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Latino Academic Achievement: Impact of Individual, Family, School, Community and Immigration Factors

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LOYOLA UNIVERSITY CHICAGO

LATINO ACADEMIC ACHIEVEMENT: IMPACT OF INDIVIDUAL, FAMILY,
SCHOOL, COMMUNITY AND IMMIGRATION FACTORS

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

PROGRAM IN SOCIAL WORK

BY

JESSICA MARTONE

CHICAGO, ILLINOIS

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For the DREAMers

Life is really simple but we insist on making it complicated

—Confucius

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ABSTRACT

The dissertation increases our understanding of the influence of multiple social systems on the academic achievement of Latino students. More specifically, this study examines the influence and dynamic interaction of individual, family, school, community, and immigration factors on the academic achievement of Latino students through a secondary data analysis of the ELS: 2002 dataset utilizing hierarchical linear modeling. Academic achievement is measured with a dichotomous variable: high achieving and low achieving. “High achieving” students are those that have an on-time transition to higher education and “low achieving” students are those that have a delayed or no transition to higher education. Latino students in the U.S. have consistently had the highest high school dropout rate of all ethnic groups as reported from 1980-2009 though there is an increasing enrollment in colleges. The findings show that living in a household with two parents, having parents who have higher educational expectations for the student, engaging in extracurricular activities, planning to go to college and seeking out information regarding college, and going to a school with a higher percentage of Hispanic teachers increase the likelihood of an on-time transition to higher education. This study makes a unique contribution to the fields of social work and education, and some of the constituents that would benefit include educators, school administrators, student support services personnel, including tutoring, mentoring, counseling and school social work

professionals, local, state and federal educational policy actors, Latino students and their families, as well as family support and early intervention professionals.

CHAPTER I

INTRODUCTION

Background

This dissertation examines the factors that impact the academic achievement of Latino¹ students in the U.S. Latino students in the U.S. have consistently had the highest dropout rate of all ethnic groups as reported from 1980-2009. The latest statistic states a 17.6% dropout rate for youth between the ages of 16-24 (U.S. Department of Education, 2011a). The most recent Census data indicate that the Latino population in the United States has increased by 15,171,776 between 2000 and 2010 and now totals 50,477,594 people (U.S. Census, 2010). These numbers indicate a large and rising Latino population in the United States and the importance of looking at the Latino experience in education.

In a comparison of national school enrollment by race and ethnicity between 2000 and 2009, the Pew Hispanic Center² (2011a) reported an increase of 2,695,046 Latinos (See Figure 1 in Appendix A). According to these figures, 21.0% of all students enrolled in schools in 2009 are Latino between the ages of 5-17. This figure has increased over the past two years with new reports showing that 23.9% of public K-12 students are Latino

¹ Latino/a and Hispanic are terms often used interchangeably. For the purpose of this dissertation, the term Latino/a will be used throughout.

² The Pew Hispanic Center is a research organization that studies the impact of Latinos on the nation and aims to better understand the U.S. Hispanic population.

(Pew Hispanic Center, 2012). Additionally, the report shows that 24.7% of public elementary school students are Latino and 25.2% of 18-24 year olds enrolled in two-year colleges are Latino (Pew Hispanic Center, 2012). Not only are more Latino students attending high school but, between 2010 and 2011, the number of Latino students who earned their high school diploma or GED increased by close to 4% (from 72.8% to 76.3%). As one of the fastest growing segments of the U.S. school population, Latino students merit the attention of researchers and policy makers.

The Pew Hispanic Center (2011b) found an increase in the number of Latino students attending college, with the majority enrolling in community colleges. They recently found that the year 2011 resulted in Latino students being the nation's largest minority group enrolled in four-year colleges and universities. Of importance, the number of Latino students enrolled in college increased by 15% from 2010 to 2011 (Pew Hispanic Center, 2012). Figure 2 (in Appendix B) displays a comparison of college enrollments, for 18-24 year olds, between 2010 and 2011. In a report prepared for the National Center for Education Statistics, it was found that 23% of the 22.3 million undergraduate students in the US were immigrants or second-generation students. Of this group, Asian students represented the largest number of first-generation immigrants and Latinos the largest number of second-generation students (Staklis & Horn, 2012).

Although there has been a significant increase in college enrollment among Latinos, it has not kept pace with the growth of the Latino population. Despite this increase, Latinos remain less likely to enroll in college than their Asian and White counterparts, however, Latino student enrollment in four-year colleges surpassed Black

student enrollment in 2011 (Pew Hispanic Center, 2012). Additionally, Latinos are less likely than their counterparts to receive associates and bachelor's degrees, though the numbers have increased among Latinos (Pew Hispanic Center, 2012). The Latino Policy Forum³ (n.d.) reports that due to lack of early education opportunities, Latino students lag behind their counterparts in early years of schooling, a difference that persists through high school and college. Suarez-Orozco and Suarez-Orozco (2009) write about principles and recommendations they see as necessary for the Obama administration to follow in order to address the educational issues of Latino students. The authors describe several key factors that must be examined: poverty, segregation, parental education, language, documentation status, school factors, English-language learning, teacher preparation/expectations, individual socio-emotional and engagement factors, generational factors, and social supports. Among their recommendations they include, increased opportunities for preschool education, refocused and revitalized teacher training, rethinking language education, increased after-school programs, supporting community mentorship programs, and developing college-pathway information. Contreras (2011) also offers recommendations to address the educational inequalities some of which include a focus on resources, teacher support and certification, eliminating high school exit exams and parental support. She also describes a model with four components that are necessary for students to do well in school and prepare for college: peer networks, community networks and infrastructure, access to adult human resources,

³ The Latino Policy Forum is a Chicago-based organization that conducts research on Latinos focused on education and a number of other issues including immigration and housing.

and access to infrastructure courses. An investigation of several different datasets has led Contreras to conclude that it is ongoing academic support that is needed at all stages, not just at certain points in the academic trajectory.

Recently, the White House launched an Initiative on Educational Excellence for Hispanic Students, with an agenda to diminish the disparity, expand educational opportunities and improve the academic achievement of Latino students (US Department of Education, 2011b; US Department of Education, 2011c). The policy recommendations of these agencies and other organizations call for increasing access to culturally and linguistically appropriate educational services, including parent-education programming; employing bilingual teachers and administrators with expertise in working with Latino communities; supporting early childhood education; promoting parent involvement; and expanding educational services to full-day programming. Obama's proposal states that new approaches to teaching and learning are needed, including, teacher preparation, support for community colleges, strengthening Hispanic-serving institutions, and improving affordability of college, among others (US Department of Education, 2011c). The time and money invested in producing these reports indicates an acknowledgement of the issue. What remains to be seen is how the results of these reports and their recommendations are implemented.

The high dropout percentage and low college enrollment for Latinos has changed little, suggesting a social issue. Stafford and Warr (1985) and Manis (1974) explain that something moves from being a private trouble to a public issue by the degree of concern, the numbers affected, the injustice, frequency of a problem and the damage it has caused.

Additionally, they explain that something has become a social problem and issue when there is a discrepancy between the norm for society and the actual conditions for a group. The statistics presented indicate that there is a discrepancy in educational outcomes for students of different ethnic/racial groups, namely for Latino students. The frequency of the problem is evident in that there has been no change for Latino students in the dropout rate from high school and little change in the numbers of students enrolling in college as would be expected with the growth of the Latino population. As the number of Latinos in the U.S. continues to rise, it is necessary to address this social issue with more research and policy.

In a report on Latinos in academia, Schmidt (2003) describes that there is a problem in the pipeline for Latino students and describes them as getting stuck or leaked out. Contreras (2011) also describes a leaking pipeline and Gandara and Contreras (2009) describe the pipeline as much narrower and more tenuous than it was in the past (p. 40). Schmidt explains that this issue begins as a language problem, which can affect achievement, from there Latino students often have little guidance in the college process and if they do attend, are then faced with balancing the demands of school with responsibility to the family. He furthers this last point by stating that Latino students often face the expectation that they will live at home, but explains that many experts feel these students would do better in college if they went further away to a school that could meet their needs. Staklis and Horn (2012) found that of Latino college students 55% of those that were first generation and 54% that were second generation did not have parents who attended a postsecondary institution (compared with 38% and 28% respectively of

Asian students). This indicates a large percentage of students who potentially lack appropriate guidance in the college process.

Latino immigrant students are faced with many stressors. Perez, Espinoza, Ramos, Coronado, and Cortes (2009) in a review of the literature found that stressors can include: loss of close relationships, housing problems, sense of isolation, documentation, acculturation process, learning English, negotiating ethnic identity, changing family roles, and adjusting to the schooling process. Students in general all deal with going to class, comprehending the information, doing homework, taking tests and navigating peer relations and social situations. When one considers these tasks in conjunction with the previously mentioned stressors immigrant youth can face, the possibility of succeeding academically seems challenging. Oakes as cited in Gibson, Gandara, and Koyama (2004) also details challenges faced by Mexican students and states that they have lower aspirations than other students, are more susceptible to gang influence, have less information about college, feel as if they do not belong in school, and that they are less likely to have teachers and staff who understand them culturally and linguistically.

Whether a student is documented or undocumented can impact whether or not they not complete high school and whether or not they go on to college (Perez et al., 2009; Contreras, 2011). Many undocumented students live in fear of deportation, which can impact multiple areas of their lives, as they fear being questioned by officials about their immigration status (Dozier, 1993). Many undocumented youth will feel pressure to contribute financially to the family, which can lead to dropout among youth (Behnke, Gonzalez, & Cox, 2010). Undocumented students have fewer options when it comes to

applying to college. Financially, they are unable to apply for federal aid (FAFSA), which limits the monies available though there are private scholarships they can apply for (Rincon, 2008). Some colleges and universities require a social security number to apply. On-line applications may be set-up so that a student cannot continue with the application until a social security number has been entered. Some schools may do this intentionally, others may not realize they have set their system up in such a way (DREAM Activist, personal communication, October 23, 2009). Having knowledge of the stressors, risks, and challenges that Latino students face will help researchers, practitioners, and educators better understand why some students are able to succeed and others are not.

Problem Statement and Significance

The educational success of Latinos can be controversial and complicated and many authors take a different stance on the issue. Noguera (2003) discusses in his book that there are many factors that youth cannot control in their lives and often failure is not for a lack of trying. He states, “Due largely to circumstances beyond their control, their dreams and those of their parents were never realized, not because of a lack of effort, but because of a lack of luck and opportunity” (p. 12). He goes on to state that the terrible conditions of urban schools are known and “that America simply does not care that large numbers of children from inner-city schools and neighborhoods are not properly educated” (p. 14). In 2001, President Bush signed an executive order, which created the President’s Advisory Commission on Educational Excellence for Hispanic Americans. This Commission called for more research on Latino students. Lauro F. Cavazos, a former secretary of education, explained that no more reports are needed, the problem is known, it is a will to do the

work that is needed (Schmidt, 2003). Similarly, Gandara and Contreras (2009) issue a call to action in their book, stating that the educational crisis in the U.S. has a Latino face. The authors explain that to better understand the Latino educational trajectory more than individual factors need to be considered, group factors as well as social and schooling conditions and community contexts and resources must be taken into account. Contreras (2011) adds that there is unequal investment in schools and that this must be addressed in order to change the educational discrepancies among students. She also discusses unequal access, which begins early, in preschool, and persists.

In another article Noguera (2004) states that what is missing from earlier research on the education of immigrants is a discussion of how the socialization and sorting of students play a role in their academic outcomes. Noguera discusses newer research that introduces the idea of social capital and its influence on the performance of immigrant students. He also states that a consideration of structure in the education process brings a new sector of information to the table. Research and information on Latino student's educational performance seems to be constantly changing as new information is presented and new variables of influence are considered. Noguera raises the important idea that many concepts are missing from the literature when discussing the academic achievement of Latino students.

While there is a considerable body of descriptive literature focused on the academic achievement of Latino students in the U.S., it is limited in scope and in its consideration of factors that potentially influence achievement. Studies tend to have a singular level of analysis and include limited predictor variables. More research focused

on understanding how multiple systems impact the academic achievement of Latino students, as well as their transition to higher education is warranted. Given the importance of considering school structure and factors as put forth by Contreras (2011), Noguera (2003, 2004) and Gandara and Contreras (2009), a complex multi-level analysis that allows for the consideration of multiple predictors at both the individual and school level is needed to better understand Latino student's educational achievement and their transition to college. This dissertation is a secondary study that utilizes a longitudinal education dataset that includes a national sample. This study contributes to understanding why some students are able to make the transition to higher education while others are not by using hierarchical linear modeling.

The National Center for Education Statistics⁴ (NCES) conducted a longitudinal and multilevel education study that began in 2002, the Education Longitudinal Study of 2002 (ELS: 2002). Follow-up data was collected in 2004, 2006 and 2012. The final data collection took place in 2012 and was completed in early 2013, and this data will be available within the year. The purpose of the study was to understand high school students as they progress through high school starting in tenth grade and their transition to postsecondary education and/or the working world. Several studies have been done using the ELS: 2002 data and many manuscripts, reports, dissertations and conference papers have been produced between 2001 and 2012 (NCES, n.d.). A review of all available abstracts using data from ELS: 2002 have revealed that there are several

⁴ The National Center for Education Statistics is a federal center dedicated to collecting and analyzing data related to education in the U.S.

limitations of the studies and their methodology. Some of these include 1) Minimal use of information related to generational status; 2) Few studies have incorporated a multilevel analysis; and 3) There are limited number of studies that look at the transition to higher education. The proposed study will attempt to address these gaps by using a multilevel analysis with ecological systems theory and cultural-discontinuity theory as a framework.

In the fields of social work and education, understanding why one of the largest minority groups in the U.S., Latinos, are doing poorly when compared to other students is of importance. While the Latino population has been the focus of many studies, including numerous education and immigration studies, there is still a great need for research in this area as their dropout rates remain the highest of all racial and ethnic groups. In social work, practitioners need to better understand what factors contribute to academic success. Additionally, both school social workers and high school guidance counselors and college counselors need to be aware of the factors that enable students to transition to higher education in order to support students and families in that process. This dissertation has important implications for education and social policy as well as education and social work programming and practice. As researchers learn more about what contributes to students' matriculation to higher education that information needs to be brought to the attention of policy makers to ensure that Latinos, one of the nation's largest groups, are graduating from high school and enrolling in higher education at the rates of other racial/ethnic groups.

Summary

This research assists in identifying factors that contribute to academic achievement, which can aid in supporting current policy initiatives and creating new and more effective education policies to support Latino students and their families. The study contributes to local and national education policy initiatives focused on Latino students. It provides unique information on many facets of a student's life, which may be important in their high school completion and transition to higher education. Such a focus can contribute to insights regarding school, community, immigration, and family, at the level of public policy regarding education, as well as community and school based policies and programs. The study addresses the impact of current education policies for Latino students and their families, and identifies new areas of research related to academic success. In addition, while the study primarily addresses educational policy, policies that span across education and immigration policy arenas, such as the Development, Relief and Education for Alien Minors (DREAM) Act, and Deferred Action for Childhood Arrivals (DACA) are addressed. This dissertation focuses on the following questions: 1) How are students who have an on-time transition to higher education different from those students who have a delayed or no transition to higher education? ; and 2) How do family, immigration, community, and school systems along with individual factors influence academic achievement outcomes in Latino students?

The following chapters provide a review of the literature and discuss the two theories used to inform this dissertation. A detailed overview of the study design, information regarding the variables included with coding and re-coding explained, and an

overview of the method used for data analysis is provided. The descriptive and multi-level results follow and finally, a discussion of the results, including contribution to theory, implications for policy and practice, limitations, areas for future research and conclusions.

CHAPTER II

REVIEW OF THE LITERATURE

The literature on academic achievement reveals that a comprehensive study of different systems and their influence on Latino student academic achievement is needed. The literature on achievement comes from the fields of education, social work, sociology and psychology and can be categorized into different topic areas that will be discussed below. Academic achievement is defined differently in many of the studies reviewed, which makes comparisons difficult, as being successful may mean “not dropping out” in one study, “going on to college” in another and could also be related to GPA, which was a measure in many of the studies. The literature reveals and confirms that factors such as parent involvement, having mentors, having a better grasp of the English language, having goals, participating in community programming, having good-quality peer relationships, and perceiving support, among others, all contribute to academic achievement. This dissertation uses a multi-level analysis and considers community, family, school and immigration systems as well as individual factors to better understand how multiple factors impact student academic achievement. See Table 14 (appendix D) for information regarding relevant studies that use the same dataset, same or similar methodology or similar outcome variable.

Conceptualizing School Achievement

Of interest in this study is the population of Latino students that complete high school and have an on-time transition to higher education as compared to those who have a delayed or no transition to higher education. However, there is limited literature that looks at this transition and therefore literature that looks at academic achievement broadly is considered. As mentioned, the literature considered contains many different definitions of “academic achievement” or “academic success”. Additionally, not every study considered uses the terms “achievement” or “success”. Therefore, what follows below is a breakdown of both how authors define achievement/success in their research or how other research has been classified if it does not contain those terms, such as studies that look at dropout or motivation. The literature reviewed focuses specifically on Latino students unless otherwise indicated.

Grade Point Average (GPA)

Many studies have chosen to look at GPA as a measure of academic achievement almost all of which also consider additional measures. Some studies have considered solely GPA (Kuperminc, Darnell, & Alvarez-Jimenez, 2008; Lopez, Ehly, & Garcia-Vazquez, 2002); others have looked at GPA in conjunction with school absences to measure a student’s academic outcomes (Sanchez, Esparza, & Colon, 2008; Colón & Sánchez, 2009). DeGarmo and Martinez (2006) looked at a student’s GPA in conjunction with homework frequency, student’s evaluation of their academic performance and their dropout likelihood (one item question) to measure academic well-being. In another study Martinez, DeGarmo, and Eddy (2004) looked at a student’s GPA in conjunction with their likelihood of high school dropout. In a qualitative study Kimura-Walsh, Yamamura,

Griffin, and Allen (2009) classified students as high achieving if they had a GPA of 3.0 or above and were enrolled in college prep courses. Perez et al. (2009) defined academic outcomes for undocumented high school, community college and University Latino students by using high school GPA, school awards received in high school, and rigorous Honors and AP classes taken. Garcia-Vazquez, Vazquez, Lopez, and Ward (1997) consider academic success as a measure of GPA along with proficiency in English and standardized test scores. Esparza and Sanchez (2008) in looking at academic outcomes consider GPA, number of classes cut, academic motivation and academic effort. Gandara and Contreras (2009) in a qualitative study looking at students who were part of a college access program called Puente, categorized students in four groups: 1) those with good grades and test scores and good effort; 2) those with high potential, who do well, but have lower motivation; 3) those with good effort, but low grades; 4) those with low performance and effort.

Math and Reading Scores

Many studies have exclusively focused on math and reading achievement scores as a marker for academic achievement. For many this consists of looking at scores at one point in time which measure proficiency in several areas of math and reading comprehension (Kalogrides, 2009; Eamon, 2005). Kalogrides (2009) explained that math and reading scores have been found to be associated with high school graduation and college attendance and therefore are important to examine. Fuligni (1997) used math and English course grades from student's official records as a measure of academic achievement. Altschul (2011) used tenth grade math, reading, science, and history standardized test scores and Carpenter (2008) looks solely at math achievement scores.

Completing High School/Dropout

Goldschmidt and Wang (1999) looked at early and late dropout behaviors of students, though not specifically Latino students. Though they did not directly look at “academic achievement”, their consideration of dropout is being viewed through the lens of academic achievement. Other studies consider dropout behavior including the factors that lead to dropout (Behnke et al., 2010). Ream and Rumberger (2008) looked at a subset of students from the National Education Longitudinal Study of 1988 (NELS: 88) dataset who had not dropped out two years after they had been measured as 8th graders and follow them through the spring of their 12th grade year, looking at dropout behaviors. DiPaula (2008) examined educational persistence, which was measured by dropout status using ELS: 2002 data from the first follow-up.

Transition to Higher Education (Postsecondary Enrollment)

Several studies have examined the transition to higher education. Though this transition is not always deemed by researchers as “achievement”, it is related to the definition of academic achievement used in this dissertation. Nuñez and Kim (2012) used a binary outcome variable comparing those students who enrolled in four-year college versus those who never enrolled in college within two years of high school graduation. Perna and Titus (2005) considered college enrollment as a three-category variable looking at those who enrolled in a two-year college, those who enrolled in a four-year college or university and those who did not enroll at all. Gonzales (2010) used in-depth interviews to examine how college-goers were different from early-exiters. He classified those who went to college as “high-achieving” and those who were early-exiters (those that do not finish high school or those that complete high school, but did not go on to

college) as “lesser academically achieving”. Oseguera and Malagon (2011) looked at factors that predict Latino students’ enrollment in for-profit colleges and universities as well as the characteristics of those students. Ovink (2011) used mixed methods to look at predictors of transition to postsecondary education. Alon, Domina, and Tienda (2010) used five large-scale datasets (including ELS: 2002) to estimate postsecondary enrollment and degree attainment. Hurtado-Ortiz and Gauvain (2007) compared two groups of recent high school students looking at those who had enrolled in college as compared with those who had not.

Postsecondary Success/Degree Attainment

There is a body of research that focuses on Latinos who make the transition to college, and looks at both success during college and degree attainment. Studies have examined factors that contribute to those students who are able to obtain a bachelor’s degree (Educational Policy Institute, 2005) as compared with those who have gone to college and not obtained a degree as well those who have received their associate’s degree and those who have received a certificate or license (Sciarra and Whitson, 2007). Campa (2010) defined successful students as community college students who originally struggled with coursework, including those who may have dropped out and returned, but at the time of the study were in their third semester of coursework and had maintained a good GPA of 3.0 or higher.

Other Measures of Success

The remaining studies have several different areas of focus related to Latino students’ educational experiences. A study by Green, Rhodes, Hirsch, Suarez-Orozco, and Camic (2008) looked at academic engagement by considering the “Academic

Engagement Scale” which was a measure of three items thought necessary to measure school success. These items considered homework completion, turning in homework on-time and paying attention in class. Sanchez, Esparza, Berardi, and Pryce (2011) looked at students during the transition from high school. Not all students went on to college, but students’ relationships with their mentors were examined during this transitional period. Nuñez (2009) looked at students who have transitioned to college to examine their sense of belonging, which she says is a measure of social capital. Castillo, Conoley, Cepeda, Ivy, and Archuleta (2010) classified students by high, middle and low-risk with respect to chances for attending college. The high-risk group had many risk factors and lower chance of attending college; the middle-risk group had an A or B average and good attendance; and the low-risk group did not have many risk factors and were more likely to attend college. Vick and Packard (2008) looked at academic success as a measure of self-regulation using The Self-Regulation subscale from the Motivated Strategies for Learning Questionnaire (MSLQ). Plunkett and Bamaca-Gomez (2003) and Alfaro, Umana-Taylor, and Bamaca (2006) considered Latino academic motivation using five items: effort in school, importance of grades and education, finishing homework on time, and liking school.

Factors Related to School Achievement

The following is a summary of the factors that have been found in previous research to affect, impact, or relate to academic achievement. Some research studies are presented with detailed information and are included in the category that is most relevant to the findings. However, the reader may find that factors that belong in different categories are presented together, which is done to preserve the study findings and present them as a

whole. Some study results have been included in each section, but with only a mention of the major findings and the author.

School Factors and Structure

Research shows that there are structural school factors that impact student achievement and that schools that are more prepared to receive immigrant students have better performance outcomes for their students (Campa, 2010; Behnke et al., 2010; Goldschmidt & Wang, 1999; Eamon, 2005). Campa (2010) and Behnke et al. (2010) give unique insight into the structural issues both within schools and communities that place additional challenges on Latino students and their families.

Behnke et al. (2010) completed their research on Latinos living in states with a recent history of immigrant arrival and looked at factors and services that prevent dropout. Given the focus on new arrival states, the authors point out that schools in these areas may not be structurally equipped to handle the needs of Latino students and their families. The authors surveyed 501 Latino youth and found that the primary reasons for dropout were “personal” (such as pregnancy or family problems), but also included academic struggles and work. Students were asked to identify problems faced and most frequently stated: discrimination/racism, violence/gangs, lack of English skills, and peer pressure. In terms of services, students said they would find helpful, they identified tutoring, mentoring, after-school programs, ESL classes and Spanish-speaking staff. This study sheds light on school factors that are important for Latino students to be academically successful.

