether to attend at all if the opportunity cost (lost wages, lost experience) is too high (Cornacchione & Daugherty, 2013). Low-income nontraditional students in higher education face complexity during a time when public higher education and the adjustment of the Pell Grant, calling for additional examination of women, Pell Grant dollars, and nontraditional age students to help inform public policy.

This study will focus on certificate, bachelor's, and associate's degree attainment as the dependent variable, with Pell Grant recipients, women, and nontraditional age students as independent variables. There is research covering the ongoing debate regarding the decline of Pell Grant allocations and its relationship to higher education access (Singell & Stone, 2007; Hillman & Orians, 2013; Dowd & Coury, 2006; Protopsaltis & Parrott, 2017). Further research has discussed nontraditionally aged students' complex balance of work, family, and education (Ross-Gordon, 2011; Brooks, 2012; Home, 1998). It is the gap between these studies that provides a point of entry to discover more on ways that women students with children fare in their road to completion. Relevant literature is included in a later section to provide clarity on terms used within the study, operationalizing each variable.

### **Purpose of the Study**

This dissertation aims to expand research focused on nontraditional age students, keeping in mind the amount of financial need students may have. Research on this population of students is key to meeting the demands of a changing workforce that increasingly requires a minimum of

a bachelor's degree (Assistance, 2012). Connected to economic mobility, this study intends to inform a potential shift toward policy development that is more conscious of the disparity between groups that are vulnerable and do not hold power in the creation of policy, such as women and low-income communities (Schneider & Ingram, 1993). Aligned with this is the need to pay closer attention to students who are older than the traditional aged college student, often missing in studies of higher education (Giancola, Munz, & Trares, 2008; Kasworm, 2010; Prince & Jenkins, 2005).

While states are responsible for implementing federal policy that includes the awarding of Pell Grants, they also have continued to divert funding away from higher education toward their own priorities (Lingenfelter & Mingle, 2014). Students were expected to pay at least half of their higher education costs, following the 2008 recession (Lingenfelter & Mingle, 2014). If other sources of federal funding to support students, such as Pell Grants, could be expanded rather than decreased, there could be positive gains for individuals as well as states.

The use of feminist theory in education is present globally. The use of critical feminist policy analysis has the opportunity to center women, inspiring similar questions to be raised in a multitude of research settings (Bozalek & Carolissen, 2012). Similarly, public institutions of higher education could reimagine their role in society and return to their purpose to serve the public good (Bok, 2009; Prince & Jenkins, 2005). Additionally, this public good has potential to meet the needs of women who have low-wage jobs and more to lose with unpredictable work schedules that often are comprised of more than one job (Jacobs & Padavic, 2015). To break this cycle, an investment in higher education could lead to stability with higher wages in work that has a predictable schedule *and* flexibility (Jacobs & Padavic, 2015). Lastly, this research will support recent trends in the presence of nontraditional age returners to shift the conversation

towards a more accurate reflection of reality – students aged 24 and older are now the *new* traditional student (Ross-Gordon, 2011).

### **Nature of the Study**

The nature of the study includes theoretical and conceptual frameworks. Research on conceptual and theoretical frameworks describe the two as independent and indeed complimentary, with theoretical framing (deductive) differing from conceptual structure (inductive) (Imenda, 2014). In this case, the theoretical frames used are feminism and adult learner theories. Additionally, the conceptual framework refers to the use of critical policy analysis. These frameworks that will be described in more detail within Chapter Two serve as a guide for the subsequent research questions.

### **Research Questions and Hypotheses**

Below are the four research questions for this study and their related hypotheses.

- (1) How do nontraditional age undergraduate students vary by gender and socioeconomic status, Pell Grant receipt, institutional characteristics, and degree attainment as compared to students aged 23 and younger with or without children?

*H<sub>1</sub>: Nontraditional age undergraduate students will have lower degree attainment than students aged 23 and younger, when controlling for Pell Grant receipt, background characteristics (gender, race, socioeconomic status) and institution type.*

- (2) For nontraditional age students who began in community college: which factors support Pell Grant recipients in their completion of a credential or degree within the community college system compared to those who did not receive Pell Grants?

- (a) Academic Performance
- (b) Hours Worked

(c) Dependent children

*H<sub>2</sub>: Nontraditional age community college students will have lower degree attainment than students aged 23 and younger; negative factors inhibiting attainment include academic performance, hours worked, and dependent children.*

(3) To what degree does institutional type affect nontraditional age students earn credentials as compared to students 23 and under, when controlling for Pell Grant receipt, hours worked, and dependent children?

(a) Institution Type

(b) Gender

*H<sub>3</sub>: Nontraditional age undergraduate women will have lower degree attainment than students aged 23 and younger and show positive effects for gender and four year institutions.*

(4) For questions 2 and 3: How do the listed factors predict degree attainment when comparing for nontraditional age women and men with dependents?

*H<sub>4</sub>: Nontraditional age undergraduate women students will have higher degree attainment than nontraditional age men and dependents will be a negative factor influencing women's attainment.*

### **Research Design and Methodology**

While much of the research on nontraditional age college students has been qualitative in focus, this study will specifically use quantitative analysis. The research design and methodology will be quantitative, appropriate because of its use in previous research related to higher education attainment outcomes and cost of education. Research conducted on the outcomes of Pell Grant recipients show that the amount available is not enough to support completion for a

student that seeks a bachelor's degree (Singell & Stone, 2007; Soares, 2013). Quantitative research in higher education has shown consistency in determining predictors of degree attainment for students at every institution type, even those not included in this study.

Quantitative methods have also revealed key outcomes for higher education such as predictors of degree attainment, specifically for students who participate in workforce development and training programs (Prince & Jenkins, 2005). The use of quantitative methods also gives insight on the magnitude and direction of relationships among and between variables (London, 2006).

### **Data**

Data will be used from the nationally representative Beginning Postsecondary Students (BPS) Longitudinal Study of 2004/09. All BPS students are attending college for the first time. The data includes information on institution types, including vocational training schools. The complete data set includes close to 17,000 students, surveyed at three distinct periods in time with additional administrative data provided by institutions. The BPS: 04/09 longitudinal cohort followed students over a six-year window, including student surveys at the end of their first year in school (2004), the end of their third year (2006), and six years after they began (2009). Finally, the source data for this study is from the full restricted-use BPS panel, which allows for more detailed information on age, financial aid, and dependent children.

**Sample selection.** The broad context for the study includes higher education and public policy within the United States. To further understand the above research questions related to student aid and nontraditional age students, the BPS dataset for the above mentioned years, is adjusted to include only students who were 18 and older at the time of enrollment. Attainment of a degree or credential is the dependent variable and all other variables are analyzed for their relationship to attainment for nontraditional aged students.

**Data analysis.** The analysis for the above mentioned data follows a secondary data analysis, as the data were collected at the national level. The outcome variable of attainment, having multiple hierarchical levels, merited the use of ordered logistic regression. This method is common when the outcome variable is ordinal in nature and functions as a simultaneous logistic regression considering all levels of the outcome (Green & Silverman, 1993). Additionally, the interpretation of the results uses a feminist and critical policy analysis framework, congruent with the theoretical and conceptual frameworks, respectively also noted in Chapter Three – Methodology.

Within Chapter Two – Literature Review, a foundation of the study incorporates contextual literature about the main aspects of the study: the public system of higher education, which includes community colleges and four-year institutions; more information on nontraditional age students; and in particular, women, an overview of public policy; and critical feminist policy analysis.

**Data presentation.** Analysis results are presented through a series of tables and figures that show the relationship between the variables and the nuances in statistical procedures within the analysis process. Use of feminist and critical policy analysis is present in the review of results and in Chapter Five – Discussion. In addition to the brief overview of methodology noted above, an in-depth discussion of methods is also provided in Chapter Three – Methodology.

### **Operational Definitions**

While some terms used to describe the population and scope of the study may be familiar, within the following section, the terms throughout the study are defined using previous literature as a basis. Variables mentioned above are also operationalized further in Chapter Three -

Methodology, and provide greater understanding of how each variable is measured within the data.

### **Nontraditional Students**

As the population of focus for this study, nontraditional age students are used to distinguish the subset population described and as a way to separate the group from students who are considered traditional age. Traditional students in higher education include those who enter college directly following high school between the ages of 18-23, whereas students who are nontraditional are aged 24 and older and often have dependents such as children, parents, or guardians (Pelletier, 2010; Soares, 2013). Research that identifies these nontraditional students use the following terms to describe students aged 24 and older: nontraditional students, adult learners, post-traditional students, mature students, and reentry students (Kasworm, 2010; Carney-Crompton & Tan, 2002). Throughout this study, the term *nontraditional age* is used, while interchangeably using terms aforementioned as authors identified in their research. Overall, the students above the age of 24 are more likely to participate in the workforce prior to enrollment in higher education (Osam, Bergman, & Cumberland, 2016). In the 1900s, nontraditional students were largely women who wished to have greater financial independence from their spouses, but over time, this group has grown to include veterans, and single parents (Goldin, 2006).

### **Gender**

Including gender as a variable within the study offers a way to elevate the overrepresentation of women who are nontraditional and with shifts in welfare policy and federal aid availability, also identify as single parents or as individuals who are also from low-income backgrounds. It is important to note that this study uses binary gender language throughout the

study, but would like to acknowledge that gender is a spectrum, where individuals may identify as men, women, gender non-conforming, or transgender (Lorber, 1996). This process situates the language used throughout this study, but not without also challenging existing norms present in literature that center gender.

### **Low-Income**

Another pertinent topic in this study is the identification of the needs of low-income students who are also Pell Grant eligible. For the purposes of this study, students are considered to be from a low-income background if they are from working class or poor families who have an Estimated Family Contribution of \$0 towards higher education (Carlson & Laderman, 2016). The amount of aid a student may receive is determined using the Federal Application for Financial Aid (FAFSA). Similarly, the range of who identify as low-income are also determined by separating reported annual income into high, middle, and low-income.

### **Federal Aid**

Each year, students (who have the ability to), complete the FAFSA, which serves as a way to gather information for the government and institutions to assist in creating award packages that may include a mix of federal aid, loans, and scholarships (Olivas, 1985). Federal aid and scholarships are most prized by low-income students since there is no need to pay back awarded funds. However, for nontraditional students who earn more than a student who has recently graduated high school, the amount of expected family income is higher, lowering the amount of aid available to the student.

### **Pell Grant**

The Pell Grant is a type of aid that is available and does not require repayment. In order to be eligible for the Pell Grant, a student must have a lower Expected Family Contribution.



However, there is a limit on the amount that can be received for the full length of college attendance for a student seeking a four-year degree (Goldrick-Rab, 2010). It is also worth noting that some students, such as undocumented students, are unable to fill out a FAFSA, thus aid such as Pell Grants are unavailable to them (Olivas, 2010).

### **Attainment**

Degree completion for this study is defined as the receipt of a degree, certificate, or credential beyond high school diploma. The decision to expand this definition is from the recognition that community colleges offer multiple opportunities for career advancement that lead to an increase in earnings upon completion or confirmed development of a skill (Kane & Rouse, 1999).

### **Limitations**

While the most recent complete panel of Beginning Postsecondary Student data available at the time, data that spans 2004-2009 is somewhat limited in its applicability for today's higher education students as well as in its use as a secondary data source. Assumptions made using historical literature as well as recent publications in the past five years limited the ability to generalize results from the data analysis. Notably, this dissertation did not include *solely* nontraditional age students, but rather includes both traditional and nontraditional students to enable comparisons between nontraditional and traditional age students. The focus on women was central to the purpose of this research, but within the interpretation of results and discussion, the effects on men and nontraditional age students as a whole was considered. Finally, because the study is focused on federal financial aid, accessed by the FAFSA, this research is restricted in its relevance for students who are international or who have an undocumented status.

## **Scope**

### **Pell Grant Eligible Students**

The combined factors of higher education affordability and the unfamiliarity of the college environment, along with available aid have an impact on matriculation and institution type (Perna & Titus, 2004). Further study shows the lower rates of degree attainment for students who are first generation and/or those who are low-income. Many of these same characteristics, including race and gender, are found when adding the component of age to attendance in higher education. Among some of the research on low-income students, Pell Grant eligibility is prized for students and parents who are unable to finance higher education, in particular, the 51.7% of families with a household income below \$15,000 (Romano & Millard, 2006). Beyond the Pell Grant, if scholarships and programs like Federal Work Study are not available, the Pell Grant supplement is insufficient support for students towards transfer to a four-year college.

### **Nontraditional Age Students**

Nontraditional students who are 24 and older have two specific goals when they enter into higher education, (1) increase earnings and (2) create financial stability for themselves and if applicable, their dependents (Kasworm, 2010; Rosenberg, 2016). Degree attainment is correlated with higher earnings and other life benefits such as health and continuity of employment (Perna, 2005). However, for the 18-24 year old student, higher loans mean a strain on income post-college, when aid is inadequate during matriculation (Kim, 2010). There might be an even greater effect for nontraditional age students who spent more time in the workforce.

Public higher education is also a consideration, due to its mission to serve the public good (Bok, 2009). Community colleges have the capacity to support students in completing their high school diploma or equivalent, gaining access to English language learning, and obtaining

technical training or an associate's degree (Brown, 2012). However, many students pause their education due to time constraints, work obligations, and financial limitations (Pelletier, 2010; Soares, 2013). For students who complete an associate's degree or who transfer to a four-year public institution, barriers to involvement and finding a true sense of belonging remain; it is challenges like these that dampen student success (Bozalek & Carolissen, 2012).

### **Significance of the Research**

This dissertation contributes to literature in higher education, public policy, and feminist studies. At a time when higher education is seen as an answer to a changing U.S. workforce, the intersection of these areas is especially relevant in reframing how we view social problems. This quantitative study explores whether and how we can update methodology to challenge the systems they examine by taking a critical view of them. In doing so, this study raises critical questions for research communities and especially for higher education. My aim is to engage public higher education in active and ongoing reflection to consider shifting their attention toward students who have financial need. Finally, I hope to continue to elevate the use of more critical methods of inquiry for institutions of higher education and federal policy development.

This study is important because it challenges current norms which rely on the traditional student experience and highlights the role age plays in education attainment. It is also critical to include women to bridge educational attainment for future generations. The knowledge produced from this research will add to previous research that examines age, higher education access, and federal policy. Including policy in higher education discourse is important because the combined use is still developing as a fairly young scholarship presence within the past five years (Lowry & Fryar, 2013). It is my hope that professionals, researchers, and developers in higher education and public policy learn how to better understand each other as symbiotic partners in lessening

poverty and increasing economic stability at the individual and national level. This research has the potential to assist policymakers in decisions that consider communities who are living in poverty, while also exerting their power to align resources with Pell Grant funding in support of higher education.

This research challenges the dominant narratives that place loans as a priority, rather than the sustainable use of grant-funded education as a pathway out of poverty. The literature review and following study contributes to: higher education and public policy research – further demonstrating the interconnectedness between these fields, advances the use of critical policy analysis, and adds quantitative knowledge to the wealth of qualitative research on poverty and higher education.

Individual students benefit from the increase in awareness of higher education institutions to include low-income students who are of a nontraditional age, have dependents, and are low-income (Paulsen & St. John, 2002). In addition, this research gives researchers and practitioners greater insight on adult students, challenging current norms and reliance on the traditional student experience (Pelletier, 2010; Richardson & King 1998; Paulsen & St. John, 2002). This work also deepens insight on the racial and ethnic backgrounds of students in higher education, as students who identify as low-income are more sensitive to cost during selection, even with need-based aid (Leslie & Brinkman, 1987).

Armed with this information, institutions and lawmakers can be better prepared to meet the needs of nontraditional students. There is a need to acknowledge federal policy as intricately connected to the available decisions prospective students have to pursue higher education (Paulsen & St. John, 2002). This includes a need for a financial investment in low-income women who are working low-wage jobs in order to recognize them as prospective students

(Jacobs & Padavic, 2015). Aligned with this is the need to pay closer attention to students who are older than the traditional 18-23 year old college student (Giancola et al., 2008; Kasworm, 2010; Prince & Jenkins, 2005).

### **Summary**

Overall, the aim of this study is to gain insight on the success factors and barriers students from nontraditional ages 24 and older had throughout their pursuit of higher education. What this study also will do is challenge the idea of “nontraditional” for the field of higher education to help increase understanding of this growing population. This initial chapter provides an overview of the context of the study, operational definitions, a review of the proposed methods, the limitations, and the benefits of this research contribution. More information is provided within Chapter Two – Literature Review, which delves further in each aspect of the study and includes the context of community colleges as a pathway towards degree completion and higher earnings for nontraditional aged students. Chapter Three – Methodology operationalizes variables included in the study, along with providing substantive support for the chosen methods that answered the research questions. Analysis of the results comprises Chapter Four – Results, with a final section that discusses recommendations for policy, institutions of higher education, and future research in Chapter Five – Discussion.

## **CHAPTER 2**

### **LITERATURE REVIEW**

Included in this chapter is a review of relevant literature that connects the major themes connected to the research questions introduced in Chapter One – Introduction. Exploration of related research studies, findings, and methods are organized below to build a story connecting each aspect of the research questions posed in the study, providing a basis of support and a place for this research within the broader academic community. To follow is a more detailed explanation of the strategies used to build the literature. The literature review is introduced by the conceptual framework and then organized by content areas. Finally, a theoretical framework is shared to layer critical policy analysis and feminism. The chapter will end with a summary and a clear connection to Chapter Three – Methodology.

#### **Strategies for Searching the Literature**

Strategies used in reviewing the literature include research that specifically focused on the intended topics noted above, but also a concentrated effort to find studies that placed nontraditional age students or Pell Grant funding at the forefront, while considering attainment of degrees and certificates in higher education. Primary resources for searching the literature were Google Scholar and the Florida State University article databases. Key search words included: adult students, higher education, public policy, nontraditional students in higher education, community colleges, Pell Grant recipients, critical policy analysis, financial aid policy, and higher education. In addition to peer-reviewed article searches, course-related texts were also a source for information related to research on public policy and higher education. Following this, I narrowed my search to find studies that included the specific combination of degree attainment and Pell Grant eligibility. In the following literature review, a number of research studies will be

included for each section in order to demonstrate the contribution this study will make to the academy.

### **Research Questions**

This dissertation seeks to connect past research on nontraditional adult learners and the evolution of and need for federal aid such as the Pell Grant in higher education. A continuous thread within these major themes is the need to focus on women's ongoing desire and need to access and complete their educational goals. Below are the research questions that will organize the literature review:

- (1) How do nontraditional age undergraduate students vary by gender and socioeconomic status, Pell Grant receipt, institutional characteristics, and degree attainment as compared to students aged 23 and younger with or without children?
- (2) For nontraditional age students who began in community college: which factors support Pell Grant recipients in their completion of a credential or degree within the community college system compared to those who did not receive Pell Grants?
  - (a) Academic Performance
  - (b) Hours Worked
  - (c) Dependent children
- (3) To what degree does institutional type affect nontraditional age students earn credentials as compared to students 23 and under, when controlling for Pell Grant receipt, hours worked, and dependent children?
  - (a) Institution Type
  - (b) Gender

(4) For questions 2 and 3: How do the listed factors predict degree attainment when comparing for nontraditional age women and men with dependents?

### **Higher Education**

Institution types that fall within higher education include four-year and two-year community colleges and universities. Credentials offered by institutions range from certificate programs to terminal degrees such as the doctoral degree. However, because the environment is often centered on students of a particular age range, there are subsets of students who feel distant from campus support. These “nontraditional students” who are often transfer or adult students, can feel challenged in the classroom and in seeking out opportunities for involvement (Kasworm, 2010).

Within the broader system of public higher education history for example, adult learners were the focus, as was vocational training, which originated in community colleges in the U.S. (Thelin, 2011; Chao, DeRocco, & Flynn, 2007). Even more telling of community colleges’ role in higher education was the preference for students to self-select into vocational programs rather than traditional arts and sciences programs (Bok, 2009). The increased focus on vocational training for hands on work does not prepare students for the demands of the contemporary job market.

### **Barriers**

Nontraditional age students, while motivated about their educational goals, can be stopped on their course to success for a number of reasons. In a study by Soares (2013), nontraditional age students had lower than a 15% completion rate if they were attending part-time and worked full-time, compared to the 57% completion rate of traditional age students. Working full time is important especially for students who are supporting dependents.



As costs increase for higher education, the ability to self-finance higher education while also financing basic needs is more difficult for students who have strained resources. As Leslie and Brinkman (1987) demonstrated in their meta-analysis of student cost research, need-based aid improves access. Aid motivates a student to enroll, even in the face of rising tuition costs.