Campa (2010) looked at resilience among Latinos with an in-depth analysis of five Mexican-American students at a community college using interviews, focus groups

and classroom observations. She examined the obstacles these students overcame in order to be successful. Campa like Noguera (2004) explains that there are structural barriers in the way of Latino student's academic success. Campa furthers this idea by stating that research on resilience does not consider cultural, economic, historic or political structures of schools. Campa concluded that these critically resilient community college students were able to succeed by focusing on the larger picture of the family and community. In another qualitative study, Kimura-Walsh et al. (2009) conducted focus groups with 16 Latina high school students in order to better understand student's access to higher education. The authors found that many students used teachers and college counselors as their primary source for college information. Some students, those with high rankings, indicated they benefited from using the College Corner at their school; however, those with lower rankings expressed difficulty accessing college resources. The authors found that students were given certain types of college information depending on how they were tracked within the school. Students indicated that they sought college information at programs offered outside of their school. Gonzales (2010) like Kimura-Walsh et al. also discusses the tracking of students and the effect this has on the knowledge they are able to obtain regarding college as well as the relationships they are able to form with teachers within the school. He describes that "positively tracked" students had beneficial experiences with respect to gaining access to college information and teachers. He explains that students' educational trajectory is influenced by their position in the school hierarchy.

Oseguera and Malagon (2011) employed logistic regression to examine for-profit and not-for-profit college and university enrollment among Latino students using the

ELS: 2002 dataset. The authors describe for-profit institutions as those similar to private career schools and that provide trade, occupational, and vocational training. The authors studied many layers of variables, using Perna's "contextual layers" framework, considering cultural capital and social capital in layer one; school and community variables in layer two; the higher education context in level three; and broader policies in layer four. They found that for both two-year and four-year schools, talking to friends and family about college decreased the odds of enrolling in a for-profit institution and discussing college with a counselor increased the odds of enrollment in a for-profit institution.

Though they did not focus specifically on Latinos, Goldschmidt and Wang (1999) considered the effect of school factors on student dropout using the NELS: 88 dataset. Using HGLM, the authors identified student-level factors and school-level factors that contributed to student dropout. The student-level risk factors for dropout include parent level of education, single-parent household, parent involvement with checking homework, being held back a year in school, misbehavior and working more than 20 hours per week. The school-level risk factors for dropout include: not attending a private school (secular or non-secular), average SES of the community, average education level of community, percent of students held back, percent of students misbehaving, and school composition. The authors found that being held back a year in school was the strongest predictor for student dropout. While the authors did not look at Latino students specifically, they have similarly identified risk factors for students that match many of those found in studies looking exclusively at Latino students.

Parental Involvement

Several studies have shown that parental involvement has contributed to the academic success of Latino students (Altschul, 2011; Nuñez & Kim, 2012; Plunkett & Bamaca-Gomez, 2003; Eamon, 2005; DeGarmo & Martinez, 2006; Kuperminc et al., 2008; Hurtado-Ortiz & Gauvain, 2007; Sciarra & Whitson, 2007). Plunkett and Bamaca-Gomez (2003) looked at the role of parenting and Latino adolescent's academic outcomes. The authors looked at four aspects of parenting: parental education level, parent's ability to help students, parental monitoring and parental support. The sample size was 273 and included students from three different schools, all of which had different SES levels. Approximately half of the students were born in Mexico, the other half in the U.S. and all of them had two parents born in Mexico. The data was gathered using a self-report questionnaire. The authors found that in homes where English was spoken more often and parents had a higher educational level there was a positive relationship with the youth's educational aspirations. It was also found that parent's ability to provide help, provide support, and monitor students was positively related to the youth's academic motivation. They also found that the student's generational status was not related to the outcomes. This study shows the importance of looking at parent's support of their students as well as parent level of education and English language abilities.

Eamon (2005) applied an ecological systems framework to study Latino's academic achievement (reading and math) as influenced by social demographics, school, neighborhood, and parenting in a secondary study of a national dataset. The author found that parent involvement predicted both reading and math achievement. Students who

lived in neighborhoods with fewer problems were found to have better reading achievement, but not math achievement. Similarly, DeGarmo and Martinez (2006) found that parental support was one of the greatest predictors of Latino student academic well-being. Collective support including parental support, peer support and school support was the best predictor of well-being. However, parental support as a single predictor was the most important. They also found that discrimination led to lower levels of academic well-being and in order for social support to counteract discrimination, Latino students needed to experience the highest levels of support.

Alfaro et al. (2006) using an ecological systems framework employed path analysis to look at 154 Latino male and 156 Latina female 9th and 10th grade students. They sought to look at the family, school, and community connections to better understand academic motivation. They found that mother's academic support was significantly and positively related to academic motivation for girls, and for boys, father's academic support was positively, but not significantly related to academic motivation. Additionally, they found that for both boys and girls, teacher's academic support was significantly and positively related to academic motivation. Kuperminc et al. (2008) conducted a study with the idea in mind that parental involvement is a type of social capital for students. The authors studied middle and high school students and found that parental involvement was associated more strongly with academic adjustment for high school students than middle school students even though there was lower parental involvement for high school students. Using the ELS: 2002 data for his dissertation, DiPaula (2008) looked at the educational persistence of Latino students and found that parental involvement with homework was predictive of educational persistence.

Hurtado-Ortiz and Gauvain (2007) conducted a quantitative analysis using a survey study to look at college attendance for Mexican-American youth. The sample included 104 recent high school graduates of which half (52) were enrolled in postsecondary education and the other half were not. The results of this study indicated that there is a positive relationship between college attendance and parental involvement with homework, parental aspirations for the child and mother's educational level. In another study focused on Mexican-American youth, Altschul (2011) used structural equation modeling with a sample of 1,609 students from the NELS: 88 dataset to look at the impact of parental involvement on academic achievement. The author found that the parental involvement through home-based activities was the most significant predictor of success. They also found parental financial investment in the child's intellectual development (i.e. extracurriculars and education resources) had more of an impact on achievement than other types of time-based involvement.

Sciarra and Whitson (2007) used multinomial logistic regression with a sample of 866 Latino students from the NELS: 88 dataset and looked at predictive factors for postsecondary degree attainment. They found that parental support and internal locus of control were the two strongest predictors between students who went on to postsecondary education, but did not receive a degree and those students who did receive a bachelor's degree or higher. Nuñez and Kim (2012) using a Latino sample from the ELS: 2002 dataset conducted a hierarchical generalized linear modeling (HGLM) analysis and found that higher parental educational expectations for students was associated with higher odds of enrollment at a four-year institution. They also found that when parents were more involved with the student's planning for college the student was 75% more likely to

enroll in a four-year institution. Students who had higher educational expectations were 40% more likely to enroll in a four-year institution and students concerned about financing college were 20% more likely to enroll in a four-year institution. In addition, being female, being from Central and South America, and taking advanced level math courses were associated with higher likelihood of college enrollment. At the school level, schools with higher percentages of free lunch recipients and absenteeism resulted in a negative association with enrollment at a four-year institution. At the state level, states with higher percentages of teachers with graduate degrees resulted in better odds of enrollment at a four-year institution. In contrast to these studies, and using math achievement as the dependent variable, Carpenter (2008) found that parental aspirations and parental expectations for their student were not significant predictors of achievement. They also did not find agreement between student and parent expectations or students perceptions of parental aspirations to be significant predictors of achievement.

Family

For Latino students, family has been found to be a protective factor and also contributes to academic achievement (Suarez-Orozco & Suarez-Orozco, 1995; Esparza & Sanchez, 2008; Castillo et al., 2010; Perez et al., 2009). Research has also shown that the experience of having an older brother and sister who attended college is positively related to Latino student college attendance (Hurtado-Ortiz & Gauvain, 2007). Kimura-Walsh et al. (2009) found that students reported that though their family was supportive, they did not use their parents as a resource for information about college due to limited knowledge. Suarez-Orozco and Suarez-Orozco (1995) did a comparative study with

*familism*¹ as a variable of interest. The authors did a cross-cultural comparison among white youth, Mexican-American youth and Mexican youth. The authors found that familism was higher among Mexican youth, when compared to the White Americans. They state that familism is a protective factor unique to the Latino population. In a study looking at familism, Esparza and Sanchez (2008) surveyed 143 Latino high school seniors and found that higher rates of familism predicted lower truancy and more academic effort. They also found that the mother's education level mediates the relationship between familism and academic achievement. The indicators of success in this study were measured by student's effort and motivation, as well as truancy and cumulative GPA. These studies connect the important idea of family to a model looking at academic success of Latino youth.

Perez et al. (2009) used a risk and resilience framework and focused their study specifically on undocumented Latino youth. Risk factors for undocumented youth identified in this study include working a high number of hours at a job, experiencing social rejection, family size and level of parental education. Protective factors include participation in the gifted and talented education (GATE), valuing school, having high bilingualism, low distress, parents/friends valuing school, participating in extracurricular activities, volunteering, and growing up with both parents. Data was collected using a two-part online survey. Using regression analysis, these researchers found that even in the face of many risk factors, those students who had high levels of personal and environmental protective factors had a higher level of academic success than students

¹ *Familism* is a term used to express family connectedness and loyalty to the family, (see Berger-Cardoso & Thompson, 2010).

facing the same risks, but that had lower levels of personal and environmental protective factors. Success is defined in this study as having a high GPA, a high number of academic awards, and high number of honors and AP courses. This study only focuses on undocumented students, which may be a limitation. The research provides important information about undocumented youth, but it would be important to compare this group to documented Latinos.

Peer relations

Peer relations for Latino students have contributed to academic achievement and have been found to be a protective factor in the lives of these students (Perez et al., 2009; Ream & Rumberger, 2008; Gibson et al., 2004). Ream and Rumberger (2008) looked at how peer social capital and social engagement influence dropout. Ream and Rumberger focused on predictors of dropout as opposed to academic achievement. Using longitudinal data, the authors found that socio-economic disadvantage diminishes educational aspirations among Latinos. They also found that peer social capital mediates the impact of student engagement on school completion or dropout. Having high-achieving friends increased student's likelihood of completing school. They found that among engaged students, organized sports and arts activities tend to reduce the likelihood of dropout. They also found that the Mexican-American youth in their study were less engaged in school activities than their white counterparts. The authors suggest that this may minimize social capital and friend networks.

Gibson et al. (2004) also discussed the importance of peer relations, in their book on school achievement for Mexican youth, pointing out that peers play an important role in the lives of Mexican youth. They define peer social capital as, "adolescent's

connections to peers and peer networks that can provide access to tangible forms of support that facilitate the accomplishment of academic goals” (p. 8). They discuss that peer relations is an important predictor of Mexican student achievement. Castillo et al. (2010) found peers to be both helpful and a distraction from success. If peers discussed college and doing well in school, they were found to be a contributing factor to success, but for many in the study, peers caused distraction. Oseguera and Malagon (2011) found that having friends who value education decreased a student’s likelihood to enroll in both two-year and four-year for-profit institutions. Gandara and Contreras (2009) have found in their research that students tend to form friendships with others of the same ethnicity, which they explain for Latinos may mean having friends who are also low-performing and dropouts. This research demonstrates that not only do the type of friends possibly contribute to a student’s success or dropout, but also the friends’ ethnic background may have an influence as well.

Community Programming/Extracurricular Activities

Authors have found that participating in extracurricular community programs and volunteering have contributed to academic success (Perez et al., 2009; Gandara & Contreras, 2009; Vick & Packard, 2008). Vick and Packard (2008) write from a strengths perspective and looked at the academic success of 66 youth who were participants in an urban community center. They approached their research using the Positive Youth Development (PYD) framework focusing on the potential that youth possess as opposed to taking a prevention approach. The authors mention that much of the literature for Latino youth focuses on what they call “at-risk” behaviors as opposed to success strategies that students possess. Data was collected using a survey and in addition, four

participant interviews were collected. Using model building and regression analysis, the authors found that self-efficacy, instrumentality and salience of becoming a college student explained 53% of the variance in academic self-regulation, which they explain as goal-directed behavior. Participant's immigration status is not clear and the authors state that acculturation was not measured. The authors discuss that participation in this type of community programming can promote academic success. However, this study did not use a control group and therefore, it is unclear how youth who are not part of the community center would have compared. Gandara and Contreras (2009) discuss that extracurricular activities can lead to belonging and success in school, but that for Latino students, extracurricular activities may be less accessible. They explain that extracurricular activities should be made a part of the curriculum to increase access for Latino students.

Social Capital

Social capital, which can be parent involvement, student perception of support, belonging and also peer relations has been found to contribute to student academic achievement (Kuperminc et al., 2008; Gibson et al., 2004; Nuñez, 2009; Perna & Titus, 2005; Ream and Rumberger, 2008). While many of these factors are explained individually in other categories, they are again explained here and supported by research that collectively looks at all of these factors and considers them as social capital. In a study exploring social and intercultural capital Nuñez (2009), looked at Latino students' transitions to college, including their sense of belonging and perception of the environment. In an analysis of data from the *Diverse Democracy Project Study*, a national longitudinal dataset and structural equation modeling, Nuñez found that when student's perceived that faculty were interested in them, they had a stronger sense of

belonging, which Nuñez designated as a type of social capital. She found that second generation students felt less of a sense of belonging than first and third generation students. In terms of intercultural capital, students felt an increased sense of belonging when they had positive cross-racial interactions and when the school had a diversity curriculum. Nuñez and several other aforementioned researchers have identified the importance of social capital for students.

Using the NELS: 88 data with a sample of African American, Latino, and Asian students (with White students as the reference group), Perna and Titus (2005) employed HLM with a categorical outcome variable: enrollment in a two-year college, four-year college, and no college enrollment. The authors looked at measures of social, economic and cultural capital and found that parental involvement is related to high odds of attending two or four-year college, with the exception of parent-contact with school related to behavior issues. They found that a friend's choice of college is related to the likelihood of student enrollment in two and four-year schools. The likelihood of enrollment in two or four-year schools was associated with the volume of resources accessed at school. The likelihood of enrollment in a two-year school is positively related to economic and cultural capital. When considering the racial breakdown, the authors found that African-American and Latino students had lower college enrollment rates, which is partly related to a lower availability of resources at their schools.

Mentors

Some research has focused exclusively on the role of mentors. Sanchez et al. (2008) focused their research on the role of mentors and student's academic achievement. They found that the presence of a mentor meant fewer school absences for a student.

However, those with a mentor and those without did not differ in GPA. Bivariate tests showed that those with mentors had higher educational expectations and had a greater sense of belonging. Sanchez et al. (2011) focused on students during their transition from high school by administering a survey to students at the end of their senior year in high school and performing an interview a year later. Some students in the sample had gone on to college, and others not. Results suggested that students who had mentors at both time points had a broader social network with more support.

Kimura-Walsh et al. (2009) found that school overcrowding prevented students from forming mentoring relationships with teachers, which they indicate limited access to possible information about college. In his in-depth interviews with 78 undocumented Latinos, Gonzales (2010) found that the tracking of students within their schools greatly influenced the relationships students were able to form with teachers and counselors. He describes the added stresses of being undocumented and reveals that students who were able to open up to adults within the school felt they had a trusted person with whom they could discuss their undocumented status. Castillo et al. (2010) reported that students found teachers to be very important and wished they brought up information regarding high school graduation and college enrollment more often. Research in this area shows the importance of mentors, but reveals that access to mentors is limited in some schools and affected by the tracking of students.

Acculturation and English Language Proficiency

Research has shown that both English language proficiency and levels of acculturation contribute to youth academic success (Eamon, 2005; Perez et al., 2009; Lopez et al., 2002; Garcia-Vazquez et al., 1997; Hurtado-Ortiz & Gauvain, 2007;

Kalogrides, 2009; Martinez et al., 2004). Lopez et al. (2002) examined the effects of acculturation and social support on academic success and found that youth who were highly integrated had higher academic success, as measured by GPA. They also found that youth who were more bicultural and Anglo-oriented had better academic success. The authors reported that all of the youth in their study perceived social support from all sources mentioned: parent, teacher, classmate, and close friend, but did not discuss how social support was related to success. The study did look at generational effects, but did not find any significance. Garcia-Vazquez et al. (1997) looked at the effect of English language ability on academic success among sixth through twelfth grade Mexican-American students. The authors found a significant effect of English proficiency on achievement scores and GPA. In a study using data from ELS: 2002, with a sample of 2,059 Latino students, Kalogrides (2009) used an OLS regression analysis to examine the theory of segmented assimilation and Latino student academic achievement. The author found that in both low-income and non-low-income schools academic achievement increases across generations, though this was much less evident in advantaged schools. Kalogrides also considered bilingualism, which was a self-report measure in this study, and found that there were no significant differences in achievement between native English speakers and non-native English speakers.

Martinez et al. (2004) completed a survey with 314 youth from four school districts in Oregon (162 of these youth were classified as Hispanic/Latino); additionally 116 Latino participants who were part of a State Latino Youth Summit (all identified as Hispanic/Latino) participated; and 130 parents from Lane County, Oregon (73 were identified as Latino). The authors aimed to look at what promotes academic success

among Latino students. They defined success by the student's GPA and how likely they were to drop out of school. It was found that greater student acculturation predicted lower likelihood of dropout, but was not significantly related to the student's GPA. Institutional barriers predicted lower GPA and greater likelihood of dropping out. Encouragement from school staff and parents predicted academic success.

Colón and Sánchez (2009) presented an immigrant optimism hypothesis, finding that those students who had greater familiarity with Latino culture and had a preference for Spanish language and greater proficiency, had higher GPAs and fewer absences. This is contrary to what other studies have found, but the authors explain that recent immigrant students may maintain more aspects of their culture and share more similarities with their parents regarding beliefs for success in the U.S. The authors describe this preference for Latino culture as a protective factor.

In a study using multiple regression with a sample of 1,341 10th grade, 8th grade and 6th grade students from immigrant families, Fuligni (1997) found that within each generation, students from homes where English was not the main language tended to have lower math and English grades. The authors indicated that first and second-generation students had better grades than those from native families, which is similar to the Colón and Sánchez (2009) finding. The factor most correlated with academic achievement was the emphasis on education by students, parents and peers. Oseguera and Malagon (2011) found that students were more likely to enroll in two-year not-for-profit institutions if English was their dominant language and they were third generation. In terms of four-year institutions, entering U.S. schools in middle school or later grades increased odds of enrollment at for-profit institutions. Alon et al. (2010) using five large-

scale datasets found that Latino students who had native-born parents were less likely to enroll in any college than their White counterparts and this difference was even larger for Latino students with foreign-born parents. The authors performed simulations and concluded that if the Latino students were to have parents with the same educational resources as White students the differential in college enrollment would be nearly gone. Parental education level also contributed to enrollment differences. The authors found that the odds of college completion were better for White students than Latino students and that this is due to what they call “ethnic inequalities” in college preparation. These studies indicate the necessity of looking at multiple systems as well as a consideration of language and generational status.

Student Engagement

In a study examining recently arrived Latino students, Green et al. (2008) used hierarchical linear modeling with a longitudinal dataset to explore academic engagement. Overall, they found a high level of academic engagement among participants. Specifically, they found that in terms of gender, boys reported higher levels of engagement initially, but girls had more positive changes over time. In terms of perceived support, girls who perceived more support had higher initial engagement, and for boys, engagement increased over time. Changes in perceived support over time also predicted levels of engagement. This study demonstrates the importance of support in student engagement. As this study shows, perceived support plays a significant role in the lives of students. It is crucial to look at both teacher’s and parent’s support of students. In a study using hierarchical multiple regression with a sample of 143 Latino 12th graders,

Colón and Sánchez (2009) found that as student's economic value of education increased, their GPA increased and their number of absences decreased.

Aspirations

The Educational Policy Institute (2005) used the NELS: 88 data to write a three-part report series titled "Latino Students and the Educational Pipeline". Part III focused on pathways to bachelor's degree completion. While the authors did not find parental aspirations of higher education to be a predictor of college degree attainment, they did find parental aspirations for an advanced degree to be a predictor. As for the students, when they predicted they would complete 'some college studies' their chances of degree attainment increased by 48%, when they predicted they would 'complete college' their chances of degree attainment increased by 53%. While college preparation assistance had no effect, high school courses did. Taking pre-calculus, calculus and remediation in English were significant predictors in college degree attainment. The researchers found that enrollment in a four-year (as opposed to two-year) college, continuous enrollment, and not delaying college matriculation after high school increased the chances of college degree attainment. In addition, being female and being from a middle-income home were significant predictors. This study indicates the importance of both parental aspirations of the student and the student's aspirations for themselves. Kalogrides (2009) found that parental expectations for their children were significantly and positively related to academic achievement for both students in low-income and advantaged schools. Castillo et al. (2010) found that students most often assumed personal responsibility for success and challenged themselves to do well and plan for college. DiPaula (2008) found that students' educational expectations were predictive of persistence in high school.

Ovink (2011) in her mixed methods dissertation looked at postsecondary aspirations and enrollment of Latino students. In the qualitative component, 50, Mexican students were interviewed and the quantitative component used ELS: 2002 data. Mexican students were compared among each other and with White students. The interview data indicated that all students aspired to some postsecondary education or training and that most planned to live at home. At the first interview point, she found that students' college aspirations almost always matched their expectations. After the third-wave of interviews she found a disconnect between student aspirations and expectations and that family and financial reasons played a role in this change. In addition, Ovink found that girls were more likely than boys to attend a four-year college. More than half of the girls planned to attend a BA granting institution and more than half of the boys planned to attend a two-year college. Parents expressed that girls would more successfully transition to college. She also found that students lacked knowledge about cost of college, financial aid, and the college process. Using logistic regression with the ELS: 2002 dataset, she found that parent expectations and student self-expectations for educational attainment did not differ for Mexican and White students. Ovink also found that steady employment was associated with higher odds of college enrollment for Mexican students and that the odds of college enrollment were higher for female Mexican students. This dissertation highlights many areas that are important to consider when trying to understand the Latino student transition to high education. Both the quantitative and qualitative components reveal several factors that are important to examine.

In a qualitative study focused on 28 students in a college prep program, *Puente*, Gandara and Contreras (2009) classified students in four categories based on grades, test

scores and effort/motivation. They found that all of the students in category one (best grades and highly motivated) had aspirations to attend a four year college or university and that all had taken college entrance exams. Those in category two aspired to go to state colleges or private four-year colleges where they had better odds of being accepted. All but one student in category three stated they wanted to go to college, but did not provide any details, only stating that community college would likely come first. Those in category four said they wanted to raise their grades and go to college, but only one had taken the SAT. One important theme in this study was family and the need for students to provide support to their families. It is important to consider the role that family may play in college aspirations and transition to college. The authors also state that these students would have been aided by school social workers to help them with psychological and social service needs.

The literature presented heretofore identifies many predictors of academic achievement. It also reveals that researchers have many different approaches both in research methodologies and definitions of academic achievement. In general, researchers approach the issue from either a deficits perspective and focus on school dropout or from a strengths perspective and focus on the positive things youth do or the positive aspects in their lives that facilitate their success. It is important to note that it is difficult to draw comparisons among these studies, as not all of them have defined academic achievement in the same way. Each of these studies offers very important findings, but it is crucial to note that may not all be generalizable to all Latino students. Immigration status, acculturation and language acquisition are often left out of the discussion, which makes it difficult to make within-group comparisons. Different researchers give varying levels of

importance to different variables; it is often unclear whether certain variables were not considered, if they were deemed unimportant or if they were not able to be included in a study. These studies make clear that it is challenging to consider many variables at once. The studies also appropriately identify and present the many variables affecting or relating to the academic achievement of Latino youth. Not only are there the challenges for youth in general, but there are the additional challenges faced by Latino immigrants and even more by undocumented Latino immigrants. The literature on the academic achievement of Latino youth is quite extensive, and has been developed over the last 10-20 years, coinciding with the influx of Latinos to the United States (Noguera, 2004). However, there is a clear need for more research on this topic as indicated by the disproportionate high school dropout rate and college enrollment rates among Latino youth.

Methodological Approaches to the Study of Academic Achievement

The research summarized has followed a number of different methodological approaches to study academic achievement. The majority of studies have taken a quantitative approach, with only small number taking a purely qualitative approach, and a few that used mixed methods. The diverse analyses have resulted in information useful to educators, practitioners and policy makers, and further the understanding of the factors that contribute to and influence academic achievement among Latino students. Below is a breakdown of the methodological approaches used, with specific details on the type of analyses that were conducted.

Qualitative

The qualitative studies reviewed use both focus groups and in-depth interviews (Gonzales, 2010; Castillo et al., 2010; Campa, 2010; Gandara & Contreras, 2009; Kimura-Walsh et al., 2009). Behnke et al. (2010) used a survey with both open and closed-ended questions, which resulted in descriptive statistics and data coded for themes and categories. Sanchez et al. (2011) used mixed methods and at the first time point utilized quantitative methods (chi-square analysis) and qualitative methods at the second time point. Ovink (2011) used mixed methods in her dissertation and the qualitative component included in-depth interviews at three time points.