Balancing time is also a hurdle for all students, especially nontraditional students who must work and care for others (Pelletier, 2010). Managing their time, assignments and staying on track to graduate can be daunting tasks, leaving many with some credits but no degree (Lane, Michelau, & Palmer, 2012). Much of the degree gap is from students pausing their matriculation due to cost and others name lost credits at the point of transferring institutions. Rosenberg (2016) surveyed nontraditional age students to better understand institutional transfer and their multivariate analyses found that students 25 and older had lower intent to transfer.

## **Pell Grant**

### **The Higher Education Act and Federal Financial Aid**

Updating policy at the federal level for Pell Grants has the potential to take a closer look at aid, which is often more supportive of full-time students. In order to support national goals for completion, it is imperative that there is a renewed commitment to nontraditional students through aid policy (Gupton, Castelo-Rodriguez, Martinez, & Imelda, 2009; Pelletier, 2010; Taliaferro & Duke-Benfield, 2016). The Pell Grant's award amount is calculated based on a formulation that considers the Expected Family Contribution (EFC). The EFC is based on previous year's earnings for a student's parent(s) and/or guardian(s), or for the student themselves if completing the FAFSA as an independent student, the cost of attendance, and level of enrollment (full-time or part-time) (Goldrick-Rab, Kelchen, Harris, & Benson, 2016).

To be eligible for the Pell Grant, students must complete the FAFSA and have a family income that is less than \$40,000. The majority of recipients fall well below the income parameters (Long, 2004). This income bracket is consistent with nontraditional adults whose income is within working class status, but also fit students who see the most benefit from completing an associate's degree or higher. Considering the types of students who would use the Pell Grant benefit, the disparity between the numbers of students attending community colleges or four-year public institutions is vast.

The Higher Education Act of 1965 (HEA) (Davis, Green-Derry, & Jones, 2013), was instituted to allot funds for individuals pursuing postsecondary education and for institutions in need of facilities development (Paulsen & Smart, 2001). This act was significant in the history of higher education policy development, but also in the increase of aid to community colleges and contribution to the growth of human capital in the United States. In 1972, the HEA was amended, and changes shifted towards a new program called the Pell Grant, which allocated grant funding to low-income students (Baum, 2015; Curs, Singell, & Waddell, 2007; Gladieux, 1995). Even with the generous funding from the HEA, other financial aid programs such as the Pell Grant did not rise enough to match the rapid increase in tuition, even at community colleges (Hilmer, 2001). As each year passes, the overall funding of higher education continues to shrink, placing campuses who rely heavily on this funding into disarray (Heller, 2002).

In a 2010 study of higher education and access for nontraditional adults in the United Kingdom, Wainwright and Marandet (2010) cite the broadening of higher education as a way to shift from viewing education as only available to the upper class to one that is within reach of all (Wainwright & Marandet, 2010). Similarly, Pell Grants allow for this same expansion, true to its initial intent. However, financial aid is mostly focused on students who attend full time, calling

for a need to rethink financial aid policy for adults (Taliaferro, 2016; Pelletier, 2010). Need grows each year as costs go up, prompting researchers to share their work in hopes that federal-level decision makers will consider increased funding (Kelly & Strawn, 2011).

The rise in tuition costs is one of many contributors to income inequality in higher education. Tuition has surpassed the national inflation rate, leaving more students with debt upon graduation (Karabel, 1972; Lowry & Fryar, 2011). Local and state monies fund community colleges and yet, these institutions receive significantly less money than four-year institutions, placing them in a position to increase tuition (Davies & Zarifa, 2012). This process compounds the low completion rates at community colleges as tuition begins to rise. Seftor and Turner (2002) found that nontraditional aged students were more sensitive to the cost of higher education than students who were within traditional age ranges, leading them to choose community colleges or a pause in education. This demonstrates the need for additional aid for nontraditional adults, especially those from low-income groups.

Any decrease in financial support, no matter the source, places the cost on the student, further burdening low-income students. Early in the development of higher education, students from low-income backgrounds were only able to attend college if they received scholarships from wealthy donors (Thelin, 2011). Even though they benefited from access, their lack of wealth was signified by their robe length (Cabrera & La Nasa, 2001). Now, instead of measuring wealth by robes, it is now apparent by college choice and sadly, indicative of implications for completion. Income, more than a student's intelligence, predicts the likelihood of persistence in higher education, which ultimately connects with a negative outcome for historically underrepresented racial and ethnic groups in the U.S. (e.g., Black, Latinx) (London, 2006).

Further, nontraditional students returning to college after a delay or in order to complete a degree seek the private benefits of education to increase their earnings (Baum, Little, & Payea, 2011). Adult students also have competing priorities: being enrolled part-time, financially independent, employed at least part-time, responsible for dependents (e.g. children, parents), and on a vocational education track (Pelletier, 2010; Soares, 2013). These characteristics show consistent themes that warrant the need for aid to fit the needs of adult students.

While higher education has continued to see a steady increase in cost, the amount of federal aid dwindles. What this means for students seeking higher education is that over half can expect to use loans to finance their path to graduation (Dynarski & Scott-Clayton, 2013). This use of a differences-in-differences analysis found that having benefits that are at the federal level aided was helpful in predicting higher college attendance. For students attending community colleges, as most nontraditional age students do, a study using logistic regression found that loans had a considerable negative influence on the ability of a student to persist towards a degree (Dowd & Coury, 2013).

This is also the case for students who began higher education with lower income backgrounds. Knowing that they can expect another bill to pay post-graduation lessens the economic benefit of attending (Johnstone, 2004). Many of these same students graduate with little awareness about the student loan process of repayment or choose to attend intermittently to avoid debt by paying out of pocket as they save for tuition (Aud, Hussar, Johnson, Kena, Roth, Manning, Wang, & Zhang, 2012). Loans not only lengthen degree completion time, they have the capability to stifle attainment altogether. Loans received by students are more than triple the amount of Pell Grants (College Board, 2017). This leaves students with debt and a degree in hand if they make it to graduation.

## **Nontraditional Aged Students in Higher Education**

Adult education has been in existence since the 1800s. Beginning movements such as the Chautauqua movement sought to bridge educational gaps for upward mobility in low and middle-income communities (Stubblefield, 1981). The meaning of “Chautauqua” in the Iroquois language means to “tie together” or “connect,” was focused on adult learners, largely attended by women, and was brought *to* communities – forming the start of distance education through the 1930s (Scott, 1999; Kilde, 1999). Later, return to education in the 1970s meant a second chance for most, including single mothers, immigrants, and veterans (Soares, 2013). Adult education has since had multiple waves of populations that include an increase in higher education for veterans returning from the war, women’s focus on economic independence, and most recently the need for a return to education following a gap that prioritized work and family.

Adult students are defined as those who are at least 24 years old and identify as independent students (Kasworm, 2010). Often, adult students are also identified as nontraditional students, placing a separation between them and students who fit a younger age range. Students in this identity category delay higher education for more than one year after completing high school, attend part-time, attend classes on nights or weekends, are financially independent, and often have dependents (Pelletier, 2010; Soares, 2013).

Even with the many responsibilities, this population of students continues to grow. It was noted that adults were the fastest growing group with 30% of the nontraditional age students attending full-time (Van Der Werf & Sabatier, 2009). College enrollments for nontraditional age students are anticipated to grow twice as fast as the 18-24 aged population and in 2016, 40% of undergraduates were 25 and older (Kelly & Strawn, 2011; Carlson & Laderman, 2016). Although there are additional gaps to fill for nontraditional age students, the opportunities for

their economic mobility provide incentives to the workforce within the United States (Soares, 2013).

In a qualitative case study, Kasworm (2010) found nontraditional age students perform at or above the academic performance of students aged 18-24. Through a series of psychometric tests and quantitative methods, a sample split between female students aged 18-22 and 35-44 were compared on their academic performance (Carney-Crompton & Tan, 2002). Findings from this study demonstrated superior academic performance from students in the 35-44 age group, even with added responsibilities, stress, and a lack of campus-based social support. This study is among many that provide insight into the capabilities of nontraditional women, while also clarifying that there are inherent contradictions when women who are assumed not to succeed because of added familial responsibilities, do so.

The story of adult students becomes more complex when considering other layers of identity that include income, especially if the student is parenting younger children who require day care. In a 2017 study, the Fragile Families and Child Wellbeing Study results were used in a secondary quantitative data analysis, finding that women who were unmarried, parenting, and low-income, increased their postsecondary attendance as children aged (Radey, 2017). The author also identifies the cycle of starting and stopping enrollment for mothers as a detriment that could be remedied by a change in policy for welfare and financial aid. The focus on both policies together highlight the need for affordable childcare, placing women with small children and income that leads to Pell Grant eligibility at the forefront (Harris, 1993; Kasworm, 2010). A study conducted by the Institute for Women's Policy Research used data from the National Postsecondary Aid Study, the Integrated Postsecondary Education Data System, the Community College Survey of Student Engagement, along with surveys and interviews to focus on childcare

needs for student parents seeking out higher education (Miller, Gault, & Thorman, 2011). In their data is a link between economic mobility and completion of higher education, along with striking differences in gender in 2011 for non-parent students (47.3% men and 52.7% women), single parent students (22.5% men and 77.5% women), and married parent students (36% men and 64% women). Even now, women continue as the majority of students with dependents seeking higher education.

## **Women in Higher Education**

### **History**

Women found their place in the adult education movement during the 1960s in an effort to protect them during the rise of divorce rates and maintain the freedom to enter into the job market (Goldin, Katz, & Kuziemko, 2006). Similar to the need for economic stability, the decision to enroll, mentioned in previous research, prompted women to seek out reentry programs which motivated desire for self-improvement, stability, independence, and an increase in earnings (Seftor & Turner, 2002). Upward mobility, while attractive, still had its limitations for Black and Latinx women from working class families. Their priority during that time, instead, was finding gainful employment that was free from discrimination (Jones, 2010). A difference in the focus of White women and women from other ethnic backgrounds aligned with the different racial and class-related stories of access and completion in higher education for women. Incorporating age adds an additional layer of consideration as women become the majority in institutions of higher education.

More recently, women represented over 50% of students in two-year and four-year institutions (St. Rose & Hill, 2013). Although women's presence on campus continues to be dominant, higher education maintains patriarchal practices that place barriers to their success.

This is especially true for women who are older and those who have dependents. Qualitative research from Haleman (2004) used ethnographic research to unfold the experiences of 10 single mothers pursuing higher education. Findings from this study show that the women often confronted stereotypes about family, motherhood, race, and class while also viewing their educational goals as a motivation and challenge towards those same assumptions. These findings have been echoed in other qualitative and quantitative studies (Haleman, 2004; Katz, 2013). The women included in the studies received welfare funding or were from working class backgrounds, hence, eligible for Pell Grants, but the studies did not highlight whether or how financial aid played a role in their journey.

As noted above, gender plays a pivotal role in the motivations for seeking higher education. Studies that discuss the experiences and outcomes of nontraditional students show results that relate to women and their home responsibilities, traditional roles, and the tension of parenting and pursuing an education. In a cross-national comparison study, Brooks (2012) found differences between universities in the United Kingdom and in Denmark regarding the importance of student identity and focus on family. These findings are similar in the United States for research that tells us the age and number of children, flexibility of work, and a wider range of course schedules have the ability to impose or ease strain on nontraditional age, women students (Katz, 2013; Kates, 1996; Marandet & Wainwright, 2010). Understandably, theory that focuses on women – such as the role of feminism in the context of the U.S – is defined and considered within the theoretical framework of the study.

### **Feminist Theory**

In Moreau's (2016) study of university policy and students who are parenting, theories from sociology and feminism were used along with a clear statement regarding the exclusion of



women in educational spaces. This study highlights the need to use feminism as a means of exploring higher education. Feminism, as explained by Moradi, Subich, and Phillips (2002), is the understanding that any inequality or inferiority of gender should be changed. Further, the authors state that there is a spectrum through which to view feminism that begins with finding balance between genders (liberal feminism) to finding equity that includes race and class, while viewing men as allies (womanism). Including feminism in this study allows for elements of added responsibilities for nontraditional age women to be seen as an asset and not a barrier, but only when adequate resources of childcare and financial aid support are present. We are in a time now where there is a tip in the scales toward women enrolling in college, calling for a change in institutions to acclimate to this dynamic (Buchmann & DiPrete, 2006).

### **Education as Feminism**

As women have shifted from minimal to majority presence in higher education, there are still societal expectations and environments that perpetuate sexism or present additional barriers for women. Even in the early Chautauqua circles, women attended in higher numbers than men and were still subject to judgment (Kilde, 1999). For women, education is not only an interest, but becomes integral for low-income or single mothers to break the cycle of poverty for the next generation (Haleman, 2004; Sharp, 2004). Feminism suggests a reclaiming of power, and in choosing to break a cycle, women can use education as a tool for self, their families, and their communities. For women who are eligible for Pell Grants, this resource continues to dwindle, usurping support for this wave of change in education and the workforce.

## Critical Policy Analysis

### Feminist Policy

As an added layer of perspective, there is a small section of literature with a feminist lens that seeks to challenge the vantage point of political theory as a whole, due to its being created and shared with its advantages towards patriarchal norms. Through a discussion of feminist political ecology lies a connection between the limitation of resources and those who need those resources. There exists a challenge to the ideas of traditional political ecology and its limitation by solely focusing on resource inequity, which includes access to and control over resources and do so based on class or ethnic background (Rocheleau, Thomas-Slayter, & Wangari, 1996).

Considering the previous literature, the policies developed for higher education produce more barriers to higher education for nontraditional students who are also low-income because of their inability to meet their financial need (Kirst, 2004). The Ticknor Society allowed women to increase their knowledge and build a support network of teachers and learners to challenge how they were seen in the social environment in the early 1900s (Bergmann, 2001).

It is this type of practice that helps to propel marginalized communities of women into higher education. However, this community-based approach does not always reach key decision makers at the state and federal levels of government. This is particularly relevant historically, as in the early years of women's access to higher education, their pursuit of education was described as their being involved in a "silent university" also tying into the invisibility of women and their education during that time (Bergmann, 2001). Their absence from institutions in a formal capacity, kept their family and educational work within the home.

## **Critical Feminist Policy Analysis**

Critical feminist policy analysis has been applied by Shaw (2004), who defines Critical Feminist Policy Analysis as a way to share the individual experiences of women, while also challenging the idea that policy is “gender neutral.” Research from other scholars present an opening for critical analysis within quantitative methods, and due to the increase in nontraditional age students, who are able to invest in higher education once their children are of school age, higher education policy is inherently gendered (Dunn & Mulvenon, 2009). Similarly, when policy is not gendered, it indeed places women in silence. Combining these theories helps connect the policy decision process at the federal level, to the benefit of nontraditional age women. Further, it is necessary for these same nontraditional students to be recognized as deserving of access to limited resources while pursuing higher education as a way out of poverty.

### **Summary**

This chapter comprehensively reviews the guiding literature that provides the foundation for the study. Nontraditional students have continued to be a small presence in higher education literature, but have a significant role in higher education history. The literature review also provided histories of higher education and the creation of the Pell Grant, while also highlighting the importance of using feminist theory to guide the perception of policy and its impact on nontraditional age students. Following this in Chapter Three – Methodology is the next step in considering how to identify factors of success for nontraditional students.

## **CHAPTER 3**

### **METHODOLOGY**

#### **Setting and Sample**

This chapter explains the use of quantitative research design for the study, including the data selected, its origins, operational use of variables, research questions, and analyses procedures. For this particular study, the use of secondary data analysis was employed as a way to develop greater insight for nontraditional aged college students. A need for a longitudinal data was important to learn more about the preparedness of institutions of higher education to retain and graduate nontraditional aged students. The research design included traditional quantitative methods and a thread of critical feminist policy analysis to address systems of inequality.

#### **Data and Sample Selection**

Data were retrieved from a restricted-use data set from the Beginning Postsecondary Students Longitudinal Study (BPS). Students in this study were surveyed after the first year of matriculation with a follow-up survey at the end of students' third and sixth years. Equally relevant was the connection BPS data had to financial aid. Since the first cohort of the study, student data used in BPS was a subset of data from the National Postsecondary Student Aid Study that focused on how students paid for college. The data set was also large enough to show generalizability and included information spanning six-years to accommodate degree completion timeline trends (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006).

The BPS survey captured data on students who enrolled in higher education for the first time and captured information at the first year (2003-2004), after three years of enrollment (2005-2006) and finally at six-years post-enrollment (2008-2009). The sample included in this study were from the first survey (2003-2004), the year three survey (2006-2006) as well as the

six-year follow up survey (2008-2009). Using this as a timeline aligned with the six-year average graduation rate for degree-seeking students in four-year institutions, but more specifically, reaches beyond the three-year expectation of degree completion for community college students (Bailey et al., 2006).

The beginning total of students (n=15,390) was narrowed by removing students younger than 18 years of age. Institution attendance in the first year (2003-2004) is defined using the Carnegie Classification of Institutions of Higher Education framework which defined institutions based on specific characteristics such as degree granting type, proportion of curriculum focused on liberal arts, etc. (Carnegie Foundation for the Advancement of Teaching, 2004). Considering these factors and the focus on a comparison between traditional and nontraditional students, institution type was considered closely, relevant to stated research in Chapter Two – Literature Review about college choice.

### **Reflexivity Statement**

Reflexivity statements are most commonly used in qualitative research. The purpose of these statements is to name the researcher's own connection to the data, environment, and participants as well as proactively identify bias, increase credibility, and lessen subjectivity (Ryan & Golden, 2006; Cunningham & Carmichael, 2018). The use of these statements, however, is not present in the majority of quantitative research. There is an assumption that quantitative research is objective in nature if the researcher had not communicated with or had any interactions with individuals who supply the data. Or that simply identifying reliability and validity of data or methods was enough. I disagree. In approaching any method of research, I believe that the researcher brings their lived experiences, assumptions, and knowledge to the decisions made from confirming a research topic to sharing recommendations for future research

(Lamb & Huttlinger, 1989). It is important for reflexivity to be named and present in research of all kinds, whether qualitative or quantitative and in particular for sociological research that has a feminist motivation (Cunningham & Carmichael, 2018; Finlay, 1998; Finlay, 2012).

My decision to select nontraditional age women as a central focus came from my experience as a first generation college student. My mother did not complete community college due to her focus on providing financial support for me. I often wondered what her experience would have been if she decided to return to complete a degree and noticed that many of the things I shared about my own experience in college were unknown to her. I imagined then, the women in my family who received financial assistance through federal welfare programs and the constraints they felt, knowing that if they wanted to earn more they would need a degree. A degree they could not afford. I also recognized that my experience is not the same as my mothers' or family members' experiences and that I entered this research from a place of economic privilege.

Beyond my choice of topic and scope of this dissertation, there was the need to be cognizant of the limits that quantitative research has in only telling part of the story of an individual, group, or community (Bryman, Becker, & Sempik, 2008; Wren, 2004). This helped me limit how much I generalized results into assumptions. Later in the chapter, I discussed how I recoded variables in an effort to centralize minoritized groups, demonstrating transparency (Newton, Rothlingova, Gutteridge, LeMarchand, & Raphael, 2011). Finally, any research worth spending time on has significance for every person doing that research, which is why I included this statement to honor my own lived experiences and interests derived therefrom.

## Methodology

Research which focused on low-income students and women cited in Chapter Two used a combination of quantitative studies while also highlighted qualitative methods to give depth to specific stories and patterns for low-income women especially. To maintain alignment with the centering of women as well as the use of quantitative methods to predict patterns of attainment, I used a method of logistic regression, ordered logistic regression (OLR) to answer the research questions (Green & Silverman, 1993). Using this method, I had the ability to isolate predictors, compare groups by age and gender, as well as view how interactions between selected variables shifted outcomes for women's attainment in higher education. Following these analyses, a generalized structural equation model (GSEM) was produced using multinomial regression.

In the interpretation of results, I applied a critical lens to honor marginalized communities in research. I also expected to pay close attention to statistical significance and sought greater value in designing each model, aligned with finding factors that influence attainment (Kline, 2015). Other researchers such as Voorhees (2001) and Nora, (1990), used *linear structural relations* (LISREL) to analyze student financial aid, namely Pell Grants and retention of community college students. This amplified the ability of researchers to invest time in telling a more complicated quantitative story, similar to my use of OLR and GSEM.

### Research Questions and Guiding Hypotheses

- (1) How do nontraditional age undergraduate students vary by gender and socioeconomic status, Pell Grant receipt, institutional characteristics, and degree attainment as compared to students aged 23 and younger with or without children?

*H<sub>1</sub>: Nontraditional age undergraduate students will have lower degree attainment than students aged 23 and younger, when controlling for Pell Grant receipt, background characteristics (gender, race, socioeconomic status) and institution type.*

(2) For nontraditional age students who began in community college: which factors support Pell Grant recipients in their completion of a credential or degree within the community college system compared to those who did not receive Pell Grants?

(a) Academic Performance

(b) Hours Worked

(c) Dependent children

*H<sub>2</sub>: Nontraditional age community college students will have lower degree attainment than students aged 23 and younger; negative factors inhibiting attainment include academic performance, hours worked, and dependent children.*

(3) To what degree does institutional type affect nontraditional age students earn credentials as compared to students 23 and under, when controlling for Pell Grant receipt, hours worked, and dependent children?

(a) Institution Type

(b) Gender

*H<sub>3</sub>: Nontraditional age undergraduate women will have lower degree attainment than students aged 23 and younger and show positive effects for gender and four year institutions.*

(4) For questions 2 and 3: How do the listed factors predict degree attainment when comparing for nontraditional age women and men with dependents?



*H4: Nontraditional age undergraduate women students will have higher degree attainment than nontraditional age men and dependents will be a negative factor influencing women's attainment.*

## **Analyses**

### **Ordered Logistic Regression**

Analysis for the above research questions centered on ordered logistic regression analysis (OLR) because of the ordinal nature of the outcome variable for attainment to delineate no attainment (=0), certificate attainment (=1), associate's degree attainment (=2), and bachelor's degree attainment (=3) (Williams, 2016). In a study using data from the 2002 Educational Longitudinal Study (ELS), ordered logistic regression was applied to examine college choice with ordinal outcome variables: student (=1), worker (=2), working student (=3), unemployed (=4) (Lee, Almonte, & Youn, 2012). Below is a general model that illustrated the subsequent analysis models for the outcome variable of attainment.

$$P(\text{Attain}_{t+i} / \text{Attain}_t) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{Pell Grant}_i + \beta_3 \text{academic performance}_i + \beta_4 \text{institution type}_i + \beta_5 \text{hours worked}_i + \beta_6 \text{dependents}_i + \beta_7 \pi \text{demographics}_i + \varepsilon_i$$

Where P = the likelihood of attainment and *t* the type of attainment (certificate, associate's, bachelor's), *i* as the individual respondent, with  $\beta$  identifying the slope intercept and subsequent variables included for model specification later in chapter four analysis. Included also is  $\pi$  serving as a vector for demographics (race, income, gender) and  $\varepsilon$  represented any unobserved variables unaccounted for in the model.

Final models used for analyses included a base model, academic performance model, dependent children model, employment model, and interaction model.

### **Model One – Base Model**

$P(\text{Attain}_{t+i} / \text{Attain}_t) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{gender} + \beta_3 \text{Pell Grant}_i + \beta_4 \text{institution type}_i + \beta_5 \text{first generation status}_i + \beta_6 \pi \text{demographics}_i + \varepsilon_i$

### **Model Two – Academic Performance**

$P(\text{Attain}_{t+i} / \text{Attain}_t) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{gender} + \beta_3 \text{Pell Grant}_i + \beta_4 \text{institution type}_i + \beta_5 \text{first generation status}_i + \beta_6 \text{academic performance}_i + \beta_7 \pi \text{demographics}_i + \varepsilon_i$

### **Model Three – Dependent Children**

$P(\text{Attain}_{t+i} / \text{Attain}_t) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{gender} + \beta_3 \text{Pell Grant}_i + \beta_4 \text{institution type}_i + \beta_5 \text{first generation status}_i + \beta_6 \text{academic performance}_i + \beta_7 \text{dependents}_i + \beta_8 \pi \text{demographics}_i + \varepsilon_i$

### **Full Model – Employment**

$P(\text{Attain}_{t+i} / \text{Attain}_t) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{gender} + \beta_3 \text{Pell Grant}_i + \beta_4 \text{institution type}_i + \beta_5 \text{income}_i + \beta_6 \text{academic performance}_i + \beta_7 \text{dependents}_i + \beta_8 \text{hours worked}_i + \beta_9 \pi \text{demographics}_i + \varepsilon_i$

### **Interaction Model**

$P(\text{Attain}_{t+i} / \text{Attain}_t) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{gender} + \beta_3 \text{Pell Grant}_i + \beta_4 \text{institution type}_i + \beta_5 \text{income}_i + \beta_6 \text{academic performance}_i + \beta_7 \text{dependents}_i + \beta_8 \text{hours worked}_i + \beta_9 \text{age*women}_i + \beta_{10} \text{age*Pell Grant}_i + \beta_{11} \pi \text{demographics}_i + \varepsilon_i$

As the models showed, each is additive, up to model three. Model four shifted from use of first generation status to reported income to reduce collinearity of results. The final interaction model highlighted the significant findings from previous models for nontraditional aged women and nontraditional aged students receiving Pell Grants.

### **Variables**

The variables were recoded from their original format suggested by Averett and Burton (1996) through binary coding (e.g. 1, 0) to facilitate clarity and consistency in the analysis.

Although BPS data was derived from the National Postsecondary Student Aid Study (NPSAS) survey, its independent reliability interviews, where participants were re-interviewed four to six weeks following their initial interview prompting question revisions (Salvucci, Walter, Conley, Fink, & Saba, 1997).

Variables included in this study have been described within Chapter Two – Literature Review to provide historical and contextual background on terminology and research related to the specific variable discussed. The following section provided insight on how each variable was defined and used within the statistical analysis procedures for the study. Operationalizing variables was encouraged by researchers to develop a common language for each factor included in a study that included its numerical treatment and its connection to concrete experiences in the world (Bovey & Hede, 2001; Calder et al., 2016). Situating each variable in this way continued the understanding from the literature and translated it to relatable knowledge of what each variable means in daily life.

### **Dependent Variable: Educational Attainment**

The dependent variable was attainment in six years, where attainment included students who were still enrolled during the third and final survey year (2008-2009). Attainment, while broadly defined referred to the completion of an associate's or bachelor's degree, instead included any credential earned. This accounted for respondents whose goal was to increase income and those who aimed for additional education, certificates, and training. Respondents were recoded to match attained completion, whether it was no credential (0), certificate (1), associate's degree (2), and bachelor's degree (3) by the time of the study close in 2009.

## **Independent Predictors: Background Characteristics**

**Gender and sex.** As mentioned, the use of binary variables facilitated clearer interpretation of variables for statistical analyses. However, the operationalization of gender or sex in this case is more complex, as past researchers who developed the data that was used in the study placed sex as a variable, using a binary (male, female) to group respondents. While this did initially provide clarity for the research for the 2004-2009 dataset, currently, in 2018, the conversation about sex and gender has evolved. I shared this in order to define that for the purposes of this study, the binary values (1, 0) were be used, but were also shifted to identify 1=female and 0=male. This, along with the reverse binary coding for racial and ethnic backgrounds centered minoritized groups such as women and underrepresented students in higher education.

**Age.** To fully isolate the sample for analysis within the BPS dataset and to clarify the independent variable of age, the analysis focused on comparing students aged 24 and older to those aged 18-23 when beginning postsecondary education. The total participants in the sample (n=15,390) was recoded to identify which students were below the age of 24 (coded as 0) and those who were 24 and older (coded as 1). Binary coding was useful when separating the variables within a data set to identify the predictors and outcomes for analyses (Averett & Burton, 1996).

**Race and ethnicity.** Similar to the reverse use of 1=have and 0=have not, I also placed a value of 1 for the racial and ethnic values in the sample, that included Black or African American, Hispanic or Latinx (BPS-Latino), Asian Pacific Islander (BPS-Asian and BPS-Native Hawaiian), First Nation or Indigenous (BPS-American Indian or Alaska Native), Biracial or

Multiracial (BPS-Other and BPS-More than one race). This was done in place of traditional methods that use 1=White.

**Family income.** Another variable, such as first generation status and classification of low-income status aligned students in the sample with their eligibility for federal programs. This included programs such as TRiO (named for the *three* initial programs: Upward Bound, Talent Search, and Student Support Services) that focused on access to higher education for students who were the first in their family to attend college and/or who were from low-income households (McElroy & Armesto, 1998; Romano & Millard, 2006). This variable also showed which students were first generation college students, giving insight to parental attainment.

**Pell Grant status.** Students who received Pell Grants were recoded as cumulative award dollars received during that time. Respondents who did not receive Pell Grants were coded as 0=no Pell, while others who have received within the range included in the data (\$100-\$25,241) over the course of six years, were separated into thirds to account for the approximate total cost of one year, or \$8,879 found in the *Digest of Education Statistics* as the average cost for tuition, fees, room and board for two-year institutions (National Center for Education Statistics, 2013). Data for this variable were recoded into low Pell, middle Pell, and high Pell. The highest amount received, \$25,241 covered almost three years of education. As an example, students who were able to use the full amount could afford an associate's degree.

### **Independent Predictors: Postsecondary Elements**

**Institution type.** When considering institution type during the first year, institution attendance in the first year (2003-2004) was defined using the Carnegie classification system. This helped determine where students began their educational journey. All institution types were included in initial analysis to include certificate-based training for attainment.

**Academic performance.** Lastly, I separated academic performance for the closing survey year (2008-2009) into three categories: low (0.00-2.00), mid (2.01-3.00), and high (3.01-4.00). Including academic performance at the close of the year assisted with determining how nontraditional students fared compared to students 23 and younger.

### **Independent Predictors: Work Obligations and Dependents**

**Hours worked.** Often included in family income is the income level for students at the point of entry that are separated into income quartiles for traditional age students. However, for independent students who were also nontraditional age, the number of hours worked provided the ability to see the time constraint that working hours had for nontraditional age students in the sample. Working was coded as 1 and not working was coded as 0 for two points in time, year three (2005-2006) and year six (2008-2009).

**Dependent children.** The number of dependent children was not available for all years of the survey. Data was included from the first year entered (2003-2004) and the last year of the survey (2008-2009). Similarly, responses stated whether or not students reported having children at the time of entry and at the time of exit. Students with no children were coded as 0.

### **Limitations**

What was not included in this study was the effect of environment within public higher education, which may influence access to support, knowledge of support, or absence of support at the institution-level. In addition to this environmental limitation, there was also a small amount of nontraditional students ( $n = 2,280$ ) in the dataset, which presented challenges for comparisons between unequal groups for each model of analysis.

Persistence was noted for all participants included in the sample, but the main variable was a measure of attainment through 2008-2009, the final survey year. Additionally, transfer

status was not clearly defined and was not used for analyses. While the number of transfers would have assisted in understanding what role transfer has in attainment, the direction of transfer and to what type of institution was unavailable. This limited the ability to see whether and how transfer specifically influenced attainment outcomes for nontraditional students.

### **Summary**

The analysis plan described in this chapter considered secondary data in an effort to use a nontraditional approach to gauge factors of success for nontraditional student attainment. A description of the data set, its origins and relevant variables were included to provide concrete examples which build upon the literature review in Chapter Two. As the study evolved, the use of ordered logistic regression and a sensitivity analysis using general structural equation modeling was presented to include the directional influence of the variables, aligning with the research questions and patterns available in the literature. An in-depth analysis was conducted and included in Chapter Four, with a closing Chapter Five which shares relevant recommendations for policy and future research.

## **CHAPTER 4**

### **RESULTS**

As described in Chapter Three (Methodology), I addressed the research questions by estimating ordered logistic regression models. After reviewing variables and applicable NCES documentation, data were cleaned and descriptive statistics organized, described below. The sections that follow include an interpretation of the ordered logistic regression models related to the stated research questions. All analytic results are organized by dependent, and independent variables for consistency.

#### **Descriptive Statistics**

Descriptive statistics describe data by capturing frequencies, mean differences among subgroup populations, and patterns. I present this information prior to describing analyses that highlight specific trends, similarities, and differences for nontraditional and traditional age students. Beyond comparisons among these variables, it is necessary to also consider the spread of the data. Below I describe descriptive relationships between predictor variables, which show results of the correlation matrix which predicted preliminary relationships among key variables, and finally, statistical analyses which assisted in answering the research questions.

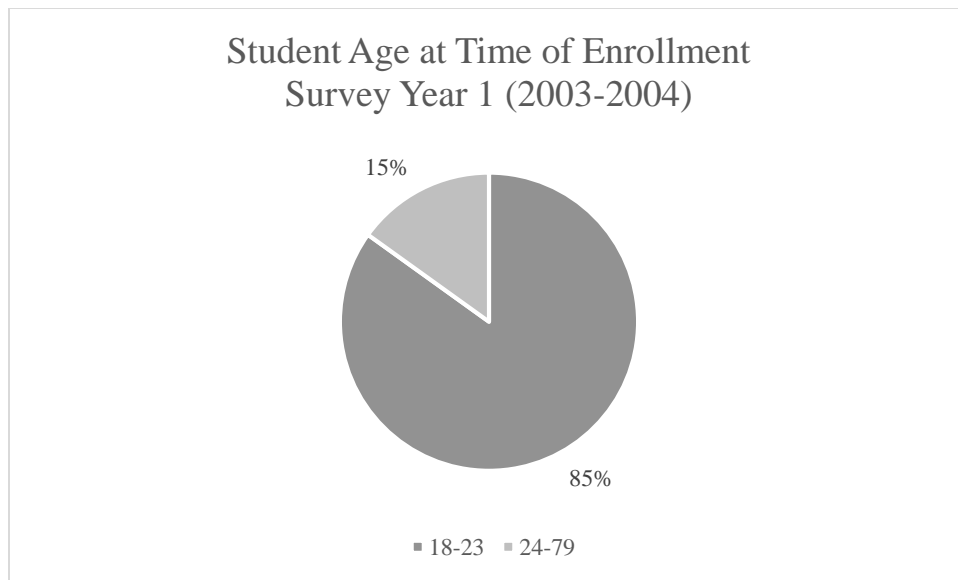
#### **Sample Characteristics**

As this study centralizes age, gender, and Pell Grant receipt, the full BPS: 2004/2009 dataset ( $n = 15,390$ ) was narrowed to only include students who were 18 years of age or older ( $n = 15,130$ ) as of year one (2003-2004). As shown in Appendix Table 5, 15% ( $n = 2,280$ ) of the final analytic dataset were nontraditional age students (between 24 and 79 years old) while 85% were traditional age students (18-23 years old). Gender also varied within these age groups, with 66% ( $n = 1,500$ ) of nontraditional age students and 57% ( $n = 7,340$ ) of traditional age students



identified as women. The paragraphs below detail descriptive patterns in key variables for the study.

**Nontraditional aged students.** Of the full number of cases included in the data, traditional age students comprised 85% of the analytic sample, a clear majority (Figure 1). This group served as the reference contrasted against outcomes for nontraditional students within the statistical models. Fifteen percent of students were aged 24 and older at the time of enrollment. These “*nontraditional aged students*” represent a smaller share of the U.S. student population; but, as has been argued here, they are an understudied and undertheorized population nonetheless affected by federal financial aid policy. The educational attainment of nontraditional age students was the focus of this study.



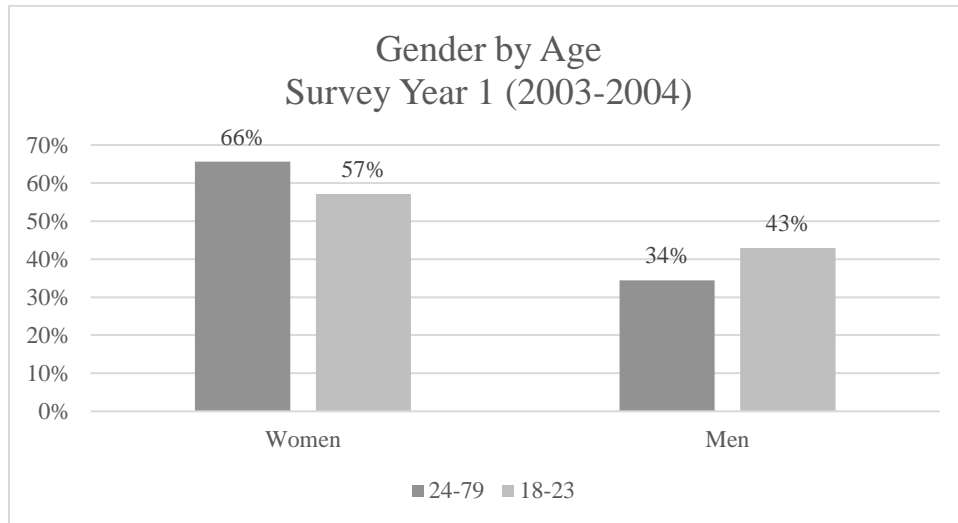
**Figure 1. Student age at time of enrollment as of survey year 1 (2003-2004)**<sup>1</sup>

**Gender.** Women represented the largest portion of the sample: a total of 58% of the full sample identified as women and 42% as men (Figure 2). When examining separate age groups,

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<sup>1</sup> Figures are unweighted and rounded to the nearest 10, as directed by National Center for Educational Statistics restricted-use data regulations. Sample totals may be inexact, on account of this rounding. See Appendix Table 5.

women were the majority in each. Women represented 57% of traditional age students and 66% of nontraditional students. Correspondingly, men represented 34% of the nontraditional age group and 43% of the traditional age students.



**Figure 2. Gender and age as of survey year 1 (2003-2004)**

**Dependent Variable: Attainment**

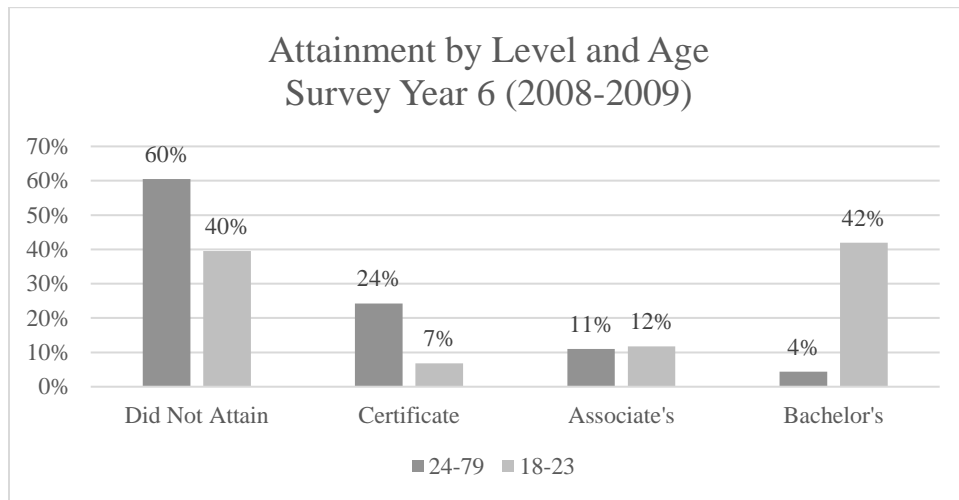
Across the six-year span of the study, 60% of nontraditional age students did not attain a degree or certificate compared to only 40% of traditional age students (Figure 3). Certificate attainment was higher for nontraditional students at 24% while only 7% of traditional age attained this same credential. Associate’s degree attainment was about the same across age, but bachelor’s degree attainment was very low for nontraditional age students, who earned these degrees at a rate of 38 percentage points lower than traditional age students.

**Independent Variables**

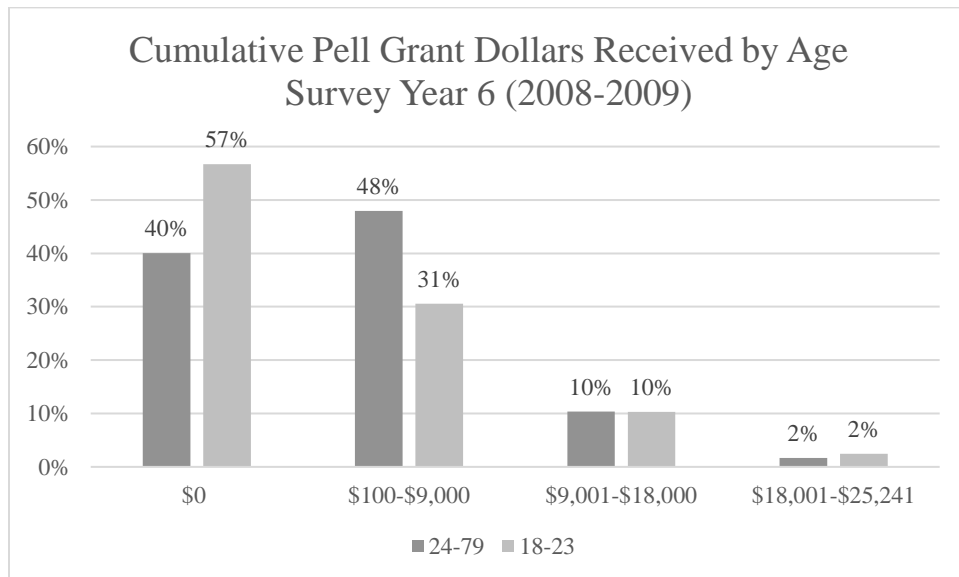
**Pell Grants.**

**Cumulative Pell Grant dollars.** Pell Grant scholarship funding was examined both with respect to the duration of years and cumulative amounts. A total of 48% of nontraditional age students compared to 31% of traditional age students received up to \$9,000 in Pell Grant dollars

through six years of survey data (Figure 4). There were comparable numbers of Pell recipients in each of the age groups, with 12% overall using more than \$9,000 towards their education.