Quantitative

As mentioned most of the studies examined have used quantitative methodologies, most used linear regression analysis (Kalogrides, 2009; Colón & Sánchez, 2009; Fuligni, 1997; Eamon, 2005; Vick & Packard, 2008; Plunkett & Bamaca-Gomez, 2003; Esparza & Sanchez, 2008; Carpenter, 2008; Hurtado-Ortiz & Gauvain, 2007; Perez et al., 2009); some employ multinomial logistic regression (Sciarra & Whitson, 2007; Educational Policy Institute, 2005; Oseguera & Malagon, 2011; Alon et al., 2010; DiPaula, 2008; Ovink, 2011); cluster analysis (Perez et al., 2009); path analysis (Kuperminc et al., 2008; Alfaro et al., 2006); bivariate correlations (Perez et al., 1997); ANOVA (Lopez et al., 2002); and MANOVA (Sanchez et al., 2008). There are several studies that use HLM, however the outcome variable and number of levels considered differ: HLM looking at student and school level factors with a categorical outcome variable (Perna & Titus, 2005); HLM with both two and three-level models with a binary outcome variable, specifically employing HGLM (Nuñez & Kim, 2012; Goldschmidt & Wang, 1999); HLM with a two-level analysis (Green et al., 2008). Finally, a number of

studies have used structural equation modeling (SEM) (Altschul, 2011; Nuñez, 2009; Ream & Rumberger, 2008; Martinez et al., 2004; DeGarmo & Martinez, 2006).

A review of the literature demonstrates a need for more multi-level analyses specifically focused on Latino student's transition to higher education. The most common methodological approach to studying college enrollment, as suggested by the literature reviewed, is multinomial logistic regression. Considering academic achievement more generally, regression analysis is most common. What is missing with many studies is the consideration of school-level factors, which is accomplished by employing a multi-level analysis.

Theoretical Framework

This dissertation was informed by two theories: ecological systems theory from the social sciences and theory of cultural-discontinuity, from the field of educational anthropology. Together, these two theories together provide a more complete framework for understanding the conceptualization behind the proposed dissertation. Ecological systems theory gives a foundational justification for the consideration of multiple variables at two levels. The cultural-discontinuity theory provides guidance on understanding the experience of Latinos in education and identifies key concepts that need to be included when shaping a statistical model.

Ecological Systems Theory

Urie Bronfenbrenner's ecological systems theory developed from general systems theory, which comes from the fields of management and psychology (Payne, 2005). The origins of systems theory are attributed to von Bertalanffy (Payne, 2005; Rothery, 2008), Minuchin, Ackerman, and Bateson (Rothery, 2008). Payne explains that the fundamental

premise of systems theory is that a system has sub-parts and each part has a role and interacts with the other parts. Glossop (1988) states that Bronfenbrenner was looking for a way to understand human development by looking at the individual in the context of their environment. Like students, each may have similar life factors, but different outcomes, or similar outcomes, but different contributing factors. It is important to consider each contributing system and how the parts interact. Rothery discusses the person-in-environment perspective, which comes from social work and focuses on not only the person, but the context in which they are living and the interaction between the two. Darling (2007), a student of Bronfenbrenner's explains that an individual's development cannot be understood in isolation. In reviewing Bronfenbrenner's work, Darling presents some of his research on academic performance and portrays his belief that all aspects of the environment, the individual and the context in which they live, are connected and must be looked at holistically in order to have a clear picture. In trying to do research and understand a phenomenon it will be nearly impossible to comprehend it, unless it is put into context. Therefore, when examining the academic achievement of students, one cannot consider the personal characteristics of the student in isolation, one must remember that this student is part of a family, part of a school, lives in a neighborhood and is part of a community with friends and participates in activities. This student is a product of his environment and to try and understand a phenomenon without contextualizing it, leaves out an important part of the story. Rothery explains a goodness of fit model, where on either side of the person are resources and demands. The resources are made up of emotional supports, information supports, and concrete instrumental supports (p. 105). The person in the center tries to create a balance between demands and

resources so as to avoid distress. This model is extremely relevant and important in understanding Latino student academic achievement. It is necessary to consider all three types of resources and how they impact a student, influencing their academic achievement.

While Bronfenbrenner is one of many scholars who has written about ecological systems theory and who has influenced the theory, he is an essential part of the discussion and his conceptualization of systems is of importance to this dissertation. Bronfenbrenner (1979) refers to this ecological context as a nested structure with the person in the center. This theoretical framework fits well with the selected method for this dissertation, as HLM is most appropriate with a nested data structure. Bronfenbrenner (1977, 1979, 1988/2005) explains that there is much more going on than the individual and what he calls their immediate situation. It is necessary to consider more than the *microsystem*, which refers to the individual and their immediate settings, extending our scope of vision to the *mesosystem*, which considers the interface between systems and events that include the individual, and the *exosystem*, which considers links between systems in which they do not participate. It is also necessary to consider the *macrosystem*, which is comprised of the overarching ideology and culture. In his later work, Bronfenbrenner (1992/2005) added to his definition of the *microsystem* to include the importance of the individual's personality and belief system. He also added to his definition of *macrosystem* by including a consideration of the beliefs, structures, and interchanges in each of the systems encompassed. Bronfenbrenner (1979, 1992/2005) explains that it is essential to consider the person, their environment and the interaction between the two. While this dissertation considers the individuals' interactions with the other systems, such as

parental involvement with the student and student extracurricular involvement, it was beyond the scope of this dissertation to consider interactions between all of the systems. Specifically this dissertation will look at individual factors and the family, community, immigration, and school systems.

In his work and research, Bronfenbrenner (1979) studies the many different contexts that influence child development. He talks about first-order social networks as when an individual participates in many different settings or systems; he defines a second-order social network as a means of obtaining information from one arena when the individual themselves cannot be present. For example, gaining access to resources or information. A high school student may not be able to understand how to transition to higher education, but there are resources they can access that will provide that information. It is essential to understand a person's direct participation, but also to understand the secondary networks that allow access to information one does not have nor the opportunity to directly encounter or experience. When considering systems and their interactions, Bronfenbrenner discusses that he saw the achievement scores of students declining and attributed it to the disconnect between home and school. He states:

Moreover, as schools are moved to the outskirts of town, they become compounds physically and socially insulated from the life of the community, neighborhoods, and families the schools purport to serve as well as from the life for which they are supposedly preparing the children....Moreover, the classrooms have little or no social identity of their own and little connection with each other or with the school as an active community. (p.231)

It is important to consider the family and the school systems and how a possible disconnect could be contributing to poor academic achievement. An ecological systems

perspective allows for the examination of these different systems and the interactions (or lack thereof) between them. In regards to this disconnect, he says:

They reflect a breakdown of the interconnections between the various segments of the child's life-family, school, peer group, neighborhood, and the beckoning, or all too often indifferent or rejecting, world of work. (p. 231)

Given the nested nature of relationships and interactions, this theoretical framework is ideal to study the academic achievement of Latino students. Others have used this framework in their research noting the importance of the connections and interactions of different areas of one's life (Eamon, 2005; Alfaro et al., 2006; Woolley, 2009).

Bronfenbrenner reminds researchers that it is important not to neglect a part of the system or an interaction. He warns that some researchers ignore the outcome and some look at the larger environment and the outcome, but forget to consider the individual. This dissertation looked at different systems, their interactions, including characteristics of the individual person and an outcome, in this case, transition to post-secondary education. However, ecological systems theory alone does not provide an adequate framework for understanding Latino student academic achievement. It is necessary to look at structural and institutionalized factors in schooling that may be influencing students and specifically, minority students.

Cultural Discontinuity Theory

The work and ideas of Henry Trueba and John Ogbu, both educational anthropologists that research minority education, have been written about and compared and contrasted (Iber, 1996; Foley, 1991; Glotzer, 1997). Foley explains the 70's as a transition period in educational research, in which the focus on the classroom to understand minority school failure shifted to a focus on communication between the

student and the teacher, with particular attention on the student's cultural background.

Ogbu propelled the discussion on the academic experiences of minorities by calling for a multilevel approach (Foley, 2004). Much like ecological systems theory, that considers many levels and their interactions, Ogbu argued for more than a micro approach. Foley brings Trueba into the discussion of educational anthropology by stating his aim to look at environments that would lead to academic success, rather than looking at the deficits and problems.

Iber (1996) compares Ogbu and Trueba by using structure and culture. Iber explains that according to Trueba's theory, academic success and failure are the result of "culturally discontinuous" interactions between students and teachers. Trueba's theory holds that if teachers have a better understanding of minority student's backgrounds, their interactions would be more positive and conducive to academic success (Iber, 1996). Trueba's theory of cultural discontinuity focuses on minority students and considers the idea that students may not succeed in the educational system due to differences in culture (Lopez et al., 2002). Trueba (1988) posits that culture is not only to be considered at the group level, but also at the individual level. He states:

At the heart of academic success, and regardless of the child's ethnicity or historical background, an effective learning environment must be constructed in which the child, especially the minority child, is assisted through meaningful and culturally appropriate relationships in the internalization of the mainstream cultural values embedded in our school system. (p. 282)

Minority students need to be assisted in a culturally appropriate manner, which seems contradictory to findings where minority students are separated through tracking mechanisms within their schools, unable to form meaningful relationships with mentors

and unable to access relevant information about college (Gonzales, 2010; Kimura-Walsh et al., 2009; Castillo et al., 2010).

Iber (1996) discusses that when considering acculturation, Trueba's theory would suggest that second generation students would perform better than first generation students would. In reviewing Trueba's work, Menchaca (1990), summarized that in order to better understand school success and failure there must be a consideration of language, parent involvement and parent language proficiency, teachers, student effort, and curriculum. Trueba (1988) emphasizes that it is culture that is omitted from the discussion on academic success of minority students. In describing an appropriate theoretical and practical approach to understanding the academic achievement of minority students Trueba (1988) states there are five things that must be taken into account: 1) recognize the significance of culture in specific instructional settings; 2) prevent stereotyping of minorities; 3) help resolve cultural conflicts in school; 4) integrate the home and the school cultures; and 5) stimulate the development of communicative and other skills that children need in order to participate meaningfully in the instructional process (p. 270).

Trueba (1999) addresses the drastic changes in the racial makeup of the school system over a 40-year period, pointing out that White students are no longer the majority. He comments that the U.S. is not equipped to meet the growing needs of Latinos, who are quickly becoming the majority group. In his many books on education, Trueba discusses several themes related to the educational experiences of Latino students. His stance on the classroom focuses on preparing teachers to be ready to meet the cultural and linguistic needs of the children (Trueba, 1999; Trueba, 1989). He discusses that teachers need to be

re-trained in how to think about their students and how to engage them in the classroom. He urges for the creation of a classroom where no group is made to feel superior. Trueba (1993,1989) and Delgado-Gaitan and Trueba (1991) also focus attention on the schools themselves, stating that policies that incorporate student's native language and culture need to be implemented by schools and argues that the lack of policies contributes to school dropout. Delgado-Gaitan & Trueba (1991) ask, "How does the home and community social and political ecology of these families affect the children's lives?" (p.34). Elsewhere, in reference to academic failure, Trueba (1989) states that it can be "fully understandable only in its macro-historical, social, economic, and political context" (p.28). Trueba indicates that the educational experience is not just the result of the individual student, but also a function of their environment. In order to better understand the academic phenomenon, he is interested in the exchange of resources among families in addition to the school context as well as economic and political environment.

Trueba's cultural-discontinuity theory fits well with the ecological systems perspective, as he too is interested in different arenas and how they connect and interact.

Trueba (1991) states:

The price of neglecting children's language and culture as the proper means to teach academic content in schools is a very high one, if we consider the long-term consequences of academic disenfranchisement and dropout phenomena. (p.37)

Trueba's research indicates that it is imperative that schools find a way to incorporate a student's language and culture into their learning, and by not, they are possibly setting a student up for exclusion and dropout. His work and insights provide valuable information

about the consideration of the individual, family and school in order to better understand minority academic achievement.

Summary

The theory of cultural-discontinuity and the ecological systems theory are both necessary to provide the appropriate framework for understanding the academic achievement, specifically the transition to higher education, of Latino students. Ecological systems theory provides a foundation, which informed the conceptual model for this dissertation. Both the ecological systems and cultural-discontinuity theories provide insight into the variables that were selected for the model.

This dissertation addresses the following two research questions: 1) how are students who have an on time transition to higher education different from those students who have a delayed or no transition to higher education? and 2) how do family, immigration, community, and school systems along with individual factors influence academic achievement outcomes in Latino students? It is hypothesized that there will be significant variables within each of the systems and with respect to the individual student factors. Particularly, the student's planning for college and educational expectations, parental involvement, parent expectations for the child, generational status, extracurricular involvement, the percentage of students enrolled in college programming and the percentage of Hispanic teachers at the school are thought to be factors that will contribute to an on-time transition to higher education. It is thought that each of these factors within the systems described will increase the likelihood that a student will have an on-time transition to higher education. The following chapter provides an overview of

the conceptual framework, the selected variables, and explanation of the method used for the analysis.

CHAPTER III

METHODOLOGY

The purpose of this study is to better understand the factors that will impact the academic achievement of Latino students, specifically looking at the transition to higher education. Using ecological systems theory and the cultural-discontinuity theory, this dissertation looks at the influence of multiple systems on the transition of Latino students within schooling systems. This dissertation answers the following research questions: 1) How are students who have an on-time transition to higher education different from those students who have a delayed or no transition to higher education? and 2) How do family, immigration, community, and school systems along with individual factors influence academic achievement outcomes in Latino students?

This chapter includes first, a description of the systems, the concepts used and how they are measured. Second, a description of the dataset used, including the purpose of the original study, sampling strategy, administering of the questionnaires, the identification of the final sample for this dissertation, including NCES procedures to handle missing data and the weighting of data. The third section describes all variables included and how they are coded; the fourth section is a presentation of the statistical models; and the fifth section provides an explanation of the method used to analyze the data.

Conceptual Definitions

The individual student and four systems that make up the surrounding environment are used to study the factors that impact Latino student academic achievement. Below are descriptions of the systems and the individual student including the concepts that will be investigated within each of the systems and how those concepts will be measured. Figure 3 (see Appendix C) provides the conceptual model and Table 15 (see Appendix E) displays information regarding the concepts, variables used, including the questionnaire they originate from, the type of variable and level of analysis. Additionally, in the “Variables” section below, there is detailed information on the variables selected, their original coding and the re-coding used for this dissertation.

The “individual student” is investigated with two concepts: educational expectations and planning for college. The student’s educational expectation is measured using a variable that asked students how far they thought they would get in school. The student’s planning for college is measured using one in a series of variables that questioned students about whether or not they had gone to specific sources for information about college. For purposes of this dissertation, the number of sources sought for information (if any) is not important, only whether or not the student sought any information at all regarding college.

The “family system” was investigated using five concepts: family composition, parent education, parental involvement, parent expectations, and language use with the student. Family composition is measured using a variable that asks about whom the student lives with, such as one or both parents or guardian(s). Parent education is measured using a composite variable that provides the highest level of education

achieved among both parents. Parental involvement is measured using two variables regarding intensity of involvement with homework. The variables selected include assisting the student with homework and checking the student's homework. Parent expectations is measured using a variable that asks the parent how far in school they want their child to go, and language use with the child is measured using a variable that asks the parent how often they use their native language with their children.

The "community system" is considered using the work of McMillan and Chavis (1986) who describe community as containing four elements: membership, influence, integration and fulfillment of needs, and shared emotional connections. The authors explain that this is a relational definition of community and also explain that there is a physical definition, which refers to the location and neighborhood of the community. This definition of community provides a perspective of membership, integration, and connection. The community system was investigated using two concepts: extracurricular involvement and close Hispanic friends. Student's extracurricular involvement is measured using several variables that ask about intramural sport participation, interscholastic sport participation, school sponsored activities, (i.e., band, yearbook, plays, etc.) and community service organized by the school. Close Hispanic friends is measured using three variables that ask students to name their close friends and identify their race; these three variables have been used to create a scale indicating the number of close Hispanic friends.

Finally, the "immigration system" was investigated using two concepts: generational status and native language. Generational status is measured using three variables in which the parent was asked to report whether the student was born in the

US/Puerto Rico/another country, whether the biological mother was born in the US/Puerto Rico/another country, and whether the biological father was born in the US/Puerto Rico/another country. Native language is measured using a variable that asks the student whether or not English is their native language.

The “school system” was investigated using three concepts: school characteristics, school programming, and teacher expectations. School characteristics is measured by the percentage of full-time Hispanic teachers that work at the school. School programming is measured by the percentage of 10th grade students enrolled in college prep programming at the school, and teacher expectations is measured using a variable which asked the student’s English teacher how far they thought they student would get in school.

ELS: 2002 Dataset

Overview and Purpose

The data comes from the National Center for Education Statistics (NCES), which conducted a longitudinal education study that began in 2002 (ELS: 2002), sponsored by the U.S. department of Education. Follow-up data was collected in 2004, 2006 and 2012. The fourth data collection took place in 2012 and was completed in early 2013 and this new data will be available within the year. The purpose of the original study came from a mandate to gather and disseminate information about education in the U.S. NCES created the National Education Longitudinal Studies Program, which currently has three completed studies and two in progress. The completed studies include: National Longitudinal Study of the High School Class of 1972 (NLS: 72); the High School and Beyond (HS&B) longitudinal study of 1980; and the National Education Longitudinal Study of 1988 (NELS: 88). The two in-progress include ELS: 2002, which is the dataset

being utilized for this dissertation and the High School Longitudinal Study of 2009 (HSLS: 09) (Ingels et al., 2007).

The ELS: 2002 study aims to understand high school students first as sophomores and then as they progress through high school as seniors and then for some on to college and for others into the working world. The data was collected nationally from different types of schools including public, private, religious, and alternative schools. The study is not only longitudinal, but also multilevel in nature. Questionnaire respondents included students, parents, teachers, administrators, and librarians/media specialists and information about schools provided by the survey administrators. The ELS: 2002 data gathers information in three broad categories: 1) Background information; 2) Process information; and 3) Outcome information. Additionally, the data captures information related to social background, home educational support system, school and classroom characteristics, postsecondary education choice and enrollment, employment and outcomes (NCES, n.d.). The nature of the ELS: 2002 data allows for several different types of analyses: cross-sectional profiles, longitudinal, cross-cohort comparisons, and international comparisons (Ingels et al., 2007). There are two basic units of analysis: students and schools. At the student-level there was data collected from students, reports from teachers, reports from parents, and assessment data. At the school-level, there are school administrator questionnaires, a library media-center questionnaire and a facilities checklist. NCES made two versions of the data available, a public-use file and a restricted-use file. The restricted-use data file contains potentially identifying information and for this reason, a restricted-use data license must be obtained. For purposes of this dissertation, a restricted-use license was obtained as race/ethnicity variables are only

contained within the restricted file and are essential to this study, which looks exclusively at Latino students.

The ELS: 2002 dataset is an appropriate choice for this study, as it will allow for the consideration of predictor variables from each of the systems and individual student factors previously described. Data that follows the same students over time and looks at their academic achievement trajectory is needed in order to better understand the factors that impact the transition to higher education.

Sampling Strategy

As mentioned, the ELS: 2002 dataset was produced in a series of longitudinal education studies. The sampling design and strategy is closely related to that of the studies that came before it. In the ELS: 2002 study, Hispanic and Asian students were over-sampled. There was a two-stage sampling process involved, first there were 1,220 schools identified as eligible for participation, these included public, Catholic and other private schools. Of those contacted, 750 participated and 700 of those schools participated in the first follow-up. The schools then supplied a list of all sophomore students and approximately 30 were randomly selected from each school. This led to a sample of 19,220 students, of which 17,590 were identified as eligible sophomores and 15,360 represent the final sample. Some students were unable to participate due to limited English language proficiency or physical or mental disability, these students were re-assessed two years later for participation. Additionally, of the students who did not respond during the base-year, a sub-sample were contacted for participation in the first follow-up. There was also sample freshening which took place where students who were 12th graders in the spring of 2004, but were not in the U.S. or not 10th graders in 2002

were added to the sample. A total of 16,520 students were part of the first follow-up and 16,400 were included in the second follow-up.

Students were surveyed in a group setting on the scheduled survey day, if unavailable they were scheduled for the makeup day, and a small percentage completed the questionnaire over the phone. School administrators, librarian, and teacher surveys were collected. Parent questionnaires were mailed after student surveys took place; parents who did not respond were contacted by phone. During the first follow-up, surveys were again collected in schools. If schools refused to participate in the follow-up study, those students from the base-year were contacted and data was collected outside of the school setting. Transcripts were collected in the spring of 2004 and early 2005. In the second follow-up there were several methods of data collection including: web self-administration, phone, in-person, or the computer-assisted telephone interview (CATI). Extensive tracing procedures were employed to locate students for second follow-up collection. Incentives were given to students at the first follow-up and second follow-up. Higher incentives were offered to students from certain subgroups, such as dropouts and prior non-respondents. For more detailed information on the sampling for the original study, see Ingels et al. (2004, 2007).

Sample Identification for Dissertation

The sample for this study comprises only a subset of the total students and includes only those who self-identified as “Hispanic” or “Latino/Latina”. Additionally, data was used from the parents and teachers and for the schools of those students who self-identified as “Hispanic” or “Latino/Latina”. Participants were asked to specify, first, if they are Hispanic/Latino/Latina, and then to indicate which of the following groups

they are a part of including: 1) Mexican, Mexican-American, Chicano; 2) Cuban; 3) Dominican; 4) Puerto Rican; 5) Central American (Guatemalan, Salvadoran, Nicaraguan, Costa Rican, Panamanian, Honduran); 6) South American (Colombian, Argentinian, Peruvian, etc.). For this study, Hispanic/Latino/Latina is inclusive of each of the six categories listed¹. Cases were selected if students answered yes to either of the following: “Hispanic, no race specified” (this category includes Hispanic or Latino ethnicity only. Race information was not reported for these cases; only Hispanic indication) or “Hispanic or Latino, regardless of race” (this category includes Hispanic or Latino ethnicity and any combination of race).

The sample in this study was limited by the large quantity of missing data. Only students and schools with complete data were included. However, the final sample includes a combination of students, some who responded at all three time points, some two and others one. Students who did not respond at the first or second follow-up were only included in the final sample if the data provided by NCES categorized them as dropouts, GED recipients or early high school degree recipients. Additionally, only schools that had three or more students sampled were included in the study and this

¹ “Latino/Latina” and “Hispanic” can include both first, second, and third generation as parents and students were asked to indicate whether they were born in the US or outside of the US. First generation immigrants refer to those who were born abroad and now live in the United States. Second generation refers to those immigrants who were born in the U.S. and have one or both foreign-born parents. Third generation refers to those who were born in the U.S. and whose parents were also born in the U.S. This study did not ask students or parents for their immigration status, which means the sample may be made up of both documented and undocumented students/families. Documented immigrants refer to those who have legal status in the U.S. This may mean they are here on a visa, have permanent residency or citizenship. Undocumented immigrants are those who are here “irregularly” and have no legal status in the U.S. This group can include those who immigrated to the U.S. alone or with their families having crossing the border without authorization and this group can also include those who may have come on a visa, but overstayed, thus putting them out-of-status.

criterion for inclusion was re-assessed a second time after participants with missing data were eliminated. This narrowed the final sample to 630 students and 100 schools.

Questionnaires

Descriptions of the questionnaires, whom they were administered to and when, follows below in Table 1. For more detailed information about the questionnaires, see Ingels et al. (2007).

Table 1. Data Collection Year and Members Sampled

	Spring term 2002	Spring term 2004	Spring term 2006
Students	X	X	X
Parents	X		
Teachers	X		
School Administrator	X	X	
Library Media Center	X		
Facility Checklist	X		

The breakdown of data collection and information available is as follows:

- 2002: Data was collected from students, the parent of each student, one English teacher for each student, one math teacher for each student, the school administrator for each school, one library/media specialist for each school and data was collected regarding the characteristics of each school.
- 2004: Data was collected from the 2002 sample, including those students who had dropped out, transfer students, new students, home school students and those students who had graduated early. Additionally, data was collected once again from the school administrator for each school.
- 2006: Data was collected from those students sampled in 2002 and 2004.

Student questionnaires. In the base year students were administered their questionnaire typically in a group setting, and in some cases using CATI. The longer

version of the interview was available in English only and a shortened version in Spanish.

The questionnaire had seven sections: 1) locating information; 2) school experiences and activities; 3) plans for the future; 4) non-English language use; 5) money and work; 6) family; and 7) beliefs and opinions about self.

In the first follow-up, a student questionnaire was given including dropout, early graduate, transfer student, home school and new participant questionnaires. Dropout students were defined as those who were not in school in the spring term of 2004 and had been out of school for more than four weeks not due to accident or illness. Additionally, these students had not received a high school diploma or GED before March 15, 2004. The CATI used screening questions to make sure students were given the proper questionnaire. There were eight sections included: 1) contact information; 2) school experiences and activities; 3) how time is spent; 4) plans and expectations for future; 5) education after high school; 6) plans for work after high school; 7) working for pay; and 8) community, family and friends.