**Figure 3. Degree attainment by level and age by survey year 6 (2008-2009)**

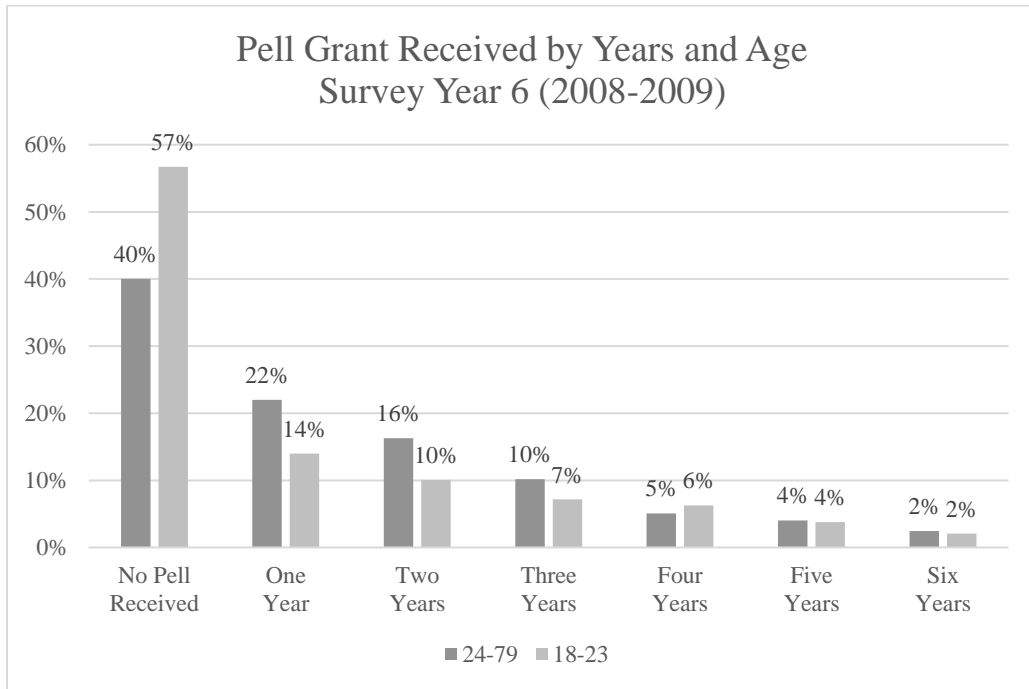


**Figure 4. Cumulative Pell Grant dollars received by age as of survey year 6 (2008-2009)**

Due to the prevalence of Pell Grant scholarship recipients in the low and middle dollar groups, I conducted a two-sample *t*-test to confirm whether a difference was present in the means

of both groups. The difference was significant, affirming that there were more traditional than nontraditional students in the low Pell Grant group.

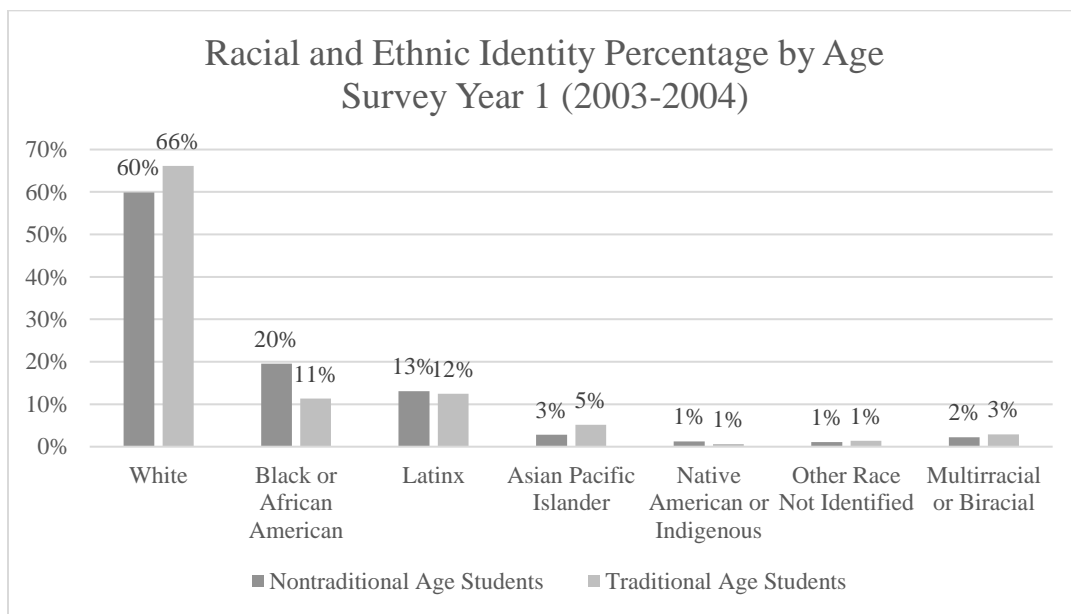
**Years awarded Pell Grants.** Similar to findings above, nearly 60% of traditional students did not receive Pell Grants (Figure 5). Specifically, only 43% of traditional aged students were eligible, applied for, and received Pell Grants for one year or more. By contrast, only 40% of nontraditional aged students did *not* receive Pell Grant funding. Sixty percent of nontraditional age students received Pell Grants for one or more years across the six-year survey. There continued to be marked differences by age group among those receiving one and two years of Pell funding. However, among the small number of students who received four years or more of funding, the age differences were negligible. Within the nontraditional and traditional age groups, 11% and 12% of students, respectively, received Pell funding for four years or more.



**Figure 5. Pell Grant received by years and age as of survey year 6 (2008-2009)**

## Covariates

**Racial and ethnic backgrounds.** Racial and ethnic background representation for nontraditional students and traditional students were consistent across both age groups, with some differences in representation of White and Black or African American students. There was a difference of nine percentage points across the two age groups for the Black or African American racial and ethnic group (Figure 6): 11% of traditional age students and 20% of nontraditional students were Black or African American. For the White racial and ethnic group, there was a six percentage point difference, with 66% of traditional age and 60% of nontraditional age students identified as White.

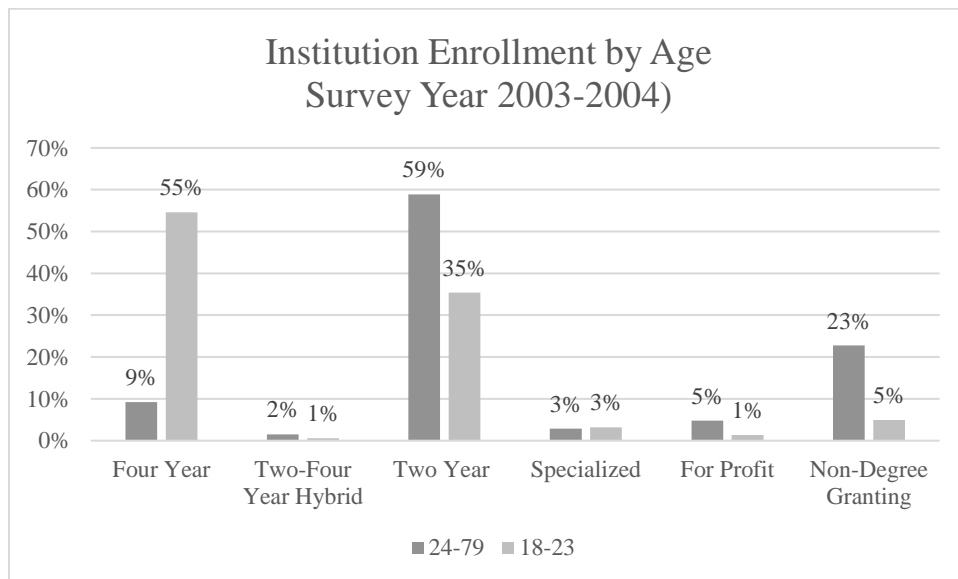


**Figure 6. Racial and ethnic identity percentage by age as of survey year 1 (2003-2004)**

Numbers are more similar across age groups for the following racial and ethnic groups: Latinx (12% of the traditional and 13% of the nontraditional groups); Other Race – Not Identified (1% of the traditional and 1% of the nontraditional groups); Multiracial or Biracial (3% of the traditional and 2% of the nontraditional groups); Asian Pacific Islander (5% of the

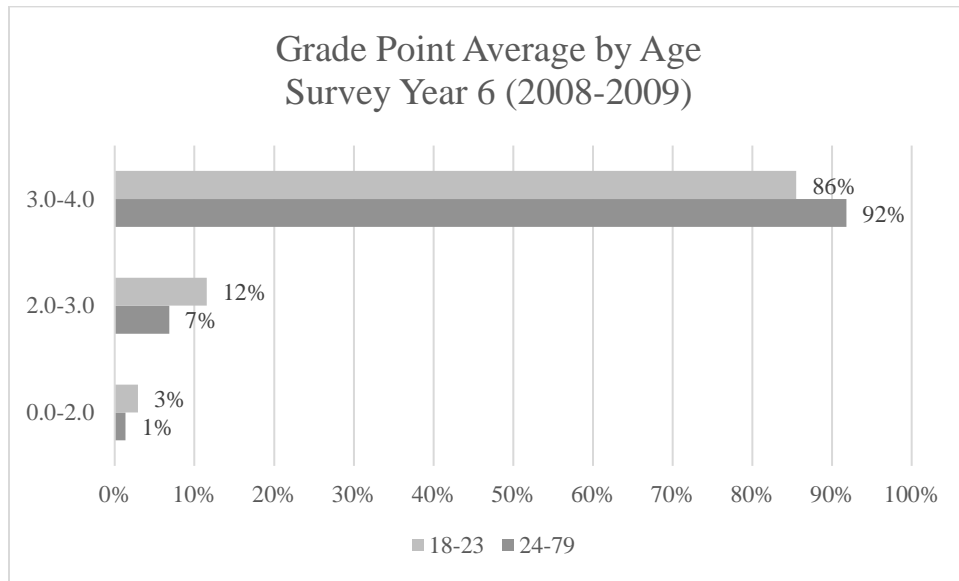
traditional and 3% of the nontraditional groups); and First Nation or Indigenous (1% of the traditional and 1% of the nontraditional groups). While numbers are smaller for First Nation or Indigenous groups in the sample, I chose not to aggregate these groups. I considered it important to note smaller populations within the sample, especially for groups that are minoritized and have less access and support for higher education.

**Institution type and academic performance.** Aligned with literature presented in Chapter 2, nontraditional students attended two-year institutions and non-degree granting institutions more than traditional age students within the dataset (Figure 7). Fifty-nine percent of nontraditional age students enrolled in two-year colleges in the first year compared to 35% of traditional age students. Conversely, 55% of traditional age students enrolled in four-year institutions, and 9% of nontraditional age students made the same decision. When reviewing the descriptive means for both students who enrolled in two-year institutions and those who enrolled in four-year institutions, there were significantly more who enrolled in four-year institutions.



**Figure 7. Institutional enrollment by age as of survey year 1 (2003-2004)**

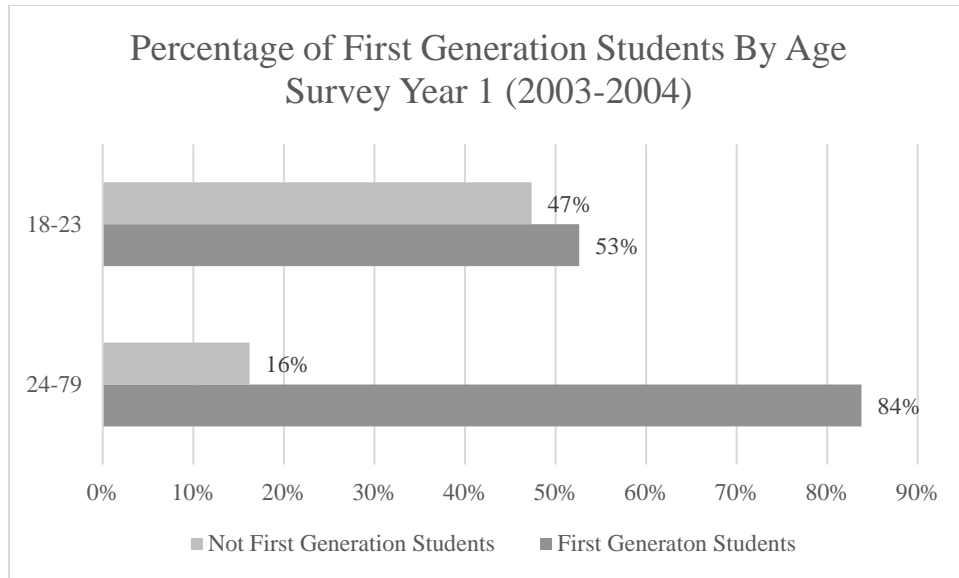
Regardless of institution choice, 92% of nontraditional students held grade point averages above a 3.0 (B average) in the survey closing year 2008-2009 (Figure 8). This is congruent with previous research that demonstrated the high academic performance and preparedness of nontraditional students, even with additional responsibilities of work and care for dependents.



**Figure 8. Grade point average by age as of survey year 6 (2008-2009)**

**Parental education and income.**

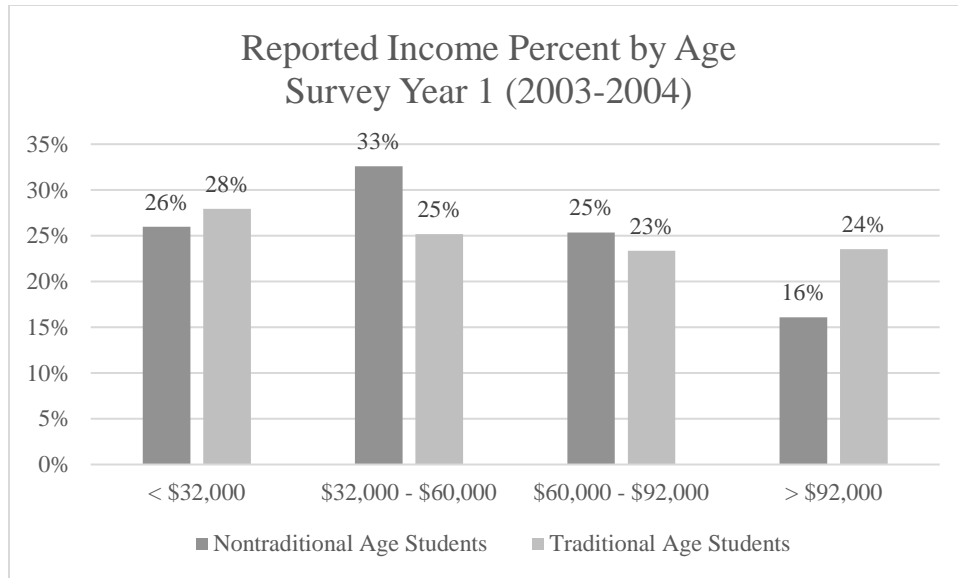
*Parental education.* This variable includes both measures for income and for first generation student status. Eighty-four percent of students from nontraditional age backgrounds identified as first generation college students (Figure 9). For traditional age students, 53% identified as first generation, a 31 percentage point difference between the age groups. A test of means was conducted to confirm whether the mean of first generation students who are not low-income was equal to the mean of students who were not low income and not first generation. It was found to be insignificant, meaning that the means between the two groups are similar.



**Figure 9. Percentage of first generation students by age as of survey year 1 (2003-2004)**

**Reported income.** Rates of students by age group was similar across low income (less than \$32,000 per year) and high-middle income (between \$60,000 and \$92,000) levels, with a 2 percentage point difference between age groups within these income categories (Figure 10). For low-middle income and high income there was more difference between the age groups, with more nontraditional students (33%) reporting low-middle income (between \$32,000 and \$60,000 per year) and fewer (16%) reporting high income a (more than \$92,000 per year). When testing for a difference in means for the two groups across all ages that are from low-middle income and high-middle income, the test was significant, showing that there is indeed a difference between the two middle income groups.



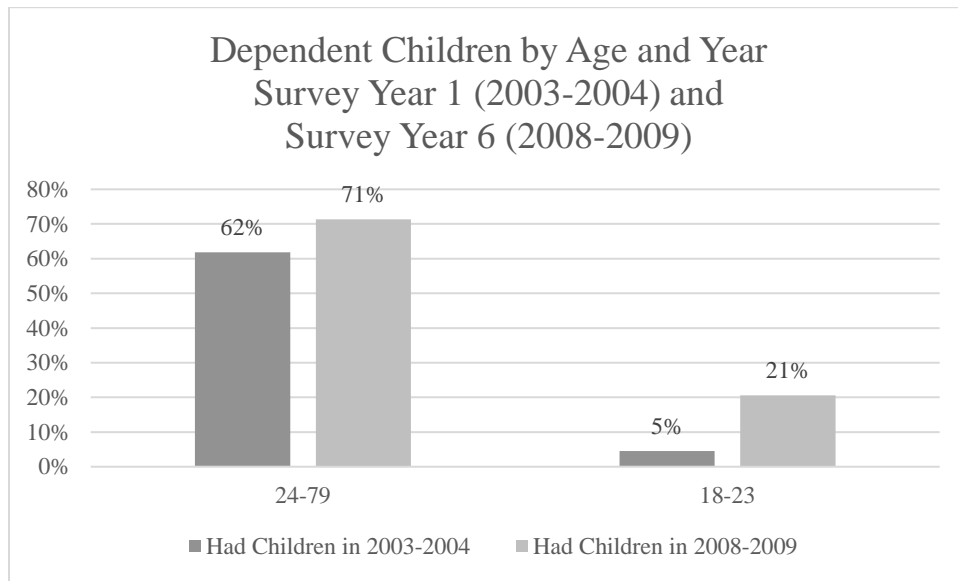


**Figure 10. Reported income percent by age as of survey year 1 (2003-2004)**

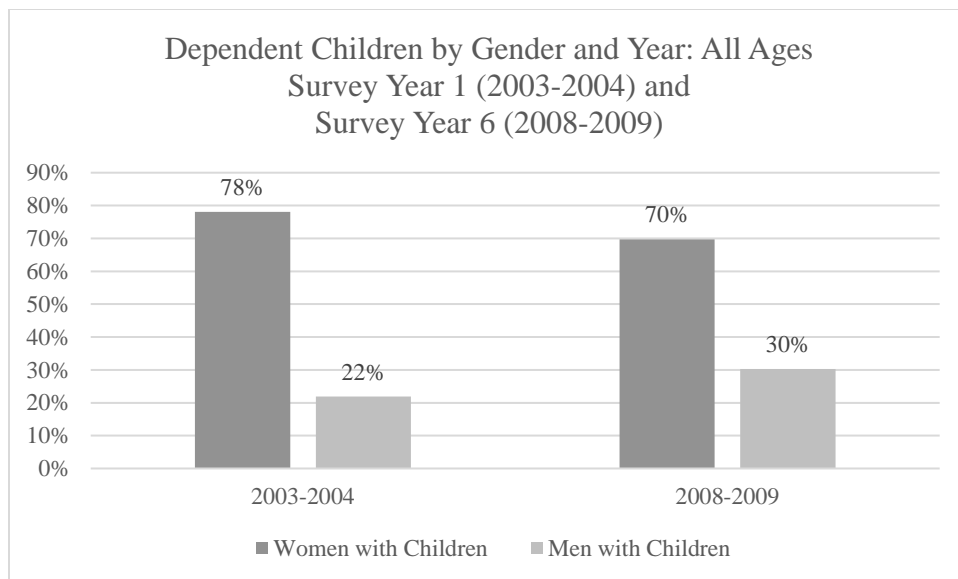
**Dependent children.** There was a higher representation of students who had children within the nontraditional age student group (Figure 11). However, this number increased for both age groups from the first survey year (2003-2004) to the final survey year (2008-2009). Notably, 62% of nontraditional students compared to only 5% of traditional students had children when they entered college in 2003-2004, a 57 percentage point difference between the groups. Even with the passage of time and the growth of participants' families, there was still a 50 percentage point difference in the rate of nontraditional and traditional students who had children in 2008-2009.