The second follow-up items were divided into four main areas: 1) high school; 2) postsecondary education; 3) employment; and 4) community. The second follow-up enabled students to be retrospectively classified as a student or a dropout in the correct time periods.

Parent questionnaire. The parent or guardian most familiar with the student was to complete the questionnaire, which was available in both Spanish and English. Parents could complete a hardcopy or use the CATI. There were five sections: 1) family background; 2) child's school life; 3) child's family life; 4) opinions about child's school; and 5) aspirations and plans for the child's future.

Teacher questionnaire. The math teacher and English teacher of each student completed a questionnaire, which evaluated the student's academic performance, education and careers goals and a second section, which addressed the teacher's background with respect to training, experience and professional growth.

Administrator questionnaires. The administrator questionnaire in the base-year addressed six areas: 1) school characteristics; 2) student characteristics; 3) teaching and staff characteristics; 4) school policies and programs; 5) technology; and 6) school governance and climate. In the first follow-up the administrator questionnaire gathered information in four areas: 1) school characteristics; 2) structure and policies; 3) student characteristics and programs; and 4) teacher and library staff characteristics. Additionally, there were reports on school environment.

Library media center questionnaire. This was completed by either the school librarian, media center director or the school administrator and provided information about the library, technology and using the media center to support school curriculum.

School facilities checklist. This was completed by the survey administrator and addressed the conditions of the school, security, and maintenance.

Weights, Missing Data and Coding Schemes

The ELS: 2002 weighting scheme was to adjust for the fact that not all selected students participated, and for unequal probability of selection (Ingels et al., 2007). NCES has created several weights, including panel weights, which allow for the examination of changes of the student populations over time as well as comparisons and generalizations. For this dissertation the F2F1WT was used, which according to the Ingels et al. (2007) description, is a panel weight that accommodates sample members who participated in

2004 and 2006, or were questionnaire-incapable in 2004 but participated in 2006. The values for this weight ranged from 0 to 805.52, with 394 cases coded with a weight of zero. HLM v. 6.08 is unable to handle cases where weight is coded as zero; therefore, in order to retain these students with a weight of zero, these cases were re-coded with a weight of .0000001.

Non-response on the survey items was coded by NCES in several ways using the following scheme: -1= “Don’t know,”; -2= “Refused,” -3= “Item legitimate skip/NA,”; -4= “Non-respondent,”; -5= “Out of Range,”; -6= “Multiple Response,”; -7= “Partial interview-break-off,”; -8= “Survey component legitimate skip/NA,” and; -9= “Missing.” Three types of imputation were used by NCES to address non-response: multiple imputation, logical imputation, and weighted sequential hot deck imputation. For further information on imputation and its use with the ELS: 2002 dataset see Ingels et al. (2007).

With regard to managing large scale datasets Thomas, Heck and Bauer (2005) and Thomas and Heck (2001) address issues with data collection including lack of a sampling frame and unequal sampling of participants with varying characteristics. They indicate that there is often a disconnect between the data collectors and the users of large scale datasets and that users may be unaware of how to properly account for those issues in their analysis. Black, Harel and McCoach (2011) warn against incorrectly handling missing data and the implications of missing data for model misspecification. They caution that missing data must be accounted for correctly by the researcher, and also note the lack of research on the effects of missing data and imputation techniques with large scale datasets. Schlomer, Bauman and Card (2010) reiterate the importance of handling

missing data correctly, but also discuss the need for appropriately reporting missing data in research, allowing for correct interpretation of the data and appropriate conclusions.

Variables

The following section includes a description of all variables included in this study. Table 16 (see Appendix F) presents the variables that were included in the study. Table 17 (see Appendix G) presents information on original variable coding and the re-coding that was used for this dissertation. The dataset was limited to the Latino sample using the base-year race variable (BYRACE²), which was coded as: 1= “Amer. Indian/Alaska Native, non-Hispanic”; 2= “Asian, non-Hispanic”; 3= “Black or African-American, non-Hispanic”; 4= “Hispanic, no race specified”; 5= “Hispanic, race specified”; 6= “More than one race, non-Hispanic”; 7= “Native Hawaii/Pac. Islander, non-Hispanic”; 8= “White, non-Hispanic”; -4= “Non-respondent”; -8= “Survey component legitimate skip/NA”. Cases were selected “if BYRACE=4 OR BYRACE=5” which resulted in a Latino sample of 2,220.

Dependent variable

The dependent variable in this study, the academic achievement of Latino students, is measured with a dichotomous variable: “high achieving” and “low achieving”. “High achieving” students are those who had an “immediate/ ‘on-time’” transition to higher education. “On-time” is defined by NCES as enrollment in a postsecondary institution within the first enrollment window following their high school

² BY, the prefix of the variable name indicates it is a “base-year” variable, which comes from the first data collection period in 2002.

completion or exit date. “Low achieving” students are those who had a delayed or no transition to higher education. This group includes students who drop out of high school; students that dropout and get their GED; students who graduate high school, but do not go on to college; and students who transition to postsecondary education, but not “on-time”.

“Academic achievement” is measured using NCES variable: F2RTYPE³, which assigned participants to categories based on whether or not they attended a postsecondary institution and when. F2RTYPE is coded as follows: 1= “standard enrollee”, meaning the student attended postsecondary education “on-time” and had some enrollment in 2006 prior to the interview; 2= “delayer”, which means the student did not start their postsecondary education “on-time”, but did have enrollment prior to the 2006 interview; 3= “leaver”, which means the student began their postsecondary education “on-time”, but did not have enrollment prior to the 2006 interview; 4= “delayer-leaver”, which means the student did not have “on-time” postsecondary enrollment and also had no enrollment prior to the 2006 interview; 5= “non-enrollee”, which means the student had no postsecondary enrollment; and 6= “high school student”, which means the student was still enrolled in high school; -4= “non-respondent”; and -8= “legitimate skip”. This variable was re-coded into “collegeenrollment” such that “standard-enrollees” and “leavers” were assigned a 1 and all other categories were assigned a 0. The new values

³ F2, the prefix of the variable name indicates it is a “second follow-up” variable, which comes from the third data collection period in 2006.

are as follows: 1=on-time transition to higher education and 0=delayed or no transition to higher education.

In order to capture more information about the students coded as “non-respondents” ($n=280$) above, a closer look was taken using the variable F2SP04DO, which categorizes spring term 2004 “dropouts” and “early alternative completers” as identified in the first follow-up, or identified retrospectively via the second follow-up interview or transcript data. The coding for the variable is as follows: 0= “Not spring ‘04 dropout/early GED recipient”; 1= “F1 identified spring term 2004 dropout”; 2= “F1 identified early GED recipient”; 3= “F2 identified spring term 2004 dropout”; 4= “F2 identified early GED recipient”; and -9= “Missing”. The sample was limited to this group of 280 and descriptive statistics were run on variable F2SP04DO. The results are as follows: Missing, $n=50$; “Not spring ‘04 dropout/early GED recipient”, $n=210$; “F1 identified spring term 2004 dropout”, $n=20$; and “F1 identified early GED recipient”, $n=3$. The only students whose status can be determined with certainty are the 20 who were coded as “F1 identified spring term 2004 dropouts” and the 3 coded as “F1 identified early GED recipients.” Therefore, these 23 students were coded with a 0 for the “collegeenrollment” variable, reflecting those who had a delayed or no transition to higher education.

Control variables

Previous research indicates that low socioeconomic status is associated with poor academic outcomes for students (Ream & Rumberger, 2008; Battle & Pastrana, 2007). Sirin (2005) completed a meta-analysis that looked at socioeconomic status and student achievement in studies published between 1990-2000. It was found that overall, family

socioeconomic status was a very strong predictor of student's academic achievement. The study also found that the strength of the relationship between socioeconomic status and student academic achievement can be impacted by many different variables, one of which is minority status. Sirin found that socioeconomic status was a stronger predictor of academic achievement for White students than for minority students. Some studies reviewed within the meta-analysis found that school and neighborhood socioeconomic status as opposed to the family socioeconomic status were better predictors of academic achievement for minorities, in particular for African-American students.

Battle and Pastrana (2007) found that when controlling for socioeconomic status, Latino students outperformed their White counterparts. They also found that socioeconomic status was 10 times more powerful in predicting student academic achievement than race. Battle and Pastrana looked at SES as a measure of mother and father's level of education, mother's and father's occupation, and family income. The ELS: 2002 dataset also used the same components to measure SES. Given that socioeconomic status is a strong predictor of academic achievement and past research has shown that Latino students outperform White students when socioeconomic status is controlled for, this study will control for this variable. However, given the interest in looking at parental level of education as a predictor variable, this dissertation only uses family income as a control rather than the composite SES provided by NCES. Several research studies have shown that being a female is a significant predictor of academic achievement (The Educational Policy Institute, 2005; Ovink, 2011; Nuñez & Kim, 2012). Therefore, gender will be controlled for in this dissertation.

“Family income” is measured using NCES composite variable, BYINCOME, which came from questionnaire item BYP85; missing information was imputed by NCES. Parents were asked “which category does your total family income from all sources in 2001 fall into? (If you are not sure about the amount, please estimate).” The coding is as follows: 1= “none”; 2= “\$1,000 or less”; 3= “\$1,001-\$5,000”; 4= “\$5,001-\$10,000”; 5= “\$10,001-\$15,000”; 6= “\$15,001-\$20,000”; 7= “\$20,001-\$25,000”; 8= “\$25,001-\$35,000”; 9= “\$35,001-\$50,000”; 10= “\$50,001-\$75,000”; 11= “\$75,001-\$100,000”; 12= “\$100,001-\$200,000”; 13= “\$200,001 or more”.

“Gender” is measured using NCES composite variable BYSEX, which was taken from the student questionnaire and if missing, was logically imputed by NCES. The coding is as follows: 1= “male” and 2= “female”. The variable was re-coded such that 1=female and 0=male.

Independent Student-Level Variables

The independent variables reflect the individual student and the four systems described and will be presented in this way.

Individual Student. “Planning for college” is measured using the NCES variable BYS59K. A series of variables BYS59A-K asked students if they had gone to specific sources to seek college entrance information. Those sources included: counselor, teacher, coach, parent, friend, sibling, other relative, college publications/websites, college representatives, college search guides, or none of the aforementioned. Students were to indicate “yes” or “no” to this question. The final variable in this series, BYS59K: “did not go to any of these sources”, was re-coded into a categorical variable called “Planningforcollege”. Students were re-coded as 0= does not know or does not plan to go

to college; 1= plans to go to college, but has not taken any action; and 2=plans to go to college and has taken action; ‘taken action’ refers to seeking out information from at least one of the aforementioned sources. Students that were coded by NCES as -3 (item skip) were re-coded as 0. This included those students who did not plan to go to college, did not know or answered that they expected less than high school graduation, or their highest level of education to be high school graduation/GED. Students who were coded by NCES as 1 “did not go to sources” were re-coded as a 1, indicating that they intended to go to college, but had not gone to any of the listed sources for information about college. Those who were coded by NCES with 0 “went to sources” were re-coded as 2, indicating those students who both planned to go to college and who had asked at least one of the aforementioned sources for information regarding college. Finally, this variable was dummy coded and those who did not know or did not plan to go to college were used as the reference group.

“Educational expectations” is measured using a composite variable created by NCES, BYSTEXP, which asked students how far they thought they would get in school. The variable originally came from BYS56 which asked “as things stand now, how far in school do you think you will get?” and was coded as: 1= “less than high school graduation”; 2= “high school graduation or GED only”; 3= “attend or complete 2-year college/school”; 4= “attend college, 4-year degree incomplete”; 5= “graduate from college”; 6= “obtain master’s degree or equivalent”; 7= “obtain PhD, MD, or other advanced degree”; and -1= “don’t know”. The composite version of the variable was imputed by NCES. For this dissertation, the variable was re-coded to create all positive values on a scale from 1-8 so as not to introduce a negative value into the analysis, as

“don’t know” was originally coded with a -1. The variable, now called “FinalSTEXP” is coded as follows: 1= “don’t know”; 2= “less than high school”; 3= “high school graduation or GED”; 4= “attend/complete 2-yr college/school”; 5= “attend college, 4-yr degree incomplete”; 6= “graduate from college”; 7= “obtain master’s degree or equivalent”; 8= “obtain PhD, MD or other advanced degree”.

Family System. “Parent education” is measured using a composite variable created by NCES, BYPARED, which was created using two other composite variables: MOTHED and FATHED which asked parents for their highest level of education reached. If information was missing from the parent questionnaire, it was gathered using the student questionnaire or was otherwise imputed by NCES. The resulting composite variable represents the parent with the highest level of education. The variable coding is as follows: 1= “did not finish high school”; 2= “graduated from high school”; 3= “attended 2-year school, no degree”; 4= “graduated from 2-year school”; 5= “attended college, no 4-year degree”; 6= “graduated from college”; 7= “completed master’s degree or equivalent”; 8= “completed PhD, MD, or other advanced degree”.

“Parental involvement” is measured using a composite variable that was created for this dissertation with two NCES variables: BYP55A asked parents how often they check that their student’s homework was completed and BYP57B asked how often they work on homework/school projects with their 10th grader. These two variables were coded on a scale from 1-4 where 1= “never”; 2= “seldom”; 3= “usually”; and 4= “always”. Using the compute function in SPSS, these two variables were added together creating a scale from 2-8 with the new variable name “FinalParentInvolvement”. This variable was re-coded and the new scale ranges from 0-6 with 0 representing no

involvement with homework and 6 representing the highest level of involvement with homework.

“Language use” is measured using NCES variable BYP30B and asked parents how often they speak their native language with their children. The responses were coded as: 1= “never”; 2= “sometimes”; 3= “about half of the time”; 4= “always or most of the time”; -3= “Item legitimate skip/NA”; -4= “Non-respondent”; -6= “Multiple response”; -7= “Partial interview-breakoff”; -8= “Survey component legitimate skip/NA”; and -9= “Missing”. Those coded with -3 represent those who speak English as their native language. This variable was renamed “natlanguage” and re-coded such that: 0=English is native language, 1=Never, 2=Sometimes, 3=About half of the time, and 4=Always or most of the time.

“Parental expectations” is measured using an NCES composite variable, BYPARASP, which came from question BYP79, which asked parents how far in school they want their 10th grader to go. Missing information was imputed by NCES. The variable was coded as follows: 1= “less than high school graduation”; 2= “high school graduation or GED only”; 3= “attend or complete 2-year college or school”; 4= “attend college, 4-year degree incomplete”; 5= “graduate from college”; 6= “obtain master’s degree or equivalent”; 7= “obtain PhD, MD, or other advanced degree”.

“Family composition” is measured using NCES variable BYFCOMP, which was created using two variables, BYP01 and BYP04. The questions used were parent/respondent’s and spouse/partner’s relationship with the child and whether the respondent lived with the student at least half-time (or if student was away at boarding school). Missing information was imputed by NCES. The responses were coded as: 1=

“mother and father”; 2= “mother and guardian”; 3= “father and guardian”; 4= “two guardians”; 5= “mother only”; 6= “father only”; 7= “female guardian only”; 8= “male guardian only”; 9= “parent/guardian lives with student less than ½ of the time”. This variable was re-coded as “FinalFamComp” to reflect traditional versus non-traditional families. Traditional family is considered living with mother and father and non-traditional is all other family compositions. Therefore, 1= living with mother and father and 0=all other family compositions.

Community System. “Extracurricular involvement” is measured using a composite variable created for this dissertation to examine whether or not students participated in an extra-curricular activity. It was created using 26 different NCES variables. BYS39A-BYS39H is a series of eight variables that asked students about intramural sport participation. The question listed the sport and asked students to indicate whether or not they had participated in an intramural team for that sport. The sports included: baseball, softball, basketball, football, soccer, other intramural team sport, individual intramural sport, and cheerleading/drill team. This question was answered using “yes” or “no” and was coded as follows: 1= “school does not have intramural team”; 2= “no”; 3= “yes”. This variable was then re-coded for this dissertation as 0=no participation and 1=participation. BYS41A-BYS41I is a series of nine variables that asked students about participation in school-sponsored activities, which included: band or chorus, school play or musical, student government, academic honor society, school yearbook or newspaper, school service clubs, school academic clubs, school hobby clubs, and school vocational clubs. The variable was coded as 0= “no” and 1= “yes”. BYS71E was one variable out of a series of seven that asked students about participation in work-

based learning experiences during high school. Only one of the seven was selected from this series and as it did not involve class credit. This variable reflects community service, which is volunteer work arranged by the school to support the local community. This variable was coded as 0= “no” and 1= “yes”. The remaining eight variables are composites created by NCES, each using five questions related to participation in an interscholastic sport/activity. The sports/activities included are as follows: baseball, softball, basketball, football, soccer, other interscholastic team, interscholastic individual sport, and cheerleading/drill team. The variables were coded as 1= “no interscholastic team”; 2= “did not participate”; 3= “participated at junior varsity level”; 4= “participated at varsity level”; and 5= “participated as varsity captain”. These eight variables were then re-coded into 0=no participation and 1=participation. All 26 variables were then used to create a sum variable resulting in a participation variable that ranged from 0-26 indicating participation in anywhere from 0 to 26 activities. This participation variable was then named “extracurricularparticipation” and was re-coded into 0=no extracurricular involvement and 1=extracurricular involvement resulting in a variable that indicates whether or not a student participated in an extracurricular activity, without regard to how many activities or how often they participated.

“Close Hispanic friends” is measured using three NCES variables: BYSF1R_R, BYSF2R_R, and BYSF3R_R, which asked students to indicate the race of their first close friend, second close friend and third close friend. The variable was coded as 1= “American Indian/Alaska native, non-Hispanic”; 2= “Asian, non-Hispanic”; 3= “Black or African-American, non-Hispanic”; 4= “Hispanic, no race specified”; 5= “Hispanic, race specified”; 6= “more than one race, non-Hispanic”; 7= “Native-Hawaii/Pacific Islander,

non-Hispanic”; 8= “White, non-Hispanic”. Each of these three variables was re-coded for this dissertation, “Hispanic, no race specified” and “Hispanic, race specified” were re-coded into 1 and all other races were coded as 0. A sum variable was created by adding together the three re-coded variables, called “totalhispanicfriends”, and is a scale from 0-3 where 0=no Hispanic friends, 1=one Hispanic friend, 2=two Hispanic friends, and 3=three Hispanic friends.

Immigration system. “Generational status” is measured using three NCES variables from the parent questionnaire: BYP17, BYP20, and BYP23. BYP17 asks the parent to indicate whether the 10th grader’s biological mother’s birthplace was in the US, Puerto Rico, or another country or area. The variable was coded as: 1= “United States”; 2= “Puerto Rico”; 3= “another country/area”. BYP20 asked whether the 10th grader’s biological father’s birthplace was in the US, Puerto Rico, or another country or area and was coded in the same manner. BYP23 asked the parent whether the 10th grader’s birthplace was in the US, Puerto Rico, or another country or area and was also coded in the same manner. Three coding schemes were created to allocate students to the appropriate group. A new variable was created called “generationalstatus.” If (BYP23=2) or (BYP23=3), the student was coded as first generation and given the value of 1. If (BYP23=1) AND (BYP17=2 or BYP17=3 or BYP20=2 or BYP20=3), then the student was coded as second generation and given the value of 2. If (BYP23=1) AND (BYP17=1) AND (BYP20=1), then the student was coded as third generation and given the value of 3. “Generationalstatus” is a categorical variable with the values 1, 2, and 3. This variable was dummy coded and third generation students were used as the reference group.

“Native language” is measured using a composite variable created by NCES, BYSTLANG, which asked the student whether or not English was their native language. Missing information was imputed by NCES. The variable is coded as: 0= “no” and 1= “yes”.

Independent School-Level Variables

School System. “School characteristics” is measured using NCES variable F1A32A, which asked school administrators what percentage of their full-time regular teaching staff were Hispanic. The responses to this question are presented as percentages. Any values greater than 95% were set to 95% by NCES.

“School programming” is measured using NCES variable BYA14B, which is part of a series of eleven questions, which asked school administrators about student participation in instructional programs. Administrators were asked: “approximately what percentage of your 10th grade students is in each of the following instructional programs? (Write “000” if no 10th grade students are in a given program).” This specific item refers to percentage of 10th graders enrolled in college prep programming. The responses to this question are presented as percentages.

“Teacher expectations” is measured using NCES variable BYTE20, which asked each student’s English teacher how far in school they expected the student to get. The responses were coded as follows: 1= “less than high school graduation”; 2= “high school graduation or GED only”; 3= “attend or complete 2-year college/school”; 4= “attend college, 4-year degree incomplete”; 5= “graduate from college”; 6= “obtain master’s degree or equivalent”; 7= “obtain PhD, MD, or other advanced degree”; and -1= “don’t know”. For this dissertation, the variable was re-coded to create all positive values on a

scale from 1-8 so as not to introduce a negative value into the analysis, as “don’t know” was originally coded with a -1. The variable, now called “FinalETEACHEXP”, is coded as follows: 1=don’t know; 2= less than high school; 3=high school graduation or GED; 4=attend/complete 2-yr college/school; 5= attend college, 4-yr degree incomplete; 6=graduate from college; 7=obtain master’s degree or equivalent; and 8=obtain PhD, MD or other advanced degree.

Statistical Models

Below, the level-1 and level-2 statistical models are presented and explained. Hierarchical Generalized Linear Modeling (HGLM)⁴ features three different level-1 models: the sampling model, link function, and the structural model.

Level-1 Models (Student-level models)

Level-1 Sampling Model

$$\varphi_{ij} = \text{prob}(Y_{ij} = 1) \quad (1)$$

$$E(Y_{ij}) = \varphi_{ij} \quad (2)$$

$$\text{Var}(Y_{ij}) = \varphi_{ij}(1 - \varphi_{ij}) \quad (3)$$

Level-1 Link Function

$$\eta_{ij} = \log\left(\frac{\varphi_{ij}}{1 - \varphi_{ij}}\right) \quad (4)$$

η_{ij} = the outcome at level 1, the log odds of success

⁴ Hierarchical Generalized Linear Modeling (HGLM) is the method used for the data analysis in this dissertation and will be explained in the following section.

Unconditional Models

Level-1

$$\eta_{ij} = \beta_{0j} + e_{ij} \quad (5)$$

Level-2

$$\beta_{0j} = \gamma_{00} + u_{0j} \quad (6)$$

Conditional Models

Level-1

$$\begin{aligned} \eta_{ij} = & \beta_{0j} + \beta_{1j}(PLANNINGFORCOLLEGE)_{ij} + \beta_{2j}(EDUCATIONALGOALS)_{ij} + \\ & \beta_{3j}(FAMILYCOMPOSITION)_{ij} + \beta_{4j}(PARENTEXPECTATIONS)_{ij} + \\ & \beta_{5j}(PARENTEducation)_{ij} + \beta_{6j}(PARENTINVOLVEMENT)_{ij} + \beta_{7j}(LANGUAGEUSE)_{ij} \\ & + \beta_{8j}(EXTRACURRICULARINVOLVEMENT)_{ij} + \beta_{9j}(CLOSEHISPANICFRIENDS)_{ij} + \\ & \beta_{10j}(GENERATIONALSTATUS)_{ij} + \beta_{11j}(NATIVELANGUAGE)_{ij} + \beta_{12j}(SEX)_{ij} + \\ & \beta_{13j}(INCOME)_{ij} \end{aligned} \quad (7)$$

Where:

η_{ij} is the outcome at level 1, the log-odds of academic achievement of student “i” in school “j”

β_{0j} is the intercept, which represents the value predicted for academic achievement when X is zero

β_{1j} represents the slope for the relationship between academic achievement and level-1 predictors.