To continue to center gender in this study, I examined more closely the number of women and number of men with children across all groups. Higher numbers of women than men reported having dependent children during the first survey year (2003-2004) and the final survey year (2008-2009) (Figure 12). Specifically, women's rate of caring for dependents was 56 percentage points higher than men during the first survey year and 40 percentage points higher

than men in the final survey year. Of all students who had children, women more often cared for dependents while managing additional work, and in this case, educational responsibilities.

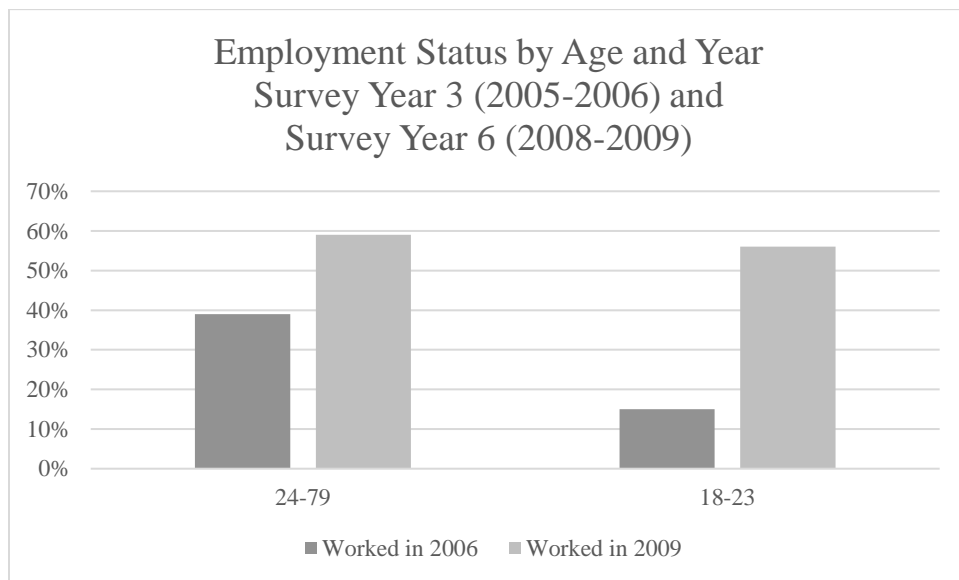


**Figure 11. Dependent children by age and year, comparing survey year 1 (2003-2004) and survey year 6 (2008-2009)**



**Figure 12. Dependent children by gender and year: all ages, comparing survey year 1 (2003-2004) and survey year 6 (2008-2009)**

**Work.** In addition to dependents, students who worked were also more present in the nontraditional age group. The largest difference in the rates of students who worked between the traditional and nontraditional groups occurred in the third year of the survey (2005-2006) (Figure 13). Within the nontraditional group, 39% worked compared to only 15% of traditional students in the third survey year. This number evened out by the final year of the survey (2008-2009) with only a three percentage point difference between nontraditional age students who worked (59%) compared to traditional age students (56%).



**Figure 13. Employment status by age and year, comparing survey year 3 (2005-2006) and survey year 6 (2008-2009)**

### Correlation Matrix

Before estimating the regression models, I measured the correlation between key variables measured at certain survey years: age (2003-2004), gender (2003-2004), dependent children (2003-2004 and 2008-2009), Pell Grant years received (2008-2009), Pell Grant amount received (2008-2009), and first generation status (2003-2004). Results for the correlation matrix

were recorded at each level of significance ( $p < 0.05$ ,  $p < 0.01$ , and  $p < 0.001$ ) and assisted in determining the strength and direction of the relationships.

Variable combinations that held maximal correlation included dependent children, age, and Pell Grant years and amount. Having dependent children (2003-2004) and being a nontraditional age student were correlated at 0.60 ( $p < 0.001$ ). The inverse was true of dependent children (2003-2004) and traditional age students (-0.60,  $p < 0.001$ ). Having dependent children at the start of enrollment (2003-2004) was also correlated with having dependent children in year six (2008-2009) at 0.60 ( $p < 0.001$ ). Receiving a total of \$9,000-\$18,000 in Pell Grant funds was correlated with receiving six years of Pell Grant awards 0.70 ( $p < 0.001$ ). These correlations illustrated that children and age were strongly correlated in addition to the amount and years of receiving Pell Grants.

Because the share of students attaining multiple years of Pell Grants was small and the correlation between Pell Grant years and dollars was high, only Pell Grant dollars are included in the analytic models. Further, early estimations of the analytic models violated multicollinearity assumptions when including Pell Grant years in the models, irrespective to how the variable was coded. Therefore, the decision to exclude this variable altogether supported the development of more parsimonious models and prevented potential measurement error. Next, I introduce and discuss the final analytic models and findings.

## **Analytic Models**

### **Ordered Logistic Regression**

This study used ordered logistic regression method to make inferences about the relationships between age, gender, and academic outcomes. Ordered logistic regression (OLR) allows concurrent model estimations for each level of the outcome variable (Green & Silverman,

1993; Winship & Mare, 1984). In this case, the outcome categories were: no attainment (reference category), certificate attainment, associate's degree attainment, and bachelor's degree attainment. Four models were specified within the analyses, and a final interaction model building off the fourth full model was estimated and analyzed as well (Tables 1 and 2). Following the discussion of the individual predictions, I compare the models' OLR cut points. Predicted probabilities are presented in addition to odds ratios and standard errors (Table 3).

For additional context, I conducted a sensitivity check by estimating a complementary, multinomial generalized structural equation model (GSEM) on variables in the final model. This model aligned with the OLR model (Appendix A4). In addition, to enhance the generalizability to a national sample a panel weight was used on the data, entered in as a probability weight (*pweight*) in Stata 15. This weight (*wtb000*) applied to BPS survey years 04/06/09 (Wine, Janson, & Wheelless, 2011). These efforts were instituted to provide maximum generalizability from the results to the greater population.

### **Model Composition**

A total of four statistical models were estimated with ordered logistic regression, as described in Chapter Three. The models include the dependent variable of attainment and primary independent variables of interest: age, gender, and Pell Grant dollars received. Across all models, I also included independent variables such as racial and ethnic background, institution type, and grade point average. Models differed in their inclusion of first generation status and income group, and later models incorporated dependent children and employment status during enrollment. All models held statistical significance in their prediction of attainment. Specific results are shared related to the research questions and grouped using the conceptual framework from Chapter Three.

## **Odds Ratios**

Model results are shared using odds ratios. Odds ratios between 0 and 1 are read as “less likely” or a negative predictor, while odds ratios above 1 are “more likely” and positive in direction (Williams, 2006). For categorical variables, odds ratios are read in relation to the variable’s reference group; for example, nontraditional age students are compared to the reference group of traditional aged students, women are compared to men, and so on.

### **Model One: Base Model**

All models reported in Table 1 estimated educational attainment, the primary outcome variable. Nontraditional student age was a statistically significant negative predictor (odds ratio (OR) = 0.62;  $p = 0.001$ ) when controlling for gender, race, Pell Grant amount, institution, and first generation status. Identifying as a woman was statistically significant and positive (OR = 1.31;  $p = 0.001$ ), consistent with findings for women’s attainment in higher education. Gender in model one showed a higher likelihood of attainment.

In contrast, Pell Grant receipt requires nuanced consideration. Overall, the independent effects of Pell Grant scholarship dollars positively predicted educational attainment, all other variables held constant. There was a small negative finding for receipt of \$100-\$9,000 over the course of six years (OR = 0.88;  $p = 0.01$ ), suggesting the limited benefits of such a small amount of aid as college costs were comparatively so much higher. However, the predictive effect became stronger and positive when the amount of Pell Grant awarded increased. This was found for students who received \$9,000-\$18,000 in Pell Grants (OR = 2.08;  $p = 0.001$ ) and higher still with the receipt of \$18,001-\$25,241 (OR = 2.87;  $p = 0.001$ ). This finding indicated that Pell Grants positively influence educational attainment at all levels. Odds ratios, unlike unstandardized slopes, tell us not only about the degree to which each predictor influences

educational attainment, but also indicate effect size. All else equal then, as the amount of Pell scholarship dollars issued increased, the measured positive effect on educational attainment rose. This is important given the downward trend in Pell Grant funding while the cost of attendance continues to increase.

Covariates that were significant, negative predictors for attainment included identifying as Black or African American (OR = 0.55;  $p = 0.001$ ), Latinx (OR = 0.63;  $p = 0.001$ ), First Nation or Indigenous (OR = 0.65;  $p = 0.05$ ), Multiracial (OR = 0.64;  $p = 0.001$ ), and Other Race – Not Identified (OR = 0.69;  $p = 0.01$ ). As compared to White students (reference group), attainment was less likely for racial and ethnic groups that are consistently underrepresented in higher education. Similarly, there were variations in the direction (positive/negative) of significance for institution types.

Enrolling in a four-year institution in the first year of the study had a strongly positive and statistically significant relationship with attainment (OR = 2.56;  $p = 0.001$ ), indicating greater likelihood that attendees to four-year institutions would attain a credential, as compared to non-degree granting institution types. Hybrid two/four year institutions (OR = 0.59;  $p = 0.01$ ), two-year institutions (OR = 0.50;  $p = 0.001$ ), and for-profit institutions (OR = 0.73;  $p = 0.01$ ) had negative relationships with attainment.

For students who were both first generation and low-income, there was a highly negative and significant association with the outcome (OR = 0.37;  $p = 0.001$ ), showing that this group was considerably less likely to attain a credential. Students who were low-income but not first generation were comparatively less disadvantaged (OR = 0.46;  $p = 0.001$ ). The negative likelihood of attaining a credential was more attenuated for those who were first generation and not low-income (OR = 0.59;  $p = 0.001$ ), but still highly negative. Students in this status had 41%

lower odds of attaining any credential, including a certificate, as compared to their otherwise similar peers who were neither first-generation nor low-income. Having any first generation or low-income status was a potential barrier in attainment.

### **Model Two: Academic Performance**

Academic performance was added to the base model, specifically, the cumulative grade point average at the end of year six (2008-2009). This addition shifted the intensity of the variables in the initial model and did not decrease the level of significance for predictors on attainment. Nontraditional age upon enrollment was associated with lower likelihood for attainment (OR = 0.59;  $p = 0.001$ ) as compared to traditional aged students. Gender maintained a significant and positive relationship with attainment, predicting that women were more likely to attain a credential than men (OR = 1.28;  $p = 0.001$ ).

Pell Grant receipt significantly predicted attainment, across all 2008-2009 dollar amount levels. Compared to receiving no Pell funds, all else equal, those receiving low levels of Pell Grant funds were predicted to have a lower likelihood of attainment than students receiving no Pell Grants as in the base model, even after adding academic performance to this estimated model. Specifically, when receiving \$100-\$9,000 in Pell Grants (low group) over the course of six years, students are less likely to attain a higher education credential (OR = 0.88;  $p = 0.01$ ). The middle level of Pell Grant funding (\$9,001-\$18,000) was more likely to attain a credential when adding academic performance to the model (OR = 2.16;  $p = 0.001$ ), raising the likelihood of attainment more than two times compared to those receiving no Pell funding. The highest Pell awardee group (\$18,001-\$25,241) again demonstrated a positive and significant relationship with attainment (OR = 3.09;  $p = 0.001$ ) over findings from the initial model (OR = 2.87;  $p = 0.001$ ).



**Table 1***The Effect of Nontraditional Age on Beginning Postsecondary Students' Educational Attainment, Models 1 through 3*

	Model 1				Model 2				Model 3			
	b	(se)	OR	(se)	b	(se)	OR	(se)	b	(se)	OR	(se)
<i>n = 15,130</i>												
<b>Independent Variables</b>												
Nontraditional Age Students	-0.47***	(0.07)	0.62***	(0.05)	-0.52***	(0.07)	0.59***	(0.04)	-0.29***	(0.09)	0.75***	(0.07)
<i>Traditional Age Students (Reference Group)</i>												
Women	0.27***	(0.05)	1.31***	(0.07)	0.25***	(0.05)	1.28***	(0.07)	0.31***	(0.05)	1.37***	(0.07)
<i>Men (Reference Group)</i>												
<b>Pell Grant Dollars Received</b>												
Received \$100-\$9,000 in Pell Grant Funds Through 08-09	-0.13**	(0.06)	0.87**	(0.05)	-0.13**	(0.06)	0.88**	(0.05)	-0.06	(0.06)	0.94	(0.06)
Received \$9,001-\$18,000 in Pell Grant Funds Through 08-09	0.73***	(0.09)	2.08***	(0.20)	0.77***	(0.09)	2.16***	(0.20)	0.84***	(0.09)	2.32***	(0.22)
Received \$18,001-\$25,241 Pell Grant Funds Through 08-09	1.05***	(0.17)	2.87***	(0.48)	1.13***	(0.17)	3.09***	(0.53)	1.18***	(0.17)	3.25***	(0.57)
<i>Received \$0 Pell Grant Funds Through 08-09 (Reference Group)</i>												
<b>Covariates</b>												
<b>Race and Ethnicity</b>												
Black Race	-0.60***	(0.09)	0.55***	(0.05)	-0.55***	(0.09)	0.58***	(0.05)	-0.49***	(0.09)	0.62***	(0.05)
Latinx Race	-0.47***	(0.08)	0.63***	(0.05)	-0.46***	(0.08)	0.63***	(0.05)	-0.43***	(0.08)	0.65***	(0.05)
First Nation or Indigenous Race	-0.43*	(0.25)	0.65*	(0.16)	-0.42*	(0.25)	0.65*	(0.16)	-0.36	(0.24)	0.70	(0.17)
Multiracial	-0.44***	(0.14)	0.64***	(0.09)	-0.41***	(0.14)	0.66***	(0.09)	-0.41***	(0.13)	0.66***	(0.09)
Other Race	-0.38**	(0.18)	0.68**	(0.13)	-0.34*	(0.18)	0.71*	(0.13)	-0.35*	(0.19)	0.70*	(0.13)
Asian Pacific Islander Race	0.16	(0.11)	1.17	(0.13)	0.17	(0.11)	1.19	(0.13)	0.10	(0.11)	1.11	(0.12)
<i>White Race (Reference Group)</i>												

**Table 1 – continued***The Effect of Nontraditional Age on Beginning Postsecondary Students' Educational Attainment, Models 1 through 3*

	Model 1				Model 2				Model 3			
	b	(se)	OR	(se)	b	(se)	OR	(se)	b	(se)	OR	(se)
<i>n = 15,130</i>												
<b><i>Institution Type</i></b>												
Enrolled in Traditional 4-year Institution 03-04	0.94***	(0.09)	2.55***	(0.23)	0.97***	(0.09)	2.64***	(0.24)	0.79***	(0.09)	2.21***	(0.21)
Enrolled in Hybrid 2-yr/4-yr Institution 03-04	-0.53**	(0.24)	0.59**	(0.14)	-0.53**	(0.23)	0.59**	(0.14)	-0.63***	(0.23)	0.53***	(0.12)
Enrolled in 2-yr Institution 03-04	-0.70***	(0.08)	0.50***	(0.04)	-0.67***	(0.08)	0.51***	(0.04)	-0.76***	(0.08)	0.47***	(0.04)
Enrolled in Specialized Institution 03-04	-0.01	(0.15)	0.99	(0.15)	0.02	(0.16)	1.02	(0.16)	-0.10	(0.16)	0.90	(0.14)
Enrolled in For Profit Institution 03-04	-0.32**	(0.15)	0.73**	(0.11)	-0.31**	(0.15)	0.74**	(0.11)	-0.32**	(0.16)	0.73**	(0.11)
<i>Enrolled in Non-Degree Granting Institution 03-04 (Reference Group)</i>												
<b><i>First Generation Status</i></b>												
First Generation Student with Low Income	-1.00***	(0.08)	0.37***	(0.03)	-1.02***	(0.08)	0.36***	(0.03)	-0.96***	(0.08)	0.38***	(0.03)
Low Income Student and Not First Generation	-0.77***	(0.13)	0.46***	(0.06)	-0.78***	(0.13)	0.46***	(0.06)	-0.74***	(0.13)	0.48***	(0.06)
First Generation Student and Not Low Income	-0.52***	(0.06)	0.59***	(0.04)	-0.54***	(0.06)	0.58***	(0.04)	-0.50***	(0.06)	0.60***	(0.04)
<i>Not First Generation and Not Low Income (Reference Group)</i>												
<b><i>Academic Performance</i></b>												
Low GPA in 08-09					-0.81***	(0.19)	0.45***	(0.09)	-0.82***	(0.19)	0.44***	(0.08)
High GPA in 08-09					0.49***	(0.08)	1.63***	(0.13)	0.49***	(0.08)	1.63***	(0.14)
<i>Middle GPA in 08-09 (Reference Group)</i>												

**Table 1 – continued***The Effect of Nontraditional Age on Beginning Postsecondary Students' Educational Attainment, Models 1 through 3*

	Model 1				Model 2				Model 3			
	b	(se)	OR	(se)	b	(se)	OR	(se)	b	(se)	OR	(se)
<i>n</i> = 15,130												
<b>Dependent Children</b>												
Had Dependent Children 08-09									-0.71***	(0.07)	0.49***	(0.04)
<i>Did Not Have Dependent Children 08-09 (Reference Group)</i>												
Had Dependent Children 03-04									0.00	(0.10)	1.00	(0.10)
<i>Did Not Have Dependent Children 03-04 (Reference Group)</i>												
/cut1	-0.68***	(0.10)	0.51***	(0.05)	-0.26**	(0.13)	0.77**	(0.10)	-0.45***	(0.13)	0.64***	(0.08)
/cut2	-0.23**	(0.10)	0.80**	(0.08)	0.20	(0.12)	1.22	(0.15)	0.01	(0.13)	1.01	(0.13)
/cut3	0.48***	(0.10)	1.62***	(0.16)	0.92***	(0.13)	2.50***	(0.31)	0.74***	(0.13)	2.10***	(0.27)
Pseudo R-squared	0.1235***				0.129***				0.1372***			
Chi-square	1853.06***				1894.15***				1958.55***			

*Note.* Beginning Postsecondary Students 2004-09 restricted-use data. Analyses by author. Robust standard errors in parentheses.

Having Pell Grant funds that met the high costs of higher education rather than limiting this resource facilitated even greater attainment for students in the sample.

Considering additional covariates of racial and ethnic background, institution type, first generation status, and the added academic performance measure of grade point averages, nearly all returned significant ORs. Congruent with the findings in model one, identifying as Black (OR = 0.58;  $p = 0.001$ ), Latinx (OR = 0.63;  $p = 0.001$ ), First Nation or Indigenous (OR = 0.65;  $p = 0.05$ ), Multiracial (OR = 0.66;  $p = 0.001$ ), and Other Race – Not Identified (OR = 0.71;  $p = 0.05$ ) were statistically negatively related to attainment when grade point average was added, as compared to the beginning model.

All institution types were positively related with attainment except specialized institutions, which continued to have no statistical significance in this model. Attending a four-year institution was associated with a higher likelihood of attainment compared to attending non-degree-granting institutions, the reference group (OR = 2.64;  $p = 0.001$ ). In contrast, attending two-year institutions (OR = 0.51;  $p = 0.001$ ), hybrid two-four year institutions (OR = 0.59;  $p = 0.01$ ), and for profit institutions (OR = 0.74;  $p = 0.01$ ) negatively predicted educational attainment as compared to attending non-degree granting institutions.

First generation and low-income status continued to be negatively associated with attainment. Findings for first generation students who were also low-income were similar between both the first and second models: attainment was 64% less likely for these students compared to their not first generation and not low-income peers, all else equal. Similar patterns between models were found for low-income and not first generation students (OR = 0.46;  $p = 0.001$ ) and first generation students who are not low-income (OR = 0.59;  $p = 0.001$ ). Results illustrated a lower likelihood of attainment for low-income students, irrespective of first

generation status. Similarly, being a first generation college student was a negative indicator of attainment irrespective of class status, with the predictions of each compounding such that those who were first generation and low income were particularly less likely to attain a credential.

Finally, the coefficient for grade point average was positive and significant, increasing with every one unit increase in grade point average by the end of year six (2008-2009) (OR = 1.63;  $p = 0.001$ ). As expected, attainment was less likely if students received a low grade point average (OR = 0.45;  $p = 0.001$ ). As much as financial support was related to attainment, academic performance contributed positively to completion. However, this finding became more complicated as dependent children were added to the model.

### **Model Three: Dependent Children**

Model three added dependent children, a factor previous literature illustrated to be related to nontraditional students (see Chapter Two). The addition of this variable to the model marginally improved the likelihood of attainment for nontraditional age students—they were still marginally less likely to attain a credential than traditional age students, but their likelihood increased in model three (OR = 0.75;  $p = 0.001$ ) compared to model two (OR = 0.59;  $p = 0.001$ ).

Regarding gender, the OR for women maintained a positive direction and showed greater likelihood for attainment in model three (OR = 1.37;  $p = 0.001$ ) than model two (OR = 1.28;  $p = 0.001$ ). This suggests that adding children to the model slightly strengthened the independent likelihood for women to attain a credential when controlling for all other variables.

Pell Grants increased in their relevance to attainment for model three, with the exception of the lowest number of years receiving Pell Grants, which lost significance. Receiving the lower amount (\$100-\$9,000) decreased the likelihood of attainment (OR = 0.94;  $p = 0.301$ ); the addition of dependent children shifted it to a non-significant finding. Awards in the middle

(\$9,001-\$18,000) and high amounts (\$18,001-\$25,241) each predicted a higher likelihood to attain versus not attaining (OR = 2.32;  $p = 0.001$  and OR = 3.25;  $p = 0.001$ , respectively).

Including dependent children still did not shift the predictive results for racial and ethnic groups in a meaningful way. Coefficients moved only a few points within racial and ethnic groups. Specifically, in the third model Black (OR = 0.62;  $p = 0.001$ ), Latinx (OR = 0.65;  $p = 0.001$ ), Multiracial (OR = 0.66;  $p = 0.001$ ), and Other Race – Not Identified (OR = 0.70;  $p = 0.05$ ) groups were associated with a lower likelihood of attainment. Being First Nation or Indigenous (OR = 0.70;  $p = 0.131$ ) was not a significant predictor of attainment; it was also still a negative predictor with the addition of dependent children to the current model.

Institution type was associated with lower likelihood of attainment in this updated model which included children compared to the previous model. For four-year institutions (OR = 2.21;  $p = 0.001$ ) there was still a high likelihood of attainment, but the magnitude of the finding was lower than in the previous model. Hybrid institutions (OR = 0.53;  $p = 0.001$ ), two-year institutions (OR = 0.47;  $p = 0.001$ ), and for profit institutions (OR = 0.73;  $p = 0.01$ ) were each negatively related with and lower in their likelihood to predict attainment from model one. Specialized institutions did not show significance for predicting attainment (OR = 0.90;  $p = 0.524$ ).

Identifying as first generation and/or low-income still yielded statistically significant findings. The associations between attainment and these statuses were higher for model three with dependent children, and still remained negative predictors of degree attainment. First generation and low-income (OR = 0.38;  $p = 0.001$ ), low-income but not first generation (OR = 0.48;  $p = 0.001$ ), and first generation students who were not low-income (not statistically significant) were all negatively associated with attainment.

There were slight changes in how grade point average accounted for the variance of attainment for model three. Obtaining a low grade point average continued to be a negative predictor for attainment (OR = 0.44;  $p = 0.001$ ). Attaining a high grade point average was a positive predictor of attainment (OR = 1.63;  $p = 0.001$ ).

As dependent children were added to consider students who enrolled with children (2003-2004) and who completed the final year of the survey with children (2008-2009), differences emerged. There were no statistically significant findings related to having children during the first year of enrollment (OR = 1.00;  $p = 0.966$ ). However, there was a significant and lowered likelihood of attainment for students with dependent children in year six (2008-2009) (OR = 0.49;  $p = 0.001$ ). These findings provide insight about the timing of child rearing during the college matriculation and completion process.

#### **Model Four: Work and Income Group**

Final model results are reported in Table 2. This model included specific variables for whether or not students worked during matriculation in survey years three (2005-2006) and six (2008-2009). Adding this variable illuminated how academic performance (model two), dependents (model three), *and* work might shift the relationships between the predictors and attainment. While a variable that connected both parental education and income status was included in previous models, this final model included reported income for students' parents (18-24) and nontraditional age students themselves. Including this variable along with work during the longitudinal survey assisted in examining yet another layer of responsibility for nontraditional age students.

**Table 2***The Effect of Nontraditional Age on Beginning Postsecondary Students' Educational Attainment, Full and Interaction Model*

	Full Model				Interaction Model			
	b	(se)	OR	(se)	b	(se)	OR	(se)
<i>n = 15,130</i>								
<b>Independent Variables</b>								
Nontraditional Age Students	-0.40***	(0.09)	0.67***	(0.06)	-0.35**	(0.15)	0.70**	(0.10)
<i>Traditional Age Students (Reference Group)</i>								
Women	0.25***	(0.05)	1.28***	(0.07)	0.33***	(0.06)	1.39***	(0.08)
<i>Men (Reference Group)</i>								
<b>Pell Grant Dollars Received</b>								
Received \$100-\$9,000 in Pell Grant Funds Through 08-09	0.07	(0.07)	1.07	(0.07)	-0.00	(0.07)	1.00	(0.07)
Received \$9,001-\$18,000 in Pell Grant Funds Through 08-09	0.73***	(0.10)	2.07***	(0.20)	0.67***	(0.11)	1.96***	(0.21)
Received \$18,001-\$25,241 Pell Grant Funds Through 08-09	1.08***	(0.18)	2.95***	(0.52)	1.06***	(0.18)	2.88***	(0.53)
<i>Received No Pell Funds Through 08-09 (Reference Group)</i>								
<b>Covariates</b>								
<b>Race and Ethnicity</b>								
Black Race	-0.49***	(0.09)	0.61***	(0.05)	-0.50***	(0.09)	0.61***	(0.05)
Latinx Race	-0.48***	(0.08)	0.62***	(0.05)	-0.47***	(0.08)	0.63***	(0.05)
First Nation or Indigenous Race	-0.37	(0.25)	0.69	(0.17)	-0.38	(0.25)	0.69	(0.17)
Multiracial	-0.41***	(0.14)	0.66***	(0.09)	-0.43***	(0.14)	0.65***	(0.09)
Other Race	-0.36*	(0.19)	0.70*	(0.13)	-0.37*	(0.19)	0.69*	(0.13)
Asian Pacific Islander Race	0.10	(0.11)	1.11	(0.13)	0.12	(0.11)	1.13	(0.13)
<i>White Race (Reference Group)</i>								
<b>Institution Type</b>								
Enrolled in Traditional 4-year Institution 03-04	0.32***	(0.10)	1.37***	(0.14)	0.34***	(0.10)	1.41***	(0.14)
Enrolled in Hybrid 2-yr/4-yr Institution 03-04	-1.14***	(0.20)	0.32***	(0.06)	-1.10***	(0.20)	0.33***	(0.07)
Enrolled in 2-yr Institution 03-04	-1.20***	(0.09)	0.30***	(0.03)	-1.16***	(0.09)	0.31***	(0.03)
Enrolled in Specialized Institution 03-04	-0.46***	(0.16)	0.63***	(0.10)	-0.43***	(0.16)	0.65***	(0.10)
Enrolled in For Profit Institution 03-04	-0.51***	(0.16)	0.60***	(0.10)	-0.49***	(0.16)	0.61***	(0.10)
<i>Enrolled in Non-Degree Granting Institution 03-04 (Reference Group)</i>								



**Table 2 – continued***The Effect of Nontraditional Age on Beginning Postsecondary Students' Educational Attainment, Full and Interaction Model*

	Full Model				Interaction Model			
	b	(se)	OR	(se)	b	(se)	OR	(se)
<b>Academic Performance</b>								
Low GPA in 08-09	-0.82***	(0.20)	0.44***	(0.09)	-0.82***	(0.20)	0.44***	(0.09)
High GPA in 08-09	0.54***	(0.08)	1.72***	(0.14)	0.54***	(0.08)	1.71***	(0.14)
<i>Middle GPA in 08-09 (Reference Group)</i>								
<b>Dependent Children</b>								
Had Dependent Children 08-09	-0.57***	(0.07)	0.56***	(0.04)	-0.57***	(0.07)	0.57***	(0.04)
<i>Did Not Have Dependent Children 08-09 (Reference Group)</i>								
Had Dependent Children 03-04	-0.16	(0.10)	0.85	(0.09)	-0.14	(0.10)	0.87	(0.09)
<i>Did Not Have Dependent Children 03-04 (Reference Group)</i>								
<b>Employment</b>								
Worked During Matriculation 05-06	-1.54***	(0.08)	0.21***	(0.02)	-1.53***	(0.08)	0.22***	(0.02)
<i>Did Not Work During Matriculation 05-06 (Reference Group)</i>								
Worked During Matriculation 08-09	0.16***	(0.05)	1.18***	(0.06)	0.16***	(0.05)	1.18***	(0.06)
<i>Did Not Work During Matriculation 08-09 (Reference Group)</i>								
<b>Income Group</b>								
Low-Income Group	-0.95***	(0.09)	0.39***	(0.04)	-0.96***	(0.09)	0.38***	(0.04)
Low-Middle Income Group	-0.50***	(0.08)	0.61***	(0.05)	-0.52***	(0.08)	0.60***	(0.05)
High-Middle Income Group	-0.32***	(0.07)	0.72***	(0.05)	-0.34***	(0.07)	0.71***	(0.05)
<i>High-Income Group (Reference Group)</i>								
<b>Interactions</b>								
Interaction: Nontraditional Students * Women					-0.43***	(0.15)	0.65***	(0.09)
Interaction: Nontraditional Students * Low Pell Amount					0.42***	(0.16)	1.53***	(0.24)
Interaction: Nontraditional Students * Mid Pell Amount					0.28	(0.21)	1.32	(0.28)
Interaction: Nontraditional Students * High Pell Amount					0.11	(0.60)	1.12	(0.68)
/cut1	-1.08***	(0.14)	0.34***	(0.05)	-1.05***	(0.14)	0.35***	(0.05)
/cut2	-0.58***	(0.14)	0.56***	(0.08)	-0.55***	(0.14)	0.57***	(0.08)
/cut3	0.19	(0.14)	1.21	(0.17)	0.22	(0.14)	1.25	(0.18)
Pseudo R-squared	0.1675***				0.1685***			
Chi-square	2073.86***				2115.69***			

Note. Beginning Postsecondary Students 2004-09 restricted-use data. Analyses by author. Robust standard errors in parentheses.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.10

Although the direction and magnitude of the relationship between nontraditional age and attainment stayed the same across the base model (OR = 0.62;  $p = 0.001$ ) and model two (grade point average) (OR = 0.59;  $p = 0.001$ ), in model three (dependent children) there was an increase (OR = 0.75;  $p = 0.001$ ), and in model four the likelihood dropped (OR = 0.67;  $p = 0.001$ ). Conversely, female gender continued to be a positive and significant predictor of attainment (OR = 1.29;  $p = 0.001$ ) even if slightly lower from model three with dependent children (OR = 1.37;  $p = 0.001$ ). Including children—but not work or income—strengthened women’s likelihood to attain a credential.

Compared to model three, low Pell Grant amount was not a significant predictor of attainment (OR = 1.07;  $p = 0.297$ ). Middle (OR = 2.07;  $p = 0.001$ ) and high amounts of Pell Grant funds (OR = 2.95;  $p = 0.001$ ) continued to be associated with a higher likelihood for attainment.

The relationship between attainment and racial and ethnic category weakened even further when adding work and income. Black students (OR = 0.61;  $p = 0.001$ ), Latinx students (OR = 0.62;  $p = 0.001$ ), Multiracial students (OR = 0.66;  $p = 0.001$ ), and Other Race – Not Identified students (OR = 0.70;  $p = 0.05$ ), all had lower odds ratios in model four than in model three (dependent children). First Nation or Indigenous identity was not a significant predictor of attainment (OR = 0.69;  $p = 0.142$ ). Depending on income, many underrepresented racial and ethnic students worked while in college, contributing to the decrease in likelihood of attainment. These students often used funds from work to pay for higher education, a cycle that didn’t end in attainment, but in debt.

Including work and income groups in the fourth model resulted in the continued positive relationship between attainment and attending four-year institutions (OR = 1.37;  $p = 0.001$ ).

However, the relationship between attending a four-year institution and attainment decreased from model three, where the odds ratio was 2.21 ( $p = 0.001$ ). Work, even when enrolled at an institution associated with a higher likelihood of attainment, can lessen the chances of reaching the finish line. Attendance at hybrid institutions (OR = 0.32;  $p = 0.001$ ), two-year colleges (OR = 0.30;  $p = 0.001$ ), and for profit institutions (OR = 0.60;  $p = 0.001$ ) were each less associated with attainment. Specialized institutions shifted from being insignificant for the three previous models to showing statistical significance upon specifying the model by work and income group. This variable, holding all others constant, was associated with a 37% decreased odds ( $p = 0.001$ ) of attaining a credential.

Grade point averages and their association with attainment remained consistent in this model with the aforementioned models. Students with low grade point averages were still less likely to earn a credential (OR = 0.44;  $p = 0.001$ ). Students with a high grade point average were more likely to attain a credential (OR = 1.72;  $p = 0.001$ ).

Substituting income for first generation student status resulted in a range of statistically significant values for all income groups included in the model. Low-income lowered the likelihood to attain (OR = 0.39;  $p = 0.001$ ). Both middle income groups returned similar negative predictive outcomes. Low-middle income (\$32,000-\$60,000) (OR = 0.61;  $p = 0.001$ ) and high middle income (\$60,000-\$92,000) (OR = 0.72;  $p = 0.001$ ) had increased odds between the third and fourth models, but still had not reached a positive level of prediction. Using the income variable within this model did not change the income groups' predictive values compared to high income (reference group) students.

Parenting dependent children in survey year one (2003-2004) continued to be insignificantly associated with attainment (OR = 0.85;  $p = 0.126$ ), while parenting children in

year six (2008-2009) contributed to lower likelihood of attainment (OR = 0.56;  $p = 0.001$ ).

Students who had children were less likely to attain a postsecondary credential, which is aligned with lower outcomes for student parents from Chapter Two. Lastly, work during survey year three (2005-2006) resulted in a lower likelihood of attainment (OR = 0.22;  $p = 0.001$ ). However, working in the final year of the survey (2008-2009) was associated with a higher likelihood of attaining a credential (OR = 1.18;  $p = 0.001$ ).

### **Model Five: Model Four with Interactions**

Upon review of the findings described above, interactions were created to see if combined predictors would significantly relate to attainment (Table 2). A significant interaction indicates the presence of a moderated path, meaning that one of the two variables within the interaction (such as women students in nontraditional students X women students) is responsible for an increased or decreased relationship between the main independent variable (nontraditional students) and the dependent variable (educational attainment). A total of four interaction terms were developed with the main independent variable of nontraditional status: gender (women) and the three levels of total Pell Grant scholarship dollars (low-level, middle-level, and high level). Interaction terms assisted in comparing the main effect of women (ex: variable women = 1) and nontraditional students (nontraditional student = 1) in the model to the outcomes of their opposites (ex: traditional men students). For instance, the interaction of nontraditional students and women was interpreted with all else constant in reference to traditional men, who were found comparatively less likely to attain a credential (OR = 0.65;  $p = 0.001$ ) than nontraditional students (OR = 0.70;  $p = 0.01$ ) or women (OR = 1.39;  $p = 0.001$ ).

To continue, the interaction of nontraditional students and low-level Pell Grant dollars (traditional students with \$0 Pell Grant dollars) returned a statistically significant result.

Traditional age students who did not receive Pell Grants were more likely to graduate (OR = 1.53;  $p = 0.001$ ) compared to the main effects for nontraditional students (OR = 0.70;  $p = 0.01$ ) and students receiving Pell Grants in the amount of \$100-\$9,000 (OR = 1.00;  $p = 0.947$ ).

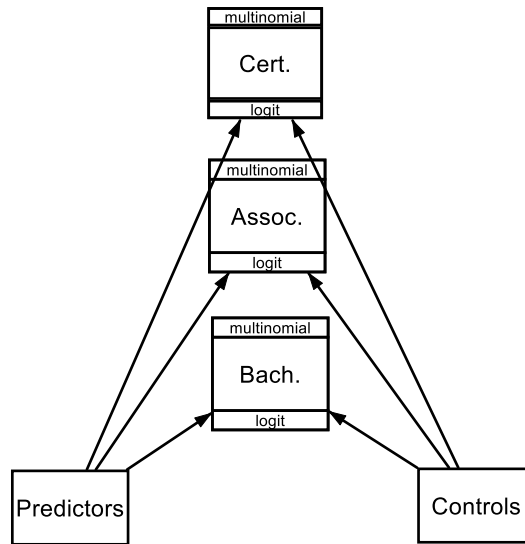
### **Cut Scores for Ordered Logistic Models**

Cut points are used in interpreting ordered logistic models to reflect the thresholds for each outcome category. These cut points are read as cumulative probabilities, or the odds of being in one outcome category versus the others in the model (Green & Silverman, 1993). Each cut represents the range for an outcome. In the case of attainment which has four possibilities, the cut scores reflect the probabilities of each possible outcome compared to the remaining. Not attaining a degree was compared to certificate, associate's, and bachelor's attainment first. Then, attaining a certificate was compared to no attainment, associate's, and bachelor's attainment, and so on. The cut score values from all models are provided within each results table, along with the coefficients and odds ratios. For all models, the highest odds were within *cut3*, which indicated that the overall sample would be more likely to attain a bachelor's degree compared to no attainment, certificate attainment, or attaining an associate's degree. This outcome was more likely due to the larger portion of the sample identifying as traditional age students (85%) who, within their age group, completed a bachelor's degree at a higher percentage (42%) than nontraditional students (4%) through 2009.

### **Generalized Structural Equation Model**

As an added layer of confirmation, a sensitivity analysis was conducted on model four using a generalized structural equation model (GSEM). This analysis is often used to determine how much each independent variable (or "observed variables") are related (or "loads") onto the outcome variable (or "latent variable") (Wheaton, Muthen, Alwin, & Summers, 1977). In this

case, the latent variable is attainment of a degree or credential by 2009 (Figure 17). Because the latent variable has more than one level, multinomial logistic regression was used to conduct the SEM.



**Figure 14. Path model used for sensitivity analysis**

In building the model, each level of the latent outcome was added to the model: no attainment, certificate attainment, associate’s degree attainment, and bachelor’s degree attainment. Then, all observed variables were connected by paths to each outcome level. This is represented below in a simplified path diagram showing “predictors” (nontraditional students, women, and Pell Grant dollars) and “controls” (institution type, race and ethnicity, grade point average, dependent children, employment status, and income group). As the model is estimated, each path produced loadings that confirmed how much (or little) each variable explained the variance of each level of attainment.

## **Results**

The loadings returned from the model are read similarly to regression coefficients. If they returned a negative coefficient, the result was a negative predictor for the outcome. Loadings are shown in a later table, but are also summarized below to illuminate key patterns that aligned with the ordinal logistic regression model completed for the primary analyses. For consistency, coefficients were translated into odds ratios. Each attainment level will be reported, but results below will focus on the predictor variables of interest: nontraditional age students, women, and Pell Grants (Table 3).

All loadings for attainment outcomes were compared to having no attainment or certificate, associate's, and bachelor's completion. The findings below were found to be consistent with the primary analyses: lower degree attainment for nontraditional students, greater likelihood of attainment for women, and finally, the variable relationship Pell Grants have with degree attainment.

### **Nontraditional Age Students**

Nontraditional students were more likely to attain a certificate (OR = 1.18;  $p = 0.297$ ) than to have no attainment at all, as reported in Table 3. The loading for nontraditional age students and attainment of an associate's degree was lower and statistically significant (OR = 0.70;  $p = 0.01$ ). Finally, related to attaining a bachelor's degree, results for nontraditional age students were more negative (OR = 0.41;  $p = 0.001$ ) than for an associate's degree. Although nontraditional students have been enrolling in higher numbers in postsecondary education, attainment was less likely for this group, unless their goal that was short-term or training-focused, like certificate attainment.