Level-2

$$\begin{aligned} \beta_{0j} = & \gamma_{00} + \gamma_{01}(SCHOOLCHARACTERISTICS)_j + \gamma_{02}(SCHOOLPROGRAMMING)_j + \\ & \gamma_{03}(TEACHEREXPECTATIONS)_j + u_{0j} \end{aligned} \quad (8)$$

Where:

β_{0j} represents the log-odds of academic achievement in school j

γ_{00} is the average log-odds of academic achievement across schools

γ_{01} represents the relationship between a level-2 predictor and academic achievement

u_{0j} represents the random error

$$\beta_{kj} = \gamma_{k0} + u_{kj}, k = 1-3 \quad (9)$$

Data Analysis

This secondary data analysis uses hierarchical linear modeling (HLM) with nested data. Most education data is hierarchical and multilevel (Hwang, 2002) and the ELS: 2002 dataset contains both multilevel and longitudinal data. HLM is a technique commonly used for education data given the different clusters in which the data are located, such as students, schools, and districts (McCoach, 2010; Tabachnick & Fidell, 2007; Bryk & Raudenbush, 1992; Raudenbush & Bryk, 2002). HLM allows researchers to look at this hierarchical data and interpret results without ignoring the different structures that are present (Hwang, 2002). Lee (2000) explains that by using HLM the researcher is able to consider multiple units of analysis, whereas with other statistical techniques the researcher must choose whether to look at where the effect is being administered or where it takes place. By using HLM, she explains that both levels can be considered. She explains that with a single-level analysis one must assume that characteristics and outcomes are the same for students and that the effects of attending different schools cannot be considered, but that HLM allows for understanding how school effects influence outcomes for students. Multiple regression is not appropriate to use with the ELS: 2002 given the non-independence of the data (Hwang, 2002). Students are clustered within schools and the effects of being in different schools need to be accounted for. With a singular level of analysis within and between school differences cannot be examined. Given that the assumption of independence is violated, a multi-level approach must be taken. When the assumption of independence is violated, HLM, which is a regression technique, is the most appropriate data analysis method to use (Williams, 1999; McCoach, 2010). Garson (2013) explains that multi-level modeling assumes that

variables at one level will cause effects at another level and that by using a multi-level analysis different types of conclusions can be drawn.

This study focuses on predictors at two levels: student-level and school-level. Given that the outcome variable is binary: 1= “on-time” transition to higher education, and 0= delayed or no transition to higher education, hierarchical generalized linear modeling (HGLM) with a Bernoulli sampling model and logit link must be used, as HLM requires a continuous outcome variable (Raudenbush & Bryk, 2002). HGLM provides two types of results: population-average and unit-specific. The unit-specific model provides outcomes over all level-2 units, whereas population-average models provide outcomes that are averaged across level-2 random effects. For this dissertation, the unit-specific results are presented. The output provided by the HLM software provides log-odds coefficients and odds ratios. In order to best understand the results, the logit was converted to a probability using the following formula:

$$\varphi_{ij} = \log \left(\frac{1}{1 + \exp(-\eta_{ij})} \right)$$

Using this formula allows the results to be discussed as the probability that a student will have an on-time transition to higher education with respect to the student-level and school-level variables.

Software

The data was analyzed using two programs: SPSS 19.0.0 (IBM, 2010) and HLM v. 6.08 (Raudenbush, Bryk, & Congdon, 2004). Using SPSS, variables were re-coded, composite variables were created, and the student-level and school-level files were prepared. The school-level dataset was created by aggregating the three school variables

to the school level. With respect to teacher expectations, this variable at level-2 represents the average expectations that teachers have of Latino students in a specific school. The remaining school-level variables report the percentage of full-time Hispanic teachers, and the percent of 10th grade students enrolled in college prep programming. The student-level and school-level files were then entered into HLM and this multi-level software program was used to run the HGLM analysis.

Diagnostics

Given the nature of the data and that it is not normally distributed due to the binary outcome variable, certain assumptions such as homoscedasticity and normal distribution do not need to be checked. Spearman's correlations were run on all of the variables and the data was checked for multi-collinearity and no variance inflation factor (VIF) exceeded three.

Non-bias Analysis

A non-bias analysis was conducted to compare those students who were included in the final sample (analytic sample) to those who were not included either due to missing data or less than three observations per school, thus requiring that the data not be included. The non-bias analysis looked at all level-1 variables using chi-square comparisons of the analytical sample ($N=630$) and the dropped cases ($N=1,200$). It was found that there are statistically significant differences ($p<0.05$) in terms the parent's expectations of their students' educational attainment, student expectations for their educational attainment, student planning for college, and generational status between the dropped cases and analytical sample. The analytical sample contained a slightly higher percentage of parents who wanted their children to obtain a Master's degree or PhD, MD

or other advanced degree. There was a tendency for the dropped cases to have a slightly higher percentage of parents whose expectations for their child were to attend or complete two-year college. Looking at student expectations for their educational attainment, the analytical sample contained a higher percentage of students who expected to obtain a Master's degree (20.8% as compared to 13.3%) and slightly more students who expected to get a PhD, MD or other advanced degree (16.4% as compared to 12.2%). There was a tendency for the dropped cases to have a slightly higher percentage of students who responded that they did not know what they expected for their education (14.5% as compared to 10.7%) and those who indicated they expected high school graduation or a GED (10.7% as compared to 6.8%). The analytical sample contained more third-generation students and fewer first-generation students. With regard to planning for college, the analytical sample contained more students who planned to go to college and had sought out information regarding college.

Summary

This chapter presented the systems considered as well as the conceptual definitions used and how they have been measured. A detailed description of the ELS: 2002 dataset was presented including sampling strategy, questionnaires utilized, coding of data, imputation and weighting. Information on how the final sample for this dissertation was reached was provided. The dependent variable, control variables and student-level and school-level variables were presented with original coding schemes and re-coding explained. Finally, the data analysis technique, HGLM, was described and preliminary diagnostics were presented. The next chapter presents the results of the descriptive analysis and the multi-level models.

CHAPTER IV

RESULTS

This chapter first presents the descriptive statistics that examine how students who have an on-time transition¹ to higher education are different from those students who have a delayed or no transition to higher education. Following, the results of the HGLM² analysis are presented, examining the influence of the individual student, family, immigration, community, and school systems on the academic achievement outcomes of Latino students. The findings from the unconditional³ model are discussed first, followed by the discussion of student, school, and multi-level⁴ models.

Descriptive Statistics

The analytic⁵ sample, derived from the NCES ELS: 2002 dataset, includes 630 students from 100 schools. Table 2 (see page 81) presents the descriptive statistics for the student-level and school-level variables. In addition to the dependent variable, all of the

¹ On-time transition refers to the dependent variable, academic achievement, which looks at students who have an on-time transition to higher education as compared to those who have a delayed or no transition to higher education.

² Hierarchical Generalized Linear Modeling (HGLM) is the method used for the data analysis in this dissertation, for detailed information see the “Data Analysis” section of Chapter 3.

³ The unconditional model refers to a model with no predictor variables. This model provides information about the explainable variance between schools with regard to the dependent variable, on-time transition to higher education, before predictor variables are entered into the model.

⁴ Multi-level model refers to the model that contains predictor variables at level-1 and level-2.

⁵ Analytic sample refers to the final sample of students included in the descriptive analysis and the HGLM analysis ($N=630$). This sample was derived from the complete sample of the NCES ELS: 2002 dataset.

level-1 and level-2 predictors are presented in the table, which provides the min, max, mean and standard deviation for each variable.

Table 2. Descriptive Statistics for Student and School-Level Variables

Variables	Min	Max	Mean	St. Dev
STUDENT LEVEL (N=630)				
Transition to College (DV)	0.00	1.00	0.53	0.00
Student Expectations	1.00	8.00	5.59	2.11
Plans for college, action taken	0.00	1.00	0.77	0.42
Plans for college, no action taken	0.00	1.00	0.11	0.31
Doesn't know /no plans for college*	0.00	1.00	0.12	0.33
Parent Education	1.00	8.00	3.63	2.17
Parent Expectations	2.00	7.00	5.54	1.32
Family Composition	0.00	1.00	0.57	0.50
Parent Involvement	0.00	6.00	1.58	0.00
Native Language Use	0.00	4.00	1.90	1.80
First Generation	0.00	1.00	0.22	0.42
Second Generation	0.00	1.00	0.43	0.50
Third Generation*	0.00	1.00	0.34	0.48
Native Language	0.00	1.00	0.49	0.50
Close Hispanic Friends	0.00	3.00	1.93	1.15
Extracurricular Involvement	0.00	1.00	0.77	0.42
Family Income (control)	1.00	13.00	8.12	2.30
Gender (control)	0.00	1.00	0.22	0.42
SCHOOL LEVEL (N=100)				
% Hispanic Teachers	0.00	95.00	15.03	19.99
Teacher Expectations	1.71	6.75	4.63	1.00
% in College Prep Program	0.00	100.00	61.91	34.97

Note. * indicates a reference group.

Table 18 (see Appendix H) displays the breakdown, by level-1 and level-2 variables, of students who had an on-time transition to higher education as compared to those who had a delayed or no transition to higher education.

In this sample, 53.5% of students had an on-time transition to higher education. The majority (80.2%) of students who had an on-time transition to higher education aspired to complete a 4-year college degree or higher. Of those who had a delayed or no transition to higher education, 60.0% aspired to complete a 4-year college degree or higher. There were 77.1% of students who had planned to go college and had taken some action towards that end, meaning they had gone to at least one source for information about college. Of the students in this group (those having taken action directed toward higher education) 59.5% had an on-time transition to higher education.

In considering the family system, over half of the sample, 57.3%, lived in a traditional family setting with both parents in the home. Sixty percent of these students in two-parent households had an on-time transition to higher education. In considering students who had an on-time transition to higher education, 35.4% had at least one parent who had completed some higher education (no degree attained) and 31.6% had at least one parent who had completed a college degree or higher. Of those students who had a delayed or no transition to higher education, 31.5% had at least one parent who had completed some higher education and 17.6% had at least one parent who had completed college or higher. The overwhelming majority of parents, 89.8%, expected their child to complete a 4-year college degree or higher. Of the student group whose parents had these expectations, 56.2% had an on-time transition to higher education.

When looking at parental involvement with homework the two groups are quite similar. There were 63.6% of students had a four to six score on the parental homework involvement scale (ranges from zero to six, where 0= no involvement with homework and 6= always involved). Of this group, 54.3% had an on-time transition to higher education meaning 45.7% had a delayed or no transition to higher education. The greatest number of parents, 43.8%, indicated that English was their native language and therefore the only language spoken with their children. Thirty-four percent of parents spoke their native language with the student all or most of the time. Half of the students, with parents that spoke their native language all or most of the time, had an on-time transition to higher education and the other 50.0% had a delayed or no transition to higher education.

In considering the immigration system, 22.2% of students are first generation immigrants, 43.4% are second generation, and 34.4% are third generation. Second generation students make up the largest group with an on-time transition to higher education, 45.4%. Fifty-five percent of third generation students and 46.1% of first generation college students had an on-time transition to higher education. The sample was evenly split regarding whether or not English was the native language. Of that group for whom English was not their native language, 51.6% had an on-time transition to higher education and 48.4% had a delayed or no transition to higher education. Of the group for whom English was their native language, 55.4% had an on-time transition to higher education and 44.6% had a delayed or no transition to higher education.

In considering the community system, the largest group of students, 45.4%, had three close Hispanic friends. Of that group, just over half (51.0%) had an on-time transition to higher education. Of the student group without any close Hispanic friends,

which represents 17.4% of the entire sample, 58.2% had an on-time transition to higher education. Of the entire sample, 77.4% were involved in at least one extra-curricular activity. Of this group, about 58.8% had an on-time transition to higher education. Thirty-five percent of students that did not participate in an extra-curricular activity had an on-time transition to higher education.

Two control variables were included in this study, gender and family income. Thirty-three percent of the sample had a family income of \$25,000 or less and 27.5% had a family income of \$50,001 or more. Of those students who had an on-time transition to higher education, 27.1% had a family income of \$25,000 or less and 20.4% had a family income of \$75,001 or more. Fifty-three percent of the sample was female, while 56.9% of students who had an on-time transition to higher education were female.

Several school system factors were considered: percentage of Hispanic teachers, teacher expectations, and participation in college prep programming. Thirty-nine percent of the sample attended a school with less than ten percent Hispanic teachers and 38.8% of the sample attended a school with twenty-one percent or more Hispanic teachers. Of those students who had an on-time transition to higher education, about 41.3% went to a school with twenty-one percent Hispanic teachers or more. Of the entire sample 36.4% attended a school where the average teacher expectations of the student's educational outcomes ranged from more than attending or completing 2-year college up to attending 4-year college, but without completing a degree; 27.6% attended a school where the average teacher expectations of the student's educational outcomes were more than attending a 4-year college, without completing a degree up to graduating from college. These two categories represent the largest number of students with an on-time transition

to higher education. In examining the percentage of 10th grade students who participate in college prep programming at the school, 45.6% attended a school where seventy-one percent or more of the 10th grade school population participated in college prep programming. Of that group, 65.7% had an on-time transition to higher education. About twelve percent of students attended schools with zero to ten percent participation rates in college prep programming. Of that group, 33.3% had an on-time transition to higher education.

HGLM Analysis

The results of five sets of models are presented below. First, the unconditional model, with no predictor variables included is discussed, followed by the student-level models, school-level model and finally, the multi-level model will be presented. The results of all models represent the weighted analytical sample.

Unconditional Model

Model 1: No level-1 or level-2 predictors. The fully unconditional model, refer to equations 5 & 6 in chapter 3, which can be seen in Table 3 (below) and Table 4 (see page 86), provides information about the between school variance with no level-1 or level-2 predictors added.

Table 3. Results of Unconditional Model of Transition to Higher Education

Fixed Effect	Coefficient	St. Error	t-ratio	df	p-value
Institutional mean (γ_{00})	-0.074	0.105	-0.699	100	0.486

The result shows that there is significant explainable variance between schools ($p = .016$). Given that this study employs a Bernoulli distribution, which has a binary outcome variable with values of 0 and 1, the Intraclass Correlation Coefficient (ICC), which

measures the proportion of variance in the outcome that is between schools (Raudenbush & Bryk, 2002), cannot be calculated in the same manner as HLM, which has a continuous outcome variable, $(\tau_{00}/(\sigma^2 + \tau_{00}))$. Snijders and Bosker (2012) provide an alternative method for calculating the ICC when there is a binary outcome variable: $\tau_{00}/(\tau_{00} + \pi^2/3)$. Using this formula, the unconditional model reveals an ICC of .0732, which means 7.3% of the variation in an on-time transition to higher education is attributable to the differences among high schools. Therefore, 92.7% of the variation remains at the student level. The model tells us that the expected log-odds of an on-time transition to higher education for a “typical” school (see Raudenbush & Bryk, 2002) are -0.074, which corresponds to a probability of 0.482. Generally speaking, students in this sample have a 48% chance of an on-time transition to higher education.

Table 4. Variance Components for the Unconditional Model of Transition to Higher Education

Random Effect	St. Dev	Variance Component	df	Chi-square	p-value
Between Institution (τ_{00})	0.510	0.260	100	131.462	0.016

Bryk and Raudenbush (2002) state that an ICC with HGLM is not as useful given that the level-1 variance is heteroscedastic. Therefore, they suggest calculating a 95% prediction interval for the included high schools with an upper and lower limit using the following formula: $\beta_{0j} \pm 1.96 * \sqrt{\tau_{00}}$. For the unconditional model the 95% prediction interval for the log-odds is (0.754, 1.145). When these log-odds are converted to a probability the interval is (0.680, 0.759) with respect to having an on-time transition to higher education. Schools in this sample have a probability of 68% to 76% for an on-time

transition of its students to higher education. This reveals that all schools in the sample have more than 50% of their students transitioning on-time to higher education.

Conditional Models

The results of two random coefficients models (level-1, predictors only) will be presented, one intercept/mean as outcome model (level-2, predictors only), and one intercept/mean and slopes as outcomes model (level-1 and level-2 predictors). The model building process included first looking at the effect of each level-1 variable as a single predictor in the random coefficients model. Next, each system (re: ecological systems perspective) and its predictor variables were examined at both level-1 and level-2. The predictors in each system were added into the model system by system to investigate the strength of predictors when multiple systems are working together, see Model 2 below. With all systems included (all predictor variables and two control variables), the model was assessed and significant predictors were selected and put into another random coefficients model, see Model 3 below. Next the level-2 model was examined by looking first at all level-2 predictors in an intercept/mean as outcome model, see Model 4 below. Level two predictors were assessed individually and in combination with others. Finally, the significant predictors from level-1 and all predictors from level-2 were put into a multi-level model, level-2 predictors were removed and tested in different combinations until the best fitting model was reached, see Model 5 below. The results of the four models for different conditions are presented below.

Random coefficients models. Two random coefficients models will be described in this section. The second model, refer to equation 7 in Chapter 3, which can be seen in Tables 5 and 6, presents all level-1 predictors and two control variables. The third model

presents all significant level-1 variables and the two control variables, the results of this model can be seen in Tables 7 and 8.

Model 2: All level-1 predictor variables. In this first student-level model, which can be seen in Tables 5 (below) and 6 (see page 90), all level-1 predictors along with the two control variables, gender and family income, have been entered into the model. In this model at level-2, the intercept is treated as random and all other β coefficients are fixed.

Table 5. Results for Random Coefficients Model with all Level-1 Predictors

Fixed Effect	Coefficient	St. Error	t-ratio	df	p-value
Institutional mean (γ_{00})	-5.770	0.754	-7.648	100	0.000
Gender	0.499	0.238	2.102	620	0.036*
Family Income	0.176	0.054	3.257	620	0.002**
Native language	-0.030	0.325	-0.092	620	0.928
First Generation	-0.560	0.407	-1.377	620	0.169
Second Generation	-0.264	0.306	-0.862	620	0.390
Parent Education	0.041	0.061	0.678	620	0.498
Parent Expectations	0.235	0.076	3.074	620	0.003**
Native Language Use	0.127	0.081	1.562	620	0.119
Family Composition	0.532	0.234	2.273	620	0.023*
Parent Involvement	0.021	0.065	0.328	620	0.743
Student expectations	0.076	0.062	1.225	620	0.221
Plans for college, action taken	1.004	0.449	2.239	620	0.025*
Plans for college, no action taken	0.370	0.483	0.766	620	0.444
Close Hispanic Friends	0.150	0.099	1.510	620	0.131
Extracurricular Involvement	1.032	0.237	4.353	620	0.000***

Note. Gender and Family income are control variables. * $p < .05$, ** $p < .01$, *** $p < .001$.

In this full model, when all variables are controlled for, the conditional log-odds of an on-time transition to higher education are -5.770, which corresponds to a probability of 0.003. In addition to the two control variables, four of the eleven predictor

variables are significant. With respect to the control variables, being a female and being from a family with a higher income are associated with higher log-odds of an on-time transition to higher education. Higher parent expectations are associated with a higher chance of an on-time transition to higher education. When all other predictors are held constant, a one-unit increase in a parent's educational expectations (for example, a change from expecting student will go to a four-year college, but not complete their degree, to going to a four year college and completing their degree) for the student means the student is expected to have 0.235 higher log-odds of an on-time transition to higher education. This indicates the student is 55.8% more likely to have an on-time transition to higher education. Students who live in a traditional family, meaning living with both parents, have higher log-odds of an on-time transition to higher education. When all other predictors are held constant, a student who lives in a traditional family arrangement as compared to a student living in any other family arrangement is expected to have 0.532 higher log-odds, meaning they are 63% more likely to have an on-time transition to higher education. A student who plans to go to college and has sought information from at least one source about college, is 73% more likely to have an on-time transition to higher education than a student who does not know if they will go to college or does not have any plans to go to college. This also includes those students who indicated they expected less than high school graduation or their highest level of education to be high graduation/GED. Students who participate in at least one extracurricular activity are 74% more likely to have an on-time transition to higher education as compared to students who do not participate in any extra-curricular activities.

The results of this model reveal that there are significant family, community and individual student predictors of on-time transition to higher education. The immigration variables, in particular, generational status, which was hypothesized to have an effect, was not significant. In examining the variance components, see Table 6, $\tau = 0.207$, $p = 0.178$, $\chi^2 = 111.862$, it can be seen that there are not significant differences between schools after controlling for the differences among the students. After calculating the ICC it is seen that 5.9% of the variation in an on-time transition to higher education is attributable to the differences among high schools. Therefore, 94.1% of the variation remains at the student level.

Table 6. Variance Components for Random Coefficients Model with all Level-1 Predictors

Random Effect	St. Dev	Variance Component	df	Chi-square	p-value
Between Institution (τ_{00})	0.455	0.207	100	111.862	0.178

Model 3: Significant level-1 predictors. All significant level-1 predictors have been entered into this third model. Again, at level-2, the intercept is treated as random and all other β coefficients are fixed.

It is seen in Table 7 (page 91) that the level-1 predictors that were significant when all level-1 variables were entered into the model are still significant. Each of the four predictor variables and gender (control) now have greater statistical significance (family income stayed the same), when in the model together, after removing the non-significant predictors from Model 2. When all other predictors are held constant, a female student is 63% more likely than a male student to have an on-time transition to higher education.

For every unit increase in family income, a student is 54% more likely to have an on-time transition to higher education. For every unit increase in parent expectations, a student is 57% more likely to have an on-time transition to higher education. A student who lives in a traditional family is 64% more likely to have an on-time transition to higher education than a student from any other family arrangement. A student who plans to go to college and has taken action to get information about college is 72% more likely to have an on-time transition to higher education than a student who does not know if they will go to college or does not plan to go to college. Finally, a student who participates in at least one extracurricular activity is 73% more likely to have an on-time transition to higher education than a student who does not participate in extracurricular activities.

Table 7. Results for Random Coefficients Model with Significant Level-1 Predictors

Fixed Effect	Coefficient	St. Error	t-ratio	df	p-value
Institutional mean (γ_{00})	-4.927	0.592	-8.318	100	0.000
Gender	0.524	0.229	2.290	630	0.022*
Family Income	0.164	0.051	3.202	630	0.002**
Parent Expectations	0.285	0.077	3.719	630	0.000***
Family Composition	0.559	0.224	2.495	630	0.013*
Plans for college, action taken	0.925	0.252	3.666	630	0.000***
Extracurricular Involvement	0.996	0.229	4.354	630	0.000***

Note. Gender and Family income are control variables. * $p < .05$, ** $p < .01$, *** $p < .001$.

In examining the variance components, see Table 8 (page 92), $\tau = 0.244$, $p = 0.075$, $\chi^2 = 119.943$, it can be seen that there are not significant differences between schools after controlling for the differences among the students. The ICC explains that 6.9% of the

variation in an on-time transition to higher education is attributable to the differences among high schools. Therefore, 93.1% of the variation remains at the student level.

Table 8. Variance Components for Random Coefficients Model with Significant Level-1 Predictors

Random Effect	St. Dev	Variance Component	df	Chi-square	p-value
Between Institution (τ_{00})	0.494	0.244	100	119.943	0.075

Intercept/mean as outcome model: The level-2 system, school, will be examined without any level-1 predictors added.

Model 4: All level-2 predictor variables. All level-2 predictors were entered into the model, refer to equation 8 in Chapter 3, and see Tables 9 and 10 (page 93). All three variables entered into this model are significant. When considering teacher expectations, which just reaches statistical significance ($p=0.47$), it is seen that when all other predictors are held constant, the expected increase in log-odds for an on-time transition to higher education is 0.254 when there is a one unit increase in the average teacher expectations for students at the school. This indicates that a student is 56% more likely to have an on-time transition to higher education with increased average teacher expectations. With a one percent increase in the total percent of Hispanic teachers at the school, a student has 0.010 higher log-odds of an on-time transition to higher education. In terms of probability, a student is 50% more likely to have an on-time transition to higher education. A one percent increase in the total percentage of 10th grade students enrolled in college prep programming at a school corresponds with a student being 50% more likely to have an on-time transition to higher education.

Table 9. Results for Intercept/Mean as Outcome Model with all Level-2 Predictors

Fixed Effect	Coefficient	St. Error	t-ratio	df	p-value
Institutional mean (γ_{00})	-1.740	0.523	-3.329	100	0.002
Teacher expectations	0.254	0.126	2.012	100	0.047 ⁺
% Hispanic teachers	0.010	0.010	2.247	100	0.027*
% in college prep	0.007	1.007	2.500	100	0.014*

Note. * $p < .05$, ** $p < .01$, ⁺ $p = .047$.

In examining the variance components, $\tau^2 = 0.132$, $p = 0.284$, $\chi^2 = 103.413$, it can be seen that there are not significant differences between schools after including the variables at level-1. This model reveals that when only the school-level variables, school characteristics, teacher expectations and school programming, are working together, they are all significant predictors of an on-time transition to higher education. The ICC explains that 3.9% of the variation in an on-time transition to higher education is attributable to the differences among high schools. Therefore, 96.1% of the variation remains at the student level. This reveals that the addition of the school level predictors has decreased the overall variation in an on-time transition to higher education between schools by 3%, revealing that the level-2 predictors selected are doing little to explain the overall variation between schools.

Table 10. Variance Components for Intercept/Mean as Outcome Model with all Level-2 Predictors

Random Effect	St. Dev	Variance Component	df	Chi-square	p-value
Between Institution (τ_{00})	0.364	0.132	100	103.413	0.284

Multi-level Model (intercept/mean and slopes as outcomes model). Finally, different school context effects were examined to see the effect on an on-time transition

to higher education. In conjunction with level-1 predictors, average teacher expectations and the percent of 10th grade students enrolled in college prep programming, did not have an effect on the outcome. The final model presented is the best fitting model, $\tau = 0.172$, $p = 0.195$, $\chi^2 = 109.845$, and includes all significant level-1 predictors and the percent of Hispanic teachers at level-2, see Table 12 (page 95). It can be seen that there are not significant differences between schools after controlling for the differences among the students. The ICC reveals that 5.0% of the variation in an on-time transition to higher education is attributable to the differences among high schools. Therefore, 95.0% of the variation remains at the student level.

Model 5: All significant level-1 variables with significant level-2 variable. All of the level-1 variables significant in Models 2 and 3 continue to retain significance and one level-2 variable from Model 4 retains significance in this final model. The results are presented in Tables 11 and 12 (see page 95).

The results of this final model help with understanding the combination of student and school level factors that are significant in predicting an on-time transition to higher education. When all other variables are held constant, a one percent increase in the total percentage of Hispanic teachers at a school means a student is 50% more likely to have an on-time transition to higher education. With respect to the two control variables, gender and family income, when all other variables are held constant, it is seen that being a female and increased family income are related to a higher likelihood of an on-time transition to higher education.

When all other variables are held constant, a one-unit increase in parent expectations corresponds to a student being 57% more likely to have an on-time

transition to higher education. A student in a traditional family setting is 62% more likely to have an on-time transition to higher education than a student in any other family setting, when all other variables are held constant. A student that has planned to go to college and has taken action to get information is 71% more likely to have an on-time transition to higher education than a student that is uncertain about their college plans or does not plan to go to college. Again, this also includes those students who indicated they expected less than high school graduation, or their highest level of education to be high graduation/GED. When all other variables are held constant, a student who has participated in at least one extracurricular activity is 72% more likely to have an on-time transition to higher education than a student who does not participate in any extracurricular activities.

Table 11. Results for Intercept/Mean and Slopes as Outcomes Model with Level-1 and Level-2 Predictors

Fixed Effect	Coefficient	St. Error	t-ratio	df	p-value
Institutional mean (γ_{00})	-5.166	0.588	-8.788	100	0.000
% Hispanic teachers (γ_{01})	0.013	0.005	2.381	100	0.019*
Gender (γ_{10})	0.506	0.231	2.189	630	0.029*
Family Income (γ_{20})	0.184	0.055	3.379	630	0.001**
Parent Expectations (γ_{30})	0.265	0.078	3.410	630	0.001**
Family Composition (γ_{40})	0.509	0.224	2.278	630	0.023*
Plans for college, action taken (γ_{50})	0.918	0.247	3.714	630	0.000***
Extracurricular Involvement (γ_{60})	0.967	0.228	4.237	630	0.000***

Note. Gender and Family income are control variables. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 12. Variance Components for Intercept/Mean and Slopes as Outcomes Model with Level-1 and Level-2 Predictors

Random Effect	St. Dev	Variance Component	df	Chi-square	p-value
Between Institution (τ_{00})	0.415	0.172	100	109.845	0.195

Table 13 (below) shows the results of all five models side by side. Model 1 represents the unconditional model with no predictor variables. Model 2 has all level-1 predictors and Model 3 has all significant level-1 predictors. Model 4 looks at only level-2 predictors and finally, Model 5 reports the best fit, which includes all significant level-1 predictors and one significant predictor at level-2. The variance components for the school level are included at the top of the table.

Table 13. Model Comparison Chart for on-time Transition to Higher Education

	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed Effects & Variance Components					
Intercept (γ_{00})	-0.074	-5.770***	-4.927***	-1.740**	-5.166***
Between institution (τ_{00})	0.260*	0.207	0.244	0.132	0.172
School level effects (N=100)					
Teacher expectations				0.254 ⁺	
% Hispanic teachers				0.010*	0.013*
% In college prep				0.007*	
Student level effects (N=630)					
Gender		0.499*	0.524*		0.506*
Family Income		0.176**	0.164**		0.184**
Native language		-0.030			
First Generation		-0.560			
Second Generation		-0.264			
Parent Education		0.041			
Parent Expectations		0.235**	0.285***		0.265**
Native Language Use		0.127			
Family Composition		0.532*	0.559*		0.509*
Parent Involvement		0.021			
Student expectations		0.076			
Plans for college, action taken		1.004*	0.925***		0.918***
Plans for college, no action taken		0.370			
Close Hispanic Friends		0.150			
Extracurricular Involvement		1.032***	0.996***		0.967***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, ⁺ $p = .047$.

The variance components show that only the unconditional model was significant, meaning there was only significant variance between schools before the predictor variables were added. However, the calculated ICC for the unconditional model specified very little differences between schools. The addition of variables at either level or both made the overall model insignificant, but demonstrated significant predictor variables. This shows the strength of the selected variables in predicting an on-time transition to higher education for students within a school, but limited overall differences across the schools in the sample.

Summary

This chapter presented the results of five different models including the unconditional model with no predictor variables, student-level models, a school-level model and finally, a multi-level model. The final model presented the best fitting model, which includes predictor variables from the individual student, family system, community system and school system. It was hypothesized that there would be significant predictors from each system and multiple significant predictors at level-2.

The immigration system did not have any significant predictors and only one variable was significant at level-2 in the final model. Overall, the models suggest that there are no significant differences between schools, but rather there is consistency across schools. More importantly, the models demonstrate that the differences in who has an on-time transition to higher education are mainly due to student-level factors. The models indicate that school by school, students are impacted the same way, meaning the results from school to school are similar. It is the individual factors that influence which students have an on-time transition to higher education when compared to those students who

have a delayed or no transition to higher education. The final chapter presents a discussion of the results, contribution to theory, implications for policy and practice, limitations of the study, future research areas, and conclusions.

CHAPTER V

DISCUSSION

This dissertation used HGLM to examine the factors that impact the academic achievement of Latino students. This research was informed by an ecological systems perspective, a framework often discussed in the field of social work, and cultural-discontinuity theory, to better understand the factors that impact the transition to higher education among Latino students. Using a national, longitudinal dataset, the ELS: 2002, multi-level modeling was employed to better understand the individual student, and the family, immigration, community and school systems. HLM was selected because it is the most appropriate statistical technique to use with a nested data structure, in this study allowing for the examination of the level-1 and level-2 factors that impact the on-time transition to higher education. Descriptive comparisons were executed, as well as multi-level models. This chapter provides a discussion of the study results, contribution to theory, implications for policy and practice, limitations, suggestions for future research, and conclusions.

Discussion of Descriptive Results

This study was conceptualized using two theoretical frameworks, the ecological systems perspective and the theory of cultural-discontinuity. The ecological systems perspective provided a framework and conceptual organization for the data. In the social sciences, social work in particular, a commonly accepted and favored view is that individuals

affect and are affected by their surroundings, such as family, community, school, and at a larger level, though not considered in this dissertation, state and national policies (Payne, 2005). In addition to the aforementioned systems, the immigration system was also included and considered the student's native language and generational status. The student's and family's immigration status was also of interest, however, due to dataset limitations, these variables could not be included. The theory of cultural-discontinuity addresses the culture of the school and the culture of family and how both cultural systems influence a student's academic performance. In keeping with the theory, this dissertation examined culture in both the home and school.

The sample in this study was limited by the large quantity of missing data. Only students and schools with complete data were included. Additionally, only schools that had three or more students sampled were initially included in the study and this criterion for inclusion was re-assessed a second time after participants with missing data were eliminated. This narrowed the final sample to 630 students and 100 schools. Slightly more than half of the students in the analytical sample had an on-time transition to higher education (53.5%) in contrast to those who had a delayed or no transition to higher education. This was a surprising finding given past research that shows high dropout rates and low college enrollment rates for Latino students (U.S. Dept. of Education, 2011a; Pew Hispanic Center, 2012), although rising enrollment in two-year college among this population has been documented (Pew Hispanic Center, 2011b; Pew Hispanic Center, 2012). This dissertation did not categorically distinguish between students enrolled in two-year or four-year colleges, only whether or not they had an on-time transition to higher education. Seventy-four percent of the entire 2006 original ELS: 2002 sample,

which includes all racial/ethnic groups, had attended postsecondary education (Ingels et al., 2007). In comparison, the weighted analytic sample in this study demonstrated that 53.5% of students had an on-time transition to higher education. The figure for the entire sample does not consider timing of transition to postsecondary education and therefore no actual comparisons can be made; however, it is interesting to see that there is some difference in these figures.

The sample was nearly split regarding gender, with slightly more females than males (53.0% as compared with 47.0%). It was not surprising to find that female students had a greater likelihood of an on-time transition than male students, as past literature has also found that females have better academic achievement than males in Latino populations (Nunez & Kim, 2012; Educational Policy Institute, 2005; Ovink, 2011). Second generation students were the largest of the three generational groups examined, representing 43.4% of the sample. This was also the largest group to have an on-time transition to higher education. Iber (1996), building on Henry Trueba's work, hypothesized that second generation students fare better with regard to academic achievement than first generation students. His hypothesis fits with the descriptive results of this study, though generational status was not found to be significant in the multi-level models.

Quite surprising was the higher education transition distribution of students across family income categories. Students from the lowest income bracket (\$25,000 or less) made up the largest group of students who had an on-time transition to higher education. Past research has shown that family SES is an important predictor of academic achievement (Battle & Pastrana, 2007; Sirin, 2005), and therefore it was selected as a

control variable for this dissertation. As explained in Chapter 3, Battle and Pastrana (2007) looked at SES as a measure of mother's and father's level of education, mother's and father's occupation, and family income. The ELS: 2002 dataset also used the same components to measure SES. However, given the interest in looking parental level of education as a predictor variable, this dissertation only used family income as a control rather than the composite SES provided by NCES. The descriptive statistics show that of the students who had an on-time transition to higher education, 27.1% were from the lowest income bracket, which is not congruent with past research. Additionally, family income was a significant predictor in the multi-level analysis. Nuñez and Kim (2012) found that Latino students from families earning between \$25,000 and \$75,000 were less likely to enroll in four-year institutions than their counterparts from families with \$75,001 and higher. However, those students from families with incomes below \$25,000 were not significantly different from those from families who made \$75,001 and above. In their discussion of this finding they speculate that this could be due to those in the lowest bracket having more access to financial aid, or other unmeasured characteristics, such as motivation. It is interesting that 27.1% of students with on-time transition to higher education in this dissertation came from the group with lowest family income, however in the multi-level model this same variable suggests that as family income increases so too does likelihood of an on-time transition to higher education. This is an illustration of the power and importance of a more comprehensive analysis. This demonstrates that it can be risky to simply conduct bivariate analyses, as this can lead to incorrect assumptions regarding the sample and relationships among variables. In the next section, the results of the multivariate, multi-level analyses will be discussed.

Discussion of Multi-level Analysis

The significant findings are summarized and followed by a discussion of the non-significant findings. In the final model for this weighted analytical sample, the two control variables, four predictors at level-1 and one predictor at level-2 achieved statistical significance. These findings demonstrate that there are significant factors in almost every system considered in this study, which help explain the probability of an on-time transition to higher education. The variables within the immigration system were the only ones that failed to attain statistical significance.

Significant Factors

Bronfenbrenner (1979) considers the individual as the center of the environment. In considering the individual student, two predictors were investigated, planning for college and student expectations. A student who planned to go to college and had gone to at least one source for information about college was 71% more likely to have an on-time transition to higher education than a student who did not plan to go to college, did not know if they would go to college or who indicated their expected level of education was high school graduation/GED or less. This significant finding indicates that students, who as sophomores planned to go to college and had sought out information regarding college, were much more likely to have an on-time transition to higher education than those without plans or who did not know. This indicates the importance of working with students early-on in high school to provide information about college, as well as creating a pro-college culture within the school.

As previous research has shown, students who had information about college and had someone to talk to were more likely to go to college than those students who did not

have access to such information (Gonzales, 2010; Kimura-Walsh et al., 2009). Among a population of students who may be the first in their families to go to college, providing the appropriate support is essential. The concept of imparting college knowledge lends itself to second-order social networks (Bronfenbrenner, 1979). Bronfenbrenner describes first-order social networks as those that a person is able to participate in and second-order social networks as those where a person gets information about an arena they are not able to participate in. For high school students, college information is obtained through second-order social networks. If a student does not have access to this network they may be less likely to have an on-time transition, or any transition, to higher education. Previous research also has found the presence of a mentor to be related to academic achievement (Kimura-Walsh et al., 2009; Gonzales, 2010; Castillo et al., 2010; Sanchez et al., 2008; Sanchez et al., 2011). Though this was not a concept considered in this study, it lends itself well to the second-order social networks, especially among students who may be the first in their families to go to college.

In the family system, parent expectations of the student's educational attainment was found to be a significant predictor of an on-time transition to higher education. Students who have parents who think they will go farther in school are more likely to have an on-time transition to higher education. This finding is consistent with past research which has also found that students have better academic achievement if their parents have higher expectations for their education (Hurtado-Ortiz & Guavain, 2008; Nunez & Kim, 2012; Kalogrides, 2009; Educational Policy Institute, 2005). Also significant within the family system, is family composition. Students living in a traditional family, meaning with both parents, were 62% more likely to have an on-time

transition to higher education. Of those who had an on-time transition to higher education, 64.3% lived in a traditional family. This is also consistent with past research, which indicates that living in two parent households leads to better academic outcomes (Perez et al., 2009). Students living in families with two parents likely have twice the resources and support, lending positively to second-order social networks. However, students who have non-traditional family arrangements may have other outlets for support and resources. These findings complement the goodness of fit model, described by Rothery, which looks at balancing resources and demands and focuses on emotional, information, and concrete instrumental support (Rothery, 2008). Support offered by the family can provide a counter-balance that may minimize difficult and confusing situations. Living in a two-parent home with parents that have higher educational expectations of their children may create an environment that provides the support and information a student needs to go to college on-time. Parents who have higher educational expectations for their children may be more connected and attentive to their child's schooling, which could benefit the child in many ways. Emphasizing communication, Trueba (1988) has noted the importance of the connection between school and family. By keeping open communication, students and parents can feel supported and schools and teachers can gain a better understanding of their needs and how to be most helpful.

The community system had one significant variable, participation in at least one extracurricular activity. Again, this study did not look at community as the physical space in which a student lives, but rather as the social space in which membership, influence, integration and fulfillment of needs, and shared emotional connections occur (McMillan

& Chavis, 1986). To better understand the community system, this study considered close Hispanic friends and participation in extracurricular activities. Perhaps participation in extracurricular activities was the only significant variable, as this may have provided the context for close friendships. The definition of extracurricular involvement employed in this study was broad, encompassing participation in intramural sports, inter-scholastic sports, school-sponsored activities and community service. While some studies distinguish between different types of participation, that level of focus was beyond the scope of this dissertation, which only considered whether or not a student participated in an activity. While the intensity of participation was varied, students who participated in at least one extracurricular activity were 72% more likely to have an on-time transition to higher education. Past research has found participation in extracurricular activities to be positively related to academic achievement (Perez et al., 2009; Gandara & Contreras, 2009; Vick & Packard, 2008). Participation in an activity provides many points of access to emotional connections and resources, again relating to second-order social networks. Students who have access to coaches, staff/faculty and other activity leaders may have more opportunities to seek out information regarding college and college applications.

Finally, when considering the school system, the variable that was significant in the final model was the percent of full-time Hispanic teachers at the school. When schools have a higher percentage of Hispanic teachers a student is 50% more likely to have an on-time transition to higher education. This is supported by Trueba's theory of cultural-discontinuity where he discusses that students have improved academic achievement if they are in schools with teachers who better understand their background. Though no conclusions can be drawn about the relationship between a teacher being

Hispanic and understanding the Latino students' cultural background, it could be speculated that the school has done a better job of creating a culture where Latino students feel supported and included. Students who feel they have someone who can understand their background both culturally and linguistically may feel more comfortable discussing their college options (Behnke et al., 2010). For students with concerns regarding immigration status, the presence of Hispanic teachers could provide a source of support from a person who may be more familiar with immigration issues. As Gonzales (2010) found, students often did not feel comfortable disclosing their documentation status. Again, looking at the student's and family's immigration status was beyond the scope of this research and dataset. Schools that have Latino students and especially those that have a large percentage of Latino students need to closely consider the cultural and linguistic composition of their faculty and staff to ensure that faculty/staff reflect the population of students being served. Both students and their families will benefit from such attention. If parents feel they can communicate with faculty/staff at the school and be understood they may be more likely to have the information they need to be more involved with their children and the school system.

While all of the variables in the final model are significant, the overall model demonstrates that the variability in an on-time transition to higher education is due mainly to within school differences and only a very small percentage of the variation is due to between school differences. Students within schools are impacted the same way; therefore, there is consistency in an on-time transition to higher education across schools.

Factors that were not found to be Significant

Both measures used for the immigration system, generational status and whether or not English was the student's native language, were not significant. Past studies have found generational status to be a significant predictor of academic achievement (Kalogrides, 2009; Fuligni, 1997; Oseguera & Malagon, 2011; Alon et al., 2010) and it was hypothesized that there would be a similar finding in this study, namely that those students who were third generation would be more likely to have an on-time transition to higher education. Perhaps the legal immigration status of the student and their family would be a more useful representation of the 'immigration system', in this study, but this information was not available in the ELS: 2002 dataset. A limitation of several studies of Latino student academic achievement is the lack of consideration of immigration status, however this is understandable, given that this is sensitive information and something many students are hesitant to share (Gonzales, 2010).

A student's expectation of their educational attainment was not found to be significant. Planning for college, operationalized as whether or not the student planned to go to college and had sought information was a better predictor of on on-time transition to higher education. This variable not only indicates an educational desire, but whether or not the student has acted on it. Therefore, a student's expectation for their educational attainment may have been captured by this 'planning for college' variable.

Among the family system, two of the five predictor variables were found to be significant. The three non-significant variables were: How often the parent spoke their native language with the student, parent involvement with homework, and parent's highest level of education. Among these three variables, it is most surprising that parental

involvement with homework was not significant, as past research has found this to be an important predictor of achievement (Plunkett & Bamaca-Gomez, 2003; Eamon, 2005; DiPaula, 2008; Kuperminc et al., 2008; Hurtado-Ortiz & Gauvain, 2007). The bivariate analysis results show that parents are more involved than not with the student's homework. However, in considering why this variable did not reach statistical significance, a possible explanation is that parental involvement ought to be examined as an interaction term in conjunction with parent's level of education. It is also possible that this variable would be significant when a different measure of academic achievement, such as GPA or test score, is used. However, when defining academic achievement as the on-time transition to higher education, parental involvement with homework may not be an important predictor. Perhaps a measure of parent's college knowledge and involvement with the college application process may have been better predictors with this definition of academic achievement. Similarly, parents' highest level of education did not attain statistical significance. It seems likely that parents who have completed college or obtained an advanced degree would be more likely to have children that have an on-time transition to higher education. However, it could be possible that while some families had college knowledge, they had not yet discussed college with their students.

The variables selected for this study are all base year variables, with the exception of the percent of Hispanic teachers at the school level. This means that the on-time transition to higher education for this analytic sample is predicted by information gathered in 2002 when the students were sophomores. Therefore, this study is looking at how information from mid-way through high school predicts an outcome approximately two years later. It must be considered that much could change in one to two years with

regard to information imparted to a student about college (from family, school etc.), and information sought out by the students themselves.

Parents were questioned about how often they spoke their native language with their child. The inclusion of this variable was driven by Henry Trueba's theory of cultural-discontinuity. In a review of Trueba's writings, Menchaca, identifies the importance of looking at language, parent involvement and parent language proficiency when trying to understand a student's academic performance (Menchaca, 1990). Similarly, Trueba (1988) discusses the necessity of joining home and school culture. The inclusion of the variable regarding language use with the child was intended to look at the relationship between how often the native language is used and academic achievement. Though this does not allow for examining the connections with schools, it does allow for the better understanding of how language and culture may operate within a student's family. This study's findings regarding parent level of education, how often the native language is spoken with the child and parental involvement with homework all contradict the findings from Plunkett and Bamaca-Gomez (2003) who found these factors to be significantly related to the student's academic motivation and educational aspirations. However, the dependent variables are different which makes comparisons difficult.

Building on McMillan and Chavis' relational definition of community (1986), this study included two community system variables: participation in extracurricular activities and close Hispanic friends. The number of close Hispanic friends a student has was not found to be significant. Past research has shown that the type of peers can impact academic achievement (Perez et al., 2009; Ream & Rumberger, 2008; Gibson et al., 2004; Castillo et al., 2010; Oseguera & Malagon, 2011; Gandara & Contreras, 2009).

Most students in this analytic sample (45.4%) indicated they had three close Hispanic friends. This group was nearly split in half between students who had an on-time transition to higher education and those who had a delayed or no transition to higher education (43.4% and 47.8% respectively). This variable failed to be statistically significant indicating that this is not a good measure of an on-time transition to higher education.

Finally, when considering the school system, the percent of 10th grade students enrolled in college prep programming at the school and the average English teacher's expectations of students' educational attainment were not found to be significant. At the school level, this study examined school characteristics, school programming and teacher expectations. Academic achievement research focused on Latino students has considered the impact of school factors and school structure on transition to higher education. Gonzales (2010) and Kimura-Walsh et al. (2009) studied the tracking of students within schools and which students are given the opportunity to access information about college. Similarly, the variables selected for the level-2 focus of this dissertation aimed to better understand access and resources. Teacher expectations of the student's educational outcomes was a student level variable that was aggregated to the school level with the idea that the average level of teacher expectations for Latino students at the school would be related to an overall expectation of student's transition to higher education. If students are in a school where overall, teachers believe Latino students will go to college, it follows that these students may have better outcomes. As Gonzales (2010) describes, at certain schools teachers did not believe some students were doing well enough to be put in college prep programming and have access to college information. Being in an

environment where teachers did not have confidence in student ability did affect students in his sample and they reported feeling that they were not granted access to the information they needed to learn about the college process. In this study it was English teacher's expectations that were selected rather than math teacher's expectations, as theoretically, it is more fitting to consider this subject area among a group of students for whom English may not be the native language.

Also of interest was the percent of 10th grade students enrolled in college prep programming at the each school. This variable was included as an indicator of the college-going culture of the school. If students are in an environment where college-going is the norm and are granted access to college prep programming, they may be more likely to have an on-time transition to higher education. Though this variable deviates slightly from Trueba's theoretical construction of culture, it is important to consider how the college-going culture is viewed within the school. Though a school may have a college-going culture, it is beyond the scope of this study to understand if the college programming is culturally appropriate. This variable failed to achieve statistical significance in this study, which is interesting since past research has shown that students desire more access to college information (Castillo et al.; 2010), and students who have more college information have better achievement (Gonzales, 2010; Kimura-Walsh et al., 2009).

The results of this study demonstrate the importance of considering multiple areas of a student's life to best understand why it is that some students have an on-time transition to higher education, while others have a delayed or no transition to higher education. Not only are students affected by the systems around them, they too affect

those systems. Neglecting to consider one system may result in omissions of factors that may be important in explaining differences among students. This study has also shown that a wide array of concepts within and across different systems ought to be included. In the final model, it was seen that after controlling for the differences among the students, there were no significant differences between schools with regard to an on-time transition to higher education. Therefore, future research should further explore the student-level factors that best explain an on-time transition to higher education for Latino students, as this information would make an important contribution to educational policy.

Contribution to Theory

Ecological systems and cultural-discontinuity theories informed this study which looked at the factors that impact the transition to higher education among Latino students. The findings from this investigation enhance the understanding and advance both theories. The results of the analysis demonstrate the importance of considering multiple systems that influence a student's life and indicate that an ecological systems framework should be retained when studying students within a school or larger context. Bronfenbrenner (1979) describes the ecological framework as a nested structure, a theoretical premise that works well with datasets such as the ELS: 2002, which is comprehensive in the number and nature of the variables that are organized in a nested structure. Similarly, the selection of HLM is ideal to appropriately treat the nested structure of the data and theoretical constructs.

Trueba has written extensively on culture and minority education and some of the literature included dates back over twenty years. In 1989, Trueba wrote that teachers should to be prepared to meet the diverse cultural and linguistic needs of students. In

1999, he wrote that the racial makeup of schools was changing and Latinos were quickly becoming the majority. It has been twenty years since he introduced these ideas and in 2011, the Initiative on Educational Excellence for Hispanic Students echoed these same ideas and recommendations. With the large and growing U.S. Latino population, Trueba's clear vision is even more relevant now and urgent in achieving these goals. Trueba looked closely at the school culture and preparedness to meet the needs of students and the results of this dissertation illuminate the clear need for having culturally appropriate resources for Latino students. The findings from this study indicate the importance that schools work with their teachers to connect school life with home life, and evaluate the cultural appropriateness of their college services to meet the diverse needs of Latino students, regardless of immigration status. The results confirm Trueba's theory and provide insight for expanding his work to consider culturally appropriate resources regarding information needed to support Latino student's transition to higher education.