**Table 3**

*Generalized Structural Equation Model: Comparative Outcomes for Nontraditional Beginning Postsecondary Students' Educational Attainment*

	Certificate Attainment (Reference: No Attainment)				Associate's Degree Attainment (Reference: No Attainment)				Bachelor's Degree Attainment (Reference: No Attainment)			
	<i>b</i>	SE	OR	SE	<i>b</i>	SE	OR	SE	<i>b</i>	SE	OR	SE
<i>Attainment Through 08-09 (n = 15,130)</i>												
<b>Independent Variables</b>												
Nontraditional Age Students (Reference = Traditional, 18-24)	0.17	(0.16)	1.18	(0.19)	-0.35**	(0.14)	0.71**	(0.10)	-0.90***	(0.19)	0.41***	(0.08)
Women (Reference=Men)	0.09	(0.13)	1.09	(0.14)	0.22***	(0.09)	1.25***	(0.11)	0.31***	(0.07)	1.37***	(0.10)
<b>Pell Grant Dollars: Funds Received Through 08-09 (Reference=none)</b>												
Pell Grant Funds: \$100-\$9,000	0.30**	(0.13)	1.36**	(0.18)	0.17*	(0.10)	1.18*	(0.12)	-0.01	(0.10)	0.99	(0.10)
Pell Grant Funds: \$9,001-\$18,000	0.65**	(0.29)	1.91**	(0.56)	1.08***	(0.15)	2.94***	(0.43)	0.92***	(0.16)	2.50***	(0.39)
Pell Grant Funds: \$18,001-\$25,241	-0.82	(0.79)	0.44	(0.35)	1.41***	(0.22)	4.11***	(0.91)	1.40***	(0.22)	4.06***	(0.90)
<b>Covariates</b>												
<b>Race and Ethnicity (Reference=White)</b>												
Black Race	-0.37**	(0.16)	0.69**	(0.11)	-0.75***	(0.14)	0.47***	(0.07)	-0.51***	(0.14)	0.60***	(0.08)
Latinx Race	-0.08	(0.14)	0.92	(0.13)	-0.50***	(0.12)	0.61***	(0.07)	-0.75***	(0.12)	0.47***	(0.06)
First Nation or Indigenous Race	-0.00	(0.48)	1.00	(0.48)	0.14	(0.41)	1.15	(0.47)	-0.51	(0.36)	0.60	(0.21)
Multiracial	-0.28	(0.35)	0.76	(0.26)	-0.38*	(0.22)	0.69*	(0.15)	-0.58***	(0.18)	0.56***	(0.10)
Other Race	-0.81**	(0.40)	0.45**	(0.18)	-0.44	(0.33)	0.64	(0.21)	-0.40	(0.25)	0.67	(0.17)
Asian Pacific Islander Race	-0.36	(0.27)	0.70	(0.19)	-0.16	(0.21)	0.85	(0.18)	0.19	(0.15)	1.21	(0.18)



**Table 3 – continued**

*Generalized Structural Equation Model: Comparative Outcomes for Nontraditional Beginning Postsecondary Students' Educational Attainment*

	Certificate Attainment (Reference: No Attainment)				Associate's Degree Attainment (Reference: No Attainment)				Bachelor's Degree Attainment (Reference: No Attainment)			
	<i>b</i>	SE	OR	SE	<i>b</i>	SE	OR	SE	<i>b</i>	SE	OR	SE
<i>Attainment Through 08-09 (n = 15,130)</i>												
<b><i>Institution Type at Enrollment, 03-04</i></b>												
<i>(Reference = Non-Degree Granting)</i>												
Traditional 4-year Institution	-3.04***	(0.19)	0.05***	(0.01)	1.34***	(0.43)	3.80***	(1.65)	3.73***	(0.48)	41.59***	(20.17)
Hybrid 2-yr/4-yr Institution	-2.20***	(0.60)	0.11***	(0.07)	2.72***	(0.53)	15.21***	(8.09)	1.56**	(0.62)	4.78**	(2.98)
2-yr Institution	-2.08***	(0.14)	0.13***	(0.02)	2.48***	(0.43)	11.90***	(5.09)	1.58***	(0.49)	4.85***	(2.37)
Specialized Institution	-3.32***	(0.40)	0.04***	(0.01)	1.89***	(0.47)	6.62***	(3.11)	3.21***	(0.51)	24.71***	(12.54)
For-Profit Institution	-1.12***	(0.23)	0.33***	(0.07)	2.71***	(0.50)	15.05***	(7.50)	2.34***	(0.66)	10.41***	(6.92)
<b><i>Academic Performance</i></b>												
<i>(Reference=Middle GPA)</i>												
Low GPA in 08-09	0.40	(0.35)	1.49	(0.52)	-0.20	(0.24)	0.82	(0.20)	-1.35***	(0.26)	0.26***	(0.07)
High GPA in 08-09	0.59***	(0.21)	1.81***	(0.38)	0.53***	(0.13)	1.70***	(0.22)	0.55***	(0.10)	1.74***	(0.17)
Had Dependent Children 08-09 <i>(Reference=Did not)</i>	0.11	(0.17)	1.12	(0.19)	-0.21**	(0.10)	0.81**	(0.08)	-1.16***	(0.11)	0.31***	(0.04)
Had Dependent Children 03-04 <i>(Reference=Did not)</i>	-0.03	(0.20)	0.97	(0.19)	-0.55***	(0.16)	0.58***	(0.09)	-0.45*	(0.24)	0.64*	(0.15)
<b><i>Employment</i></b>												
Worked During Matriculation 05-06 <i>(Reference=Did Not Work)</i>	-0.37***	(0.13)	0.69***	(0.09)	-1.65***	(0.13)	0.19***	(0.02)	-3.85***	(0.24)	0.02***	(0.01)
Worked During Matriculation 08-09 <i>(Reference=Did Not Work)</i>	0.25**	(0.11)	1.28**	(0.15)	-0.06	(0.08)	0.94	(0.08)	0.26***	(0.07)	1.30***	(0.09)

**Table 3 – continued**

*Generalized Structural Equation Model: Comparative Outcomes for Nontraditional Beginning Postsecondary Students' Educational Attainment*

	Certificate Attainment (Reference: No Attainment)				Associate's Degree Attainment (Reference: No Attainment)				Bachelor's Degree Attainment (Reference: No Attainment)			
	<i>b</i>	SE	OR	SE	<i>b</i>	SE	OR	SE	<i>b</i>	SE	OR	SE
<i>Attainment Through 08-09 (n = 15,130)</i>												
<b>Income Group</b>												
<i>(Reference=High Income)</i>												
Low-Income Group	0.01	(0.20)	1.01	(0.20)	-0.77***	(0.15)	0.47***	(0.07)	-1.25***	(0.13)	0.29***	(0.04)
Low-Middle Income Group	0.21	(0.20)	1.24	(0.25)	-0.18	(0.13)	0.84	(0.11)	-0.59***	(0.11)	0.55***	(0.06)
High-Middle Income Group	0.26	(0.20)	1.30	(0.26)	-0.18	(0.13)	0.83	(0.11)	-0.38***	(0.10)	0.69***	(0.07)
Constant	-0.75**	(0.33)	0.47**	(0.16)	-3.32***	(0.46)	0.04***	(0.02)	-2.84***	(0.50)	0.06***	(0.03)
Pseudo R-squared	0.2975***											
Chi-square	2992.46***											

*Note.* Beginning Postsecondary Students 2004-09 restricted-use data. Analyses by author. Robust standard errors in parentheses.

\*\*\* p<0.01, \*\*<0.05, \* p<0.10.

## **Women**

Women had a higher likelihood of attainment at all levels as compared to no attainment. When comparing the loadings of attaining a certificate to no attainment, there was a positive but not statistically significant outcome (OR = 1.09;  $p = 0.498$ ). There was a positive loading for associate's degree attainment over no attainment (OR = 1.25;  $p = 0.001$ ). Finally, bachelor's degree attainment is another likely outcome for women (OR = 1.37;  $p = 0.001$ ).

## **Pell Grant Receipt**

Receiving Pell Grants produced high loadings across both associate's degree and bachelor's degree outcomes. There was more variation in the loadings for certificates outcome, differing by the amount received in Pell Grants. If receiving \$100-\$9,000 in Pell Grants, loadings were positive and statistically significant for certificate attainment compared to no degree (OR = 1.36;  $p = 0.01$ ) and associate's degree compared to no degree (OR = 1.81;  $p = 0.05$ ). The low amount in Pell Grant funds did not have a significant loading for bachelor's degree attainment as compared to no attainment (OR = 0.99;  $p = 0.903$ ), meaning this amount is less likely to lead to a bachelor's degree. It is simply not enough.

Receiving the mid-level amount of Pell (\$9,001-\$18,000) was statistically significant for all attainment levels: certificate (OR = 1.91;  $p = 0.01$ ), associate's degree (OR = 2.94;  $p = 0.001$ ), and bachelor's degree (OR = 2.50;  $p = 0.001$ ) as compared to no degree. Lastly, the receipt of the highest amount of Pell over the course of the six-year study (\$18,001-\$25,241) was less related to certificate attainment and not significant (OR = 0.44;  $p = 0.023$ ). It could be that certificate completers pay out of pocket or do not use their Pell Grants toward tuition and fees. The highest level of Pell awarded surged, however, in its relationship with associate's degrees (OR = 4.11;  $p$

= 0.001) and bachelor's degrees (OR = 4.06;  $p = 0.001$ ). In summary, high Pell Grants are related to higher attainment.

### **Probability of Attainment**

As seen in the descriptive and statistical analyses, the outlook for nontraditional students' attainment is far less positive than that of traditional age students. Knowing that students often hold more than only one identity, it was important to also consider the multiple profiles for key variables that might, together, predict outcomes of attainment. Profiles for nontraditional age students along with gender and Pell Grant dollars received were developed using predicted probabilities to better understand how they together predicted possible outcomes for attainment (Table 4).

Women overall had a 33% chance of attaining a bachelor's degree compared to men who had a 29% chance. Nontraditional age lowered the chance of attainment for women to 27% and men to 24%. However, for student profiles that included nontraditional age, gender, and the highest level of Pell Grant dollars (\$18,001-\$25,241), predicted probabilities were higher. The chances of nontraditional women and men with high Pell Grants attaining a bachelor's degree increased to 45% and 41%, respectively. This makes a compelling case for the positive relationship between Pell Grants and earning a bachelor's degree.

Including child rearing with the identities of having high Pell Grant funds, nontraditional age, and gender decreased the chances of bachelor's degree attainment for women to 39% and men to 35%. Including additional identities in this type of analysis helps to build a case for how compounding student differences can relate to attainment for nontraditional students.

Finally, when adding the difference between two-year and four-year enrollment to age, gender, high Pell, work, and child rearing, the chances of attaining a bachelor's degree decreased

for students who matriculated at two-year institutions (26% for women and 22% for men) and increased for four-year institutions (42% for women and 37% for men). Institution type *and* Pell Grants have a clear relationship with attainment for nontraditional age students across gender, work, and family.

### **Summary**

Comprehensive findings from the descriptive data and inferential analyses assisted in clarifying the outlook for nontraditional students in higher education. As a smaller portion of the full data sample, these students were less likely to graduate. Pell Grant receipt, while offsetting some of the financial burden, still did not support attainment for nontraditional students, especially the majority who began their collegiate journey at two-year institutions. Overall, however, Pell Grants were positively related to attainment, which is promising for future policy recommendations.

What the data also revealed was how the transition to parenthood during college enrollment lowered chances of attainment compared to those who started college with children in the probability profiles. The literature from Chapter Two illustrated the challenges students with dependent children faced, especially with confirming childcare. The results confirmed this connection. Chapter Five will expand on the results to give recommendations on how this research can be used for policy makers and higher education institutions, future research considerations, and address additional limitations found throughout the analyses process.

**Table 4**  
*Probability of Degree Attainment by Student Profile*

	No Degree Attainment	Certificate Attainment	Associate's Degree	Bachelor's Degree	Total Attainment
<i>Student Profile (n = 15,130)</i>					
<b><i>Gender Only</i></b>					
Women	46%	9%	13%	33%	100%
Men	50%	9%	13%	29%	100%
<b><i>Nontraditional Age and Gender</i></b>					
Women	51%	9%	13%	27%	100%
Men	56%	9%	12%	24%	100%
<b><i>Nontraditional Age with Children (2008-2009)</i></b>					
Women	58%	9%	12%	21%	100%
Men	63%	8%	11%	17%	100%
<b><i>Nontraditional Age with Employment (2008-2009)</i></b>					
Women	57%	9%	12%	22%	100%
Men	62%	9%	11%	18%	100%
<b><i>Nontraditional Age and Gender with \$100-\$9,000 in Pell Grants</i></b>					
Women	50%	9%	13%	28%	100%
Men	55%	9%	12%	24%	100%
<b><i>Nontraditional Age and Gender with \$9,001-\$18,000 in Pell Grants</i></b>					
Women	40%	9%	14%	38%	100%
Men	44%	9%	13%	34%	100%
<b><i>Nontraditional Age and Gender with \$18,001-\$25,241 in Pell Grants</i></b>					
Women	33%	8%	14%	45%	100%
Men	37%	9%	14%	41%	100%
<b><i>Nontraditional Age and Gender with \$100-\$9,000 in Pell Grants, Work, and Children</i></b>					
Women	56%	9%	12%	22%	100%
Men	61%	9%	12%	19%	100%

**Table 4 – continued**  
*Probability of Degree Attainment by Student Profile*

	No Degree Attainment	Certificate Attainment	Associate's Degree	Bachelor's Degree	Total Attainment
<i>Student Profile (n = 15,130)</i>					
<i>Nontraditional Age and Gender with \$9,001-\$18,000 in Pell Grants, Work, and Children</i>					
Women	45%	9%	14%	32%	100%
Men	50%	9%	13%	28%	100%
<i>Nontraditional Age and Gender with \$18,001-\$25,241 in Pell Grants, Work, and Children</i>					
Women	38%	9%	14%	39%	100%
Men	42%	9%	14%	35%	100%
<i>Nontraditional Age and Gender with \$18,001-\$25,241 in Pell Grants, Work, and Children, Two- year Institution</i>					
Women	49%	10%	15%	26%	100%
Men	54%	10%	14%	22%	100%
<i>Nontraditional Age and Gender with \$18,001-\$25,241 in Pell Grants, Work, and Children, Four- year Institution</i>					
Women	34%	9%	15%	42%	100%
Men	38%	9%	15%	37%	100%

*Note.* Beginning Postsecondary Students 2004-09 restricted-use data. Analyses by author.

## **CHAPTER 5**

### **DISCUSSION**

Expanding our understanding of underrepresented or underserved student populations in higher education is the purpose of this research. Within the qualitative research summarized in earlier chapters, it was clear that nontraditional age students who were women with dependents show great promise. Education is indeed an act of feminism for women, and higher education is a pathway that provides great power to women who have additional identities (e.g., low-income, first-generation) that lessen their likelihood to succeed. This discussion section highlights the research question hypotheses findings and implications, policy recommendations, limitations found throughout the analysis process, and recommendations for continued research.

#### **Research Results Implications**

##### **Nontraditional Age Attainment**

(1) How do nontraditional age undergraduate students vary by gender and socioeconomic status, Pell Grant receipt, institutional characteristics, and degree attainment as compared to students aged 23 and younger with or without children?

*H<sub>1</sub>: Nontraditional age undergraduate students will have lower degree attainment than students aged 23 and younger, when controlling for Pell Grant receipt, background characteristics (gender, race, socioeconomic status) and institution type.*

(1) How do nontraditional age undergraduate students vary by gender and socioeconomic status, Pell Grant receipt, institutional characteristics, and degree attainment as compared to students aged 23 and younger with or without children?



*H<sub>1</sub>: Nontraditional age undergraduate students will have lower degree attainment than students aged 23 and younger, when controlling for Pell Grant receipt, background characteristics (gender, race, socioeconomic status) and institution type.*

A portion of this research question was answered through the results of the descriptive statistics. Women represented a majority of nontraditional age (66%) and traditional age (57%) students. Economically, there was little difference in the type of students in each income distribution except for the low-middle income group (\$32,000-\$60,000) which had more nontraditional (33%) than traditional (25%) students and the high-income group (>\$92,000) which had fewer nontraditional (16%) than traditional (24%) students. Greater numbers of nontraditional students (48%) received between \$100-\$9,000 in Pell Grant funds versus 31% of traditional students.

The institution of choice for nontraditional students were two-year colleges and universities for 59% of nontraditional students. This finding is congruent with the literature that states their high presence in community colleges (Lankin, Mullane, & Robinson, 2007; Leigh & Gill, 1997). However, connected to this were higher patterns of no degree attainment for nontraditional age students through year six of the survey 2008-2009 with 60% of the population of these students not attaining a degree or certificate. As found in the OLR models, nontraditional age students are less likely to attain than traditional age students (OR = 0.67;  $p = 0.001$ ) holding gender, socioeconomic status, Pell Grant receipt, institution, and dependent children constant (model four). Results for the predicted probability profiles (Table 3) show that the chances of attainment for a bachelor's degree decrease when adding age for nontraditional women (27%) and nontraditional age men (24%). Chances for no degree attainment increase to almost half for nontraditional aged women (51%) and nontraditional aged men (56%). These

combined results support the initial hypothesis that nontraditional age students would have lower degree attainment than traditional age students.

Nontraditional age attainment outcomes could be the results of many factors that were echoed in the literature from previous chapters. The cost of higher education can deter or lengthen degree completion timing for nontraditional age students and in particular, low-income students (Cornacchione & Daugherty, 2013). While access may be higher for nontraditional age students and academic attainment steady and matching that of traditional age students, completion still remains low. It is possible that nontraditional age students do well and are motivated, but work and family take a higher importance, leaving educational attainment as a low priority.

### **Work and Dependent Children**

(2) For nontraditional age students who began in community college: which factors support Pell Grant recipients in their completion of a credential or degree within the community college system compared to those who did not receive Pell Grants?

- (a) Academic Performance
- (b) Hours Worked
- (c) Dependent children

*H<sub>2</sub>: Nontraditional age community college students will have lower degree attainment than students aged 23 and younger; negative factors inhibiting attainment include academic performance, hours worked, and dependent children.*

Using the interaction model as a basis for interpretation of this research question, students overall, when holding age and other factors constant, were less likely to attain when enrolling in a two-year institution at the beginning of their collegiate experience (OR = 0.33;  $p = 0.001$ )

compared to students who attended a non-degree granting institution. Conversely, when controlling for age and all other factors, enrollment in a four-year institution was associated with higher attainment (OR = 1.65;  $p = 0.001$ ). This, again, highlights differences for institution type and the need that students have to consider college choice as a determinant of attainment. This same importance can be said of Pell Grant receipt.

For nontraditional students, who were more likely than traditional students to select two-year institutions, receiving Pell Grants increased the likelihood of graduation. When receiving only \$100-\$9,000 in Pell Grants the likelihood of attainment increased (OR = 1.08;  $p = 0.291$ ), although this finding was not statistically significant. Holding the institution type constant, as the level of Pell Grants increased, participants were more likely to attain. Specifically, with \$9,001-\$18,000 Pell Grant dollars the odds ratio was 2.01 ( $p = 0.001$ ). There was an increase in the likelihood for receiving \$18,001-\$24,541 in Pell Grant monies cumulatively across the six-year study to an odds ratio of 2.92 ( $p = 0.001$ ). These statistics were compared to the reference group of students who did not receive any Pell Grant funding during the study.

Academic performance continued as a key factor in predicting attainment and in particular; high grades meant higher likelihood of attainment. As shown in the descriptive statistics, nontraditional students had slightly higher grades than traditional students. That combined with the right institution and support seems to make a difference for attainment.

For nontraditional students who worked during the final year of the study (2008-2009), there was a higher likelihood of graduation (OR = 1.14;  $p = 0.334$ ) but no statistical significance. When working during the third year of matriculation (2005-2006), attainment was less likely (OR = 0.22;  $p = 0.001$ ), holding all else constant in the interaction model. However, working during year six (2008-2009) made attainment more likely (OR = 1.15;  $p = 0.01$ ) in both the

interactive model and separately. Work mid-matriculation had more negative consequences than towards the end of matriculation. Reasons why students worked during the third (2005-2006) and final (2008-2009) years were not explicitly analyzed.

Finally, the effects of dependent children on attainment for nontraditional students was examined further. Descriptive statistics showed greater numbers of nontraditional students entering college with children in the first year of the study (62%) and final year of the study (71%). Comparatively, only 5% in 2003-2004 (year one) and 21% in 2008-2009 (year six) of traditional age students did the same. Finally, as highlighted in Chapter Four, nontraditional students represented an overwhelmingly large number of students with dependent children when entering higher education 2003-2004 (62%).

Collectively, the response to the research question for factors that support success for nontraditional age students, high academic performance, and working towards the end of matriculation have a positive effect on attainment. Findings still showed negative outcomes for nontraditional students across all models and within the predicted probability results. Chances of attainment continue to be lower for nontraditional age students, regardless of gender, but even lower when attending a two-year institution. Results from the study align with the predicted hypothesis that nontraditional age students who begin at community colleges had lower attainment than their traditional aged peers.

### **Pell Grant and Institutional Influence**

(3) To what degree does institutional type affect nontraditional age students earn credentials as compared to students 23 and under, when controlling for Pell Grant receipt, hours worked, and dependent children?

(a) Institution Type

(b) Gender

*H<sub>3</sub>: Nontraditional age undergraduate women will have lower degree attainment than students aged 23 and younger and show positive effects for gender and four year institutions.*

When holding all other variables constant, students who started in community colleges were negatively likely to attain (OR = 0.33;  $p = 0.001$ ). This, along with the positive finding for Pell Grant recipients to attain at low but not statistically significant (OR = 1.08;  $p = 0.291$ ), middle (OR = 2.01;  $p = 0.001$ ), and high (OR = 2.92;  $p = 0.001$ ) levels of funding, showed that institution type has a strong relationship with attainment, beyond even receiving high amounts of Pell Grant.