Implications for Policy and Practice

The results of this dissertation have several implications for policy and practice. This research comes from the field of social work and is informed by educational research. As professions, the practice and policy relevance of research is extremely important for both social work and education. With respect to social work practice, the results of this dissertation indicate that early planning for college leads to greater likelihood of an on-time transition to higher education. Therefore, social workers and school counselors need to work with students and families early on in their high school years to initiate discussion and understanding about navigating the college process and helping students

find the support they need. This is also an educational policy issue, as the study findings indicate that offering college prep programming and requiring student's participation in such programming would be beneficial. As recommended by Contreras (2011) students need academic support throughout all of their schooling, not just at certain points. Given the importance of parent expectations of their students' educational attainment, it is essential that parents also have support in the college process. High schools and colleges should reach out to families that have little or no experience with higher education and provide information and support to parents. Though this study did not directly examine parental involvement with the college planning and application process, the findings suggest the importance of schools as a forum where parents can come together, help one another, and receive support from the high school. Ideally, schools should work closely with parents to provide an array of options that address diverse higher education information and resource needs, while considering the different parent occupations and schedules.

Given that participation in extracurricular activities greatly increases the likelihood of an on-time transition to higher education, schools ought to encourage more student participation, as well increase the integration of extracurricular activities into the school curriculum. Past research has shown that for Latino students, options to participate in extracurricular activities may be limited due to access (Gandara & Contreras, 2009). Gandara and Contreras indicate that access to such activities is increased for students if they are incorporated into the regular school day. School systems should assess if students are benefiting from participation and consider their role in promoting involvement and expanding access. School systems should also consider the

opportunities that extracurricular activities offer to develop significant relationships, such as mentoring and social support networks that enhance access to information and resources.

Given the significance of having a higher percentage of full-time Hispanic teachers, schools need to consider the cultural and linguistic competencies of their faculty and staff. Schools should also consider this in their recruitment targets and in teacher preparation programs. Additionally, schools can pursue recruitment, staffing, professional development, and programmatic initiatives, such as those proposed by the White House Initiative on Educational Excellence for Hispanic Students, which include increasing access to culturally and linguistically appropriate educational services; employing bilingual teachers and administrators with expertise in working with Latino communities; promoting parent involvement; and promoting new approaches to teaching and learning, including teacher preparation (US Department of Education, 2011b; US Department of Education, 2011c). Such objectives and initiatives should be considered and included in school-based efforts and strategic plans to improve educational outcomes and promote on-time transitions to higher education. The Latino Policy Forum (n.d.) also urges that school systems expand early education opportunities, as they conclude that a lack of early education has led to the educational disparities between Latino students and students from other ethnic/racial groups. Such efforts would go far in responding to the urgent call to address the Latino education crisis (Gandara & Contreras, 2009; US Department of Education, 2011b; US Department of Education, 2011c).

Social workers practicing in schools and community organizations would benefit from the knowledge of these findings to enhance their work with Latino families. As the

results of this study show, no specific system is more important than another in terms of the student and their surrounding environments. Social workers have a unique role in school and community settings to bridge across systems in ways that enhance education outcomes for Latino youth. As discussed in chapter one, the educational disparities among groups of students is a public issue. Given the number of people affected, one can conclude that this is not a private trouble, but rather a social issue requiring policy and practice attention (Stafford & Warr, 1985; Manis, 1974).

The Development, Relief and Education for Alien Minors (DREAM) Act is a piece of legislation that would provide a path to legalization for undocumented youth in the United States who attend college or join the military (Batalova & McHugh, 2010). This legislation originally introduced in 2001 has gained support and momentum over the eleven years it has been proposed, but it has never gained enough congressional support to pass. The DREAM Act came to a vote most recently in December 2010 and passed in the House of Representatives, but failed in the Senate (Mascaro & Oliphant, 2010). However, individual states have begun to pursue state versions of the DREAM Act. This legislation does not offer legal immigration relief, but rather offers a private scholarship fund for undocumented students and provides training for high school counselors and college personnel working with undocumented students (Illinois Coalition for Immigrant and Refugee Rights [ICIRR], 2011). On June 15, 2012, President Obama passed the Deferred Action for Childhood Arrivals (DACA) memorandum, which allows undocumented youth temporary relief from immigration enforcement and allows them to apply for employment authorization (ICIRR, 2013b). In November 2012, Maryland passed a state DREAM Act, which Shebaya from the American Civil Liberties Union and

Lin from the Washington Legislative Office were hopeful would urge federal action on immigration reform (Shebaya & Lin, 2012). The beginning of 2013 has marked a renewed energy by the Obama administration, which on January 28, 2013 announced a plan for addressing comprehensive immigration reform (ICIRR, 2013a).

While a discussion of comprehensive immigration reform is a step in the right direction, as 2013 moves forward undocumented youth will continue to wait and some will age-out of their opportunity to legalize due to the provisions of the DREAM Act legislation. The DREAM Act failure will only prolong the difficulties many undocumented immigrant youth face in making the transition to higher education. Immigration status is not discussed in every study, but it is a very important concept to consider when conducting a study and interpreting the findings. Considering that not all immigrant students know they have the option to go to college or may not be able to attend due to documentation and related financial reasons, researchers must discuss this facet when a measure of academic achievement deals with college matriculation. More research in the area of Latino student academic achievement may aid in helping policy makers understand the importance of passing this piece of legislation. As comprehensive immigration reform moves forward, social workers, educators, and policy makers alike need to be ready to push this reform, implement new policies, and ensure students and families know their rights and have access to support.

Limitations

There are several limitations to this study. The use of secondary data does not allow for the collection of primary data that can most precisely measure what is being studied (Boslaugh, 2007). By definition, secondary data analysis applies data collected for one

purpose to a new research question. This may yield information that is imprecise or incomplete. Secondary data analysis does not allow for further investigation of a theme, as is possible with primary data collection. The information provided in the dataset used for this study, while allowing for a broad, multisystem view, did not allow for an in-depth exploration of the concepts of interest in the study. The data constrained how these concepts could be operationalized in this study. Applying the selected framework to data collected by another source required working within the parameters of the available information and variables were selected that best matched the concepts of interest. For example, the immigration system could not be examined in a more meaningful way, such as considering legal immigration status, given that this information was not collected in the original study. While this rich data set afforded a very comprehensive multi-level, multivariate analysis, it did not allow for depth in consideration of the various factors and systems. In short, it was a trade between comprehensiveness and depth. Such a study is very beneficial in highlighting future areas for greater elaboration and examination across interacting systems.

The information collected dates back to 2002, which is now nearly eleven years old. As described in chapter one, there have been many national and local immigration policy initiatives or attempts over the last eleven years, which could make the sample of Latino students in this study different from the Latino students of 2013. Though the results are not meant to be generalized to anyone other than the sophomore cohort of 2002, they do identify what areas and concepts are important to consider when looking at the transition to higher education. Given the limitations, secondary data analysis with the

ELS: 2002 dataset was the most appropriate choice as the amount and breadth of information collected would be difficult to attain in any other way.

A major limitation to this study was missing data. The sample, using the base-year race variable, resulted in 2,220 Latino students. After all students and schools with missing data, and schools with less than three observations were removed, the resulting sample was 630 students and 100 schools. Given the inclusion of several variables at level-1 and level-2, the analysis would have benefited from a much larger sample size. However, imputation was not utilized and will be a task for future research.

Future Research

There are four main areas for future research utilizing the ELS: 2002 dataset. First, it would be of interest to replicate this study after imputing missing data and compare results given the different sample sizes. Second, it would be fruitful to consider moderating variables and include interaction terms in the HGLM analysis. For example, parental involvement with homework was not found to be significant; however, parent's level of education could be a moderating variable, in which case an interaction between these two variables ought to be created and explored. Third, it is of interest to take a look at the first follow-up variables from 2004 and look at any changes over time and consider how they may influence an on-time transition to higher education. For example, a student's planning for college may have changed from 2002 to 2004, and this change over time may play an important role in their transition to higher education. Finally, the fourth data collection for the ELS: 2002 took place in 2012 and was completed in early 2013. This data will be available within the year and will allow researchers to examine

college completion among the 2002 cohort and which students have gone on to complete or pursue an advanced degree.

In addition to research using the ELS: 2002 dataset, future research should take a qualitative or mixed-methods approach, that incorporates qualitative components, as very few studies reviewed for this dissertation were qualitative in nature. Interviews can provide nuanced information, which cannot be gathered or understood in the same manner with a quantitative research design. Also, given the enactment of DACA in 2012 (ICIRR, 2013b) and the recent discussions around comprehensive immigration reform (ICIRR, 2013a), future research ought to be comparative in nature looking at educational outcomes, specifically the transition to higher education before, during and after policy change.

Conclusions

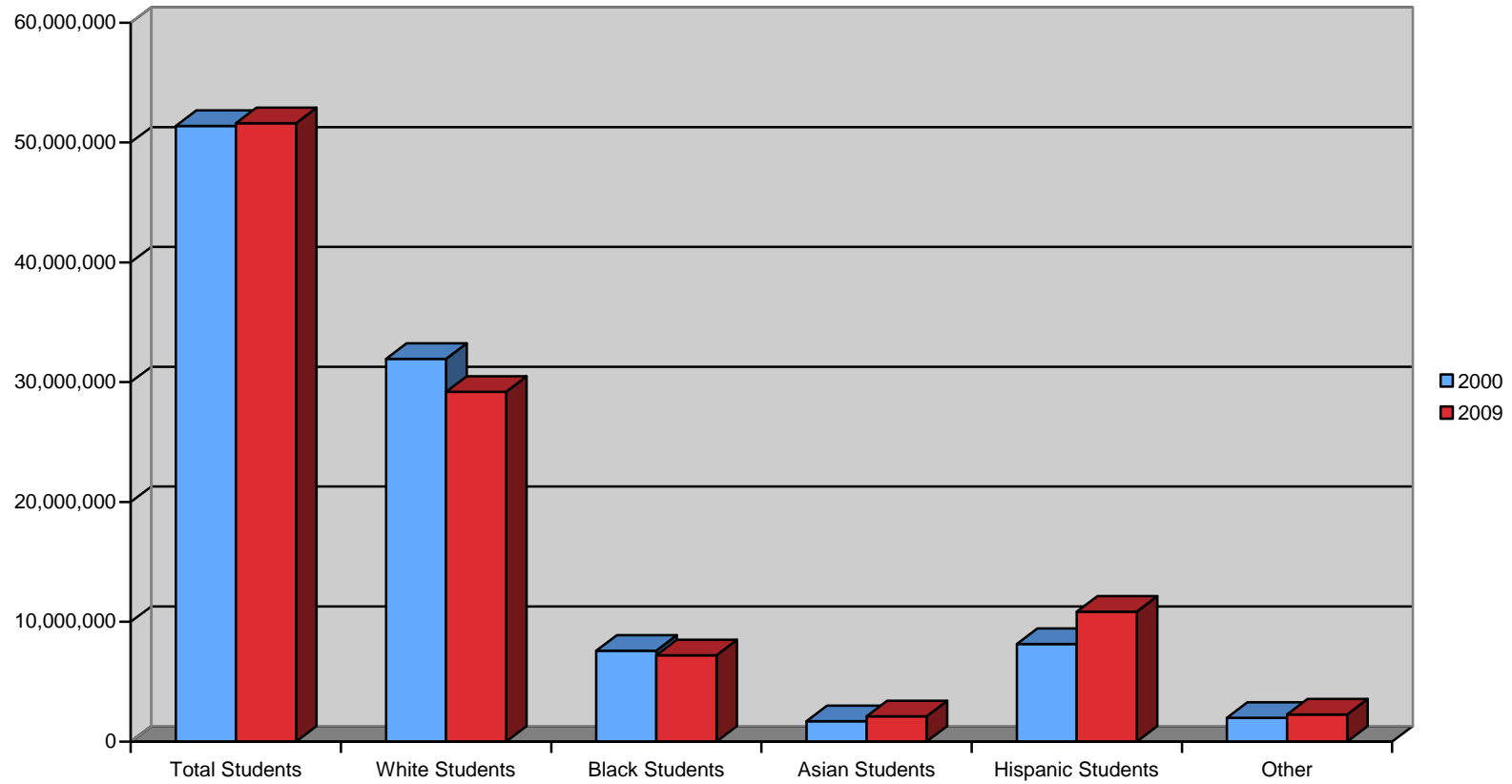
This dissertation employed a multi-level analysis with a binary outcome variable: on-time transition to higher education as compared to a delayed or no transition to higher education. Past research on the academic achievement of Latino students has primarily utilized quantitative research methods; however, few studies have used multi-level modeling. Given the nested structure of the dataset used, and others like it, where students are found within different schools, multi-level methods that account for this type of structure are ideal. The results of this study demonstrate the importance of considering culture as well as the multiple systems the make up a student's environment. Significant predictors were found for the individual student, the family system, community system and school system. Implications for policy and practice were discussed and future directions for research with Latino students were included. This study has shed light on

the importance of students' planning for college and seeking out information regarding college, participation in extracurricular activities, family structure, parental expectations and the percent of Hispanic teachers at the school. With more Latino students transitioning to higher education than ever before, it is extremely important to understand how this transition occurs and utilize that information to promote policy and practices with Latino students and their families that encourage and facilitate this transition.

APPENDIX A

RACIAL BREAKDOWN OF U.S. STUDENTS ENROLLED IN SCHOOL (K-12)

Figure 1. Racial Breakdown of U.S. Students Enrolled in School (K-12)

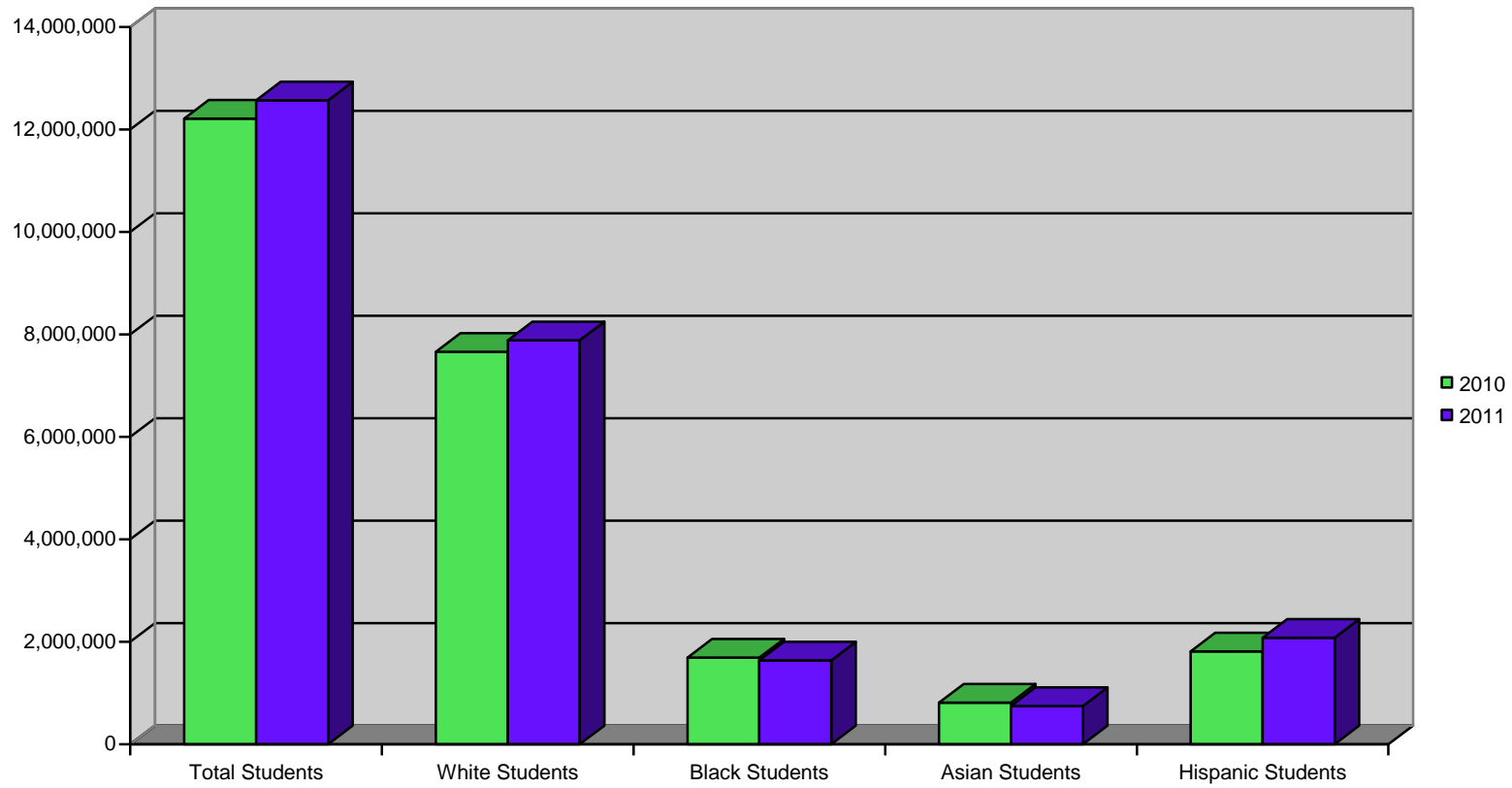


Note. Information comes from Pew Hispanic Center (2011).

APPENDIX B

RACIAL BREAKDOWN OF U.S. STUDENTS, 18-24, ENROLLED IN COLLEGE

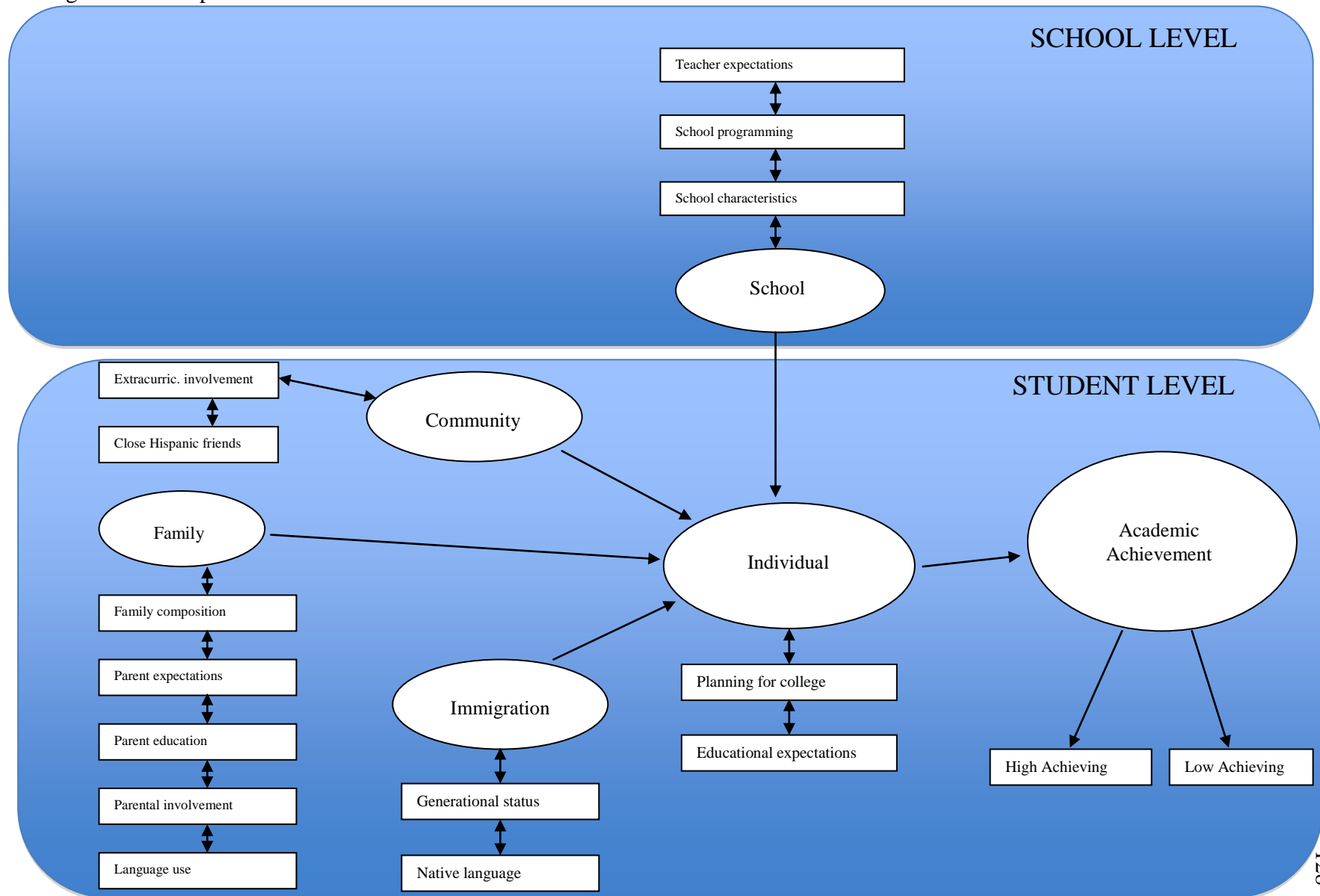
Figure 2. Racial Breakdown of U.S. Students, 18-24, Enrolled In College



Note. Information comes from Pew Hispanic Center (2012).

APPENDIX C
CONCEPTUAL MODEL

Figure 3. Conceptual Model



APPENDIX D
RELATED STUDIES

Table 14. Related Studies

Study Name, Author(s) and year	Outcome variable	Methodology used, data source and sample size/population	Variables of interest	Results
Building a multicontextual model of Latino college enrollment: Student, school and state-level effects Nuñez, A., & Kim, D. (2012).	Enrollment in 4-year college vs. students who never enrolled in college within 2 years of high school graduation	HLM with a 3-level model (used HGLM because binary outcome variable) ELS: 2002 <i>N</i> =2,240 Latino students	Student level, school level and state level factors	Family context variables were significant predictors of college enrollment. At the school level percentage of free lunch and absenteeism were significant predictors and at the state level living in a state with a higher proportion of teachers with graduate level degrees was significant.
Generational status and academic achievement among Latino high school students: Evaluating the segmented assimilation theory Kalogrides, D. (2009).	Math and reading scores, 10 th grade	OLS regression ELS: 2002 <i>N</i> =2,060 Latino students	Generational status, bilingualism, cultural connections, parental expectations, and social capital	Achievement increases across generations; no significant differences in achievement when considering bilingualism; parental expectations are significantly and positively related to achievement for both students in low-income and advantaged schools.

Table 14. Related Studies (continued)

Study Name, Author(s) and year	Outcome variable	Methodology used, data source and sample size/population	Variables of interest	Results
The relationship between parental involvement as social capital and college enrollment: An examination of racial/ethnic group differences Perna, L.W, & Titus, M.A. (2005).	Enrollment in two- year college, four- year college and no college enrollment	HLM with a 2-level model. Categorical outcome variable NELS: 88 <i>N</i> =9,810 Latino, African American, and Asian students with White students used as reference group	Race/ethnicity, gender, economic capital (income and perceived importance of cost/aid), cultural capital (parent's education and educational expectations, language and participation), human capital (academic achievement and preparation) and social capital (involvement)	Parental involvement is related to higher odds of attending 2 or 4-year college, with the exception of parent-contact with school related to behavior issues. Friend's choice of college is related to likelihood of student's enrollment in 2 and 4-year schools. The likelihood of enrollment in 2 or 4-year schools related to the volume of resources accessed at school. The likelihood of enrollment in a 2-year school is positively related to economic and cultural capital.

Table 14. Related Studies (continued)

Study Name, Author(s) and year	Outcome variable	Methodology used, data source and sample size/population	Variables of interest	Results
When can schools affect dropout behavior? A longitudinal multilevel analysis. Goldschmidt, P., & Wang, J. (1999).	Dropout vs. no dropout	HGLM with two-level model NELS: 88 $N \approx 25,000$ Not Latino specific	Student characteristics: early dropout, work, misbehavior, math and reading achievement and remedial English; Family characteristics: parent education, SES, checking homework and family composition. At level-2: school sector, community, policies and practice, and school composition	Being held back is strongest predictor of dropout and misbehavior is second. A student who works more than 20 hours a week has increased odds of dropping out. Students who have a single parent, parent with lower level of education and parent who checks homework rarely have increased odds of dropout. Attending a private school decreased odds of dropping out. Percentage of students held back and that misbehave are related to dropout.

Table 14. Related Studies (continued)

Study Name, Author(s) and year	Outcome variable	Methodology used, data source and sample size/population	Variables of interest	Results
Supportive adult relationships and the academic engagement of Latin American immigrant youth Green, Rhodes, Hirsch, Suarez-Orozco and Camic (2008).	Academic Engagement	HLM: two-level model Longitudinal Immigration Student Adaptation (LISA) study N=139 Latino sample (Mexico and Central America) from San Francisco	Initial engagement, gender and perceived support	Boys reported higher levels of engagement to begin with, but girls had more positive changes over time. Girls who perceived more support had higher initial engagement, and for boys, engagement increased over time. Changes in perceived support over time also predicted levels of engagement.