When considering gender with institution attended and their combined relationship with attainment, women were consistently positively related to attainment in both the full model (OR = 1.29;  $p = 0.001$ ) and interactive model (OR = 1.38;  $p = 0.001$ ). When considering nontraditional women separately and controlling for all other variables, they were negatively likely to graduate (OR = 0.66;  $p = 0.001$ ). Women also showed positive gains across all probability profiles, showing higher attainment for bachelor's degrees over men.

This does show a difference in gender with women overall having higher attainment, however, nontraditional age students overall are less likely to attain, aligned with the hypothesis presented for the study for research question three for lower nontraditional age attainment as over half of nontraditional aged students (66%) were women. The findings also show that institution type is indeed a factor for degree attainment. Community colleges still showed in this set of results, greater access but lower attainment. These institutions are still highlighted as creating greater access, but more work is needed to determine in what ways specifically, they are not leading to graduation for students who attend, specifically nontraditional aged women.

Institutional transfer, highlighted as a limitation of the study might be a factor for students seeking degree completion at the bachelor's level but find that even more courses must be repeated (and paid for) and that the anticipated time to complete stretches beyond their expectations leading to burnout. Four-year colleges, as hypothesized, showed higher outcomes for students, especially for nontraditional age students in the predicted probability findings.

Pell Grants on the other hand showed the highest outcomes, but only for the smallest portion (2%) who received greater than \$18,000 in Pell Grants. Even with positive outcomes for Pell Grant receipt above \$100, understanding Pell Grants at the student level may lead to missing available funding if students do not complete the FAFSA and instead pay out of pocket for courses. It could be an unnecessary cost for nontraditional age students especially, if they are financing semesters that could cost less with financial aid.

### **Gender Differences**

(4) For questions 2 and 3: How do the listed factors predict degree attainment when comparing for nontraditional age women and men with dependents?

*H<sub>4</sub>: Nontraditional age undergraduate women students will have higher degree attainment than nontraditional age men and dependents will be a negative factor influencing women's attainment.*

Predicted probabilities provided information related to differences between nontraditional age women and men with dependents. For bachelor's degree attainment, women had a 22% chance compared to 17% for men. They shared a 22% percent chance of attaining an associate's degree, as well as a 9% chance of attaining a certificate. Regarding no degree attainment, women and men had a 58% and 63% chance of no completion, respectively. The presence of children

was highly associated with a lower likelihood of attainment when occurring after year one but before year six (2008-2009) (OR = 0.57;  $p = 0.001$ ).

Factors highlighted for research question two (academic performance, hours worked, and dependents) and research question three (institution type and gender) had differences in their predictive strength for attainment. Academic performance, when high, was associated with a higher likelihood of attainment as was working in year six (2008-2009) and having dependents present in the first year of enrollment (2003-2004). When institution type and gender, attainment was more likely when attending a four-year institution and identifying as a woman. Using the same dataset, institutional choice four-year institutions were also found to have higher attainment outcomes (Perez-Felkner, Thomas, Nix, Hopkins, and D'Sa, 2019).

Consistent with women's higher performance than men, nontraditional aged women as hypothesized, showed higher chances of degree attainment as compared to men. Dependents, across all ages and genders showed lower chances of attainment and a lesser likelihood of attainment. What this tells us is that family obligations have an effect on completion, but does not impact grades. The literature review in Chapter Two demonstrates the high academic performance of nontraditional age students, but did not highlight the academic achievements of student parents even with children. When viewed collectively, findings state that parenting students have the ability to attain, but what is still unclear is why they are not attaining at the same rates as traditional age students. Reasons for lesser attainment could be connected to the cost of higher education which can directly conflict with the cost of raising children. Prioritizing work over academics can lead to pauses in education or even the decision to not return if there are opportunities for economic growth through job promotions or salary increases.

## **Policy Implications**

When comparing this study's findings to the outlined literature review, there was alignment for low-income, first-generation, and Black and Latinx students. Outcomes from this study illustrate how multiple identities that one person can hold complicate reaching attainment. Some of these factors cannot be manipulated by educational institutions in real life, such as race or income, while others can be addressed by policy makers who make decisions that impact many. As this study centralized age, gender, and public policy, a restating of key findings is important in distilling conclusions about this research and future research.

### **Nontraditional Age Students**

As presented in Chapter Two, nontraditional students have a substantial amount of responsibilities while enrolled in college. Results from this study showed that those responsibilities, independent of age, may have limited students who had dependents (2008-2009), worked (2005-5006), or who were from underrepresented racial and ethnic backgrounds from attaining a certificate or degree. For students who had all of those responsibilities and identities—including nontraditional students—these negative predictors of completion inhibited many from the finish line. Those who entered higher education later in their lives should not face the prospect of not completing their education before they even start classes. Nontraditional age students are far less likely to attain compared to others aged 18-23. As they made up 40% of the student population in 2016, it is essential that non-traditional students are given the attention and resources needed to succeed (Carlson & Laderman, 2016).

### **Women in Higher Education**

In these nationally representative U.S. data, women represented the majority (58%) of the students in the study. While women were the majority, the research that attend purposefully to



attainment outcomes for nontraditional women represents a small portion of research studies (Buchmann & DiPrete, 2006). When separated by age, women made up 66% of all nontraditional age students. Women were the largest population present in the data and had positive outcomes for attainment in this study; they were also the largest population to report having dependent children. Seventy-eight percent of women students regardless of age had dependent children as compared to only 22% of men. Since women had higher chances for attainment compared to men, it could be assumed that parenting did not deter women from attaining a college credential. Further, women with children were positively predicted to attain a bachelor's degree even as they had a greater responsibility for childcare.

However, this does not mean that colleges and universities should not adjust to meet the changing needs of women students to surpass challenges reaching a certificate or degree. Considerable shifts in recruitment, support for parenting children, and adequate mentorship can make a difference for women students and lessens inequality that still continues throughout society (Moradi, Subich, & Phillips, 2002). Inequalities are expanded when women are the head of household and solely responsible for their family and their own upward mobility. This points to the need for purposeful reconsideration of the needs of low-income women who would benefit from Pell Grants, but who may run out of funds before completing an associate's degree, as Pell funding continues to lag behind soaring tuition costs (Goldrick-Rab, 2016). Connected to the feminist theoretical framework for the study is the notion that inequality for women should be changed and is reflected in women's higher attainment outcomes from the study.

### **Pell Grant Federal Aid**

Of the research that has highlighted the stretch and strain of Pell Grants, this research adds the continued demand for more grant dollars for this form of financial aid. The upper limit

of total Pell Grants funds per individual measured in this study were \$25,241 over the duration of a six-year study. Broadly, this amount would not extend far for students today. The costs of college push low-income students into taking semesters off, delaying re-entry, and prioritizing work over an education. Higher education has continued to shift toward a business model focused on accumulating wealth and missing the opportunities to uplift those who need it the most. Predictive attainment for Pell Grant recipients who received \$9,000-\$25,241 were higher than for any other variable, even higher than attending a four-year institution or being a woman. Close attention should follow this important source of access for low-income students and women especially, whose education level can minimize poverty for the next generation.

Pell Grant amounts in this study ranged from low (\$100-\$9,000) to middle (\$9,001-\$18,000) and high (\$18,001-\$25,241). The smallest number of Pell Grant recipients were within the high range, with only 2% of nontraditional and 2% of traditional students receiving that amount cumulatively through 2008-2009. The majority of students received the low amount of Pell Grant funds, which was not enough to cover the cost of a degree, both during the time of the study and currently. If the scales will ever be balanced for low-income students, Pell Grant funding needs to be allocated to match the cost of a degree and should increase at the same rate as tuition at colleges and universities.

In keeping with the centering of gender, Pell Grant policy adjustment should reflect the demographics of low-income students, particularly those who are also women. Considering the presence of dependent children for women students in higher education, and even broadly, any student parent, there should be a Pell Grant funding structure that includes childcare support within colleges and universities. Further, the shift from loan counseling to Pell Grant eligibility

should lessen debt for low-income students and women rather than leave them less likely to graduate with added debt.

### **Study Limitations**

While this study did not include a measure of the number of dependent children for students, such an analysis could contribute to the previous literature cited in Chapter Two. Similarly, the attainment outcome variable measured final educational attainment. Further attention to institution transfer (number and direction) would have added to the transition path of nontraditional students, and seems potentially relevant to the study of this population, as observed in the national dataset used in this dissertation (Hampton & Perez-Felkner, 2018) and in other analyses of U.S. national data (Goldrick-Rab, 2006). Transfer to a four-year to complete a bachelor's degree becomes a challenge for students who find that all of their courses do not align with their degree path or that they have to repeat courses at the four-year institution accompanied by unexpected costs and lengthier completion timelines.

Within this nationally representative data, women were overrepresented, enhancing the ability to highlight gender-specific outcomes. The data, gathered over ten years ago limited gender to binary biological identities, rather than use of a gender identity spectrum which would create more inclusion. In addition to the limits of gender categories, outcomes could have been measured differently if the sample included only nontraditional students or had variables that combined gender and age to more closely align results for nontraditional aged women. This would have allowed for clearer gender-specific comparisons through the isolation of age.

Student experiences on campus and in the classroom would have assisted in determining how students' experiences might aid or hinder attainment, beyond cost and high academic performance. The literature on belongingness from Kasworm (2010) pointed to the sense of

community and confidence for students in the classroom, and having these factors included in the models would complement the use of demographics, institution type, and academic performance and their influence on attainment. An additional aspect of nontraditional age students that was included were children, but the number of children and age of those children would assist in viewing how ages of children or the size of the students' family potentially impact available finances or time to dedicate towards higher education.

Finally, much was learned from this research using data from over ten years ago. More recent data would have assisted with a more timely examination of how Pell Grants apply within the current structure of higher education. Similar to this is the smaller number of students (n=2,280) who were nontraditional age, representing only 15% of the full data set. Use of a solely nontraditional age dataset could support greater claims on gender differences for Pell Grants as well as the other factors included in the study. Additionally, a limitation in the models included two point-in-time measures for work and for dependent children. While not initially returned as collinear variables, including both points of time lessened the ability of the models to fully isolate the degree to which each independent factor influenced attainment. For future research variables like these should be treated separately to strengthen interpretations.

### **A Call for Future Research**

Continuation of research on women in higher education should center women in the development of datasets and analyses processes. The data were comprised of 58% women, and to investigate in-group differences, future datasets could, for example, be shifted to only women. Such a shift provides the availability to see differences among women, further leading to understanding patterns, trends, needs, and successes. Within this same focus, researching a dataset with solely Pell Grant recipients also centers research on income to better understand Pell

Grant reach and also attend to its limits. Adding to this is the need for a mixed methods study that gives a comprehensive view of student experiences which are difficult to obtain from statistical measures alone.

### **Challenging Gendered and Gender Neutral Policy**

Policy that is built by the economically advantaged is not always effective in helping the economically disadvantaged (Schneider & Ingram, 1993). With knowledge of this and the emphasis on critical feminist policy analysis in this study, future research could identify policy impact by gender identity, to expand the notion that policy should not be gender neutral.

Research that focuses specifically on policies that are connected to higher education at the federal level. This could include differences in gender for low-income students while paying close attention to age while reviewing federal financial aid, temporary aid for needy families, and other programs that allow for or limit attendance to college while receiving benefits.

### **Centering Women in Research**

Congruent with Shaw's (2004) research which centered women in policy building and reform, this study contributes to using education to minimize poverty. The narratives of women students who are also nontraditional age, who have dependent children, and who nonetheless have high academic achievement are worth placing at the center of not only this research, but all research that joins higher education and public policy research. Naming women as a population of interest while also highlighting their statistical outcomes will amplify the invaluable qualitative narrative that informed this research study. Findings about nontraditional women with Pell Grants that provide a conduit for degree attainment will support future policy developments that can confidently center women and the challenges that they face. While research has taken notice of women's comparative advantage over men in postsecondary enrollment and attainment,

there has not been the same attention to the share of women participating in higher education at a later age, potentially after participating in the workforce or having children.

### **Poverty Reduction Outcomes**

The research claims made by Haleman (2004) and Sharp (2004) include education for mothers reducing poverty for the following generation for low-income families. A follow up study could examine the difference in educational outcomes for higher education. This study would attend to completion of the same attainment outcomes of this study: no attainment, certificate, associate's degree, and bachelor's degree. A study like this would add to the ability of researchers to determine how and to what degree attainment type is related to the attainment of the next generation, expanding on what we already know about economic outcomes for the bachelor's degree level.

### **Women's Networks in College**

Citing the research from the early education of women in the 1900s, there was clear community amongst women while they sought education (Bergman, 2001; Stubblefield, 1981). Community building for women continues today in divergent conversations as women find difficulty in creating smaller subnetworks in fields like science, technology, engineering, and math (STEM) where women are underrepresented (Šaras, Perez-Felkner, & Nix, 2019; ). However, in work done by Dyrness (2007), communities among mothers showed the potential to increase education outside of the traditional education system. A study that follows women who are parenting children in higher education, noting their connection to other mothers, their academic connection to other women faculty, and their attainment outcomes. Findings from a study like this would support the claim of education as feminism for women while also providing

alternative network options for nontraditional aged women who may not naturally gravitate to traditional sorority or student organization contexts.

### **Summary**

In conclusion, this dissertation provided an opportunity to develop a better understanding of the ways that public policy can affect the outcomes of students who are disadvantaged, or not at the center, like nontraditional age students and women. Having the autonomy to understand a topic and population that is in close proximity to my own identity as a Pell Grant recipient allowed me to also consider my own experiences and combined identities. Work such as this builds on the previous research of others who each identified areas of interest separately: women, nontraditional students, and Pell Grant recipients. This work joined an investigation of these groups together to contribute more to our understanding of non-traditional age women students' educational attainment.

## APPENDIX A

### TABLES

**Table 5**  
*Variable List and Descriptive Statistics*

	Mean	Std. Dev.	Min	Max
<i>Sample Size (n = 15,130)</i>				
<b>Dependent Variable</b>				
Attainment Through 2008-2009	1.41	1.35	0.00	3.00
<i>BPS Variable: at1ty6y</i>	1.41	1.35	0.00	3.00
<b>Independent Variables</b>				
Nontraditional Age Students	0.15	0.36	0.00	1.00
Traditional Age Students (Reference Group)	0.85	0.36	0.00	1.00
<i>BPS Variable: age</i>	21.08	6.78	18.00	79.00
Women	0.58	0.49	0.00	1.00
Men (Reference Group)	0.42	0.49	0.00	1.00
<i>BPS Variable: gender</i>	1.58	0.49	1.00	2.00
Received \$100-\$9,000 in Pell Grant Funds Through 08-09	0.33	0.47	0.00	1.00
Received \$9,001-\$18,000 in Pell Grant Funds Through 08-09	0.10	0.30	0.00	1.00
Received \$18,001-\$25,241 Pell Grant Funds Through 08-09	0.02	0.15	0.00	1.00
Received \$0 Pell Grant Funds Through 08-09 (Reference Group)	0.54	0.50	0.00	1.00
<i>BPS Variable: pellcu09</i>	\$ 3,092	\$ 4,999	\$ -	\$ 25,241
<b>Covariates</b>				
<b><i>Race and Ethnicity</i></b>				
Black Race	0.13	0.33	0.00	1.00
Latinx Race	0.13	0.33	0.00	1.00
First Nation or Indigenous Race	0.01	0.08	0.00	1.00
Multiracial	0.03	0.16	0.00	1.00
Other Race	0.01	0.11	0.00	1.00
Asian Pacific Islander Race	0.05	0.21	0.00	1.00
White Race (Reference Group)	0.65	0.48	0.00	1.00
<i>BPS Variable: race</i>	1.83	1.54	1.00	8.00
<b><i>Institution Type</i></b>				
Enrolled in Traditional 4-year Institution 03-04	0.48	0.50	0.00	1.00
Enrolled in Hybrid 2-yr/4-yr Institution 03-04	0.01	0.08	0.00	1.00
Enrolled in 2-yr Institution 03-04	0.39	0.49	0.00	1.00
Enrolled in Specialized Institution 03-04	0.03	0.17	0.00	1.00
Enrolled in For Profit Institution 03-04	0.02	0.13	0.00	1.00
Enrolled in Non-Degree Granting Institution 03-04 (Reference Group)	0.08	0.26	0.00	1.00
<i>BPS Variable: cc2000</i>	5.25	3.89	0.00	19.00
<b><i>Academic Performance</i></b>				
Low GPA in 08-09	0.03	0.16	0.00	1.00
High GPA in 08-09	0.86	0.34	0.00	1.00
Middle GPA in 08-09 (Reference Group)	0.11	0.31	0.00	1.00
<i>BPS Variable: gpa09</i>	5.55	1.11	1.00	7.00



**Table 5 – continued***Variable List and Descriptive Statistics*

	Mean	Std. Dev.	Min	Max
<i>Sample Size (n = 15,130)</i>				
<b>Dependent Children</b>				
Had Dependent Children 08-09	0.28	0.45	0.00	1.00
Did Not Have Dependent Children 08-09 (Reference Group)	0.72	0.45	0.00	1.00
<i>BPS Variable: depany09</i>	0.28	0.45	0.00	1.00
Had Dependent Children 03-04	0.13	0.34	0.00	1.00
Did Not Have Dependent Children 03-04 (Reference Group)	0.87	0.34	0.00	1.00
<i>BPS Variable: depchild</i>	0.13	0.34	0.00	1.00
<b>Employment</b>				
Worked During Matriculation 05-06	0.18	0.39	0.00	1.00
Did Not Work During Matriculation 05-06 (Reference Group)	0.82	0.39	0.00	1.00
<i>BPS Variable: jobhrs06</i>	7.21	15.77	0.00	80.00
Worked During Matriculation 08-09	0.56	0.50	0.00	1.00
Did Not Work During Matriculation 08-09 (Reference Group)	0.44	0.50	0.00	1.00
<i>BPS Variable: jobhrs09</i>	22.46	21.20	0.00	80.00
<b>First Generation Status</b>				
First Generation Student with Low Income	0.22	0.42	0.00	1.00
Low Income Student and Not First Generation	0.06	0.23	0.00	1.00
First Generation Student and Not Low Income	0.35	0.48	0.00	1.00
Not First Generation and Not Low Income (Reference Group)	0.37	0.48	0.00	1.00
<i>BPS Variable: trio</i>	2.87	1.14	1.00	4.00
<b>Income Group</b>				
Low-Income Group	0.28	0.45	0.00	1.00
Low-Middle Income Group	0.26	0.44	0.00	1.00
High-Middle Income Group	0.24	0.43	0.00	1.00
High-Income Group (Reference Group)	0.22	0.42	0.00	1.00
<i>BPS Variable: incgrp</i>	2.41	1.11	1.00	4.00
<b>Interactions</b>				
Interaction: Nontraditional Students * Women	0.10	0.30	0.00	1.00
Interaction: Nontraditional Students * Low Pell Amount	0.07	0.26	0.00	1.00
Interaction: Nontraditional Students * Mid Pell Amount	0.02	0.12	0.00	1.00
Interaction: Nontraditional Students * High Pell Amount	0.00	0.05	0.00	1.00

*Note.* Beginning Postsecondary Students 2004-09 restricted-use data. Analyses by author.

## APPENDIX B

### IRB APPROVAL FORM



Office of the Vice President for Research  
Human Subjects Committee  
Tallahassee, Florida 32306-2742  
(850) 644-8673 · FAX (850) 644-4392

#### APPROVAL MEMORANDUM

Date: 06/06/2018

To: Amber Hampton [REDACTED]

Address: 114 W Call St (C/O Dr. Perez-Felkner) Tallahassee, FL 32304

Dept.: EDUCATIONAL FOUNDATIONS AND POLICY STUDIES

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research  
Community Colleges and the Public Good: Access for Nontraditional Low-income Students

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR § 46.110(7) and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 06/05/2019 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Lara Perez-Felkner [REDACTED] Advisor  
HSC No. 2018.24992

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## **BIOGRAPHICAL SKETCH**

Amber E. Holton-Thomas (Hampton) was born in Cleveland, Ohio and graduated from John Marshall High School in 2001. She completed her Bachelors of Arts degree with a double major in Psychology and Spanish at Capital University in 2005 and her Masters of Arts Degree in Higher Education at New York University in 2007. Following this, she worked at the NYU School of Medicine and in 2010, transitioned to Florida State University working in the Center for Multicultural Affairs and later in Center for Leadership and Social Change. Since 2017, Amber has lived in the DC-metro area with her husband and serves in the role of Associate Director for Assessment and Research in the Diversity & LGBTQ Office at George Mason University in Fairfax, Virginia.