Table 14. Related Studies (continued)

Study Name, Author(s) and year	Outcome variable	Methodology used, data source and sample size/population	Variables of interest	Results
For-profit colleges and universities and the Latina/o students who enroll in them. Oseguera, L., & Malagon, M.C. (2011).	Enrollment in 2-year for-profit colleges and universities vs. 2-year not-for-profit colleges and universities and enrollment in 4-year for-profit colleges and universities vs. 4-year not-for-profit colleges and universities.	Logistic regression ELS: 2002 <i>N</i> =2,110 Latino students	Language ability, generational status, value of education, parent's education level, parental involvement, school expectations, peers, opportunity for college information, academic preparation, community context variables, higher education context and understanding of federal policies regarding aid and economic context	Students more likely to enroll in 2-year not-for-profit if English was dominant language and were 3 rd generation. Parental education, involvement and talking to friends and family about college decreased the odds of enrolling in a for-profit institution (among several other variables). Discussing college with a counselor increased the odds of enrollment in a for-profit institution. In terms of 4-year institutions, entering US schools in middle school or later increased odds of enrollment at for-profit, increases in students' educational expectations decrease the odds of for-profit enrollment. Findings for 4-year college information are the same as 2-year findings (as are several other variables).

Table 14. Related Studies (continued)

Study Name, Author(s) and year	Outcome variable	Methodology used, data source and sample size/population	Variables of interest	Results
Latino/a postsecondary Pathways: Investigating gender, aspirations and expectations, and racial/ethnic differences in college enrollment patterns. Ovink, S.M. (2011). (Doctoral dissertation).		Mixed Methods: Qualitative interviews with Mexican-origin high school students-3 time points: fall semester of senior year, summer after high school graduation and 6 months after graduation. Logistic regression using sample of Latino and White students from the ELS: 2002 dataset. N=1,530 Mexican students and N=8,890 White students	Educational aspirations, expectations, individual and family characteristics.	Qualitative interviews demonstrated that all students aspired to some postsecondary education or training, most planned to live at home. Most students lacked knowledge about cost of college/financial aid/college process. At first interview college aspirations almost always matched expectations. After third-wave of interviews there was a disconnect between aspirations and expectations. Family and financial reasons played a role. Girls were more likely than boys to attend a 4-year college. More than half of the girls planned to attend a BA granting institution and more than

half of the boys planned to attend a 2-year college. Parent desires indicated that girls would more successfully transition to college.

Quantitative analysis:
Importance of a steady job was associated with higher odds of college enrollment for Mexican students. Parent and self-expectations for educational attainment did not differ for Mexican and White students. Odds of college enrollment for Mexican students were higher for females than males.

APPENDIX E

EXPLANATION OF VARIABLES

Table 15. Explanation of Variables

System	Underlying Concept	Survey & Year Measured	Type of variable & Level of Analysis
INDIVIDUAL STUDENT			
1) Student's educational aspirations (BYSTEXP)	Educational Expectations	SQ: 2002	Categorical: student
2) Whether or not students plans to go to college and has sought out information (BYS59K)	Planning for college	SQ: 2002	Categorical: student
FAMILY SYSTEM			
1) Family composition (BYFCOMP)	Family composition	PQ: 2002	Categorical: student
2) Highest level of education of parents living in home (BYPARED)	Parent Education	PQ: 2002	Categorical: student
3) Parent involvement with homework (BYP55A + BYP57B)	Parent involvement	PQ: 2002	Continuous: student
4) Parent expectations of student's educational attainment (BYPARASP)	Parent expectations	PQ: 2002	Categorical: student
5) How often parent uses native language with children (BYP30B)	Language use	PQ: 2002	Categorical: student
IMMIGRATION SYSTEM			
1) Student born in US/Puerto Rico/Another country (BYP23); Biological mother born in US/Puerto Rico/Another country (BYP17); Biological father born in US/Puerto Rico/Another country (BYP20)	Generational Status	PQ: 2002	Categorical: student
2) Student native language (BYSTLNG)	Native Language	SQ: 2002	Categorical: student

Note. SQ=student questionnaire, PQ=parent questionnaire, TQ=teacher questionnaire, AQ=administrator questionnaire.

Table 15. Explanation of Variables (continued)

System	Underlying Concept	Survey & Year Measured	Type of variable & Level of Analysis
COMMUNITY SYSTEM			
1) Student involvement in extra-curricular activities: sports, school sponsored, and community service (BYS39A-BYS39H + BYS41A-BYS41I + BYBASEBL+ BYSOFTBL+ BYBASKBL+ BYFOOTBL + BYSOCCER + BYTEAMSP + BYSOLOSP+ BYCHRDRL+ BYS71E)	Extracurricular Involvement	SQ: 2002	Categorical: student
2) Race of close Hispanic friends at school (BYSF1R_R + BYSF2R_R + BYSF3R_R)	Close Hispanic Friends	SQ: 2002	Categorical: student
SCHOOL SYSTEM			
1) % of full-time Hispanic staff at school (F1A32A)	School characteristics	AQ: 2004	String: school
2) % of 10 th grade students enrolled in college prep programming (BYA14B)	School programming	AQ: 2002	String: school
3) How far English teacher expects student to go in school (BYTE20)	Teacher expectations	TQ: 2002	Categorical: school

Note. SQ=student questionnaire, PQ=parent questionnaire, TQ=teacher questionnaire, AQ=administrator questionnaire.

APPENDIX F

LIST OF ALL VARIABLES INCLUDED IN THE HGLM ANALYSIS

Table 16. List of all Variables Included in the HGLM Analysis

Variable	Name or Derived Name	Coding
DEPENDENT VARIABLE		
Transition to higher education	COLLEGE	1: On-time transition to higher education 0: Delayed or no transition to higher education
LEVEL-1 (STUDENT LEVEL) VARIABLES		
Control Variables		
Gender	BYSEX	1=Female 0=Male
Family Income	BYINCOME	1=none; 2=\$1,000 or less; 3=\$1,001-\$5,000; 4=\$5,001-\$10,000; 5=\$10,001-\$15,000; 6=\$15,001-\$20,000; 7=\$20,001-\$25,000; 8=\$25,001-\$35,000; 9=\$35,001-\$50,000; 10=\$50,001-\$75,000; 11=\$75,001-\$100,000; 12=\$100,001-\$200,000; 13=\$200,001+
Predictor Variables		
Student Expectations	FinalSTEXP	1=Don't know 2=Less than high school graduation 3=High school graduation or GED only 4=Attend or complete 2-year college/school 5=Attend college, 4-year degree incomplete 6=Graduate from college 7=Obtain Master's degree or equivalent 8=Obtain PhD, MD, or other advanced degree

Table 16. List of all Variables Included in the HGLM Analysis (continued)

Variable	Name or Derived Name	Coding
LEVEL-1 (STUDENT LEVEL) VARIABLES		
Predictor Variables (continued)		
Planning for college	Planningforcollege	<p>1= those who don't know or don't plan to go to college 0= those who plan to go to college, but have not taken any action & those who plan to go to college and have taken action *REFERENCE GROUP</p> <p>1= those who plan to go to college, but have not taken any action 0= those who plan to go to college and have taken action & those who don't know or don't plan to go to college</p> <p>1= those who plan to go to college and have taken action 0= those who don't know or don't plan to go to college & those who plan to go to college, but have not taken any action</p>
Parent education	BYPARED	<p>1=Did not finish high school 2=Graduated from high school or GED 3=Attended 2-year school, no degree 4=Graduated from 2-year school 5=Attended college, no 4-year degree 6=Graduated from college 7=Completed Master's degree or equivalent 8=Completed PhD, MD, other advanced degree</p>

Table 16. List of all Variables Included in the HGLM Analysis (continued)

Variable	Name or Derived Name	Coding
LEVEL-1 (STUDENT LEVEL) VARIABLES		
Predictor Variables (continued)		
Parent expectations	BYPARASP	1=less than high school graduation 2=high school graduation or GED only 3=attend or complete 2-year college or school 4=attend college, 4-year degree incomplete 5=graduate from college 6=obtain master's degree or equivalent 7=obtain PhD, MD, or other advanced degree
Native language use	natlanguse	0=English is native language 1=Never 2=Sometimes 3=About half of the time 4=Always or most of the time
Family Composition	FinalFamComp	1=traditional family 0=non-traditional family
Parent Involvement	HomeworkInvolvement	Scale from 0-6
Generational Status	GenerationalStatus	1=first generation 2= second generation 3=third generation
Native Language	BYSTLANG	1= English 0=Not English
Close Hispanic friends	TotalHispanicFriends	Scale from 0-3
Extracurricular involvement	Extracurricularparticipation	1= participation in extra-curricular activities 0= no participation

Table 16. List of all Variables Included in the HGLM Analysis (continued)

Variable	Name or Derived Name	Coding
LEVEL-2 (SCHOOL LEVEL) VARIABLES		
% Hispanic teachers	F1A32A ^a	Percentage
% 10th grade students enrolled in college prep programming	BYA14B	Percentage
Teacher expectations	FinalETEACHEXP	1=Don't know 2=Less than high school graduation 3=High school graduation or GED only 4=Attend or complete 2-year college/school 5=Attend college, 4-year degree incomplete 6=Graduate from college 7=Obtain Master's degree or equivalent 8=Obtain PhD, MD, or other advanced degree

^aF1, the prefix of the variable name indicates it is a "first follow-up" variable, which comes from the second data collection period in 2004

APPENDIX G

VARIABLE NAMES AND CODING STRATEGY

Table 17. Variable Names and Coding Strategy

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Dependent Variable				
Transition to Higher Education	F2RTYPE	This variable classifies respondents on the basis of their postsecondary participation and the timing of their postsecondary enrollment	1=Standard enrollee 2=Delayer (delayed entry/enrolled in '06) 3=Leaver (immediate entry/no '06 enrollment) 4=Delayer-Leaver (delay/no '06 enrollment) 5=Non-enrollee 6=High school student -4=Non-respondent -8=Survey component legitimate skip/NA	COLLEGE 1: On-time transition to higher education 0: Delayed or no transition to higher education
Control Variables				
Gender	BYSEX	Sex-composite	1=male 2=female	BYSEX 1=female 0-male

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Control Variables (continued)				
Family Income	BYINCOME	Total family income from all sources 2001-composite	1=none 2=\$1,000 or less 3=\$1,001-\$5,000 4=\$5,001-\$10,000 5=\$10,001-\$15,000 6=\$15,001-\$20,000 7=\$20,001-\$25,000 8=\$25,001-\$35,000 9=\$35,001-\$50,000 10=\$50,001-\$75,000 11-\$75,001-\$100,000 12=\$100,001-\$200,000 13=\$200,001 or more	BYINCOME 1=none 2=\$1,000 or less 3=\$1,001-\$5,000 4=\$5,001-\$10,000 5=\$10,001-\$15,000 6=\$15,001-\$20,000 7=\$20,001-\$25,000 8=\$25,001-\$35,000 9=\$35,001-\$50,000 10=\$50,001-\$75,000 11-\$75,001-\$100,000 12=\$100,001-\$200,000 13=\$200,001 or more

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables				
Student Expectations	BYSTEXP	How far in school student thinks they will get-composite	1=Less than high school graduation 2=High school graduation or GED only 3=Attend or complete 2-year college/school 4=Attend college, 4-year degree incomplete 5=Graduate from college 6=Obtain Master's degree or equivalent 7=Obtain PhD, MD, or other advanced degree -1=Don't know -4=Non-respondent -8=Survey component legitimate skip/NA	FinalSTEXP 1=Don't know 2=Less than high school graduation 3=High school graduation or GED only 4=Attend or complete 2-year college/school 5=Attend college, 4-year degree incomplete 6=Graduate from college 7=Obtain Master's degree or equivalent 8=Obtain PhD, MD, or other advanced degree

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Planning for college	BYS59K	Has gone to counselor/teacher coach/parent/friend/sibling/ other relative/college publications or websites/college representatives/ college search guides for college entrance information BYS59K: Did not go to any of these sources	0=Went to sources 1=Did not go to sources -3=Item legitimate skip/NA -4=Non-respondent -7=Partial interview-breakoff -8=Survey component legitimate skip/NA -9=Missing	Planningforcollege 1= those who don't know or don't plan to go to college 0= those who plan to go to college, but have not taken any action & those who plan to go to college and have taken action*REFERENCE GROUP 1= those who plan to go to college, but have not taken any action 0= those who plan to go to college and have taken action & those who don't know or don't plan to go to college 1= those who plan to go to college and have taken action 0= those who don't know or don't plan to go to college & those who plan to go to college, but have not taken any action

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Parent education	BYPARED	Parents' highest level of education	1=Did not finish high school 2=Graduated from high school or GED 3=Attended 2-year school, no degree 4=Graduated from 2-year school 5=Attended college, no 4-year degree 6=Graduated from college 7=Completed Master's degree or equivalent 8=Completed PhD, MD, other advanced degree	BYPARED 1=Did not finish high school 2=Graduated from high school or GED 3=Attended 2-year school, no degree 4=Graduated from 2-year school 5=Attended college, no 4-year degree 6=Graduated from college 7=Completed Master's degree or equivalent 8=Completed PhD, MD, other advanced degree

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Parent expectations	BYPARASP	How far in school parent wants 10th grader to go-composite	1=less than high school graduation 2=high school graduation or GED only 3=attend or complete 2-year college or school 4=attend college, 4-year degree incomplete 5=graduate from college 6=obtain master's degree or equivalent 7=obtain PhD, MD, or other advanced degree	BYPARASP 1=less than high school graduation 2=high school graduation or GED only 3=attend or complete 2-year college or school 4=attend college, 4-year degree incomplete 5=graduate from college 6=obtain master's degree or equivalent 7=obtain PhD, MD, or other advanced degree

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Native language use	BYP30B	How often parent speaks native language with children	1=Never 2=Sometimes 3=About half of the time 4=Always or most of the time -1=Don't know -2=Refused -3=Item legitimate skip/NA -4=Non-respondent -6=Multiple response -7=Partial interview-breakoff -8=Survey component legitimate skip/NA -9=Missing	natlanguse 0=English is native language 1=Never 2=Sometimes 3=About half of the time 4=Always or most of the time

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Family Composition	BYFCOMP	Family composition	1=Mother and father 2=Mother and male guardian 3=Father and female guardian 4=Two guardians 5=Mother only 6=Father only 7=Female guardian only 8=Male guardian only 9=Lives with student less than half time -4=Non-respondent -8=Survey component legitimate skip/NA -9=Missing	FinalFamComp 1=traditional family 0=non-traditional family

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Parent Involvement	BYP55A + BYP57B	How often check that homework completed & Worked on homework/school projects with 10th grader	1=Never 2=Seldom 3=Usually 4=Always -1=Don't know -2=Refused -4=Non-respondent -6=Multiple response -7=Partial interview-breakoff -8=Survey component legitimate skip/NA -9=Missing	HomeworkInvolvement Scale from 0-6
Generational Status	BYP23, BYP17 & BYP20	Whether 10th grader's birthplace in US or elsewhere; Whether 10th grader's mother's birthplace in US or elsewhere; Whether 10th grader's father's birthplace in US or elsewhere	1=US 2=Puerto Rico 3=Another country/area -1=Don't know -2=Refused -4=Non-respondent -8=Survey component legitimate skip/NA -9=Missing	GenerationalStatus 1=third generation 0= first generation & second generation *REFERENCE GROUP 1=second generation 0= first generation & third generation 1=first generation 0= second generation & third generation

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Native Language	BYSTLANG	Whether English is student's native language-composite	0 =No 1 =Yes	BYSTLANG 1= English 0=Not English
Close Hispanic friends	BYSF1R_R + BYSF2R_R + BYSF3R_R	1st friend's race; 2nd friend's race; 3rd friend's race	1=Amer. Indian/Alaska Native, non-Hispanic 2=Asian, non-Hispanic 3=Black or African American, non-Hispanic 4=Hispanic, no race specified 5= Hispanic, race specified 6=More than one race, non-Hispanic 7=Native Hawaii/Pac. Islander, non-Hispanic 8=White, non-Hispanic -4=Non-respondent -8=Survey component legitimate skip/NA -9=Missing For BYSF2R_R & BYSF3R_R Add: -3=Item legitimate skip/NA	TotalHispanicFriends Scale from 0-3

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
STUDENT LEVEL				
Independent Variables (continued)				
Extracurricular involvement	BYS39A-BYS39H (intramural sports) + BYS41A-BYS41I (school sponsored activities) + BYBASEBL, BYSOFTBL, BYBASKBL, BYFOOTBL, BYSOCCER, BYTEAMSP, BYSOLOSP, BYCHRDRL (interscholastic sports)+ BYS71E (community service)	Played intramural baseball/ softball/basketball/football/soccer/ other intramural team sport/ individual intramural sport/intramural cheerleading/drill team; Participated in school band or chorus/ school play or musical/ student government/ academic honor society/school yearbook or newspaper/school service clubs/school academic clubs/ school hobby clubs/school vocational clubs; Interscholastic baseball/softball/ basketball/ football/ soccer/other interscholastic team/ individual sport/ cheerleading or drill team Participation; Participated in community service	(intramural sports) 1=School doesn't have intramural team 2=No 3=Yes -4=Non-respondent -6=Multiple response -7=Partial interview-breakoff -8=Survey component legitimate skip/NA -9=Missing (school sponsored activities) 0= No 1=Yes -1=Don't know -4=Non-respondent -6=Multiple response -8=Survey component legitimate skip/NA	Extracurricular participation 1= participation in extracurricular activities 0= no participation

-9=Missing

(interscholastic sports)

1=No interscholastic team

2=Did not participate

3=Participated at junior
varsity level

4=Participated at varsity
level

5=Participated as varsity
captain

-4=Non-respondent

-8=Survey component
legitimate skip/NA

-9=Missing

(community service)

0=No

1=Yes

-4=Non-respondent

-7=Partial interview-break-
off

-8=Survey component
legitimate skip/NA

-9=Missing

Table 17. Variable Names and Coding Strategy (continued)

Category	Source Variable(s)	Description of the Variable	Original Coding	Coding Used and Variable Name or Derived Name
SCHOOL LEVEL				
% Hispanic teachers	F1A32A	% of full-time teachers are Hispanic	Percentage -4=Non-respondent -8=Survey component legitimate skip/NA -9=Missing	F1A32A Percentage
% 10 th grade students enrolled in college prep programming	BYA14B	% 10th graders in college prep program	Percentage -4=Non-respondent -5=Out of range -7=Partial interview-breakoff -8=Survey component legitimate skip/NA -9=Missing	BYA14B Percentage
Teacher expectations	BYTE20	How far English teacher expects student to get in school	1=Less than high school graduation 2=High school graduation or GED only 3=Attend or complete 2-year college/school 4=Attend college, 4-year degree incomplete 5=Graduate from college 6=Obtain Master's degree or equivalent	FinalETEACHEXP 1=Don't know 2=Less than high school graduation 3=High school graduation or GED only 4=Attend or complete 2-year college/school 5=Attend college, 4-year degree incomplete

7=Obtain PhD, MD, or
other advanced degree
-1=Don't know
-4=Non-respondent
-6=multiple respondent
-8=Survey component
legitimate skip/NA
-9=missing

6=Graduate from college
7=Obtain Master's degree
or equivalent
8=Obtain PhD, MD, or
other advanced degree
-9=missing

APPENDIX H

PROPORTION OF STUDENTS WITH ON-TIME TRANSITION TO HIGHER
EDUCATION BY INDEPENDENT VARIABLES

Table 18. Proportion of Students with on-time Transition to Higher Education by Independent Variables

Variables	On-time Transition to Higher Education	Delayed/no Transition to Higher Education	Total
STUDENT-LEVEL			
Transition to Higher Education	53.5%	46.5%	100%
Student Educational Expectations			
Don't know	3.9%	6.8%	10.7%
High school or less	1.6%	6.3%	7.9%
Attend/complete 2-yr college	1.9%	3.6%	5.5%
Attend 4-yr college, degree incomplete	1.7%	3.3%	5.0%
Graduate from college	16.6%	17.5%	33.6%
Masters or equivalent	15.6%	5.2%	20.8%
PhD, MD, or equivalent	11.2%	5.2%	16.4%
Planning for College***			
Plans for college, action taken	45.9%	31.2%	77.1%
Plans for college, no action taken	4.7%	6.2%	10.9%
Doesn't know/no plans for college	2.8%	9.1%	12.0%
Parent Education			
Less than high school	9.8%	12.1%	21.1%
High school	8.7%	11.5%	20.2%
Some postsecondary education	18.9%	14.7%	33.6%
College degree or higher	16.9%	8.2%	25.1%
Parent Expectations of student's educational attainment**			
High school completion/GED	1.3%	3.8%	5.0%
Attend/complete 2-yr college	1.4%	2.8%	4.3%
Attend 4-yr college, no degree	0.3%	0.63%	0.95%
Graduate from college	18.8%	22.6%	41.3%
Masters or equivalent	11.7%	6.8%	18.5%
PhD, MD, or equivalent	20.0%	9.9%	30.0%
Family Composition*			
Traditional Family	34.4%	22.9%	57.3%
Non-traditional Family	19.1%	23.7%	42.7%

Note. N=630; * $p < .05$, ** $p < .01$, and *** $p < .001$ in the final model.

Table 18. Proportion of Students with on-time Transition to Higher Education by Independent Variables (continued)

Variables	On-time Transition to Higher Education	Delayed/no Transition to Higher Education	Total
STUDENT-LEVEL (continued)			
Parent Involvement			
0 on scale	1.7%	1.6%	3.3%
1 on scale	2.5%	2.2%	4.7%
2 on scale	4.6%	4.3%	8.8%
3 on scale	10.1%	9.5%	19.6%
4 on scale	12.6%	9.3%	22.0%
5 on scale	11.5%	11.4%	22.9%
6 on scale	10.4%	8.4%	18.8%
Native Language Use			
English is native language	23.0%	20.8%	43.8%
Never	1.4%	0.63%	2.1%
Sometimes	5.8%	3.3%	9.1%
About half of the time	6.0%	4.6%	10.6%
Always or most of the time	17.2%	17.2%	34.4%
Generational Status			
First Generation	10.3%	12.0%	22.2%
Second Generation	24.3%	19.1%	43.4%
Third Generation	18.9%	15.5%	34.4%
Native Language			
English	27.3%	21.9%	49.2%
Not-English	26.2%	24.6%	50.8%
Close Hispanic Friends			
None	10.1%	7.3%	17.4%
One	9.5%	8.4%	17.8%
Two	10.7%	8.7%	19.4%
Three	23.2%	22.2%	45.4%
Extracurricular Involvement***			
Yes	45.6%	31.9%	77.4%
No	7.9%	14.7%	22.6%

Note. N=630; * $p < .05$, ** $p < .01$, and *** $p < .001$ in the final model.

Table 18. Proportion of Students with on-time Transition to Higher Education by Independent Variables (continued)

Variables	On-time Transition to Higher Education	Delayed/no Transition to Higher Education	Total
STUDENT-LEVEL (continued)			
Family Income (control)**			
\$25,000 or less	14.5%	18.8%	33.3%
\$25,001-\$35,000	8.4%	10.1%	18.5%
\$35,001-\$50,000	10.7%	10.1%	20.8%
\$50,001-\$75,000	9.0%	5.7%	14.7%
\$75,001 and above	10.9%	1.9%	12.8%
Gender (control)*			
Female	30.4%	22.6%	53.0%
Male	23.0%	24.0%	47.0%
SCHOOL-LEVEL			
% Hispanic Teachers*			
Less than 10%	20.3%	18.6%	39.0%
10-20%	11.0%	11.2%	22.2%
21-30%	7.4%	6.8%	14.2%
31-50%	4.3%	3.6%	7.9%
51% and above	10.4%	6.3%	16.7%
% students enrolled in College Prep Programming			
0-10%	3.9%	7.9%	11.8%
11-40%	10.4%	13.6%	24.0%
41%-70%	9.1%	9.5%	18.6%
71%-100%	30.0%	15.6%	45.6%
Avg. Teacher Expectations of student educational attainment			
Don't know-high school completion/GED	2.1%	3.2%	5.2%
More than high school completion/GED-attend or complete 2-yr college	10.6%	12.6%	23.2%
More than attend or complete 2-yr college-attend 4-yr college, degree incomplete	16.9%	19.6%	36.4%
More than attend 4-yr college, degree incomplete-graduate from college	17.2%	10.4%	27.6%
More than graduate college-less than Masters	6.8%	0.79%	7.6%

Note. N=630; * $p < .05$, ** $p < .01$, and *** $p < .001$ in the final model.

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VITA

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